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## Sikeston Power Station 2022 Annual Groundwater Monitoring Report for Bottom Ash Pond For Compliance with USEPA 40 CFR 257.90(e)





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January 31, 2023

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## <u>Prepared for:</u> Sikeston Board of Municipal Utilities 1551 West Wakefield Avenue Sikeston, Missouri 63801

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## 1.0 EXECUTIVE SUMMARY

This report has been developed to fulfill the requirements of the United States Environmental Protection Agency (USEPA) 40 CFR 257 Subpart A – Classification of Solid Waste Disposal Facilities and Practices, which requires owners or operators to provide an Annual Groundwater Monitoring Report. Sikeston Board of Municipal Utilities (SBMU) provides this report of groundwater monitoring activities completed during 2022 for the Bottom Ash Pond at the Sikeston Power Station (SPS).

The Bottom Ash Pond at the SPS remained in Detection Monitoring status for the entirety of 2022. The ninth and tenth semiannual Detection Monitoring groundwater sampling events were initiated at the SPS Bottom Ash Pond in November 2021 (second semi-annual event for 2021) and April 2022 (first semiannual event for 2022), respectively. However, receipt of final data reports from the laboratory and data evaluation for the November 2021 event were completed during 2022 and therefore these results are addressed in this report. Although the first semiannual event for 2022 was planned and attempted in April, field equipment malfunctions delayed the sampling event until August. The second semiannual event for 2022 (eleventh semiannual Detection Monitoring groundwater sampling event) was initiated in November 2022, but receipt of final analytical reports and data evaluation were not completed prior to completion of this report.

Detection Monitoring statistical evaluations are completed after each sampling event to assess significant increases relative background data. Initial results suggested that Chloride concentrations in MW-6 had increased relative to background data during the ninth and tenth semiannual Detection Monitoring groundwater sampling events, but the increases were demonstrated to be the result of an alternate source hydraulically upgradient of the SPS. As a result, the BAP remains in Detection Monitoring status as of the date of this report.

Event Start	Event Name	Event Purpose	Final Data Received from Laboratory	Constituents Sampled	Verified SSIs	Statistical Analysis Results Completed
11/1/2021	2021 - 2nd	9th Detection	12/9/2021	Appendix III Constituents		
12/27/2021	Semi-annual Event	Verification Sampling	1/7/2021	TDS at MW-3, Chloride at MW-6	None	2/7/2022
8/3/2022	2022 - 1st	10th Detection	8/30/2022	Appendix III Constituents		
9/12/2022	Semi-annual Event	Verification Sampling	9/28/2022	TDS at MW-5, Chloride at MW-6	None	10/28/2022
11/1/2022		11th Detection	11/22/2022	Appendix III Constituents		
12/13/2022	2022 – 2nd Semi-annual Event	Verification Sampling	In Progress	TDS & pH at MW-5, Cl, TDS, & Ca at MW-6 pH at MW-3, MW-4, & MW-8	Not Completed at This Time	Not Completed at This Time

### Table 1 2022 Bottom Ash Pond Groundwater Sampling Summary

## 2.0 INTRODUCTION

The Sikeston Power Station (SPS), owned and operated by the Sikeston Board of Municipal Utilities (SBMU), is an electric power producer and distributor located within the western city limits of Sikeston, in southern Scott County, Missouri. The SBMU-SPS began operation in 1981 and produces approximately 235 megawatts. Coal combustion residuals (approximately 10,000 tons per annum) are currently sold or placed in the facility's bottom ash surface impoundment that is approximately 61 acres in size and is used for ash disposal. The second coal ash impoundment measuring approximately 30 acres in size was primarily used for fly ash disposal but is currently undergoing closure. Ash emplacement in the fly ash pond ceased on April 11, 2021, and closure was initiated on May 11, 2021. The Fly Ash Pond is subject to the alternate compliance schedule specified by the United States Environmental Protection Agency (USEPA) under 40 CFR Part 257.100(e)(5)(ii) due to its initial inactive status and the Response to Partial Vacatur (the Direct Final Rule). Consequently, this report pertains specifically to the Bottom Ash Pond.

Pursuant to USEPA's 40 CFR Part 257 (§257) Federal Criteria for Classification of Solid Waste Disposal Facilities and Practices, Subpart D – Standards for Disposal of Coal Combustion Residuals (CCR) in Landfills and Surface Impoundments (ponds), the establishment of a groundwater monitoring system and routine detection sampling and reporting is required at all coal ash surface impoundments. The purpose of a monitoring well system is to evaluate the quality of groundwater as it passes beneath the waste mass within an impoundment. Groundwater samples are collected and analyzed on a semi-annual basis in accordance with §257.93, or as otherwise detailed in a site-specific Groundwater Monitoring and Sampling Plan (GMSAP). Statistical analyses of the resulting data are conducted in accordance with §257.90(e). If results suggest a statistically significant increase (SSI) in one or more constituents for detection monitoring listed in Appendix III of §257, a written demonstration is required to determine if the SSI is attributable to an ash pond release or to other causative factors. If a successful demonstration is not made, an assessment monitoring program must be initiated as required under §257.95.

In 2018, an Alternate Source Demonstration (ASD) was prepared to address three suspected SSIs associated with the Bottom Ash Pond. The ASD was successful and recommended eight additional rounds of background groundwater sampling for the constituents listed in Appendix III and IV to Part 257 to encompass annual fluctuations in the aquifer. By October 2020 these eight additional rounds of background sampling were complete, and the resulting data and the detection monitoring results completed prior to October 2020 were used to update the baseline data sets for each well, which now includes 10 sampling events. The next background update is scheduled to follow the eleventh detection sampling event initiated in November 2022.

A collection of statistical tools, including time series plots, box and whiskers plots, histograms, probability plots, outlier analysis, trend analysis, and analysis of variation, was used to explore, understand, and prepare the data sets for statistical analysis. This analysis allowed for censoring

of outliers and data set detrending. Prediction limits were then calculated with the revised data sets described above for comparison to detection monitoring results compiled after October 2020. The 2022 statistical analysis was performed in accordance with §257.93(f) using the appropriate statistical analysis method as filed in the SBMU-SPS operating record on October 17, 2017.

This report describes the results of the ninth and tenth semiannual detection groundwater sampling events conducted at the SPS Bottom Ash Pond on November 1, 2021, and August 3, 2022. The first semiannual event for 2022 was scheduled and attempted in April 2022, but field equipment malfunctions delayed completion of the sampling event. Included is a description of the sampling events, groundwater elevations, water table surfaces, summaries of field activities, analytical results, and statistical analysis results. Field sampling and reporting activities were conducted in accordance with the site-specific GMSAP (Gredell Engineering, 2021).

The eleventh semi-annual groundwater sampling field activities were initiated on November 1, 2022, but data analysis was not complete at the time of this report. The results will therefore be included in the 2023 Annual Groundwater Monitoring Report.

## 3.0 GROUNDWATER MONITORING SYSTEM

The groundwater monitoring system for the Bottom Ash Pond consists of five monitoring wells. The wells are identified as MW-3, MW-4, MW-5, MW-6, and MW-8. Monitoring wells MW-3 and MW-6 are located hydraulically upgradient of the Bottom Ash Pond, whereas MW-4, MW-5 and MW-8 are hydraulically downgradient of the Bottom Ash Pond. MW-3 through MW-6 were installed during characterization of the site in May 2016 (Gredell Engineering, 2017). MW-8 was installed in April 2017 to serve as an additional downgradient monitoring well. Well construction activities were performed under the direction of a Registered Geologist in the State of Missouri. Well design and installation techniques were completed in accordance with 10 CSR 23-4, which is consistent with the standards summarized in 40 CFR 257.91(e). All five wells monitor uppermost groundwater, which is within the alluvial aquifer at the Bottom Ash Pond site. Each well is between 34 and 36 feet deep as measured from ground surface and yields sufficient quantities of water for the purposes of sampling and analysis.

Table 2 presents a construction summary of the wells comprising the Bottom Ash Pond groundwater monitoring system. Figures 1 and 2 depict well locations and groundwater contour maps of the uppermost aquifer for the most recent semi-annual sampling events. These maps and the historical piezometric data summarized in Table 3 confirm that water in the uppermost aquifer continues to move in a west-southwesterly direction, consistent with the conclusions of the Site Characterization Report (Gredell Engineering, 2017). All groundwater wells are equipped with dedicated tubing for use with a peristaltic pump. This system has been used for chemical sampling since inception of groundwater sampling with the Bottom Ash Pond monitoring system. The Bottom Ash Pond monitoring system is described in more detail in the site-specific GMSAP for this facility (Gredell Engineering, 2021).

## 4.0 FIELD SAMPLING SUMMARY

SPS environmental staff initiated the ninth semi-annual detection groundwater sampling event on November 1, 2021, at the Sikeston Power Station. Following this sampling event, it was noted that Total Dissolved Solids (TDS) analysis for sample MW-3 was completed after the hold time had expired and the Chloride concentration for sample MW-6 exceeded its prediction limit. In accordance with the statistical analysis program, these well constituent pairs were resampled on December 27, 2021. The resample data for the ninth semi-annual detection resulted in an unqualified TDS result for MW-3 that did not exceed the prediction limit and confirmed the SSI of Chloride at MW-6.

SPS environmental staff attempted to initiate the tenth semi-annual detection groundwater sampling event in April 2021, but field equipment malfunctions delayed completion until August 3, 2022. Following the August sampling event, it was noted that Total Dissolved Solids (TDS) analysis for sample MW-5 and the Chloride concentration for sample MW-6 exceeded their respective prediction limits. In accordance with the statistical analysis program, these well constituent pairs were resampled on September 12, 2022. The resample data for the tenth semi-annual detection resulted in rejection of a false positive exceedance of the prediction limit for TDS in MW-5 but confirmed the SSI of Chloride at MW-6.

Potential sources were investigated to assess a cause for the increase in Chloride concentration in groundwater samples from MW-6 during each sampling event. An Alternate Source Demonstration (ASD) was successfully completed for each SSI occurrence. The increase in Chloride in this upgradient well was attributed to an alternate source up gradient of the ash pond. These ASDs are provided in Appendix 8.

Sampling procedures for both sampling events were consistent with the GMSAP. Groundwater samples were collected using low-flow sampling techniques and dedicated sampling equipment. Field tests of indicator parameters were performed using an In-Situ, Inc. SmarTROLL<sup>™</sup> MP or Aqua TROLL 400 Multiparameter Probe with flow cell unit and HF Scientific MicroTPI field portable turbidimeter. Each groundwater sample was subsequently analyzed for the constituents listed in §257 Appendix III. All monitoring wells produced sufficient volumes of groundwater for full analysis.

SPS environmental staff inspected each monitoring well upon arrival. Wells were reported to be in satisfactory condition and had locks in place. Staff initially gauged water levels in the monitoring wells using a standard electronic water level meter graduated in increments of 0.01 feet. Static water levels were recorded on forms provided in the GMSAP. Each well was then purged while staff monitored water quality until indicator parameters (pH and specific conductance) stabilized in accordance with the criteria in the GMSAP. Additional parameters (turbidity, temperature, dissolved oxygen, and oxidation/reduction potential) were also monitored for stability prior to groundwater sample collection. Following stabilization of indicator parameters, final field data were recorded, and groundwater samples were then collected.

Field notes documenting the sampling events and copies of the chain-of-custody forms are presented in Appendix 1. Field sampling notes are also summarized in Table 4, including initial and final water level measurements, purge volumes, and pH. Laboratory analytical reports for the sampling events, including the field blanks and sample duplicates, and Quality Assurance/Quality Control (QA/QC) documentation are presented in Appendix 2. A summary of background and detection monitoring analytical data, including field parameters, is presented in Appendix 3.

## 4.1 Field Quality Assurance/Quality Control

Field QA/QC during the November 1, 2021, sampling event included the collection of one field blank and one field duplicate. The duplicate was collected from MW-8 (Table 6). Rinsate blanks were not collected because dedicated sampling equipment was used. Samples were shipped to PDC Laboratories' (now Pace Analytical Services, LLC) primary facility located in Peoria, Illinois using standard chain-of-custody documentation procedures. Samples collected during this sampling event were received by the primary facility on November 3, 2021, and subsequently analyzed for the six detection monitoring constituents listed in §257 Appendix III and required under §257.94(b) (Table 5). Results for these six detection monitoring constituents and field-measured pH are provided in the final analytical report, which was received from PDC Laboratories on December 9, 2021.

Similarly, field QA/QC during the August 3, 2022, sampling event included collection of one field blank and one field duplicate. The duplicate was again collected from MW-8 (Table 6). Rinsate blanks were not collected because dedicated sampling equipment was used. Samples were shipped to Pace Analytical Services, LLC primary facility located in Peoria, Illinois using standard chain-of-custody documentation procedures. Samples collected during this sampling event were received by the primary facility on August 5, 2022, and subsequently analyzed for the six detection monitoring constituents listed in §257 Appendix III and required under §257.94(b) (Table 5). Results for these six detection monitoring constituents and field-measured pH are provided in the final analytical reports, which were received from PDC Laboratories on August 30, 2022.

## 5.0 ANALYTICAL SUMMARY

Analytical data summary reports for each monitoring well sampled during the ninth and tenth detection monitoring events are provided in Appendix 2. The data pertain to water quality results from the uppermost aquifer beneath the Bottom Ash Pond, along with sample duplicates and field blank results.

## 5.1 Laboratory Quality Control

Laboratory analyses of all groundwater samples collected during the ninth and tenth detection monitoring events were completed by Pace Analytical Services, LLC of Peoria, Illinois (formerly PDC Laboratories, Inc.). The results were accompanied by appropriate QA/QC documentation. That documentation is presented in Appendix 2.

## 5.2 **Precision and Accuracy**

Precision is a measure of the reproducibility of analytical results, generally expressed as a *Relative Percent Difference (RPD)*. 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. Accuracy is defined as the degree of agreement between the measured amount of a species and the amount actually known to be present, expressed as a percentage. It is generally determined by calculating the percent recoveries for analyses of surrogate compounds, laboratory control samples, continuing calibration check standards and matrix spike samples. Acceptable percent recoveries are established for SW-846 and USEPA methods. Field and laboratory blank analyses are also used to address measurement bias.

The analyses of the samples collected during the ninth detection monitoring event were performed within appropriate hold times (except as noted above for TDS in MW-3) and both initial and continuing calibrations met acceptance criteria for all analyses. Similarly, method blanks and LCS analyses met acceptance criteria. The case narrative for the November 2021 sampling event indicates that all testing was performed according to the lab's TNI accreditations. However, TDS analysis for MW-3 was conducted outside the seven-day hold time and the result was qualified in the analytical report, but subsequent resampling at MW-3 on December 27, 2021 resulted in a TDS concentration analyzed within acceptable hold time.

The analyses of the samples collected during the tenth detection monitoring event were also performed within appropriate hold times and both initial and continuing calibrations met acceptance criteria for all analyses. Similarly, method blanks and LCS analyses met acceptance criteria. The case narrative for this sampling event indicates that all testing was performed according to the lab's TNI accreditations. However, TDS failed to meet the required acceptance criteria for duplicate analysis and the result was qualified in the analytical report.

Additional QA/QC comments for these sampling events include the following:

• *Field Duplicates:* Analyses of duplicate samples are used to define the total variability of the sampling/analytical system as a whole. One field duplicate from MW-8 was collected

during each of the sampling events. RPDs were calculated for all detected chemical parameters, and a summary table showing the results of the RPD calculations is included as Table 6. Using a tolerance level of  $\pm 20$  percent, all calculated RPDs were within acceptable ranges for each parameter.

- *Field Blank:* One field blank was incorporated into the data set for each sampling event. The field blank analytical results for the ninth and tenth events indicate low levels of Boron (11 ug/L and 12 ug/L), respectively.
- *Laboratory Blanks:* Method blanks, artificial, and matrix-less samples are analyzed to monitor the laboratory system for interferences and contamination from glassware, reagents, etc. Method blanks are taken throughout 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. Reference to Appendix 2 should be made for comments related to these and other laboratory control samples.

## 5.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely reflect site conditions. Representativeness of the data is determined by comparing actual sampling procedures to those delineated in the field sampling plan, comparing results from field duplicate samples and reviewing the results of field blanks.

Approved sampling procedures are described in the GMSAP. Procedures specified in that plan have been followed. Approved sampling procedures should be reviewed annually. Groundwater monitoring data is evaluated using an intrawell statistical analysis methodology and is conducted separately for each constituent in each monitoring well using prediction limits in accordance with §257.93(f)(3) and the performance standards in §257.93(g). The stated statistical approach, along with supporting documentation and engineering certification, are available in the SBMU-SPS On-Site Operating Record.

### 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 (Appendix 2). Furthermore, the sample must have been analyzed within the specified holding time and in such a manner that analytical QC acceptance criteria are met.

## 6.0 STATISTICAL ANALYSIS

The statistical analysis approach used to evaluate groundwater within the uppermost aquifer for the Bottom Ash Pond monitoring well network at SBMU-SPS consists of intra-well analysis using prediction limits. The analysis is conducted separately for each constituent in each of the five monitoring wells for each sampling event in accordance with §257.93(f)(3). This statistical method complies with the accepted performance standards listed in §257.93(g).

The background data used to evaluate current groundwater quality in MW-3, MW-4, MW-5, and MW-6 is based on 18 rounds of groundwater sampling spanning November 2016 to October 2020. The background data used to evaluate current groundwater quality MW-8 is based on 18 rounds of groundwater sampling spanning May 2017 to October 2020. In general, all background data were used for each well constituent pair. However, data trend removal and screening of outliers reduced the background sample population for some well constituent pairs (Appendix 3). The background may be updated every two years in accordance with Unified Guidance (USEPA, 2009).

Statistical analysis was performed in accordance with §257.93 using Sanitas© for Ground Water (Version 9.6.35; 2022). Intra-well prediction intervals were compared at the 99 percent confidence level for each constituent with a 1 of 2 retest methodology to improve accuracy and reduce false positives. The groundwater results from the ninth and tenth semiannual detection groundwater sampling events conducted at the SPS Bottom Ash Pond were compared to the prediction limits (Table 8) to determine if SSIs over background were apparent.

If the number of reportable concentrations of a given constituent in a database for a given well is not sufficient to permit parametric analysis, non-parametric prediction interval analysis is conducted. Both parametric and non-parametric prediction limit analysis were performed for the Bottom Ash Pond groundwater monitoring well network data. Following review of baseline data for outliers and trends, prediction intervals are computed based on the reviewed and screened background monitoring data sets (Appendix 3), including values reported as less than detection limits.

Initially, outlier analysis was performed for the background data set using Exploratory Data Analysis (EDA) with Sanitas©, time-series plots, box and whiskers plots, histograms, and probability plots. These analyses resulted in the identification of 12 outliers from the 630 data points. The outliers are identified with shaded cells in Appendix 3 and were screened from the background data prior to conducting additional statistical analysis. Trend analysis was also conducted on the screened background data sets using Sanitas© and modification of data sets was completed where constituent-well pairs were found to be significantly trending upward (or downward in the case of pH). The resulting alternate data sets are summarized in Table 7 and in Appendix 3.

The results of the statistical analysis for the ninth and tenth semiannual detection groundwater sampling events are described below. A complete database summarizing the sample results, dates of sampling, and the purpose of sampling event, as per §257.90(e)(3), is provided in Appendix 3. A statistical power curve, based on the background data, is provided in Appendix 4.

Time series plots of background data for all detection monitoring constituents are presented in Appendix 5. Box and whiskers plots of background data are presented in Appendix 6. Prediction limit charts are provided in Appendix 7.

## 6.1 Statistical Results

The results of the statistical analysis for the ninth and tenth semiannual detection groundwater sampling events did not suggest the presence of SSIs associated with a release from the the Bottom Ash Pond at the Sikeston Power Station. Consequently, semi-annual detection monitoring should continue as specified in §257.94(b).

## 7.0 LIMITATIONS

This report has been prepared for the exclusive use of the client and GREDELL Engineering Resources, Inc. for the specific project discussed in accordance with generally accepted environmental practices common to this locale at this time. The report is applicable only to this specific project and identified site conditions as they existed at the time of report preparation. The use of this report by others to develop independent interpretations of data or conclusions not explicitly stated in this report are the sole responsibility of those firms or individuals.

This report is not a guarantee of subsurface conditions. Variations in subsurface conditions may be present that were not identified during this or previous investigations. Interpretations of data and recommendations made in this report are based on observations of data that were available and referred to in this report unless otherwise noted. No other warranties, expressed or implied, are provided.

## 8.0 **REFERENCES**

GREDELL Engineering Resources, Inc., 2017, *Sikeston Power Station Site Characterization for Compliance with Missouri State Operating Permit #MO-0095575*, dated May 2017.

GREDELL Engineering Resources, Inc., 2019, Sikeston Power Station, 2018 Annual Groundwater Monitoring and Corrective Action Report for Bottom Ash Pond for Compliance with USEPA 40 CFR 257.90(e), dated January 30, 2019.

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# TABLES

Table 2Groundwater Monitoring Network Summary

Monitoring Well ID <sup>1,2</sup>	Northing Location <sup>3,4</sup>	Easting Location <sup>3,4</sup>	Ground Surface Elevation <sup>3,4</sup> (feet)	Top of Riser Elevation <sup>3,4</sup> (feet)	Well Depth <sup>5</sup> (feet)	Base of Well Elevation <sup>6</sup> (feet)	Screen Length <sup>7</sup> (feet)	Top of Screen Elevation (feet)
MW-3	381130.00	1079946.62	306.11	308.55	37.21	271.34	10	281.5
MW-4	380804.62	1077766.95	303.26	305.61	37.55	268.06	10	278.3
MW-5	379858.94	1078477.85	303.57	305.91	37.17	268.74	10	278.9
MW-6	379874.77	1079384.36	305.37	307.72	38.03	269.69	10	279.9
MW-8	380311.20	1077940.08	302.37	304.77	37.41	267.36	10	277.6

#### NOTES:

1. Refer to Figure 1 for monitoring well locations.

2. Refer to Sikeston Power Station On-Site Operating Record for well construction diagrams.

3. Monitoring well survey data provided by Bowen Engineering & Surveying, Inc.

4. Horizontal Datum: Missouri State Plane Coordinates - NAD 83 (Feet), Vertical Datum: NAVD 88 (Feet).

5. Depth measurements relative to surveyed point on top of well casing.

6. Sump installed at base of screen (0.2 feet length).

7. Actual screen length (9.7 feet) is the machine-slotted section of the 10-foot length of Schedule 40 PVC pipe.

#### Table 3

#### Historical Groundwater Level Summary

Well ID	MW-3	MW-4	MW-5	MW-6	MW-8
Date		Groundw	ater Elevation (	(feet MSL)	
05/12/16	298.13	296.01	296.68	297.41	NM
06/28/16	297.58	294.75	295.51	296.57	NM
07/15/16	297.37	294.77	295.53	296.44	NM
08/08/16	297.05	294.66	294.87	295.77	NM
09/08/16	296.76	294.40	294.96	295.84	NM
10/05/16	296.40	294.02	294.70	295.57	NM
11/01/16	296.10	293.99	294.49	295.24	NM
11/30/16	296.03	294.26	294.80	295.37	NM
01/24/17	296.35	294.73	295.19	295.77	NM
01/26/17	296.35	294.73	295.19	295.77	NM
02/22/17	296.00	294.40	294.81	295.41	NM
02/24/17	296.00	294.40	294.81	295.41	NM
03/20/17	296.45	295.10	295.46	295.97	NM
04/19/17	296.35	294.73	295.19	295.81	NM
04/27/17	296.72	295.41	295.78	296.20	NM
05/17/17	297.81	295.76	296.31	297.11	NM
05/18/17	NM	NM	NM	NM	295.67
06/08/17	297.81	295.64	296.17	296.96	NM
06/09/17	NM	NM	NM	NM	295.57
07/13/17	296.98	294.60	295.22	296.06	294.70
08/03/17	NM	NM	NM	NM	294.12
08/15/17	NM	NM	NM	NM	294.02
08/30/17	NM	NM	NM	NM	293.72
09/14/17	NM	NM	NM	NM	293.57
09/27/17	NM	NM	NM	NM	293.26
10/31/17	295.22	293.11	293.65	294.41	293.20
06/13/18	297.33	294.93	295.60	296.47	295.02
11/26/18	295.63	293.76	294.27	294.91	293.88
12/26/18	296.04	294.19	294.64	295.36	294.31
01/08/19	296.38	294.62	295.17	295.77	294.73
02/05/19	296.73	294.99	295.46	296.06	295.07
02/22/19	298.35	296.58	297.33	297.94	296.79
03/27/19	298.51	296.05	296.72	297.69	296.15
04/16/19	298.93	296.58	297.31	298.22	296.67
05/14/19	299.25	296.36	297.10	298.21	296.45
05/28/19	298.95	296.01	296.80	297.91	296.16
06/12/19	298.82	296.00	296.71	297.82	296.10
07/17/19	298.38	295.84	296.46	297.44	295.97
07/24/19	298.41	295.97	296.66	297.57	296.13
08/14/19	297.80	295.03	295.70	296.76	295.12
08/28/19	297.55	294.81	295.47	296.51	294.91
09/16/19	297.22	294.51	295.20	296.20	294.63
10/10/19	296.84	294.29	294.89	295.85	294.36
10/22/19	296.80	294.40	295.00	295.88	294.50
11/04/19	297.34	295.24	295.80	296.57	295.32
02/18/20	299.00	296.50	297.28	298.22	296.66
03/30/20	300.09	297.66	298.48	299.40	297.81
07/21/20	298.35	295.16	295.98	297.19	295.32
10/20/20	297.08	294.53	295.29	296.17	294.77
04/16/21	298.03	295.55	296.08	297.06	295.55
11/01/21	295.95	293.74	294.31	295.11	293.86
08/03/22	296.52	293.79	294.40	295.47	293.87

#### NOTES:

1. Refer to Figure 1 for monitoring well locations.

2. Refer to Sikeston Power Station On-Site Operating Record for well construction diagrams.

3. NM - Not Measured.

4. Maximum and minimum groundwater elevations are shaded.

# Table 4Water Level and Field Parameter Summary<br/>November 1, 2021

Monitoring Well I.D.	Hydraulic Position	Initial Water Level (ft, BTOC <sup>2</sup> )	Final Water Level (ft, BTOC <sup>2</sup> )	Minimum <sup>3</sup> Purge Vol. (mL <sup>4</sup> )	Actual Purge Vol. (mL <sup>4</sup> )	pH (S.U.⁵)
MW-3	Upgradient	12.60	12.60	300	5,740	6.57
MW-4	Downgradient	11.87	11.87	300	3,620	7.34
MW-5	Downgradient	11.60	11.60	300	4,340	6.90
MW-6	Upgradient	12.61	12.61	300	6,560	6.88
MW-8	Downgradient	10.91	10.91	300	2,860	7.16

#### Water Level and Field Parameter Summary August 3, 2022

Monitoring Well I.D.	Hydraulic Position	Initial Water Level (ft, BTOC <sup>2</sup> )	Final Water Level (ft, BTOC <sup>2</sup> )	Minimum <sup>3</sup> Purge Vol. (mL <sup>4</sup> )	Actual Purge Vol. (mL <sup>4</sup> )	pH (S.U.⁵)
MW-3	Upgradient	12.03	12.03	300	7,700	6.65
MW-4	Downgradient	11.82	11.82	300	8,480	7.32
MW-5	Downgradient	11.51	11.51	300	9,120	6.82
MW-6	Upgradient	12.25	12.25	300	8,100	6.86
MW-8	Downgradient	10.90	10.90	300	5,440	7.08

#### NOTES:

1. Sequence of sampling is MW-3, MW-6, MW-5, MW-8, MW-4.

2. BTOC: Below Top of Casing

3. Purge calculations based on 1/4" ID tubing and complete evacuation of single tubing volume.

4. mL: milliliter

5. S.U.: Standard Unit.

## Table 5Groundwater Monitoring Constituents

	US	EPA 40 CFR 257		
Appendix III	-	Appendix IV -		
Constituents for Detectio	n Monitoring	Constituents for Assessment M	onitoring	
Chemical Constituent Method		Chemical Constituent	Method	
pH (S.U.)	Field	Antimony (µg/L)	SW 6020	
Boron (µg/L)	SW 6020	Arsenic (μg/L)	SW 6020	
Calcium (mg/L)	SW 6020	Barium (µg/L)	SW 6020	
Chloride (mg/L)	EPA 300.0	Beryllium (µg/L)	SW 6020	
Fluoride (mg/L)	EPA 300.0	Cadmium (µg/L)	SW 6020	
Sulfate (mg/L)	EPA 300.0	Chromium (µg/L)	SW 6020	
Total Dissolved Solids (mg/L)	SM 2540C	Cobalt (µg/L)	SW 6020	
		Fluoride (mg/L)	EPA 300	
		Lead (µg/L)	SW 6020	
		Lithium (µg/L)	SW 6020	
		Mercury (µg/L)	SW 6020	
		Molybdenum (µg/L)	SW 6020	
		Selenium (μg/L)	SW 6020	
		Thallium (μg/L)	SW 6020	
		Radium 226 and 228 combined (pCi/L)	EPA 903.1 & 904.0	

#### NOTES:

- 1. S.U. = Standard Unit.
- 2.  $\mu$ g/L = micrograms per liter.
- 3. mg/L = milligrams per liter.
- 4. pCi/L = picocurie per liter.

Prepared by: KAE Checked by: JMC Approved by: MCC

# Table 6Relative Percent Difference Summary -<br/>November 1, 2021

Chemical Parameter	Units	MW-8	DUP	Relative Percent Difference
рН	S.U.	7.16	7.16	0.00
Boron	µg/L	430	440	2.30
Calcium	mg/L	80	82	2.47
Chloride	mg/L	45	40	11.76
Fluoride	mg/L	0.258	0.256	0.78
Sulfate	mg/L	94	87	7.73
Total Dissolved Solids	mg/L	360	390	8.00

### Relative Percent Difference Summary -August 3, 2022

Chemical Parameter	Units	MW-8	DUP	Relative Percent Difference
рН	S.U.	7.08	7.08	0.00
Boron	µg/L	420	410	2.41
Calcium	mg/L	100	100	0.00
Chloride	mg/L	56	55	1.80
Fluoride	mg/L	<0.250	<0.250	N/A
Sulfate	mg/L	140	140	0.00
Total Dissolved Solids	mg/L	490	490	0.00

#### NOTES:

1. S.U. = Standard Unit.

2.  $\mu$ g/L = micrograms per liter.

3. mg/L = milligrams per liter.

4. Relative Percent Difference tolerance = 20%.

5. N/A = Not applicable - parameter concentration below reporting limit.

#### Table 7 Alternate Data Sets

Constitu	uent-Well Pair <sup>1</sup>	Alternate Background Data Base	Background
Well ID Constituent		(to eliminate trending data) <sup>2</sup>	set size (n)
MW-3	рН	June 2017 through October 2020	12
MNA/ C	pН	January 2017 through October 2020	17
0- 99191	Boron	November 2018 through October 2020	8
	Calcium	November 2018 through October 2020	8
MW-8	Chloride	June 2018 through October 2020	8
	Total Dissolved Solids	November 2018 through October 2020	8

#### NOTES:

1. Trending constituent-well pairs identified based on Mann-Kendall Sen's Slope Trend Analysis of data.

2. Alternate background data sets eliminate significant increasing (or decreasing for pH) trends in data sets.

40 CFR 257 Appendix III Constituents for Detection Monitoring	Units	MW-3	MW-4	MW-5	MW-6	MW-8
pH Upper	S.U.	6.772	7.516	7.011	7.00	7.242
pH Lower	S.U.	6.254	7.221	6.68	6.67	7.038
Chloride	mg/L	2.43	19.57	19.46	2.954	78.74
Fluoride	mg/L	0.438	0.259	0.272	0.338	0.26
Sulfate	mg/L	29.71	144.5	267.4	40.3	149.9
Total Dissolved Solids	mg/L	183.4	414.6	545.9	251.5	547.4
Boron	µg/L	52.07	1549	537.2	58.99	577.9
Calcium	mg/L	23.56	97.16	132.9	48.81	120

## Table 8 Intra-Well Prediction Limit Summary

#### NOTES:

1. Prediction limits for MW-3 through MW-6 based on data spanning November 2016 to October 2020, except as noted in Table 7.

2. Prediction limits for MW-8 based on data spanning May 2017 to October 2020, except as noted in Table 7.

# **FIGURES**





LEGEND	
PROPERTY LINE	PL
GROUNDWATER CONTOUR	
MONITORING WELL	(MW)
UP GRADIENT MONITORING LOCATION	UG
DOWN GRADIENT MONITORING LOCATION	DG
GENERAL FLOW DIRECTION	-

- NOTES:

   1. IMAGE PROVIDED BY BING MAPS.

   2. MONITORING WELL LOCATIONS, CASING ELEVATIONS & UNDERGROUND CULVERT ELEVATIONS SURVEYED BY BOWEN ENGINEERING & SURVEYING.

   3. GROUNDWATER ELEVATIONS MEASURED BY SIKESTON POWER STATION STAFF ON NOVEMBER 1, 2021.

   4. MAP DEVELOPMENT BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.

   5. RANGE OF HYDRAULIC GRADIENT AS DETERMINED BY SURFER® SOFTWARE

   6. RANGE OF HYDRAULIC GRADIENT AS DETERMINED BY SURFER® SOFTWARE

ID	GROUNDWATER ELEVATION	CASING ELEVATION	NORTHING	EASTING
3	295.95	308.55	381130.00	1079946.62
4	293.74	305.61	380804.62	1077766.95
5	294.31	305.91	379858.94	1078477.85
6	295.11	307.72	379874.77	1079384.36
3	293.86	304.77	380311.20	1077940.08

GREDELL Engine	ering Resources, Inc.	0,	IKES1	d NO	OWER ASH F	STATIO OND	z		IGURE 1		THE GEOLOGIST WHO REVIEWED AND APPROVED THIS REPORT ASSUMES RESPONSIBILITY ONLY FOR GEOLOGIC INTERPRETATIONS OF DATA APPEARING ON THE PAGE AND DISCLAIMS PUBSILIANT TO SECTION
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1505 East High Street	Telephone: (573) 659-9078		MOM	TOR	NG & F	REPORT					OTHER DOCUMENTS OR INSTRUMENTS NOT PREPARED UNDER THE SUPERVISION OF THE GEOLOGIST RELATING
Jerrerson City, Missouri	Facsimile: (5/3) 659-90/9	SURVEYED DES	SIGNED DF	RAWN CF	ECKED APF	ROVED DA	TE SCA	E PROJECT NAME TED CIK ECTON / CW/MA D / DA	FILE NAME	SHEET #	TO OR INTENDED TO BE USED FOR ANY PART OR PARTS
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MW-3 MW-4 MW-5 MW-6 MW-8



LEGEND	
PROPERTY LINE	PL
GROUNDWATER CONTOUR	
MONITORING WELL	<u>m</u> w
UP GRADIENT MONITORING LOCATION	UG
DOWN GRADIENT MONITORING LOCATION	DG
GENERAL FLOW DIRECTION	-

- NOTES:

   1. IMAGE PROVIDED BY BING MAPS.

   2. MONITORING WELL LOCATIONS, CASING ELEVATIONS & UNDERGROUND CULVERT ELEVATIONS SURVEYED BY BOWEN ENGINEERING & SURVEYING.

   3. GROUNDWATER ELEVATIONS MEASURED BY SIKESTON POWER STATION STAFF ON AUGUST 3, 2022.

   4. MAP DEVELOPMENT BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.

   5. RANGE OF HYDRAULIC GRADIENT AS DETERMINED BY SURFER® SOFTWARE

   4. MAP DEVELOPMENT BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE

WELL ID	GROUNDWATER ELEVATION	CASING ELEVATION	NORTHING	EASTING
MW-3	296.52	308.55	381130.00	1079946.62
MW-4	293.79	305.61	380804.62	1077766.95
MW-5	294.40	305.91	379858.94	1078477.85
MW-6	295.47	307.72	379874.77	1079384.36
MW-8	293.87	304.77	380311.20	1077940.08

GREDFLL Enginee	sring Resources Inc	SIKE	STON	POWE	R STA	LION		FIG	iure 2		THE GEOLOGIST WHO REVIEWED AND APPROVED THIS REPORT ASSUMES RESPONSIBILITY ONLY FOR GEOLOGIC INTERPRETATIONS OF DATA APPEARING ON
	ERING LAND - AIR - WATER	2022	ANNU	M ASI AL GR		VATER		GROUNDWAT	ER CONTOUR M/	٩	THE PAGE AND DISCLAIMS PURSUANT TO SECTION SEG 4468 RSMO ANY RESPONSIBILITY FOR ALL OTHER PLANS SPECIFICATIONS FSTIMATES REPORTS OF
1505 East High Street	Telephone: (573) 659-9078	Ĕ	INITO	RING 8	k REPO	RT		ñ no	01 0, 2022		OTHER DOCUMENTS OR INSTRUMENTS NOT PREPARED UNDER THE SUPERVISION OF THE GEOLOGIST RELATING
JETTERSON CITY, INISSOURI MO CORP. ENGINEERIN	6 LICENSE NO. E-2001001669-D	URVEYED DESIGNED		CHECKED KE	APPROVED MCC 1	DATE 10/2022	SCALE AS NOTED	PROJECT NAME SIKESTON/GWMAP/BAP	FILE NAME GW CONT BAP 10-2022	SHEET # 1 OF 1	TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS FIGURE REFERS.



# Appendix 1

Field Sampling Notes

# **Appendix 1a**

Field Sampling Notes – November 1, 2021 (Second 2021 Semi-annual Event) Field Instrumentation Calibration Log

Facility: SBMU SPS CCR Groundwater Sampling

Callbrated by: ASLish Parel

	Field Instr	uments:	In-Situ	ទា	arTROLL Fie	ld Meter					HF scientif	ic, i	nc. Micro TPI Fl	eld Portable Tur	bld	imeter			
		S/N #:		7	424	7			. 8	/N 1	:201	60	07366	ale ware die die state alle alle alle alle alle alle alle					
	Date	Timə	pH Standa	rds	pH Measure- ments	Specific Conductand Standard (µS/cm)	:0	Specific Conductance Measurement (µS/cm)	Oxidation Ře Stan	edu dar	ction Potent d (mV)	lai	Oxidation Reduction Potential Measurement (mV)	Dissolved (%	Ox )	ygen	Turbidity Standard* (NTU)		Turbidity Measurements (NTU)
			4.00	=	4.00				Temperature	=	17.98			Temperature (°C)	=	17.94	0.02	=	0.02
of Day	11/01		7.00	=	7.00									Tap Water Source	×	Sikeshe City	10.0	=	10.0
ginning c Calibrati	2021	0625	10.00	=	10.00	1413	=	140.5	Standard (mV)	=	229.0	=	229.6	Barometric Pressure (mm/Hg)	=	1013.6	1000	=	1000.0
B			10.00		0.00									Measurement	4	99.98			
			4.00	=	4.02				Temperature	=	17.85			Temperature (°C)	:	16.33	0.02	=	0.0/
Check			7.00	=	7.02									Tap Water Source	=	140:19 City	10.0	=	9.87
l of Day (	2021	1710	10.00	-	9.95	1413	=	1430.9	Standard (mV)	=	229.0	=	233.6	Barometric Pressure (mm/Hg)	=	1013	1000	=	9942
End			10.00		1.0									Measurement	=	10437			

The Multi-Probe Field Meter measures Temperature, Specific Conductance, Dissolved Oxygen, pH, and Oxidation Reduction Potential. Notes:

The HF scientific, inc. Micro TPI Field Portable Turbidimeter measures Turbidity.

Dissolved oxygen is calibrated via % saturation method; however, field measurements are recorded as mg/L

I certify that the aforementioned meters were calibrated within the manufacturers specifications.

By: ABL, M. Parel Date: 11-01-2321

## Monitoring Well Field Inspection

Monitoring Well ID: <u>MW 3</u> Name (Field Staff): <u>A futel D Dillingham</u> Date: <u>11/1/21</u>
Access: Accessibility: Good / Fair Poor Poor Well clear of weeds and/or debris?: Yes / No Well identification clearly visible?: Yes / No Poor No Poor Accessibility:
Remarks:         Concrete Pad:       Good // Inadequate         Condition of Concrete Pad:       Good // Inadequate         Depressions or standing water around well?:       Yes       No // //         Remarks:       Remarks:       No // //
Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good        Damaged         Condition of Locking Cap:       Good        Damaged         Condition of Lock:       Good        Damaged         Condition of Weep Hole:       Good        Damaged         Remarks:       Baraged
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded         Condition of Riser:       Good // Damaged         Condition of Riser Cap:       Good // Damaged         Measurement Reference Point:       Yes // No         Remarks:       Kenarks:
Dedicated Purging/Sampling Device:       Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flexible         Silicone Tubing       Silicone Tubing         Condition:       Good / Damaged       Missing         Remarks:       Monitoring Well Locked/Secured Post Sampling?:       Yes / No         Remarks:       No
Field Certification Ashish Casel Las Tech 11/01/202 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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## Field Sampling Log

Monitor	ing Well ID:	MW	3 Fac	ility: SBML	Sikeston Po	ower Statio	n - Groundw	ater Monitor	ing	
Initial Wate	r Level (feet	btoc):	12.60			Date: /	1.01	-2021		
Initial Grou	ndwater Elev	ation (NAVD	88):		·	Air Pressui	e in Well?	YI		روې ورو ه م مه وه وه وه
PURGE IN	FORMATIO	N	a :	ನಂ.ಕರ್ಮ ನಂ.ಪುರ್ವಾನ,		k werke in it is an and analyzing	s (respectively) and the second			
Date:	11-2	01-202								
Name (San	nple Collecto	or):	0:11	inghi	(M)	* *				
Method of	Well Purge:	Low Flow	Perstaltic I	Pump	Dec	licated Tub	ing?	M I N		
Time Purgi	ng Initiated:	Č	723		One	e (1) Well V	oiume (mL):		NA	
Beginning	Water Level	(feet btoc):	14	2.60	Tot	el Volume I	ourged (mL)	: .	574	5
Beginning	Groundwate	r Elevation (N	IAVD88):		We	li Purged T	o Dryness?		Y / 🚯	
Well Total	Depth (feet l	btoc):	36.98	)	Wa	ter Level af	ter Samplin	(feet btoc):	12.6	0
Casing Dia	meter (feet)	: 2" Sch 40	) PVC			(i.	e., pump is c	f <b>f)</b>		
odding on	(100)				Tim	ne Sampling	Completed	:		
PURGE ST	ABILIZATI	ON DATA			8		Ovidation			
Time	Purge Rate	Cumulative	Temp	Specific Conductance	Dissolved Oxygen	pH	Reduction	Turbidity	Water Level	Notes (e.g., opacity,
	(mL/min)	(mL)	(°C)	(µS/cm)	(mg/L)	(S.U.)	Potential (mV)	(NTU)	(feet btoc)	color, odor)
0725		420	13.53	211.15	16.12	7.03	76.5	14.68	12.60	Fight aby
0727	270	960	12.78	208.15	14,17	6.69	88.0	11.74	12.60	tr Bi
0729	260	1480	12.44	206.77	13.43	6.57	90.0	10.07	12.60	A. 19
0731	270	2020	12.25	204.93	12.76	6.52	99.2	7.25	12.60	Clear, Mar.
0733	20	2540	12.12	203.24	12.61	6.51	85.6	4.93	12.60	
0735	270	3080	12.04	Dol. 10	12.19	6.53	81.0	3.19	12.60	
0737	260	3600	12.00	202:02	12.61	6.52	79.0	3.33	12.60	100
0739	270	<i>u1</i> 45	12.02	194.55	11.52	6.64	76.2	2,71	12.60	
0741	210	4660	11.94	200.00	11.47	6.54	74.6	1.99	12.60	10 IV
0743	270	5200	11.90	199.92	10.74	6.55	72.2	1.73	12.60	s• )/
0745	270	5740	11.89	199.66	10.10	6.57	70.3	1.46	12.60	35 97
								2		
							5. K.			
					55					
2 2										
1					1 V		1			
		1								
						· · · ·				

btoc - below top of casing

Field	Sam	pling	Log
-------	-----	-------	-----

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We	IIID: M	W3
Sampling Informa	ation:			, .			
Method of Samplin	ig: Low Flow -	Perstaltic Pum	p & Tubing			Dedicated:	(Y / N
Water Level @ Sa	mpling (feet btoc)	): 12.6	2				
Monitoring Event:	Annual ( )	Semi-Annua	al () Quarte	rly() Me	onthly ( )	Other ()	
Final Purge Stabliz	ation Sampling [	Data:	·	Tu (b) 1000			
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp • • (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
11/1/21	270	11.89	199.66	10.10	6.57	70.3	J. 46
2 - HF scientific, in General Information Weather Condition	nc. Micro TPI Fie ion: ns @ time of sam	ld Portable Turb	idimeter Błly J	qur		• •	
Sample Character	istics:	lear a	1 oness,	OZONess.			<u></u>
Sample Collection	Order:	Per SAP	· • 4.	×. 		· · · ·	• .
Comments and Oi	bservations:		2 G - 2 A		t et ag	ę n	έφ
αΨ¢ τ Φ		41 	k kan lang B	3	1 a 24	4. 31	
		. 21 1					
	۴.						٠
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Mangagan karapan dan penggan sana dan sana dan karapan karapan karapan karapan karapan karapan karapan karapan Karapan karapan karapan Karapan karapan							
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				•			
				•	•••••	· · · · · · · · · · · · · · · · · · ·	

I certify that sampling procedures were in accordance with applicable EPA and State protocols.

h.31 Date: / / - / -C a By: 72

Title: Las Jack

Page 2 of 2

ser

Prepared by: GREDELL Engineering Resources, Inc.

## **Monitoring Well Field Inspection**

Facility: SBMU SPS - CCR Groundwater Monitoring
Monitoring Well ID: <u>MW 6</u>
Access: Accessibility: Good <u>Fair</u> Poor
Well clear of weeds and/or debris?: Yes 📈 No
Well identification clearly visible?: Yes <u>No</u>
Remarks:
Concrete Pad: Good / Inadequate
Depressions or standing water around well?: Yes No
Remarks:
Protective Outer Casing: Material = $4^{\circ} \times 4^{\circ}$ Steel Hinged Casing with Hasp
Condition of Protective Casing: Good Damaged
Condition of Locking Cap: Good Damaged
Condition of Lock: Good Damaged
Condition of Weep Hole: Good <u>Damaged</u>
Remarks:
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good / Damaged
Condition of Riser Cap: Good Damaged
Measurement Reference Point: Yes K No
Remarks:
Dedicated Purging/Sampling Device: Type = <u>¼ ° ID Semi-Rigid Polyethylene &amp; 0.170° ID Flexible</u> Silicone Tubing
Condition: Good L Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes No
Remarks:
Field Certification Agh & Rey Las Teon

Prepared by: GREDELL Engineering Resources, Inc.

## Field Sampling Log

Monito	ring Well ID:	Mn	16 Fac	ility: SBML	J Sikeston P	ower Statio	n - Groundw	ater Monitor	ing		
Initial Wate	er Level (fee	t btoc):	Q. (1	•		Date:	1-01.	202	)	genter a	
Initial Grou	ndwater Ele	vation (NAVD				Air Pressur	e in Well?	YN		्र्वः - व क्षेत्रं ज्ञान्व	
PURGE IN	FORMATIO	N		9	a alaa b- •	navijše o nj	- 42 Million - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	्यतः स्वयं के स्वयं य	τ. <sub>Ο</sub> ι	an - a bein	
Date:	11-0	1-202	0:1								
Name (Sar	nple Collect	or):	10.11	ingha	1m						
Method of	Well Purge:	Low Flow	Perstaltic F	oump	Dec	dicated Tub	ing? (	Y) N			
Time Purgi	ing Initiated:	08	34		One	e (1) Well V	/olume (mL)	:	NA		
Beginning	Water Level	(feet btoc):	12	.61	Tot	al Volume I	Purged (mL)	:	6560	)	
Beginning	Groundwate	er Elevation (N	AVD88):		We	I Purged T	o Dryness?		Y / (h)		
	Denth (feet	btoc):	37.7	7	 Wa	ter Level at	ter Samplin	g (feet btoc):	12.6	51	
						(i.(	e., pump is c	off)			
Casing Dia	ameter (feet)		0790	<u> </u>	Tim	ne Sampling	g Completed	i:	093	3	
PURGE S	TABILIZATI	ON DATA									
Time	Purge	Cumulative	Temp	Specific	Dissolved	рН	Oxidation Reduction	Turbidity	Water	Notes	i citv
	(mL/min)	(mL)	(°C)	(µS/cm)	(mg/L)	(S.U.)	Potential (mV)	(NTU)	(feet btoc)	color, oc	lor)
0836		320	12.21	504.25	11.99	8.84	6.20	7.20	12.61	Cleur, no	tor
08 38	830	780	11.57	493.38	9.41	6.88	-1.90	8.12	12.61	**	4
0840	240	1260	11.92	489.59	8.90	6.89	-7.40	7.72	12.61		
0842	230	1720	12.03	485.18	7.92	6.89	-10.8	5.19	12.61	1	
2844	253	2220	12.03	481.53	7.15	6.89	-12.5	5.86	12.61	IN .	
0746	230	2600	12.03	484.64	6.01	6.84	10-2	4.01	17 (1	~~~~~	7)
2848	240	3160	12.03	1122 20	6.44	6.04	-17.0	G (2	12 11	N	11
0800	22.3	(1100	12 21	Ux 1-	6.77	6.80	+17 C	2 67	12.61	0	7
DXCV	262	4602	12.23	U 25 51	5.77	6.20	-17.7	4.23	12.61	IK	77
20054	aus	5080	12.07	483.21	5.27	6.89	-19.2	3.97	12.61	ęt	1/
0758	250	5580	12.08	433.42	5.24	6.89	-19.6	2.30	12.61	**	v
0000	250	6080	12.07	479.72	5.19	6.88	-19.6	3.14	12.61		17
09.02	240	6560	12.07	475.88	5.05	6.88	-20.8	2.22	12.61		9
4 4				ļ							
	-										
*1	1	1		1	L	1	1		40 0 4 Million 1	A second s	

btoc - below top of casing
Field	Samplin	ig Log
-------	---------	--------

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We	HID:	w 6
Sampling Informa	tion:	2					
Method of Samplin	g: Low Flow -	Perstallic Pump	& Tubing			Dedicated:	(Y / N
Water Level @ Sa	mpling (feet btoc)	12.6	1				
Monitoring Event:	Annual ()	Semi-Annua	Quarte	rly() Mo	onthiy ( )	Other ()	
Final Purge Stabliz	ation Sampling D	)ata:			• 0 • • • • • •		10
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
11-01-222 290R	240	12.07	475.88	5.05	6.88	-20.8	<b>೨</b> , ನಿಶ
See instrument Calibr See instrument cal 1 - In-Situ SmarTr 2 - HF scientific, ir General Informati Weather Condition	ation Data: ibration log of da oll Multi-Probe Fi nc. Micro TPI Fiel ion: is @ time of sam	ily calibration dat ield Meter (Temp Id Portable Turbi pling: <u>Su</u>	ta for the follow perature, Specif dimeter	ing instruments: ic Conductance, Dissolv	ved Oxygen, pH	, Oxidation Red	uction Potentia
Sample Character	istics:	lear, c	DIMESS	, where is	-	5 <sup>12</sup> 10	
Sample Collection	Order:	Per SAP	*: *:			¥ )	5 A
Comments and Ot	oservations:						
		· · · · · · · · · · · · · · · · · · ·	a.				
, )				n in de la construcción de la const S		n gan a dhalla dhalla a gi Yaning a dhalla na taonan na manan gana yang a gan a siyan na san sha ku na	denember songe angehennen dage alle dan en fingen av det den det ander andere
<u></u>	<u></u>	*	· ·			•	
San dan kanala sa ka	1					¥/	
÷.	<b>1</b> 4	.e	14	2	-		
?					* #		54
L cortific that comp	lina procedures v	vere in accordan	ce with apolical	ble FPA and State proto	cols		

i certify that sampling p

Date: 11-21-2021 By: Ashira Pase

Title: 243 Tech

Page 2 of 2

Prepared by: GREDELL Engineering Resources, Inc.

Facility: <u>SBMU SPS - CCR Groundwater Monitoring</u> Monitoring Well ID: <u>MW_5</u> Name (Field Staff): <u>A Patti O Oillingham</u> Date: <u>//·ol·2021</u>
Access: Accessibility: Good / Fair Poor
Well clear of weeds and/or debris?: Yes 📈 No
Well identification clearly visible?: Yes <u> </u>
Remarks:
Concrete Pad: Good V Inadequate
Depressions or standing water around well?: Yes No
Remarks:
Protective Outer Casing: Material = 4" x 4" Steel Hinged Casing with Hasp
Condition of Protective Casing: Good Lange Damaged
Condition of Locking Cap: Good Damaged
Condition of Lock: Good Damaged
Condition of Weep Hole: Good Condition of Weep Hole: Good Condition
Remarks:
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good Damaged
Condition of Riser Cap: Good L Damaged
Measurement Reference Point: Yes No
Remarks:
Dedicated Purging/Sampling Device: Type = 1/4 " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes No
Remarks:
Field Certification ASTAN PGJOL Les Tech 11-2021 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

January 2017

Initial Water Level (feet btoc): 11-65 Date: 11-01-2321 Initial Groundwater Elevation (NAVD88): Air Pressure in Well? Y / N	
Initial Groundwater Elevation (NAVD88): Air Pressure in Well? Y /	
PURGE INFORMATION	10-100 million
Date: 11-01-2021	
Name (Sample Collector): D Dillingham	
Method of Well Purge: Low Flow Perstaltic Pump Dedicated Tubing?	
Time Purging Initiated: 1036 One (1) Well Volume (mL): NA	
Beginning Water Level (feet btoc): 11.6. Total Volume Purged (mL):	340.
Beginning Groundwater Elevation (NAVD88): Well Purged To Dryness? Y /	
Well Total Depth (feet btoc): 37.16 Water Level after Sampling (feet btoc): 1	1.60
Casing Diameter (feet): 2" Sch 40 PVC	120
PURGE STABILIZATION DATA	ar Notes
Time         Purge         Cumulative         Temp         Specific         Dissolved         pH         Reduction         Turbidity         Leve           (mL/min)         (mL)         (°C)         (µS/cm)         (mg/L)         (S.U.)         Potential         (NTU)         (feet b)	el (e.g., opacity, toc) color, odor)
103-3 340 11. 35 810.01 14.48 6.82 -3.7 10.89 11.6	O VEROW ODD
1040 230 800 12.50 740.13 11.99 6.89 -15.9 2.48 11.6	O Clear North
1042 QUD 1280 12.51 794.38 10.29 6.89 -17.1 3.26 11.1	U * V
1044 250 1780 12.68 797.18 7.92 6.89 -19.0 2.26 11.	SU " "
1046 260 2300 12.85 294.70 7.59 6.89 -21.0 1.61 11.6	3 11 17
1048 253 2800 12.69 794.26 8.16 6.90 -22.0 0.67 11.1	5
1050 250 3300 12.67 746.21 7.70 6.90 -23.2 1.29 11.	60
1052 250 3800 12.77 791.87 7.72 6.90 -24.9 1.20 11.6	
(054 273 4342 12. 79 793.82 7.62 6.02 -25 SU.SS 11.6	0 9

Prepared by: GREDELL Engineering Resources, Inc.

Page 1 of 2

Facility:	SBMU Sikeston I	Power Station - (	CCR Groundwa	ter Monitoring	Monitoring We		W5
ampling information	tion:						
amping morna			0.77.11.			Dedicated:	
lethod of Sampling	g: Low Flow -	Perstaltic Pump	& Tubing			Dedicated.	
/ater Level @ Sar	npling (feet btoc)	: <u>11. G</u>	2				
lonitoring Évent:	· · · Annual ( )	Semi-Annua	Quarter	rty() Me	onthly()	Other ()	
inal Purge Stabliz	ation Sampling D	)ata:				Oxidation	1
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Reduction Potential (mV)	Turbidity (NTU)
11-01-2021	270	12.79	79.22	7.62	6.90	-25.5	0.50
ieneral Informati	on: s @ time of sam	pling: <u>Su</u>	ANY				
		lant C	NON	· OINON	<b>F</b> ··· •	٠.	
Sample Character	istics:	Har, C		, our the			
Sample Collection	Order:	Per SAP					
Comments and Ol	oservations:	• •	an la c	•. · · ·			
	Harry and a Marine Balance and a second s	*			9.	1	
		•••		A	1	)	
	ι.	s					- <u>1994</u> -1995-1997-1997-1997-1997-1997-1997-1997
×.							
	,					and the second	
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	and good grammers and an experimentary says and the first of the state of the second second second second second				den - Margan Manster, Danis (12)	a and a state of the second	
		and the second se					

I certify that sampling procedures were in accordance with applicable EPA and State protocols.

Date: 11-01-2021 By: ASL.32 Padel

Title: Las Tech

Page 2 of 2

Facility:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:       MW 8         Name (Field Staff):       A Podel 0 0;11;1444         Date:       11-0(-352)
Access: Accessibility: Good Fair Poor Poor Well clear of weeds and/or debris?: Yes No Well identification clearly visible?: Yes No Remarks:
Concrete Pad:       Good L       Inadequate         Condition of Concrete Pad:       Good L       Inadequate         Depressions or standing water around well?:       Yes No L         Remarks:       Remarks:
Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good //       Damaged         Condition of Locking Cap:       Good //       Damaged         Condition of Lock:       Good //       Damaged         Condition of Weep Hole:       Good //       Damaged         Remarks:       Bemarks:       Damaged
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded         ''       Condition of Riser:       Good //       Damaged         Condition of Riser Cap:       Good //       Damaged         Measurement Reference Point:       Yes       No         Remarks:       Remarks:
Dedicated Purging/Sampling Device: Type = ½ * ID Semi-Rigid Polyethylene & 0.170" ID Flexible         Silicone Tubing         Condition:       Good / Damaged         Remarks:         Monitoring Well Locked/Secured Post Sampling?:       Yes
Remarks: Field Certification A.S. Reserved Las Zeel 11-01-2021 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

Field	Sampling	Log
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Monitor	ing Well ID:	MW	8 Faci	lity: SBMU	Sikeston Po	ower Statio	n - Ground₩	ater Monitor	ing	
Initial Wate	r Level (feet	btoc):	0.91	s - 1 		Date: )	1.01.	2021		
Initial Grou	ndwater Elev	vation (NAVD	88):			Air Pressur	e in Well?	YN		
PURGE IN	FORMATIO	N								
Date:	11-0	1-202	./							
Name (San	nple Collecto	or):	Dil	ling	ham	2:		<u></u>		
Method of \	Nell Purge:	Low Flow	Perstattic F	oump	Dec	licated Tub	ing?	VIN		4
Time Pu <b>rg</b> i	ng Initiated:		1184		One	e (1) Well V	'olume (mL):		NA	
Beginning	Water Level	(feet btoc):	10	.91	Tota	al Volume F	Purged (mL)	:	3	
Beginning	Groundwate	r Elevation (N	IAVD88):		We	I Purged T	o Dryness?		Y / 🔊	
Well Total	Depth (feet l	otoc):	37.0	6	Wa	ter Level af	ter Sampling	g (feet btoc):	10.0	21
Casing Dia	meter (feet)	: <u>2" Sch 4(</u>	) PVC			(1.6	e., pump is c	<b>m)</b>	121	7
					Tim	ne Sampling	g Completed	-	1-01	
PURGE ST	TABILIZATIO	ON DATA			Disvisional		Oxidation		Mator	Notes
Time	Purge Rate	Cumulative Volume	Temp	Specific Conductance	Dissolved Oxygen	рН (SU)	Reduction Potential	Turbidity (NTU)	Level	(e.g., opacity,
	(mL/min)	(mL)	(0)	(µS/cm)	(mġ/L)	(0.0.)	(mV)		(feet btoc)	color, odor)
1136		380	14.64	655,09	3.86	7.11	-37.5	1.36	10.91	Crear, Glar
1138	250	882	14.08	655.24	3.60	7.14	-39.4	0.79	13.91	11. IF.
1145	240	1360	14.02	657.43	3.53	7.15	-41.1	1.12	13.91	
1142	280	1360	14.07	662.60	0.47	7.15	-42.1	1.05	13.91	A 10
<b>HYU</b>	260	2380	14.08	669.93	3.41	7.16	-44.0	0.96	13.91	
1146	240	2860	14.15	676.84	3.42	7.16	-45.1	0,71	13.91	¥
0								- 01	•	
		•	2 ·				ž.			
		121			•				ļ	
•										
				•						
						L				
			1	1.1.1					1	•

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring Wel	11D:	w8
Sampling Informa	ition:						
Method of Samplin	g: Low Flow -	Perstaltic Pump	& Tubing			Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc)	10.9	41				
Monitoring Event:	Annual (-)	Semi-Annua	Quarte	rly () Mo	onthly ( )	Other ()	
Final Purge Stabliz	ation Sampling D	)ata: •		. <b>1</b>	s 4 <del>3</del>		
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
11-01-2021	242	14.5.	6 76.89	٥. 42	7.18	-45.1	J. 71
Instrument Calibu See instrument ca 1 - In-Situ SmarTu 2 - HF scientific, in	ration Data: libration log of da roll Multi-Probe F nc. Micro TPI Fie	ily calibration da ield Meter (Temp Id Portable Turbi	ta for the followi perature, Specifi idimeter	ing instruments: ic Conductance, Dissolv	ed Oxygen, pH	, Oxidation Red	uction Potentia
General Informat Weather Conditior 54°チ	ion: ns @ time of sam	pling: <u>Sv</u>	nny				
Sample Character	istics:	lear nu	620,	(GOG/Less	**		1
Sample Collection	Order:	Per SAP	8	· · . · · · · · · · · · · · · · · · · ·	•		* <b>*</b>
Comments and O	bservations: Jed Fi	erd Dr	vplicat	٩	8 1	-	2 
Reaction of the second s					angara ku-atan dalaman ngangangangan teta. 19 <sup>10 - 100</sup>		
							<u>,</u>
and the second se							
I certify that samp	bling procedures v	were in accordar	nce with applicat	ble EPA and State proto	cols.		
Date: 110 %	2021 By: 10	Sh 6	1hm	Title:	Lus	Leon	

Page 2 of 2

Prepared by: GREDELL Engineering Resources, Inc.

Facility: <u>SBMU SPS – CCR Groundwater Monitoring</u>
Name (Field Staff): A Patel D Dillingham
Date: 11-01-2021
Access: Accessibility: Good Fair Poor Poor
Well clear of weeds and/or debris?: Yes No
Well identification clearly visible?: Yes Mo
Remarks:
Concrete Pad: Condition of Concrete Pad: Good // Inadequate
Depressions or standing water around well?: Yes No
Remarks:
Protective Outer Casing: Material = <u>4" x 4" Steel Hinged Casing with Hasp</u>
Condition of Protective Casing: Good 1 Damaged
Condition of Locking Cap: Good Damaged
Condition of Lock: Good Damaged
Condition of Weep Hole: Good Damaged
Remarks:
Well Riser: Material = 2* Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good Damaged
Condition of Riser Cap: Good Damaged
Measurement Reference Point: Yes No
Remarks:
Dedicated Purging/Sampling Device: Type = <u>1/4</u> " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes Mo No
Remarks:
Field Certification
Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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Monitor	ing Well ID:	MW	<u> </u>	ility: SBMU	J Sikeston P	ower Statio	on - Groundw	ater Monito	ring		
Initial Wate	r Level (fee	t btoc):	11.8	7		Date: 4	11-01	-2021			
Initial Grou	ndwater Ele	vation (NAVD	88):			Air Pressu	re in Well?	YIN			
PURGE IN	FORMATIO	N									
Date:	11-0,	1-202	3	Ŧ							
Name (San	nple Collect	or):	0:11	insh	GM	•	New State			······	
Method of \	Well Purge:	Low Flow	Perstaltic	Pump	De	licated Tub	oing? (	Y) / N			
Time Purgi	ng Initiated:	/	310		On	e (1) Well \	/olume (mL)	•	NA		
Beginning	Water Level	(feet btoc):	1	1.87	Tot	al Volume i	Purged (mL)	:	362	0	
Beginning	Groundwate	r Elevation (N	AVD88):		We	I Purged T	o Dryness?		YIO		
Well Total	Depth (feet	btoc):	37.:	26	Wa	ter Level a	fter Sampling	g (feet btoc):	11.8	7	
Casing Dia	meter (feet)	: <u>2" Sch 40</u>	0 PVC		Tin	ne Samolin	a Completed		134	l y	
PURGE ST							g p				
Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)	Water Level (feet btoc)	No (e.g., color	otes opacity, , odor)
13/2		370	16.20	592,82	1.03	7.27	-39.6	326	11.87	Clear,	nslop
1314	280	940	15.18	604.55	0.85	7.31	-46.9	4.12	11.87	n	31
1316	270	1485	15.03	607.23	3.77	7.32	-50,8	2.96	11.87	11	11
1318	260	2000	14.67	613.64	0.64	7.33	-54.7	3.37	11.87	<u>h</u>	ly .
1320	270	2560	14.85	605.00	0.56	7.38	-56.7	2.98	11.87		11
1322	260	3090	14.87	638.51	0.55	7.33	- 57.9	2.25	11.87	^	7
1324	270	3620	14.87	609.76	0.54	7.34	-59,7	2,97	11.87	11	
yee a											
4				<u> </u>							
-							1.		1		

btoc - below top of casing

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We	ell ID: M	w4
Sampling Informat	ion:	2					
Method of Sampling	: Low Flow -	Perstattic Pump	& Tubing			Dedicated:	(Y) / N
Water Level @ San	pling (feet btoc)	. 11.8	7				
Monitoring Event:	Annual ( )	Semi-Annua	Quarte	erly() Mo	onthly ( )	Other ()	
Final Purge Stabliza	ation Sampling D	)ata:					-
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
11-01-2021 1324	270	14.87	609.76	0.54	7.34	-59.8	2.97
Instrument Calibra See instrument calil 1 - In-Situ SmarTro 2 - HF scientific, inc	t <b>ion Data:</b> bration log of dai Il Multi-Probe Fi c. Micro TPI Fiel	ily calibration dat eld Meter (Temp d Portable Turbi	ta for the follow perature, Specifi dimeter	ing instruments: ic Conductance, Dissolv	ved Oxygen, pH	I, Oxidation Red	uction Potentia
General Informatio	on:	~					
Weather Conditions	a @ time of sam	pling: <u>30</u>	עחת				44
Sample Characteris	tics:	lear, (	Col Mes	s, oderless		( <b>a</b> )	: × a
Sample Collection (	Order:	•Per SAP	. e.	e the set	*		*( 
Comments and Ob	servations:	2	E	× 1.			
(ullecte	2 Fiel	2. Blui	nk.	• . • •	6	<b>*</b> 1	•,
	(#)				•	¥).	
		•	*	•	(4) (4)		
							<b></b>
				18			
<u> </u>							<b>New York Control of C</b>
		engen og en væren som en skalende som en skale	<u></u>				

I certify that sampling procedures were in accordance with applicable EPA and State protocols.

Title: Les Les 6201 Date: 11-01-21 By:

Page 2 of 2

Prepared by: GREDELL Engineering Resources, Inc.

# **Appendix 1b**

Field Sampling Notes – December 27, 2021 (Re-sample) Field Instrumentation Calibration Log

Facility:	SBMU SPS	CCR	Groundwater	Sampling	
Facility:	SBMU SPS	CCR	Groundwater	Sampling	

Calibrated by: Ashish Paler

	Field Instr	uments:	In-Situ s	marTROLL Fie	eld Meter	HF scientific, inc. Micro TPI Field Portable TurbIdimeter												
		S/N #:	47	4247				S/	Nŧ	* 201	16	0736	6	ŝ				
	Date	Time	pH Standard	pH Measure- ments	Specific Conductand Standard (µŜ/cm)	ce	Specific Conductance Measurement (µS/cm)	Oxidation Re Stand	du tar	ction Potent d (mV)	iai:	Oxidation Reduction Potential Measurement (mV)	Dissolved (%	Ох )	ygen	Turbidity Standards (NTU)		Turbidity Measurements (NTU)
			4.00	= 4.00				Temperature (°C)	=	13.22			Temperature (°C)	2	13.34	0.02	=	0.02
of Day	12-27-		7.00	= 7.00	-								Tap Water Source	=	CITY	10.0	=	10.0
ginning ( Calibrati	2021	0630	10.00		1413	=	1412.8	Standard (mV)		227.0	H	229.5	Barometric Pressure (mm/Hg)	-	994.55	1000	H.	1000 0
Be	- C	-		10.00									Measurement	=	99.93			(000,0
			4.00	= 4.10		10		Temperature (°C)	=	13.22			Temperature (°C)	=	12.78	0.02	=	3.01
Check	12.27-		7.00	= 7.10	-								Tap Water Source	=	Si Mesto	2 10.0	=	9.94
l of Day (	202)	1330	10.00	- 10.05	1413	=	1374.8	Standard (mV)	=	229.0	=	223.6	Barometric Pressure (mm/Hg)	=	994.37	1000	=	9941
End			10.00		1								Measurement	=	100.44			

Notes: \_\_\_\_\_The Multi-Probe Field Meter measures Temperature, Specific Conductance, Dissolved Oxygen, pH, and Oxidation Reduction Potential.

The HF scientific, inc. Micro TPI Field Portable Turbidimeter measures Turbidity.

Dissolved oxygen is calibrated via % saturation method; however, field measurements are recorded as mg/L.

I certify that the aforementioned meters were calibrated within the manufacturers specifications.

Date: 12-27-21 By Ashish Regel

Facility: <u>SBMU SPS - CCR Groundwater Monitoring</u> Monitoring Well ID: <u>MW 3</u> Name (Field Staff): <u>A Patel D Dillingham</u>
Date: $12 - \alpha 1 - \alpha 1$
Accessibility: Good — Fair Poor
Well clear of weeds and/or debris?: Yes <u>No</u> No
Well identification clearly visible?: Yes <u>No</u> No
Remarks:
Concrete Pad: Good Inadequate
Depressions or standing water around well?: Yes No
Remarks:
<u>Protective Outer Casing</u> : Material = $4^{*} \times 4^{*}$ Steel Hinged Casing with Hasp
Condition of Protective Casing: Good 1 Damaged
Condition of Locking Cap: Good Damaged
Condition of Lock: Good Condition of Lock: Good
Condition of Weep Hole: Good L Damaged
Remarks:
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good L Damaged
Condition of Riser Cap: Good 🖵 🖉 Damaged
Measurement Reference Point: Yes V No
Remarks:
Dedicated Purging/Sampling Device: Type = 1/4 " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes No
Remarks:
Field Certification Hahish Partel Las Tech 17-27-21 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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January 2017

Monito	ring Well ID	Mn	/ 3_Fac	cility: SBMU	J Sikeston P	ower Statio	n - Groundw	ater Monitor	ing				
Initial Wate	er Level (fee	et btoc):	12.5	5		Date:	8-27	-21					
Initial Grou	indwater Ele	evation (NAVE	088):			Air Pressure in Well? Y /(N)							
PURGE IN	FORMATIC	DN											
Date:	12-2	7-21		-									
Name (Sar	nple Collect	tor):0	Dil	lingh	um								
Method of	Well Purge:	Low Flov	Perstaltic	Pump	De	dicated Tub	ing? (	Y)   N					
Time Purging Initiated: 0739						e (1) Well V	/olume (mL)		NA				
Beginning Water Level (feet btoc): 12.55					Tot	al Volume I	Purged (mL)	:	392.	<u> </u>			
Beginning	Groundwate	er Elevation (N	NAVD88):		We	Il Purged T	o Dryness?		Y / 🕅				
Well Total	Depth (feet	btoc):	36.9	9	Wa	iter Level a	fter Samplin	g (feet btoc):	12.8	55			
Casing Dia	ameter (feet)	): <u>2" Sch 4</u>	0 PVC		Tin	،.۱) ne Samplin	g Completed	)))  :	081	8			
PURGE S	TABILIZATI	ON DATA			÷								
Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential	Turbidity (NTU)	Water Level (feet btoc)	Notes (e.g., opacity, color, odor)			
14701		420	8.87	202 01	202	6.85	72.6	15.91	12.55	CIRGY NO			
07/12	300	1.222	202	2,1122	1.91	6.61	86.0	1029	12.55	11 6			
STUC	312	1640	7.70	2.227	12	6.50	85.2	5.70	12.55	te b			
07117	223	2200	7.70	2.21.87	1.64	6.40	79.5	2.20	12.55	11 17			
0749	200	2800	7.65	192 09	1.61	6.47	13.6	1.59	12.55	4 11			
0751	121	3260	7.62	165 52	1.62	6.47	66.3	1.94	22.51	11 10			
0753	280	3920	7.62	194.74	1.67	6.48	623	1.03	12.55	1			
					•								
							8						
							8 - S			ű.			
)													

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	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We		W3
Sampling Informa	ition:						
Method of Samplin	g: Low Flow -	Perstaltic Pump	o & Tubing			Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc)	: /2.S	5				-
Monitorina Event:	Annual ()	Semi-Annua	II () Quarte	rly() Me	onthly ()	Other	
Final Purge Stabliz	ration Sampling [	)ata:				•	
Date Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
12-27-21	280	7.62	194.74	1.67	6.48	KAR AP	1.03
Seneral Informati	on: s @ time of sam	pling: <u>Cla</u>	oud y				
Sample Characteri	stics: <u>U</u>	ear, Col	orless,	Odarless		. •	
		' Per SAP	• 25				
Sample Collection	Order:		8	•			
Sample Collection	Order:				*	* .	
Sample Collection	Order:				*	* • •	2
Sample Collection	Order:				•	*	2
Sample Collection	Order:				*		
Sample Collection	Order:				4) 		
Sample Collection	Order:				•		
Sample Collection	Order:				•		
Sample Collection Comments and Ot	Order:				4 · · · · · · · · · · · · · · · · · · ·	*	

I certify that sampling procedures were in accordance with applicable EPA and State protoco

Date: 12-27-21 By: 18m

Title: Las Tery

Page 2 of 2

Facility: <u>SBMU SPS – CCR Groundwater Monitoring</u>
Name (Field Staff): A Puter O Dilling hum
Date: $ 2 - 27 \cdot 2 $
Accessibility: Good L Fair Poor
Well clear of weeds and/or debris?: Yes // No
Well identification clearly visible?: Yes <u>V</u> No
Remarks:
Concrete Pad: Condition of Concrete Pad: Good Legisland Inadequate
Depressions or standing water around well?: Yes No
Remarks:
<u>Protective Outer Casing</u> : Material = $4^{\circ} \times 4^{\circ}$ Steel Hinged Casing with Hasp
Condition of Protective Casing: Good L Damaged
Condition of Locking Cap: Good Langed
Condition of Lock: Good Damaged
Condition of Weep Hole: Good Damaged
Remarks:
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good Condition of Riser: Good Condition
Condition of Riser Cap: Good L Damaged
Measurement Reference Point: Yes V No
Remarks:
Dedicated Purging/Sampling Device: Type = <u>1/4</u> " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes No
Remarks:
Field Certification the A Lat Teal 12-27-21
Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

1.4.1

January 2017

Monitor	ing Well ID:	Mw	6 Fac	ility: SBMU	Sikeston P	ower Statio	n - Groundw	ater Monitor	ing	
Initial Wate	r Level (fee	t btoc):	12.4.	1		Date:	12-2	7-21		
Initial Groui	ndwater Ele	vation (NAVE	)88):			Air Pressur	e in Well?	Y 1		
PURGE IN	FORMATIO	N								
Date:	12-27	1-21								
Name (San	nple Collect	or):	Dill	inghi	uM					
Method of \	Nell Purge:	Low Flow	Perstaltic	Pump	Dec	dicated Tub	ing? (	Y) / N		15
Time Purgi	ng Initiated:		0840		On	e (1) Well V	/olume (mL)		NA	
Beginning \	(feet btoc):	Tot	al Volume I	<sup>p</sup> urged (mL)	:	381	40			
Beginning (	Groundwate	er Elevation (N	NAVD88):		We	ell Purged T	o Dryness?		Y / 🕅	
Well Total I	Depth (feet	btoc):	37.74	1	Wa	iter Level at	fter Samplin	g (feet btoc):	12.	47
Casing Dia	meter (feet)	: <u>2" Sch 4</u>	0 PVC		Tin	(i.e ne Sampling	e., pump is o g Completed	off)	092	4
PURGE ST	ABILIZATI	ON DATA								
Time	Purge Rate (ml./min)	Cumulative Volume (mL)	Temp (°C)	Specific Coriductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential	Turbidity (NTU)	Water Level (feet btoc)	Notes (e.g., opacity, color, odor)
08/10	(1121111)	260	700	11270.	1 110	670	(mv)	21.29	12.47	Clobdy no
28111	750	300	780	11.11 60	1.97	6 00	-40.2	10.9.	12.47	Clear no ada
JY UG	250	1360	7.70	1117 20	0.80	6.82	-46.2	6.17	12.47	1- N
28/102	240	1840	7.75	446 91	0.21	6. 89	-49.2	5.13	12.47	11 H
085-	270	2380	7.75	444 74	0.7.2	6.90	-52.2	4.05	12.47	11 1
0852	240	2860	7.74	445.56	0.7.	6.91	-54.0	2.92	12,47	11 #
0854	260	3380	7.72	444.61	2.67	6.91	-55.2	3.80	12.47	W ))
0856	230	3840	7.72	444.67	0.67	6.91	-56.0	3.26	12.47	11 0
•		2			J					
						1				
ų										

btoc - below top of casing

1

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We	ell ID:	V 6
Sampling Informa	ation:						
Method of Samplin	ig: Low Flow -	Perstaltic Pump	& Tubing			Dedicated	(Y) / N
Water Level @ Sa	mpling (feet btoc)	12.4	7				
Monitoring Event:	Annual ()	Semi-Annua	I() Quarte	rly() M	lonthly ()	Other (	
Final Purge Stabliz	ation Sampling D	)ata:					
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
12-27-21	230	7.72	444.67	J.67	6.91	- 56.0	3.28
See instrument Calibr See instrument cal 1 - In-Situ SmarTr 2 - HF scientific, ir General Informati Weather Condition	ibration Data: libration log of da oll Multi-Probe Fi nc. Micro TPI Fiel ion: as @ time of sam	ily calibration da eld Meter (Temp ld Portable Turbi pling:	ta for the followi berature, Specifi dimeter	ng instruments: c Conductance, Disso	lved Oxygen, pł	H, Oxidation Red	uction Potentia
<u>04</u>	istics:	ear co	101285	51 Mess			
							a tat
	• • • • • • • • • • • • • • • • • • •	<u>reioar</u>			* :		7
Comments and Ob	servations:		· · · · · · ·	an cok	8		
Collect	puplic	ick un	E fierd	BLANN		2	
Fi	eid	<u>, e</u>	÷.				
		at 15	*	* × *	8	27	
1		· .	е «	2 8	s x *		
			1				
<u></u>							
I certify that sampl	ing procedures w	vere in accordan	ce with applicab	le EPA and State prot	ocols.		
Date: 12-27-	21 ву: Д	Ashish	pase	۲itle ک	Lab	Tech	

Page 2 of 2

Facility: <u>SBMU SPS - CCR Groundwater Monitoring</u> Monitoring Well ID: <u>MW 2</u> Name (Field Staff): <u>A Patel の のうしうかりんいか</u> Date: <u>  み・みて・みし</u>
Accessi       Good       Fair       Poor         Well clear of weeds and/or debris?:       Yes       No
Remarks:
Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good       Damaged         Condition of Locking Cap:       Good       Damaged         Condition of Lock:       Good       Damaged         Condition of Weep Hole:       Good       Damaged         Remarks:       Good       Damaged
Well Riser: Material = <u>2" Diameter, Schedule 40 PVC, Flush Threaded</u> Condition of Riser:       Good       Damaged         Condition of Riser Cap:       Good       Damaged         Measurement Reference Point:       Yes       No         Remarks:       Kemarks:       Kemarks:
Dedicated Purging/Sampling Device: Type = ¼ " ID Semi-Rigid Polyethylene & 0.170" ID Flexible         Silicone Tubing         Condition:       Good /         Damaged       Missing         Remarks:         Monitoring Well Locked/Secured Post Sampling?: Yes /       No         Remarks:
Field Certification M. A. U. Tech 12-27-21 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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Monito	ring Well ID:	MW	2_Fac	sility: SBMU	J Sikeston P	ower Statio	on - Groundw	ater Monito	ring		
Initial Wate	er Level (fee	t btoc):	11.50	4		Date:	2-27	1-21	- 1		
Initial Grou	ndwater Ele	vation (NAVE	088):	81	_	Air Pressu	re in Well?	Y /N			
PURGE IN	FORMATIO	N									
Date:	12-2	7-21		10							
Name (Sar	nple Collect	or):	9:11	inghi	um	•					-
Method of	Well Purge:	Low Flow	Perstaltic	Pump	De	dicated Tub	oing? (	Y) / N			
Time Purgi	ing Initiated:	0	955		On	e (1) Well \	/olume (mL)		NA		-
Beginning	Water Leve	l (feet btoc)	_1	1.54	Tot	al Volume	Purged (mL)	:	2943		
Beginning	Groundwate	er Elevation (N	AVD88):	0	We	ell Purged T	o Dryness?	÷.	Y / 🕅		
Well Total	Depth (feet	btoc):	37.17		Wa	ater Level a	fter Samplin	g (feet btoc)	11.5	:4	
Casing Dia	imeter (feet)	2" Sch 44	0 PVC			(i.	e., pump is c	off)	10-	1	
					Tin	ne Sampling	g Completed	l:	10 0	8	
PURGE ST	TABILIZATI	ON DATA					Oxidation		I		
Time	Purge Rate	Cumulative Volume	Temp	Specific Conductance	Dissolved Oxygen	pH (SUI)	Reduction	Turbidity (NTU)	Water Level	(e.g., op	es bacity,
( <u>)</u>	(mL/min)	(mL)	(0)	(µS/cm)	(mg/L)	(0.0.)	(mV)	(1110)	(feet btoc)	color, c	odor)
0957		380	9.35	147.72	1.35	6.75	-8.1	9.61	11.54	CIRCO, O	der
0459	260	900	8.94	147.61	1.16	6.45	3.5	8.95	11.54	n	- 71
1001	250	1420	8.87	155.07	1.10	6.38	7.7	5.09	1.54	1	11
1003	263	1920	8.87	156.30	1.01	6.35	11.4	2.21	11.54	11	],
1005	260	2440	8.90	162.69	0.84	6.32	14.7	1.65	11.54	11	- 11
1007	250	2940	8.93	160.49	0.88	6.31	11.7	1.53	11.54		_
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-											
				÷							-
							4				
			а. С. С. С.		*				1 1 1		

btoc - below top of casing

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Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring W	ell ID:	W 2
Sampling Informa	ation:	2 A <b>A</b> Marka			a		
Method of Samplin	ig: Low Flow	- Perstaltic Pump	o & Tubing	19	,	Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc	»: U.S	u				
Monitoring Event:	Annual ()	Semi-Annua	l() Quarte	rly() Mo	onthly ( )	Other ()	
Final Purge Stabliz	zation Sampling I	Data: :					,1
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
12.27-21 1007	AP B-Aw 250	8.95	160.99	J. 88	6.31	17.7	1.53
Instrument Calibr See instrument cal 1 - In-Situ SmarTr 2 - HF scientific, ir	ration Data: libration log of da roll Multi-Probe F nc. Micro TPI Fie	aily calibration da ield Meter (Temj eld Portable Turb	ta for the followi perature, Specifi idimeter	ng instruments: c Conductance, Dissolv	ved Oxygen, pl	H, Oxidation Rec	uction Potentia
General Information	ion: ns @ time of sam	npling: <u>Su</u>	nny bu	litte t cloudy			
Sample Character	istics: <u> </u>	lear, 6	or less.	oderless	• • <u>•</u> • •	<u>.</u>	<u>* *</u>
Sample Collection	Order:	Per SAP				с. <sup>2</sup> с.	
•		ingen inn. Aine a' the			*-	Fre	18
	DServations:		80	• • • • • •		2 ×	
Lancore	Cierd	Blank	200 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 - 1882 -		47,133	94	
C 62 1007 D	Field	Blank	**				
· · · ·	Field	Blank	**				
· · · · · · · · · · · · · · · · · · ·	Field	Blank					
	Field	Blank					
	Field	Blank	• •				
	Field	Blank					
	Field	Blank					
	Field	Blank					
I certify that samp	Field ling procedures	were in accordar	ice with applicat	>le EPA and State proto	pcols.		

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Facility: SBMU SPS – CCR Groundwater Monitoring         Monitoring Well ID:       MW 9         Name (Field Staff):       Publ 0 p; Ilingham         Date:       IZ - Z7-21
Access:       Good       Fair       Poor         Well clear of weeds and/or debris?:       Yes       No
Remarks: <u>Concrete Pad</u> :         Condition of Concrete Pad:       Good <u>L</u> Inadequate         Depressions or standing water around well?:       Yes         Remarks:       No <u>L</u>
Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good       Damaged         Condition of Locking Cap:       Good /       Damaged         Condition of Lock:       Good /       Damaged         Condition of Veep Hole:       Good /       Damaged         Paraged          Condition of Weep Hole:       Good /       Damaged
<th< td=""></th<>
Tromance:         Dedicated Purging/Sampling Device: Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flexible         Silicone Tubing       Silicone Tubing         Condition:       Good       Damaged         Remarks:       Monitoring Well Locked/Secured Post Sampling?: Yes /       No
Remarks:       Field Certification     Man     Aser     Las     Tech     I?-??       Signed     Title     Date

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Fie	eld	Sam	pling	Log
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Monito	ring Well ID:	Mm	<b>Ý</b> Fac	ility: SBML	J Sikeston P	ower Statio	n - Groundw	ater Monito	ring	-
Initial Wate	er Level (fee	t btoc):	19.2	2		Date:	2-27	.21		
Initial Grou	ndwater Ele	vation (NAVE	088):	<b>(</b> #)		Air Pressur	e in Well?	Y / 😡		
PURGE IN	FORMATIO	N								
Date:	18-2-	1-21		0						
Name (Sar	PURGE INFORMATION         Date: $18 - 27 - 21$ Name (Sample Collector):       D://N         Method of Well Purge:       Low Flow Perstaltic Pump       Dedicated Tubing? $1/N$ Method of Well Purge:       Low Flow Perstaltic Pump       Dedicated Tubing? $1/N$ Time Purging Initiated: $1/OS$ One (1) Well Volume (mL):       NA         Beginning Water Level (feet btoc): $19.22$ Total Volume Purged (mL): $27.60$ Well Total Depth (feet btoc): $37.18$ Well Purged To Dryness? $Y/10$ Casing Diameter (feet): $2"$ Sch 40 PVC       Time Sampling Completed: $1/44$									
Method of	Well Purge:	Low Flow	v Perstaltic I	Pump	De	dicated Tub	ing? (	Y) / N		
Time Purgi	ng Initiated:		108		On	e (1) Well V	/olume (mL)	:	NA	
Beginning	Water Level	(feet btoc):		9.22	Tot	ai Volume I	Purged (mL)	:	276	50
Beginning	Groundwate	er Elevation (N	NAVD88):		We	Il Purged T	o Dryness?	э	Y / 🕅	
Well Total	Depth (feet	btoc):	37.1	3	Wa	iter Level at	fter Sampling	g (feet btoc)	. 19	22
Casing Dia	imeter (feet)	: 2" Sch 4	0 PVC			(1.0	e., pump is c	лт) 	1 / /	111
					i in	ne Sampling	g Completed	I		19
PURGE ST	FABILIZATI			0.15	Disashuad		Oxidation		Water	Notes
Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp (°C)	Specific Conductance (µS/cm)	Oxygen (mg/L)	рН (S.U.)	Reduction Potential	Turbidity (NTU)	Level (feet btoc)	(e.g., opacity, color, odor)
1110	(	242	976	821 22	1.22	7.46		2.93	19.22	clear no
1112	242	820	8.22	225.86	0.95	7.55	-18.1	1.30	19.22	15 H
11111	240	1300	8.66	886.02	0.22	7.58	-20.1	1.10	19.22	N //
1116	243	1780	8.60	891.26	2.77	7.58	-23.4	1.23	19.22	رە ١١
1118	265	2300	8.57	887.16	0.72	7.58	-21.1	0.82	19.22	N N
1120	230	2760	8.57	886.04	2.73	7.58	-21.5	3.87	19.22	
					0					
				a						
			ा इ			31 32 - 1 - 22			. <u>.</u>	10 I
10		e	11111	-						

btoc - below top of casing

Facility:	SBMU Sikeston	Power Station	- CCR Groundwa	ter Monitoring	Monitoring We	ell ID: <u>Μγ</u>	v 9
Sampling Informa	ation:						
Method of Samplir	ng: Low Flow -	Perstaltic Pur	p & Tubing	÷.	9	Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc)	/9.2	2				
Monitoring Event:	Annual ()	Semi-Annu	al () Quarte	rly() Ma	onthly ( )	Other (	
Final Purge Stabliz	zation Sampling D	)ata:				•	
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
12-27-21	235	8.57	866.04	0.70	7.58	- 21.5	0.87
See instrument ca 1 - In-Situ SmarTi 2 - HF scientific, ii General Informat	libration log of da roll Multi-Probe Fi nc. Micro TPI Fiel <b>ion:</b>	ily,calibration d eld Meter (Ten d Portable Turl	ata for the followi nperature, Specifi bidimeter	ng instruments: c Conductance, Dissol	ved Oxygen, pł	H, Oxidation Red	Iuction Potentia
Weather Condition	ns @ time of sam	pling: C/2	0009		A		
Sample Character	istics: M Con	MACH	entess	Clear Colo	less, oc	for loss.	
Sample Collection	Order:	Per SAP	<u></u>	a 3	* *	*	
Comments and Ol	bservations:				9 • 392	1. s. 1.	
Collect	Field	1) 19 ( 1-0	Car				(34); 77
×							
I certify that samp	ling procedures w	ere in accorda	nce with applicab	ble EPA and State proto	ocols.		

Page 2 of 2

Date: 12-27-21 By: Bhish fare

Title: Las Tech

Facility: <u>SBMU SPS – CCR Groundwater Monitoring</u>
Name (Field Staff): A Pater D Dillingham
Date: 12-27-21
Access: Accessibility: Good Fair Poor
Well clear of weeds and/or debris?: Yes No
Well identification clearly visible?: Yes Mo
Remarks:
Concrete Pad: Good L Inadequate
Depressions or standing water around well?: Yes No
Remarks:
<u>Protective Outer Casing</u> : Material = $\frac{4^{\circ} \times 4^{\circ}}{5}$ Steel Hinged Casing with Hasp
Condition of Protective Casing: Good <u>  Damaged</u>
Condition of Locking Cap: Good <u>C</u> Damaged
Condition of Lock; Good <u>C</u> Damaged
Condition of Weep Hole: Good V Damaged
Remarks:
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good Condition of Riser: Good Condition
Condition of Riser Cap: Good 🖌 Damaged
Measurement Reference Point: Yes <u>No</u>
Remarks:
Dedicated Purging/Sampling Device: Type = <u>1/4</u> " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good // Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes
Remarks:
Field Certification Min Parc los Tech 12-27-21 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

January 2017

Monito	ring Well ID:	MW	IR Fac	ility: SBML	J Sikeston P	ower Statio	n - Groundw	ater Monito	ing	
Initial Wate	er Level (fee	t btoc):	18.70	)		Date:	2-27	-21		
Initial Grou	ndwater Ele	vation (NAVE	088):	1		Air Pressur	e in Well?	Y /		
PURGE IN	FORMATIO	N								
Date:	12-27	1-21		14						
Name (Sar	nple Collect	or):	Di	ling	nam					
Method of	Well Purge:	Low Flow	v Perstaltic I	Pump	De	djcated Tub	ing? (	Y) / N		
Time Purgi	ing Initiated:	l	157		On	e (1) Well V	/olume (mL)	:	NA	
Beginning	Water Level	(feet btoc):	18	.75	Tot	al Volume I	Purged (mL)	:	2780	2
Beginning	Groundwate	er Elevation (N	NAVD88):		We	ell Purged T	o Dryness?		Y / 🕅	
Well Total	Depth (feet	btoc): 3	18.08		Wa	ater Level a	fter Samplin	g (feet btoc)	18.	70
Casing Dia	imeter (feet)	: <u>2" Sch 4</u>	0 PVC			(1.0	e., pump is c	οπ)	125	7
					Tin	ne Sampling	g Completed	1:	. 40	
PURGE S	TABILIZATI	ON DATA				1	Oxidation			Natas
Time	Time         Purge Rate         Cumulative Volume (ml.)         Temp (°C)         Specific Conductance (uS/cm)					рН (S.U.)	Reduction Potential	Turbidity (NTU)	VVater Level (feet btoc)	(e.g., opacity, color, odor)
1150	,	2110	9 41	714 22	1.75	6.31	2.9	1.34	18.75	clear, hpar
1201	230	200	2.7	757.42	1.43	6.61	14.2	1.74	18.70	11 30
1203	240	1280	8.57	755.49	1.22	6.54	16.3	1.67	18.70	1, 1,
1205	243	1760	8.46	754.50	1.18	6.51	205	1.39	18.70	ц <i>у</i>
1207	275	23.00	8.42	758.45	1.24	6.49	20.8	1.48	18.73	
1209	240	2780	8.40	757.27	1.22	6.48	21.7	1.32	18.70	
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					-				the strength of the strength o	

btoc - below top of casing

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Facility:	SBMU Sikeston	Power Station - (	CCR Groundwa	ter Monitoring	Monitoring We		WIR
Sampling Informa	ition:			14 x			
Method of Samplin	g: Low Flow -	Perstaltic Pump	& Tubing			Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc)	: 18.70	o				
Monitoring Event:	Annual ()	Semi-Annual	() Quarte	riy() Mo	onthly ( )	Other (	
Final Purge Stabliz	ation Sampling D	lata:	а 585. в				
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
1224	240	8.40	757.27	1.28	6.48	21.7	।. उन्न
Instrument Calibr See instrument cal 1 - In-Situ SmarTr 2 - HF scientific, in	ration Data: libration log of da roll Multi-Probe Fi nc. Micro TPI Fiel	ily calibration dat eld Meter (Temp d Portable Turbi	ta for the followi perature, Specifi dimeter	ing instruments: ic Conductance, Dissol	ved Oxygen, pH	, Oxidation Red	uction Potentia
Weather Condition	ion: is @ time of sam	pling: <u>C10</u>	arth				
Sample Character	istics: <u>Cl</u>	ear, a	plovess,	odorless.	• • •		<u></u>
Sample Collection	Order:	Per SAP	• • •	· · · · ·	o // #	. (*)	
* <sup>*</sup> * **		1990 - 1990 - 1990 1980 - 19			201 	81 B	*
Contract of	Field	Duplice	ate.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	ະ*ົ⊻	*	<u>1</u> )
	347		*•	* ** ×	<sup>37</sup> ेर्	ħi	
I certify that samp Date: 12-27	ling procedures w	vere in accordan	ice with applical	ble EPA and State prot	cools. as	Tech	

Page 2 of 2

# Appendix 1c

Field Sampling Notes – August 3, 2022 (First 2022 Semi-annual Event)

F	eid Instrui	ments: <u>l</u> i	n-Situ SmarTROLL I	WP or In-Situ	AquaTROLL 400		-	HF scientific, in	K		
		S/N #:	893508					Ovidation			Turbidity
	Date	Time	pH Standards (S.U.)	pH Measure- ments (S II /mV)	Specific Conductance Standard (uS/cm)	Specific Conductance Measurement (µS/cm)	Oxidation Reduction Potential Standard (mV)	Reduction Potential Measurement (mV)	Dissolved Oxygen (%)	Turbidity Standards (NTU)	Measurements (NTU)
_			4.00 @ 25.00°C	(5.031117)					Temperature = 21.	73 0.02	=0,02
			Standard is =	4.05 136.0	1413 @25.00°C		220 mV at 25.00°C		Tap Water Source	25.507 10.0	
4	3/3/ 2022	0618	7.00 @25.00°C Standard is 7.00 @ 25°C	7.06	1413	14132	Standard is	23.8	Barometric Pressure = 75	2.58 1000	= 1000.00
	1		10.00 @25.00 c	10.05	తి శిక్త ఉండి		29.0		(mm/rig) Measurement = 100	xiu	10
		1	0.32 @ 25°C	-212.9					Temperature = 21.	95 0.02	= 0.04
			4.00 @ 25.00°C	4.05 NA	1413 @25.00°C		220 mV at 25.00°C		Tap Water Si	12531617	
	01.1		7.00 @25.00°C	700		1210 2		3.27.2	Source	10.0	= 10.4-
	2022	1425	Standard is	NA	1413	= 130B.3	Standard is	x x 7 . x	Barometric Pressure = 75	1000	= 1004
			10.00 @25.00°C Standard is	9.98 NA	Dasac		as c		(mm/Hg) Measurement = 9	1.98	1004.0

Field Instrumentation Calibration Log

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The HF scientific, inc. Micro TPI Field Portable Turbidimeter measures Turbidity. Dissolved oxygen is calibrated via % saturation method; however, field measurements are recorded as mg/L.

I certify that the aforementioned meters were calibrated within the manufacturers specifications.

Date: 8/3/2022

By: John Paser

Rev: February 14, 2022

-

Facility:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:       MW 3         Name (Field Staff):       A Publ 1 Lows         Date:       B-3-2002
Access:   Accessibility:   Good   Fair   Poor   Well clear of weeds and/or debris?:   Yes   No   Well identification clearly visible?:   Yes   No   Remarks:   Concrete Pad:   Condition of Concrete Pad:   Condition of Concrete Pad:   Depressions or standing water around well?:   Yes   No
Protective Outer Casing: Material = 4" x 4" Steel Hinged Casing with Hasp   Condition of Protective Casing: Good   Condition of Locking Cap: Good   Condition of Lock: Good   Condition of Weep Hole: Good
Remarks:         Well Riser: Material = <u>2" Diameter, Schedule 40 PVC, Flush Threaded</u> Condition of Riser:       Good       Damaged         Condition of Riser Cap:       Good       Damaged         Measurement Reference Point: Yes       No
Remarks:         Dedicated Purging/Sampling Device: Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flexible         Silicone Tubing         Condition:         Good 1       Damaged         Missing         Remarks:         Monitoring Well Locked/Secured Post Sampling?: Yes /
Remarks: Field Certification Ann A Lub Tech 8-3-2022 Signed Title Date January 2017

Prepared by: GREDELL Engineering Resources, Inc.

Monitoring	Well ID:	MW7	Facility:	SBMU Si	keston Powe	er Station - (	Groundwater	Monitoring		
Wohitohing			<u></u>	<u></u>	·Dat	te: 8-	3-20	22		
nitial Water Le	evel (feet bto	oc):@	.03		- Air	Pressure if	Well?	Y /		
nitial Groundy	vater Elevati	ion (NAVD88)								
PURGE INFO	RMATION	22								
Date:	8-3	-2022		•						
Name (Samp	le Collector)		Lowe	5				V/N		
Method of W	ell Purge:	Low Flow P	erstaltic Pu	mp	Dedic	ated 1 uping	gr 🕚			
Duraine	Initiated:	07	UO		One	(1) Well Vol	lume (mL):	<u>N</u>	A	
Time Purging	f millated.		12.	0A	Total	Volume Pu	irged (mL):		110	<u> </u>
Beginning W	ater Level (1	eet bloc).		<u> </u>	Well	Purged To	Dryness?	Y		
Beginning G	roundwater	Elevation (NA	VD88): _			er Level afte	er Sampling	(feet btoc):_	12	•03
Well Total D	epth (feet b	toc):	6-48			(i.e.	, pump is off	0	mol	M
Casing Diar	neter (feet):	2" Sch 40	PVC		— Tim	e Sampling	Completed:	-	081	<u> </u>
					1					Nutra
PURGE ST	ABILIZATIC	N DATA		Specific	Dissolved	рН	Oxidation Reduction	Turbidity	Water Level	(e.g., opacity,
Time	Purge Rate	Volume	Temp (°C)	Conductance	Oxygen (ma/L)	(S.U.)	Potential	(NTU)	(feet btoc)	color, odor)
1	(mL/min)	(mL)			0.11	6 56	81.1	16.72	12.03	FIGHE
10742		550	19.61	171.56	266	6.55	62.2	18.3	12.08	man AS
6744	305	160	17.87	171/1	0.58	6.55	55.9	17.12	12.08	Cler, odd
0746	290	1740	17.28	170.58	0.56	6.56	54.5	14.58	12.05	0 /
0748	300	29.20	17.28	166.44	0.55	6.57	49.4	15.70	1203	4
0150	220	3520	17.19	164.71	0.46	6.59	47.3	11.08	1202	11 1
6154	300	4120	17.19	164.87	D. Un	6.05	45.9	13.28	12.03	"
67.56	290	4700	17,13	162.66	0.43	6.61	45.7	10.52	12.03	11
07.58	005 0	5300	17.14	168.41	0.38	6.64	UN.7	10.68	12.03	4
0800	250	5800	17.1	162.20	0.37	6.66	37.9	8.07	12.2	u
28 02	340	7100	1712	156. 22	0.5	6.67	ULS	8.74	12.08	(1
0804	1310	17700	17.06	158-09	0.36	6.65	42,0	0.28	14.00	
0801	500					-		1		
						-	-			
		-	-			· . ·		_	3.4	
	_									

btoc - below top of casing

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Prepared by: GREDELL Engineering Resources, Inc.

upling Information:	Facility:	SBMU Sikeston	Power Station -	CCR Groundw	ater Monitoring	Monitoring We	ell ID: 🔥	INS
thod of Sampling:       Low Flow - Perstaltic Pump & Tubing       Dedicated:       () / N         /ater Level @ Sampling (feet btoc):       12.3	pling Information	ation:						
/ater Level @ Sampling (feet btoc):       12.03         // donitoring Event:       Annual ()       Semi-Annual ()/       Quarterly ()       Monthly ()       Other ()         Final Purge Stabilization Sampling Data:	thod of Samplir	ng: Low Flow	- Perstaltic Pum	p & Tubing			Dedicated	
Monitoring Event:       Annual ()       Semi-Annual ()       Quarterly ()       Monthly ()       Other ()         Final Purge Stabilization Sampling Data:       Image: Sample Rate (mL/min), (°C)       Temp Specific Conductance (µS/cm)       Dissolved Oxygen (mg/L)       PH (S.U.)       Reduction (NTU)         Bate       320       17.0%       158.09       0.36       6.65       42.0       8.29         Instrument Calibration Data:       See instrument calibration log of daily calibration data for the following instruments:       1       In-Situ SmarTroll Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentia         2       HF scientific, inc. Micro TPI Field Portable Turbidimeter       Semple Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentia         Year       Year       Sample Characteristics:       Octor TPI Field Portable Turbidimeter         General Information:       Year       Year       Year         Year       Sample Collection Order:       Per SAP         Comments and Observations:       Image: Year       Year         Year       Year       Year	/ater Level @ Sa	mpling (feet btoc	): 12.0	3			Dedibated.	U/ N
Final Purge Stabilization Sampling Data:       Date       Sample Time       Temp (nL/min)       Specific Conductance (uS/cm)       Dissolved Oxygen (mg/L)       PH (S.U.)       Oxidation Reduction (NTU)         2-3-222       300       17.04       158.09       0.36       6.65       42.0       8.28         Instrument Calibration Data:         See instrument calibration log of daily calibration data for the following instruments:         1 - In-Situ SmarTroll Multi-Probe Field Mefer (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentia         2 - HF scientific, inc. Micro TPI Field Portable Turbidimeter         General Information:         Weather Conditions @ time of sampling:         Sample Collection Order:       Per SAP         Comments and Observations:	Monitoring Event:	Annual ()	Semi-Annua	al (1) Quarte	erly ( )	Monthly ( )	Other ()	
Date Sample Time       Sample Rate (mL/min)       Temp (°C)       Specific Conductance (µS/cm)       Dissolved Oxygen (mg/L)       pH (S.U.)       Oxidation Reduction (NTU)         2-3-2-22-22 (NTU)       300       [7.04]       [58.09]       0.36       6.65       42.0       8.28         Instrument Calibration Data:         See instrument calibration log of daily calibration data for the following instruments:         1 - In-Situ SmarTroll Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentia         2 - HF scientific, inc. Micro TPI Field Portable Turbidimeter         General Information:         Weather Conditions @ time of sampling:         99%         Sample Collection Order:       Per SAP         Comments and Observations:	Final Purge Stabliz	ation Sampling D	Data:				.,	
3D       17.0%       158.09       0.36       6.65       42.0       8.28         Instrument Calibration Data:         See instrument calibration log of daily calibration data for the following instruments:         1 - In-Situ SmarTroll Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentia         2 - HF scientific, inc. Micro TPI Field Portable Turbidimeter         General Information:         Weather Conditions @ time of sampling:         Jump         Sample Collection Order:       Per SAP         Comments and Observations:	<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
Instrument Calibration Data: See instrument calibration log of daily calibration data for the following instruments: 1 - In-Situ SmarTroll Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentia 2 - HF scientific, inc. Micro TPI Field Portable Turbidimeter General Information: Weather Conditions @ time of sampling: TTOPF Sample Characteristics: Sample Collection Order: Per SAP Comments and Observations:	8-3-2022	300	17.02	158.09	0.36	6.65	42.0	8.28
General Information:         Weather Conditions @ time of sampling:         JP9°F         Sample Characteristics:         OPAR, Coloner, odoles         Sample Collection Order:         Per SAP	Instrument Calibra See instrument cali 1 - In-Situ SmarTro 2 - HF scientific, in	<b>ation Data:</b> ibration log of dai oll Multi-Probe Fid c. Micro TPI Field	ly calibration dat eld Meter (Temp d Portable Turbio	a for the followi erature, Specifi dimeter	ng instruments: c Conductance, Disso	lved Oxygen, pH	, Oxidation Redu	uction Potentia
Weather Conditions @ time of sampling:       Summy         T9°F       Sample Characteristics:       Ocar, Coloner, Solars,	General Information	on:					8 <b>*</b>	
Sample Characteristics: Ocar, Coloner, Jones Sample Collection Order: Per SAP Comments and Observations:	Weather Conditions	s @ time of samp	oling: <u>Su</u>	nny				
Sample Characteristics: OCAL, COLONDIS, OCALS Sample Collection Order: Per SAP Comments and Observations:	<u>79°</u> F							
Sample Collection Order: Per SAP Comments and Observations:	Sample Characteris	stics: Qe	Ar, Col	over, a	Salver		ă II	
Comments and Observations:	Sample Collection (	Order:	Per SAP					
	Comments and Obs	servations:		ж	<b>e</b> 2			
	<i>n</i>		•200 10	8				
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I certify that sampling procedures were in accordance with applicable EPA and State protocols.

Date: 8-3-2022 By: M

Title: Kes Ters

Page 2 of 2

141-

Facility:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:       MW 6         Name (Field Staff):       A Part J Lowes
Date: <u>5-200</u>
Accessibility: Good Fair Poor
Well clear of weeds and/or debris?: Yes No
Well identification clearly visible?: Yes 🗹 No
Remarks:
Concrete Pad: Good L Inadequate
Depressions or standing water around well?: Yes No
Remarks:
<u>Protective Outer Casing</u> : Material = $\frac{4" \times 4"}{5teel Hinged Casing with Hasp}$
Condition of Protective Casing: Good
Condition of Locking Cap: Good 🗹 Damaged
Condition of Lock: Good Condition Damaged
Condition of Weep Hole: Good Condition of Weep Hole: Good Condition
Remarks:
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded
Condition of Riser: Good L Damaged
Condition of Riser Cap: Good L Damaged
Measurement Reference Point: Yes No
Remarks:
Dedicated Purging/Sampling Device: Type = 1/4 " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good L Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes No
Remarks:
Field Certification Ashan A Las Tech 8-3-200 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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January 2017

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Monitori	ng Well ID:	MW	<b>Facil</b>	ity: <u>SBMU</u>	Sikeston Po	ower Station	- Groundwa	ater Monitori	ng	
nitial Water	Level (feet	btoc):	12-2	5		Date: 8	-3-2	20		
Initial Groun	dwater Elev	ation (NAVD	88): '			Air Pressure	in Well?	Y /		
PURGE INF	ORMATION	N						· · ·		
Date:	8-3	~22								
Name (Sam	ple Collecto	or):	I La	vop_						
Method of V	Vell Purge:	Low Flow	Perstaltic P	ump	Dec	dicated Tubi	ng?	Y) I N		
Time Purair	na Initiated:	0	253		One	e (1) Well Vo	olume (mL):	-	NA	
		(feat btee);	12	DE	 Tot	al Volume P	uraed (mL)		810	0
Beginning v	vater Level				\A(c		Dryness?	-	YAN	
Beginning C	Groundwate	r Elevation (N	IAVD88):		vve		Divitess	- (f t   htm o) -		28
Well Total [	Depth (feet l	otoc):	37.70		Wa	iter Level aff (i.e	ter Sampling	g (feet btoc): off)	0	
Casing Dia	meter (feet)	2" Sch 40	PVC	I	Tin	ne Samoling	Completed	:	092	6
					ж 23	io oumpinig			042	GAP
PURGE ST	ABILIZATIO	ON DATA		Creation	Dissolved		Oxidation		Water	Notes
Time	Purge Rate	Volume	Temp	Conductance	Oxygen	pH (S.U.)	Reduction Potential	Turbidity (NTU)	Level	(e.g., opacity,
	(mL/min)	(mL)	(0)	(µS/cm)	(mg/L)	0	(mV)			Right Ficke
0855		Bus	23.39	347.5	0.73	6.81	- 41,(	43.41	14.20	Clear A.
0857	310	1160	18.54	382.5	0.73	0.81	200	20.87	12.26	11 11 00 00 11
0859	300	1760	18.57	374.56	0.18	6.81	-8/./	17 4	12 21	1. 4
0301	300	2360	17.98	367.5	0.78	6.81	-812	RCIS6	10 36	is le
8903	290	2440	17.00	363.61	0.74	6.81	- 682	21.45	101,00	11 11
0905	290	3520	17.88	365.04	0.76	6.83	- 89.3	16.06	121076	11 11
0907	240	4100	17.86	396.60	3.73	6.84	-91.2	16.86	12.28	N D
2020	300	4700	17.85	402.95	2.50	6 86	-92.2	15.34	12,28	11 77
1190	240	5280	17.86	393.01	0.48	6.85	-91.4	15.07	12.28	11 11
2413	300	5880	17.84	394.50	0.50	6.84	-91.7	13.64	12.28	1. 1.
7415	280	6443	17.86	3 79.34	0.49	6.84	-41.3	11.58	12.28	1
0917	260	6940	17.83	375.15	0.45	6.86	- 92.4	12.01	12.018	
10019	280	7500	17.86	392.30	0.36	6.86	-92.6	11.36	12.28	
1921	200	8100	17.84	321.04	2.45	6.86	-93.3	12.36	12.28	11 17
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btoc - below top of casing

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Facility:	SBMU Sikeston	Power Station	- CCR Groundwa	ter Monitoring	Monitoring We	ell ID: 🚺	w 6
Sampling Informa	ation:	*		*1 <u>1</u>			
Method of Sampling: Low Flow - Perstaltic Pump & Tubing						Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc	): 12.2	8				
Monitoring Event:	Annual ()	Semi-Annu	al () Quarte	rly() Mo	onthly()	Other ()	
Final Purge Stabliz	ation Sampling I	Data:					
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
8-3-2020	300	17.84	381.04	0. KJ	6.86	- 93.5	1-2.36
2 - HF scientific, ir General Informati Weather Condition	nc. Micro TPI Fie	Id Portable Turb	nny, Ho	7		м. з. ц.	
Sample Characteri	stics:	ear, G	orless,	GLAIRSS		1 5 <u>6</u> 17	¥.2 @
Sample Collection	Order:	Per SAP	100 File of 10				
Comments and Ob	servations:				્ ક્	13 E R 2	
	tel Ci	eu Bi	CARE				
		- <u> </u>	( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	11 - 134 - 14 1		a 10 K	
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	· · · · ·			A A A A A A A A A A A A A A A A		100 K	
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I certify that sampling procedures were in accordance with applicable EPA and State protocols.

Date: 8-3-22 By: Boh h

1221

Title: Las Tech

Page 2 of 2

Facility:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:       MWS         Name (Field Staff):       A Page J Lowes							
Date: 8-3-20-22							
Access: Accessibility: Good Fair Poor Poor							
Well clear of weeds and/or debris?: Yes No							
Well identification clearly visible?: Yes No							
Remarks:							
Concrete Pad: Condition of Concrete Pad: Good Inadequate							
Depressions or standing water around well?: Yes No							
Remarks:							
Protective Outer Casing: Material = $\frac{4" \times 4"}{1000}$ Steel Hinged Casing with Hasp							
Condition of Protective Casing: Good Damaged							
Condition of Locking Cap: Good Damaged							
Condition of Lock: Good <u>L</u> Damaged							
Condition of Weep Hole: Good Damaged							
Remarks:							
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded							
Condition of Riser: Good <u>/</u> Damaged							
Condition of Riser Cap: Good 1 Damaged							
Measurement Reference Point: Yes / No							
Remarks:							
Dedicated Purging/Sampling Device: Type = 1/4 " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing							
Condition: Good Damaged Missing							
Remarks:							
Monitoring Well Locked/Secured Post Sampling?: Yes V No							
Remarks:							
Field Certification ALAR /al Tand Re La Jack							
Signed Title Date							

Prepared by: GREDELL Engineering Resources, Inc.

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January 2017
Monito	ring Well ID	MW	5 Fac	cility: SBM	J Sikeston P	ower Static	on - Groundv	vater Monitor	ing	
Initial Wate	er Level (fee	t btoc):	11.51			Date: 2	P-3-2	るよ		
Initial Grou	indwater Ele	vation (NAVE	088):		_	Air Pressu	re in Well?	Y IN		
PURGE IN	IFORMATIC	N								
Date:	8-3	-2022	)	. *	-					
Name (Sar	mple Collect	or):	rstin	Low	28	í				
Method of	Well Purge:	Low Flow	v Perstaltic	Pump	De	dicated Tub	oing?	Y) / N		
Time Purgi	ing Initiated:		8161		On	e (1) Well V	/olume (mL)	:	NA	
Beginning	Water Level	(feet btoc):	1	1.51	Tot	al Volume,	Purged (mL)	:	912	0
Beginning	Groundwate	er Elevation (I	NAVD88):		We	ell Purged T	o Dryness?		Y /N	
Well Total	Depth (feet	btoc):	37.1	1 37	Wa	ater Level a	fter Samplin	g (féet btoc):	1/1	51
Casing Dia	umeter (feet)	: 2" Sch 4	0 PVC	1247		(i.	e., pump is o	off)	10	
					Tin	ne Sampling	g Completed	l:	10.	67
PURGE S	TABILIZATI	ON DATA					Ovidation			
Time	Purge Rate	Cumulative	Temp	Specific Conductance	Dissolved	pН	Reduction	Turbidity	Water	Notes
2	(mL/min)	(mL)	(°C)	(µS/cm)	(mg/L)	(S.U.)	Potential (mV)	(NTU)	(feet btoc)	color, odor)
1020		560	21.76	734.97	1.19	6.74	-68.5	141.6	11.51	Yellow no
1022	280	1120	18.87	746.38	1.31	6.71	-71.3	62.19	11.51	clear, ng
1024	290	1700	18.22	756.58	1.20	6.78	-74.9	38.97	11.51	1× 4
1026	28D	2260	17.99	744.3	1.14	6.81	- 77.8	23.97	11.51	14 19
1028	280	2820	12.90	759.W	1.09	6.81	-79.2	Qa. US	11.51	IX 11
1030	CYC	3380	17.86	723.45	1.04	6.82	-77.4	21.35	11.51	" "
1032	280	3940	17.74	740,72	1.01	6.82	-77.9	21.52	11.51	te n
1034	270	4500	17.80	752,61	0.96	6.20	.81.3	21.17	11.51	n 5
1036	300	5100	17.0	736.71	0.93	6.83	- 78.1	17.08	N.SI	11 11
1038	272	5640	17.83	735.42	0.91	6.80	-77.4	13.91	11.51	1. 11
1040	300	6240	17.82	747.28	0.89	6.81	- 82.5	14.91	11.51	1. 1.
1042	280	6800	17.85	744.54	0.84	6.82	- 82.6	12.47	11.51	IN II
1044	290	7380	17.74	769.45	0.82	6.82	- 81.9	12.65	11.51	11 15
1046	293	7960	17.81	730.77	0.80	6.80	-84.5	11.00	11.51	VI 1-
1048	243	8540	17.86	72.76	5.0.7	6.81	-827	11.43	11.51	et tr
1050	240	9120	17.88	758.20	0.69	6.82	- 82.7	11.65	11.51	11 /1
				100.00					- Gr	

btoc - below top of casing

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We	II ID: N	WS
Sampling Informa	ition:						
Method of Samplin	g: Low Flow	- Perstaltic Pump	& Tubing			Dedicated:	(Y) / N
Water Level @ Sa	molina (feet bloc	11.51					0
Monitoring Event		Semi-Annua	Quarte	rlv() Mo	onthly ( )	Other ()	
Final Burge Stabliz		Data:	Guard	() () () () () () () () () () () () () (	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Dete	Careala Data	Tama	Specific	Disselved Oversen		Oxidation	Turbidity
<u>Date</u> Sample Time	(mL/min)	(°C)	Conductance (µS/cm)	(mg/L)	рп (S.U.)	Potential (mV)	(NTU)
8-3-2021 1050	२५०	17.88	758.32	<i>5</i> .59	6.R	-83.7	11.68
1 - In-Situ SmarTr 2 - HF scientific, ir General Informati	oll Multi-Probe F nc. Micro TPI Fie on:	ield Meter (Temp Id Portable Turbi	perature, Specifi dimeter	c Conductance, Dissolv	ed Oxygen, pH	, Oxidation Rec	duction Potentia
Weather Condition	s @ time of sam	pling: <u>50</u>					
Sample Characteri	stics:	Jean, C	or less,	Odorless			
							100 B
Sample Collection	Order:	Per SAP					
Sample Collection	Order:	Per SAP			24 (1) (2) (4) (4) (4)	2 (92) 2 (92) 2 (92)	
Sample Collection	Order:	Per SAP			2 3 943 5 9		
Sample Collection	Order:	Per SAP			2 3 5 5 5 5 5		
Sample Collection	Order:	Per SAP			2 2 2 2 2 2 2 2 2 2 2 2 2 2		
Sample Collection	Order:	Per SAP					
Sample Collection	Order:	Per SAP		· · · · · · · · · · · · · · · · · · ·			
Sample Collection	Order:	Per SAP					
Sample Collection	Order:	Per SAP					
Sample Collection	Order:	Per SAP		· · · · · · · · · · · · · · · · · · ·			
Sample Collection	Order:	Per SAP					
Sample Collection	Order:	Per SAP					
Sample Collection Comments and Ob	Order:	Per SAP	ce with applicab	le EPA and State proto	cols.		

- By: 146.0 Date: 0-3 w

Title: Let Weg

Page 2 of 2

## Monitoring Well Field Inspection

Facility:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:       MW 8         Name (Field Staff):       A Part I J Lowes         Date:       S-3-2000
Access: Accessibility: Good Fair Poor Poor Well clear of weeds and/or debris?: Yes No Well identification clearly visible?: Yes No Remarks:
Concrete Pad:       Good       Inadequate         Depressions or standing water around well?:       Yes       No         Remarks:       No       Image: No
Protective Outer Casing:       Material = $\underline{4^* \times 4^*}$ Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good       Damaged         Condition of Locking Cap:       Good       Damaged         Condition of Lock:       Good       Damaged         Condition of Weep Hole:       Good       Damaged         Remarks:       Betwarks:       Damaged
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded         Condition of Riser:       Good         Condition of Riser Cap:       Good         Measurement Reference Point:       Yes         Remarks:       Yes
Dedicated Purging/Sampling Device: Type = ¼ " ID Semi-Rigid Polyethylene & 0.170" ID Flexible         Silicone Tubing         Condition:       Good Damaged Missing         Remarks:         Monitoring Well Locked/Secured Post Sampling?:       Yes 1 No
Remarks:       Field Certification And A     Las Toga     8-3-200p       Signed     Title     Date

Prepared by: GREDELL Engineering Resources, Inc.

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January 2017

Monito	ring Well ID:	MW	Fac	ility: SBM	J Sikeston P	ower Statio	n - Groundw	vater Monitor	ing	
Initial Wate	er Level (fee	t btoc):	10.91	0		Date: 8	-3-20	22		
Initial Grou	ndwater Ele	vation (NAVE	)88):			Air Pressu	re in Well?	Y /		
PURGE IN	FORMATIO	N								
Date:	5-	3-200	2	•(•)						
Name (Sar	nple Collect	or):	Low	29		· · ·				
Method of	Well Purge:	Low Flow	v Perstaltic I	oump	De	dicated Tub	oing?	Y) / N		
Time Purgi	ng Initiated:	/	125		On	e (1) Well \	/olume (mL)	:	NA	
Beginning	Water Level	(feet btoc):	Ja	0.90	Tot	al Volume	Purged (mL)	:	544	<u>ა</u>
Beginning	Groundwate	er Elevation (N	AVD88):		We	Il Purged T	o Dryness?	• *	Y 1	
Well Total	Depth (feet	btoc):	37.So		Wa	iter Level a	fter Sampling	g (feet btoc):	10.	95
Casing Dia	meter (feet)	: 2" Sch 4	0 PVC			(i.	e., pump is c	off)		
					Tin	ne Sampling	g Completed	l:   		<u> </u>
PURGE ST	FABILIZATIO	ON DATA			4		Ovidation			
Time	Purge Rate	Cumulative Volume	Temp	Specific Conductance	Dissolved Oxygen	рН	Reduction	Turbidity	Water Level	Notes (e.g., opacity,
	(mL/min)	(mL)	(°C)	(µS/cm)	(mg/L)	(S.U.)	Potential (mV)	(NTU)	(feet btoc)	color, odor)
1127		540	23.15	760.56	035	7.01	-113.5	6.57	13.90	clear, oder
1124	280	1100	20.48	767.21	0.29	7.04	-112.8	12.41	10.95	
1131	270	1640	19.51	776.89	25.0	7.05	-112.8	12.68	10,90	
1133	290	2220	19.36	757.40	0.23	7.07	-112.5	13.11	10.90	
1134	270	2760	19.31	74A.15	0.21	7.07	-112.1	8.81	10.90	4 17
1136	270	3300	19.24	169.22	0.18	7.08	-112.0	10.52	10.90	
1137	260	3820	19.24	163.99	0.15	7.08	-111.7	11.63	10.90	η
1140	290	4400	19.24	771.87	0.19	7.09	-112.0	11.01	10.90	4 83
1142	270	4940	19.25	158.20	0.19	7.08	-111.0	11.80	10.90	N 4
1144	250	5440	19.27	752.04	0.18	7.08	-110,8	11.32	10,90	11 V
						. <sup>2</sup>				
l	Υ.									

Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring We		w P
Sampling Informa	ition:						
Method of Samplin	g: Low Flow -	Perstaltic Pump	& Tubing		···	Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc)	10.9:	>				
Monitoring Event:	Annual ()	Semi-Annua	I 🛹 🛛 Quarte	rly ( )	Monthly ()	Other ()	
Final Purge Stabliz	ation Sampling D	)ata:	·····				
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxyge (mg/L)	en pH (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
8-3-2002	250	19.27	752.04	0.18	7.07	-110.8	1432
1 - In-Situ SmarTr 2 - HF scientific, ir General Informati Weather Condition	oll Multi-Probe Fi nc. Micro TPI Fiel on: s @ time of sam	eld Meter (Temp d Portable Turbi bling: <u>Svr</u>	oerature, Specifi dimeter	c Conductance, Dis	ssolved Oxygen, p⊢	l, Oxidation Red	uction Potentia
Sample Characteri	stics;(A	RUY, (10	Mess o	2010.55			*
Sample Collection	Order:	Per SAP			4 K.	•	
	• •	• • • •	8. <del>X</del> . 0			· · ·	
Comments and Ob	servations:				1 <sup>7</sup> 4 . 88		
Collea	ed Fit		Plicate	3.7	1 <u>1</u> 1		
	× .				1.		
•>	1.4	N	*( *	t			10
<u> </u>	¥ 41 <sup>6</sup> 9				12 (*		
** 0°	11 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	2) K		<b>.</b> */	).	8	
							×

I certify that sampling procedures were in accordance with applicable EPA and State protocols.

Date: 3-3-2022 By: AD2-84

Radel Title: Lab Tech

Page 2 of 2

## Monitoring Well Field Inspection

Facility: <u>SBMU SPS - CCR Groundwater Monitoring</u> Monitoring Well ID: <u>MW Y</u> Name (Field Staff): <u>A Part D Dillingham</u> Date: <u>3-3-2022</u>
Access: Accessibility: Good Fair Poor Poor Well clear of weeds and/or debris?: Yes No Well identification clearly visible?: Yes No Remarks:
Concrete Pad:       Good       Inadequate         Condition of Concrete Pad:       Good       Inadequate         Depressions or standing water around well?:       Yes       No         Remarks:       No       No
Protective Outer Casing:       Material = <u>4" x 4" Steel Hinged Casing with Hasp</u> Condition of Protective Casing:       Good       Damaged         Condition of Locking Cap:       Good       Damaged         Condition of Lock:       Good       Damaged         Condition of Weep Hole:       Good       Damaged         Remarks:       Good       Damaged
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded   Condition of Riser:   Good   Condition of Riser Cap:   Good   Measurement Reference Point:   Yes   No   Remarks:
Dedicated Purging/Sampling Device: Type = <u>1/4 " ID Semi-Rigid Polyethylene &amp; 0.170" ID Flexible Silicone Tubing</u> Condition: Good Damaged Missing   Remarks: Monitoring Well Locked/Secured Post Sampling?:
Remarks: Field Certification March Lever Tech 3-3-2622 Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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January 2017

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Monito	oring Well ID	MW	4 Fa	cility: SBM	U Sikeston F	Power Stati	on - Groundv	vater Monito	ring	
Initial Wat	er Level (fee	et btoc):	11.82		1	Date: 8	13-2	1022		
Initial Gro	undwater Ele	evation (NAV	D88):			Air Pressu	re in Well?	YN	)	
PURGE I	FORMATIC	ON		÷						
Date:	2-3	3 - 20	ええ	20						
Name (Sa	mple Collec	tor):	r Low	RS		30 - K				
Method of	Well Purge	: Low Flor	w Perstaltic	Pump	De	dîcated Tu	bing?	Y/N		
Time Purc	ing Initiated	:	1209		On	e (1) Well '	Volume (ml.)		NA	
Declasing	Motor Lovo	(fact btoo):	1	1 22	To	tal Volumo	Burgad (ml.)		843	Э
beginning	vvalei Leve			1.00						
Beginning	Groundwate	er Elevation (I	NAVD88):	10	We	ell Purged	O Dryness?	4	T W	1 Am
Well Total	Depth (feet	btoc):	37.1	3	Wa	ater Level a	ifter Samplin	g (feet btoc)		. 83
Casing Dia	ameter (feet)	): <u>2" Sch 4</u>	0 PVC			( <sup>1</sup>			120	÷
					a Lin	ne Samplin	g Completed	1:	1000	
PURGE S	TABILIZATI	ON DATA		1			Ovidation		[	
Time	Purge Rate	Cumulative Volume	Temp	Specific Conductance	Dissolved Oxygen	pН	Reduction	Turbidity	Water	Notes (e.g., opacity,
Į.	(mL/min)	(mL)	(°C)	(µS/cm)	(mg/L)	(S.U.)	Potential (mV)	(NTU)	(feet btoc)	color, odor)
1311		580	23.53	519.61	0.74	7.28	-1342	14.31	711-31	While IS
1313	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Clew, Nodo							
1315	240	1540	2034	549.17	0.52	7.33	-1343	12.85	11.82	1ª \$
1317	250	2040	20.12	521.17	3.47	7.33	-1333	14.46	11.82	<b>u</b> <i>b</i>
1319	250	2540	19.95	524.09	2,42	7.33	-133.0	11.36	11.82	ti ti
1321	230	3000	19.88	516.93	0.42	7.33	-1280	13.58	11.82	n v
1323	240	3480	19.79	545.79	2.41	7.33	-133.0	12.26	11.82	N 13
1325	260	4000	19.82	532.46	D.4	7.34	-132.6	13.99	11.82	
1327	240	4480	19.54	518.32	0.36	7.32	-131.8	11.67	11. 72	11 P
1229	260	5000	19.76	521.15	0.36	7.33	-131.8	13.12	11.80	v <i>"</i>
1231	220	6440	19:73	527.87	0.36	7.33	-1315	9.61	11.82	Cc M
1333	260	5960	19.67	526.49	2.34	7.32	-131.5	9-20	11.92	n ()
1335	272	6500	19.62	547.53	0.33	7.32	-131.2	9.40	11.82	e P
1337	230	6900	19.65	539.46	0.33	7.33	-131.3	1.95	11.82	(i
(339	250	7460	19.72	542.37	0.33	7.31	-131.2	6.46	11.72	N
134(	230	7920	19.70	557.44	3.32	7.32	-131.1	6.00	11.82	11 11
1343	280	8482	19.67	552.43	0.32	7.32	-130.9	6.40	11:82	N >>
			1	1				Sector and the sector of		
·*				1						

btoc - below top of casing

Sampling Information:       Method of Sampling: Low Flow - Perstalitic Pump & Tubing       Dedicated: (*) / N         Water Level @ Sampling (test bloo):	Facility:	SBMU Síkeston	Power Station	- CCR Groundwa	ater Monitoring	Monitoring W	rell ID:	W 4
Method of Sampling:       Low Flow - Perstatic Pump & Tubling       Dedicated:       (*) / N         Water Level @ Sampling (feet bloc):	Sampling Informa	tion:	v		2			
Water Level @ Sampling (feet bloc): $\mu$ , $q$ , $q$ Monitoring Event:       Annual ()       Semi-Annual ()       Quarterly ()       Monthly ()       Other ()         Final Purge Stabilization Sampling Data:       Image: Sample Rate information information:       Image: Sample Rate information information information information information information information information information:       Image: Sample Rate information information information:       Image: Sample Rate information information information:       Image: Sample Rate information:       Image: Sample Rate information information:       Image: Sample Rate information:       Image: Sample Rate information information:       Image: Sample Rate informatinformation:       Image: Sample Rate information:	Method of Sampling	g: Low Flow	- Perstaltic Pun	np & Tubing	5		Dedicated:	(Y) / N
Monitoring Event: Annual () Semi-Annual () Quarterly () Monthly () Other () Final Purge Stabilization Sampling Data: Data       Sample Rate       Temp       Specific Conductance (mg/L)       Dissolved Oxygen       pH       Oxidation $g_2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -$	Water Level @ Sar	npling (feet btoc	): 11.5	12				2000 D
Final Purge Stabilization Sampling Data:       Specific Conductance (uS/cm)       Dissolved Oxygen PH (S.U)       PH (S.U)       Reduction Turbidity (NTU)         & -3 - 2b-22       2 30       19.67       5 52.40       0.32       7.32       -1 32.9       G. 4 Jo         Instrument Calibration Data:         See instrument calibration log of daily calibration data for the following instruments:         1 - In-Siu SmarTroil Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potenti         2 - H Secientic, inc. Micro TPI Field Portable Turbidimeter         General Information:         Weather Conditions @ time of sampling:       SUNNY, H2H         Q 8 ° F       Sample Collection Order:       Pee SAP         Sample Collection Order:         Pee SAP	Monitoring Event:	Annual ()	Semi-Annu	ial 🚺 Quarte	erly() M	ionthly ()	Other ()	
Date Sample Time       Sample Rate (m/min)       Temp (C)       Specific Conductance (µS/m)       Dissolved Oxygen (mg/L)       pH (S.U.)       Oxidation Reduction (nt/l)       Turbidity (NTU)         8-3-2-22 (343)       2 30       19.67       5 52.40       0.32       7.32       -1/32.9       G.47         Instrument Calibration Data:         See instrument calibration Data         See instrument calibration Bata         See instrument calibration Data         See instrument calibration Data         See instruments:         1 - Instruments:         See instruments:         See instruments:         See instruments:         Q 8 ° C         Summer Coll Mata         Q 8 ° C         Contentis and Observations:	Final Purge Stabliz	ation Sampling [	Data:	•				
8 - 3 - 222 $230$ $19.67$ $552.48$ $0.32$ $7.32$ $-132.9$ $6.40$ Instrument Calibration Data:         See instrument calibration data for the following instruments:         1 - In-Situ SmarTroll Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potentil         Ceneral Information:         Weather Conditions @ time of sampling: $5 VNY$ , $K24$ Q 8 ° F         Sample Collection Order:         Per SAP         Comments and Observations:         Contents and Observations:         I certify that sampling procedures were in accordance with applicable EPA and State protocols.         2-2	Date Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
Instrument Calibration Data:         See instrument calibration log of daily calibration data for the following instruments:         1 - In-Situ SmarTroll Multi-Probe Field Meter (Temperature, Specific Conductance, Dissolved Oxygen, pH, Oxidation Reduction Potenti         2 - HF scientific, inc. Micro TPI Field Portable Turbidimeter         General Information:         Weather Conditions @ time of sampling:       SUMMY, HDJ         Q 8 ° F       Clear, COLONESS, OCONESS         Sample Characteristics:       Clear, COLONESS, OCONESS         Sample Collection Order:       Per SAP          Per SAP          Comments and Observations:         I certify that sampling procedures were in accordance with applicable EPA and State protocols.	8-3-2022	280	19.67	552.43	0.32	7.32	-132.9	6.40
Sample Characteristics:	2 - HF scientific, in General Information Weather Conditions $98^{\circ}$	ic. Micro TPI Fie on: s @ time of sam	ld Portable Turi	nny, Ho	9			
Comments and Observations:	Sample Characteris	stics: Order:	2017 , COI . •Per SAP	01235,0	doness			<u></u>
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	Comments and Ob	servations:			905년 년(전) · · · · · · · · · · · · · · · · · · ·		ы а <sub>ра</sub>	7.6
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	·	-4.5	<u> </u>	· 's	*** P3		10. 	×.
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	••			ас		1997 (P. 1997) 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	- H <sub>el</sub>	5
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	13.8 1					n gao	8	
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	<u></u>	40.5 (a	t, a der			· · ·		
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	. *	<u>8</u>	···· · · · · ·					(32)
I certify that sampling procedures were in accordance with applicable EPA and State protocols.	2 2						S Roa U	
I certify that sampling procedures were in accordance with applicable EPA and State protocols.				2				
I certify that sampling procedures were in accordance with applicable EPA and State protocols.			۰.	9. M	88 X 8			ж) Ж
I certify that sampling procedures were in accordance with applicable EPA and State protocols.			8. g 6	, VSI	4 S.	*	¥1	
	I certify that samplir	ng procedures w	vere in accorda	nce with applicab	le EPA and State proto	ocols.	Tout	Ř

# **Appendix 1d**

Field Sampling Notes – September 12, 2022 (Re-sample)

#### **Field Instrumentation Calibration Log**

Facility: SBMU - Sikeston Power Station Ash Ponds - Groundwater Monitoring

Calibrated by:

12/2022

HF scientific, inc. Micro TPI Field Portable Turbidimeter

S/N #: 89350-8 Date Time pH Standards Measure- Conductar	Field Instr	uments:	In-Situ SmarTROLI	L MP or In-Situ	AquaTROLL 40
Date Time pH Standards Measure-Conductar	Date	S/N #:	893508	<u>,</u>	
(S.U.) ments Standard (S.U./mV) (µS/cm)	Field Instr Date	Time	pH Standards (S.U.)	pH Measure- ments (S.U./mV)	Specific Conductance Standard (µS/cm)

201607366

	Date	Time	pH Standards (S.U.)	pH Measure- ments (S.U./mV)	Specific Conductance Standard (µS/cm)	Specific Conductance Measurement (µS/cm)	Oxidation Reduction Potential Standard (mV)	Oxidation Reduction Potential Measurement (mV)	Dissolved ( (%)	Oxygen	Turbidity Standards (NTU)	Turbidity Measurements (NTU)
libration			4.00 @ 25.00°C	4.00	1413 @25.00°C		220 mV at 25.00°C		Temperature (°C)	= 21.84 Sikoshan	0.02	=0.02
g of Day Ca	9/12/ 2022	<b>07</b> 30	7.00 @25.00°C =	7.00	4 3 =	1412.8	=	229.1	Source	+1:2	10.0	= 10, 7
Beginning			10.00 @25.00°c =	10.00	5. we		229 mV @ 25 °C		Barometric Pressure (mm/Hg) Measurement	= 754.49 = 100.04	1000	= 1000.0
eck			4.00 @ 25.00°C =	4.08 NA	1413 @25.00°C		220 mV at 25.00℃		Temperature (°C)	= 26.04	0.02	= 0_[]
of Day Ch	9/12/ 2022	/ 300	7.00 @25.00°C =	7.08 NA	=	1427.3	=	226.8	Source	City	10.0	= 10.79
End			10.00 @25.00°C =	10.10 NA			Standard is mV @ Standard is mV @ Standard is standard is mV @		Pressure (mm/Hg) Measurement	= 753.g = 98.03	1000	- 1007

The In-Situ SmarTROLL MP Field Meter and In-Situ AquaTROLL 400 measure Temperature, Specific Conductance, Dissolved Oxygen, pH, and Oxidation Reduction Potential. Notes: The HF scientific, inc. Micro TPI Field Portable Turbidimeter measures Turbidity.

Dissolved oxygen is calibrated via % saturation method; however, field measurements are recorded as mg/L.

By:

I certify that the afgrementioned meters were calibrated within the manufacturers specifications.

Date:

Rev: February 14, 2022

# Monitoring Well Field Inspection

Pacifity:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:	
Name (Field Staft):   Date:   9.12.22     Access:     Access:   Vell clear of weeds and/or debris?:   Yes \sqrt{No}   Remarks:   Condition of Concrete Pad:   Condition of Concrete Pad:   Condition of Concrete Pad:   Condition of Concrete Pad:   Condition of Protective Casing:   Good Parently:   Yes   No   Remarks:         Protective Outer Casing:   Material = 4" x 4" Steel Hinged Casing with Hasp   Condition of Protective Casing:   Good \sqrt{Parently:   Damaged   Condition of Lock:   Good \sqrt{Parently:   Damaged   Condition of Riser:   Good \sqrt{Parently:   Damaged   Condition of Riser:   Good \sqrt{Parently:   Measurement Reference Point:   Yes	
Date:       9.12.22         Access:       Accessibility:       Good       Fair       Poor         Well clear of weeds and/or debris?:       Yes       No	
Facility:       SBMU SPS - CCR Groundwater Monitoring         Monitoring Well ID:       MW 6         Name (Field Staff):       Lowes A Patt 1         Date:       9.12.22         Access:       Accessibility:         Good Fair       Fair Poor         Well clear of weeds and/or debris?:       Yes No         Well identification clearly visible?:       Yes No         Remarks:       Condition of Concrete Pad:         Condition of Concrete Pad:       Good Imaged	
I acuity.       SDMU SPS_CCK Groundwater Monitoring         Monitoring Well ID:       Image: A Paki         Date:       9.12.22         Accesss:       Accesssibility:       Good Pairs         Accessibility:       Good Pairs       Pair Poor Poor Pairs         Well clear of weeds and/or debris?:       Yes No Poor Poor No         Well identification clearly visible?:       Yes No Poor No         Remarks:       Remarks:         Condition of Concrete Pad:       Good Pairs         Condition of Concrete Pad:       Good Pairs         Condition of Protective Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good Pairs         Condition of Locking Cap:       Good Pairs         Condition of Locking Cap:       Good Pairs         Condition of Locking Cap:       Good Pairs         Condition of Veep Hole:       Good Pairs         Condition of Riser:       Good Pairs         Condition of Riser:       Good Pairs         Condition of Riser:       Good Pairs         Measurement Reference Point:       Yes No         Remarks:       No         Pedicated Purging/Sampling Device:       Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Fle: Silicone Tubing         Condition	
Well clear of weeds and/or debris?:       Yes ∠       No	۰.
Well identification clearly visible?:       Yes ↓ No         Remarks:       Condition of Concrete Pad:       Good ↓ Inadequate         Depressions or standing water around well?:       Yes No ↓         Remarks:       Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good ↓       Damaged         Condition of Protective Casing:       Good ↓       Damaged         Condition of Locking Cap:       Good ↓       Damaged         Condition of Lock:       Good ↓       Damaged         Condition of Lock:       Good ↓       Damaged         Condition of Kiser       Good ↓       Damaged         Condition of Riser:       Good ↓       Damaged         Well Riser:       Meterial = 2" Diameter, Schedule 40 PVC, Flush Threaded       Condition of Riser:       Good ↓         Condition of Riser:       Good ↓       Damaged	
Remarks:         Good / Inadequate         Depressions or standing water around well?: Yes No /         Remarks:         Protective Outer Casing: Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing: Good /         Damaged         Condition of Protective Casing: Good /         Damaged         Condition of Protective Casing: Good /         Damaged         Condition of Locking Cap: Good /         Damaged         Condition of Lock: Good /         Damaged         Condition of Lock: Good /         Damaged         Condition of Lock: Good /         Damaged         Condition of Weep Hole: Good /         Damaged	
Concrete Pad:       Good └ Inadequate         Depressions or standing water around well?:       Yes No ↓ ✓         Remarks:       Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good └ Damaged         Condition of Locking Cap:       Good └ Damaged         Condition of Locking Cap:       Good └ Damaged         Condition of Locking Cap:       Good └ Damaged         Condition of Lock:       Good └ Damaged         Condition of Veep Hole:       Good └ Damaged         Condition of Weep Hole:       Good └ Damaged         Remarks:       Vell Riser:         Well Riser:       Material = 2" Diameter, Schedule 40 PVC, Flush Threaded         Condition of Riser Cap:       Good └ Damaged	
Depressions or standing water around well?:       YesNo         Remarks:       Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good       Damaged         Condition of Protective Casing:       Good       Damaged         Condition of Locking Cap:       Good       Damaged         Condition of Lock:       Good       Damaged         Condition of Weep Hole:       Good       Damaged         Remarks:	·····
Remarks:         Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good        Damaged	
Protective Outer Casing:       Material = 4" x 4" Steel Hinged Casing with Hasp         Condition of Protective Casing:       Good       Damaged         Condition of Locking Cap:       Good       Damaged         Condition of Locking Cap:       Good       Damaged         Condition of Lock:       Good       Damaged         Condition of Lock:       Good       Damaged         Condition of Veep Hole:       Good       Damaged         Remarks:	
Condition of Protective Casing: Good Damaged   Condition of Locking Cap: Good Damaged   Condition of Lock: Good Damaged   Condition of Veep Hole: Good Damaged   Condition of Weep Hole: Good Damaged   Remarks:	
Condition of Locking Cap: Good Damaged   Condition of Lock: Good Damaged   Condition of Weep Hole: Good Damaged   Remarks:	
Condition of Lock: Good Damaged   Condition of Weep Hole: Good Damaged   Remarks:	
Condition of Weep Hole:       Good ↓ Damaged         Remarks:	
Remarks:         Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded         Condition of Riser: Good / Damaged         Condition of Riser Cap: Good / Damaged         Condition of Riser Cap: Good / Damaged         Measurement Reference Point: Yes / No         Remarks:         Dedicated Purging/Sampling Device: Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flex         Silicone Tubing         Condition:       Good / Damaged	
Well Riser: Material = 2" Diameter, Schedule 40 PVC, Flush Threaded         Condition of Riser:       Good /       Damaged         Condition of Riser Cap:       Good /       Damaged         Measurement Reference Point: Yes       No         Remarks:       No         Dedicated Purging/Sampling Device: Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flex         Silicone Tubing         Condition:       Good /       Damaged	
Condition of Riser: Good   Condition of Riser Cap: Good   Condition of Riser Cap: Good   Measurement Reference Point: Yes   Yes No   Remarks:     Dedicated Purging/Sampling Device:   Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flex Silicone Tubing   Condition: Good   Damaged   Missing	
Condition of Riser Cap: Good Damaged Measurement Reference Point: Yes No Remarks: Dedicated Purging/Sampling Device: Type = ½ " ID Semi-Rigid Polyethylene & 0.170" ID Flex Silicone Tubing Condition: Good Damaged Missing	
Measurement Reference Point: Yes       No         Remarks:	
Remarks:         Dedicated Purging/Sampling Device: Type = 1/4 " ID Semi-Rigid Polyethylene & 0.170" ID Flex         Silicone Tubing         Condition:       Good         Damaged       Missing	
Dedicated Purging/Sampling Device: Type = 1/4 " ID Semi-Rigid Polyethylene & 0.170" ID Flex         Silicone Tubing         Condition:       Good         Damaged       Missing	
Condition: Good Damaged Missing	exible
Remarks:	
Monitoring Well Locked/Secured Post Sampling?: Yes V No	
Remarks:	

Prepared by: GREDELL Engineering Resources, Inc.

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Monito	ring Well ID	: <u>M</u> w	G Fac	cility: <u>SBM</u>	U Sikeston F	ower Static	on - Groundv	vater Monito	ring	<del>_</del>	
Initial Wate	er Level (fee	t btoc):	12.80	)		Date:	9-12	-22			
Initial Grou	ndwater Ele	vation (NAVI	088):			Air Pressu	re in Well?	Y TO	F		
PURGE IN	FORMATIC	N		<u>_</u>		· · · · · · · · · · · · · · · · · · ·					
Date:	9-12	1-22									
Name (Sar	nple Collect	ior):	Lo	wes							
Method of	Well Purge:	Low Flov	v Perstattic	Pump	De	dicated Tut	oing? (	Ƴ/ N			
Time Purgi	ing Initiated:		)83/		On	e (1) Well \	/olume (mL)	:	NA		
Beginning	Water Leve	I (feet btoc):	2	.80	To	tal Volume	Purged (mL)	):	85	<u>50</u>	
Beginning	Groundwate	er Elevation (*	NAVD88):		We	ell Purged T	o Dryness?		Y / 🕅		
Well Total	Depth (feet	btoc):	37.71	ł	 Wa	- ater Level a	fter Samplin	g (feet btoc)	12.	82	
Casing Dia	moter (feet)	2" Sch 4		<b>F</b>		(i.	e., pump is a	off)			
		<u>2 3014</u>			Tin	ne Samplin	g Completed	i:	090	2	
PURGE ST	TABILIZATI	ON DATA									
Time	Time Purge Cumulative Temp Specific Dissolved nH Reduction Turbidity Water Note										
	Rate (mL/min)	Volume (mL)	(°C)	Conductance (µS/cm)	Oxygen (mg/L)	(S.U.)	Potential	(NTU)	Level (feet btoc)	(e.g., opacil color, odor	ly, r)
2833		820	17.99	431.12	1.11	6.79	-71.5	30.75	12.9	Yeliow Flehe	\$6
0835	415	1640	17.45	431.39	1.13	6.82	-14.ĭ	22.39	12.82	4	<u> </u>
0837	280	2200	17.25	414.14	0.72	6.85	-76.2	18.26	12.82	clear, no	<u>or</u>
0839	<u> 3</u> £)	2900	17.09	443.06	<u>0.77</u>	6.86	-77.3	17.93	12.82	<b>N</b>	-
<u>0841</u>	340	3580	1700	443 15	0.57	6.26	-78.6	14,96	(2.82	N	0
0843	313	4200	17.01	424.19	0.58	6.87	-79.6	15.51	12.72	•	<u>"</u>
<u>08us</u>	320	4840	17.0	436.37	0.65	6.89	-805	16.65	12.82	**	<i>"</i>
0801	330	5500	17.00	450.42	0.48	6.89	-81.3	13.82	12.82		<u> </u>
2849	350	6200	16.96	437.99	0.50	6.90	-82.2	N.76	12.82		
<u>9851</u>	293	6780	16.97	422.53	5.52	6.40	-82.1	11.07	12.82		<u> </u>
0853	293	7360	17.01	413.07	<u>J.52</u>	6.9	-82.0	10,70	12,82	<u></u>	
<u> 2885</u>	510	1480	17.0/	432.41	2.55	6.40	<u>- 15 2 2</u>	1(.32	12.82	<b>K</b>	<u>-</u>
0857	<u>845</u>	8200	16.99	443.46	<u>3.55</u>	6.9	- 82.3	11.06	N.D		
		· · · · ·									
i					l						
									· · · · ·		
	1	1	1	I	1	1	1		1	J	

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Facility:	SBMU Sikeston	Power Station -	CCR Groundwa	ter Monitoring	Monitoring W	ell ID: <u>M</u>	W6
Sampling Informa	ation:						
Method of Samplin	ig: Low Flow -	Perstaltic Pum	o & Tubing	•		Dedicated:	(Y) / N
Water Level @ Sa	mpling (feet btoc	12.2	33				
Monitoring Event:	Annual ()	Semi-Annua	ıl () Quarte	riy() N	fonthly ( )	Other wy Re	sample
Final Purge Stabliz	zation Sampling [	Data:					
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
9 <u>-12-22</u> 0757	240	16.99	443.46	دی . د	6.90	-823	11.06
General Informat Weather Condition <u>56°</u> F Sample Character Sample Collection	ion: Is @ time of sam istics:	pling: <u>Su</u> <u>(ear, C</u> Per SAP	olaless	, odorless			· · · · ·
Comments and OI	bservations:	2 BIO	ink	•		•	
				•		•	
•	· · ·	•			*	·	
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Page 2 of 2

I certify that sampling procedures were in accordance with applicable EPA and State protocols.

Title: Las Teen Date: 9-12-22 By: Rom 1

January 2017

# Monitoring Well Field Inspection

Facility: <u>SBMU SPS – CCR Groundwater Monitoring</u> Monitoring Well ID: <u>MW 5</u> Name (Field Staff): <u>J Lowes A</u> Patel
Date: 9-12-22
Access: Accessibility: Good <u>Fair</u> Poor
Well clear of weeds and/or debris?: Yes No No
Well identification clearly visible?: Yes Yes No
Remarks:
Concrete Pad: Good Inadequate
Depressions or standing water around well?: Yes No
Remarks:
<u>Protective Outer Casing</u> : Material = $\frac{4^{n} \times 4^{n}}{2}$ Steel Hinged Casing with Hasp
Condition of Protective Casing: Good Condition
Condition of Locking Cap: Good 2 Damaged
Condition of Lock: Good 🗹 Damaged
Condition of Weep Hole: Good Damaged
Remarks:
Well Riser: Material = <u>2" Diameter, Schedule 40 PVC, Flush Threaded</u>
Condition of Riser: Good Damaged
Condition of Riser Cap: Good 🗹 Damaged
Measurement Reference Point: Yes <u>No</u>
Remarks:
Dedicated Purging/Sampling Device: Type = <u>14</u> " ID Semi-Rigid Polyethylene & 0.170" ID Flexible Silicone Tubing
Condition: Good 🖌 Damaged Missing
Remarks:
Monitoring Well Locked/Secured Post Sampling?: Yes V No
Remarks:
Field Certification by les Teel 9.12.22
Signed Title Date

Prepared by: GREDELL Engineering Resources, Inc.

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Monito	ing Well ID:	MW	15 Fac	ility: SBM	J Sikeston P	ower Static	n - Groundv	vater Monitor	ring		
Initial Wate	r Level (fee	t btoc):	11.88	· · · · ·		Date: C	1-12-	22			
Initial Grou	ndwater Ele	vation (NAVE	088):			Air Pressu	re in Well?	Y (N)	) 		
PURGE IN	FORMATIO	N							<u></u>		
Date:	9-12	· 22									
Name (Sar	nple Collect	or):	Low	bg							
Method of	Well Purge:	Low Flov	v Perstaltic	Pump	De	dicated Tub	bing? (	Ŷ/ N			
Time Purgi	ng Initiated:		0 <b>95</b> 0		On	e (1) Well \	/olume (mL)	:	NA	,	
Beginning	Water Level	(feet btoc):	11	87	Tot	al Volume I	Purged (mL)	:	894	0	
Beginning	Groundwate	er Elevation (N	NAVD88):		We	II Purged T	o Dryness?		ү /🚱		
Well Total	Depth (feet	btoc):	<u> 37. 13</u>		Wa	iter Level a	fter Samplin	g (feet btoc):	11.	87	
Casing Dia	meter (feet)	: <u>2" Sch 4</u>	0 PVC		Ti~	u.) Ne Samoliov	c., pump is c	,	1-2	6	:
						ie Gamping	goonpietee			<u> </u>	
FUNCE 3	Purce	Cumulative		Specific	Dissolved		Oxidation	Turkidik	Water	Notes	
Time	Rate	Volume (ml.)	(°C)	Conductance	Oxygen (mg/L)	p∺ (S.U.)	Potential	(NTU)	Level (feet btoc)	(e.g., opac color. odd	city, or)
		2.2-	1260	960 00	2 27	(70	(mV)	22 80	11 23	BOW FIG	X
252	76	380	18.07	067.44	88	6.14	-03.4	33.00	11 23	Blow # T	10
172×	260	1642	1701	85000	1.03	6.84	-77 7	14 27	11.88	CLOBE NO	dor Via
0134 0955	270	1040	16 00	275 4	1.20 0.41	6.87	-22.1	13.22	11.88	11	0 <u>0</u> *
064	200	225	11 13	701.27	0 65	6 88	-79.9	11.31	11.82	1·	"
10438	170	3.240	16 00	207 8-	0.59	6 80	-80.6	7.86	11. 88	11	U
1000	760	3820	16.86	784.05	0.59	6.90	-81.4	6.27	11.87	4	b
1000	27.7	4260	16.00	206.99	0.57	6.90	- 82.0	5.79	11.88	"	*
1004	26.7	11940	16.80	802.64	0.56	6.90	-80.5	6.85	11.88	r	11
1008	237	5500	16 22	226.94	0.52	6.90	-805	6.09	11.82	1.	1,
1010	300	6100	16.81	873.91	2.52	6.90	- 81.6	3.42	11.88	••	•
1012	290	6660	16.83	861.41	0.50	6.90	-81.7	4.05	11.88	34	y
101	290	1240	16.00	860.00	0.42	6.90	- 81.4	4.50	11. 78	1.	*
1016	2%0	7800	16.28	861.68	QUZ	6.90	-82.6	3.36	11.88	1	1)
1019	280	8360	16.92	881.92	0.42	6.90	-83.4	3.23	11.88	\ <u>\</u>	•
1020	290	8940	17.00	882.54	0.61	6.25	-85.4	3.12	11.82	<b>n</b>	6
								l			

btoc - below top of casing

Facility:	SBMU Sikeston	Power Station	- CCR Groundwa	ater Monitoring	Monitorina W		w 5
Sampling Inform	ation:	• .		¥	the fille of the second s		<u></u>
Method of Samplir	ng: Low Flow	- Perstaltic Pum	p & Tubing		·	Dedicated	
Water Level @ Sa	mpling (feet btoc	):11.8	77			Dedicated.	()/N
Monitoring Event:	Annual ()	Semi-Annua	al() Quarte	rlv() M	onthly ( )	Other & A	
Final Purge Stabliz	zation Sampling [	Data:			ionany ( )		sample
<u>Date</u> Sample Time	Sample Rate (mL/min)	Temp (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	рН (S.U.)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
<u>4-12-28</u> 1020	290	17.00-	882.54	0.41	6.95	-85.4	3.12
1 - In-Situ SmarTr 2 - HF scientific, ir General Informati	libration log of da roll Multi-Probe Fi nc. Micro TPI Fiel <b>ion:</b>	ily calibration da ield Meter (Tem ld Portable Turb	ata for the followi perature, Specifi idimeter	ng instruments: c Conductance, Dissol	ved Oxygen, pł	I, Oxidation Rec	luction Potentia
Weather Condition	is @ time of sam		any				
58°F			<u></u>				
Sample Character	istics:	zar, Co	oness,	odorles 5			
Sample Collection	Order:	Per SAP				·	• • • •
						,	
	oservations:	$\hat{\mathbf{n}}$	i cala	•		• •	
CONRCT	FILLE			· · ·		•	
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		<u> </u>	· · ·	•	· · ·		
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• . • .					<u>.                                    </u>		
	•.		•. 			· · ·	•
I certify that samp	ling procedures v	vere in accorda	nce with applicat	We EPA and State prot			
Date: <u>9-12-</u>	· 22 ву: _	184.34	Fa.	EL Title	a las	Leen	
F			Pag	e 2 of 2			

# Appendix 2

Laboratory Analytical Results and Quality Assurance/Quality Control Data

# **Appendix 2a**

Laboratory Analytical Results and Quality Assurance/Quality Control Data – November 1, 2021

(Second 2021 Semi-annual Event)



December 09, 2021

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

Dear Luke St Mary:

Please find enclosed the analytical results for the sample(s) the laboratory received. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Dail & Schindler

Project Manager (309) 692-9688 x1716 gschindler@pdclab.com





#### SAMPLE RECEIPT CHECK LIST

#### Items not applicable will be marked as in compliance

Work Order EK00904

YES	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers received undamaged
NO	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided



Sample: EK00904-01 Name: MW-3 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 07:45 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	1.0	mg/L		11/11/21 17:28	1	1.0	11/11/21 17:28	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/11/21 17:28	1	0.250	11/11/21 17:28	CRD	EPA 300.0 REV 2.1
Sulfate	14	mg/L		11/11/21 17:46	10	10	11/11/21 17:46	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	130	mg/L	Н	11/09/21 15:31	1	17	11/09/21 16:19	ADM	SM 2540C
<u>Total Metals - PIA</u>									
Boron	25	ug/L		11/09/21 10:07	5	10	11/10/21 11:27	JMW	EPA 6020A
Calcium	14000	ug/L		11/09/21 10:07	5	200	11/10/21 11:27	JMW	EPA 6020A
Sample: EK00904-02 Name: MW-4 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 13:24 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	16	mg/L		11/10/21 15:56	5	5.0	11/10/21 15:56	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/10/21 15:38	1	0.250	11/10/21 15:38	CRD	EPA 300.0 REV 2.1
Sulfate	95	mg/L		11/10/21 16:14	25	25	11/10/21 16:14	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	360	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u> Total Metals - PIA</u>									
Boron	870	ug/L		11/09/21 10:07	5	10	11/10/21 11:31	JMW	EPA 6020A
Calcium	76000	ug/L		11/09/21 10:07	5	200	11/10/21 11:31	JMW	EPA 6020A



Sample: EK00904-03 Name: MW-5 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 10:54 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	13	mg/L		11/10/21 17:27	5	5.0	11/10/21 17:27	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/10/21 16:32	1	0.250	11/10/21 16:32	CRD	EPA 300.0 REV 2.1
Sulfate	170	mg/L		11/10/21 17:45	50	50	11/10/21 17:45	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	490	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u>Total Metals - PIA</u>									
Boron	330	ug/L		11/09/21 10:07	5	10	11/10/21 11:34	JMW	EPA 6020A
Calcium	94000	ug/L		11/09/21 10:07	5	200	11/10/21 11:34	JMW	EPA 6020A
Sample: EK00904-04 Name: MW-6 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 09:02 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	4.3	mg/L		11/10/21 18:03	1	1.0	11/10/21 18:03	CRD	EPA 300.0 REV 2.1
Fluoride	0.330	mg/L		11/10/21 18:03	1	0.250	11/10/21 18:03	CRD	EPA 300.0 REV 2.1
Sulfate	27	mg/L		11/10/21 18:21	5	5.0	11/10/21 18:21	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	220	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u>Total Metals - PIA</u>									
Boron	56	ug/L		11/09/21 10:07	5	10	11/10/21 11:38	JMW	EPA 6020A
Calcium	47000	ug/L		11/09/21 10:07	5	200	11/10/21 11:38	JMW	EPA 6020A



Sample: EK00904-( Name: MW-8 Matrix: Ground W	05 Vater - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 11:46 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	45	mg/L		11/10/21 18:57	25	25	11/10/21 18:57	CRD	EPA 300.0 REV 2.1
Fluoride	0.258	mg/L		11/10/21 18:39	1	0.250	11/10/21 18:39	CRD	EPA 300.0 REV 2.1
Sulfate	94	mg/L		11/10/21 18:57	25	25	11/10/21 18:57	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	360	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u>Total Metals - PIA</u>									
Boron	430	ug/L		11/09/21 10:07	5	10	11/10/21 11:42	JMW	EPA 6020A
Calcium	80000	ug/L		11/09/21 10:07	5	200	11/10/21 11:42	JMW	EPA 6020A
Sample: EK00904-( Name: FIELD DUF Matrix: Ground W	06 PLICATE Vater - Field Du	plicate					Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 00:00 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	40	mg/L		11/10/21 19:33	5	5.0	11/10/21 19:33	CRD	EPA 300.0 REV 2.1
Fluoride	0.256	mg/L		11/10/21 19:15	1	0.250	11/10/21 19:15	CRD	EPA 300.0 REV 2.1
Sulfate	87	mg/L		11/10/21 19:51	50	50	11/10/21 19:51	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	390	mg/L		11/05/21 15:48	1	26	11/05/21 17:16	ADM/BM S	SM 2540C
<u> Total Metals - PIA</u>									
Boron	440	ug/L		11/09/21 10:07	5	10	11/10/21 11:45	JMW	EPA 6020A
Calcium	82000	ug/L		11/09/21 10:07	5	200	11/10/21 11:45	JMW	EPA 6020A



Sample: EK009 Name: FIELD Matrix: Grou	904-07 BLANK nd Water - Field Bla	ink					Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 13:24 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		11/11/21 18:05	1	1.0	11/11/21 18:05	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/11/21 18:05	1	0.250	11/11/21 18:05	CRD	EPA 300.0 REV 2.1
Sulfate	< 1.0	mg/L		11/11/21 18:05	1	1.0	11/11/21 18:05	CRD	EPA 300.0 REV 2.1
General Chemistry - Pl	<u>A</u>								
Solids - total dissolved solids (TDS)	< 17	mg/L		11/08/21 17:55	1	17	11/08/21 18:11	JAA	SM 2540C
<u> Total Metals - PIA</u>									
Boron	11	ug/L		11/09/21 10:07	5	10	11/10/21 11:49	JMW	EPA 6020A
Calcium	< 200	ug/L		11/09/21 10:07	5	200	11/10/21 11:49	JMW	EPA 6020A

#### **QC SAMPLE RESULTS**

Paramotor	Posult	Unit	Qual	Spike	Source Result	%PEC	%REC	חסס	RPD Limit
	Result	Unit	Quai	Level	Result	/iREC	Linits	KFU	L
<u> Batch B147394 - No Prep - SM 2540C</u>									
Blank (B147394-BLK1)				Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147394-BS1)				Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	1020	mg/L		1000		102	84.9-109		
Duplicate (B147394-DUP1)	Sample: EJ056	40-03		Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	1200	mg/L			1170			3	5
Duplicate (B147394-DUP2)	Sample: EK004	31-05		Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	740	mg/L	М		690			7	5
<u> Batch B147627 - No Prep - SM 2540C</u>									
Blank (B147627-BLK1)				Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147627-BS1)				Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	973	mg/L		1000		97	84.9-109		
Duplicate (B147627-DUP1)	Sample: EK005	74-04		Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	450	mg/L			470			4	5
Duplicate (B147627-DUP2)	Sample: EK009	04-06		Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	410	mg/L			390			5	5
<u> Batch B147792 - No Prep - SM 2540C</u>									
Blank (B147792-BLK1)				Prepared &	Analyzed: 11/	/08/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147792-BS1)				Prepared &	Analyzed: 11/	/08/21			
Solids - total dissolved solids (TDS)	960	mg/L		1000		96	84.9-109		
Batch B147842 - SW 3015 - EPA 6020A									
Blank (B147842-BLK1)				Prepared: 1	1/09/21 Analy	yzed: 11/10/2	1		
Boron	< 10	ug/L							
Calcium	< 200	ug/L							
LCS (B147842-BS1)				Prepared: 1	1/09/21 Analy	yzed: 11/10/2	1		
Boron	484	ug/L		555.6		87	80-120		
Calcium	5320	ug/L		5556		96	80-120		
<u> Batch B147924 - No Prep - SM 2540C</u>									
Blank (B147924-BLK1)				Prepared &	Analyzed: 11/	/09/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147924-BS1)				Prepared &	Analyzed: 11/	/09/21			
Solids - total dissolved solids (TDS)	980	mg/L		1000		98	84.9-109		
Duplicate (B147924-DUP1)	Sample: EK006	16-01		Prepared &	Analyzed: 11/	/09/21			
Solids - total dissolved solids (TDS)	1010	mg/L			1060			5	5
Batch B148133 - IC No Prep - EPA 300.0 REV	<u>2.1</u>								

Calibration Blank (B148133-CCB1)

Prepared & Analyzed: 11/10/21



#### **QC SAMPLE RESULTS**

Parameter	Result	Unit	Qual	Spike Level	Source Result	%RFC	%REC	RPD	RPD Limit
			quui			/01120			
<u> Batch B148133 - IC No Prep - EPA 300.0 REV 2.1</u>									
Calibration Blank (B148133-CCB1)				Prepared &	Analyzed: 11/	10/21			
Fluoride	0.00	mg/L			-				
Chloride	0.545	mg/L							
Sulfate	0.00	mg/L							
Calibration Check (B148133-CCV1)				Prepared &	Analyzed: 11/	10/21			
Sulfate	5.22	mg/L		5.000		104	90-110		
Chloride	5.03	mg/L		5.000		101	90-110		
Fluoride	5.28	mg/L		5.000		106	90-110		
Batch B148294 - IC No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B148294-CCB1)				Prepared &	Analyzed: 11/	11/21			
Sulfate	0.00	mg/L							
Chloride	0.219	mg/L							
Fluoride	0.00	mg/L							
Calibration Check (B148294-CCV1)				Prepared &	Analyzed: 11/	'11/21			
Sulfate	4.97	mg/L		5.000		99	90-110		
Fluoride	5.02	mg/L		5.000		100	90-110		
Chloride	4.85	mg/L		5.000		97	90-110		
Matrix Spike (B148294-MS1)	Sample: EK010	80-02		Prepared &	Analyzed: 11/	11/21			
Chloride	1.0E9	mg/L	Q4	1.500	9.6	NR	80-120		
Sulfate	1.00E9	mg/L	Q4	1.500	8.76	NR	80-120		
Matrix Spike Dup (B148294-MSD1)	Sample: EK010	80-02		Prepared &	Analyzed: 11/	'11/21			
Chloride	1.0E9	mg/L	Q4	1.500	9.6	NR	80-120	0	20
Sulfate	1.00E9	mg/L	Q4	1.500	8.76	NR	80-120	0	20
<u> Batch B150295 - IC No Prep - EPA 300.0 REV 2.1</u>									
Calibration Blank (B150295-CCB1)				Prepared &	Analyzed: 12	/06/21			
Chloride	0.858	mg/L							
Calibration Check (B150295-CCV1)				Prepared &	Analyzed: 12	/06/21			
Chloride	4.73	mg/L		5.000		95	90-110		
Matrix Spike (B150295-MS1)	Sample: EL009	28-01		Prepared &	Analyzed: 12	/06/21			
Chloride	7.4	mg/L	Q4	3.000	5.0	79	80-120		
Matrix Spike (B150295-MS2)	Sample: EL009	28-02		Prepared &	Analyzed: 12	/07/21			
Chloride	1.0E9	mg/L	Q4	3.000	180	NR	80-120		
Matrix Spike (B150295-MS3)	Sample: EL009	28-03		Prepared &	Analyzed: 12/	/07/21			
Chloride	1.0E9	mg/L		3.000	370	NR	80-120		
Matrix Spike Dup (B150295-MSD1)	Sample: EL009	28-01		Prepared &	Analyzed: 12/	/06/21			
Chloride	7.4	mg/L	Q4	3.000	5.0	79	80-120	0.1	20
Matrix Spike Dup (B150295-MSD2)	Sample: EL009	28-02		Prepared &	Analyzed: 12/	/07/21			
Chloride	1.0E9	mg/L	Q4	3.000	180	NR	80-120	0	20
Matrix Spike Dup (B150295-MSD3)	Sample: EL009	28-03		Prepared &	Analyzed: 12	/07/21			
Chloride	1.0E9	mg/L		3.000	370	NR	80-120	0	20



#### NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

#### **Certifications**

- CHI McHenry, IL 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556
- PIA Peoria, IL 2231 W. Altorfer Drive, Peoria, IL 61615

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SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042

TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

#### **Qualifiers**

- H Test performed after the expiration of the appropriate regulatory/advisory maximum allowable hold time.
- M Analyte failed to meet the required acceptance criteria for duplicate analysis.
- Q4 The matrix spike recovery result is unusable since the analyte concentration in the sample is greater than four times the spike level. The associated blank spike was acceptable.

Dail & Schindler



Certified by: Gail Schindler, Project Manager



PDC LABORATORIES, INC. WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

#### CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

			ALL HIGH	HLIGHTED	AREAS	S MUST E	BE COMPL	ETED BY C	LIENT (PLEA	SE PRINT)											
CLIENT		PROJECT NUMBER				PROJECT LOCATION			PURCHASE ORDER #			ALYSI	S REO	UESTE	D	(FO	R LAB USE C	ONLY)			
1 SIKESTON BMU POWER ST	SIKESTON BMU POWER STATION										C	)		oneq	ULUIL			EVM	MALL	0-	
ADDRESS		PHONE NUMBER				E-MAIL			DATE SHIPPED							LOGIN #	- Kuu	MQ 4 -	$\Psi_{1}$		
1551 W WAKEFIELD			5/3-4/5-3131														LOGGED BY	<i>(</i> :	KE	tr	
		SAM							MATRIX	TYPES	-					14	CLIENT: SIKESTON BMU, SIKESTON				
STAT SIKESTON, MO 63801			ASE PRIN	т)				MATRIX TTPE			<b>J</b> .						POWER STA	TION			
			Daniel Dillinghave					DW- DRINKING WATER GW- GROUND WATER			SC						PROJECT: S	SIKESTON BO	OTTOM AS	н	
CONTACT PERSON		SAM	PLER'S	·				NAS-NON AQUEOUS SOLI			F										
MR LUKE ST MARY		SIGN	SIGNATURE					SO-SOIL SOL-SOLD			4						PROJ. MGR.	: GJ SCHIND	LER		
		-	"					1			N N										
		w	Ware a.				a ellection			DDEC	Ľ										
2 (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL I	REPORT)	COL	LECTED	COLLEC	TED	GRAB	СОМР	TYPE	COUNT	CODE CLIENT PROVIDED	<u>ក្រ</u>	'n						REMARKS			
MW-3		1-	1-21	074	5	х		GW	2	3,6	x	x									
MW-4		11-	1-21	132	Ų	х		GW	2	3,6	X	x									
MW-5		11-	1.21	105	4	х		GW	2	3,6	x	x									
MW-6			1-21	090	2	х		GW	2	3,6	x	x									
MW-8			1-21	114	6	х		GW	2	3,6	x	x									
DUPLICATE						х		GW	2	3,6	x	x									
FIELD BLANK			1-21	132	4	х		DI	2	3,6	X	x									
CHEMICAL PRESERVATION CODES: 1-HCL 2	– H2SO4	3 – HNO3	4 – NA	ЮН	5 – NA2	S2O3	6 – UNP	RESERVED	7 – OTHER	8									to an entrance	-	
TURNAROUND TIME REQUESTED (PLEASE CIR (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL ANI	RCLE) NC ID SURCHARGE	) )	USH		1	NEED	ED	6	l understan	d that by init	ialing th	is box	give t	he lab	permis	sion to p	roceed with anal	ysis, even the	ough it ma	y	
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL	PHONE							$\sim$	e qualit	ied. Qu	alified	data n	nay NOT	<u>I</u> be acco	eptable to report	to all regulate	ory authori	ities.			
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFI	ERENT FROM A	BOVE:							PROCEED	WITH ANAL	ISIS AN	D QUA	LIFY R	ESULT	S: (INIT	TIALS) _		-			
RELINQUISHED BY: (SIGNATURE)	DATE	12/2	RECEIVED BY: (SIGNATURE)				0	DA				COMMENTS: (FOR LAB USE ONLY)									
1 And In TIME										тім	TIME			ి	-						
RELINQUISHED BY: (SIGNATURE)	E		R	ECEIVE	D BY: (SIC	GNATURE)			DAT	E						°C					
TIME										TIM	TIME			CHILL PROCESS STARTED PRIOR TO RECEIPT							
RELINQUISHED BY: (SIGNATURE)	DATE	E		RI	ECEIVE	D BY: (SIC	GNATURE)	1,		DAT	DATE			SAMPLE(S) RECEIVED ON IC SAMPLE ACCEPTANCE NON				ANT	YORN	$\cap$	
	TIME				K	alt	431	Kig.	UN.	ТІМ	DATE DATE				DATE AND TIME TAKEN FROM SAMPLE BOTTLE				C	/	
				district allow-			FI	V UU	4		011	14		-						ALC: ALC: NO	
									1												

# Appendix 2b

Laboratory Analytical Results and Quality Assurance/Quality Control Data – December 27, 2021

(Re-sample)



January 07, 2022

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

Dear Luke St Mary:

Please find enclosed the analytical results for the sample(s) the laboratory received. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Dail & Schindler

Project Manager (309) 692-9688 x1716 gschindler@pdclab.com





#### SAMPLE RECEIPT CHECK LIST

#### Items not applicable will be marked as in compliance

Work Order EL04922

YES	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers received undamaged
NO	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided



Sample: EL04922-01 Name: MW-3 Matrix: Ground Wa	l ater - Grab						Sampled:12/27/2Received:12/29/2PO #:25816	21 07:53 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	170	mg/L		01/03/22 09:57	1	26	01/03/22 11:18	JAA	SM 2540C
Sample: EL04922-02 Name: MW-6 Matrix: Ground Wa	2 ater - Grab						Sampled:         12/27/2           Received:         12/29/2           PO #:         25816	21 08:56 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	3.5	mg/L		01/03/22 17:58	1	1.0	01/03/22 17:58	CRD	EPA 300.0 REV 2.1
Sample: EL04922-03 Name: DUPLICATE Matrix: Ground Wa	3 ater - Field Du	plicate					Sampled:12/27/2Received:12/29/2PO #:25816	21 00:00 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	3.4	mg/L		01/03/22 18:16	1	1.0	01/03/22 18:16	CRD	EPA 300.0 REV 2.1
Sample: EL04922-04 Name: FIELD BLAN Matrix: Ground Wa	t IK ater - Field Bla	ank					Sampled:12/27/2Received:12/29/2PO #:25816	21 08:56 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		01/03/22 18:34	1	1.0	01/03/22 18:34	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	20	mg/L		01/03/22 09:57	1	17	01/03/22 11:18	JAA	SM 2540C



#### **QC SAMPLE RESULTS**

				Spike	Source		%REC		RPD
Parameter	Result	Unit	Qual	Level	Result	%REC	Limits	RPD	Limit
Batch B220779 - No Prep - SM 2540C									
Blank (B220779-BLK1)				Prepared &	Analyzed: 01	/03/22			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B220779-BS1)				Prepared &	Analyzed: 01	/03/22			
Solids - total dissolved solids (TDS)	960	mg/L		1000		96	84.9-109		
Duplicate (B220779-DUP1)	Sample: EL048	94-02		Prepared &					
Solids - total dissolved solids (TDS)	480	mg/L	М		8	5			
Batch B220859 - IC No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B220859-CCB1)				Prepared &	Analyzed: 01	/03/22			
Chloride	0.240	mg/L							
Calibration Check (B220859-CCV1)				Prepared &	Analyzed: 01	/03/22			
Chloride	4.99	mg/L		5.000		100	90-110		



#### NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

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#### **Qualifiers**

M Analyte failed to meet the required acceptance criteria for duplicate analysis.

Pail & Schindler



Certified by: Gail Schindler, Project Manager



-

PDC LABORATORIES, INC. WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

### CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

	ALL HIC	GHLIGHTED AREA	AS MUST	BE COMPL	LETED BY C	LIENT (PLEA	SE PRINT)										
(1) SIKESTON POWER STATION	PROJEC	PROJECT NUMBER			PROJECT LOCATION			PURCHASE ORDER #				ESTED	,	(FOR LAB USE ONLY)			
													C 12 (0) 1077 - (1)				
	PHONE	E NUMBER	E-MAIL			DATE S							LOGIN #_ ECOMMYCC 47				
1331 W WAREFIELD	5/3-4	515-415-5151												LOGGED BY: KEG			
CITY OUTCOME THE SECOND	SAMPLER					MATRIX TYPES:			~					SIKESTON BMU, SIKESTON POWER			
STAT SIKESION, MO 63801	(PLEASE PRI	(PLEASE PRINT)				WW-WASTEWATER											
	Daniel Dillingh				hans	GW- GROUND WATER								RESAMPLES			
MRILIKE ST MARY	SAMPLER'S SIGNATURE	AMPLER'S GNATURE				LCHT-LEACHATE								GJ SCHINDLER			
	-	-	•			SO-SOIL SOL-SOLID											
	Wan			Ilea	here	ļ											
3 SAMPLE DESCRIPTION	DATE	TIME	SAMP	LE TYPE	MATRIX	IX BOTTLE PRI		SC		.							
(UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	COLLECTED	COLLECTED	GRAB	ØOMP	TYPE	COUNT	CODE CLIENT PROVIDED	F	ប					REMARKS			
MW-3	12-27-2	1 0753	x		GW	1	6	x									
MW-6	12.27.2	0856	x		GW	1	6		x								
DUPLICATE	12.27.2	,	X		GW	1	6		Y								
	12.27.21	0861															
		0036	X		DI	1	6	X	×								
CHEMICAL PRESERVATION CODES: 1-HCL 2-H2SO4 2			<u></u>			7.071/57											
	- HNO3 4- NA	5-NA2	.5203	6 - UNP	RESERVED	7-OTHER											
(5) TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NOR (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)	MAL RUSH		DATE RES NEEDE	ULTS	$\bigcirc$	l understand	that by initia	ling this	box I	give the	e lab pe	rmissi	on to pro	oceed with analysis, even though it may			
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE					U.	not meet all s Policy and the	sample confo e data will be	mance	required. Qua	ements lified d	ents as defined in the receivin			eiving facility's Sample Acceptance ptable to report to all regulatory authorities.			
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABO	VE:					PROCEED W	TH ANALYS	LYSIS AND QUALIFY RESULTS: (INITIALS)									
RELINQUISHED BY: (SIGNATURE) DATE	16.80	RECEIVE	D BY: (SIG	NATURE)			DATE			17	>	COM	MENTS:	(FOR LAB USE ONLY)			
the /h							TIME			10	).						
	833	DEADLY															
UATE DATE		REGEIVE	∪ вт:(SlG	NATURE)			DATE			SAN	APLE T	EMPER	RATURE	UPON RECEIPT			
TIME							TIME			СН	LL PRO	CESS	STARTE				
RELINQUISHED BY: (SIGNATURE) DATE		RECEIVE	D BY: (SIG	NATURE)	r.		DATE	120	17.	SAMPLE(S) RECEIVED ON ICE				NICE IONCONFORMANT			
TIME		1/ .	A	1			TIME	109	19	REP	PORTIS	NEED	ED	YOR			
		Cather	X	Na				DATE AND TIME TAKEN FROM SAMPLE BOTTLE					ROM SAMPLE BOTTLE				
	L			1 - 61	X			.1	- Ur	1							

Page .

# Appendix 2c

Laboratory Analytical Results and Quality Assurance/Quality Control Data – August 3, 2022

(First 2022 Semi-annual Event)


Pace Analytical Services, LLC 2231 W. Altorfer Drive Peoria, IL 61615 (800)752-6651

August 30, 2022

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

Dear Luke St Mary:

Please find enclosed the analytical results for the sample(s) the laboratory received. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of Pace Analytical Services, LLC.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

Pace Analytical Services appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lisa.grant@pacelabs.com.

Sincerely,

pail of Schindler

Gail Schindler Project Manager (309) 692-9688 x1716 gail.schindler@pacelabs.com



### SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order FH01475 YES Samples received within temperature compliance when applicable YES COC present upon sample receipt YES COC completed & legible YES Sampler name & signature present YES Unique sample IDs assigned YES Sample collection location recorded YES Date & time collected recorded on COC YES Relinquished by client signature on COC YES COC & labels match YES Sample labels are legible YES Appropriate bottle(s) received YES Sufficient sample volume received YES Sample containers received undamaged NO Zero headspace, <6 mm present in VOA vials NO Trip blank(s) received YES All non-field analyses received within holding times NO Short hold time analysis YES Current PDC COC submitted NO Case narrative provided



Sample: FH01475- Name: MW-3 Matrix: Ground V	-01 Water - Grab						Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 08:06 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		08/12/22 09:47	1	1.0	08/12/22 09:47	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 09:47	1	0.250	08/12/22 09:47	CJP	EPA 300.0 REV 2.1
Sulfate	11	mg/L		08/15/22 15:51	5	5.0	08/15/22 15:51	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	130	mg/L	М	08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
Total Metals - PIA									
Boron	23	ug/L		08/11/22 10:15	5	10	08/17/22 08:18	JMW	EPA 6020A
Calcium	16000	ug/L		08/11/22 10:15	5	200	08/17/22 08:18	JMW	EPA 6020A
Sample: FH01475- Name: MW-4 Matrix: Ground V	-02 Water - Grab						Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 13:43 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	14	mg/L		08/12/22 10:41	5	5.0	08/12/22 10:41	CJP	EPA 300.0 REV 2.1
Sulfate	93	mg/L		08/15/22 16:45	25	25	08/15/22 16:45	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Fluoride	< 0.250	mg/L		08/22/22 12:26	1	0.250	08/22/22 12:26	ТТН	SM 4500F C 1997
Solids - total dissolved solids (TDS)	390	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u> Total Metals - PIA</u>									
Boron	880	ug/L		08/11/22 10:15	5	10	08/17/22 08:21	JMW	EPA 6020A
Calcium	76000	ug/L		08/11/22 10:15	5	200	08/17/22 08:21	JMW	EPA 6020A



Sample: FH01475-( Name: MW-5 Matrix: Ground W	03 Vater - Grab						Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 10:50 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	12	mg/L		08/12/22 11:35	5	5.0	08/12/22 11:35	CJP	EPA 300.0 REV 2.1
Sulfate	210	mg/L		08/15/22 17:03	50	50	08/15/22 17:03	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Fluoride	< 0.250	mg/L		08/22/22 12:34	1	0.250	08/22/22 12:34	ттн	SM 4500F C 1997
Solids - total dissolved solids (TDS)	560	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	390	ug/L		08/11/22 10:15	5	10	08/17/22 08:25	JMW	EPA 6020A
Calcium	110000	ug/L		08/11/22 10:15	5	200	08/17/22 08:25	JMW	EPA 6020A
Sample: FH01475-0 Name: MW-6 Matrix: Ground W	04 Vater - Grab						Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 09:21 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	4.3	mg/L		08/12/22 12:11	1	1.0	08/12/22 12:11	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 12:11	1	0.250	08/12/22 12:11	CJP	EPA 300.0 REV 2.1
Sulfate	24	mg/L		08/12/22 13:05	5	5.0	08/12/22 13:05	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	230	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	51	ug/L		08/11/22 10:15	5	10	08/17/22 08:51	JMW	EPA 6020A
Calcium	43000	ug/L		08/11/22 10:15	5	200	08/17/22 08:51	JMW	EPA 6020A



Sample: FH01475- Name: MW-8 Matrix: Ground V	05 Vater - Grab						Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 11:44 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	56	mg/L		08/12/22 13:42	25	25	08/12/22 13:42	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 13:24	1	0.250	08/12/22 13:24	CJP	EPA 300.0 REV 2.1
Sulfate	140	mg/L		08/12/22 13:42	25	25	08/12/22 13:42	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	490	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	420	ug/L		08/11/22 10:15	5	10	08/17/22 08:54	JMW	EPA 6020A
Calcium	100000	ug/L		08/11/22 10:15	5	200	08/17/22 08:54	JMW	EPA 6020A
Sample: FH01475- Name: FIELD DUF Matrix: Ground V	06 PLICATE Vater - Field Du	plicate					Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 00:00 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	55	mg/L		08/12/22 14:36	25	25	08/12/22 14:36	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 14:00	1	0.250	08/12/22 14:00	CJP	EPA 300.0 REV 2.1
Sulfate	140	mg/L		08/12/22 14:36	25	25	08/12/22 14:36	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	490	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	410	ug/L		08/11/22 10:15	5	10	08/17/22 08:58	JMW	EPA 6020A
Calcium	100000	ug/L		08/11/22 10:15	5	200	08/17/22 08:58	JMW	EPA 6020A



Sample: FH01475 Name: FIELD BL Matrix: Ground	-07 ANK Water - Field Bla	ank					Sampled:   08/03/2     Received:   08/05/2     PO #:   28362	22 09:21 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		08/12/22 14:54	1	1.0	08/12/22 14:54	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 14:54	1	0.250	08/12/22 14:54	CJP	EPA 300.0 REV 2.1
Sulfate	< 1.0	mg/L		08/12/22 14:54	1	1.0	08/12/22 14:54	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	< 17	mg/L		08/10/22 10:23	1	17	08/10/22 17:46	ZEJ	SM 2540C
Total Metals - PIA									
Boron	12	ug/L		08/11/22 10:15	5	10	08/17/22 09:02	JMW	EPA 6020A
Calcium	< 200	ug/L		08/11/22 10:15	5	200	08/17/22 09:02	JMW	EPA 6020A



## **QC SAMPLE RESULTS**

Parameter	Result	Unit	Qual	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B240379 - No Prep - SM 2540C									
Blank (B240379-BLK1)				Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B240379-BS1)				Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	1010	mg/L		1000		101	84.9-109		
Duplicate (B240379-DUP1)	Sample: FH014	75-01		Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	110	mg/L	М		130			17	5
Duplicate (B240379-DUP2)	Sample: FH014	75-07		Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	6.67	mg/L			6.67			0	5
<u> Batch B240514 - SW 3015 - EPA 6020A</u>									
Blank (B240514-BLK1)				Prepared: (	08/11/22 Anal	yzed: 08/16/2	2		
Boron	< 10	ug/L							
Calcium	< 200	ug/L							
LCS (B240514-BS1)				Prepared: (	08/11/22 Anal	yzed: 08/16/2	2		
Boron	540	ug/L		555.6		97	80-120		
Calcium	5740	ug/L		5556		103	80-120		
Batch B240840 - IC No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B240840-CCB1)				Prepared &	Analyzed: 08	/12/22			
Fluoride	0.00	mg/L							
Chloride	0.188	mg/L							
Sulfate	0.00	mg/L							
Calibration Check (B240840-CCV1)				Prepared &	Analyzed: 08	/12/22			
Fluoride	5.18	mg/L		5.000		104	90-110		
Sulfate	5.06	mg/L		5.000		101	90-110		
Chloride	5.00	mg/L		5.000		100	90-110		
Batch B240945 - No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B240945-CCB1)				Prepared &	Analyzed: 08	/15/22			
Sulfate	0.00	mg/L							
Calibration Check (B240945-CCV1)				Prepared &	Analyzed: 08	/15/22			
Sulfate	4.97	mg/L		5.000	-	99	90-110		
Batch B241379 - No Prep - SM 4500F C 1997									
Calibration Blank (B241379-CCB1)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.00800	mg/L							
Calibration Blank (B241379-CCB2)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.0100	mg/L							
Calibration Check (B241379-CCV1)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.652	mg/L		0.7000		93	90-110		
Calibration Check (B241379-CCV2)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.694	mg/L		0.7000		99	90-110		



Pace Analytical Services, LLC 2231 W. Altorfer Drive Peoria, IL 61615 (800)752-6651



## NOTES

Specifications regarding method revisions, method modifications, and calculations used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

### **Certifications**

CHI - McHenry, IL - 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556

PIA - Peoria, IL - 2231 W. Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553

Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870) Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338) Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042

TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

### **Qualifiers**

M Analyte failed to meet the required acceptance criteria for duplicate analysis.

Dail & Schindler



Certified by: Gail Schindler, Project Manager



PACE ANALYTICAL SERVICES WWW.PACELABS.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

## CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)   1 CLIENT PROJECT NUMBER PROJECT LOCATION PURCHASE ORDER # (3) ANALYSIS REQUESTED (FOR LAB USE ONLY)													
	PROJECT	NUMBER	PRO	JECT LOCA	ATION	PURCHAS	E ORDER #	$\overline{(}$	) AN	LYSIS RE	OUESTED	)	(FOR LAB USE ONLY)
SIRESTON BIND POWER STATION			BOTT	OM ASH	APP III			U	)				CTIDUTS-A
ADDRESS	PHONE	NUMBER		E-MAIL		DATE S	HIPPED					1	LOGIN # 1701972 Off
1551 W WAKEFIELD	573-47	5-3131											LOGGED BY:
						and the second second							CLIENT: SIKESTON DMIL SIKESTON
	SAMPLER (PLEASE PRINT	7				MATRIX	TYPES:						POWER STATION
STAT SINESTON, WO 63801	The	Lan 1	Del	80		WW- WASTEWA DW- DRINKING V	TER VATER	S					PROJECT: SIKESTON BOTTOM ASH
	005	111 (	un	9		GW- GROUND W WWSL- SLUDGE		Ő					APP III
	SAMPLER'S SIGNATURE					LCHT-LEACHATI	E	15					PROJ. MGR.: GJ SCHINDLER
WIR LURE ST WART		DE	C. S			SO-SOIL SOL-SOLID		ő					1
	C							s,					
	DATE	TIME	CAMPI	ETYPE	MATDIX	POTTLE	DDEC	Щ	UA C				
(2) SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	COLLECTED	COLLECTED	GRAB	COMP	TYPE	COUNT	CODE	리	m				REMARKS
$\bigcirc$							PROVIDED				+		
MW-3	8/3/22	0806	X		GW	2	3,6	X	X				
MW-4	8/3/22	1343	x		GW	2	3,6	x	x				
MW-5	3/2/22	1050	x		GW	2	3.6	x	x				
MW-6	2/2/22	1021	v		CW/	2	2.6	v	Y				
MW-5	0/2/22	0701	<b>^</b>		Gw	2	3,0	<b>^</b>	<b>^</b>		+		
MW-8	8/3/22	[144	X		GW	2	3,6	X	X				
DUPLICATE	8/3/22		X		GW	2	3,6	X	X				
FIELD BLANK	8/3/22	0921	X		DI	2	3,6	x	x				
CHEMICAL PRESERVATION CODES: I-HCL 2-H2SO4 3-	HNO3 4 - NAC	0H 5 – NA2	28203	6 – UNPF	RESERVED	7 – OTHER		d-second	Louise				
TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORM (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)	AL RUSH		DATE RES		$\bigcirc$	l understan	d that by initia	aling thi	is box l	give the la	b permiss	ion to pro	ceed with analysis, even though it may
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE					$\Box$	not meet all	sample confe	ormanc	e requi	ements as	defined i	n the rece	iving facility's Sample Acceptance
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABOVE:	E:					PROCEED	WITH ANALY	SIS ANI	D QUAL	IFY RESUL	.TS: (INIT	IALS)	table to report to all regulatory autionities.
RELINQUISHED BY: (SIGNATURE)		RECEIVE	D BY: (SIG		L		DATE			To	CO		(FOR LAB USE ONLY)
	122	RECEIVE									001		
Shih (m TIME)	7						TIME			$\sim$			
RELINQUISHED BY: (SIGNATURE) DATE		RECEIVE	D BY: (SIG	NATURE)			DATE			-			)-0-
										SAMPL	E TEMPE	RATURE	UPON RECEIPT
TIME							TIME			CHILL	PROCESS	S STARTE	D PRIOR TO RECEIPT YORN
RELINQUISHED BY: (SIGNATURE) DATE	/	RECEIVE	D BY: (SIG	NATURE)	_	1	DAT	5/2	2	SAMPL	E(S) REC	EIVED ON	ONCONFORMANT
TIME				-	1		TIME	-/			I IS NEE	020	TORP
				/	U		10	13	D	DATE	AND TIME	TAKEN F	ROM SAMPLE BOTTLE

# **Appendix 2d**

Laboratory Analytical Results and Quality Assurance/Quality Control Data – September 12, 2022

(Re-sample)



Pace Analytical Services, LLC 2231 W. Altorfer Drive Peoria, IL 61615 (800)752-6651

September 28, 2022

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

**RE: SIKESTON BOTTOM ASH RESAMPLES** 

Dear Luke St Mary:

Please find enclosed the analytical results for the **4** sample(s) the laboratory received on **9/14/22 1:40 pm** and logged in under work order **FI02653**. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of Pace Analytical Services, LLC.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

Pace Analytical Services appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lisa.grant@pacelabs.com.

pail of Schindler

Gail Schindler Project Manager (309) 692-9688 x1716 gail.schindler@pacelabs.com



### SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order FI02653 YES Samples received within temperature compliance when applicable YES COC present upon sample receipt YES COC completed & legible YES Sampler name & signature present YES Unique sample IDs assigned YES Sample collection location recorded YES Date & time collected recorded on COC YES Relinquished by client signature on COC YES COC & labels match YES Sample labels are legible YES Appropriate bottle(s) received YES Sufficient sample volume received YES Sample containers received undamaged NO Zero headspace, <6 mm present in VOA vials NO Trip blank(s) received YES All non-field analyses received within holding times NO Short hold time analysis YES Current PDC COC submitted NO Case narrative provided



Sample: Fl02653-01 Name: MW-5 Matrix: Ground Wa	ter - Grab						Sampled:   09/12/2     Received:   09/14/2     PO #:   30965	22 10:20 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	510	mg/L	М	09/15/22 10:35	1	26	09/15/22 11:57	ZEJ	SM 2540C
Sample: Fl02653-02 Name: MW-6 Matrix: Ground Wa	ter - Grab						Sampled:   09/12/2     Received:   09/14/2     PO #:   30965	22 08:57 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	4.7	mg/L		09/16/22 23:12	1	1.0	09/16/22 23:12	CRD	EPA 300.0 REV 2.1
Sample: Fl02653-03 Name: DUPLICATE Matrix: Ground Wa	ter - Grab						Sampled:   09/12/2     Received:   09/14/2     PO #:   30965	22 00:00 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	11	mg/L		09/17/22 00:42	10	10	09/17/22 00:42	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	520	mg/L		09/15/22 10:35	1	26	09/15/22 11:57	ZEJ	SM 2540C
Sample: Fl02653-04 Name: FIELD BLAN Matrix: Ground Wa	K ter - Grab						Sampled:   09/12/2     Received:   09/14/2     PO #:   30965	22 08:57 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		09/17/22 01:00	1	1.0	09/17/22 01:00	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	< 26	mg/L		09/15/22 10:35	1	26	09/15/22 11:57	ZEJ	SM 2540C



## NOTES

Specifications regarding method revisions, method modifications, and calculations used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

### **Certifications**

- CHI McHenry, IL 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556
- PIA Peoria, IL 2231 W. Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553 Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870) Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338) Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

- SPMO Springfield, MO 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program
- STL Hazelwood, MO 944 Anglum Rd, Hazelwood, MO 63042 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

### **Qualifiers**

M Analyte failed to meet the required acceptance criteria for duplicate analysis.

Dail & Schindler



Certified by: Gail Schindler, Project Manager

Pace

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

# CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

	ALL HIGHLIGHTED AREA	S MUST BE COMPLE	ETED BY CL	IENT (PLEASE	PRINT)							
1 CLIENT SIKESTON POWER STATION	PROJECT NUMBER	PROJECT LOC	ATION	PURCHASE O	RDER #	3	ANA	LYSIS	REQU	JESTE	D	(FOR LAB USE ONLY)
ADDRESS 1551 W WAKEFIELD	PHONE NUMBER 573-475-3131	E-MAIL		DATE SHIF	PED							LOGIN # +102653
CITY STAT SIKESTON, MO 63801	SAMPLER (PLEASE PRINT) JUSTIN	owes		MATRIX TY WW- WASTEWATER DW- DRINKING WATE GW- GROUND WATEI WWSL- SLUDGE	PES:							SIKESTON BMU, SIKESTON POWER STATION SIKESTON BOTTOM ASH 2022 RESAMPLES
CONTACT PERSON MR LUKE ST MARY	SAMPLER'S SIGNATURE J. LOWLE	3		NAS- NON AQUEOUS LCHT-LEACHATE OIL-OIL SO-SOIL SOL-SOLID	SOLID							GJ SCHINDLER
2 (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE TIME COLLECTED COLLECTED	GRAB COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	TDS	Ч					REMARKS
MW-5	9-12-22 1020	x	GW	1	6	x						
MW-6	9-12-22 0857	x	GW	1	6		x					
DUPLICATE	9-12-22	x	GW	1	6	x	x					
FIELD BLANK	9-12-22 08 57	x	DI	1	6	x	x					
CHEMICAL PRESERVATION CODES: I – HCL 2 – H2SO4 3	- HNO3 4 - NAOH 5 - NA	2S2O3 6 – UNP	RESERVED	7 – OTHER					I		I	
5   TURNAROUND TIME REQUESTED (PLEASE CIRCLE)   NORM (RUSH TAT IS SUBJECT TO PACE LABS APPROVAL AND SURCHARGE)     6   RUSH RESULTS VIA (PLEASE CIRCLE)   EMAIL   PHONE     EMAIL IF DIFFERENT FROM ABOVE:   PHONE # IF DIFFERENT FROM ABOVE:   PHONE # IF DIFFERENT FROM ABOVE:	IAL RUSH	DATE RESULTS NEEDED	6	l understand th not meet all sa Policy and the PROCEED WI	hat by initia ample confo data will be TH ANALYS	ling thi ormance qualifi SIS ANI	is box I e requi ied. Qu D QUAI	give t remen alified _IFY R	he lab ts as d data n ESULT	permi lefined nay <u>N(</u> IS: (IN	ssion to p d in the re <u>DT</u> be acco ITIALS)	proceed with analysis, even though it may ceiving facility's Sample Acceptance eptable to report to all regulatory authorities.
RELINQUISHED BY: (SIGNATURE)	13 - 22 RECEIV	ED BY: (SIGNATURE)			DATE			1	8	С	OMMENT	S: (FOR LAB USE ONLY)
Ashish fase Time	007				TIME							
DATE DATE	RECEIV	ED BY: (SIGNATURE)			DATE			s	AMPLE	TEM	PERATUR	RE UPON RECEIPT 2.3 °C
		i			TIME			C		ROCE		TED PRIOR TO RECEIPT
DATE	RECEIV	ED BY: (SIGNATURE)	1		DATE	9/1	1/2	) S. R	AMPLE	ACC	EPTANCE	NONCONFORMANT
Of Of			_		TIME	340	>	D	ATE AI	ND TI	NE TAKEN	N FROM SAMPLE BOTTLE
					I							

# **Appendix 3**

Groundwater Quality Data Base

	Field Parameters								Appe	ndix III Monitor	ing Const	tituents (Detection	n)						Ар	pendix IV N	<i>l</i> ionitorin	ng Cons	tituents	(Assessm	nent)			
Well	Date	Monitoring Purpose	Spec. Cond.	Temp.	ORP	D.O.	Turbidity	pН	Chloride	Fluoride	Sulfate	TDS	Boron	Calcium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226 and 228 (Combined)
ID		morntoring r arpooo	µmhos/cm	°C	mV	mg/L	NTU	S.U.	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
									None	4.0	None	None	None	None	6	10	2000	4	5	100	6	15	40	2	100	50	2	5
MW-3 (UG)	11/30/2016	Background	254.0	15.75	-27.1	0.41	37.28	7.08	2.3	0.438	26	160	18	24	<3.0	1.5	96	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.668
	1/24/2017	Background	226.4	16.52	-8.4	0.39	4.46	6.88	2.0	0.261	30	130	12	21	<3.0	1.2	120	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.677(ND)
	2/22/2017	Background	226.6	16.47	9.7	0.36	3.56	<del>0.9</del> 3	1.9	0.290	26	120	33	22	<3.0	1.0	120	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.460(ND)
	3/20/2017	Background	212.1	17.07	33.7	0.43	6.61	6.68	1.8	0.286	21	170	22	19	<3.0	<1.0	110	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.277(ND)
	4/27/2017	Background	223.2	15.35	9.2	0.57	2.69	6.68	2.0	0.257	28	140	54	20	<3.0	<1.0	110	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	9.9	<1.0	<1.0	-0.030(ND)
	5/17/2017	Background	224.9	17.68	26.8	0.45	12.59	6.59	1.5	<0.250	21	130	19	17	<3.0	<1.0	120	<1.0	<1.0	<4.0	<2.0	<1.0	<10	0.40	<1.0	<1.0	<1.0	0.844(ND)
	6/8/2017	Background	217.9	16.73	18.2	0.49	2.61	6.66	1.7	0.276	22	160	20	19	<3.0	<1.0	110	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	-0.469(ND)
	7/13/2017	Background	243.8	19.02	5.5	0.39	4.79	6.71	2.2	0.256	19	160	18	20	<3.0	<1.0	100	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.715(ND)
	10/31/2017	Background / D1	246.2	16.74	12.4	0.65	7.47	6.64	2.0	0.331	20	140	27	19	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	6/13/2018	Background / D2	194.2	17.19	42.3	0.42	7.57	6.59	1.3	0.291	17	130	23	20	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/26/2018	Background / D3	194.9	15.05	49.8	0.47	2.23	6.50	1.5	0.301	18	100	23	17	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/5/2019	Background	205.0	14.49	46.9	0.49	1.92	6.46	1.5	0.342	20	160	22	17	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	5/28/2019	Background / D4	218.4	16.42	32.2	0.82	9.69	6.4	1.3	<0.250	20	(NA)	51	17	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	7/23/2019	Buokground / B 1	203.0	16.58	71.0	0.88	4.96	(NA)	(NA)	(NA)	(NA)	140	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/28/2019	Background / D5	207.4	16.97	75.6	0.89	4.02	6.4	1.1	<0.250	18	140	35	15	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	11/4/2019	Background	202.3	16.60	63.2	0.70	4.22	6.4	1.4	<0.250	18	130	37	15	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/18/2020	Background / D6	207.6	14.17	58.6	1.22	6.34	6.4	1.3	<0.250	21	(NA)	27	16	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	3/30/2020	Buokground / Bo	199.3	14.87	61.2	1.20	6.01	(NA)	(NA)	(NA)	(NA)	180	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	7/21/2020	Background / D7	197.8	16.87	-40.4	8.42	3.43	6.5	1.0	<0.250	15	140	21	18	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	10/20/2020	Background	206.2	16.22	-15.1	8.73	2.88	6.5	1.2	<0.250	15	130	21	17	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	4/16/2021	Detection 8	189.2	14.10	41.3	12.69	4.03	6.5	1.2	<0.250	16	(NA)	25	17	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	4/17/2021	Botootion o	196.8	14.04	34.3	12.04	3.47	(NA)	(NA)	(NA)	(NA)	150	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/1/2021	Detection 9	199.7	11.89	70.3	10.10	1.46	6.57	1.0	<0.250	14	(NA)	25	14	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	12/27/2021	Deteotion o	194.7	7.62	62.3	1.67	1.03	(NA)	(NA)	(NA)	(NA)	170	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/3/2022	Detection 10	158.1	17.06	42.0	0.36	8.28	6.65	< 1.0	<0.250	11	130	23	16	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

#### NOTES:

1. All data transcribed from analytical lab data sheets or field notes.

2. Less than (<) symbol denotes concentration not detected at or above reportable limits.

3. (ND) denotes Radium 226 and 228 (combined) concentration not detected above minimum detectable concentration.

4. (NA) denotes analysis not conducted, or not available at time of report.

5. Background monitoring per USEPA 40 CFR 257.93.

6. Detection monitoring per USEPA 40 CFR 257.94.

7. Assessment monitoring per USEPA 40 CFR 257.95.

8. Additional background sampling based on recommendations in Alternate Source Demonstration dated September 26, 2018 (see Gredell Engineering, 2019).

9. Background updated March 2021 to include previous background, additional background (see note 8), and detection monitoring data through October 2020 except as noted in note 10.

10. Censored data for outlier removal or trend elimination indicated as shown below:

4.5 - Value identified by Sanitas for Groundwater as an outlier.

	Field Parameters								Арре	ndix III Monitor	ing Const	tituents (Detection	ר)						Ар	pendix IV N	/Ionitoriı	ng Cons	tituents	(Assessm	nent)			
Well	Date	Monitoring Purpose	Spec. Cond.	Temp.	ORP	D.O.	Turbidity	pН	Chloride	Fluoride	Sulfate	TDS	Boron	Calcium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226 and 228 (Combined)
ID		monitoring r arpooo	µmhos/cm	°C	mV	mg/L	NTU	S.U.	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
									None	4.0	None	None	None	None	6	10	2000	4	5	100	6	15	40	2	100	50	2	5
MW-4 (DG)	11/30/2016	Background	575.6	17.51	-108.3	0.48	0.61	7.46	18	0.259	140	390	1400	89	<3.0	<1.0	41	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.572(ND)
	1/24/2017	Background	543.7	17.00	-105.2	0.50	0.48	7.45	15	<0.250	120	290	880	79	<3.0	<1.0	46	<2.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.7031(ND)
	2/22/2017	Background	554.0	17.95	-115.3	0.51	1.19	7.49	13	<0.250	97	320	1500	78	<3.0	<1.0	51	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.550(ND)
	3/20/2017	Background	562.8	18.58	-108.8	0.69	1.70	7.37	12	<0.250	94	350	1400	72	<3.0	<1.0	53	<1.0	<1.0	<4.0	<2.0	<1.0	<10	1.3	<1.0	<1.0	<1.0	1.036
	4/27/2017	Background	536.9	17.25	-129.6	0.91	2.38	7.38	14	<0.250	99	300	1300	74	<3.0	<1.0	50	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.210(ND)
	5/17/2017	Background	554.9	17.90	-115.5	0.63	3.02	7.38	14	<0.250	96	320	1200	71	<3.0	<1.0	66	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.774(ND)
	6/8/2017	Background	509.7	18.24	-122.9	0.86	0.84	7.38	12	<0.250	86	340	1100	61	<3.0	<1.0	45	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.464(ND)
	7/13/2017	Background	575.5	19.46	-115.2	0.52	1.43	7.37	13	<0.250	88	300	1200	79	<3.0	<1.0	52	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.086(ND)
	10/31/2017	Background / D1	525.8	18.35	-118.1	0.63	1.07	7.31	17	<0.250	83	290	1400	67	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	6/13/2018	Background / D2	511.5	18.92	-120.7	0.44	18.50	7.32	14	<0.250	86	290	1200	80	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/26/2018	Background / D3	468.0	16.07	-101.8	0.53	1.01	7.36	8.8	<0.250	54	260	1100	64	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/5/2019	Background	761.0	15.62	-97.5	0.52	2.58	7.3	33	<0.250	140	420	1100	100	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	5/28/2019	Background / D4	581.7	18.65	-108.5	0.37	3.30	7.3	11	<0.250	75	(NA)	980	70	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	7/23/2019	Baokground / B4	615.2	18.88	-105.2	0.43	0.36	(NA)	(NA)	(NA)	(NA)	340	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/28/2019	Background / D5	645.4	19.60	-101.7	0.40	2.31	(NA)	18	<0.250	110	300	1100	83	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	10/23/2019	Baokground / Bo	620.0	18.90	-110.6	0.55	1.93	7.3	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/4/2019	Background	657.7	18.52	-104.2	0.50	0.96	7.2	2.1	<0.250	120	400	1200	89	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/18/2020	Background / D6	526.9	14.49	-87.6	0.63	1.60	7.4	11	<0.250	66	(NA)	930	67	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	3/30/2020	Buokground / Bo	520.6	16.45	-91.1	0.35	19.51	(NA)	(NA)	(NA)	(NA)	300	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	7/21/2020	Background / D7	550.7	19.75	-145.6	5.06	6.49	(NA)	14	<0.250	86	290	920	76	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	8/3/2020	Baokground / B1	567.8	18.81	-117.8	4.87	7.19	7.4	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	10/20/2020	Background	596.6	17.94	-92.1	6.36	1.80	7.4	17	<0.250	96	330	1000	80	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	4/16/2021	Detection 8	591.2	15.99	-58.4	4.85	12.85	7.4	19	<0.250	100	340	920	85	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/1/2021	Detection 9	609.8	14.87	-59.8	0.54	2.97	7.34	16	<0.250	95	360	870	76	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/3/2022	Detection 10	552.4	19.67	-130.9	0.32	6.40	7.32	14	<0.250	93	390	880	76	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

#### NOTES:

1. All data transcribed from analytical lab data sheets or field notes.

2. Less than (<) symbol denotes concentration not detected at or above reportable limits.

3. (ND) denotes Radium 226 and 228 (combined) concentration not detected above minimum detectable concentration.

4. (NA) denotes analysis not conducted, or not available at time of report.

5. Background monitoring per USEPA 40 CFR 257.93.

6. Detection monitoring per USEPA 40 CFR 257.94.

7. Assessment monitoring per USEPA 40 CFR 257.95.

8. Additional background sampling based on recommendations in Alternate Source Demonstration dated September 26, 2018 (see Gredell Engineering, 2019).

9. Background updated March 2021 to include previous background, additional background (see note 8), and detection monitoring data through October 2020 except as noted in note 10.

10. Censored data for outlier removal or trend elimination indicated as shown below:

4.5 - Value identified by Sanitas for Groundwater as an outlier.

	Field Parameters				Appendix III Monitoring Constituents (Detection)						Appendix IV Monitoring Constituents (Assessment)																	
Well	Date	Monitoring Purpose	Spec. Cond.	Temp.	ORP	D.O.	Turbidity	рН	Chloride	Fluoride	Sulfate	TDS	Boron	Calcium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226 and 228 (Combined)
ID		inerinering i aipeee	µmhos/cm	°C	mV	mg/L	NTU	S.U.	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
									None	4.0	None	None	None	None	6	10	2000	4	5	100	6	15	40	2	100	50	2	5
MW-5 (DG)	11/30/2016	Background	808.3	16.20	-48.7	0.50	1.24	6.97	16	0.255	230	560	470	96	<3.0	<1.0	84	<1.0	<1.0	<4.0	4.3	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.844
	1/24/2017	Background	745.3	16.24	-37.6	0.58	0.72	6.90	15	<0.250	270	470	480	120	<3.0	<1.0	91	<1.0	<1.0	<4.0	5.2	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.827(ND)
	2/22/2017	Background	717.8	17.75	-50.5	0.36	3.43	6.97	11	<0.250	170	420	470	100	<3.0	<1.0	83	<1.0	<1.0	<4.0	3.6	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.130(ND)
	3/20/2017	Background	737.9	17.78	-36.5	0.72	2.16	6.85	11	<0.250	170	480	320	99	<3.0	<1.0	76	<1.0	<1.0	<4.0	4.4	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.538(ND)
	4/27/2017	Background	777.3	16.07	-58.8	0.69	5.20	6.80	12	<0.250	460	480	490	120	<3.0	<1.0	87	<1.0	<1.0	<4.0	4.8	<1.0	<10	<0.20	3.0	<1.0	<1.0	1.676
	5/17/2017	Background	760.1	17.81	-56.0	0.46	5.35	6.81	11	<0.250	200	440	5700	240	<3.0	1.8	180	<1.0	<1.0	16	5.3	6.3	<10	0.24	<1.0	<1.0	<1.0	1.739
	6/8/2017	Background	678.3	17.72	-58.6	0.69	1.89	6.82	11	<0.250	180	480	360	97	<3.0	<1.0	77	<1.0	<1.0	<4.0	3.9	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.869(ND)
	7/13/2017	Background	799.0	19.19	-82.0	1.08	17.49	6.98	10	<0.250	190	430	320	110	<3.0	<1.0	81	<1.0	<1.0	<4.0	3.8	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.767(ND)
	10/31/2017	Background / D1	591.8	17.45	-77.6	0.85	3.17	6.89	13	<0.250	88	310	280	72	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	6/13/2018	Background / D2	756.4	18.28	-55.6	0.84	1.91	6.77	11	<0.250	240	480	370	130	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/26/2018	Background / D3	836.4	14.90	-27.0	0.51	0.38	6.74	17	<0.250	230	520	420	120	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/5/2019	Background	845.6	15.22	-23.7	0.41	0.71	6.72	15	0.272	200	480	450	120	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	5/28/2019	Background / D/	861.1	18.31	-59.1	0.60	3.71	6.9	10	<0.250	190	(NA)	280	110	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	7/23/2019	Background / D4	806.9	18.66	-44.9	0.81	1.34	(NA)	(NA)	(NA)	(NA)	480	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/28/2019	Background / D5	848.4	18.49	-42.2	0.64	0.82	6.8	16	<0.250	190	480	410	110	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	11/4/2019	Background	729.9	18.03	-55.8	0.77	2.65	6.8	3.2	<0.250	15	440	420	99	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/18/2020	Background / D6	871.7	14.05	-45.2	0.81	0.88	6.8	15	<0.250	210	(NA)	400	110	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	3/30/2020	Baokground / Bo	750.4	15.84	-49.7	0.62	2.90	(NA)	(NA)	(NA)	(NA)	450	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	7/21/2020	Background / D7	816.5	18.35	-102.9	4.37	5.36	6.8	14	<0.250	210	470	330	110	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	10/20/2020	Background	886.3	16.27	-70.2	8.15	3.72	6.9	15	<0.250	220	590	360	120	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	4/16/2021	Detection 8	837.4	15.79	-11.1	7.27	2.84	6.9	10	<0.250	240	510	370	120	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/1/2021	Detection 9	790.8	12.79	-25.5	7.62	0.50	6.90	13	<0.250	170	490	330	94	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/3/2022	Detection 10	758.3	17.88	-83.7	0.59	11.66	6.82	12	<0.250	210	(NA)	390	110	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	9/12/2022	Deteotion 10	882.5	17.00	-85.4	0.41	3.12	(NA)	(NA)	(NA)	(NA)	510	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

#### NOTES:

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3. (ND) denotes Radium 226 and 228 (combined) concentration not detected above minimum detectable concentration.

4. (NA) denotes analysis not conducted, or not available at time of report.

5. Background monitoring per USEPA 40 CFR 257.93.

6. Detection monitoring per USEPA 40 CFR 257.94.

7. Assessment monitoring per USEPA 40 CFR 257.95.

8. Additional background sampling based on recommendations in Alternate Source Demonstration dated September 26, 2018 (see Gredell Engineering, 2019).

9. Background updated March 2021 to include previous background, additional background (see note 8), and detection monitoring data through October 2020 except as noted in note 10.

10. Censored data for outlier removal or trend elimination indicated as shown below:



4.5 - Value identified by Sanitas for Groundwater as an outlier.

	Field Parameters				Appendix III Monitoring Constituents (Detection)						Appendix IV Monitoring Constituents (Assessment)																	
				-	0.55	5.0	<b>T</b>		Obleside	Fluxeda	Quifete	TDO	Dener	0.1.1.1.1.1	A 4 <sup>1</sup>	A	Deview	Dentilian	Qualitations	<u>Olevenius</u>	O a h a h		1.141.1		Mahahahamma	Quitaniana	<b>T</b> h 11:	Radium 226 and 228
VVell	Date	Monitoring Purpose	Spec. Cond.	lemp.	ORP	D.O.	Turbidity	рн	Chioride	Fluoride	Suifate	TDS	Boron	Calcium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobait	Lead	Litnium	Mercury	woybdenum	Selenium	I nallium	(Combined)
ID			µmhos/cm	۰C	mV	mg/L	NIU	S.U.	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
									None	4.0	None	None	None	None	6	10	2000	4	5	100	6	15	40	2	100	50	2	5
MW-6 (UG)	11/30/2016	Background	369.0	16.39	-49.4	0.85	0.84	<del>6.9</del> 2	2.8	0.331	36	200	30	45	<3.0	4.3	190	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.532
	1/24/2017	Background	358.9	16.29	-44.8	0.66	0.26	6.87	2.4	<0.250	43	200	21	41	<3.0	5.7	220	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.948(ND)
	2/22/2017	Background	352.5	17.20	-42.2	0.81	15.27	6.89	2.1	0.269	32	160	59	40	<3.0	6.4	210	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.685(ND)
	3/20/2017	Background	360.8	16.90	24.9	0.36	9.70	6.73	2.1	<0.250	31	240	31	39	<3.0	5	160	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.577(ND)
	4/27/2017	Background	331.5	15.71	-50.9	0.39	8.35	6.72	2.3	<0.250	34	170	30	38	<3.0	3.2	180	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.243(ND)
	5/17/2017	Background	323.2	17.65	-71.5	0.45	7.13	6.76	1.8	<0.250	30	170	35	30	<3.0	4.9	190	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.173(ND)
	6/8/2017	Background	326.7	17.50	-53.0	0.33	3.86	6.73	1.7	<0.250	29	180	38	36	<3.0	4.6	190	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.893(ND)
	7/13/2017	Background	396.8	19.68	-84.0	0.72	2.17	6.98	1.6	<0.250	28	180	31	40	<3.0	5.8	200	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.575(ND)
	10/31/2017	Background / D1	359.6	17.57	-57.9	0.71	1.48	6.72	1.7	0.303	29	170		38	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	6/13/2018	Background / D2	345.4	17.59	-44.0	0.40	13.24	6.67	2.3	<0.250	32	160	45	41	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/26/2018	Background / D3	375.3	15.04	-37.6	1.07	1.66	6.72	1.5	0.313	29	180	46	36	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/5/2019	Background	384.7	14.86	-33.9	0.56	2.68	6.72	1.6	0.338	27	160	44	40	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	5/28/2019	Bookground / D4	418.2	16.93	-48.2	0.34	7.15	6.7	2.5	<0.250	30	(NA)	52	40	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	7/23/2019	Background / D4	419.3	17.64	-59.8	0.51	2.03	(NA)	(NA)	(NA)	(NA)	180	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/28/2019	Background / D5	442.2	17.67	-65.4	0.66	1.15	6.7	1.0	<0.250	24	200	54	44	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	11/4/2019	Background	388.3	17.62	-48.1	0.38	1.68	6.7	1.4	0.319	22	210	47	43	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/18/2020	Background / D6	390.3	14.54	-54.5	0.81	5.79	6.7	1.7	<0.250	24	(NA)	40	41	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	3/30/2020	Background / Bo	391.0	15.17	-53.6	0.67	3.99	(NA)	(NA)	(NA)	(NA)	230	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	10/20/2020	Background	455.5	16.43	-60.5	6.31	0.57	7.0	2.4	<0.250	24	250	47	49	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	4/16/2021	Detection 8	399.3	14.69	-7.1	6.88	16.55	6.8	2.0	<0.250	24	200	52	44	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/1/2021	Detection 9	475.9	12.07	-20.8	5.05	2.22	6.88	4.3	0.330	27	220	56	47	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	12/27/2021	200000000	444.7	7.72	-56.0	0.67	3.26	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/3/2022	Detection 10	381.1	17.84	-93.0	0.40	12.36	6.86	4.3	<0.250	24	230	51	43	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	9/12/2022		443.5	16.99	-82.3	0.50	11.06	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

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2. Less than (<) symbol denotes concentration not detected at or above reportable limits.

3. (ND) denotes Radium 226 and 228 (combined) concentration not detected above minimum detectable concentration.

4. (NA) denotes analysis not conducted, or not available at time of report.

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6. Detection monitoring per USEPA 40 CFR 257.94.

7. Assessment monitoring per USEPA 40 CFR 257.95.

8. Additional background sampling based on recommendations in Alternate Source Demonstration dated September 26, 2018 (see Gredell Engineering, 2019).

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10. Censored data for outlier removal or trend elimination indicated as shown below:

4.5 - Value identified by Sanitas for Groundwater as an outlier.

			Field Parameters				Appendix III Monitoring Constituents (Detection)						Appendix IV Monitoring Constituents (Assessment)															
				_						·.	0 15 1	75.0		0.1.1	A 17		<b>.</b> .										<b>-</b>	Radium 226 and 228
Well	Date	Monitoring Purpose	Spec. Cond.	Temp.	ORP	D.O.	lurbidity	рН	Chloride	Fluoride	Sulfate	IDS	Boron	Calcium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	I hallium	(Combined)
ID			µmhos/cm	്റ	mV	mg/L	NIU	S.U.	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
									None	4.0	None	None	None	None	6	10	2000	4	5	100	6	15	40	2	100	50	2	5
MW-8 (DG)	5/18/2017	Background	662.5	17.58	-89.4	0.29	2.39	7.16	40	<0.250	100	340	400	74	<3.0	<1.0	86	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.067
	6/9/2017	Background	678.2	17.90	-108.5	0.31	0.47	7.16	43	<0.250	110	380	520	92	<3.0	<1.0	86	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.839(ND)
	7/13/2017	Background	661.5	18.57	-107.1	0.23	1.20	7.25	30	<0.250	89	320	430	87	<3.0	<1.0	74	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	1.034(ND)
	8/3/2017	Background	665.7	19.06	-108.4	0.24	0.98	7.15	37	<0.250	89	<del>33</del> 0	490	80	<3.0	<1.0	74	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.681(ND)
	8/15/2017	Background	594.9	18.56	-88.7	0.38	0.99	7.16	36	<0.250	83	320	530	75	<3.0	<1.0	68	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.906(ND)
	8/30/2017	Background	644.2	18.62	-91.3	0.29	1.18	7.15	4	<0.250	96	290	510	88	<3.0	<1.0	75	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.805(ND)
	9/14/2017	Background	707.9	18.52	-90.1	0.48	0.67	7.13	53	<0.250 H	110	370	510	80	<3.0	<1.0	77	<1.0	<1.0	<4.0	<2.0	<1.0	12	<0.20	<1.0	<1.0	<1.0	0.314(ND)
	9/27/2017	Background	764.0	19.11	-89.6	0.30	0.58	7.05	50	<0.250	120	420	480	82	<3.0	<1.0	80	<1.0	<1.0	<4.0	<2.0	<1.0	<10	<0.20	<1.0	<1.0	<1.0	0.594(ND)
	10/31/2017	Background / D1	698.1	17.99	-96.3	0.38	0.94	7.09	40	<0.250	110	380	540	80	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	6/13/2018	Background / D2	788.8	18.34	-99.1	0.23	4.80	7.11	65	<0.250	(NA)	430	520	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	7/10/2018	Ŭ	899.4	18.52	-94.2	0.35	2.69	(NA)	(NA)	(NA)	150	(NA)	(NA)	120	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/26/2018	Background / D3	662.1	15.08	-77.6	0.35	2.88	7.17	45	<0.250	100	320	500	94	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/5/2019	Background	839.7	14.72	-76.0	0.30	2.66	7.14	71	0.26	140	390	550	110	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	5/28/2019	Background / D4	836.6	18.25	-90.6	0.29	4.89	7.1	53	<0.250	130	(NA)	540	100	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	7/23/2019		819.5	19.34	-90.7	0.30	1.39	(NA)	(NA)	(NA)	(NA)	420	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/28/2019	Background / D5	769.1	19.38	-90.0	0.25	1.25	7.1	55	<0.250	110	360	460	93	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	11/4/2019	Background	729.8	18.39	-80.0	0.29	0.86	7.1	2.0	<0.250	4.5	400	480	98	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	2/18/2020	Background / D6	747.9	13.49	-75.7	0.29	0.69	7.2	53	<0.250	110	(NA)	480	93	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	3/30/2020	<b>3</b>	840.0	15.71	-82.4	0.20	7.48	(NA)	(NA)	(NA)	(NA)	480	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	7/21/2020	Background / D7	673.7	19.33	-130.8	2.91	3.56	7.1	50	<0.250	100	420	470	89	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	10/20/2020	Background	794.1	17.14	-83.8	3.59	0.88	7.2	56	<0.250	130	460	510	110	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8	Note 8
	4/16/2021	Detection 8	758.6	15.85	-44.7	3.47	5.16	7.2	51	<0.250	130	400	460	100	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	11/1/2021	Detection 9	676.9	14.15	-45.1	0.42	0.71	7.16	45	0.258	94	360	430	80	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	8/3/2022	Detection 10	752.0	19.27	-110.8	0.18	11.32	7.08	56	<0.250	140	490	420	100	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

#### NOTES:

1. All data transcribed from analytical lab data sheets or field notes.

2. Less than (<) symbol denotes concentration not detected at or above reportable limits.

3. (ND) denotes Radium 226 and 228 (combined) concentration not detected above minimum detectable concentration.

4. (NA) denotes analysis not conducted, or not available at time of report.

5. Background monitoring per USEPA 40 CFR 257.93.

6. Detection monitoring per USEPA 40 CFR 257.94.

7. Assessment monitoring per USEPA 40 CFR 257.95.

8. Additional background sampling based on recommendations in Alternate Source Demonstration dated September 26, 2018 (see Gredell Engineering, 2019).

9. Background updated March 2021 to include previous background, additional background (see note 8), and detection monitoring data through October 2020 except as noted in note 10.

10. Censored data for outlier removal or trend elimination indicated as shown below:

4.5 - Value identified by Sanitas for Groundwater as an outlier.

# Appendix 4

**Statistical Power Curve** 



**Power Curve** 

Kappa = 2.104, based on 5 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 10/19/2022 11:41 AM View: Everything Minus Detrended Data SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

# **Appendix 5**

**Time Series Plots** 

Boron



Time Series Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

Calcium





Sanitas<sup>™</sup> v.9.6.35 Software licensed to GREDELL Engineering. UG Hollow symbols indicate censored values.





Time Series Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

Sanitas<sup>™</sup> v.9.6.35 Software licensed to GREDELL Engineering. UG Hollow symbols indicate censored values.





Time Series Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

S.U.



Time Series Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

pН

Sulfate



Time Series Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17



**Total Dissolved Solids** 



# **Appendix 6**

Box and Whiskers Plots

# Box & Whiskers Plot

	SBMU-Sikeston Power Station	Client: GREDE	LL Engineering	Data: SBMU-SPS	S EDD File 09-28-17	Printed 10/2	20/2022, 1:43 PI	Μ	
Constituent	Well	<u>N</u>	Mean	Std. Dev.	Std. Err.	<u>Median</u>	Min.	<u>Max.</u>	<u>%NDs</u>
Boron (ug/l)	MW-3 (bg)	21	26.48	10.43	2.277	23	12	54	0
Boron (ug/l)	MW-4	21	1123	195.8	42.73	1100	870	1500	0
Boron (ug/l)	MW-5	20	386	65	14.53	380	280	490	0
Boron (ug/l)	MW-6 (bg)	21	43.71	8.51	1.857	44	27	59	0
Boron (ug/l)	MW-8	21	487.1	42.33	9.236	490	400	550	0
Calcium (mg/l)	MW-3 (bg)	21	18.1	2.488	0.5429	17	14	24	0
Calcium (mg/l)	MW-4	21	76.95	9.195	2.007	76	61	100	0
Calcium (mg/l)	MW-5	19	110.3	10.44	2.395	110	94	130	0
Calcium (mg/l)	MW-6 (bg)	21	40.86	4.139	0.9031	41	30	49	0
Calcium (mg/l)	MW-8	21	92.71	11.57	2.525	92	74	120	0
Chloride (mg/l)	MW-3 (bg)	21	1.533	0.4103	0.08953	1.5	1	2.3	4.762
Chloride (mg/l)	MW-4	19	14.25	2.727	0.6255	14	8.8	19	0
Chloride (mg/l)	MW-5	21	12.44	3.077	0.6715	12	3.2	17	0
Chloride (mg/l)	MW-6 (bg)	21	2.119	0.8641	0.1886	2	1	4.3	4.762
Chloride (mg/l)	MW-8	20	49.35	9.074	2.029	50	36	71	0
Fluoride (mg/l)	MW-3 (bg)	21	0.2776	0.04608	0.01006	0.256	0.25	0.438	47.62
Fluoride (mg/l)	MW-4	21	0.2504	0.001964	0.0004286	0.25	0.25	0.259	95.24
Fluoride (mg/l)	MW-5	21	0.2513	0.00487	0.001063	0.25	0.25	0.272	90.48
Fluoride (mg/l)	MW-6 (bg)	21	0.2716	0.03379	0.007373	0.25	0.25	0.338	66.67
Fluoride (mg/l)	MW-8	21	0.2509	0.002726	0.0005948	0.25	0.25	0.26	90.48
pH (S.U.)	MW-3 (bg)	21	6.61	0.1815	0.0396	6.59	6.4	7.08	0
pH (S.U.)	MW-4	21	7.363	0.06522	0.01423	7.37	7.2	7.49	0
pH (S.U.)	MW-5	21	6.85	0.07453	0.01626	6.82	6.72	6.98	0
pH (S.U.)	MW-6 (bg)	21	6.784	0.1021	0.02228	6.73	6.67	7	0
pH (S.U.)	MW-8	21	7.141	0.04857	0.0106	7.15	7.05	7.25	0
Sulfate (mg/l)	MW-3 (bg)	21	19.81	4.729	1.032	20	11	30	0
Sulfate (mg/l)	MW-4	21	96.38	21.09	4.602	95	54	140	0
Sulfate (mg/l)	MW-5	18	206.7	27.87	6.568	205	170	270	0
Sulfate (mg/l)	MW-6 (bg)	21	28.62	5.113	1.116	29	22	43	0
Sulfate (mg/l)	MW-8	20	112.1	19.17	4.286	110	83	150	0
Total Dissolved Solids (mg/l)	MW-3 (bg)	21	143.3	19.32	4.216	140	100	180	0
Total Dissolved Solids (mg/l)	MW-4	21	329.5	42.95	9.373	320	260	420	0
Total Dissolved Solids (mg/l)	MW-5	19	477.4	33.47	7.679	480	420	560	0
Total Dissolved Solids (mg/l)	MW-6 (bg)	21	195.7	27.85	6.078	200	160	250	0
Total Dissolved Solids (mg/l)	MW-8	21	384.8	54.83	11.96	380	290	490	0



Box & Whiskers Plot Analysis Run 10/20/2022 1:41 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

Boron

# **Box & Whiskers Plot**

Constituent: Boron (ug/l) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	18	1400	470	36	
1/24/2017	12	880	480	27	
2/22/2017	33	1500	470	59	
3/20/2017	22	1400	320	37	
4/27/2017	54	1300	490	36	
5/17/2017	19	1200	5700 (o)	35	400
6/8/2017	20	1100	360	38	520
7/13/2017	18	1200	320	31	430
8/3/2017					490
8/15/2017					530
8/30/2017					510
9/14/2017					510
9/27/2017					480
10/31/2017	27	1400	280	41	540
6/13/2018	23	1200	370	43	520
11/26/2018	23	1100	420	46	500
2/5/2019	22	1100	450	44	550
5/28/2019	51	980	280	52	540
8/28/2019	35	1100	410	54	460
11/4/2019	37	1200	420	47	480
2/18/2020	27	930	400	40	480
7/21/2020	21	920	330	46	470
10/20/2020	21	1000	360	47	510
4/16/2021	25	920	370	52	460
11/1/2021	25	870	330	56	430
8/3/2022	23	880	390	51	420
Median	23	1100	380	44	490
LowerQ.	20.5	925	330	36.5	460
UpperQ.	30	1250	435	51.5	520
Min	12	870	280	27	400
Max	54	1500	490	59	550
Mean	26.48	1123	386	43.71	487.1


Calcium

Box & Whiskers PlotAnalysis Run 10/20/2022 1:41 PMView: n=18 no outliers removedSBMU-Sikeston Power StationClient: GREDELL EngineeringData: SBMU-SPS EDD File 09-28-17

## **Box & Whiskers Plot**

Constituent: Calcium (mg/l) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	24	89	96	45	
1/24/2017	21	79	120	41	
2/22/2017	22	78	100	40	
3/20/2017	19	72	99	39	
4/27/2017	20	74	120	38	
5/17/2017	17	71	240 (o)	30	74
6/8/2017	19	61	97	36	92
7/13/2017	20	79	110	40	87
8/3/2017					80
8/15/2017					75
8/30/2017					88
9/14/2017					86
9/27/2017					92
10/31/2017	19	67	72 (o)	38	86
6/13/2018	20	80	130	41	
7/10/2018					120
11/26/2018	17	64	120	36	94
2/5/2019	17	100	120	40	110
5/28/2019	17	70	110	40	100
8/28/2019	15	83	110	44	93
11/4/2019	15	89	99	43	98
2/18/2020	16	67	110	41	93
7/21/2020	18	76	110	43	89
10/20/2020	17	80	120	49	110
4/16/2021	17	85	120	44	100
11/1/2021	14	76	94	47	80
8/3/2022	16	76	110	43	100
Median	17	76	110	41	92
LowerQ.	16.5	70.5	99	38.5	86
UpperQ.	20	81.5	120	43.5	100
Min	14	61	94	30	74
Max	24	100	130	49	120
Mean	18.1	76.95	110.3	40.86	92.71



Chloride

Box & Whiskers Plot Analysis Run 10/20/2022 1:41 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

mg/l

## **Box & Whiskers Plot**

Constituent: Chloride (mg/l) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	2.3	18	16	2.8	
1/24/2017	2	15	15	2.4	
2/22/2017	1.9	13	11	2.1	
3/20/2017	1.8	12	11	2.1	
4/27/2017	2	14	12	2.3	
5/17/2017	1.5	14	11	1.8	46
6/8/2017	1.7	12	11	1.7	43
7/13/2017	2.2	13	10	1.6	36
8/3/2017					37
8/15/2017					36
8/30/2017					41
9/14/2017					53
9/27/2017					50
10/31/2017	2	17	13	1.7	45
6/13/2018	1.3	14	11	2.3	65
11/26/2018	1.5	8.8	17	1.5	45
2/5/2019	1.5	33 (o)	15	1.6	71
5/28/2019	1.3	11	10	2.5	53
8/28/2019	1.1	18	16	1	55
11/4/2019	1.4	2.1 (o)	3.2	1.4	2 (o)
2/18/2020	1.3	11	15	1.7	53
7/21/2020	1	14	14	<1	50
10/20/2020	1.2	17	15	2.4	56
4/16/2021	1.2	19	10	2	51
11/1/2021	1	16	13	4.3	45
8/3/2022	<1	14	12	4.3	56
Median	1.5	14	12	2	50
LowerQ.	1.2	12	11	1.6	44
UpperQ.	1.95	17	15	2.4	54
Min	1	8.8	3.2	1	36
Max	2.3	19	17	4.3	71
Mean	1.533	14.25	12.44	2.119	49.35





Box & Whiskers Plot Analysis Run 10/20/2022 1:41 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

## **Box & Whiskers Plot**

Constituent: Fluoride (mg/l) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	0.438	0.259	0.255	0.331	
1/24/2017	0.261	<0.25	<0.25	<0.25	
2/22/2017	0.29	<0.25	<0.25	0.269	
3/20/2017	0.286	<0.25	<0.25	<0.25	
4/27/2017	0.257	<0.25	<0.25	<0.25	
5/17/2017	<0.25	<0.25	<0.25	<0.25	<0.25
6/8/2017	0.276	<0.25	<0.25	<0.25	<0.25
7/13/2017	0.256	<0.25	<0.25	<0.25	<0.25
8/3/2017					<0.25
8/15/2017					<0.25
8/30/2017					<0.25
9/14/2017					<0.25
9/27/2017					<0.25
10/31/2017	0.331	<0.25	<0.25	0.303	<0.25
6/13/2018	0.291	<0.25	<0.25	<0.25	<0.25
11/26/2018	0.301	<0.25	<0.25	0.313	<0.25
2/5/2019	0.342	<0.25	0.272	0.338	0.26
5/28/2019	<0.25	<0.25	<0.25	<0.25	<0.25
8/28/2019	<0.25	<0.25	<0.25	<0.25	<0.25
11/4/2019	<0.25	<0.25	<0.25	0.319	<0.25
2/18/2020	<0.25	<0.25	<0.25	<0.25	<0.25
7/21/2020	<0.25	<0.25	<0.25	<0.25	<0.25
10/20/2020	<0.25	<0.25	<0.25	<0.25	<0.25
4/16/2021	<0.25	<0.25	<0.25	<0.25	<0.25
11/1/2021	<0.25	<0.25	<0.25	0.33	0.258
8/3/2022	<0.25	<0.25	<0.25	<0.25	<0.25
Median	0.256	0.25	0.25	0.25	0.25
LowerQ.	0.25	0.25	0.25	0.25	0.25
UpperQ.	0.2905	0.25	0.25	0.308	0.25
Min	0.25	0.25	0.25	0.25	0.25
Max	0.438	0.259	0.272	0.338	0.26
Mean	0.2776	0.2504	0.2513	0.2716	0.2509



Box & Whiskers Plot Analysis Run 10/20/2022 1:41 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

pН

## Box & Whiskers Plot

Constituent: pH (S.U.) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	7.08	7.46	6.97	6.92	
1/24/2017	6.88	7.45	6.9	6.87	
2/22/2017	6.93	7.49	6.97	6.89	
3/20/2017	6.68	7.37	6.85	6.73	
4/27/2017	6.68	7.38	6.8	6.72	
5/17/2017	6.59	7.38	6.81	6.76	7.16
6/8/2017	6.66	7.38	6.82	6.73	7.16
7/13/2017	6.71	7.37	6.98	6.98	7.25
8/3/2017					7.15
8/15/2017					7.16
8/30/2017					7.15
9/14/2017					7.13
9/27/2017					7.05
10/31/2017	6.64	7.31	6.89	6.72	7.09
6/13/2018	6.59	7.32	6.77	6.67	7.11
11/26/2018	6.5	7.36	6.74	6.72	7.17
2/5/2019	6.46	7.3	6.72	6.72	7.14
5/28/2019	6.4	7.3	6.9	6.7	7.1
8/28/2019	6.4		6.8	6.7	7.1
10/23/2019		7.3 (R)			
11/4/2019	6.4	7.2	6.8	6.7	7.1
2/18/2020	6.4	7.4	6.8	6.7	7.2
7/21/2020	6.5		6.8	6.7	7.1
8/4/2020		7.4			
10/20/2020	6.5	7.4	6.9	7	7.2
4/16/2021	6.6	7.4	6.9	6.8	7.2
11/1/2021	6.57	7.34	6.9	6.88	7.16
8/3/2022	6.65	7.32	6.82	6.86	7.08
Median	6.59	7.37	6.82	6.73	7.15
LowerQ.	6.48	7.315	6.8	6.7	7.1
UpperQ.	6.68	7.4	6.9	6.875	7.165
Min	6.4	7.2	6.72	6.67	7.05
Max	7.08	7.49	6.98	7	7.25
Mean	6.61	7.363	6.85	6.784	7.141



Sulfate

Box & Whiskers Plot Analysis Run 10/20/2022 1:41 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

mg/l

## **Box & Whiskers Plot**

Constituent: Sulfate (mg/l) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	26	140	230	36	
1/24/2017	30	120	270	43	
2/22/2017	26	97	170	32	
3/20/2017	21	94	170	31	
4/27/2017	28	99	460 (o)	34	
5/17/2017	21	96	200	30	100
6/8/2017	22	86	180	29	110
7/13/2017	19	88	190	28	89
8/3/2017					89
8/15/2017					83
8/30/2017					96
9/14/2017					110
9/27/2017					120
10/31/2017	20	83	88 (o)	29	110
6/13/2018	17	86	240	32	
7/10/2018					150
11/26/2018	18	54	230	29	100
2/5/2019	20	140	200	27	140
5/28/2019	20	75	190	30	130
8/28/2019	18	110	190	24	110
11/4/2019	18	120	15 (o)	22	4.5 (o)
2/18/2020	21	66	210	24	110
7/21/2020	15	86	210	22	100
10/20/2020	15	96	220	24	130
4/16/2021	16	100	240	24	130
11/1/2021	14	95	170	27	94
8/3/2022	11	93	210	24	140
Median	20	95	205	29	110
LowerQ.	16.5	86	185	24	98
UpperQ.	21.5	105	230	31.5	130
Min	11	54	170	22	83
Max	30	140	270	43	150
Mean	19.81	96.38	206.7	28.62	112.1



**Total Dissolved Solids** 

Box & Whiskers Plot Analysis Run 10/20/2022 1:41 PM View: n=18 no outliers removed SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

mg/l

## **Box & Whiskers Plot**

Constituent: Total Dissolved Solids (mg/l) Analysis Run 10/20/2022 1:43 PM View: n=18 no outliers removed

SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

	MW-3 (bg)	MW-4	MW-5	MW-6 (bg)	MW-8
11/30/2016	160	390	560	200	
1/24/2017	130	290	470	200	
2/22/2017	120	320	420	160	
3/20/2017	170	350	480	240	
4/27/2017	140	300	480	170	
5/17/2017	130	320	440	170	340
6/8/2017	160	340	480	180	380
7/13/2017	160	300	430	180	320
8/3/2017					330
8/15/2017					320
8/30/2017					290
9/14/2017					370
9/27/2017					420
10/31/2017	140	290	310 (o)	170	380
6/13/2018	130	290	480	160	430
11/26/2018	100	260	520	180	320
2/5/2019	160	420	480	160	390
7/23/2019	140	340	480	180	420
8/28/2019	140	300	480	200	360
11/4/2019	130	400	440	210	400
3/30/2020	180	300	450	230	480
7/21/2020	140	290	470	220	420
10/20/2020	130	330	590 (o)	250	460
4/16/2021	150	340	510	200	400
11/1/2021		360	490	220	360
12/27/2021	170				
8/3/2022	130	390		230	490
9/12/2022			510		
Median	140	320	480	200	380
LowerQ.	130	295	450	170	335
UpperQ.	160	355	490	220	420
Min	100	260	420	160	290
Max	180	420	560	250	490
Mean	143.3	329.5	477.4	195.7	384.8

# Appendix 7

**Prediction Limit Charts** 

## **Prediction Limit**

	SBMU-Si	keston Power Station	Client: GRE	DELL Engineering	Data: SE	BMU-SPS	EDD Fil	e 09-28-17	Printed 10/19/2	022, 1:16 PM	
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
Boron (ug/l)	MW-3	52.07	n/a	11/1/2021	25	No	18	0	sqrt(x)	0.001504	Param Intra 1 of 2
Boron (ug/l)	MW-4	1549	n/a	11/1/2021	870	No	18	0	No	0.001504	Param Intra 1 of 2
Boron (ug/l)	MW-5	537.2	n/a	11/1/2021	330	No	17	0	No	0.001504	Param Intra 1 of 2
Boron (ug/l)	MW-8	577.9	n/a	11/1/2021	430	No	18	0	No	0.001504	Param Intra 1 of 2
Calcium (mg/l)	MW-3	23.56	n/a	11/1/2021	14	No	18	0	No	0.001504	Param Intra 1 of 2
Calcium (mg/l)	MW-4	97.16	n/a	11/1/2021	76	No	18	0	No	0.001504	Param Intra 1 of 2
Calcium (mg/l)	MW-5	132.9	n/a	11/1/2021	94	No	16	0	No	0.001504	Param Intra 1 of 2
Calcium (mg/l)	MW-6	48.81	n/a	11/1/2021	47	No	18	0	No	0.001504	Param Intra 1 of 2
Chloride (mg/l)	MW-3	2.43	n/a	11/1/2021	1	No	18	0	No	0.001504	Param Intra 1 of 2
Chloride (mg/l)	MW-4	19.57	n/a	11/1/2021	16	No	16	0	No	0.001504	Param Intra 1 of 2
Chloride (mg/l)	MW-5	19.46	n/a	11/1/2021	13	No	18	0	No	0.001504	Param Intra 1 of 2
Chloride (mg/l)	MW-6	2.954	n/a	11/1/2021	4.3	Yes	18	5.556	No	0.001504	Param Intra 1 of 2
Fluoride (mg/l)	MW-3	0.438	n/a	11/1/2021	0.25ND	No	18	38.89	n/a	0.005373	NP Intra (normality)
Fluoride (mg/l)	MW-4	0.259	n/a	11/1/2021	0.25ND	No	18	94.44	n/a	0.005373	NP Intra (NDs) 1 of 2
Fluoride (mg/l)	MW-5	0.272	n/a	11/1/2021	0.25ND	No	18	88.89	n/a	0.005373	NP Intra (NDs) 1 of 2
Fluoride (mg/l)	MW-6	0.338	n/a	11/1/2021	0.33	No	18	66.67	n/a	0.005373	NP Intra (NDs) 1 of 2
Fluoride (mg/l)	MW-8	0.26	n/a	11/1/2021	0.258	No	18	94.44	n/a	0.005373	NP Intra (NDs) 1 of 2
pH (S.U.)	MW-4	7.516	7.221	11/1/2021	7.34	No	17	0	No	0.000752	Param Intra 1 of 2
pH (S.U.)	MW-5	7.011	6.68	11/1/2021	6.9	No	18	0	No	0.000752	Param Intra 1 of 2
pH (S.U.)	MW-8	7.242	7.038	11/1/2021	7.16	No	18	0	No	0.000752	Param Intra 1 of 2
Sulfate (mg/l)	MW-3	29.71	n/a	11/1/2021	14	No	18	0	No	0.001504	Param Intra 1 of 2
Sulfate (mg/l)	MW-4	144.5	n/a	11/1/2021	95	No	18	0	No	0.001504	Param Intra 1 of 2
Sulfate (mg/l)	MW-5	267.4	n/a	11/1/2021	170	No	15	0	No	0.001504	Param Intra 1 of 2
Sulfate (mg/l)	MW-6	40.3	n/a	11/1/2021	27	No	18	0	No	0.001504	Param Intra 1 of 2
Sulfate (mg/l)	MW-8	149.9	n/a	11/1/2021	94	No	17	0	No	0.001504	Param Intra 1 of 2
Total Dissolved Solids (mg/l)	MW-3	183.4	n/a	12/27/2021	170	No	18	0	No	0.001504	Param Intra 1 of 2
Total Dissolved Solids (mg/l)	MW-4	414.6	n/a	11/1/2021	360	No	18	0	No	0.001504	Param Intra 1 of 2
Total Dissolved Solids (mg/l)	MW-5	545.9	n/a	11/1/2021	490	No	16	0	No	0.001504	Param Intra 1 of 2
Total Dissolved Solids (mg/l)	MW-6	251.5	n/a	11/1/2021	220	No	18	0	No	0.001504	Param Intra 1 of 2
Boron (ug/l)	MW-6	61.29	n/a	11/1/2021	56	No	7	0	No	0.001504	Param Intra 1 of 2
Calcium (mg/l)	MW-8	120	n/a	11/1/2021	80	No	8	0	No	0.001504	Param Intra 1 of 2
Chloride (mg/l)	MW-8	78.74	n/a	11/1/2021	45	No	8	0	No	0.001504	Param Intra 1 of 2
pH (S.U.)	MW-3	6.772	6.254	8/3/2022	6.65	No	12	0	No	0.000752	Param Intra 1 of 2
pH (S.U.)	MW-6	7	6.67	11/1/2021	6.88	No	17	0	n/a	0.01183	NP Intra (normality)
Total Dissolved Solids (mg/l)	MW-8	547.4	n/a	11/1/2021	360	No	8	0	No	0.001504	Param Intra 1 of 2

# Boron Intrawell Parametric



Background Data Summary (based on square root transformation): Mean=5.086, Std. Dev.=1.013, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8996, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Boron Intrawell Parametric



Background Data Summary: Mean=1162, Std. Dev.=184, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.948, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Boron Intrawell Parametric



Background Data Summary: Mean=390, Std. Dev.=69.19, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9407, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Boron Intrawell Parametric



Background Data Summary: Mean=495.6, Std. Dev.=39.14, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9399, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Calcium Intrawell Parametric



Background Data Summary: Mean=18.5, Std. Dev.=2.407, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9507, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

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### Within Limit





Background Data Summary: Mean=76.61, Std. Dev.=9.769, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9656, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

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### Within Limit

# Calcium Intrawell Parametric



Background Data Summary: Mean=110.7, Std. Dev.=10.33, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9039, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Calcium



Background Data Summary: Mean=40.22, Std. Dev.=4.081, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9539, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Chloride Intrawell Parametric



Background Data Summary: Mean=1.611, Std. Dev.=0.3894, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9507, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Chloride Intrawell Parametric



Background Data Summary: Mean=13.86, Std. Dev.=2.655, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9515, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Chloride Intrawell Parametric



Background Data Summary: Mean=12.57, Std. Dev.=3.278, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8761, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

**Exceeds** Limit

## Chloride





Background Data Summary: Mean=1.883, Std. Dev.=0.509, n=18, 5.556% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9587, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Within Limit

## Fluoride

Intrawell 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 18 background values. 38.89% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 88.89% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 66.67% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride



Intrawell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).





Background Data Summary: Mean=7.369, Std. Dev.=0.06927, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9505, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.





Background Data Summary: Mean=6.846, Std. Dev.=0.07853, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9237, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.





Background Data Summary: Mean=7.14, Std. Dev.=0.04826, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9628, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate Intrawell Parametric



Background Data Summary: Mean=20.83, Std. Dev.=4.218, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9206, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate Intrawell Parametric



Background Data Summary: Mean=96.44, Std. Dev.=22.84, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9502, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.
# Sulfate



Background Data Summary: Mean=206.7, Std. Dev.=27.69, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9482, critical = 0.835. Kappa = 2.193 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate



Background Data Summary: Mean=29.22, Std. Dev.=5.264, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9321, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate



Background Data Summary: Mean=110.4, Std. Dev.=18.55, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9427, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

## Total Dissolved Solids Intrawell Parametric



Background Data Summary: Mean=142.2, Std. Dev.=19.57, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9412, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

# Total Dissolved Solids



Background Data Summary: Mean=323.9, Std. Dev.=43.13, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8945, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

# Total Dissolved Solids





Background Data Summary: Mean=472.5, Std. Dev.=34.16, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8811, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

# Total Dissolved Solids





Background Data Summary: Mean=192.2, Std. Dev.=28.19, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9055, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## **Prediction Limit**

	SBMU-S	ikeston Power Statio	on Client: GR	Client: GREDELL Engineering		Data: SBMU-SPS EDD File 09-28-17				Printed 10/19/2022, 1:25 PM		
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method	
Boron (ug/l)	MW-3	52.07	n/a	8/3/2022	23	No	18	0	sqrt(x)	0.001504	Param Intra 1 of 2	
Boron (ug/l)	MW-4	1549	n/a	8/3/2022	880	No	18	0	No	0.001504	Param Intra 1 of 2	
Boron (ug/l)	MW-5	537.2	n/a	8/3/2022	390	No	17	0	No	0.001504	Param Intra 1 of 2	
Boron (ug/l)	MW-8	577.9	n/a	8/3/2022	420	No	18	0	No	0.001504	Param Intra 1 of 2	
Calcium (mg/l)	MW-3	23.56	n/a	8/3/2022	16	No	18	0	No	0.001504	Param Intra 1 of 2	
Calcium (mg/l)	MW-4	97.16	n/a	8/3/2022	76	No	18	0	No	0.001504	Param Intra 1 of 2	
Calcium (mg/l)	MW-5	132.9	n/a	8/3/2022	110	No	16	0	No	0.001504	Param Intra 1 of 2	
Calcium (mg/l)	MW-6	48.81	n/a	8/3/2022	43	No	18	0	No	0.001504	Param Intra 1 of 2	
Chloride (mg/l)	MW-3	2.43	n/a	8/3/2022	1ND	No	18	0	No	0.001504	Param Intra 1 of 2	
Chloride (mg/l)	MW-4	19.57	n/a	8/3/2022	14	No	16	0	No	0.001504	Param Intra 1 of 2	
Chloride (mg/l)	MW-5	19.46	n/a	8/3/2022	12	No	18	0	No	0.001504	Param Intra 1 of 2	
Chloride (mg/l)	MW-6	2.954	n/a	8/3/2022	4.3	Yes	18	5.556	No	0.001504	Param Intra 1 of 2	
Fluoride (mg/l)	MW-3	0.438	n/a	8/3/2022	0.25ND	No	18	38.89	n/a	0.005373	NP Intra (normality)	
Fluoride (mg/l)	MW-4	0.259	n/a	8/3/2022	0.25ND	No	18	94.44	n/a	0.005373	NP Intra (NDs) 1 of 2	
Fluoride (mg/l)	MW-5	0.272	n/a	8/3/2022	0.25ND	No	18	88.89	n/a	0.005373	NP Intra (NDs) 1 of 2	
Fluoride (mg/l)	MW-6	0.338	n/a	8/3/2022	0.25ND	No	18	66.67	n/a	0.005373	NP Intra (NDs) 1 of 2	
Fluoride (mg/l)	MW-8	0.26	n/a	8/3/2022	0.25ND	No	18	94.44	n/a	0.005373	NP Intra (NDs) 1 of 2	
pH (S.U.)	MW-4	7.516	7.221	8/3/2022	7.32	No	17	0	No	0.000752	Param Intra 1 of 2	
pH (S.U.)	MW-5	7.011	6.68	8/3/2022	6.82	No	18	0	No	0.000752	Param Intra 1 of 2	
pH (S.U.)	MW-8	7.242	7.038	8/3/2022	7.08	No	18	0	No	0.000752	Param Intra 1 of 2	
Sulfate (mg/l)	MW-3	29.71	n/a	8/3/2022	11	No	18	0	No	0.001504	Param Intra 1 of 2	
Sulfate (mg/l)	MW-4	144.5	n/a	8/3/2022	93	No	18	0	No	0.001504	Param Intra 1 of 2	
Sulfate (mg/l)	MW-5	267.4	n/a	8/3/2022	210	No	15	0	No	0.001504	Param Intra 1 of 2	
Sulfate (mg/l)	MW-6	40.3	n/a	8/3/2022	24	No	18	0	No	0.001504	Param Intra 1 of 2	
Sulfate (mg/l)	MW-8	149.9	n/a	8/3/2022	140	No	17	0	No	0.001504	Param Intra 1 of 2	
Total Dissolved Solids (mg/l)	MW-3	183.4	n/a	8/3/2022	130	No	18	0	No	0.001504	Param Intra 1 of 2	
Total Dissolved Solids (mg/l)	MW-4	414.6	n/a	8/3/2022	390	No	18	0	No	0.001504	Param Intra 1 of 2	
Total Dissolved Solids (mg/l)	MW-5	545.9	n/a	9/12/2022	510	No	16	0	No	0.001504	Param Intra 1 of 2	
Total Dissolved Solids (mg/l)	MW-6	251.5	n/a	8/3/2022	230	No	18	0	No	0.001504	Param Intra 1 of 2	
Boron (ug/l)	MW-6	58.99	n/a	8/3/2022	51	No	8	0	No	0.001504	Param Intra 1 of 2	
Calcium (mg/l)	MW-8	120	n/a	8/3/2022	100	No	8	0	No	0.001504	Param Intra 1 of 2	
Chloride (mg/l)	MW-8	78.74	n/a	8/3/2022	56	No	8	0	No	0.001504	Param Intra 1 of 2	
pH (S.U.)	MW-3	6.772	6.254	8/3/2022	6.65	No	12	0	No	0.000752	Param Intra 1 of 2	
pH (S.U.)	MW-6	7	6.67	8/3/2022	6.86	No	17	0	n/a	0.01183	NP Intra (normality)	
Total Dissolved Solids (mg/l)	MW-8	547.4	n/a	8/3/2022	490	No	8	0	No	0.001504	Param Intra 1 of 2	

# Boron Intrawell Parametric



Background Data Summary (based on square root transformation): Mean=5.086, Std. Dev.=1.013, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8996, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Boron Intrawell Parametric



Background Data Summary: Mean=1162, Std. Dev.=184, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.948, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Boron Intrawell Parametric



Background Data Summary: Mean=390, Std. Dev.=69.19, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9407, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

## Boron Intrawell Parametric



Background Data Summary: Mean=495.6, Std. Dev.=39.14, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9399, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Calcium Intrawell Parametric



Background Data Summary: Mean=18.5, Std. Dev.=2.407, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9507, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

## Calcium Intrawell Parametric



Background Data Summary: Mean=76.61, Std. Dev.=9.769, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9656, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

## Calcium Intrawell Parametric



Background Data Summary: Mean=110.7, Std. Dev.=10.33, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9039, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

# Calcium Intrawell Parametric



Background Data Summary: Mean=40.22, Std. Dev.=4.081, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9539, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Within Limit

## Chloride

Intrawell Parametric



Background Data Summary: Mean=1.611, Std. Dev.=0.3894, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9507, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Chloride Intrawell Parametric



Background Data Summary: Mean=13.86, Std. Dev.=2.655, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9515, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Chloride Intrawell Parametric



Background Data Summary: Mean=12.57, Std. Dev.=3.278, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8761, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

**Exceeds** Limit

## Chloride





Background Data Summary: Mean=1.883, Std. Dev.=0.509, n=18, 5.556% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9587, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Within Limit

## Fluoride

Intrawell 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 18 background values. 38.89% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride



Intrawell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 88.89% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 66.67% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).

Within Limit

## Fluoride



Intrawell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. Well-constituent pair annual alpha = 0.01072. Individual comparison alpha = 0.005373 (1 of 2).





Background Data Summary: Mean=7.369, Std. Dev.=0.06927, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9505, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.





Background Data Summary: Mean=6.846, Std. Dev.=0.07853, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9237, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.





Background Data Summary: Mean=7.14, Std. Dev.=0.04826, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9628, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate Intrawell Parametric



Background Data Summary: Mean=20.83, Std. Dev.=4.218, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9206, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate Intrawell Parametric



Background Data Summary: Mean=96.44, Std. Dev.=22.84, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9502, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate



Background Data Summary: Mean=206.7, Std. Dev.=27.69, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9482, critical = 0.835. Kappa = 2.193 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate



Background Data Summary: Mean=29.22, Std. Dev.=5.264, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9321, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

# Sulfate



Background Data Summary: Mean=110.4, Std. Dev.=18.55, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9427, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

# Total Dissolved Solids





Background Data Summary: Mean=142.2, Std. Dev.=19.57, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9412, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

### Within Limit

# Total Dissolved Solids Intrawell Parametric



Background Data Summary: Mean=323.9, Std. Dev.=43.13, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8945, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

## Within Limit

# Total Dissolved Solids





Background Data Summary: Mean=472.5, Std. Dev.=34.16, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8811, critical = 0.844. Kappa = 2.15 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.
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### Within Limit

# Total Dissolved Solids





Background Data Summary: Mean=192.2, Std. Dev.=28.19, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9055, critical = 0.858. Kappa = 2.104 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Prediction Limit Analysis Run 10/19/2022 1:19 PM View: Everything Minus Detrended Data SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

### Within Limit

# Boron Intrawell Parametric



Background Data Summary: Mean=47, Std. Dev.=4.375, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9419, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Prediction Limit Analysis Run 10/19/2022 1:21 PM View: Detrended Boron MW-6 SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

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### Within Limit

# Calcium



Background Data Summary: Mean=98.38, Std. Dev.=7.909, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8713, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Prediction Limit Analysis Run 10/19/2022 1:23 PM View: Detrended Calcium MW-8 SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

### Within Limit

# Chloride Intrawell Parametric



Background Data Summary: Mean=56, Std. Dev.=8.298, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9251, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Prediction Limit Analysis Run 10/19/2022 1:23 PM View: Detrended Chloride MW-8 SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

### Within Limits





Background Data Summary: Mean=6.513, Std. Dev.=0.1115, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8763, critical = 0.805. Kappa = 2.322 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Prediction Limit Analysis Run 10/19/2022 1:24 PM View: Detrended pH MW-3 SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

# Within Limits



pН

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. Limits are highest and lowest of 17 background values. Well-constituent pair annual alpha = 0.02359. Individual comparison alpha = 0.01183 (1 of 2).

Prediction Limit Analysis Run 10/19/2022 1:24 PM View: Detrended pH MW-6 SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

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### Within Limit

# Total Dissolved Solids Intrawell Parametric



Background Data Summary: Mean=406.3, Std. Dev.=51.53, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9779, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Prediction Limit Analysis Run 10/19/2022 1:25 PM View: Detrended TDS MW-8 SBMU-Sikeston Power Station Client: GREDELL Engineering Data: SBMU-SPS EDD File 09-28-17

# **Appendix 8**

Alternate Source Demonstrations

# Appendix 8a

Alternate Source Demonstration For Chloride in MW-6 - April 5, 2022

1505 East High Street Jefferson City, Missouri 65101 Telephone (573) 659-9078 www.ger-inc.biz

# **GREDELL Engineering Resources, Inc.**

Sikeston Board of Municipal Utilities Sikeston Power Station Detection Monitoring Program for Bottom Ash Pond – Chloride in MW-6 Alternate Source Demonstration



Board of Municipal Utilities Sikeston Power Station 1551 West Wakefield Avenue Sikeston, MO 63801





April 2022

# **PROFESSIONAL ENGINEER'S CERTIFICATION**

#### 40 CFR 257.94(e)(2) Alternate Source Demonstration

I, Thomas R. Gredell, P.E., a professional engineer licensed in the State of Missouri, hereby certify in accordance with 40 CFR 257.94(e)(2) to the accuracy of the alternate source demonstration described in the following report for the Sikeston Board of Municipal Utilities, Sikeston Power Station, Bottom Ash Pond CCR unit. The report demonstrates that the statistically significant increase of Chloride in MW-6 is not the result of a release from the Bottom Ash Pond and is attributable to an alternate source. This demonstration successfully meets the requirements of 40 CFR 257.94(e) as found in federal regulation 40 CFR 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments. In addition, the demonstration was made using EPA Unified Guidance (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance: EPA 530/R-09-007) and generally accepted methods.

Name:	Thomas R. Gredell, P	P.E. 1
Signature:	Donald	TOT MISSING
Date:	April4, 5	THOMAS R. GREDELL
Registration Nu State of Regist	umber: PE-02113	NUMBER
	AND IN	PE-021137 PE-021137 PE-021137 PE-021137
		Conne

# Sikeston Board of Municipal Utilities Sikeston Power Station Detection Monitoring Program for Bottom Ash Pond - Chloride in MW-6 Alternate Source Demonstration

# April 2022

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Appendix 3a – 2020 Sikeston Public Well Assessment Reports (CARES)

Appendix 3b – 2014 Sikeston Public Well Assessment Reports (CARES)

# **1.0 INTRODUCTION**

This Alternate Source Demonstration (ASD) Report has been prepared to address the results of the semi-annual sampling event initiated on November 1, 2021 at the Sikeston Board of Municipal Utilities (SBMU) Sikeston Power Station's (SPS) Bottom Ash Pond, a coal combustion residual (CCR) surface impoundment. Following receipt of final analytical data, it was apparent that an error resulted in delayed analysis and hold time exceedance for Total Dissolved Solids (TDS) in sample MW-3, and the reported concentration of Chloride in sample MW-6 exceeded its respective prediction limit for this well. Consequently, resampling for the aforementioned well constituent pairs was initiated on December 27, 2021. Following receipt of final analytical data from the resampling event, it was confirmed that the Chloride concentration in sample MW-6 represents a statistically significant increase (SSI) over background for this well. The resample of MW-3 resulted in an unqualified result for TDS which did not suggest an SSI. SBMU-SPS requested that Gredell Engineering conduct an evaluation and develop an ASD, if warranted.

As stated in §257.94(e)(2), an owner or operator may demonstrate that a source other than the CCR unit caused the apparent SSI over background for a constituent. The owner or operator must complete the written demonstration within 90 days of detecting an SSI over background to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner of the CCR unit may continue with a detection monitoring program. The owner or operator must also include the certified demonstration in the annual groundwater monitoring report required by §257.90(e).

Gredell Engineering has completed an evaluation of the groundwater sampling events, analytical data results, and other potential factors, for the SBMU SPS Bottom Ash Pond groundwater monitoring system to determine if an alternate source is the cause of the apparent SSI of Chloride in MW-6. This report presents the results of that evaluation and includes supporting documentation.

# 2.0 OBSERVATIONS AND DATA COLLECTION

The Bottom Ash Pond groundwater monitoring system consists of five wells, designated MW-3, MW-4, MW-5, MW-6, and MW-8 (Figure 1). Monitoring wells MW-3, MW-4, MW-5, and MW-6 were installed in April 2016, and sampled on an approximate monthly basis beginning in November 2016 and ending in July 2017 to establish an initial background data base. Monitoring well MW-8 was installed in April 2017 and was sampled at an increased frequency beginning in May 2017 and ending in September 2017. Additional information regarding these wells is available in the Groundwater Monitoring, Sampling and Analysis Plan (GMSAP) for the site.

The background data base for the Bottom Ash Pond is periodically updated in general accordance with U.S. Environmental Protection Agency (USEPA) Unified Guidance for statistical analysis of groundwater monitoring data (USEPA, 2009). The results of the eight initial background sampling events and ten additional sampling events included in updates to the background data base were evaluated in accordance with §257.93, and intra-well analysis using prediction limits was determined to be the most appropriate statistical analysis approach for detection monitoring. Following receipt of final analytical data reports from the contract laboratory, the reported concentration for each detection monitoring constituent from each well is compared to its respective prediction limit. If a constituent concentration exceeds the respective prediction limit for a particular well or is outside the predicted range (in the case of pH), SSI over background is suspected.

The SPS initiated its semiannual detection groundwater sampling event for the Bottom Ash Pond on November 1, 2021. The contracted laboratory received the samples on November 3, 2021 and issued final analytical results on December 9, 2021 (Appendix 1a). However, the Chloride result for sample MW-6 appeared elevated relative to the prediction limit for this well constituent pair, and the TDS result for sample MW-3 was qualified for hold time exceedance. Consequently, resampling was initiated for Chloride at MW-6 and TDS at MW-3 on December 27, 2021. The analytical laboratory received these samples on December 29, 2021 and issued the analytical report for the resampling event on January 7, 2022 (Appendix 1b).

The following table summarizes the analytical results for Chloride in MW-6 and TDS in MW-3 from the November 1, 2021 sampling and December 27, 2021 resampling events. Prediction limits for these well constituent pairs are also presented.

Sampling Event Date	Well Constituent Pair	Analytical Result (mg/L)	Prediction Limit (mg/L)	SSI Suspected or Confirmed?
November 1, 2021	MW-3 TDS	130	180	No
November 1, 2021	MW-6 Chloride	4.3	2.956	Suspected
December 27, 2021	MW-3 TDS	170	180	No
	MW-6 Chloride	3.5	2.956	Confirmed

# **Table 1** -- Analytical Results and Prediction Limit Summary

.

# 3.0 SUMMARY OF DATA ANALYSIS AND FINDINGS

The USEPA provides Unified Guidance for statistical analysis of groundwater monitoring data (USEPA, 2009). This Unified Guidance document was reviewed to assess the validity of the apparent SSI of Chloride in MW-6. Chapter 4 of the Unified Guidance discusses groundwater monitoring programs and statistical analysis of the associated data. A key component of statistical analysis is "*to determine whether or not the increase is actually due to a contaminant release*". Three of these considerations are pertinent to the data associated with Chloride testing, MW-6 sampling, and the Bottom Ash Pond groundwater monitoring system and for that reason are listed below.

- 1. Chapter 4, page 4-8: Did the test correctly identify an actual release of an indicator or hazardous constituent?
- 2. Chapter 4, page 4-8: Could observed SSIs for naturally occurring analytes be due to longer term (i.e., seasonal, or multi-year) variation?
- 3. Chapter 4, page 4-9: Are any of these contaminants observed upgradient of the regulated units?

Each of these considerations were evaluated to determine the validity of the apparent SSI for Chloride in MW-6. The results of this evaluation are discussed below.

# Unified Guidance Consideration 1

Since completion of the hydrogeologic site characterization (Gredell Engineering, 2017), the piezometers installed for the characterization were converted to monitoring wells MW-1 through MW-6. As documented in that report, 12 groundwater maps were developed showing the direction of flow and hydraulic gradient based on the monthly groundwater elevations. These groundwater maps demonstrate a consistent west-southwestern direction of flow showing minimal variation in hydraulic gradient over the 12-month period extending from May 2016 to April 2017. Moreover, three additional monitoring wells (MW-7 through MW-9) were installed in locations shown on Figure 1 to provide sufficient downgradient monitoring of the ash ponds at the SPS and to further refine and confirm overall groundwater flow direction. Based on over five years of monitoring since 2016, the groundwater data consistently demonstrate that MW-6 is not downgradient of the Bottom Ash Pond and groundwater flow direction remains consistently to the west-southwest.

MW-6 was installed to monitor spatial variability of groundwater geochemistry upgradient of the Bottom Ash Pond. Based on the weight of evidence that MW-6 is not hydraulically downgradient from the Bottom Ash Pond, the well is not positioned to detect a release from the pond. Therefore, the conclusion to the first consideration question from Unified Guidance listed above is negative.

The analytical results for MW-6 could <u>not</u> have identified an actual release of Chloride from the Bottom Ash Pond.

## **Unified Guidance Consideration 2**

Boswell et al. (1968) published a study of the Quaternary Aquifers in the Mississippi Embayment which documented characteristics of the alluvial aquifer underlying the regulated units (i.e., the Bottom Ash Pond and Fly Ash Pond) at the site. The study stated that while the chief source of recharge is precipitation, recharge also occurs from the upward movement of groundwater from underlying aquifers. While the alluvial and Wilcox Aquifers are discussed separately, Luckey (1985) notes that the alluvial aquifer and the underlying Wilcox Aquifer commonly are hydraulically interconnected. The hydraulic connection between the alluvial aquifer and Wilcox Aquifer is further demonstrated by the potentiometric contour maps presented by Luckey (1985), which demonstrate a similar flow direction (west-southwest) in both aquifers in the Sikeston area.

Drilling records for high-yield wells (Appendix 2) at the SPS and in areas east generally document permeable sand and gravel at and near the contact between the alluvial aquifer and the underlying Wilcox Aquifer. These permeable sands and gravels and the lack of a laterally continuous low-permeability aquitard between the two aquifers permit the upward movement and mixing of water between these aquifers near the SPS.

It is also noted that the high-yield Sikeston Municipal wells (Appendix 3) at Plant 3, which is located approximately one-half mile east of the SPS, are 142 to 145 feet deep and screened in the lower part of the alluvial aquifer. Appendix 3 documents between 30 and 34 feet of drawdown or reduction in hydraulic head in the alluvial aquifer as a result municipal well pumping. This reduction in hydraulic head results in an upward hydraulic gradient from the underlying Wilcox Aquifer. The rate of upward movement of groundwater from the Wilcox into the alluvial aquifer undoubtedly increases as these high-yield wells withdraw groundwater.

High-yield irrigation wells are common to support crop farming in southeast Missouri. Luckey and Fuller (1980) state that the alluvium is the only aquifer that is used for irrigation in the area. As shown on Figure 2, the irrigation wells near the SPS are generally 140 feet deep or less and are screened in the lower part of the alluvial aquifer. Demand on the aquifer increased in 2021 due to substantially lower annual precipitation (43.63 inches) relative to calendar years 2020 and 2019 (56.04 and 57.38 inches, respectively). This additional demand on irrigation to support farming resulted in more drawdown on the alluvial aquifer in 2021 relative to previous years. The additional drawdown reduces hydraulic head relative to the underlying Wilcox Aquifer and results in greater upward flow of groundwater from the Wilcox, which then mixes and interacts with groundwater in the alluvial aquifer.

Boswell et al. (1968) also states that the alluvial aquifer contains appreciable quantities of Chloride ranging from 0.3 to 1,870 mg/L, owing to chemical dissolution of soil and rocks. Such concentrations suggest that the level of Chloride in MW-6 may be naturally occurring. Combined with the increased demand on groundwater in 2021, the current increase in Chloride is likely a temporal variation resulting from upward movement, co-mingling, and geochemical interaction of groundwater from the underlying Wilcox Aquifer. This geochemical variation is not represented by the background data set for the Bottom Ash Pond monitoring system. Consequently, the conclusion to the second consideration question from Unified Guidance listed above is affirmative.

# Unified Guidance Consideration 3

Relatively high concentrations of Chloride are documented in irrigation wells, industrial supply wells, and SBMU municipal (i.e., public drinking water supply) wells located upgradient of the regulated units. Data published by the Missouri Department of Natural Resources in their 2020 Annual Water Quality Report for the SBMU municipal water system summarize location and construction of the public drinking water supply wells (Appendix 3). Several additional publications were reviewed to determine the natural occurrence and variability of Chloride in the alluvial and Wilcox Aquifers.

Luckey and Fuller (1980) presented comprehensive hydrogeologic data for the unconsolidated aquifers in southeastern Missouri. This study inventoried and sampled over 800 irrigation, high-yield industrial, and municipal wells and included data on the alluvial and Wilcox Aquifers underlying the regulated units (i.e., Bottom Ash Pond and Fly Ash Pond) at the SPS. While the alluvial and Wilcox Aquifers are typically discussed separately in the technical literature, Luckey (1985) states that these two aquifers commonly are hydraulically interconnected. This hydraulic connection between aquifers is also demonstrated by the drilling records in Appendix 2, which document permeable sand and gravel at the alluvium/Wilcox contact.

Luckey and Fuller (1980) summarize analytical data for Chloride in the alluvial and Wilcox Aquifers in the Sikeston area. Seven wells located upgradient of the Bottom Ash Pond were included in their study. Four of these wells were identified as irrigation or industrial supply wells and three were SBMU municipal wells located closer to the SPS.

Similarly, Brahana et al. (1985) presented a study of groundwater quality based on comprehensive sampling and analysis of samples from 42 wells set in the unconsolidated aquifers of the Northern Mississippi Embayment. The locations of these and other wells are indicated on Figure 2. Chloride data from these wells is summarized in Table 2 and on Figure 2.

Well Type	Owner	Well Location	Formation	Chloride Concentration (mg/L)	Data Source
	Roth	T26N R14E S11CBC	Alluvium	4.8	
Irrigation or	Drury Dev.	T26N R14E S15CCD	Alluvium	5.3	
Supply	Miner	T26N R14E S16DDD	Alluvium	13	Luckey and Fuller
	Scott	T26N R14E S15DBB	Alluvium	9.8	(1980)
	Sikeston ID #19120	T26N R14E S19CDD	Wilcox	17	
Municipal	Sikeston ID #26235	T26N R14E S19DCB	Wilcox	7.8	
Municipal	Sikeston ID #2700	T26N R14E S19CDD	Wilcox	5.4	
	Sikeston ID #5941	T26N R14E S19CDD	Wilcox	5.2	Brahana et al. (1985)

Table 2 – Chloride Results in Upgradient In	igation, Industrial and Municipal Wells
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These data demonstrate that local concentrations of Chloride up gradient of the site range from 4.8 mg/L to 17 mg/L. Therefore, the conclusion to the third consideration question from Unified Guidance listed above is affirmative.

# 4.0 CONCLUSIONS AND RECOMMENDATIONS

Gredell Engineering concludes that the apparent SSI of Chloride in MW-6 is not the result of a release from the Bottom Ash Pond and is attributable to an alternate source. The following supports this conclusion:

- MW-6 is not hydraulically downgradient of the Bottom Ash Pond and is not positioned to identify
  a release of an indicator (Chloride) from the regulated unit. Groundwater flow direction is
  consistently from the east-northeast to the west-southwest as documented during all
  monitoring events at the SPS.
- The reported Chloride concentration in MW-6 is naturally occurring and due to temporal variation resulting from chemical dissolution of Chloride from soil or rocks, and variable upward groundwater movement from the underlying Wilcox Aquifer over a longer term (i.e., multi-year) than accounted for during the background sampling period of the regulated unit's monitoring system.
- Chloride is present in high-capacity wells located upgradient of the regulated units. Chloride concentrations range from 4.8 to 17 mg/L, as reported by the United States Department of the Interior Geological Survey and the Missouri Department of Natural Resources.

Based on these conclusions, Gredell Engineering recommends continuance of semi-annual detection monitoring in accordance with §257.94.

# 5.0 LIMITATIONS

This report has been prepared for the exclusive use of the client and GREDELL Engineering Resources, Inc. for the specific project discussed in accordance with generally accepted environmental practices common to this locale at this time. The report is applicable only to this specific project and identified site conditions as they existed at the time of report preparation. The use of this report by others to develop independent interpretations of data or conclusions not explicitly stated in this report are the sole responsibility of those firms or individuals.

This report is not a guarantee of subsurface conditions. Variations in subsurface conditions may be present that were not identified during this or previous investigations. Interpretations of data and recommendations made in this report are based on observations of data that were available and referred to in this report unless otherwise noted. No other warranties, expressed or implied, are provided.

# 6.0 **REFERENCES**

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- USEPA, 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance: EPA 530/R-09-007, Office of Resource Conservation and Recovery, Program Implementation and Information Division, Washington, D.C.

# Figures





LEGEND	
PROPERTY LINE	PL
GROUNDWATER CONTOUR	
MONITORING WELL	MW
UP GRADIENT	lig
MONITORING LOCATION	00
DOWN GRADIENT	DG
MONITORING LOCATION	20
GENERAL FLOW DIRECTION	
NOT MONITORED DURING	NINA
THIS EVENT	NIM

- NOTES:

   IMAGE PROVIDED BY BING MAPS.
   MONITORING WELL LOCATIONS, CASING ELEVATIONS & UNDERGROUND CULVERT ELEVATIONS SURVEYED BY BOWEN ENGINEERING & SURVEYING.
   GROUNDWATER ELEVATIONS MEASURED BY SIKESTON POWER STATION STAFF ON NOVEMBER 1, 2021.
   MAP DEVELOPMENT BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.
   RANGE OF HYDRAULIC GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.0005 FT./FT. TO 0.001 FT./FT.

)	GROUNDWATER ELEVATION	CASING ELEVATION	NORTHING	EASTING
	295.95	308.55	381130.00	1079946.62
	293.74	305.61	380804.62	1077766.95
	294.31	305.91	379858.94	1078477.85
	295.11	307.72	379874.77	1079384.36
	293.86	304.77	380311.20	1077940.08

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# **Appendices**

# **Appendix 1a**

Laboratory Analytical Results and Quality Control Reports November 1, 2021 Sample Event



December 09, 2021

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

Dear Luke St Mary:

Please find enclosed the analytical results for the sample(s) the laboratory received. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Dail & Schindler

Project Manager (309) 692-9688 x1716 gschindler@pdclab.com





#### SAMPLE RECEIPT CHECK LIST

#### Items not applicable will be marked as in compliance

Work Order EK00904

YES	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers received undamaged
NO	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided



Sample: EK00904-01 Name: MW-3 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 07:45 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	1.0	mg/L		11/11/21 17:28	1	1.0	11/11/21 17:28	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/11/21 17:28	1	0.250	11/11/21 17:28	CRD	EPA 300.0 REV 2.1
Sulfate	14	mg/L		11/11/21 17:46	10	10	11/11/21 17:46	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	130	mg/L	Н	11/09/21 15:31	1	17	11/09/21 16:19	ADM	SM 2540C
<u>Total Metals - PIA</u>									
Boron	25	ug/L		11/09/21 10:07	5	10	11/10/21 11:27	JMW	EPA 6020A
Calcium	14000	ug/L		11/09/21 10:07	5	200	11/10/21 11:27	JMW	EPA 6020A
Sample: EK00904-02 Name: MW-4 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 13:24 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	16	mg/L		11/10/21 15:56	5	5.0	11/10/21 15:56	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/10/21 15:38	1	0.250	11/10/21 15:38	CRD	EPA 300.0 REV 2.1
Sulfate	95	mg/L		11/10/21 16:14	25	25	11/10/21 16:14	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	360	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u> Total Metals - PIA</u>									
Boron	870	ug/L		11/09/21 10:07	5	10	11/10/21 11:31	JMW	EPA 6020A
Calcium	76000	ug/L		11/09/21 10:07	5	200	11/10/21 11:31	JMW	EPA 6020A



Sample: EK00904-03 Name: MW-5 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 10:54 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	13	mg/L		11/10/21 17:27	5	5.0	11/10/21 17:27	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		11/10/21 16:32	1	0.250	11/10/21 16:32	CRD	EPA 300.0 REV 2.1
Sulfate	170	mg/L		11/10/21 17:45	50	50	11/10/21 17:45	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	490	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u>Total Metals - PIA</u>									
Boron	330	ug/L		11/09/21 10:07	5	10	11/10/21 11:34	JMW	EPA 6020A
Calcium	94000	ug/L		11/09/21 10:07	5	200	11/10/21 11:34	JMW	EPA 6020A
Sample: EK00904-04 Name: MW-6 Matrix: Ground Wate	r - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 09:02 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	4.3	mg/L		11/10/21 18:03	1	1.0	11/10/21 18:03	CRD	EPA 300.0 REV 2.1
Fluoride	0.330	mg/L		11/10/21 18:03	1	0.250	11/10/21 18:03	CRD	EPA 300.0 REV 2.1
Sulfate	27	mg/L		11/10/21 18:21	5	5.0	11/10/21 18:21	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	220	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u>Total Metals - PIA</u>									
Boron	56	ug/L		11/09/21 10:07	5	10	11/10/21 11:38	JMW	EPA 6020A
Calcium	47000	ug/L		11/09/21 10:07	5	200	11/10/21 11:38	JMW	EPA 6020A



Sample: EK00904-( Name: MW-8 Matrix: Ground W	05 Vater - Grab						Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 11:46 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	45	mg/L		11/10/21 18:57	25	25	11/10/21 18:57	CRD	EPA 300.0 REV 2.1
Fluoride	0.258	mg/L		11/10/21 18:39	1	0.250	11/10/21 18:39	CRD	EPA 300.0 REV 2.1
Sulfate	94	mg/L		11/10/21 18:57	25	25	11/10/21 18:57	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	360	mg/L		11/04/21 08:59	1	26	11/04/21 10:19	JAA	SM 2540C
<u>Total Metals - PIA</u>									
Boron	430	ug/L		11/09/21 10:07	5	10	11/10/21 11:42	JMW	EPA 6020A
Calcium	80000	ug/L		11/09/21 10:07	5	200	11/10/21 11:42	JMW	EPA 6020A
Sample: EK00904-( Name: FIELD DUF Matrix: Ground W	06 PLICATE Vater - Field Du	plicate					Sampled:         11/01/2           Received:         11/03/2           PO #:         25816	21 00:00 21 09:50	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	40	mg/L		11/10/21 19:33	5	5.0	11/10/21 19:33	CRD	EPA 300.0 REV 2.1
Fluoride	0.256	mg/L		11/10/21 19:15	1	0.250	11/10/21 19:15	CRD	EPA 300.0 REV 2.1
Sulfate	87	mg/L		11/10/21 19:51	50	50	11/10/21 19:51	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	390	mg/L		11/05/21 15:48	1	26	11/05/21 17:16	ADM/BM S	SM 2540C
<u> Total Metals - PIA</u>									
Boron	440	ug/L		11/09/21 10:07	5	10	11/10/21 11:45	JMW	EPA 6020A
Calcium	82000	ug/L		11/09/21 10:07	5	200	11/10/21 11:45	JMW	EPA 6020A



Sample: EK0090 Name: FIELD BI Matrix: Ground	4-07 LANK I Water - Field Bla	nk				Sampled:         11/0           Received:         11/0           PO #:         258	01/21 13:24 03/21 09:50 16	
Parameter	Result	Unit	Qualifier Pro	epared Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA								
Chloride	< 1.0	mg/L	11/11	/21 18:05 1	1.0	11/11/21 18:05	CRD	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L	11/11	/21 18:05 1	0.250	11/11/21 18:05	CRD	EPA 300.0 REV 2.1
Sulfate	< 1.0	mg/L	11/11	/21 18:05 1	1.0	11/11/21 18:05	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA								
Solids - total dissolved solids (TDS)	< 17	mg/L	11/08	/21 17:55 1	17	11/08/21 18:11	JAA	SM 2540C
Total Metals - PIA								
Boron	11	ug/L	11/09	/21 10:07 5	10	11/10/21 11:49	JMW	EPA 6020A
Calcium	< 200	ug/L	11/09	/21 10:07 5	200	11/10/21 11:49	JMW	EPA 6020A

### **QC SAMPLE RESULTS**

Paramotor	Posult	Unit	Qual	Spike	Source Result	%PEC	%REC	חסס	RPD Limit
	Result	Unit	Quai	Level	Result	/iREC	Linits	KFU	L
<u> Batch B147394 - No Prep - SM 2540C</u>									
Blank (B147394-BLK1)				Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147394-BS1)	(B147394-BS1)			Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	1020		1000		84.9-109				
Duplicate (B147394-DUP1)	Sample: EJ056		Prepared &	Analyzed: 11/					
Solids - total dissolved solids (TDS)	1200 mg/L				1170		3	5	
Duplicate (B147394-DUP2)	Sample: EK00431-			Prepared &	Analyzed: 11/	/04/21			
Solids - total dissolved solids (TDS)	740	mg/L	М		690			7	5
<u> Batch B147627 - No Prep - SM 2540C</u>									
Blank (B147627-BLK1)				Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147627-BS1)				Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	973	mg/L		1000		97	84.9-109		
Duplicate (B147627-DUP1)	Sample: EK005	74-04		Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	450	mg/L			470			4	5
Duplicate (B147627-DUP2)	Sample: EK00904-06			Prepared &	Analyzed: 11/	/05/21			
Solids - total dissolved solids (TDS)	410	mg/L			390			5	5
<u> Batch B147792 - No Prep - SM 2540C</u>									
Blank (B147792-BLK1)				Prepared &	Analyzed: 11/	/08/21			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147792-BS1)				Prepared &	Analyzed: 11/	/08/21			
Solids - total dissolved solids (TDS)	960	mg/L		1000		96	84.9-109		
Batch B147842 - SW 3015 - EPA 6020A									
Blank (B147842-BLK1)				Prepared: 1	1/09/21 Analy	yzed: 11/10/2	1		
Boron	< 10	ug/L							
Calcium	< 200	ug/L							
LCS (B147842-BS1)				Prepared: 1	1/09/21 Analy	yzed: 11/10/2	1		
Boron	484	ug/L		555.6		87	80-120		
Calcium	5320	ug/L		5556		96	80-120		
<u> Batch B147924 - No Prep - SM 2540C</u>									
Blank (B147924-BLK1)	147924-BLK1)			Prepared & Analyzed: 11/09/21					
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B147924-BS1)				Prepared &	Analyzed: 11/	/09/21			
Solids - total dissolved solids (TDS)	980	mg/L		1000		98	84.9-109		
Duplicate (B147924-DUP1)	Sample: EK00616-01			Prepared &	Analyzed: 11/				
Solids - total dissolved solids (TDS)	1010	1010 mg/L		1060					5
Batch B148133 - IC No Prep - EPA 300.0 REV	<u>2.1</u>								

Calibration Blank (B148133-CCB1)

Prepared & Analyzed: 11/10/21



## **QC SAMPLE RESULTS**

Parameter	Result	Unit	Qual	Spike Level	Source Result	%RFC	%REC	RPD	RPD Limit	
			quui			/01120				
<u> Batch B148133 - IC No Prep - EPA 300.0 REV 2.1</u>										
Calibration Blank (B148133-CCB1)				Prepared & Analyzed: 11/10/21						
Fluoride	0.00	mg/L								
Chloride	0.545	mg/L								
Sulfate	0.00	mg/L								
Calibration Check (B148133-CCV1)				Prepared &	Analyzed: 11/	10/21				
Sulfate	5.22	mg/L		5.000		104	90-110			
Chloride	5.03	mg/L		5.000		101	90-110			
Fluoride	5.28	mg/L		5.000		106	90-110			
Batch B148294 - IC No Prep - EPA 300.0 REV 2.1										
Calibration Blank (B148294-CCB1)				Prepared &	Analyzed: 11/	11/21				
Sulfate	0.00	mg/L								
Chloride	0.219	mg/L								
Fluoride	0.00	mg/L								
Calibration Check (B148294-CCV1)				Prepared &	Analyzed: 11/	'11/21				
Sulfate	4.97	mg/L		5.000		99	90-110			
Fluoride	5.02	mg/L		5.000		100	90-110			
Chloride	4.85	mg/L		5.000		97	90-110			
Matrix Spike (B148294-MS1)	Sample: EK010	80-02		Prepared & Analyzed: 11/11/21						
Chloride	1.0E9	mg/L	Q4	1.500	9.6	NR	80-120			
Sulfate	1.00E9	mg/L	Q4	1.500	8.76	NR	80-120			
Matrix Spike Dup (B148294-MSD1)	Sample: EK01080-02			Prepared &	Analyzed: 11/	'11/21				
Chloride	1.0E9	mg/L	Q4	1.500	9.6	NR	80-120	0	20	
Sulfate	1.00E9	mg/L	Q4	1.500	8.76	NR	80-120	0	20	
<u> Batch B150295 - IC No Prep - EPA 300.0 REV 2.1</u>										
Calibration Blank (B150295-CCB1)				Prepared &	Analyzed: 12	/06/21				
Chloride	0.858	mg/L								
Calibration Check (B150295-CCV1)				Prepared &	Analyzed: 12	/06/21				
Chloride	4.73	mg/L		5.000		95	90-110			
Matrix Spike (B150295-MS1)	Sample: EL009	28-01		Prepared &	Analyzed: 12	/06/21				
Chloride	7.4	mg/L	Q4	3.000	5.0	79	80-120			
Matrix Spike (B150295-MS2)	Sample: EL00928-02			Prepared &	Analyzed: 12	/07/21				
Chloride	1.0E9	mg/L	Q4	3.000	180	NR	80-120			
Matrix Spike (B150295-MS3)	Sample: EL00928-03		Prepared &	Analyzed: 12/	/07/21					
Chloride	1.0E9	mg/L		3.000	370	NR	80-120			
Matrix Spike Dup (B150295-MSD1)	Sample: EL00928-01		Prepared &	Analyzed: 12/	/06/21					
Chloride	7.4	mg/L	Q4	3.000	5.0	79	80-120	0.1	20	
Matrix Spike Dup (B150295-MSD2)	Sample: EL009	28-02		Prepared &	Analyzed: 12/	/07/21				
Chloride	1.0E9	mg/L	Q4	3.000	180	NR	80-120	0	20	
Matrix Spike Dup (B150295-MSD3)	Sample: EL009	28-03		Prepared &	Analyzed: 12	/07/21				
Chloride	1.0E9	mg/L		3.000	370	NR	80-120	0	20	



### NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

#### **Certifications**

- CHI McHenry, IL 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556
- PIA Peoria, IL 2231 W. Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230

Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553 Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870) Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338) Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042

TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

#### **Qualifiers**

- H Test performed after the expiration of the appropriate regulatory/advisory maximum allowable hold time.
- M Analyte failed to meet the required acceptance criteria for duplicate analysis.
- Q4 The matrix spike recovery result is unusable since the analyte concentration in the sample is greater than four times the spike level. The associated blank spike was acceptable.

Dail & Schindler



Certified by: Gail Schindler, Project Manager


PDC LABORATORIES, INC. WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

### CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

		ALL HIG	HLIGHTE	DAREA	S MUST E	BE COMPL	ETED BY C	JENT (PLEA	SE PRINT)							
CLIENT		PROJEC	TNUMBE	R	PROJECT LOCATION PURCHASE ORDER				E ORDER #	(3	) AN	ALYSI	S REQ	UESTEI	)	(FOR LAB USE ONLY)
SIKESTON BMU POWER STATE	JN					OM ASH	APP III									FV MAAAU-
ADDRESS		PHONE 573-4	PHONE NUMBER E-MAIL 573-475-3131					DATE SHIPPED								LOGIN # 2 COUPT 0
1551 W WAREFIELD																LOGGED BY:
CITY		SAMPLER						MATRIX	TYPES:	1						CLIENT: SIKESTON BMU, SIKESTON
STAT SIKESTON, MO 63801		(PLEASE PRI	чт)		v c			WW-WASTEWATER DW- DRINKING WATER								PROJECT. SIKESTON BOTTOM ASH
ZIP		Danie	1	DII	ling	ham	,	GW-GROUND W WWSL-SLUDGE NAS-NON AQUE		Ιế						APP III
CONTACT PERSON		SAMPLER'S SIGNATURE						LCHT-LEACHAT OIL-OIL SO-SOIL	E	4						PROJ. MGR.: GJ SCHINDLER
MR LORE ST MART		C				·		SOL-SOLID		So						
		War	20	2.	21	lluc	han			L.	A					
2 (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)		DATE COLLECTED	COLLI	ME ECTED	GRAB	LE TYPE COMP	MATRIX	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	င်	B, C					REMARKS
MW-3		11-1-21	07	45	x		GW	2	3,6	x	x					
MW-4		11-1-21	13	24	x		GW	2	3,6	x	x					
M/A/ 5		11-1-21	105	54	x		GW	2	3,6	x	x					
		1-1-21	09	20	x		GW	2	3.6	x	x					
		11-1-21	114	16	x		GW	2	3.6	x	x					
		11-1-21	'		x		GW	2	3.6	x	x					
		11-1-21	13	24	x		DI	2	3.6	x	x					
										1						
CHEMICAL PRESERVATION CODES: 1-HCL 2-H2SC	4 3-	HNO3 4 – N	АОН	5 – NA	2\$203	6 – UNP	RESERVED	7 – OTHER		J	1					
TURNAROUND TIME REQUESTED (PLEASE CIRCLE) (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCE	NORMA IARGE)	AL RUSH			DATE RES	BULTS		l understan	d that by initi	aling th	is box	give t	he lab	permiss	sion to pr	roceed with analysis, even though it may
5 RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PH	ONE							not meet all Policy and t	sample cont he data will b	ormanc e qualif	e required. Qu	iremen alified	ts as d data n	efined i ay <u>NO</u> T	n the rec be acce	eiving facility's Sample Acceptance ptable to report to all regulatory authorities.
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT F	ROM ABOVE	1						PROCEED	WITH ANALY	SIS AN	D QUA	LIFYR	ESULT	S: (INIT	IALS)	
RELINQUISHED BY: (SIGNATURE)	DATE	121		RECEIVE	ED BY: (SIC	SNATURE)	8		DAT	E		1	2	co	MMENTS	: (FOR LAB USE ONLY)
1 An	TIME	120							TIME			-1(	8			
	DATE	35		RECEIVI	ED BY: (SIG	GNATURE)			DAT	E		-				
KELINGUISHED BI. (SIGHETOTE)	TIME								TIME			S	AMPLE	TEMPE	RATURE	
	DATE			RECEIV	ED BY / CI	NATURE			DAT	e/	1	_ C S	HILL PI	ROCES (S) REC	S START	ED PRIOR TO RECEIPT (Y OR N )N ICE (Y OR N
RELINQUISHED BY: (SIGNATURE)	DATE			RECEIVI	o 1. (Sit	JAATONE)	01		17	103/	21	S. R	AMPLE	ACCER IS NEE	DED	NONCONFORMANT
	TIME			K	alt	29-3	Ala	1	ТІМЁ	a	-0	D	ATE A		TAKEN	FROM SAMPLE BOTTLE
					U	FI	VW	A		947	N					
								1/								

# **Appendix 1b**

Laboratory Analytical Results and Quality Control Reports December 27, 2021 Resample Event



January 07, 2022

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

Dear Luke St Mary:

Please find enclosed the analytical results for the sample(s) the laboratory received. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Dail & Schindler

Project Manager (309) 692-9688 x1716 gschindler@pdclab.com





#### SAMPLE RECEIPT CHECK LIST

#### Items not applicable will be marked as in compliance

Work Order EL04922

YES	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers received undamaged
NO	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided



### ANALYTICAL RESULTS

Sample: EL04922-01 Name: MW-3 Matrix: Ground Wa	l ater - Grab						Sampled:12/27/2Received:12/29/2PO #:25816	21 07:53 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	170	mg/L		01/03/22 09:57	1	26	01/03/22 11:18	JAA	SM 2540C
Sample: EL04922-02 Name: MW-6 Matrix: Ground Wa	2 ater - Grab						Sampled:12/27/2Received:12/29/2PO #:25816	21 08:56 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	3.5	mg/L		01/03/22 17:58	1	1.0	01/03/22 17:58	CRD	EPA 300.0 REV 2.1
Sample: EL04922-03 Name: DUPLICATE Matrix: Ground Wa	3 ater - Field Du	plicate					Sampled:12/27/2Received:12/29/2PO #:25816	21 00:00 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	3.4	mg/L		01/03/22 18:16	1	1.0	01/03/22 18:16	CRD	EPA 300.0 REV 2.1
Sample: EL04922-04 Name: FIELD BLAN Matrix: Ground Wa	l IK ater - Field Bla	ank					Sampled:12/27/2Received:12/29/2PO #:25816	21 08:56 21 11:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		01/03/22 18:34	1	1.0	01/03/22 18:34	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	20	mg/L		01/03/22 09:57	1	17	01/03/22 11:18	JAA	SM 2540C



### **QC SAMPLE RESULTS**

				Spike	Source		%REC		RPD
Parameter	Result	Unit	Qual	Level	Result	%REC	Limits	RPD	Limit
Batch B220779 - No Prep - SM 2540C									
Blank (B220779-BLK1)				Prepared &	Analyzed: 01	/03/22			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B220779-BS1)				Prepared &	Analyzed: 01	/03/22			
Solids - total dissolved solids (TDS)	960	mg/L		1000		96	84.9-109		
Duplicate (B220779-DUP1)	Sample: EL048	94-02		Prepared &	Analyzed: 01	/03/22			
Solids - total dissolved solids (TDS)	480	mg/L	М		520			8	5
Batch B220859 - IC No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B220859-CCB1)				Prepared &	Analyzed: 01	/03/22			
Chloride	0.240	mg/L							
Calibration Check (B220859-CCV1)				Prepared &	Analyzed: 01	/03/22			
Chloride	4.99	mg/L		5.000		100	90-110		



### NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

#### **Certifications**

- CHI McHenry, IL 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556
- PIA Peoria, IL 2231 W. Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230

Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553 Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870) Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338) Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042

TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

#### **Qualifiers**

M Analyte failed to meet the required acceptance criteria for duplicate analysis.

Pail & Schindler



Certified by: Gail Schindler, Project Manager



-

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

### CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)															
(1) SIKESTON DOWED STATION		PROJEC	CT NUMBER	PR	OJECT LOC	CATION	PURCHAS	E ORDER #	G		ALVSIS REQUESTED				(FOR LAB USE ONLY)
SIRESTON FOWER STATION			and the second						C		AL 1913	REQUE	SILD		0 7 60 022 00
ADDRESS		PHONE	ENUMBER		E-MAIL		DATE S	HIPPED						1	LOGIN # ELOGYCL-OG
1551 W WAKEFIELD		573-4	175-3131	31										KPCD	
CITY		SAMPLER		1			MATRIX	TYPES:							SIKESTON BMU, SIKESTON POWER
STAT SIKESTON, MO 63801		(PLEASE PRI	NT)	1			WW-WASTEWAT							STATION	
		Dani	iel i	11:0	100	hand	DW-DRINKING WATER GW-GROUND WATER								SIKESTON BOTTOM ASH APP III RESAMPLES
CONTACT PERSON		SAMPLER'S	<u> </u>			NAS- NON AQUEOUS SOLID LCHT-LEACHATE									
MR LUKE ST MARY		SIGNATURE			-	OIL-OIL SO-SOIL									GJ SCHINDLER
						,	SOL-SOLID								1 1
		Wan	e a.	21	lles	licas	<b>k</b>								1
SAMPLE DESCRIPTION		DATE	TIME	SAMP	LE TYPE	MATRIX	BOTTLE	PRES	SC						
ONIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPOR	RT)	COLLECTED	COLLECTED	GRAB	ØOMP	TYPE	COUNT	CODE	I F	Ω					REMARKS
		19.00						PROVIDED							
IVIVV-3		12-27-3	10153	X		GW	1	6	X						
MW-6		12-27-21	10856	x		GW	1	6		x					
		13. 37.								~					
DUPLICATE		105 . 05 (.5)	/	X		GW	1	6		X					
FIELD BLANK		12-27-21	2856	x		DI	1	6	x	x					
CHEMICAL PRESERVATION CODES: I-HCL 2-H2S	04 3-H	1NO3 4 - NA	AOH 5-NA2	\$203	6 – UNPE	RESERVED	7-OTHER	1	<u> </u>			Constant of the second			
TURNAROUND TIME REQUESTED (PLEASE CIRCLE)	NORMA	L RUSH	L	DATE RES	ULTS		Į								
5 INSU PROVIDE LABS APPROVAL AND SURC	HARGE)			NEEDE	Ð	(6)	I understand not meet all s	that by initia sample confo	ling this	box I	give the ements	lab pen as defin	mission ed in th	to pro	ceed with analysis, even though it may
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PH	IONE		L			$\sim$	Policy and th	e data will be	qualifie	d. Qua	lified da	ta may	NOT be	accept	table to report to all regulatory authorities.
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT F	ROM ABOVE:						PROCEED W	VITH ANALYS	SIS AND	QUAL	IFY RES	ULTS: (	INITIAL	S)	
RELINQUISHED BY: (SIGNATURE)	DATE	2.01	RECEIVE	D BY: (SIG	NATURE)	J	and the second	DATE				\ \	COMM	ENTS: (	(FOR LAB USE ONLY)
	TIME	g -d[/						THE			8	)			
of the for	08	30						TIME			$\sim$	-			
RELINQUISHED BY: (SIGNATURE)	DATE		RECEIVE	D BY: (SIG	NATURE)			DATE			1				11
+	TIME							TIME			SAM	PLE TE	MPERA	TURE	
RELINGUISHED BY (SIGNATURE)								1 ImC			CHIL	L PROC	ESS ST		D PRIOR TO RECEIPT
NELINGUISHED BY: (SIGNATURE)	DATE		RECEIVE	D BY: (SIG	NATURE)	1		DATE	120	17.	SAM	PLE(S)	CEPTA	NCE NO	DNCONFORMANT
	TIME		10	A	-			TIME	19	14	REP	ORTISI	NEEDEI	D	YOR
			KALA	X	11 -				11	Un	DAT	E AND T	IME TA	KEN FF	ROM SAMPLE BOTTLE
			1 may		y a	NY_			11	TQ					
					[4D]	()									

Page .

# Appendix 2

Geologic Drilling Logs for High-Yield Wells Near SPS

164 WL-81-5p15 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER City of Sikeston 19120 COUNTY WELL NO. FARM Scott 6 Т 148 DRILLER Layne - Arkansas Co 26 DATE 8-10-60 ELEV Browning PROD. 1641 GPM. 330 NDEX SHEET NO. LOGGED BY Julells 8-26-60 0 REMARKS 307 - 4 18" esg 34" hole @ bottom. SWL. 66' BRN, MOD. CRSU 50 clo 5 5 clo de w/oce GRAN -SD. MED - VICESE W/ SRAW. cl. do PDWP# 10 4010743 10 do SO BEN, MED lo GENN. de de cíc de Cr6 Allovion de SD-CASTO BARN 100de do de de do 10 do w/pea GRAVEL yellow In la vierse. 200do highly polished dewy GAMME de do de 20 do de do 50. offer to oce CRSP. sillyer office to met. sille gray. 300 W. loox de. 11 su-gray alta to exse-silly -sugray alta locase so-meil to care. 50. alta to Occ dease. silly. do inc? 400 sil Tep. Portons -Creech TD /09

W1-79-2P15 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES OWNER LOG NO. ð Sikeston Water Works CI 26235 FARM & ble N. of Wala & Light WELL NO. COUNTY Scott Plent in alley. DRILLER hayne Arkansas R 26 14E 16-6-69 - Splaker: 23-6-69 Sikesten North DATE ELEVS; /ver men PROD. test 1500 gpm 44 ft dd 9 327 LOGGED BY loly 1-69 REMARKS SWL 68 CHYI SOIL - BRN JERY MAND. BRO. Ulfa- fu- Stanger SAND - CLENEL - Well Sort In- Ned NO 10 SHAN. CLEMA UTTA- Ins . wellsort 00 SHAND CLEAN SIFA well Sortes do de MAD. CLENN. Ala - Ces cree. 00. Dans. CLORA - for crie wellout Ho - - Poorly sorter | - FN- derse - oce Gran, 00. PDupt Do. Do. 4010743 AN- Crse 100 . Do w/ ace v/ene 5 Gran. No IN. V/erie w/ Gran. Po Do w/PER Grovel. Do - Busicelly erse CRSE - Wlocc crant' P.G. Crie - Vicrie - Wil Gran & Pra Grav. Crse- ulcrie 120 Do . w/aran 00 20 00 men - erse wi uferse i Gran 120 SAND-MED. WIGHAN ! Poo Good. PU 200 -SAND - Cras w/Bran. 00 erse-vierse wigran i Pon Grave. MED- crse wigran ? Pon Gravel. mal- viene w/P.G do In eno w/RG. Probles Dirty CLAY. BAN al Pepples. SAND+ FA-Med. SILTY. 20 AND- Ulfa- for

MISSUEL BUREAU OF GEOLGY & MINES, POLLA, MO MISSENT BUREAU OF SEOLOGY & MILLS, ROLLA, MO Lon Swanner Water MO SURVEY NO OWNER MO SURVEY Nº OWNER 2700 City of Sikeston FARM Municipal Plant 2700 City of Sikeston COUNTY WELL Nº WELL Nº COUNTY Scott of Sikeston Scatt 3 @ Municipal Plank 3 T DRILLER Cortess well supply Co. R R DRILLER Corliss Well Co. 2618 14E 26N/4E DATE DATE Dec. 1932 Dec. 1932 ELEVATION PRODUCTION ELEVATION PRODUCTION 327 327 750 G.P.M. SAMPLES STUDIED 19 SAMPLES STUDIED 2-15-38 Hundhausen Farrar REMARKS From sples. submitted. REMARKS Elev. 300 27-11A S.W.4. = 27' sand, subrang. artisora magne 0 Sand, polished in the larger gran save rounded tragments It granite with a small and of green of dark colored PDWP# do + garnet 4010743 iquedes rock POWP # 70/0743 - marnet - marnetita Much coarser & less royuded igneous rock. Fragments chiefly granitie in small. Very Rive sand in small. schles. Igneous schutes 50 50 8/23/62 adort mixed with this Tome 590 cond. 220 micromhog off 7.2 Chiefly medium gramed said same coarse material as tem from USES above. 100 100 ANAL, NO.2091 T.D.S. 153.0 CL. 6.3 SOA 1.4 150 150 - silverped prosiling mallant, here have al 200 200 0000 100 mpla 194 to 218 Chiefly dirab brownish grey day Tangrey clay - Lognate 150mplo 415'- to 2.50' - Clear angular gt2 and medium course ung. sand some of the larger 250 grains are poliched 250 250 150mp/2 260 10 920 one sole









WL 83 5 STATE OF MISSOURI **DIVISION OF** GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER City of Sikeston 11,630 COUNTY FARM WELL I Scott 5 14R т DRILLER Layne Arkansas 26 ZEE 7-651 DATE 8-1551 ELEV. 330 PROD. 880 gpm 335 Banks LOGGED BY S. Marin Korie August 29,57 0 REMARKS 32'05 330' of 12" csg 60' of 8" csg 80' of 8" screen \$0'05 32" & 330'0 \$ 17 Hale At. Water tank SWL 2 soil and sond do soud, igneous frage gravel, coarse sand rounded sand do do do coarse sand, graves eurl do rounded sand, grand U do PDWP# 4 to 20 10 4010743 do do graval of isucius fragma 100 -(1) -4 2 to gravel, coarse coarse sand sand 3 10 0.6 8 rover = de, to . stated Plei uto coarse cand do gravel, coarce sand to de L medium usause can avoid coerce sand avol 200 -L h do sand de do ho de 10 de de do. chay 40



17 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER illestan Vower 28241 COUNTY WELL NO. FARM Scott R DRILLER Layne-WESTERR 26 DATE ELEV. PROD. 3 05 FANZ 80 LOGGED BY with. REMARKS 80'W, 15'N of Well #2 lecation PDWPZ 4010743 2 Havien 100 . Noxidize, hematice If yell sd. 200 Wilc



wilcox 300 Mf. white sol. 6, PC 400

WL 715 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER KESTON ROOM Coca - COLA BOTTLING Co. 107/3 COUNTY FARM WELL NO. SCOTT - ar Loss Welling DRILLER R 14E 26 DATE mar. 1949 ELEV. Brawning PROD. 328 Rentes LOGGED BY McNes 19 63 5/11/49 REMARKS



# **Appendix 3a**

2020 Sikeston Public Well Assessment Reports (CARES)

**General System Information** PWSS No. 4010743



Name	Sikeston
PWSSID	MO4010743
Population Served	16.393
Primary County Served	Scott
Service Connections	7,908
Source(s) of Water	Southeast Missouri Lowlands Groundwater Province
System Classification	Community (C)
Primary Source Type	Groundwater (GW)
System Type	Municipality
System Treatment	4-log Treatment of Viruses, Fluoridation, Greensand Filtration, Sedimentation, Gaseous Pre-Chlorination, Permanganate, Slat Tray Aeration, Gaseous Post-Chlorination, Diffused Aeration, (Pre) pH Adjustment, pH Adjustment, Rapid Sand Filtration
DNR Region of Operations	Southeast Regional Office
Source Water/Wellhead Protection Plan	No
Drinking Water Watch	Drinking Water Watch
Reference Maps	
Although the data in this data a accuracy of the data or related materials. This map and relate	set have been compiled, in part or in whole, by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the d materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related d information are subject to change as additional information is acquired. For additional information, please contact the Department's Drinking Water Branch (Water

Overview Map (Aerial) PWSS No. 4010743 - 8 Wells, Scott County Map Prepared: Jun 11, 2020 Data Release: May 4, 2020





Groundwater System System Well Source Water Protection Boundary 20-Year Time of Travel Half-Mile Buffer

SWAP - Source Water Assessment Plan http://drinkingwater.missouri.edu/swap Aerial Photos: Bing Maps, Microsoft. Jun 11, 2020.

Miles

0.5

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Although the data in this data set have been compiled, in part or in whole, by the Missouri Department of Natural Resources, no warranty, expressed or impiled, is made by the department as to the accuracy of the data or related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials. This map and related information are subject to change as additional information is acquired. For additional information, please contact the Department's Drinking Water Branch (Water Protection Program).







http://drinkingwater.missouri.edu/swap Aerial Photos: Bing Maps, Microsoft. Jun 11, 2020. Land Use

0





Although the data in this data set have been compiled, in part or in whole, by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data or related materials. The act of distribution shal not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials. This map and related information are subject to change as additional information is acquired. For additional information, please contact the Department's Dinking Water Branch (Water Protection Program).

Miles

0.5

Sikeston				<b>≋</b>
Land Use Statistics PWSS No. 4010743	N C	Map Prepared: Jun 11, 2020 Data Release: May 4, 2020	Prepared by CARES, Unive	MISSOURI DEPARTMENT OF NATURAL RESOURCES ersity of Missouri Extension
Land Use	% Land Area, 2017	% Land Area, 2018	% Land Area, 2019	Avg. % Land Area
Corn	0	0	0	0
Cotton	0	0	0	0
Rice	0	0	0	0
Soybeans	0	0.04	0	0.01
Other Crop	0	0	0	0
Other Hay/Non-Alfalfa	0	0	0	0
Grassland/Pasture	0	0	0	0
Forest/Shrubland	0	0	0	0
Developed/High Intensity	23.04	22.78	23.04	22.95
Developed/Low-Med Intensity	62.14	61.83	61.3	61.76
Developed/Open Space	14.82	15.35	15.66	15.27
Open Water	0	0	0	0
Wetlands	0	0	0	0
Barren	0	0	0	0
Although the data in this data set have been compile accuracy of the data or related materials. The act o materials. This map and related information are sub	ed, in part or in whole, by the M f distribution shall not constitut ect to change as additional info	lissouri Department of Natural Resources, no e any such warranty, and no responsibility is prmation is acquired. For additional informati	o warranty, expressed or implied, is r s assumed by the department in the u on, please contact the Department's	nade by the department as to the use of these data or related Drinking Water Branch (Water

Well/Intake Data - PW Scott County, Sheet 1 c	'SS No. 4010743 of 2	Sheet Prepared	: Jun 11, 2020	Prepared by CARES, University of Missou	TMENT OF AL RESOURCES In Extension
Well Number Local Well Name Well ID # DGLS ID #	W1 Well #1, Plant #2 13051 0011630	W5 Well #6, Plant #2 13049 0019120	W6 Well #7, Plant #2 13048 0026235	W7 Well #8, Plant #3 13047	W9 Well #10, Plant #3 13045
Status Latitude Longitude	Active 36.879040 -89.586450	Active 36.878180 -89.585580	Active 36.879540 -89.583700	Active 36.880623 -89.601124	Emergency 36.878620 -89.600250
12-Digit Hydrologic Unit	080202010305	080202010305	080202010305	080202040604	080202040604
County MoDNR Region	Scott Southeast	Scott Southeast	Scott Southeast	Scott Southeast	Scott Southeast
Groundwater Province <sup>1</sup>	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr
Source Aquifer(s) <sup>2</sup>	Wilcox aquifer	Wilcox aquifer	Wilcox aquifer	Alluvial aquifer	Alluvial aquifer
Confined/Unconfined <sup>3</sup> Regional Drilling	Unconfined	Unconfined			
Area <sup>4</sup> Total Dissolved	undetermined	undetermined	undetermined	undetermined	undetermined
Solids≌ Date Drilled (year) Material (C/U)	1951 Unconsolidated	1960 Unconsolidated	1969 Unconsolidated	1976 Unconsolidated	1959 Unconsolidated
Casing Base Formation	Wilcox	Wilcox	Wilcox	Alluvium	Alluvium
Total Depth Formation	Midway	Wilcox	Midway	Alluvium	Alluvium
Total Depth Ground Elevation (ft) Casing Depth (ft) Casing Size (in) Casing Type	421 327 331 12	401 326 307 18	404 326 309 18	145 325 108 18 Steel	142 325 119 12 Steel
Screen Length (ft) Screen Size (in)	81 8	80 12	80 12	30 12	21 12
Static Water Level (ft) Well Yield (gpm) Head (ft) Draw Down (ft)	60 600 90 60	66 1100 69 54	65 1450 105 59	27 1300 57 33	30 1000 34
Pump Test Date (year)	1975	1960	1992	1976	1987
Pump Type Pump Manufacturer	Vertical Turbine	Vertical Turbine	Vertical Turbine	Vertical Turbine	Vertical Turbine
Pump Depth (ft) Pump Capacity (gpm) Pump Meter (Y/N)	150 863 	135 1500	170 1600	84 1350 	64 1150 
Surface Drainage State Approved (Y/N)					
Liquefaction Risk Landslide Risk	High Low	High Low	High Low	High Low	High Low
Collapse Risk Flood Risk	Low Low	Low	Low	Low Low	Low
Contamination Risk	Low	Low	Low	Moderate	Moderate
Conduit Flow Risk <sup>6</sup>	K6	K6	K6	K6	K6

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#### Well/Intake Data - PWSS No. 4010743 Scott County, Sheet 2 of 2

Sheet Prepared: Aug 12, 2020



Well Number	W10	W11	W13
Local Well Name	Well #11, Plant #1	Well #12	Well #13 Plant #3
Well ID #	13044	13043	18782
DGLS ID #			
Status	Active	Active	Active
Latitude	36.878770	36.880440	36.880459
Longitude	-89.582680	-89.582630	-89.602615
12-Digit Hydrologic Unit	080202010305	080202010305	080202040604
County	Scott	Scott	Scott
MoDNR Region	Southeast	Southeast	Southeast
Groundwater Province <sup>1</sup>	Southeast Missouri Lowlands	Southeast Missouri Lowlands	Southeast Missouri Lowlands
Source Aquifer(s) <sup>2</sup>	Wilcox	Wilcox	Alluvial
Confined/Unconfined <sup>3</sup>	Unconfined	Unconfined	Unconfined
Regional Drilling Area <sup>4</sup>	Area 5	Area 5	Area 5
Total Dissolved Solids $\frac{5}{2}$	undetermined	undetermined	undetermined
Date Drilled (year)	1987	1991	2013
Material (C/U)	Unconsolidated	Unconsolidated	Unconsolidated
<b>Casing Base Formation</b>	Wilcox	Wilcox	Alluvium
Total Depth Formation	Wilcox	Wilcox	Alluvium
Total Depth	390	391	160
Ground Elevation (ft)	325	325	325
Casing Depth (ft)	300	292	111
Casing Size (in)	16	18	16
Casing Type	Steel	Steel	Steel
Screen Length (ft)	80	80	110
Screen Size (in)	10	12	
Static Water Level (ft)	65	80	31
Well Yield (gpm)	1062	835	2400
Head (ft)	109	94	69
Draw Down (ft)	43		
Pump Test Date (year)	1987	1991	
Pump Type Pump Manufacturer	Vertical Turbine	Vertical Turbine	Vertical Turbine
Pump Depth (ft)	174	174	100
Pump Capacity (gpm)	1000	1000	1000
Pump Meter (Y/N)			
GWUDISW (Y/N)			
Surface Drainage			
State Approved (Y/N)			
Liquefaction Risk	High	High	High
Landslide Risk	Low	Low	Low
Collapse Risk	Low	Low	Low
Flood Risk	Low	Low	Low
Surface Contamination Risk	Low	Low	Moderate
Conduit Flow Risk <sup>6</sup>	K6	K6	К6
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the data or related materials. The act of c information are subject to change as add	listribution shall not constitute any itional information is acquired. For	such warranty, and no responsibil additional information, please co	ity is assumed by the department in the use of these data or related materials. This map and related nater the Department's Drinking Water Branch (Water Protection Program).

**Contaminant Summary** 

Sheet Prepared: Jun 11, 2020



PWS	S NO. 4010743		Prepared by CARES, University of Missouri Extension					
57 pc	57 potential contaminant sources in the listed databases (multiple databases may list the same contaminant source):							
	Database		Database					
~	ACRES (Assessment, Cleanup And Redevelopment Exchange System)		MN-TEMPO (Minnesota - Permitting, Compliance, & Enforcement)					
~	AIR (Integrated Compliance Information System-Air)	v	MO-DNR (Missouri Department Of Natural Resources)					
~	AIRS/AFS (Air Facility System)	v	NCDB (National Compliance Database)					
~	AIRS/AQS (Air Quality System)	<i>v</i>	NPDES (National Pollutant Discharge Elimination System)					
	BR (Biennial Reporters)		OTAQREG (Office Of Transportation And Air Quality Fuels Registration)					
	BRAC (Base Realignment And Closure)		RADINFO (Radiation Information System)					
V	CEDRI (Compliance And Emissions Data Reporting Interface)	1	RCRAINED (Recourse Conservation And Recovery Act Information System)					
	ECRM (Enforcement Criminal Records Management)		RES (Renewable Fuel Standard)					
	E-GGRT (Electronic Greenhouse Gas Reporting Tool)		RMP (Risk Management Plan)					
	EGRID (Emissions & Generation Resource Integrated Database)	V	SEMS (Superfund Enterprise Management System)					
~	EIA-860 (Energy Information Administration-860 Database)	~	SFDW (Safe Drinking Water Information System)					
~	EIS (Emission Inventory System)		SSTS (Section Seven Tracking System)					
	FFDOCKET (Federal Facility Hazardous Waste Compliance Docket)		STATE (State Systems)					
~	ICIS (Integrated Compliance Information System)		TRIS (Toxics Release Inventory System)					
	LMOP (Landfill Methane Outreach Program)		TSCA (Toxic Substances Control Act)					
	LUSI-ARRA (Leaking Underground Storage Tank - American Recovery And Reinvestment Act)	v	SWIP (Source Water Inventory Project Field Inventory - see below)					
60 pc	otential contaminant sources in the SWIP Field Inventory:							
Count	Site Type	Count	Site Type					
0	Airport or abandoned airfield	0	Laundromat					
0	Animal feedlot	0	Livestock auction					
0	Apartments and condominiums	0	Machine or metalworking shop					
0	Asphalt plant	2	Manufacturing (general)					
6	Auto repair shop	0	Material stockpile (industrial)					
8	Automotive dealership	0	Medical institution					
0	Barber and beauty shop	0	Metal production facility					
0		7						
0	Camparound	1	Paint store					
2	Car wash	0	Park land					
0	Cement Plant	0	Parking lot					
0	Cemetery	1	Petroleum production or storage					
0	Communication equipment mfg	0	Pharmacies					
0	Country club	0	Photography shop or processing lab					
3	Dry cleaner	0	Pit toilet					
1	Dumping and/or burning site	0	Plastic material and synthetic mfg					
0	Electric equipment mtg or storage	1	Print shop					
0	Electric substation	0	Recycling/reduction facility					
3	Feed/Fertilizer/Co-on	0	Research lab					
2	Fire station	0	Restaurant					
2	Funeral service and crematory	1	Sawdust pile					
1	Furniture manufacturer	0	School					
0	Furniture repair or finishing shop	0	Sports and hobby shop					
0	Garden and/or nursery	0	Swimming pool					
0	Garden, nursery, and/or florist	0	Tailing pond					
0	Gasoline service station	5	Tank (above-ground fuel)					
0	Golf courses	0	lank (other)					
0	Government office	0	Tank (pesticide)					
0	Hardware and lumber store	0						
0	Hazardous waste (Federal facility)	1	Veterinary service					
1	Highway maintenance facility	0	Wastewater treatment facility					
0	Jewelry or metal plating shop	2	Well (abandoned)					
0	Junk yard or salvage yard	1	Well (domestic)					
0	Lagoon (commercial)	0	Well (irrigation)					
0	Lagoon (industrial)	0	Well (livestock)					
0	Lagoon (municipal)	0	Well (monitoring)					
0	Lagoon (residential)	0	Well (public water supply)					
0	Landfill (municipal)	0	Well (unknown)					

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### Susceptibility Determination PWSS No. 4010743

Sheet Prepared: Jun 11, 2020



The Missouri Department of Natural Resources (MoDNR) has assembled this information to assess the susceptibility of drinking water sources to contamination. There are many unforseen and unpredictable factors that may cause a source to be contaminated. MoDNR routinely monitors all public supplies to ensure public health is protected. Public water systems and local communities are encouraged to take all measures possible to reduce the susceptibility of their drinking water source to chemical contamination. For more information, call 1-800-361-4827.	linimally usceptible	loderately usceptible	iighly usceptible	ndetermined
Dots containing numeric values correspond to the number of individual wells or surface water intakes.	≥0	≥0	τω	$\supset$
GROUND WATER				
Geological and Hydrogeological Assessment Criteria				
Are any system wells deemed by the Public Difficing water branch to be under the direct initidence of surface water?				
Do any system wells draw water from a source with high total dissolved solids (TDS)?				
Are any system wells located provimal to known subsurface or groundwater contamination?				ŏ
Do any system wells draw water from an unconfined aquifer?				
Based on known stratigraphic relationships for each well, the risk of contamination from surface sources is:	Ğ	3	$\sim$	
Well Construction and Maintenance Assessment Criteria				
Are all system wells state, approved?		$\bigcirc$		
Do any system wells exhibit structural defects, construction deficiencies, or other conditions that might allow				
contamination to enter the well at the wellhead?		$\bigcirc$	$\bigcirc$	
Are security measures in place to prevent unauthorized tampering with all system wells?		$\bigcirc$	$\bigcirc$	
Does the system have back-up, emergency power available?	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
Monitoring Assessment Criteria				
Have any system wells exhibited consistent detections for any of the following parameters in raw water?				
Volatile Organic Chemicals (VOC):		$\bigcirc$		
Synthetic Organic Chemicals (SOC):		$\bigcirc$	$\bigcirc$	
Inorganic Compounds (IOC):	0	$\bigcirc$		
Nitrates/Nitrites:		$\bigcirc$		
Radionuclides:		$\bigcirc$	$\bigcirc$	
Bacteria/Viruses/Microbial Pathogens:	0	$\bigcirc$	0	0
Natural Hazard Assessment Criteria				
The number of system wells located in a region prone to flooding.	8	$\bigcirc$	$\bigcirc$	
The number of system wells located in a region that may experience the following conditions in the event of a large-scale earthquake.				
Potential liquefaction risk:		$\bigcirc$	8	
Potential landslide risk:	8	$\bigcirc$	$\bigcirc$	
Potential subsurface collapse/instability risk:	8	$\bigcirc$		
Are any system wells prone to declining water levels during a prolonged drought?		$\bigcirc$	$\bigcirc$	
Do all system wells have lightning surge protection?	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
Potential Contaminant Inventory Assessment Criteria				
Potential sources of contamination exist within the wellhead protection area:		0		
A system well is located in an area with a high density of transportation corridors:		1	7	
A system well is located in an area that may have improperly maintained or faulty on-site septic systems:	$\bigcirc$	$\bigcirc$	0	
Additional Assessment Criteria				
Does the system have a wellhead/source water protection plan endorsed by the Department of Natural Resources?		0		
Does the system have an emergency interconnection with a neighboring public water system?				
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#### Map Prepared: Jun 11, 2020 Data Release: May 4, 2020



Notes PWSS No. 4010743

> For additional information about Missouri's regional groundwater provinces, please visit the Missouri Department of Natural Resources' Water Resources Center Web page or contact the Missouri Geological Survey.

<sup>2</sup> Source aquifers are determined from well log information, where available, and on general water quality characteristics for the regional groundwater province within which each well is located. Source aquifers for wells with little or no well log information are inferred based on best available information.

Additional Source Aquifer Notes:

- Water sources labeled "Cincinnatian, Pennsylvanian, or Devonian/Silurian" are not regionally extensive aquifer systems in Missouri. These represent isolated, localized water-bearing formations. Broad water quality descriptions are Not currently available for these sources. "Precambrian" water sources exhibit water quality characteristics similar to the St. Francois aquifer.
- The Springfield Plateau aquifer is regionally extensive only in southwest and west-central Missouri. Aquifers labeled "Mississippian" or "Springfield Plateau (equivalent)" refer to wells that draw water from the same geological formations that comprise the Springfield Plateau aquifer, but are located in areas of the state not hydraulically connected to the regional aquifer system. Broad water quality generalizations are not available for these isolated, localized water-bearing units.
- <sup>3</sup> Unconfined aquifers are generally more vulnerable to surface or shallow subsurface contamination and warrant additional protections around the wellhead. Confined aquifers are not as vulnerable to surface or shallow subsurface contamination, but may exhibit naturally elevated levels of dissolved minerals, radionuclides, or variations in other water quality parameters such as dissolved oxygen and pH.
- 4 Please refer to 10 CSR 23-3.090 and 10 CSR 23-3.100 for additional information about well construction standards for Missouri's regional well drilling areas.
- <sup>5</sup> TDS1 Total dissolved solids information is currently only available for the Ozark and Springfield Plateau aquifers. Information is based on broad, regional groundwater quality trends, rather than on well-specific monitoring.
- <sup>6</sup> K6 This well is not constructed in materials prone to conduit or solution flow.

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# **Appendix 3b**

2014 Sikeston Public Well Assessment Reports (CARES)

### Sikeston PWSS No. 4010743

**R13E** 

8 Wells, Scott County





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Sikeston							
PWSS No. 4010743				Drepored by	Sheet l	Jpdate: Jun 09, 201	4
Scott County, sheet 1 of 2				CENTER FOR APPLIED	CI Mi	ssouri Department of	
8 wells				ENVIRONMENTAL SYSTEMS UNIVERSITY OF MISSOURI	<b>6</b>	latural Resources	
Well Number	W1	W5	W6	W7		W8	
Extended PWS #	4010743101	4010743105	4010743106	4010743107		4010743108	
Local Well Name	Well #1. Plant #2	Well #6. Plant #2	Well #7. Plant #2	Well #8. Plar	nt #3	Well #9. Plant #3	
Well ID #	13051	13049	13048	13047		13046	
DGLS ID #	0011630	0019120	0026235				
Facility Type	City	City	City	City		City	
Status	Active	Active	Active	Active		Active	
Latitude	36.87904	36.87818	36.87954	36.88062318	303	36.880473182	
Longitude	-89.58645	-89.58558	-89.5837	-89.6011240	613	-89.6026440566	
Location Method	GPS	GPS	GPS	GPS		GPS	
Method Accuracy (ft)	38	43	43	43		39	
USGS 7.5 Quadrangle	Sikeston North	Sikeston North	Sikeston North	Sikeston Nor	rth	Sikeston North	
County	Scott	Scott	Scott	Scott		Scott	
MoDNR Region	Southeast	Southeast	Southeast	Southeast		Southeast	
Date Drilled (year)	1951	1960	1969	1976		1976	
Material (C/U)	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolida	ted	Unconsolidated	
Base of Casing Formation	Wilcox	Wilcox	Wilcox	Alluvium		Alluvium	
Total Depth Formation	Midway	Wilcox	Midway	Alluvium		Alluvium	
Total Depth	421	401	404	145		143	
Ground Elevation (ft)							
Top Seal							
Bottom Seal							
Casing Depth (ft)	331	307	309	108		108	
Casing Size (in)	12	18	18	18		18	
Casing Type				Steel		Steel	
Elev. of Casing Top (ft)					<u> </u>		
Outer Casing Depth (ft)							
Outer Casing Size (in)							
Screen Length (ft)	81	80	80	30		30	
Screen Size (in)	8	12	12	12		12	
Static Water Level (ft)	60	66	65	27		27	
Well Yield (gpm)	600	1100	1450	1300		1300	
Head (ft)					······		
Draw Down (ft)	60	54	59	33		34	
Pump Test Date (year)	1975	1960	1992	1976			
Pump Type	Vertical Turbine	Vertical Turbine	Vertical Turbine	Vertical Turb	ine	Vertical Turbine	
Pump Manufacturer					<u> </u>		
Pump Depth (ft)	150	135	170	84		84	
Pump Capacity (gpm)	863	1500	1600	1350		1350	
			- <u>-                                   </u>				
VUC Detection (Y/N)	N	N N	N	IN N	N N		
Chloringtion (Y/N)	1(Y/N) N N N		N ✓		in V		
	Ŷ	ř V	Ŷ	ř		ř V	
	1	T	T	T		1	
State Approved(V/N)							
Date Abandonod (voor)							
Date Abandoned (year)							
Date Fluggeu (year)							

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PWSS No. 4010743

Scott County, sheet 2 of 2

#### 8 wells



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Sheet Update: Jun 09, 2014

Missouri Department of **Matural Resources** 

Well Number	W9	W10	W11	
Extended PWS #	4010743109	4010743110	4010743111	
Local Well Name	Well #10, Plant #3	Well #11, Plant #1	Well #12	
Well ID #	13045	13044	13043	
DGLS ID #				
Facility Type	City	City	City	
Status	Active	Active	Active	
Latitude	36.87862	36.87877	36.88044	
Longitude	-89.60025	-89.58268	-89.58263	
Location Method	GPS	GPS	GPS	
Method Accuracy (ft)	65	44	45	
USGS 7.5 Quadrangle	Sikeston North	Sikeston North	Sikeston North	
County	Scott	Scott	Scott	
MoDNR Region	Southeast	Southeast	Southeast	
Date Drilled (year)	1959	1987	1991	
Material (C/U)	Unconsolidated	Unconsolidated	Unconsolidated	
Base of Casing Formation	Alluvium	Wilcox	Wilcox	
Total Depth Formation	Alluvium	Wilcox	Wilcox	
Total Depth	142	390	382	
Ground Elevation (ft)				
Top Seal				
Bottom Seal				
Casing Depth (ft)	119	300	292	
Casing Size (in)	12	16	18	
Casing Type	Steel	Steel	Steel	
Elev. of Casing Top (ft)				
Outer Casing Depth (ft)				
Outer Casing Size (in)	<u> </u>			
Screen Length (ft)	21	80	80	
Screen Size (in)	12	10	12	
Static Water Level (ft)	30	65		
Well Yield (gpm)	1000	1062		
Head (ft)				
Draw Down (ft)		43		
Pump Test Date (year)	1987	1987		
Pump Type	Vertical Turbine	Vertical Turbine	Vertical Turbine	
Pump Manufacturer				
Pump Depth (ft)	64	174	174	
Pump Capacity (gpm)	1150	1000	1000	
Pump Meter (Y/N)				
VOC Detection (Y/N)	Ν	Ν	Ν	
Nitrate Detection (Y/N)	Ν	Ν	Ν	
Chlorination (Y/N)	Y	Υ	Y	
Filtration (Y/N)	Υ	Υ	Y	
GWUDISW (Y/N)				
Surface Drainage				
State Approved(Y/N)				
Date Abandoned (year)				
Date Plugged (year)				

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Scott County, sheet 1 of 4

162 potential contaminant sources



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Sheet Update: Jun 09, 2014

Missouri Department of Natural Resources 4 9

Map C.No.	CARES ID	Site Name	Туре	I	Location Code	Accuracy Code	Method Code	Database Code
C1	140966	Elanco Products			UN	NV	UN	Dealcov
C2	108627	Scott-New Madrid Electric Coop			UN	NV	UN	Chemcov
C3	108628	Coleman Plant			UN	NV	UN	Chemcov
C4	108630	Sikeston Bd of Municipal Utilities			UN	NV	UN	Chemcov
C5	110225	Board Of Municipal Utilities			UN	NV	UN	Tanks
C6	110226	Board Of Municipal Utilities			UN	NV	UN	Tanks
C7	110379	Boyer Construction Company			UN	NV	UN	Tanks
C8	110498	Bridger Equipment Company			UN	NV	UN	Tanks
C9	110543	Brown Sand & Gravel Co, Inc			UN	NV	UN	Tanks
C10	111299	Charles Terrell			UN	NV	UN	Tanks
C11	111413	City Garage			UN	NV	UN	Tanks
C12	111527	City Of Miner			UN	NV	UN	Tanks
C13	111831	Community Shelter Workshop			UN	NV	UN	Tanks
C14	111964	Cooney Equipment Company			UN	NV	UN	Tanks
C15	112305	Dekalb Ag Research			UN	NV	UN	Tanks
C16	112309	Dekalb-pfizer Genetics			UN	NV	UN	Tanks
C17	112488	Don King Equipment			UN	NV	UN	Tanks
C18	112154	Ferrell Excavating				NV		Tanks
C19	113047	Hale Auction Company				NV/		Tanks
C20	114303	Holiday 66 Service				NV		Tanks
C21	11/332	Home Oil Co				NIV/		Tanks
C22	11/207	Hucks #120						Tanks
022	114397							Tanka
023	114828							Tanks
024	115060	Kellett Oli Co.						Tariks
025	115145				UN	INV	UN	Tanks
C26	115609	Lewis Bros Bakeries, Inc			UN	NV	UN	Tanks
C27	115921	Malone & Hyde Drug Dist-never Owned			UN	NV	UN	Tanks
C28	116354	Mhtd Dist Garage			UN	NV	UN	Tanks
C29	116376	Mid South Tractor Parts			UN	NV	UN	lanks
C30	117395	Par Gas (sinclair)			UN	NV	UN	Tanks
C31	117520	Pepsi Cola			UN	NV	UN	Tanks
C32	118701	Santie Wholesale Oil Co			UN	NV	UN	Tanks
C33	118714	Saunders System Inc			UN	NV	UN	Tanks
C34	118760	Scott Co R-v School Dist			UN	NV	UN	Tanks
C35	118765	Scott-new Madrid-mississippi El Cor			UN	NV	UN	Tanks
C36	118815	Semo Motor Company			UN	NV	UN	Tanks
C37	118816	Semo Nursing Center Inc			UN	NV	UN	Tanks
C38	119100	Sikeston			UN	NV	UN	Tanks
C39	119102	Sikeston Coca-cola Bottling Co			UN	NV	UN	Tanks
C40	119103	Sikeston Concrete Prods Co, Inc			UN	NV	UN	Tanks
C41	119104	Sikeston General Oil Co			UN	NV	UN	Tanks
C42	119106	Sikeston Maint Shed			UN	NV	UN	Tanks
C43	119107	Sikeston Pepsi Cola			UN	NV	UN	Tanks
C44	119381	Southwestern Bell			UN	NV	UN	Tanks
C45	120481	Todd Corporation			UN	NV	UN	Tanks
C46	120611	Trigg Shell			UN	NV	UN	Tanks
C47	120622	Troop E Satellite			UN	NV	UN	Tanks
C48	120761	Union Pacific			UN	NV	UN	Tanks
C49	120798	United Parcel Service, Inc			UN	NV	UN	Tanks
C50	120840	Uptown Shell			UN	NV	UN	Tanks
Code A2 A3 A4 A5 A6 A0 Z1 C1 C1	Address Ma Block/Gr Street Cr Nearest Primary 3 Digitizati Other Ad ZIP Cod Census - 19 Block Ce Block Ce	Method Codes   tching (Geocoding) Code Global Positioning System Code Oth   oup G1 Static Mode P1 I   stret/ine G2 Kinematic Mode P1 I   stret Intersection G3 Differential Post Processing UN U   street Name G4 Precise Positioning Service UN U   on G5 Signal Averaging UN U   g0 I1 Topo Map Interpolation U U U   g0 I1 Topo Map Servet Wareney UOQQ) Servet Wareney UQQQ) Servet Wareney	er .and Survey Quarter Description Jnknown	Lor BL Build CF Cent IN Inters LS Lago MG Main OT Othe PL Pile RD Roac TK Tank WI	cation Cod ing er of Facility section on or Pond Access Poin Office r	es It (Gate) or Tower	Ac Code m km ft yd Mi UN NF	curacy Codes Metric Meters Kilometers English Feet Yards Miles Unknown Site not found at database position Site not found at
C2 C3	ыоск/Gr Tract Ce	oup Centrolu 13 Satellite Imagery		vv∟ vvell UN Unkn	own		NV	verified

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PWSS No. 4010743

Scott County, sheet 2 of 4

162 potential contaminant sources



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Sheet Update: Jun 09, 2014

Missouri Department of Natural Resources 4 9

Map C.No.	CARES ID	Site Name Type	Location Code	Accuracy Code	Method Code	Database Code
C51	120845	U-pump-it	UN	NV	UN	Tanks
C52	121651	Woodtruss	UN	NV	UN	Tanks
C53	121750	Quality Plating	UN	NV	UN	SMARS
C54	122606	Jerry James Trailers Inc.	UN	NV	UN	HW Gen
C55	123286	Scott-new Madrid-mississippi Electric	UN	NV	UN	HW Gen
C56	123833	Cooney Equipment Co.	UN	NV	UN	HW Gen
C57	123835	Semo Motor Co.	UN	NV	UN	HW Gen
C58	123836	Sikeston Dry Cleaners	UN	NV	UN	HW Gen
C59	123890	Todd, Inc.	UN	NV	UN	HW Gen
C60	124108	Satterfield Body Shop Hazar Entry	CF	33 ft	12	HW Gen
C61	124665	Missouri Delta Community Hospital	UN	NV	UN	HW Gen
C62	124814	Auto Tire & Parts	UN	NV	UN	HW Gen
C63	125054	Stricker Body Shop	UN	NV	UN	HW Gen
C64	125343	At&t	UN	NV	UN	HW Gen
C65	125753	King Cleaners	UN	NV	UN	HW Gen
C66	125930	Mid-south Tractor Parts	UN	NV	UN	HW Gen
C67	126133	Carnell's Body Shop	UN	NV	UN	HW Gen
C68	126233	Mo Dept Of Transportation	UN	NV	UN	HW Gen
C69	126406	Heritage American Homes	UN	NV	UN	HW Gen
C70	127163	One Day Cleaners	UN	NV	UN	HW Gen
C71	127545	Kelpro, Inc.	UN	NV	UN	HW Gen
C72	127758	Chamberlain's Amoco	UN	NV	UN	HW Gen
C73	127798	Canedy Sign Co., Inc.	UN	NV	UN	HW Gen
C74	127851	Faultiess Cleaners	UN	NV	UN	HW Gen
C75	128391	Don King Salvage	UN	NV	UN	HW Gen
C76	128417	Bootheel Diesel Fuel Injection	UN	NV	UN	HW Gen
C77	128903	Sikeston Light And Water	UN	NV	UN	HW Gen
C78	128972	Missouri Highway & Transportation Dept.	UN	NV	UN	HW Gen
C79	129213	Media Press	UN	NV	UN	HW Gen
C80	129679	Dekalb Plant Genetics	UN	NV	UN	HW Gen
C81	129840	Quality Plating % Usepa Region Vii	UN	NV	UN	HW Gen
C82	130016	Central States Coca-cola	UN	NV	UN	HW Gen
C83	130088	Curtis H. Cline	UN	NV	UN	HW Gen
C84	130731		UN	NV	UN	HVV Gen
000	132505	HANDY STREET CALCIUM ARSENATE SITE	UN	NV	UN	CERCLIS
085	132606	MRM INDUSTRIES	UN	NV NV	UN	LERCLIS
000	135413	Dekalo Agresearch Inc	UN	NV NV	UN	APCP
C88	136492	Mcmullin Gin Co Inc	UN	NV NV	UN	APCP
C89	136493	Sikeston Cotton Oil Milli Inc	UN		UN	APCP
C90	130501		UN	INV	UN	APCP
Con	126502					
C92	130503	Sinesiun Fuwer Statiun				
C93	130505	Filester Westworking	UN			APCP
C94	130500	Sikeston woodworking	UN			APCP
C95	126514					
C90	130314	Morror Aluminum Processing Inc.				
C00	136521					
C 00	136529			INV NV		
C100	136527	i autuess creatiets ilic Sikaetan				
	100007					
Code A2 A3 A4 A5 A6 A0 Z1 C1 C2	Address Ma Block/Gr Street Cr Nearest Primary J Digitizati Other Ad ZIP Code Census - 19 Block Ce Block/Gr	Method Codes   Itching (Geocoding) Code Global Positioning System Code Other BL BL BL De   pup G1 Static Mode P1 Land Survey IN In   pup centerline G2 Kinematic Mode S2 Quarter Description LS L   Street Intersection G3 Differential Post Processing UN Unknown LS L   Street Name G4 Precise Positioning Service UN Unknown MA M   pn G5 Signal Averaging MA M M   press Matching G6 Real Time Differential Processing OT CO	Location Cod Building Senter of Facility Intersection Jain Access Poin Aain Office Dither Vile Soad Tank, Standpipe, Vell	les nt (Gate) or Tower	Ac Code m km ft yd mi UN NF NV	curacy Codes Metric Meters Kilometers English Feet Yards Unknown Site not found at database position Site position not
C2 C3	Block/Gr Tract Ce	bup Centroid I3 Satellite Imagery WL V	Vell Jnknown		NV	Site position

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Map C.No.	CARES ID	Site Name	Туре	Location Code	Accuracy Code	Method Code	Database Code
C101	136539	King Laundry And Dry Cleaners		UN	NV	UN	APCP
C102	136540	Sikeston Dry Cleaners		UN	NV	UN	APCP
C103	385324	Magic Car Wash	Car wash	BL	33 ft	12	CARES
C104	385325	Williams Auto Sales	Auto repair shop	BL	33 ft	12	CARES
C105	385326	Rogers Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C106	385327	The House of Color	Paint store	BL	33 ft	12	CARES
C107	385328	Drakes Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C108	385329	Hucks	Tank (underground fuel)	BL	33 ft	12	CARES
C109	385330	Jim's Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C110	385331	Cox's Car Wash	Car wash	BI	33 ft	12	CARES
C111	385332	Sinclair Gas	Tank (above-ground fuel)	BL	33 ft	12	CARES
C112	205222	Midtown Motors		CE	22.4	12	CARES
0112	305333				33 IL	12	CARES
0113	385334		Automotive dealership	BL	33 π 00 ft	12	CARES
C114	385335		Print shop	BL	33 ft	12	CARES
C115	385336	Feeders Supply	Feed/Fertilizer/Co-op	BL	33 ft	12	CARES
C116	385338	Meeks Print Shop	Other	BL	33 ft	12	CARES
C117	385339	Cornell's Collision Repair	Auto repair shop	BL	33 ft	12	CARES
C118	385340	FG Convienience Store	Tank (underground fuel)	BL	33 ft	12	CARES
C119	385341	Rhodes Convienience Store	Tank (underground fuel)	BL	33 ft	12	CARES
C120	385342	Animal Health Center	Veterinary service	BL	33 ft	12	CARES
C121	385343	Elite Car Wash	Other	BL	33 ft	12	CARES
C122	385344	Sikeston Fire Department	Fire station	BL	33 ft	12	CARES
C123	385345	Allsops Woodworking	Furniture manufacturer	BL	33 ft	12	CARES
C124	385346	Sonny's Solid Waste	Tank (above-ground fuel)	CF	33 ft	12	CARES
C125	385349	Auto Repair	Auto repair shop	BL	33 ft	12	CARES
C126	385350	·	Well (domestic)	WL	33 ft	12	CARES
C127	385351	Riggs Building Supplies and Home Center	Hardware and lumber store	BL	33 ft	12	CARES
C128	385352	Sabona Mfg	Manufacturing (general)	BI	33 ft	12	CARES
C129	385353	Janitrol/Janitor Supply	Other	BI	33 ft	12	CARES
C130	385354	Patriot/Heritage Homes	Manufacturing (general)	BL	33 ft	12	CARES
C131	385355	Sheltered Workshop	Sawdust pile	CE	33 ft	12	CARES
0131	205255	Aromark	Dry clooper		22 H	12	CARES
0102	305350	Aldindik	Divideaner	DL	33 IL	12	CARES
0133	385357		Other	IK	33 π	12	CARES
C134	385358	Riggs Wholesale Co.	Hardware and lumber store	BL	33 ft	12	CARES
C135	385359	Electric Substation	Other	CF	33 ft	12	CARES
C136	385440	Sikeston Auto Service	Auto repair shop	BL	33 ft	12	CARES
C137	385441	Sinclair Service Station	Tank (above-ground fuel)	BL	33 ft	12	CARES
C138	385442	Phillips 66	Tank (underground fuel)	BL	33 ft	12	CARES
C139	385443	Sikeston Laundry and Drycleaners	Dry cleaner	BL	33 ft	12	CARES
C140	385444	C & K Building Materials	Hardware and lumber store	BL	33 ft	12	CARES
C141	385445	King Laudry and Cleaners	Dry cleaner	BL	33 ft	12	CARES
C142	385446	Moll Printing Co.	Other	BL	33 ft	12	CARES
C143	385447	Premier Motor	Automotive dealership	BL	33 ft	12	CARES
C144	385448	Amoco	Tank (underground fuel)	BL	33 ft	12	CARES
C145	385449	Griffs Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C146	385450	Beaver Janitor Supply	Other	ТК	33 ft	12	CARES
C147	385451	Blanchard Funeral Parlor	Funeral service and crematorv	BL	33 ft	12	CARES
C148	385452	Service Station	Tank (underground fuel)	BI	33 ft	12	CARES
C149	385453	Cargill	Feed/Fertilizer/Co-op	CF	33 ft	12	CARES
C150	385454		Tank (above-ground fuel)	с. тк	33 ft	. <u> </u> 12	CARES
0100	000404				50 H		0/IIIE0
Codo	Addroop Mo	Method Codes		Location Cod	es	Ac	curacy Codes
A2	Block/Gr	oup G1 Static Mode	Code Other	CF Center of Facility		m	Meters
A3 A4	Street Ce Nearest	enterline G2 Kinematic Mode Street Intersection G3 Differential Post Processina	S2 Quarter Description	IN Intersection LS Lagoon or Pond		km	Kilometers English
A5	Primary	Street Name G4 Precise Positioning Service	UN UNKNOWN	MG Main Access Poin	t (Gate)	ft	Feet
AO	Other Ad	dress Matching G6 Real Time Differential Processing		OT Other		ya mi	Miles
Z1	ZIP Code Census - 19	e Centroid Interpolation 190 I1 Topo Map	F	PL Pile RD Road		UN NF	Unknown Site not found at
C1	Block Ce	ntroid I2 Aerial Photography (DOQQ)	, , , , , , , , , , , , , , , , , , ,	TK Tank, Standpipe,	or Tower	NI\/	database position
C3	Tract Ce	ntroid		UN Unknown		NV.	verified

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Map C.No.	CARES ID	Site Name	Туре	Location Code	Accuracy Code	Method Code	Database Code
C151	385455	Sikeston Seed Co., Inc.	Feed/Fertilizer/Co-op	BL	33 ft	12	CARES
C152	385456	H & H Small Engine Repair	Auto repair shop	BL	33 ft	12	CARES
C153	385457	Auto Repair	Auto repair shop	BL	33 ft	12	CARES
C154	385458	J J Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C155	385459	Sikeston City Dump	Dumping and/or burning site	CF	33 ft	12	CARES
C156	385460	William Farr and Purnell Funeral Home	Funeral service and crematory	BL	33 ft	12	CARES
C157	385461		Well (abandoned)	BL	33 ft	12	CARES
C158	385462		Well (abandoned)	BL	33 ft	12	CARES
C159	385463	Sikeston Fire Station	Fire station	BL	33 ft	12	CARES
C160	385464		Tank (above-ground fuel)	TK	33 ft	12	CARES
C161	385465	Sikeston Highway Maintenence Facility	Highway maintenance facility	CF	33 ft	12	CARES
C162	385466	Shell	Petroleum production or storage	BL	33 ft	12	CARES

			Method Codes				Location Codes	Ac	curacy Codes
Code A2 A3 A4 A5 A6 A0 Z1 C1 C2 C3	Address Matching (Geocoding) Block/Group Street Centerline Nearest Street Intersection Primary Street Name Digitization Other Address Matching ZIP Code Centroid Census - 1990 Block Centroid Block/Group Centroid Tract Centroid	Code G1 G2 G3 G4 G5 G6 I1 I2 I3	Global Positioning System Static Mode Kinematic Mode Differential Post Processing Precise Positioning Service Signal Averaging Real Time Differential Processing Interpolation Topo Map Aerial Photography (DOQQ) Satellite Imagery	Code P1 S2 UN	Other Land Survey Quarter Description Unknown	BL CF IN MA OT PL RD K	Building Center of Facility Intersection Lagoon or Pond Main Access Point (Gate) Main Office Other Pile Road Tank, Standpipe, or Tower Well	Code m km ft yd mi UN NF NV	Metric Meters Kilometers English Feet Yards Miles Unknown Site not found at database position Site position not verified

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## Sikeston

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**Contaminant Summary Sheet** 

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AFS (EPA ARS Facility Sites)         Perch (MONN Perchards Sites in Missouri)           Is APSC (MADRA Are Permitted Landills & Transfer Stations)         Pera A (MONN Rechards Applicators)           Is CPRCLIS (EPA CERCLIS)         Sites (MISSOURS Superful Applicators)           Is Chemoci (VA Selected Chemical Sites)         1           Is Chemoci (VA Selected Chemical Sites)         48           Is Chemoci (VA Selected Chemical Sites)         48           Is MARS (MONR Statefind Mongement and Registry System)           Is Mark (MONR Net Sections)         48           Is MARS (MONR Sections)         15           Is MARS (MONR Net Sections)         48           Is MARS (MONR Net Sections)         16           Is MARS (MONR Net Sections)         17           Is MARS (MONR Net Sections)         18           Is MARS (MONR Net Sectins)         18           Is M	16	2 Potential Contaminant Sources in the Listed Databas	es:	
16         APP (MDA NE Aire Permitted Landitis & Transfer Sitations)         Per At p (MDA Leonsed Pesticide Applicators)           2         CERCUS (EPA CERCUS)         Sitations)         ARGHI (EPA Resource Canservation and Recovery Information System)           3         Chemoro (WA Selected Chemical Sites)         1         SMARS (MdDNR Southand Registry System)           3         Denkoru (WA Selected Chemical Sites)         1         SMARS (MdDNR Southand Registry System)           3         Divide (MdDNR Leonset Locations)         48         Tarks (MdDNR Resolved and Unresolved Waste Transport)           USIT (MdDNR Leonset Locations)         48         Tarks (MdDNR Resolved and Unresolved Waste Transport)           USIT (MdDNR Leonset Locations)         40         Tarks (MdDNR Resolved and Unresolved Waste Transport)           USIT (MdDNR Leonset Locations)         40         SWIP Field Inventory (see below)           3         HW Tran (MdDNR Heardows Waste Transport)         VCP (MdDNR Undersolved Waste Transport)           USI (MdDNR Leonset Stronge Tanks)         WGIS (MdDNR Undersolved Waste Transport)         WGIS (MdDNR Undersolved Waste Transport)           Market of transport of abandome during the SWIP Field Inventory (see below)         WGIS (MdDNR Undersolved Waste Transport)           4         Animal Contaminant Sources in the SWIP Field Inventory (see below)         WGIS (MdDNR Undersolved Waste Transport)           5		AFS (EPA AIRS Facility Sites)		Perchlo (MoDNR Perchlorate Sites in Missouri)
APF (MDNR Active Pormited Landits & Transfer Stations)         RCR18 (EPA Resource Conservation and Requestry System)           2         CERCLUS (EPA CERCLIS)         State (USGS Muruhama II Massie State)           3         Chemics V(A Selected Chemical Sites)         1         SMARS (McONR Superfund Management and Registry System)           1         Detaktive MoDNR Rearrison State Superfund Management and Registry System)         1         That M Conf. McDNR Hazerdous Water Generators)           1         HW Can (McONR Hazerdous Water Generators)         The 7 (MERC The II Reports)           1         LUST (McONR Hazerdous Water Generators)         The 7 (MERC The II Reports)           MDOT (McONR Hazerdous Water Generators)         The 1 (Partice The II Reports)           MDOT (McONR Hazerdous Water Generators)         The 1 (Partice The II Reports)           MDOT (McONT Hazerdous Water Generators)         The 1 (Partice The II Reports)           MDOT (McONT Hazerdous Water Generators)         WCIS (McONR Water Caulity Information System)           0         Autor apart Adored all field         Machine or metalworking shop           0         Autor apart Adored all field         Material adored and II (Partice III (Reports))           0         Autor apart Adored all field         Material adored and III (Partice IIII (Reports))           0         Autor apart Adored and IIII (Partice IIIIIIIII (Partice IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	16	APCP (MoDNR Air Pollution Control Program Sites)		Pest Ap (MDA Licensed Pesticide Applicators)
2         CERCLIS (EPA CERCLIS)         Siles (USGS Minuteman II Meslie Siles)         Automa (Max Selected Chemical Sites)           3         Chemocy (VA Selected Chemical Sites)         1         SMARS (MoDNR Superfund Management and Registry System)           Disolar (MDN Pasticide Dealer Locations)         1         SMARS (MoDNR Percleum Tark Database)           Dison (MoDNR Continued Disolar List)         Tire J (MCNR Resolved and Unresolved Waste Tire Dumps)           TIR (EPA Toxic Release Inventory)         VCP (MoDNR Voluting Cleanup Porgam Sites)           UST (MoDNR Leasting Underground Storage Tarks)         VCP (MoDNR Voluting Cleanup Porgam Sites)           MDST (MoDNR Hazardoux Waste Transporters)         VCP (MoDNR Voluting Cleanup Porgam Sites)           MDST (MoDNR Hazardoux Waste Transporters)         VCP (MoDNR Voluting Cleanup Porgam Sites)           Avaport or abandoned airfield         0         Machine or metalworking shop           A Ariport or abandoned airfield         0         Machine or metalworking shop           A Automative dealership         0         Material stockple (industrial)           A atomative dealership         0         Mareiral stockple (industrial)           Batter and beauty shop         7         Other           Batter and beauty shop         1         Park tand           Cernett Plant         0         Photiography shop or processing lab		APF (MoDNR Active Permitted Landfills & Transfer Stations)		RCRIS (EPA Resource Conservation and Recovery Information System)
3         Chemoor (VA Salectad Chemical State)         1         SMARS (MODN Reprinted Management and Registry System)           1         Debaciv (MDA Residue Desider Locations)         Hass (MoDNR Confirmed Diano List) Grain B (USDA Former Grain Bin States)         Tire 2 (MRRC Tire I Reports) Tire D (MoDNR Hazardoue Waste Generators)           HW Yen (MoDNR Hazardoue Waste Generators)         TIR (EPA Toxic Relase Inderprints)         TIR (EPA Toxic Relase Inderprints)           HW Tan (MoDNR Hazardoue Waste Generators)         TIR (EPA Toxic Relase Inderprints)         VCP (MoDNR Vehicronol Storage Transporters)           LUST (MoDNR Lesking Underprint)         Soft MoDNR Water Quality Information System)         WOIS (MoDNR Water Quality Information System)           60         Potential Contaminant Sources in the SWIP Field Inventory (see balow)         Marking Interprint           61         Autor registry Soft MoDNR Mater Quality Information System)         Marking Interprint           63         Autor registry Soft MoDNR         Marking Interprint           64         Autor registry Soft MoDNR         Marking Interprint           65         Autor registry Soft MoDNR         Marking Interprint           66         Autor registry Soft MoDNR         Marking Interprint           67         Other         Interprint Interprint         Marking Interprint           68         Autoreregistry Soft Proteront         Parkitore <td>2</td> <td>CERCLIS (EPA CERCLIS)</td> <td></td> <td>Silos (USGS Minuteman II Missile Silos)</td>	2	CERCLIS (EPA CERCLIS)		Silos (USGS Minuteman II Missile Silos)
1         Desicov (MDA Pesticide Desider Locations)         48         Tanks (MoDNR Petroleum Tank Database)           Disk (MDA Restricted Desider Locations)         48         Tanks (MoDNR Petroleum Tank Database)           31         HW Tank (MODNR Heardoued Maste Tre Dumps)         Tire 2 (MRRC Tire II Reports)           LUST (MoDNR Hazardoue Waste Transporters)         UST (MoDNR Volontary Cleanup Porgam Sites)           UST (MoDNR Lasting Underground Storage Tanks)         VCP (MoDNR Volontary Cleanup Porgam Sites)           MDDT (MoDNR Hazardoue Waste Tansporters)         VCP (MoDNR Volontary Cleanup Porgam Sites)           UST (MoDNR Lasting Underground Storage Tanks)         60           Autor pair and condominiums         0           A Arigent or abandoned airfield         0           A Arigent and condominiums         0           Autoregraf adop         0           Autoregraf adop         0           Autoregraf adop         0           Badward add condominiums         0           Badward adopt adopt         1           Badward adopt adopt         1           Badward adopt adopt         1           Badward adopt adopt         1           Badward adopt adopt adopt         1           Badward adopt adopt adopt adopt         1           Badward adopt adopt ado	3	Chemcov (VA Selected Chemical Sites)	1	SMARS (MoDNR Superfund Management and Registry System)
Dioxin (MoDNR Confirmed Dioxin List) Grain B (USDA Fourmer Grain Bin Stes)         Ther 2 (MERC Ther II Reports)           HW Gen (MoDNR Hazardous Waste Greenators)         Ther 2 (MERC Ther II Reports)           HW Tran (MoDNR Hazardous Waste Greenators)         TR (EPA Took Reasing Underground Storage Transporters)           LUST (MoDNR Hazardous Waste Greenators)         VCP (MoDNR Water Quality Information System)           MODT (MoDOT Hazardous Waste Greenators)         VCP (MoDNR Water Quality Information System)           MODT (MoDOT Hazardous Waste Greenators)         VCP (MoDNR Water Quality Information System)           60 Potential Contaminant Sources in the SWIP Field Inventory (see below)         VOIS (MoDNR Water Quality Information System)           61 Auto regist shop         0 Matchine or metalworking shop         Anarrat feedot           0 Apartments and condominums         0 Matchine or metalworking shop         Anarrat feedot           0 Apartments and condominums         0 Medical institution         Medical institution           8 Autometive dealership         0 Medical institution         Medical institution           8 Autometive dealership         0 Medical production facility         Parking led           0 CarPO         0 Parking led         Parking led         Parking led           0 Apartments         0 Parking led         Parking led         Parking led           0 CarPO         0 Parking l	1	Dealcov (MDA Pesticide Dealer Locations)	48	Tanks (MoDNR Petroleum Tank Database)
Grain BUONR (JUDINR Journal Dublication)       The Dublic Promotion and Unresolved Waste The Dumps)         31       HW Tran (MoDNR Hazardous Waste Generators)       Thit Dublic Relaxase Inventory)         11       HW Tran (MoDNR Hazardous Waste Generators)       Thit Dublic Relaxase Inventory)         12       HW Tran (MoDNR Hazardous Waste Tansporters)       UCP (MoDNR Veature) Cleanup Program Sites)         1257 (MoDNR Leadensking Underground Storage Tanks)       WOIS (MoDNR Veature) Cleanup Program Sites)         MUST (MoDNR Hazardous Waste Tansporters)       WOIS (MoDNR Veature) Cleanup Program Sites)         MUST (MoDNR Hazardous Waste Tansporters)       WOIS (MoDNR Veature) Cleanup Program Sites)         MUST (MoDNR Hazardous Waste Tansporters)       WOIS (MoDNR Veature) Cleanup Program Sites)         MUST (MoDNR Hazardous Waste Tansporters)       WOIS (MoDNR Veature) Cleanup Program Sites)         Must repair also       Automotion and mating Generation         A Automotic dealership       Material stocklips (industrial)         Automotic dealership       Midial production facility         Bast yard and matina       1         Bast yard and matina       1         Campfound       1         Carmopround       1         Carmopround       1         Carmopround       1         Carmopround       1         <		Diaxin (MoDNR Confirmed Diaxin List)	-0	Tior 2 (MEDC Tior II Poports)
Inter Continue Value (Values)       The Content values)         Inter Content values       The Content values         Inter Content values       Values         Inter Content values       Values         Inter Content values       Values         Values <td< td=""><td></td><td>Grain B (USDA Former Grain Bin Sites)</td><td></td><td>Tire D (MeDNP Resolved and Upresolved Waste Tire Dumps)</td></td<>		Grain B (USDA Former Grain Bin Sites)		Tire D (MeDNP Resolved and Upresolved Waste Tire Dumps)
31         PM Vari (WolDM Readous visat Carlinstor)         PM Vari (WolDM Readous Visat Tansporters)           UST (MODNR Leadous Visat Tansporters)         VCP (MODNR Vater Quality Information System)           MUDT (MODNT Highway Maintenance Fabilities)         WOIS (MODNR Vater Quality Information System)           60         Potential Contaminant Sources in the SWIP Field Inventory:           60         Arinon Feedot         2           61         Arinon Feedot         2           62         Apathenis and condominiums         0           63         Autorepair shop         0           64         Autorepair and dealership         0           65         Autorepair and dealership         0           66         Surprovide Carlos and marina         1           7         Other         Other         Park find           8         Autorepair shop         0         Metaira torepaira           6         Autorepair shop         0         Metaira torepaira           7         Other         Other         Park find           8         Autorepair shop         7         Other           9         Carney Find         0         Park find           1         Park find         Park find         Park find	21	HW Can (MaDND Hazardaya Wasta Canaratara)		The D (MoDINE Resolved and Offessived Waste The Dumps)
HW Train (MoUNK Plazardous Waster Transporters)       VCP (MOUNK Voluntary Useratory)         LUST (MADOR Leaking Underground Storage Tanks)       WOS (MODR Voluntary Useratory)         ADDOT (MODOT Highway Maintenance Facilities)       SWIP Field Inventory (see below)         60 Potential Contaminant Sources in the SWIP Field Inventory (see below)       Modor (industrial)         0 Ainora or abandoned airfield       0 Machine or metalworking shop         0 Animal feediot       2 Manufacturing (general)         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine or metalworking shop         0 Apartments and condominums       0 Matchine production facility         8 Automotive dealership       0 Matchine production facility         8 Automotive dealership       0 Parki land         0 Communication equipment mfg       0 Phatmades         0 Communication equipment mfg       0 Phatiography shop or processing lab         0 Communica	31	HW Gen (MoDNR Hazardous Waste Generators)		IRI (EPA Toxic Release Inventory)
LUST (MOUNK Water Quark mathemace Facilities)         WULS (MOUNK Water Quark methods system)           MoDOT (MoDOT Highway Maintenace Facilities)         For the standard system)           60 Potential Contaminant Sources in the SWIP Field Inventory:         Machine or metalworking shop           0 Ariprot or abandoned atrifield         0 Machine or metalworking shop           0 Apartments and condominiums         0 Material stockpile (industrial)           0 Autorapid standardship         0 Material stockpile (industrial)           0 Autorapid standardship         0 Material stockpile (industrial)           0 Autorapid standardship         0 Material stockpile (industrial)           0 CarPor         0 Parking tot           0 CarPor         0 Parking tot           0 Caread and matina         1 Partostore           0 Caread and matina         1 Partostore           0 Caread and matina         1 Partostore           0 Communication equipment mig         0 Patking tot           0 Communication equipment mig         0 Rescycling/reduction fac		HW Iran (MODNR Hazardous Waste Transporters)		VCP (MoDNR Voluntary Cleanup Program Sites)
MoDOT (MoDOT Highway Maintenance Facilities)           PADS (EPA PCB Activity Data Base System)         60         SWIP Field Inventory (see below)           60         Potential Contaminant Sources in the SWIP Field Inventory: <ul> <li>Airport or abandoned affield</li> <li>Airport or abandoned affield</li> <li>Anoninal feedot</li> <li>Apartments and condominiums</li> <li>Mathematical stockpile (industrial)</li> <li>Apartments and condominiums</li> <li>Material stockpile (industrial)</li> <li>Adutorepair shop</li> <li>Mator repair shop</li> <li>Mator and manna</li> <li>Parter and beauty shop</li> <li>Carporoind</li> <li>Parter and beauty shop</li> <li>Carporoind</li> <li>Parter and beauty shop</li> <li>Caranground</li> <li>Park Iand</li> <li>Caranground</li> <li>Park Iand</li> <li>Park Iand</li> <li>Carnetary</li> <li>Photography shop or processing lab</li> <li>Communication equipment mfg</li> <li>Photography shop or processing lab</li> <li>Durpring and/o burning site</li> <li>Partin shop</li> <li>Durpring and/o burning site</li> <li>Part machinery storage</li> <li>Read/Fartilizer/Oc-op</li> <li>School</li> <li>School</li> <li>School</li> <li>School</li> <li>Proversa station</li> <li>School</li> <li>School</li> <li>School</li></ul>		LUST (MODNR Leaking Underground Storage Tanks)		WQIS (MoDNR Water Quality Information System)
PADS (EPA PCB Activity Data Base System)         60         SWIP Field Inventory (see below)           60 Potential Contaminant Sources in the SWIP Field Inventory: <ul> <li>Airport or abandoned airfield</li> <li>Manufacturing (general)</li> <li>Apartments and condominiums</li> <li>Apartments and condominiums</li> <li>Apartments and condominiums</li> <li>Apartments and condominiums</li> <li>Material stockpile (industrial)</li> <li>Apartments and condominiums</li> <li>Material stockpile (industrial)</li> <li>Apartments and condominiums</li> <li>Material stockpile (industrial)</li> <li>Apartments data condominiums</li> <li>Material stockpile (industrial)</li> <li>Material stockpile (industrial)</li> <li>Material data condominiant</li> <li>Park land</li> <li>Peark land</li> <li>Peark land</li> <li>Pearmaces</li> <li>Park land</li> <li>Pearmaces</li> <li>Part land</li> <li>Pharmaces</li> <li>Proteitament mfg</li> <li>Pharmaces</li> <li>Proteitament mfg</li> <li>Pharmaces</li></ul>		MoDOT (MoDOT Highway Maintenance Facilities)		
60 Potential Contaminant Sources in the SWIP Field Inventory:         0       Airport or abandoned airfield       0       Machine or metalworking shop         0       Animal feediot       2       Manufacturing (general)         0       Apather test and condominiums       0       Material stochylic (industrial)         0       Apather test and condominiums       0       Material stochylic (industrial)         0       Apather test and condominiums       0       Material stochylic (industrial)         0       Apather test and condominiums       0       Material stochylic (industrial)         0       Apather test and condominiums       0       Material stochylic (industrial)         0       Bather and beauty shop       7       Other         0       Bather and beauty shop       7       Other         0       Carwash       1       Paint store         0       Carwash       1       Pathing lot         0       Cennetery       0       Phating lot         0       Cennetery       0       Phating lot         0       Communication equipment mfg       0       Phatiography shop or processing lab         0       Country club       0       Plastic material and synthetic mfg         1		PADS (EPA PCB Activity Data Base System)	60	SWIP Field Inventory (see below)
0       Airport or abandoned airfield       0       Machine or metalworking shop         0       Animal feedicu       2       Mauldacturing (general)         0       Apattments and condominiums       0       Material stockpile (industrial)         0       Asphatt plant       0       Metail production facility         1       Matterial stockpile (industrial)       0         2       Automotive dealership       0       Mining operation         0       Barber and beauty shop       7       Other         0       Barber and beauty shop       7       Other         0       Carmy and marina       1       Paint store         0       Carmy and marina       1       Petroleum production or storage         0       Carmy and       0       Parking lot         2       Car wash       1       Petroleum production or storage         0       Communication equipment mfg       0       Phat store         1       Detroleum production or storage       0       Reside and the synthetic mfg         2       Car wash       0       Relaticad yard       0         1       Durunication equipment mfg       0       Phit stop         2       Contrup club       0	60	Potential Contaminant Sources in the SWIP Field Inve	ntory	
0     Animal feedict     2     Manufacturing (general)       0     Apartments and condominums     0     Material stocholle (industrial)       0     Asphalt plant     0     Medical institution       0     Autor repair shop     0     Metal production facility       0     Autor and marina     0     Metal production facility       0     Boat yard and marina     1     Paint store       0     CarRo     0     Park land       0     Carwash     1     Petroleum production or storage       0     Country club     0     Phatography shop or processing lab       0     Country club     0     Plastic material and synthetic mtg       0     Fore storage     0     Restroad yard       0     Electric equipment mtg or storage     0     Research lab       0     Fore stand     0     School       1     Fore stand     0     School       2     Feed/Fertilizer/Ocop     1     Sawdust pile       1     Fore stand hobby shop     0     School <td>0</td> <td>Airport or abandoned airfield</td> <td>0</td> <td>Machine or metalworking shop</td>	0	Airport or abandoned airfield	0	Machine or metalworking shop
0     Apartments and condominiums     0     Material stockpile (industrial)       0     Asphalt plant     0     Medical institution       6     Autor repair shop     0     Mining operation       8     Autorotive dealership     0     Mining operation       0     Barber and beauty shop     7     Other       0     Barber and beauty shop     7     Other       0     Carry and matrina     1     Paint store       0     Carry and and matrina     0     Parking lot       0     Carry area     1     Petroleum production or storage       0     Carrent Plant     0     Phatmacies       0     Communication equipment mfg     0     Pit toilet       0     Connucitation equipment mfg     0     Pit toilet       0     Centery     0     Pit toilet       0     Centery     0     Relican advard       1     Dumping and/or burning site     0     Relican advard       1     Der deaner     1     Print shop       1     Dumping and/or burning site     0     Resizera advard       1     Der deaner     0     Resizera advard       1     Der deaner     0     Resizera advard       1     Feed/Fritizer/Co-op	0	Animal feedlot	2	Manufacturing (general)
0       Aybrait plant       0       Medical institution         6       Auto repairs shop       0       Metal production facility         8       Automotive dealership       0       Mining operation         0       Barber and beauty shop       7       Other         0       Barber and beauty shop       7       Other         0       Carren and beauty shop       0       Park land         0       Carren and beauty shop       0       Park land         0       Carren and       0       Park land         0       Carren and       0       Pharmacies         0       Cerment Plant       0       Photography shop op processing lab         0       Communication equipment mfg       0       Phastic material and synthetic mfg         0       Country club       0       Plastic material and synthetic mfg         1       Durping and/or buring site       0       Relation and yard         1       Derit toilet       1       Petroleum for actility         1       Durping and/or buring site       0       Relation actility         1       Derit toilet       1       Research lab       1         1       Derediferilitzer/Co-op       1       Sa	0	Apartments and condominiums	0	Material stockpile (industrial)
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8       Automotive dealership       0       Mining operation         0       Barbor and beauty shop       7       Other         0       Barbor and beauty shop       7       Other         0       Carpor       0       Parking lot         0       Carwash       1       Petroleum production or storage         0       Carwash       1       Petroleum production or storage         0       Cerment Plant       0       Phatmacies         0       Communication equipment mfg       0       Photography shop or processing lab         0       Communication equipment mfg       0       Plastic material and synthetic mfg         0       Country club       0       Plastic material and synthetic mfg         0       Electric equipment mfg or storage       0       Rescarch lab         0       Electric sequipment mfg or storage       0       Rescarch lab         1       Furgiture manufacturer       0       School         2       Fire station       0       School         3       Feed/Fertilizer/Co-op       1       Sawdust pile         4       Fire station       0       School         5       Tank (above-ground fuel)       Garden and/or nursery <t< td=""><td>6</td><td>Auto repair shop</td><td>0</td><td>Metal production facility</td></t<>	6	Auto repair shop	0	Metal production facility
0       Baltor and beauty ship       7       Onter         0       Boat yard and marina       1       Pairt store         0       CAFO       0       Park land         0       Carwash       1       Petroleum production or storage         0       Carwash       1       Petroleum production or storage         0       Cement Plant       0       Pharmacies         0       Communication equipment mfg       0       Plit toilet         0       Country club       0       Plastice material and synthetic mfg         3       Dry cleaner       1       Print shop         1       Dumping and/or burning site       0       Raitroad yard         0       Electric substation       0       Research lab         1       Farm machinery storage       0       Research lab         2       Fure station       0       School         2       Fure repair of hinshing shop       0       Tailing pond         1       Furiture manufacturer       0       Swimming pool         1       Garden and/or nursery       5       Tank (above-ground fuel)         1       Garden and/or furits       0       Tank (underground fuel)         1	8	Automotive dealership	0	Mining operation
CACO       Park land         Campground       Park land         Campground       Parking lot         Carwash       I Petroleum production or storage         Carwash       Photography shop or processing lab         Carwash       Photography shop or processing lab         Communication equipment mfg       Photography shop or processing lab         Communication equipment mfg       Plastic material and synthetic mfg         Dycleaner       I Print shop         Dumping and/or burning site       Recycling/reduction facility         Electric equipment mfg or storage       Research lab         Electric substation       Research lab         Fire station       School         Fire station       School         Fire station       School         Furniture manufacturer       Synthing pool         O Garden and/or nursery       S Tank (above-ground fuel)         Garden, nursery, and/or florist       Tank (betref)         Garden in ursery, and/or florist       Tank (betref)         Government office       Tank (baove-ground fuel)         Government office       Tank (baove-ground fuel)         Government office       Tank (baove-ground fuel)         Government office       Tank (underground fuel)         Gov		Barber and beauty shop	1	Other Paint store
Campground       0       Parking lot         Car wash       1       Petroleum production or storage         Cement Plant       0       Pharmacies         Carmunication equipment mfg       0       Phatking lot         Country club       0       Phatsic material and synthetic mfg         Dumping and/or burning site       0       Rairoad yard         Delectric substation       0       Research lab         Electric substation       0       Research lab         Fair machinery storage       0       Research lab         Feed/Fertilizer/Co-op       1       Sawdust pile         Fire station       0       School         Furniture manufacturer       0       Svimming pool         Furniture repair or finishing shop       0       Tailing pond         Garden and/or nursery       5       Tank (above-ground fuel)         Garden and/or nursery       5       Tank (bater)         Government office       0       Trucking terminal         Gravensus (Federal facility)       2       Well (charground fuel)         Garden andor nursery       0       Wastewater treatment facility         Garden andor nursery       6       Tank (bater)         Gasoline service station       1 <td></td> <td>CAFO</td> <td>0</td> <td>Park land</td>		CAFO	0	Park land
2       Carwash       1       Petroleum production or storage         0       Cement Plant       0       Pharmacies         0       Communication equipment mfg       0       Photography shop or processing lab         0       Country club       0       Pit toilet         0       Country club       0       Pit toilet         0       Electric equipment mfg or storage       1       Print shop         0       Electric equipment mfg or storage       0       Research lab         0       Electric substation       0       Research lab         0       Feed/Fertilizer/Co-op       1       Sawdust pile         2       Fire station       0       School         3       Feed/Fertilizer/Co-op       1       Sawdust pile         4       Funiture manufacturer       0       Sports and hobby shop         0       Fauriture repair or finishing shop       0       Tailing pond         0       Garden, nursery, and/or florist       0       Taik (above-ground fuel)         0       Garden, nursery, and/or florist       0       Tark (tretrinary service         0       Garden nursery, and/or florist       0       Tark (underground fuel)         0       Garden courses	0	Campground	0	Parking lot
0       Cement Plant       0       Pharmacies         0       Cemetery       0       Photography shop or processing lab         0       Communication equipment mfg       0       Pit toilet         0       Contry club       0       Plastic material and synthetic mfg         3       Dry cleaner       1       Print shop         0       Electric equipment mfg or storage       0       Relcad yard         0       Electric substation       0       Research lab         0       Farm machinery storage       0       Restaurant         3       Feed/Fertilizer/Co-op       1       Sawdust pile         2       Fire station       0       School         2       Funeral service and crematory       0       Sports and hobby shop         1       Furniture repair of fishing shop       0       Tank (above-ground fuel)         0       Garden and/or nursery       5       Tank (above-ground fuel)         0       Garden service station       0       Tank (other)         0       Gasotine service station       0       Tank (other)         0       Gasotine service station       0       Tank (pesticide)         0       Government office       0       Ta	2	Car wash	1	Petroleum production or storage
0     Cemetery     0     Photography shop or processing lab       0     Communication equipment mfg     0     Pit toilet       1     Dumping and/or burning site     0     Railroad yard       1     Dumping and/or burning site     0     Railroad yard       0     Electric equipment mfg or storage     0     Recycling/reduction facility       0     Electric substation     0     Research lab       1     Farm machinery storage     0     Research lab       2     Fire station     0     School       3     Feed/Fertilizer/Co-op     1     Sawdust pile       2     Funeral service and crematory     0     School       3     Feed/Fertilizer/Co-ap     1     Sawdust pile       2     Funeral service and crematory     0     School       3     Feed/Fertilizer/Co-ap     1     Simoning pool       4     Furniture manufacturer     0     Swimming pool       5     Tank (above-ground fuel)     Garden, nursery, and/or forist     0       6     Garden, nursery, and/or forist     0     Tank (underground fuel)       0     Garden and/or nursery     5     Tank (above-ground fuel)       0     Garden nursery, and/or forist     0     Tank (underground fuel)       0 </td <td>0</td> <td>Cement Plant</td> <td>0</td> <td>Pharmacies</td>	0	Cement Plant	0	Pharmacies
0     Communication equipment mfg     0     Pit toilet       0     Country club     0     Plastic material and synthetic mfg       1     Dumping and/or burning site     0     Rairoad yard       0     Electric equipment mfg or storage     0     Recycling/reduction facility       0     Electric substation     0     Research lab       0     Farm machinery storage     0     Restaurant       3     Feed/Fertilizer/Co-op     1     Sawdust pile       2     Fire station     0     School       3     Funeral service and crematory     0     Sorts and hobby shop       1     Furniture manufacturer     0     Swimming pool       0     Farm advin rursery     5     Tank (above-ground fuel)       0     Garden and/or nursery     5     Tank (above-ground fuel)       0     Garden nursery, and/or florist     0     Tank (pesticide)       0     Garden subset     1     Veterinary service       0     Garden bin     1     Veterinary service       0     Garden bin     1     Veterinary service       0     Garden bin     1     Veterinary service       0     Garden purces station     0     Tank (pesticide)       0     Garden bin     1	0	Cemetery	0	Photography shop or processing lab
0     Country club     0     Plastic material and synthetic mfg       3     Dry cleaner     1     Print shop       1     Dumping and/or burning site     0     Railroad yard       0     Electric equipment mfg or storage     0     Research lab       0     Farm machinery storage     0     Research lab       1     Farm machinery storage     0     Research lab       2     Fire station     0     School       2     Fire station     0     School       1     Furniture manufacturer     0     Swimming pool       0     Farm and/or nursery     5     Tank (above-ground fuel)       0     Garden, nursery, and/or florist     0     Tank (other)       0     Garden, nursery, and/or florist     0     Tank (underground fuel)       0     Garden and/or nursery     5     Tank (underground fuel)       0     Garden and/or nursery     0     Tank (underground fuel)       0     Garde	0	Communication equipment mfg	0	Pit toilet
3       Dry cleaner       1       Print shop         1       Dumping and/or burning site       0       Railroad yard         0       Electric substation       0       Research lab         0       Feard machinery storage       0       Restaurant         3       Feed/Fertilizer/loc-op       1       Sawdust pile         2       Fire station       0       School         3       Funeral service and crematory       0       Spotts and hobby shop         4       Furiture repair or finishing shop       0       Tailing pond         6       Garden and/or nursery       5       Tank (above-ground fuel)         0       Garden nursery, and/or florist       0       Tank (other)         0       Garden full       0       Tank (underground fuel)         0       Gorden service station       0       Tank (underground fuel)         0       Garden full       0       Tank (underground fuel)         0       Gorden mad/or nursery       6       Tank (underground fuel)         0       Garden and/or nursery       6       Tank (underground fuel)         0       Garden and/or nursery       6       Tank (underground fuel)         0       Garden nursery service	0	Country club	0	Plastic material and synthetic mfg
1       Dumping and/or burning site       0       Raintod yard         0       Electric equipment mfg or storage       0       Recycling/reduction facility         0       Electric substation       0       Research lab         0       Freed/Fertilizer/Co-op       1       Sawdust pile         2       Fire station       0       School         2       Fire station       0       Sports and hobby shop         1       Funeral service and crematory       0       Sports and hobby shop         2       Fure and for insishing shop       0       Tailing pond         0       Garden nursery, and/or florist       0       Tank (above-ground fuel)         0       Garden nursery, and/or florist       0       Tank (other)         0       Gardine service station       0       Tank (underground fuel)         0       Gord courses       6       Tank (underground fuel)         0       Gardine service station       0       Tank (underground fuel)         0       Gord courses       6       Tank (underground fuel)         0       Gardin unservice       0       Wastewater treatment facility         1       Veterinary service       0       Vastewater treatment facility	3	Dry cleaner	1	Print shop
0       Electric substation       0       Respondential energy         0       Farm machinery storage       0       Restaurant         3       Feed/Fertilizer/Co-op       1       Sawdust pile         2       Fire station       0       School         2       Fire station       0       School         3       Feed/Fertilizer/Co-op       1       Sawdust pile         2       Fire station       0       School         3       Functal service and crematory       0       Sports and hobby shop         1       Furniture manufacturer       0       Swimming pool         0       Furniture repair of finishing shop       0       Tank (other)         0       Garden, nursery, and/or florist       0       Tank (other)         0       Gasoline service station       0       Tank (other)         0       Gasoline service station       0       Tank (other)         0       Government office       0       Trucking terminal         0       Grain bin       1       Veterinary service         3       Hardware and lumber store       0       Well (domestic)         0       Junk yard or salvage yard       0       Well (invistock)	1	Dumping and/or burning site	0	Railroad yard
In Factor and Status       Interference of the status         Imachinery storage       Interference of the status         Imachinery storage       Imachinery storage         Imachinery store       Imachinery storage <t< td=""><td></td><td>Electric equipment mig of storage</td><td>0</td><td>Recycling/reduction raciity Research lab</td></t<>		Electric equipment mig of storage	0	Recycling/reduction raciity Research lab
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2       Funeral service and crematory       0       Sports and hobby shop         1       Furniture manufacturer       0       Swimming pool         0       Furniture repair or finishing shop       0       Tailing pond         0       Garden and/or nursery       5       Tank (above-ground fuel)         0       Garden, nursery, and/or florist       0       Tank (above-ground fuel)         0       Gasoline service station       0       Tank (underground fuel)         0       Golf courses       6       Tank (underground fuel)         0       Gori courses       6       Tank (underground fuel)         0       Gori courses       0       Trucking terminal         0       Grain bin       1       Veterinary service         3       Hardware and lumber store       0       Wastewater treatment facility         0       Hazardous waste (Federal facility)       2       Well (abandoned)         1       Highway maintenance facility       1       Well (domestic)         0       Jawelry or metal plating shop       0       Well (irrigation)         0       Junk yard or salvage yard       0       Well (irrigation)         0       Lagoon (nunnicipal)       0       Well (unknown)	2	Fire station	0	School
1       Furniture manufacturer       0       Swimming pool         0       Furniture repair or finishing shop       0       Tailing pond         0       Garden and/or nursery       5       Tank (above-ground fuel)         0       Garden, nursery, and/or florist       0       Tank (other)         0       Gasoline service station       0       Tank (other)         0       Golf courses       6       Tank (underground fuel)         0       Golf courses       6       Tank (underground fuel)         0       Garin bin       1       Veterinary service         3       Hardware and lumber store       0       Wastewater treatment facility         0       Jewelry or metal plating shop       0       Well (domestic)         1       Highway maintenance facility       1       Well (domestic)         0       Junk yard or salvage yard       0       Well (irrigation)         0       Junk yard or salvage yard       0       Well (public water supply)         0       Lagoon (industrial)       0       Well (unknown)         0       Lagoon (residential)       0       Well (unknown)         1       Laundfromat       Understand       Unknown) <td>2</td> <td>Funeral service and crematory</td> <td>0</td> <td>Sports and hobby shop</td>	2	Funeral service and crematory	0	Sports and hobby shop
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## Sikeston

PWSS No. 4010743

Susceptibility Determination Sheet



Q

Sheet Update: Mar 14, 2014

Missouri Department of

8 wells				
The Missouri Department of Natural Resources (MoDNR) has assembled this information to assess the susceptibility of drinking water sources to contamination. There are many unforseen and unpredictable factors that may cause a source to be contaminated. MoDNR routinely monitors all public supplies to ensure public health is protected. Public water systems and local communities are encouraged to take all measures possible to reduce the susceptibility of their drinking water source to chemical contamination. For more information, call 1-800-361-4827.	Not Susceptible	Moderately Susceptible	Highly Susceptible	Incomplete Data
A system is highly susceptible because of construction deficiencies if:				
A well was not constructed according to plans approved by MoDNR-PDWB,				Х
A well was not cased to a depth approved by MoDNR,				Х
A well casing is not of sufficient weight,				Х
A well is not sufficiently sealed (grouted) around the casing, or A well has developed holes in the casing or other flaws that compromise its integrity.				Х
A system is highly susceptible due to direct influence of surface water if:				
A well has tested positive for surface water indicators such as algae or high turbidity.				Х
A system is highly susceptible to surface contaminants if:				
A well casing does not extend 12 inches above the well house floor, or 18 inches above the ground surface,				х
A well casing does not extend four feet above the 100-year flood level, or four feet above the highest known flood elevation,				Х
A well is not provided with a properly screened vent, or				Х
All openings in a well casing are not properly sealed.				Х
A system is highly susceptible based on detection histories if:				
Volatile Organic Chemicals (VOCs) have been detected in a well,	Х			
Synthetic Organic Chemicals (SOCs) have been detected in a well,				Х
Inorganic Chemicals (IOCs) have been detected in a well above naturally occurring levels,				Х
Nitrates have been detected at or above one-half the MCL,	Х			
Bacteria has been consistently detected in a well, or				Х
Viruses or microbiological contaminants are detected in a well.				Х
A system is highly susceptible to weather, vandalism, and sabotage if:				
A well is not in a locked well house of adequate construction.				X (1)
A system is moderately susceptible due to local geology if:				
A producing aquifer is less than 100 feet below the surface,	Х			
A producing aquifer has conduit flow conditions due to surficial karst topography,				Х
A producing aquifer is not overlain by an impermeable confining layer,				Х
A producing aquifer is overlain by a conductive (>5X10e-4) formation (including soil), or				Х
A producing aquifer is confined, but there are open wells nearby penetrating that layer.				Х
A system is moderately susceptible to contaminants if:				
Any contaminants listed in Appendix F-a are found in the source water area,		X (2)		
Septic systems are present in the source water area,				Х
A well is indirectly connected to a surface water body,				Х
A submersible well pump cannot be ruled out from containing PCBs or PHAs, or				Х
There is a high density of transportation corridors in the source water area.				Х
A system is highly susceptible to contamination if:				
Any contaminant sites identified in the source water area are known to have contaminated groundwater that may migrate toward a well.				Х
<ul> <li>(1) This system was not assessed to determine if adequate security devices such as padlocks, gates, and lighting are in place to deter vandals and have this type of protection in place.</li> <li>(2) A well (or wells) serving this system has been determined to be susceptible due to the presence of potential contaminant sources. The water s team should take extra care to ensure that all potential contaminants in the source water area are handled properly to avoid contamination of the other should take extra care to ensure that all potential contaminants in the source water area are handled properly to avoid contamination of the other should take extra care to ensure that all potential contaminants in the source water area are handled properly to avoid contamination of the other should take extra care to ensure that all potential contaminants in the source water area are handled properly to avoid contamination of the other should take extra care to ensure that all potential contaminants in the source water area are handled properly to avoid contamination of the other should be applied to the presence of the source water area are handled properly to avoid contamination of the other should be applied to the presence of the presence of the source water area are handled properly to avoid contamination of the other should be applied to the presence of the presence of</li></ul>	d saboteur ystem and rinking wa	s. All wat the wellh ter supply	er system ead prote /.	s should ction

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# Appendix 8b

Alternate Source Demonstration For Chloride in MW-6 - October 11, 2022

1505 East High Street Jefferson City, Missouri 65101 Telephone (573) 659-9078 www.ger-inc.biz

## **GREDELL Engineering Resources, Inc.**

Sikeston Board of Municipal Utilities Sikeston Power Station Detection Monitoring Program for Bottom Ash Pond – Chloride in MW-6 Alternate Source Demonstration





Sikeston Power Station 1551 West Wakefield Avenue Sikeston, MO 63801





October 2022

### **PROFESSIONAL ENGINEER'S CERTIFICATION**

#### 40 CFR 257.94(e)(2) Alternate Source Demonstration

I, Thomas R. Gredell, P.E., a professional engineer licensed in the State of Missouri, hereby certify in accordance with 40 CFR 257.94(e)(2) to the accuracy of the alternate source demonstration described in the following report for the Sikeston Board of Municipal Utilities, Sikeston Power Station, Bottom Ash Pond CCR unit. The report demonstrates that the statistically significant increase of Chloride in MW-6 is not the result of a release from the Bottom Ash Pond and is attributable to an alternate source. This demonstration successfully meets the requirements of 40 CFR 257.94(e) as found in federal regulation 40 CFR 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments. In addition, the demonstration was made using EPA Unified Guidance (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance: EPA 530/R-09-007) and generally accepted methods.

Name: Thomas R. Gredell, P.E. Signature: / GREDELL Date: October PROE NUMBER Registration Number: PE-021137 PE-021137 State of Registration: Missouri

## Sikeston Board of Municipal Utilities Sikeston Power Station Detection Monitoring Program for Bottom Ash Pond - Chloride in MW-6 Alternate Source Demonstration

## October 2022

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- Appendix 1b Laboratory Analytical Results and Quality Control Report, September 12, 2022 Retest Event
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Appendix 3a – 2020 Sikeston Public Well Assessment Reports (CARES)

Appendix 3b – 2014 Sikeston Public Well Assessment Reports (CARES)

## **1.0 INTRODUCTION**

This Alternate Source Demonstration (ASD) Report has been prepared to address the results of the semi-annual sampling event initiated on August 3, 2022 at the Sikeston Board of Municipal Utilities (SBMU) Sikeston Power Station's (SPS) Bottom Ash Pond, a coal combustion residual (CCR) surface impoundment. Following receipt of final analytical data, it was apparent that the reported concentration of Total Dissolved Solids (TDS) in sample MW-5 and Chloride in sample MW-6 exceeded their respective prediction limits. Consequently, retesting for the aforementioned well constituent pairs was initiated on September 12, 2022. Following receipt of final analytical data from the retesting event, it was confirmed that the Chloride concentration in sample MW-6 represents a statistically significant increase (SSI) over background for this well. The retesting of MW-5 did not confirm an SSI. SBMU-SPS requested that Gredell Engineering conduct an evaluation of the confirmed SSI of Chloride concentration in MW-6 and develop an ASD, if warranted.

As stated in §257.94(e)(2), an owner or operator may demonstrate that a source other than the CCR unit caused the apparent SSI over background for a constituent. The owner or operator must complete the written demonstration within 90 days of detecting an SSI over background to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner of the CCR unit may continue with a detection monitoring program. The owner or operator must also include the certified demonstration in the annual groundwater monitoring report required by §257.90(e).

Gredell Engineering has completed an evaluation of the groundwater sampling events, analytical data results, and other potential factors, for the SBMU SPS Bottom Ash Pond groundwater monitoring system to determine if an alternate source is the cause of the apparent SSI of Chloride in MW-6. This report presents the results of that evaluation and includes supporting documentation.

## 2.0 OBSERVATIONS AND DATA COLLECTION

The Bottom Ash Pond groundwater monitoring system consists of five wells, designated MW-3, MW-4, MW-5, MW-6, and MW-8 (Figure 1). Monitoring wells MW-3, MW-4, MW-5, and MW-6 were installed in April 2016, and sampled on an approximate monthly basis beginning in November 2016 and ending in July 2017 to establish an initial background data base. Monitoring well MW-8 was installed in April 2017 and was sampled at an increased frequency beginning in May 2017 and ending in September 2017. Additional information regarding these wells is available in the Groundwater Monitoring, Sampling and Analysis Plan (GMSAP) for the site.

The background data base for the Bottom Ash Pond is periodically updated in general accordance with U.S. Environmental Protection Agency (USEPA) Unified Guidance for statistical analysis of groundwater monitoring data (USEPA, 2009). The results of the eight initial background sampling events and ten additional sampling events included in updates to the background data base were evaluated in accordance with §257.93, and intra-well analysis using prediction limits was determined to be the most appropriate statistical analysis approach for detection monitoring. Following receipt of final analytical data reports from the contract laboratory, the reported concentration for each detection monitoring constituent from each well is compared to its respective prediction limit. If a constituent concentration exceeds the respective prediction limit for a particular well or is outside the predicted range (in the case of pH), SSI over background is suspected.

The statistical method selected and certified for evaluation of groundwater monitoring data at this site incorporates a 1-of-2 retesting strategy in accordance with Unified Guidance for statistical analysis of groundwater monitoring data (USEPA, 2009). Therefore, a suspected SSI is confirmed if, and only if, the constituent concentration in a second statistically independent sample (retest) from the same well is also demonstrated to exceed the prediction limit.

The SPS initiated its semiannual detection groundwater sampling event for the Bottom Ash Pond on August 3, 2022. The contracted laboratory received the samples on August 5, 2022 and issued final analytical results on August 30, 2022 (Appendix 1a). However, the TDS result for sample MW-5 and the Chloride result for sample MW-6 appeared elevated relative to their respective prediction limits for these well constituent pairs. Consequently, retesting was initiated for these well constituent pairs on September 12, 2022. The analytical laboratory received these samples on September 14, 2022 and issued the analytical report for the retesting event on September 28, 2022 (Appendix 1b).

The following table summarizes the analytical results for TDS in MW-5 and Chloride in MW-6 from the August 3, 2022 sampling and September 12, 2022 retesting events. Prediction limits for these well constituent pairs are also presented. The apparent SSI of TDS in MW-5 is not confirmed by retesting, however the chloride concentration in MW-6 represents a confirmed SSI. Therefore, an evaluation is

presented to determine if an alternate source is the cause of the elevated Chloride concentration in MW-6 relative to its respective baseline data.

Sampling Event Date	Well Constituent Pair	Analytical Result (mg/L)	Prediction Limit (mg/L)	SSI Suspected or Confirmed?
August 2, 2022	MW-5 TDS	560	539.8	Suspected
August 5, 2022	MW-6 Chloride	W-6 Chloride 4.3 2.956		Suspected
Sontombor 12, 2022	MW-5 TDS	510	539.8	Not Confirmed
September 12, 2022	MW-6 Chloride	4.7	2.956	Confirmed

## Table 1 -- Analytical Results and Prediction Limit Summary

## 3.0 SUMMARY OF DATA ANALYSIS AND FINDINGS

The USEPA provides Unified Guidance for statistical analysis of groundwater monitoring data (USEPA, 2009). This Unified Guidance document was reviewed to assess the validity of the apparent SSI of Chloride in MW-6. Chapter 4 of the Unified Guidance discusses groundwater monitoring programs and statistical analysis of the associated data. A key component of statistical analysis is "*to determine whether or not the increase is actually due to a contaminant release*". Three of these considerations are pertinent to the data associated with Chloride testing, MW-6 sampling, and the Bottom Ash Pond groundwater monitoring system and are listed below.

- 1. Chapter 4, page 4-8: Did the test correctly identify an actual release of an indicator or hazardous constituent?
- 2. Chapter 4, page 4-8: Could observed SSIs for naturally occurring analytes be due to longer term (i.e., seasonal, or multi-year) variation?
- 3. Chapter 4, page 4-9: Are any of these contaminants observed upgradient of the regulated units?

Each of these considerations were evaluated to determine the validity of the apparent SSI for Chloride in MW-6. The results of this evaluation are discussed below.

### Unified Guidance Consideration 1

Since completion of the hydrogeologic site characterization (Gredell Engineering, 2017), the piezometers installed for the characterization were converted to monitoring wells MW-1 through MW-6. As documented in that report, 12 groundwater maps were developed showing the direction of flow and hydraulic gradient based on the monthly groundwater elevations. These groundwater maps demonstrate a consistent west-southwestern direction of flow showing minimal variation in hydraulic gradient over the 12-month period extending from May 2016 to April 2017. Moreover, three additional monitoring wells (MW-7 through MW-9) were installed in locations shown on Figure 1 to provide sufficient downgradient monitoring of the ash ponds at the SPS and to further refine and confirm overall groundwater flow direction. Based on over five years of monitoring since 2016, the groundwater data consistently demonstrate that MW-6 is not downgradient of the Bottom Ash Pond and groundwater flow direction remains consistently to the west-southwest.

MW-6 was installed to monitor spatial variability of groundwater geochemistry upgradient of the Bottom Ash Pond. Based on the weight of evidence that MW-6 is not hydraulically downgradient from the Bottom Ash Pond, the well is not positioned to detect a release from the pond. Therefore, the conclusion to the first consideration question from Unified Guidance listed above is negative.

The analytical results for MW-6 could <u>not</u> have identified an actual release of Chloride from the Bottom Ash Pond.

### **Unified Guidance Consideration 2**

Boswell et al. (1968) published a study of the Quaternary Aquifers in the Mississippi Embayment which documented characteristics of the alluvial aquifer underlying the regulated units (i.e., the Bottom Ash Pond and Fly Ash Pond) at the site. The study stated that while the chief source of recharge is precipitation, recharge also occurs from the upward movement of groundwater from underlying aquifers. While the alluvial and Wilcox Aquifers are discussed separately, Luckey (1985) notes that the alluvial aquifer and the underlying Wilcox Aquifer commonly are hydraulically interconnected. The hydraulic connection between the alluvial aquifer and Wilcox Aquifer is further demonstrated by the potentiometric contour maps presented by Luckey (1985), which demonstrate a similar flow direction (west-southwest) in both aquifers in the Sikeston area.

Drilling records for high-yield wells (Appendix 2) at the SPS and in areas east generally document permeable sand and gravel at and near the contact between the alluvial aquifer and the underlying Wilcox Aquifer. These permeable sands and gravels and the lack of a laterally continuous low-permeability aquitard between the two aquifers permit the upward movement and mixing of water between these aquifers near the SPS.

It is also noted that the high-yield Sikeston Municipal wells (Appendix 3) at Plant 3, which is located approximately one-half mile east of the SPS, are 142 to 145 feet deep and screened in the lower part of the alluvial aquifer. Appendix 3 documents between 30 and 34 feet of drawdown or reduction in hydraulic head in the alluvial aquifer as a result municipal well pumping. This reduction in hydraulic head results in an upward hydraulic gradient from the underlying Wilcox Aquifer. The rate of upward movement of groundwater from the Wilcox into the alluvial aquifer undoubtedly increases as these high-yield wells withdraw groundwater.

High-yield irrigation wells are common to support crop farming in southeast Missouri. Luckey and Fuller (1980) state that the alluvium is the only aquifer that is used for irrigation in the area. As shown on Figure 2, the irrigation wells near the SPS are generally 140 feet deep or less and are screened in the lower part of the alluvial aquifer. Demand on the aquifer increased in 2021 due to lower annual precipitation (43.63 inches) relative to calendar years 2020 and 2019 (56.04 and 57.38 inches, respectively). Even less precipitation occurred during the first 8 months 2022 (28.2 inches), compared to the first 8 months of 2021 (32.12 inches), 2020 (42.96 inches), and 2019 (41.32 inches). This additional demand on irrigation to support farming resulted in more drawdown on the alluvial aquifer in 2021 and 2022 relative to previous years. The additional drawdown reduces hydraulic head relative to the underlying Wilcox Aquifer and results in greater

upward flow of groundwater from the Wilcox, which then mixes and interacts with groundwater in the alluvial aquifer.

Boswell et al. (1968) also states that the alluvial aquifer contains appreciable quantities of Chloride ranging from 0.3 to 1,870 mg/L, owing to chemical dissolution of soil and rocks. Such concentrations suggest that the Chloride concentration in MW-6 (4.3 mg/L) may be naturally occurring. Combined with the increased demand on groundwater in 2021 and 2022, the recent increase in Chloride is likely a temporal variation resulting from upward movement, co-mingling, and geochemical interaction of groundwater from the underlying Wilcox Aquifer. This geochemical variation is not represented by the background data set for the Bottom Ash Pond monitoring system. Consequently, the conclusion to the second consideration question from Unified Guidance listed above is affirmative.

### **Unified Guidance Consideration 3**

Relatively high concentrations of Chloride are documented in irrigation wells, industrial supply wells, and SBMU municipal (i.e., public drinking water supply) wells located upgradient of the regulated units. Data published by the Missouri Department of Natural Resources in their 2020 Annual Water Quality Report for the SBMU municipal water system summarize location and construction of the public drinking water supply wells (Appendix 3). Several additional publications were reviewed to determine the natural occurrence and variability of Chloride in the alluvial and Wilcox Aquifers.

Luckey and Fuller (1980) presented comprehensive hydrogeologic data for the unconsolidated aquifers in southeastern Missouri. This study inventoried and sampled over 800 irrigation, high-yield industrial, and municipal wells and included data on the alluvial and Wilcox Aquifers underlying the regulated units (i.e., Bottom Ash Pond and Fly Ash Pond) at the SPS. While the alluvial and Wilcox Aquifers are typically discussed separately in the technical literature, Luckey (1985) states that these two aquifers commonly are hydraulically interconnected. This hydraulic connection between aquifers is also demonstrated by the drilling records in Appendix 2, which document permeable sand and gravel at the alluvium/Wilcox contact.

Luckey and Fuller (1980) summarize analytical data for Chloride in the alluvial and Wilcox Aquifers in the Sikeston area. Seven wells located upgradient of the Bottom Ash Pond were included in their study. Four of these wells were identified as irrigation or industrial supply wells and three were SBMU municipal wells located closer to the SPS.

Similarly, Brahana et al. (1985) presented a study of groundwater quality based on comprehensive sampling and analysis of samples from 42 wells set in the unconsolidated aquifers

of the Northern Mississippi Embayment. The locations of these and other wells are indicated on Figure 2. Chloride data from these wells is summarized in Table 2 and on Figure 2.

Well Type	Owner	Well Location	Formation	Chloride Concentration (mg/L)	Data Source
	Roth	T26N R14E S11CBC	Alluvium	4.8	
Irrigation or	Drury Dev.	T26N R14E S15CCD	Alluvium	5.3	
Supply	Miner	T26N R14E S16DDD	Alluvium	13	Luckey and Fuller
sappiy	Scott	T26N R14E S15DBB	Alluvium	9.8	(1980)
	Sikeston ID #19120	T26N R14E S19CDD	Wilcox	17	
Municipal	Sikeston ID #26235	T26N R14E S19DCB	Wilcox	7.8	
Municipai	Sikeston ID #2700	T26N R14E S19CDD	Wilcox	5.4	
	Sikeston ID #5941	T26N R14E S19CDD	Wilcox	5.2	Brahana et al. (1985)

**Table 2** – Chloride Results in Upgradient Irrigation, Industrial and Municipal Wells

These data demonstrate that local concentrations of Chloride up gradient of the site range from 4.8 mg/L to 17 mg/L. Therefore, the conclusion to the third consideration question from Unified Guidance listed above is affirmative.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Gredell Engineering concludes that the confirmed SSI of Chloride in MW-6 is not the result of a release from the Bottom Ash Pond and is attributable to an alternate source. The following supports this conclusion:

- MW-6 is not hydraulically downgradient of the Bottom Ash Pond and is not positioned to identify
  a release of an indicator (Chloride) from the regulated unit. Groundwater flow direction is
  consistently from the east-northeast to the west-southwest as documented during all
  monitoring events at the SPS.
- The reported Chloride concentration in MW-6 is naturally occurring and due to temporal variation resulting from chemical dissolution of Chloride from soil or rocks, and variable upward groundwater movement from the underlying Wilcox Aquifer over a longer term (i.e., multi-year) than accounted for during the background sampling period of the regulated unit's monitoring system.
- Chloride is present in high-capacity wells located upgradient of the regulated units. Chloride concentrations range from 4.8 to 17 mg/L, as reported by the United States Department of the Interior Geological Survey and the Missouri Department of Natural Resources.

Based on these conclusions, Gredell Engineering recommends continuance of semi-annual detection monitoring in accordance with §257.94.

## 5.0 LIMITATIONS

This report has been prepared for the exclusive use of the client and GREDELL Engineering Resources, Inc. for the specific project discussed in accordance with generally accepted environmental practices common to this locale at this time. The report is applicable only to this specific project and identified site conditions as they existed at the time of report preparation. The use of this report by others to develop independent interpretations of data or conclusions not explicitly stated in this report are the sole responsibility of those firms or individuals.

This report is not a guarantee of subsurface conditions. Variations in subsurface conditions may be present that were not identified during this or previous investigations. Interpretations of data and recommendations made in this report are based on observations of data that were available and referred to in this report unless otherwise noted. No other warranties, expressed or implied, are provided.

## 6.0 **REFERENCES**

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## **Figures**



WELL I MW-3 MW-4 MW-5 MW-6 MW-8



LEGEND	
PROPERTY LINE	PL
GROUNDWATER CONTOUR	
MONITORING WELL	<u>m</u> w
UP GRADIENT MONITORING LOCATION	UG
DOWN GRADIENT MONITORING LOCATION	DG
GENERAL FLOW DIRECTION	-

- NOTES:

   1. IMAGE PROVIDED BY BING MAPS.

   2. MONITORING WELL LOCATIONS, CASING ELEVATIONS & UNDERGROUND CULVERT ELEVATIONS SURVEYED BY BOWEN ENGINEERING & SURVEYING.

   3. GROUNDWATER ELEVATIONS MEASURED BY SIKESTON POWER STATION STAFF ON AUGUST 3, 2022.

   4. MAP DEVELOPMENT BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.

   5. RANGE OF HYDRAULIC GRADIENT AS DETERMINED BY SURFER® SOFTWARE

   4. MAP DEVELOPMENT BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE

ID GF	OUNDWATER	CASING ELEVATION	NORTHING	EASTING
3	296.52	308.55	381130.00	1079946.62
4	293.79	305.61	380804.62	1077766.95
5	294.40	305.91	379858.94	1078477.85
6	295.47	307.72	379874.77	1079384.36
8	293.87	304.77	380311.20	1077940.08

<b>GREDELL Engineeri</b>	ng Resources, Inc.	SIKE B	STON	ASH	STAT STAT - OND	NOI		FIG	SURE 1	c	THE GEOLOGIST WHO REVIEWED AND APPROVED THIS REPORT ASSUMES RESPONSIBILITY ONLY FOR GEOLOGIC INTERPREATIONS OF DATA APPEARING ON THE PAGE AND DISCI AIMS PURSULANT TO SECTION
ENVIRONMENTAL ENGINEERI	NG LAND - AIR - WATER	U	CHLOR	DE IN	9-MM					ŗ	256.456 RSMO ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS OR
1505 East High Street	Telephone: (573) 659-9078	ALTERNAT	E SOU	RCE D	EMONS	TRATI	NO		0.0, 5055		OTHER DOCUMENTS OR INSTRUMENTS NOT PREPARED UNDER THE SUPERVISION OF THE GEOLOGIST RELATING
Jellerson City, Missouri		SURVEYED DESIGNED	DRAWN	CHECKED A	PROVED	DATE	SCALE	PROJECT NAME	FILE NAME	SHEET #	TO OR INTENDED TO BE USED FOR ANY PART OR PARTS
MO CORP. ENGINEERING LICE	VSE NO. E-2001001669-D	NA NA	CM	KE	MCC 10	1/2022 A	S NOTED S	SIKESTON/GWMAP/BAP	BAP ALT DEMONSTRATION	1 OF 1	OF THE PROJECT TO WHICH THIS FIGURE REFERS.





# **Appendices**

# **Appendix 1a**

Laboratory Analytical Results and Quality Control Reports August 3, 2022 Sample Event



Pace Analytical Services, LLC 2231 W. Altorfer Drive Peoria, IL 61615 (800)752-6651

August 30, 2022

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

Dear Luke St Mary:

Please find enclosed the analytical results for the sample(s) the laboratory received. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of Pace Analytical Services, LLC.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

Pace Analytical Services appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lisa.grant@pacelabs.com.

Sincerely,

pail of Schindler

Gail Schindler Project Manager (309) 692-9688 x1716 gail.schindler@pacelabs.com



#### SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order FH01475 YES Samples received within temperature compliance when applicable YES COC present upon sample receipt YES COC completed & legible YES Sampler name & signature present YES Unique sample IDs assigned YES Sample collection location recorded YES Date & time collected recorded on COC YES Relinquished by client signature on COC YES COC & labels match YES Sample labels are legible YES Appropriate bottle(s) received YES Sufficient sample volume received YES Sample containers received undamaged NO Zero headspace, <6 mm present in VOA vials NO Trip blank(s) received YES All non-field analyses received within holding times NO Short hold time analysis YES Current PDC COC submitted NO Case narrative provided



Sample: FH01475- Name: MW-3 Matrix: Ground V	-01 Water - Grab						Sampled:         08/03/2           Received:         08/05/2           PO #:         28362	22 08:06 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		08/12/22 09:47	1	1.0	08/12/22 09:47	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 09:47	1	0.250	08/12/22 09:47	CJP	EPA 300.0 REV 2.1
Sulfate	11	mg/L		08/15/22 15:51	5	5.0	08/15/22 15:51	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	130	mg/L	М	08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
Total Metals - PIA									
Boron	23	ug/L		08/11/22 10:15	5	10	08/17/22 08:18	JMW	EPA 6020A
Calcium	16000	ug/L		08/11/22 10:15	5	200	08/17/22 08:18	JMW	EPA 6020A
Sample: FH01475- Name: MW-4 Matrix: Ground V	-02 Water - Grab						Sampled:         08/03/2           Received:         08/05/2           PO #:         28362	22 13:43 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	14	mg/L		08/12/22 10:41	5	5.0	08/12/22 10:41	CJP	EPA 300.0 REV 2.1
Sulfate	93	mg/L		08/15/22 16:45	25	25	08/15/22 16:45	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Fluoride	< 0.250	mg/L		08/22/22 12:26	1	0.250	08/22/22 12:26	ТТН	SM 4500F C 1997
Solids - total dissolved solids (TDS)	390	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	880	ug/L		08/11/22 10:15	5	10	08/17/22 08:21	JMW	EPA 6020A
Calcium	76000	ug/L		08/11/22 10:15	5	200	08/17/22 08:21	JMW	EPA 6020A



Sample: FH01475-( Name: MW-5 Matrix: Ground W	03 Vater - Grab						Sampled:         08/03/2           Received:         08/05/2           PO #:         28362	22 10:50 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	12	mg/L		08/12/22 11:35	5	5.0	08/12/22 11:35	CJP	EPA 300.0 REV 2.1
Sulfate	210	mg/L		08/15/22 17:03	50	50	08/15/22 17:03	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Fluoride	< 0.250	mg/L		08/22/22 12:34	1	0.250	08/22/22 12:34	ттн	SM 4500F C 1997
Solids - total dissolved solids (TDS)	560	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	390	ug/L		08/11/22 10:15	5	10	08/17/22 08:25	JMW	EPA 6020A
Calcium	110000	ug/L		08/11/22 10:15	5	200	08/17/22 08:25	JMW	EPA 6020A
Sample: FH01475-0 Name: MW-6 Matrix: Ground W	04 Vater - Grab						Sampled:         08/03/2           Received:         08/05/2           PO #:         28362	22 09:21 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	4.3	mg/L		08/12/22 12:11	1	1.0	08/12/22 12:11	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 12:11	1	0.250	08/12/22 12:11	CJP	EPA 300.0 REV 2.1
Sulfate	24	mg/L		08/12/22 13:05	5	5.0	08/12/22 13:05	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	230	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	51	ug/L		08/11/22 10:15	5	10	08/17/22 08:51	JMW	EPA 6020A
Calcium	43000	ug/L		08/11/22 10:15	5	200	08/17/22 08:51	JMW	EPA 6020A



Sample: FH01475- Name: MW-8 Matrix: Ground V	05 Vater - Grab						Sampled:         08/03/2           Received:         08/05/2           PO #:         28362	22 11:44 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	56	mg/L		08/12/22 13:42	25	25	08/12/22 13:42	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 13:24	1	0.250	08/12/22 13:24	CJP	EPA 300.0 REV 2.1
Sulfate	140	mg/L		08/12/22 13:42	25	25	08/12/22 13:42	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	490	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	420	ug/L		08/11/22 10:15	5	10	08/17/22 08:54	JMW	EPA 6020A
Calcium	100000	ug/L		08/11/22 10:15	5	200	08/17/22 08:54	JMW	EPA 6020A
Sample: FH01475- Name: FIELD DUF Matrix: Ground V	06 PLICATE Vater - Field Du	plicate					Sampled:         08/03/2           Received:         08/05/2           PO #:         28362	22 00:00 22 10:30	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	55	mg/L		08/12/22 14:36	25	25	08/12/22 14:36	CJP	EPA 300.0 REV 2.1
Fluoride	< 0.250	mg/L		08/12/22 14:00	1	0.250	08/12/22 14:00	CJP	EPA 300.0 REV 2.1
Sulfate	140	mg/L		08/12/22 14:36	25	25	08/12/22 14:36	CJP	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	490	mg/L		08/10/22 10:23	1	26	08/10/22 17:46	ZEJ	SM 2540C
<u>Total Metals - PIA</u>									
Boron	410	ug/L		08/11/22 10:15	5	10	08/17/22 08:58	JMW	EPA 6020A
Calcium	100000	ug/L		08/11/22 10:15	5	200	08/17/22 08:58	JMW	EPA 6020A



Sample: FH01475-07         Sampled:         08/03/22         09:21           Name:         FIELD BLANK         Received:         08/05/22         10:30           Matrix:         Ground Water - Field Blank         PO #:         28362										
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method	
Anions - PIA										
Chloride	< 1.0	mg/L		08/12/22 14:54	1	1.0	08/12/22 14:54	CJP	EPA 300.0 REV 2.1	
Fluoride	< 0.250	mg/L		08/12/22 14:54	1	0.250	08/12/22 14:54	CJP	EPA 300.0 REV 2.1	
Sulfate	< 1.0	mg/L		08/12/22 14:54	1	1.0	08/12/22 14:54	CJP	EPA 300.0 REV 2.1	
General Chemistry - PIA										
Solids - total dissolved solids (TDS)	< 17	mg/L		08/10/22 10:23	1	17	08/10/22 17:46	ZEJ	SM 2540C	
Total Metals - PIA										
Boron	12	ug/L		08/11/22 10:15	5	10	08/17/22 09:02	JMW	EPA 6020A	
Calcium	< 200	ug/L		08/11/22 10:15	5	200	08/17/22 09:02	JMW	EPA 6020A	



#### **QC SAMPLE RESULTS**

Parameter	Result	Unit	Qual	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B240379 - No Prep - SM 2540C									
Blank (B240379-BLK1)				Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	< 17	mg/L							
LCS (B240379-BS1)				Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	1010	mg/L		1000		101	84.9-109		
Duplicate (B240379-DUP1)	Sample: FH014	75-01		Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	110	mg/L	М		130			17	5
Duplicate (B240379-DUP2)	Sample: FH014	75-07		Prepared &	Analyzed: 08	/10/22			
Solids - total dissolved solids (TDS)	6.67	mg/L			6.67			0	5
<u> Batch B240514 - SW 3015 - EPA 6020A</u>									
Blank (B240514-BLK1)				Prepared: (	08/11/22 Anal	yzed: 08/16/2	2		
Boron	< 10	ug/L							
Calcium	< 200	ug/L							
LCS (B240514-BS1)				Prepared: (	08/11/22 Anal	yzed: 08/16/2	2		
Boron	540	ug/L		555.6		97	80-120		
Calcium	5740	ug/L		5556		103	80-120		
Batch B240840 - IC No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B240840-CCB1)				Prepared &	Analyzed: 08	/12/22			
Fluoride	0.00	mg/L							
Chloride	0.188	mg/L							
Sulfate	0.00	mg/L							
Calibration Check (B240840-CCV1)				Prepared &	Analyzed: 08	/12/22			
Fluoride	5.18	mg/L		5.000		104	90-110		
Sulfate	5.06	mg/L		5.000		101	90-110		
Chloride	5.00	mg/L		5.000		100	90-110		
Batch B240945 - No Prep - EPA 300.0 REV 2.1									
Calibration Blank (B240945-CCB1)				Prepared &	Analyzed: 08	/15/22			
Sulfate	0.00	mg/L							
Calibration Check (B240945-CCV1)				Prepared &	Analyzed: 08	/15/22			
Sulfate	4.97	mg/L		5.000	-	99	90-110		
Batch B241379 - No Prep - SM 4500F C 1997									
Calibration Blank (B241379-CCB1)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.00800	mg/L							
Calibration Blank (B241379-CCB2)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.0100	mg/L							
Calibration Check (B241379-CCV1)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.652	mg/L		0.7000		93	90-110		
Calibration Check (B241379-CCV2)				Prepared &	Analyzed: 08	/22/22			
Fluoride	0.694	mg/L		0.7000		99	90-110		



Pace Analytical Services, LLC 2231 W. Altorfer Drive Peoria, IL 61615 (800)752-6651



#### NOTES

Specifications regarding method revisions, method modifications, and calculations used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

#### **Certifications**

CHI - McHenry, IL - 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556

PIA - Peoria, IL - 2231 W. Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553

Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870) Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338) Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042

TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

#### **Qualifiers**

M Analyte failed to meet the required acceptance criteria for duplicate analysis.

Dail & Schindler



Certified by: Gail Schindler, Project Manager



PACE ANALYTICAL SERVICES WWW.PACELABS.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

### CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

	ALL HIGH	ILIGHTED AREA	AS <u>MUST</u> B	E COMPLE	ETED BY CL	IENT (PLEA	SE PRINT)			the second s			
	PROJECT	PROJECT LOCATION		PURCHASE ORDER #		$\overline{(}$	) AN	LYSIS RE	DUESTED		(FOR LAB USE ONLY)		
SIRESTON BIND POWER STATION		BOTT	OM ASH	APP III			U	)				CIDUTS-A	
ADDRESS	PHONE	PHONE NUMBER		E-MAIL		DATE SHIPPED						1	LOGIN # HOIGTP OH
1551 W WAKEFIELD	573-47											LOGGED BY:	
												CLIENT: SIKESTON PMIL SIKESTON	
	SAMPLER (PLEASE PRINT	n				MATRIX	TYPES:						POWER STATION
STAT SINESTON, WO 63801	Thatin I mas				WW- WASTEWATER DW- DRINKING WATER		TER VATER	S					PROJECT: SIKESTON BOTTOM ASH
	005	111 (	un	9		GW- GROUND W WWSL- SLUDGE		Ő					APP III
	SAMPLER'S SIGNATURE					LCHT-LEACHATE		15					PROJ. MGR.: GJ SCHINDLER
WIR LUKE ST WART		SIGNATURE DL.C.S				SO-SOIL SOL-SOLID		8					
	C							s,					1
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(2) SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	COLLECTED	COLLECTED	GRAB	COMP	TYPE	COUNT	CODE	리	'n				REMARKS
							PROVIDED				+		
MW-3	8/3/22	0806	X		GW	2	3,6	X	Х				
MW-4	8/3/22	1343	x		GW	2	3,6	x	x				
MW-5	3/2/22	1050	x		GW	2	3.6	x	x				
MW-6	2/2/22	1021	v		CW/	2	2.6	v	Y				
MW-5	0/2/22	0721	<b>^</b>		Gw	2	3,0	<b>^</b>	^				
MW-8	8/3/22	[144	X		GW	2	3,6	X	X				
DUPLICATE	8/3/22		X		GW	2	3,6	X	X				
FIELD BLANK	8/3/22	0921	x		DI	2	3,6	x	x				
CHEMICAL PRESERVATION CODES: I-HCL 2-H2SO4 3-	HNO3 4 - NAC	0H 5 – NA2	2\$203	6 – UNPF	RESERVED	7 – OTHER		d-anna anna anna anna anna anna anna ann	<u></u>				
TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORM (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)	AL RUSH		DATE RES	ULTS	$\bigcirc$	l understan	d that by initia	aling thi	s box l	give the la	b permiss	ion to pro	oceed with analysis, even though it may
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE					$\Box$	not meet al	not meet all sample conformance require			irements as defined in the receiving facility's Sample Acceptance			
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABOVE:	E:					PROCEED	WITH ANALY	SIS ANI		IFY RESUL	.TS: (INIT)	ALS)	table to report to an regulatory authorities.
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									D	DATE AND TIME TAKEN FROM SAMPLE BOTTLE			

# **Appendix 1b**

Laboratory Analytical Results and Quality Control Reports September 12, 2022 Retest Event



Pace Analytical Services, LLC 2231 W. Altorfer Drive Peoria, IL 61615 (800)752-6651

September 28, 2022

Luke St Mary Sikeston BMU, Sikeston Power Station 1551 W Wakefield Sikeston, MO 63801

**RE: SIKESTON BOTTOM ASH RESAMPLES** 

Dear Luke St Mary:

Please find enclosed the analytical results for the **4** sample(s) the laboratory received on **9/14/22 1:40 pm** and logged in under work order **FI02653**. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of Pace Analytical Services, LLC.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

Pace Analytical Services appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lisa.grant@pacelabs.com.

pail of Schindler

Gail Schindler Project Manager (309) 692-9688 x1716 gail.schindler@pacelabs.com



#### SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order FI02653 YES Samples received within temperature compliance when applicable YES COC present upon sample receipt YES COC completed & legible YES Sampler name & signature present YES Unique sample IDs assigned YES Sample collection location recorded YES Date & time collected recorded on COC YES Relinquished by client signature on COC YES COC & labels match YES Sample labels are legible YES Appropriate bottle(s) received YES Sufficient sample volume received YES Sample containers received undamaged NO Zero headspace, <6 mm present in VOA vials NO Trip blank(s) received YES All non-field analyses received within holding times NO Short hold time analysis YES Current PDC COC submitted NO Case narrative provided



Sample: Fl02653-01 Name: MW-5 Matrix: Ground Wa	iter - Grab						Sampled:         09/12/2           Received:         09/14/2           PO #:         30965	22 10:20 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	510	mg/L	М	09/15/22 10:35	1	26	09/15/22 11:57	ZEJ	SM 2540C
Sample: Fl02653-02 Name: MW-6 Matrix: Ground Wa	iter - Grab						Sampled:         09/12/2           Received:         09/14/2           PO #:         30965	22 08:57 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	4.7	mg/L		09/16/22 23:12	1	1.0	09/16/22 23:12	CRD	EPA 300.0 REV 2.1
Sample: Fl02653-03 Name: DUPLICATE Matrix: Ground Wa	ıter - Grab						Sampled:         09/12/2           Received:         09/14/2           PO #:         30965	22 00:00 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	11	mg/L		09/17/22 00:42	10	10	09/17/22 00:42	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	520	mg/L		09/15/22 10:35	1	26	09/15/22 11:57	ZEJ	SM 2540C
Sample: Fl02653-04 Name: FIELD BLAN Matrix: Ground Wa	K ıter - Grab						Sampled:         09/12/2           Received:         09/14/2           PO #:         30965	22 08:57 22 13:40	
Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/L		09/17/22 01:00	1	1.0	09/17/22 01:00	CRD	EPA 300.0 REV 2.1
General Chemistry - PIA									
Solids - total dissolved solids (TDS)	< 26	mg/L		09/15/22 10:35	1	26	09/15/22 11:57	ZEJ	SM 2540C


## NOTES

Specifications regarding method revisions, method modifications, and calculations used for analysis are available upon request. Please contact your project manager.

\* Not a TNI accredited analyte

#### **Certifications**

- CHI McHenry, IL 4314-A W. Crystal Lake Road, McHenry, IL 60050 TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556
- PIA Peoria, IL 2231 W. Altorfer Drive, Peoria, IL 61615

TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553 Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870) Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

- Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)
- SPMO Springfield, MO 1805 W Sunset Street, Springfield, MO 65807 USEPA DMR-QA Program
- STL Hazelwood, MO 944 Anglum Rd, Hazelwood, MO 63042 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389 TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080 Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050 Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

### **Qualifiers**

M Analyte failed to meet the required acceptance criteria for duplicate analysis.

Dail & Schindler



Certified by: Gail Schindler, Project Manager

Pace

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

## CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

	ALL HIGHLIGHTED AREA	S MUST BE COMPLE	ETED BY CL	IENT (PLEASE	PRINT)							
1 CLIENT SIKESTON POWER STATION	PROJECT NUMBER	PROJECT LOC	ATION	PURCHASE O	RDER #	3	ANALYSIS REQUESTED				D	(FOR LAB USE ONLY)
ADDRESS 1551 W WAKEFIELD	PHONE NUMBER 573-475-3131	E-MAIL		DATE SHIF	PED							LOGIN # +102653
CITY STAT SIKESTON, MO 63801	SAMPLER (PLEASE PRINT) JUSTIN	owes		MATRIX TY WW- WASTEWATER DW- DRINKING WATE GW- GROUND WATEI WWSL- SLUDGE	PES:							SIKESTON BMU, SIKESTON POWER STATION SIKESTON BOTTOM ASH 2022 RESAMPLES
CONTACT PERSON MR LUKE ST MARY	SAMPLER'S SIGNATURE J. LOWLE	3		NAS- NON AQUEOUS LCHT-LEACHATE OIL-OIL SO-SOIL SOL-SOLID	SOLID							GJ SCHINDLER
2 (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE TIME COLLECTED COLLECTED	GRAB COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	TDS	Ч					REMARKS
MW-5	9-12-22 1020	x	GW	1	6	x						
MW-6	9-12-22 0857	x	GW	1	6		x					
DUPLICATE	9-12-22	x	GW	1	6	x	x					
FIELD BLANK	9-12-22 08 57	x	DI	1	6	x	x					
CHEMICAL PRESERVATION CODES: I – HCL 2 – H2SO4 3	- HNO3 4 - NAOH 5 - NA	2S2O3 6 – UNP	RESERVED	7 – OTHER					I		I	
TURNAROUND TIME REQUESTED (PLEASE CIRCLE)       NORMAL       RUSH         Mathematical Strength       Normal       Normal         RUSH RESULTS VIA (PLEASE CIRCLE)       EMAIL       PHONE         Email IF DIFFERENT FROM ABOVE:       PHONE # IF DIFFERENT FROM ABOVE:       PROCEED WITH ANALYSIS AND QUALIFY RESULTS: (INITIALS)												
RELINQUISHED BY: (SIGNATURE)	13 - 22 RECEIV	ED BY: (SIGNATURE)			DATE			1	8	С	OMMENT	S: (FOR LAB USE ONLY)
Ashish fase Time	007				TIME							
DATE DATE	RECEIV	ED BY: (SIGNATURE)			DATE			s	AMPLE	TEM	PERATUR	RE UPON RECEIPT 2.3 °C
		i			TIME			C		ROCE		TED PRIOR TO RECEIPT
DATE	RECEIV	ED BY: (SIGNATURE)	1		DATE	9/1	1/2	) S. R	AMPLE	ACC	EPTANCE	NONCONFORMANT
Of Of			_		TIME	340	>	D	ATE AI	ND TI	NE TAKEN	N FROM SAMPLE BOTTLE
					I							

# Appendix 2

Geologic Drilling Logs for High-Yield Wells Near SPS

164 WL-81-5p15 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER City of Sikeston 19120 COUNTY WELL NO. FARM Scott 6 Т 148 DRILLER Layne - Arkansas Co 26 DATE 8-10-60 ELEV Browning PROD. 1641 GPM. 330 NDEX SHEET NO. LOGGED BY Julells 8-26-60 0 REMARKS 307 - 4 18" esg 34" hole @ bottom. SWL. 66' BRN, MOD. CRSU 50 clo 5 5 clo de w/oce GRAN -SD. MED - VICESE W/ SRAW. cl. do PDWP# 10 4010743 10 do SO BEN, MED lo Genry. de de cíc do Cr6 Allovion de SD-CASTO BARN 100de do de de do 10 do w/pea GRAVEL yellow In la vierse. 200do highly polished dewy GAMME de do de 20 do de do 50. offer to oce CRSP. sillyer office to met. sille gray. 300 W. loox de. 11 su-gray alta to exse-silly -sugray alta locase so-meil to care. 50. alta to Occo deese. silly. do inc? 400 sil Tep. Portons -Creech TD /09

W1-79-2P15 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES OWNER LOG NO. ð Sikeston Water Works CI 26235 FARM & ble N. of Wala & Light WELL NO. COUNTY Scott Plent in alley. DRILLER hayne Arkansas R 26 14E 16-6-69 - Splaker: 23-6-69 Sikesten North DATE ELEVS; /ver men PROD. test 1500 gpm 44 ft dd 9 327 LOGGED BY loly 1-69 REMARKS SWL 68 CHYI SOIL - BRN JERY MAND. BRO. Ulfa- fu- Stanger SAND - CLENEL - Well Sort In- Ned NO 10 SHAN. CLEMA UTTA- Ins . wellsort 00 SHAND CLEAN SIFA well Sortes do de MAD. CLENN. Ala - Ces cree. 00. Dans. CLORA - for crie wellout Ho - - Poorly sorter | - FN- derse - oce Gran, Do PDupt Do. Do. 4010743 AN- Crse 100 . Do w/ ace v/ene 5 Gran. No IN. V/erie w/ Gran. Po Do w/PER Grovel. Do - Busicelly erse CRSE - Wlocc crant' P.G. Crie - Vicrie - Wil Gran & Pra Grav. Crse- ulcrie 120 Do . w/aran 00 20 00 men - erse wi uferse i Gran 120 SAND-MED. WIGHAN ! Poo Good. PU 200 -SAND - Cras w/Bran. 00 erse-vierse wigran i Pon Grave. MED- crse wigran ? Pon Gravel. mal- viene w/P.G do In eno w/RG. Probles Dirty CLAY. BAN al Pepples. SAND+ FA-Med. SILTY. 20 AND- Ulfa- for

MISSUEL BUREAU OF GEOLGY & MINES, POLLA, MO MISSENT BUREAU OF SEOLOGY & MILLS, ROLLA, MO Lon Swanner Water MO SURVEY NO OWNER MO SURVEY Nº OWNER 2700 City of Sikeston FARM Municipal Plant 2700 City of Sikeston COUNTY WELL Nº WELL Nº COUNTY Scott of Sikeston Scatt 3 @ Municipal Plank 3 T DRILLER Cortess well supply Co. R R DRILLER Corliss Well Co. 2618 14E 26N/4E DATE DATE Dec. 1932 Dec. 1932 ELEVATION PRODUCTION ELEVATION PRODUCTION 327 327 750 G.P.M. SAMPLES STUDIED 19 SAMPLES STUDIED 2-15-38 Hundhausen Farrar REMARKS From sples. submitted. REMARKS Elev. 300 27-11A S.W.4. = 27' sand, subrang. artisora magne 0 Sand, polished in the larger gran save rounded tragments It granite with a small and of green of dark colored PDWP# do + garnet 4010743 iquedes rock POWP # 70/0743 - marnet - marnetita Much coarser & less royuded igneous rock. Fragments chiefly granitie in small. Very Rive sand in small. schles. Igneous schutes 50 50 8/23/62 adort mixed with this Tome 590 cond. 220 micromhog off 7.2 Chiefly medium gramed said same coarse material as tem from USES above. 100 100 ANAL, NO.2091 T.D.S. 153.0 CL. 6.3 SOA 1.4 150 150 - silverped prosiling mallant, here have al 200 200 0000 100 mpla 194 to 218 Chiefly dirab brownish grey day Tangrey clay - Lognate 150mplo 415'- to 2.50' - Clear angular gt2 and medium course ung. sand some of the larger 250 grains are poliched 250 250 150mp/2 260 10 920 one sole









WL 83 5 STATE OF MISSOURI **DIVISION OF** GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER City of Sikeston 11,630 COUNTY FARM WELL I Scott 5 14R т DRILLER Layne Arkansas 26 ZEE 7-651 DATE 8-1551 ELEV. 330 PROD. 880 gpm 335 Banks LOGGED BY S. Marin Korie August 29,57 0 REMARKS 32'05 330' of 12" csg 60' of 8" csg 80' of 8" screen \$0'05 32" & 330'0 \$ 17 Hale At. Water tank SWL 2 soil and sond do soud, igneous frage gravel, coarse sand rounded sand do do do coarse sand, graves eurl do rounded sand, grand U do PDWP# 4 to 20 10 4010743 do do graval of isucius fragma 100 -(1) -4 2 to gravel, coarse coarse sand sand 3 10 0.6 8 rover = de, to . stated Plei uto coarse cand do gravel, coarce sand to de L medium usause can avoid coerce sand avol 200 -L h do sand de do ho de 10 de de do. chay 40



17 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER illestan Vower 28241 COUNTY WELL NO. FARM Scott R DRILLER Layne-WESTERR 26 DATE ELEV. PROD. 3 05 FANZ 80 LOGGED BY with. REMARKS 80'W, 15'N of Well #2 lecation PDWPZ 4010743 2 Havien 100 . Noxidize, hematice If yell sd. 200 Wilc



wilcox 300 Mf. white sol. 6, PC 400

WL 715 STATE OF MISSOURI DIVISION OF GEOLOGICAL SURVEY AND WATER RESOURCES LOG NO. OWNER KESTON ROOM Coca - COLA BOTTLING Co. 107/3 COUNTY FARM WELL NO. SCOTT - ar Loss Welling DRILLER R 14E 26 DATE mar. 1949 ELEV. Brawning PROD. 328 Rentes LOGGED BY McNes 19 62 5/11/49 REMARKS



# **Appendix 3a**

2020 Sikeston Public Well Assessment Reports (CARES)

**General System Information** PWSS No. 4010743



Name	Sikeston
PWSSID	MO4010743
Population Served	16.393
Primary County Served	Scott
Service Connections	7,908
Source(s) of Water	Southeast Missouri Lowlands Groundwater Province
System Classification	Community (C)
Primary Source Type	Groundwater (GW)
System Type	Municipality
System Treatment	4-log Treatment of Viruses, Fluoridation, Greensand Filtration, Sedimentation, Gaseous Pre-Chlorination, Permanganate, Slat Tray Aeration, Gaseous Post-Chlorination, Diffused Aeration, (Pre) pH Adjustment, pH Adjustment, Rapid Sand Filtration
DNR Region of Operations	Southeast Regional Office
Source Water/Wellhead Protection Plan	No
Drinking Water Watch	Drinking Water Watch
Reference Maps	
Although the data in this data a accuracy of the data or related materials. This map and relate	set have been compiled, in part or in whole, by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the d materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related d information are subject to change as additional information is acquired. For additional information, please contact the Department's Drinking Water Branch (Water

Overview Map (Aerial) PWSS No. 4010743 - 8 Wells, Scott County Map Prepared: Jun 11, 2020 Data Release: May 4, 2020





Groundwater System System Well Source Water Protection Boundary 20-Year Time of Travel Half-Mile Buffer

SWAP - Source Water Assessment Plan http://drinkingwater.missouri.edu/swap Aerial Photos: Bing Maps, Microsoft. Jun 11, 2020.

Miles

0.5

 $\cap$ 





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http://drinkingwater.missouri.edu/swap Aerial Photos: Bing Maps, Microsoft. Jun 11, 2020. Land Use

0





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Miles

0.5

Sikeston				<b>≋</b>
Land Use Statistics PWSS No. 4010743	N C	Map Prepared: Jun 11, 2020 Data Release: May 4, 2020	Prepared by CARES, Unive	MISSOURI DEPARTMENT OF NATURAL RESOURCES ersity of Missouri Extension
Land Use	% Land Area, 2017	% Land Area, 2018	% Land Area, 2019	Avg. % Land Area
Corn	0	0	0	0
Cotton	0	0	0	0
Rice	0	0	0	0
Soybeans	0	0.04	0	0.01
Other Crop	0	0	0	0
Other Hay/Non-Alfalfa	0	0	0	0
Grassland/Pasture	0	0	0	0
Forest/Shrubland	0	0	0	0
Developed/High Intensity	23.04	22.78	23.04	22.95
Developed/Low-Med Intensity	62.14	61.83	61.3	61.76
Developed/Open Space	14.82	15.35	15.66	15.27
Open Water	0	0	0	0
Wetlands	0	0	0	0
Barren	0	0	0	0
Although the data in this data set have been compile accuracy of the data or related materials. The act o materials. This map and related information are sub	ed, in part or in whole, by the M f distribution shall not constitut ect to change as additional info	lissouri Department of Natural Resources, no e any such warranty, and no responsibility is prmation is acquired. For additional informati	o warranty, expressed or implied, is r s assumed by the department in the u on, please contact the Department's	nade by the department as to the use of these data or related Drinking Water Branch (Water

Well/Intake Data - PW Scott County, Sheet 1 c	'SS No. 4010743 of 2	Sheet Prepared	: Jun 11, 2020	Prepared by CARES, University of Missou	TMENT OF AL RESOURCES In Extension
Well Number Local Well Name Well ID # DGLS ID #	W1 Well #1, Plant #2 13051 0011630	W5 Well #6, Plant #2 13049 0019120	W6 Well #7, Plant #2 13048 0026235	W7 Well #8, Plant #3 13047	W9 Well #10, Plant #3 13045
Status Latitude Longitude	Active 36.879040 -89.586450	Active 36.878180 -89.585580	Active 36.879540 -89.583700	Active 36.880623 -89.601124	Emergency 36.878620 -89.600250
12-Digit Hydrologic Unit	080202010305	080202010305	080202010305	080202040604	080202040604
County MoDNR Region	Scott Southeast	Scott Southeast	Scott Southeast	Scott Southeast	Scott Southeast
Groundwater Province <sup>1</sup>	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr	Southeast Missouri Lowlands Gr
Source Aquifer(s) <sup>2</sup>	Wilcox aquifer	Wilcox aquifer	Wilcox aquifer	Alluvial aquifer	Alluvial aquifer
Confined/Unconfined <sup>3</sup> Regional Drilling	Unconfined	Unconfined			
Area <sup>4</sup> Total Dissolved	undetermined	undetermined	undetermined	undetermined	undetermined
Solids≌ Date Drilled (year) Material (C/U)	1951 Unconsolidated	1960 Unconsolidated	1969 Unconsolidated	1976 Unconsolidated	1959 Unconsolidated
Casing Base Formation	Wilcox	Wilcox	Wilcox	Alluvium	Alluvium
Total Depth Formation	Midway	Wilcox	Midway	Alluvium	Alluvium
Total Depth Ground Elevation (ft) Casing Depth (ft) Casing Size (in) Casing Type	421 327 331 12	401 326 307 18	404 326 309 18	145 325 108 18 Steel	142 325 119 12 Steel
Screen Length (ft) Screen Size (in)	81 8	80 12	80 12	30 12	21 12
Static Water Level (ft) Well Yield (gpm) Head (ft) Draw Down (ft)	60 600 90 60	66 1100 69 54	65 1450 105 59	27 1300 57 33	30 1000 34
Pump Test Date (year)	1975	1960	1992	1976	1987
Pump Type Pump Manufacturer	Vertical Turbine	Vertical Turbine	Vertical Turbine	Vertical Turbine	Vertical Turbine
Pump Depth (ft) Pump Capacity (gpm) Pump Meter (Y/N)	150 863 	135 1500	170 1600	84 1350 	64 1150 
Surface Drainage State Approved (Y/N)					
Liquefaction Risk Landslide Risk	High Low	High Low	High Low	High Low	High Low
Collapse Risk Flood Risk	Low Low	Low	Low	Low Low	Low
Contamination Risk	Low	Low	Low	Moderate	Moderate
Conduit Flow Risk <sup>6</sup>	K6	K6	K6	K6	K6

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### Well/Intake Data - PWSS No. 4010743 Scott County, Sheet 2 of 2

Sheet Prepared: Aug 12, 2020



Well Number	W10	W11	W13
Local Well Name	Well #11, Plant #1	Well #12	Well #13 Plant #3
Well ID #	13044	13043	18782
DGLS ID #			
Status	Active	Active	Active
Latitude	36.878770	36.880440	36.880459
Longitude	-89.582680	-89.582630	-89.602615
12-Digit Hydrologic Unit	080202010305	080202010305	080202040604
County	Scott	Scott	Scott
MoDNR Region	Southeast	Southeast	Southeast
Groundwater Province <sup>1</sup>	Southeast Missouri Lowlands	Southeast Missouri Lowlands	Southeast Missouri Lowlands
Source Aquifer(s) <sup>2</sup>	Wilcox	Wilcox	Alluvial
Confined/Unconfined <sup>3</sup>	Unconfined	Unconfined	Unconfined
Regional Drilling Area <sup>4</sup>	Area 5	Area 5	Area 5
Total Dissolved Solids $\frac{5}{2}$	undetermined	undetermined	undetermined
Date Drilled (year)	1987	1991	2013
Material (C/U)	Unconsolidated	Unconsolidated	Unconsolidated
<b>Casing Base Formation</b>	Wilcox	Wilcox	Alluvium
Total Depth Formation	Wilcox	Wilcox	Alluvium
Total Depth	390	391	160
Ground Elevation (ft)	325	325	325
Casing Depth (ft)	300	292	111
Casing Size (in)	16	18	16
Casing Type	Steel	Steel	Steel
Screen Length (ft)	80	80	110
Screen Size (in)	10	12	
Static Water Level (ft)	65	80	31
Well Yield (gpm)	1062	835	2400
Head (ft)	109	94	69
Draw Down (ft)	43		
Pump Test Date (year)	1987	1991	
Pump Type Pump Manufacturer	Vertical Turbine	Vertical Turbine	Vertical Turbine
Pump Depth (ft)	174	174	100
Pump Capacity (gpm)	1000	1000	1000
Pump Meter (Y/N)			
GWUDISW (Y/N)			
Surface Drainage			
State Approved (Y/N)			
Liquefaction Risk	High	High	High
Landslide Risk	Low	Low	Low
Collapse Risk	Low	Low	Low
Flood Risk	Low	Low	Low
Surface Contamination Risk	Low	Low	Moderate
Conduit Flow Risk <sup>6</sup>	K6	K6	К6
Although the data in this data set have be	een compiled, in part or in whole, b	y the Missouri Department of Natu	ral Resources, no warranty, expressed or implied, is made by the department as to the accuracy of
the data or related materials. The act of c information are subject to change as add	listribution shall not constitute any itional information is acquired. For	such warranty, and no responsibil additional information, please co	ity is assumed by the department in the use of these data or related materials. This map and related nater the Department's Drinking Water Branch (Water Protection Program).

**Contaminant Summary** 

Sheet Prepared: Jun 11, 2020



PVVS	S NO. 4010743		Prepared by CARES, University of Missouri Extension
57 pc	otential contaminant sources in the listed databases (mult	tiple da	tabases may list the same contaminant source):
	Database		Database
~	ACRES (Assessment, Cleanup And Redevelopment Exchange System)		MN-TEMPO (Minnesota - Permitting, Compliance, & Enforcement)
~	AIR (Integrated Compliance Information System-Air)	~	MO-DNR (Missouri Department Of Natural Resources)
×.	AIRS/AFS (Air Facility System)	V	NCDB (National Compliance Database)
~	AIRS/AQS (Air Quality System)	~	NPDES (National Pollutant Discharge Elimination System)
	BR (Biennial Reporters)		OTAQREG (Office Of Transportation And Air Quality Fuels Registration)
	BRAC (Base Realignment And Closure)		RADINFO (Radiation Information System)
V	CEDRI (Compliance And Emissions Data Reporting Interface)	1	RCRAINEQ (Recovery act Information System)
	ECRM (Enforcement Criminal Records Management)		RES (Renewable Fuel Standard)
	E-GGRT (Electronic Greenhouse Gas Reporting Tool)		RMP (Risk Management Plan)
	EGRID (Emissions & Generation Resource Integrated Database)	V	SEMS (Superfund Enterprise Management System)
~	EIA-860 (Energy Information Administration-860 Database)	~	SFDW (Safe Drinking Water Information System)
~	EIS (Emission Inventory System)		SSTS (Section Seven Tracking System)
	FFDOCKET (Federal Facility Hazardous Waste Compliance Docket)		STATE (State Systems)
~	ICIS (Integrated Compliance Information System)		TRIS (Toxics Release Inventory System)
	LMOP (Landfill Methane Outreach Program)		TSCA (Toxic Substances Control Act)
	LUST-ARRA (Leaking Underground Storage Tank - American Recovery And Reinvestment Act)	4	SWIP (Source Water Inventory Project Field Inventory - see below)
60 pc	otential contaminant sources in the SWIP Field Inventory:		
Count	Site Type	Count	Site Type
0	Airport or abandoned airfield	0	Laundromat
0	Animal feedlot	0	Livestock auction
0	Apartments and condominiums	0	Machine or metalworking shop
0	Asphalt plant	2	Manufacturing (general)
6	Auto repair shop	0	Material stockpile (industrial)
8	Automotive dealership	0	Medical institution
0	Barber and beauty shop	0	Metal production facility
0	Boat yard and marina	0	Mining operation
0	CAFO	1	Dirier Paint store
2	Car wash	0	Park land
0	Cement Plant	0	Parking lot
0	Cemetery	1	Petroleum production or storage
0	Communication equipment mfg	0	Pharmacies
0	Country club	0	Photography shop or processing lab
3	Dry cleaner	0	Pit toilet
1	Dumping and/or burning site	0	Plastic material and synthetic mfg
0	Electric equipment mfg or storage	1	Print shop
0	Electric substation	0	Railroad yard
0	Farm machinery storage	0	Recycling/reduction facility
3	Feeu/Ferunzen/Go-op	0	Research and a second s
2	Funeral service and crematory	1	Sawdust nile
1	Furniture manufacturer	0	School
0	Furniture repair or finishing shop	0	Sports and hobby shop
0	Garden and/or nursery	0	Swimming pool
0	Garden, nursery, and/or florist	0	Tailing pond
0	Gasoline service station	5	Tank (above-ground fuel)
0	Golf courses	0	Tank (other)
0	Government office	0	Tank (pesticide)
0	Grain bin	6	I ank (underground fuel)
3	Haroware and lumber store	0	i rucking terminal
1	Habway maintenance facility	1	Veterinary service Wastewater treatment facility
0	lewelry or metal plating shop	2	Well (abandoned)
0	Junk vard or salvage vard	1	Well (domestic)
0	Lagoon (commercial)	0	Well (irrigation)
Ő	Lagoon (industrial)	0	Well (livestock)
0	Lagoon (municipal)	0	Well (monitoring)
0	Lagoon (residential)	0	Well (public water supply)
0	Landfill (municipal)	0	Well (unknown)

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## Susceptibility Determination PWSS No. 4010743

Sheet Prepared: Jun 11, 2020



Dots containing numeric values correspond to the number of individual wells or surface water intakes.              ころうろうろうろうろうろうろうろうろうろうろうろうろうろ		
GROUND WATER         Geological and Hydrogeological Assessment Criteria         Are any system wells deemed by the Public Drinking Water Branch to be under the direct influence of surface water?         Are any system wells potentially prone to karst conditions or solution flow?         Do any system wells draw water from a source with high total dissolved solids (TDS)?         Are any system wells located proximal to known subsurface or groundwater contamination?         Do any system wells draw water from an unconfined aquifer?		
Geological and Hydrogeological Assessment Criteria         Are any system wells deemed by the Public Drinking Water Branch to be under the direct influence of surface water?         Are any system wells potentially prone to karst conditions or solution flow?         Do any system wells draw water from a source with high total dissolved solids (TDS)?         Are any system wells located proximal to known subsurface or groundwater contamination?         Do any system wells draw water from an unconfined anuifer?		
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Do any system wells draw water from a source with high total dissolved solids (TDS)? Are any system wells located proximal to known subsurface or groundwater contamination?		
Are any system wells located proximal to known subsurface or groundwater contamination?		
Do any system wells draw water from an upconfined aquifer?		
Do any system wers draw water norm an uncommed aquiter:	0	-
Based on known stratigraphic relationships for each well, the risk of contamination from surface sources is:		
Well Construction and Maintenance Assessment Criteria		
Are all system wells state-approved?	$\bigcirc$	
Do any system wells exhibit structural defects, construction deficiencies, or other conditions that might allow ontamination to enter the well at the wellhead?		
Are security measures in place to prevent unauthorized tampering with all system wells?	$\bigcirc$	
Does the system have back-up, emergency power available?	$\bigcirc$	
Monitoring Assessment Criteria		
Have any system wells exhibited consistent detections for any of the following parameters in raw water?		
Volatile Organic Chemicals (VOC):		
Synthetic Organic Chemicals (SOC):	Õ	$\overline{\bigcirc}$
Inorganic Compounds (IOC):	ŏ	
Nitrates/Nitrites:	ŏ	
Radionuclides:	ŏ	$\overline{\bigcirc}$
Bacteria/Viruses/Microbial Pathogens:	Ŏ	
Natural Hazard Assessment Criteria		
The number of system wells located in a region prone to flooding.	$\bigcirc$	$\bigcirc$
The number of system wells located in a region that may experience the following conditions in the event of a large-scale earthquake.		
Potential liquefaction risk:	8	$\bigcirc$
Potential landslide risk:	$\bigcirc$	
Potential subsurface collapse/instability risk:	$\bigcirc$	
Are any system wells prone to declining water levels during a prolonged drought?	$\bigcirc$	
Do all system wells have lightning surge protection?	$\bigcirc$	
Potential Contaminant Inventory Assessment Criteria		
Potential sources of contamination exist within the wellhead protection area:	$\bigcirc$	$\bigcirc$
A system well is located in an area with a high density of transportation corridors:	7	
A system well is located in an area that may have improperly maintained or faulty on-site septic systems:	$\bigcirc$	
Additional Assessment Criteria		
Does the system have a wellhead/source water protection plan endorsed by the Department of Natural Resources?		$\bigcirc$
Does the system have an emergency interconnection with a neighboring public water system?	-	Õ
Although the data in this data set have been compiled, in part or in whole, by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department of the data or related materials. The set of distribution about a data was a set of the data or related materials.		

#### Map Prepared: Jun 11, 2020 Data Release: May 4, 2020



Notes PWSS No. 4010743

> For additional information about Missouri's regional groundwater provinces, please visit the Missouri Department of Natural Resources' Water Resources Center Web page or contact the Missouri Geological Survey.

<sup>2</sup> Source aquifers are determined from well log information, where available, and on general water quality characteristics for the regional groundwater province within which each well is located. Source aquifers for wells with little or no well log information are inferred based on best available information.

Additional Source Aquifer Notes:

- Water sources labeled "Cincinnatian, Pennsylvanian, or Devonian/Silurian" are not regionally extensive aquifer systems in Missouri. These represent isolated, localized water-bearing formations. Broad water quality descriptions are Not currently available for these sources. "Precambrian" water sources exhibit water quality characteristics similar to the St. Francois aquifer.
- The Springfield Plateau aquifer is regionally extensive only in southwest and west-central Missouri. Aquifers labeled "Mississippian" or "Springfield Plateau (equivalent)" refer to wells that draw water from the same geological formations that comprise the Springfield Plateau aquifer, but are located in areas of the state not hydraulically connected to the regional aquifer system. Broad water quality generalizations are not available for these isolated, localized water-bearing units.
- <sup>3</sup> Unconfined aquifers are generally more vulnerable to surface or shallow subsurface contamination and warrant additional protections around the wellhead. Confined aquifers are not as vulnerable to surface or shallow subsurface contamination, but may exhibit naturally elevated levels of dissolved minerals, radionuclides, or variations in other water quality parameters such as dissolved oxygen and pH.
- 4 Please refer to 10 CSR 23-3.090 and 10 CSR 23-3.100 for additional information about well construction standards for Missouri's regional well drilling areas.
- <sup>5</sup> TDS1 Total dissolved solids information is currently only available for the Ozark and Springfield Plateau aquifers. Information is based on broad, regional groundwater quality trends, rather than on well-specific monitoring.
- <sup>6</sup> K6 This well is not constructed in materials prone to conduit or solution flow.

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# **Appendix 3b**

2014 Sikeston Public Well Assessment Reports (CARES)

# Sikeston PWSS No. 4010743

8 Wells, Scott County



Missouri Department of Natural Resources





Sikeston									
PWSS No. 4010743				Drepored by	Sheet L	Jpdate: Jun 09, 2014			
Scott County, sheet 1 of	of 2		5	CENTER FOR APPLIED	Missouri Department of				
8 wells				ENVIRONMENTAL SYSTEMS UNIVERSITY OF MISSOURI	🚺 Na	atural Resources			
Well Number	W1	W5	W6	W7		W8			
Extended PWS #	4010743101	4010743105	4010743106	4010743107		4010743108			
Local Well Name	Well #1. Plant #2	Well #6. Plant #2	Well #7. Plant #2	Well #8. Plar	nt #3	Well #9. Plant #3			
Well ID #	13051	13049	13048	13047		13046			
DGLS ID #	0011630	0019120	0026235						
Facility Type	City	City	City	City		City			
Status	Active	Active	Active	Active	Active Active				
Latitude	36.87904	36.87818	36.87954	36.88062318	303	36.880473182			
Longitude	-89.58645	-89.58558	-89.5837	-89.6011240	613	-89.6026440566			
Location Method	GPS	GPS	GPS	GPS		GPS			
Method Accuracy (ft)	38	43	43	43		39			
USGS 7.5 Quadrangle	Sikeston North	Sikeston North	Sikeston North	Sikeston Nor	rth	Sikeston North			
County	Scott	Scott	Scott	Scott		Scott			
MoDNR Region	Southeast	Southeast	Southeast	Southeast		Southeast			
Date Drilled (year)	1951	1960	1969	1976		1976			
Material (C/U)	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolida	ted	Unconsolidated			
Base of Casing Formation	Wilcox	Wilcox	Wilcox	Alluvium		Alluvium			
Total Depth Formation	Midway	Wilcox	Midway	Alluvium		Alluvium			
Total Depth	421	401	404	145		143			
Ground Elevation (ft)									
Top Seal									
Bottom Seal									
Casing Depth (ft)	331	307	309	108		108			
Casing Size (in)	12	18	18	18		18			
Casing Type				Steel		Steel			
Elev. of Casing Top (ft)									
Outer Casing Depth (ft)									
Outer Casing Size (in)									
Screen Length (ft)	81	80	80	30		30			
Screen Size (in)	8	12	12	12		12			
Static Water Level (ft)	60	66	65	27		27			
Well Yield (gpm)	600	1100	1450	1300		1300			
Head (ft)									
Draw Down (ft)	60	54	59	33		34			
Pump Test Date (year)	1975	1960	1992	1976					
Pump Type	Vertical Turbine	Vertical Turbine	Vertical Turbine	Vertical Turb	ine	Vertical Turbine			
Pump Manufacturer									
Pump Depth (ft)	150	135	170	84		84			
Pump Capacity (gpm)	863	1500	1600	1350		1350			
			- <u></u>	<u></u>					
VUC Detection (Y/N)	N	N N	N	IN N		N			
Chloringtion (Y/N)		IN V	IN V	N ✓					
	T V	T V	T V	T V		T V			
	1 	I		T		I			
Surface Drainage									
State Approved(V/N)									
Date Abandoned (year)									
Date Plugged (year)									
Date i luggeu (year)									

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Scott County, sheet 2 of 2

### 8 wells



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Missouri Department of **Matural Resources** 

Well Number	W9	W10	W11	
Extended PWS #	4010743109	4010743110	4010743111	
Local Well Name	Well #10, Plant #3	Well #11, Plant #1	Well #12	
Well ID #	13045	13044	13043	
DGLS ID #				
Facility Type	City	City	City	
Status	Active	Active	Active	
Latitude	36.87862	36.87877	36.88044	
Longitude	-89.60025	-89.58268	-89.58263	
Location Method	GPS	GPS	GPS	
Method Accuracy (ft)	65	44	45	
USGS 7.5 Quadrangle	Sikeston North	Sikeston North	Sikeston North	
County	Scott	Scott	Scott	
MoDNR Region	Southeast	Southeast	Southeast	
Date Drilled (year)	1959	1987	1991	
Material (C/U)	Unconsolidated	Unconsolidated	Unconsolidated	
Base of Casing Formation	Alluvium	Wilcox	Wilcox	
Total Depth Formation	Alluvium	Wilcox	Wilcox	
Total Depth	142	390	382	
Ground Elevation (ft)				
Top Seal				
Bottom Seal				
Casing Depth (ft)	119	300	292	
Casing Size (in)	12	16	18	
Casing Type	Steel	Steel	Steel	
Elev. of Casing Top (ft)				
Outer Casing Depth (ft)				
Outer Casing Size (in)				
Screen Length (ft)	21	80	80	
Screen Size (in)	12	10	12	
Static Water Level (ft)	30	65		
Well Yield (gpm)	1000	1062		
Head (ft)				
Draw Down (ft)		43		
Pump Test Date (year)	1987	1987		
Pump Type	Vertical Turbine	Vertical Turbine	Vertical Turbine	
Pump Manufacturer				
Pump Depth (ft)	64	174	174	
Pump Capacity (gpm)	1150	1000	1000	
Pump Meter (Y/N)				
VOC Detection (Y/N)	Ν	Ν	Ν	
Nitrate Detection (Y/N)	Ν	Ν	Ν	
Chlorination (Y/N)	Y	Y	Y	
Filtration (Y/N)	Υ	Υ	Υ	
GWUDISW (Y/N)				
Surface Drainage				
State Approved(Y/N)				
Date Abandoned (year)				
Date Plugged (year)				

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Scott County, sheet 1 of 4

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Map C.No.	CARES ID	Site Name	Туре	I	_ocation Code	Accuracy Code	Method Code	Database Code
C1	140966	Elanco Products			UN	NV	UN	Dealcov
C2	108627	Scott-New Madrid Electric Coop			UN	NV	UN	Chemcov
C3	108628	Coleman Plant			UN	NV	UN	Chemcov
C4	108630	Sikeston Bd of Municipal Utilities			UN	NV	UN	Chemcov
C5	110225	Board Of Municipal Utilities			UN	NV	UN	Tanks
C6	110226	Board Of Municipal Utilities			UN	NV	UN	Tanks
C7	110379	Boyer Construction Company			UN	NV	UN	Tanks
C8	110498	Bridger Equipment Company			UN	NV	UN	Tanks
C9	110543	Brown Sand & Gravel Co, Inc			UN	NV	UN	Tanks
C10	111299	Charles Terrell			UN	NV	UN	Tanks
C11	111413	City Garage			UN	NV	UN	Tanks
C12	111527	City Of Miner			UN	NV	UN	Tanks
C13	111831	Community Shelter Workshop			UN	NV	UN	Tanks
C14	111964	Cooney Equipment Company			UN	NV	UN	Tanks
C15	112305	Dekalb Ag Research			UN	NV	UN	Tanks
C16	112309	Dekalb-pfizer Genetics			UN	NV	UN	Tanks
C17	112488	Don King Equipment			UN	NV	UN	Tanks
C18	112154	Ferrell Excavating				NV		Tanks
C19	113047	Hale Auction Company				NV/		Tanks
C20	114303	Holiday 66 Service				NV		Tanks
C21	11/332	Home Oil Co				NIV/		Tanks
C22	11/207	Hucks #120						Tanks
022	114397							Tanka
023	114828							Tanks
024	115060	Kellett Oli Co.						Tariks
025	115145				UN	INV	UN	Tanks
C26	115609	Lewis Bros Bakeries, Inc			UN	NV	UN	Tanks
C27	115921	Malone & Hyde Drug Dist-never Owned			UN	NV	UN	Tanks
C28	116354	Mhtd Dist Garage			UN	NV	UN	Tanks
C29	116376	Mid South Tractor Parts			UN	NV	UN	lanks
C30	117395	Par Gas (sinclair)			UN	NV	UN	Tanks
C31	117520	Pepsi Cola			UN	NV	UN	Tanks
C32	118701	Santie Wholesale Oil Co			UN	NV	UN	Tanks
C33	118714	Saunders System Inc			UN	NV	UN	Tanks
C34	118760	Scott Co R-v School Dist			UN	NV	UN	Tanks
C35	118765	Scott-new Madrid-mississippi El Cor			UN	NV	UN	Tanks
C36	118815	Semo Motor Company			UN	NV	UN	Tanks
C37	118816	Semo Nursing Center Inc			UN	NV	UN	Tanks
C38	119100	Sikeston			UN	NV	UN	Tanks
C39	119102	Sikeston Coca-cola Bottling Co			UN	NV	UN	Tanks
C40	119103	Sikeston Concrete Prods Co, Inc			UN	NV	UN	Tanks
C41	119104	Sikeston General Oil Co			UN	NV	UN	Tanks
C42	119106	Sikeston Maint Shed			UN	NV	UN	Tanks
C43	119107	Sikeston Pepsi Cola			UN	NV	UN	Tanks
C44	119381	Southwestern Bell			UN	NV	UN	Tanks
C45	120481	Todd Corporation			UN	NV	UN	Tanks
C46	120611	Trigg Shell			UN	NV	UN	Tanks
C47	120622	Troop E Satellite			UN	NV	UN	Tanks
C48	120761	Union Pacific			UN	NV	UN	Tanks
C49	120798	United Parcel Service, Inc			UN	NV	UN	Tanks
C50	120840	Uptown Shell			UN	NV	UN	Tanks
Code A2 A3 A4 A5 A6 A0 Z1 C1 C1	Address Ma Block/Gr Street Cr Nearest Primary 3 Digitizati Other Ad ZIP Cod Census - 19 Block Ce Block Ce	Method Codes           tching (Geocoding)         Code         Global Positioning System         Code         Oth           oup         G1         Static Mode         P1         L           netretine         G2         Kinematic Mode         P1         L           Street Intersection         G3         Differential Post Processing         UN         L           Street Name         G4         Precise Positioning Service         UN         L           on         G5         Signal Averaging         L         L           offerential         Frecise Positioning Service         UN         L           on         G5         Signal Averaging         L         L           g0         I1         Topo Map         L         D         L           g0         I1         Topo Map         L         Aerial Photography (DOQQ)         L           g1n         Centroid         I3         Setabilitic Imagene         L         L	er .and Survey Quarter Description Jnknown	Loc BL Build CF Centr IN Inters LS Lago MG Main OT Othe PL Pile RD Road TK Tank	cation Cod ing er of Facility section on or Pond Access Poin Office Standpipe,	es It (Gate) or Tower	Ac Code m km ft yd mi UN NF	curacy Codes Metric Meters Kilometers English Feet Yards Miles Unknown Site not found at database position Site not found at
C2 C3	ыоск/Gr Tract Ce	oup Centrolu 13 Satellite Imagery		vv∟ vvell UN Unkn	own		NV	verified

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Map C.No.	CARES ID	Site Name Type	Location Code	Accuracy Code	Method Code	Database Code
C51	120845	U-pump-it	UN	NV	UN	Tanks
C52	121651	Woodtruss	UN	NV	UN	Tanks
C53	121750	Quality Plating	UN	NV	UN	SMARS
C54	122606	Jerry James Trailers Inc.	UN	NV	UN	HW Gen
C55	123286	Scott-new Madrid-mississippi Electric	UN	NV	UN	HW Gen
C56	123833	Cooney Equipment Co.	UN	NV	UN	HW Gen
C57	123835	Semo Motor Co.	UN	NV	UN	HW Gen
C58	123836	Sikeston Dry Cleaners	UN	NV	UN	HW Gen
C59	123890	Todd, Inc.	UN	NV	UN	HW Gen
C60	124108	Satterfield Body Shop Hazar Entry	CF	33 ft	12	HW Gen
C61	124665	Missouri Delta Community Hospital	UN	NV	UN	HW Gen
C62	124814	Auto Tire & Parts	UN	NV	UN	HW Gen
C63	125054	Stricker Body Shop	UN	NV	UN	HW Gen
C64	125343	At&t	UN	NV	UN	HW Gen
C65	125753	King Cleaners	UN	NV	UN	HW Gen
C66	125930	Mid-south Tractor Parts	UN	NV	UN	HW Gen
C67	126133	Carnell's Body Shop	UN	NV	UN	HW Gen
C68	126233	Mo Dept Of Transportation	UN	NV	UN	HW Gen
C69	126406	Heritage American Homes	UN	NV	UN	HW Gen
C70	127163	One Day Cleaners	UN	NV	UN	HW Gen
C71	127545	Kelpro, Inc.	UN	NV	UN	HW Gen
C72	127758	Chamberlain's Amoco	UN	NV	UN	HW Gen
C73	127798	Canedy Sign Co., Inc.	UN	NV	UN	HW Gen
C74	127851	Faultiess Cleaners	UN	NV	UN	HW Gen
C75	128391	Don King Salvage	UN	NV	UN	HW Gen
C76	128417	Bootheel Diesel Fuel Injection	UN	NV	UN	HW Gen
C77	128903	Sikeston Light And Water	UN	NV	UN	HW Gen
C78	128972	Missouri Highway & Transportation Dept.	UN	NV	UN	HW Gen
C79	129213	Media Press	UN	NV	UN	HW Gen
C80	129679	Dekalb Plant Genetics	UN	NV	UN	HW Gen
C81	129840	Quality Plating % Usepa Region Vii	UN	NV	UN	HW Gen
C82	130016	Central States Coca-cola	UN	NV	UN	HW Gen
C83	130088	Curtis H. Cline	UN	NV	UN	HW Gen
C84	130731		UN	NV	UN	HVV Gen
000	132505	HANDY STREET CALCIUM ARSENATE SITE	UN	NV	UN	CERCLIS
085	132606	MRM INDUSTRIES	UN	NV NV	UN	LERCLIS
000	135413	Dekalo Agresearch Inc	UN	NV NV	UN	APCP
C88	136492	Mcmullin Gin Co Inc	UN	NV NV	UN	APCP
C89	136493	Sikeston Cotton Oil Milli Inc	UN			APCP
C90	130501		UN	INV	UN	APCP
Con	126502					
C92	126505	Sinesiun Fuwer Statiun				
C93	130505	Filester Westwarking	UN			APCP
C94	130500	Sikeston woodworking	UN			APCP
C95	126514					
C90	130314	Morror Aluminum Processing Inc.				
C00	136521					
C 00	136529			INV NV		
C100	136527	i autuess oreandis ilio Sikaetan				
	100007					
Code A2 A3 A4 A5 A6 A0 Z1 C1 C2	Address Ma Block/Gr Street Cr Nearest Primary J Digitizati Other Ad ZIP Code Census - 19 Block Ce Block/Gr	Method Codes           Itching (Geocoding)         Code         Global Positioning System         Code         Other         BL         BL         BL           pup         G1         Static Mode         P1         Land Survey         IN         In           pup         G2         Kinematic Mode         S2         Quarter Description         IN         In           Street Intersection         G3         Differential Post Processing         UN         Unknown         LS         L           Street Name         G4         Precise Positioning Service         UN         Unknown         MA         M           on         G5         Signal Averaging         MA         M         M           dress Matching         G6         Real Time Differential Processing         OT         CO         CO	Location Cod Building Senter of Facility Intersection Jain Access Poin Aain Office Dither Vile Soad Tank, Standpipe, Vell	les nt (Gate) or Tower	Ac Code m km ft yd mi UN NF NV	curacy Codes Metric Meters Kilometers English Feet Yards Unknown Site not found at database position Site position not
C2 C3	Block/Gr Tract Ce	bup Centroid I3 Satellite Imagery WL V	Vell Jnknown		NV	Site position

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Map C.No.	CARES ID	Site Name	Туре			Method Code	Database Code
C101	136539	King Laundry And Dry Cleaners	UN	NV	UN	APCP	
C102	136540	Sikeston Dry Cleaners		UN	NV	UN	APCP
C103	385324	Magic Car Wash	Car wash	BL	33 ft	12	CARES
C104	385325	Williams Auto Sales	Auto repair shop	BL	33 ft	12	CARES
C105	385326	Rogers Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C106	385327	The House of Color	Paint store	BL	33 ft	12	CARES
C107	385328	Drakes Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C108	385329	Hucks	Tank (underground fuel)	BL	33 ft	12	CARES
C109	385330	Jim's Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C110	385331	Cox's Car Wash	Car wash	BI	33 ft	12	CARES
C111	385332	Sinclair Gas	Tank (above-ground fuel)	BL	33 ft	12	CARES
C112	205222	Midtown Motors		CE	22.4	12	CARES
0112	305333				33 IL	12	CARES
0113	385334		Automotive dealership	BL	33 π 00 ft	12	CARES
C114	385335		Print shop	BL	33 ft	12	CARES
C115	385336	Feeders Supply	Feed/Fertilizer/Co-op	BL	33 ft	12	CARES
C116	385338	Meeks Print Shop	Other	BL	33 ft	12	CARES
C117	385339	Cornell's Collision Repair	Auto repair shop	BL	33 ft	12	CARES
C118	385340	FG Convienience Store	Tank (underground fuel)	BL	33 ft	12	CARES
C119	385341	Rhodes Convienience Store	Tank (underground fuel)	BL	33 ft	12	CARES
C120	385342	Animal Health Center	Veterinary service	BL	33 ft	12	CARES
C121	385343	Elite Car Wash	Other	BL	33 ft	12	CARES
C122	385344	Sikeston Fire Department	Fire station	BL	33 ft	12	CARES
C123	385345	Allsops Woodworking	Furniture manufacturer	BL	33 ft	12	CARES
C124	385346	Sonny's Solid Waste	Tank (above-ground fuel)	CF	33 ft	12	CARES
C125	385349	Auto Repair	Auto repair shop	BL	33 ft	12	CARES
C126	385350	·	Well (domestic)	WL	33 ft	12	CARES
C127	385351	Riggs Building Supplies and Home Center	Hardware and lumber store	BL	33 ft	12	CARES
C128	385352	Sabona Mfg	Manufacturing (general)	BI	33 ft	12	CARES
C129	385353	Janitrol/Janitor Supply	Other	BL	33 ft	12	CARES
C130	385354	Patriot/Heritage Homes	Manufacturing (general)	BL	33 ft	12	CARES
C131	385355	Sheltered Workshop	Sawdust pile	CE	33 ft	12	CARES
0131	205255	Aromark	Dry clooper		22 H	12	CARES
0102	305350	Aldindik	Divideaner	DL	33 IL	12	CARES
0133	385357		Other	IK	33 π	12	CARES
C134	385358	Riggs Wholesale Co.	Hardware and lumber store	BL	33 ft	12	CARES
C135	385359	Electric Substation	Other	CF	33 ft	12	CARES
C136	385440	Sikeston Auto Service	Auto repair shop	BL	33 ft	12	CARES
C137	385441	Sinclair Service Station	Tank (above-ground fuel)	BL	33 ft	12	CARES
C138	385442	Phillips 66	Tank (underground fuel)	BL	33 ft	12	CARES
C139	385443	Sikeston Laundry and Drycleaners	Dry cleaner	BL	33 ft	12	CARES
C140	385444	C & K Building Materials	Hardware and lumber store	BL	33 ft	12	CARES
C141	385445	King Laudry and Cleaners	Dry cleaner	BL	33 ft	12	CARES
C142	385446	Moll Printing Co.	Other	BL	33 ft	12	CARES
C143	385447	Premier Motor	Automotive dealership	BL	33 ft	12	CARES
C144	385448	Amoco	Tank (underground fuel)	BL	33 ft	12	CARES
C145	385449	Griffs Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C146	385450	Beaver Janitor Supply	Other	ТК	33 ft	12	CARES
C147	385451	Blanchard Funeral Parlor	Funeral service and crematorv	BL	33 ft	12	CARES
C148	385452	Service Station	Tank (underground fuel)	BI	33 ft	12	CARES
C149	385453	Caroll	Feed/Fertilizer/Co-op	CF	33 ft	12	CARES
C150	385454		Tank (above-ground fuel)	с. тк	33 ft	. <u> </u> 12	CARES
0100	000404				50 H		0/IIIE0
Codo	Addroop Mo	Method Codes		Location Cod	es	Ac	curacy Codes
A2	Block/Gr	oup G1 Static Mode	Code Other	CF Center of Facility		m	Meters
A3 A4	Street Ce Nearest	enterline G2 Kinematic Mode Street Intersection G3 Differential Post Processina	S2 Quarter Description	IN Intersection LS Lagoon or Pond		km	Kilometers English
A5	Primary	Street Name G4 Precise Positioning Service	UN UNKNOWN	MG Main Access Poin	t (Gate)	ft	Feet
AO	Other Ad	dress Matching G6 Real Time Differential Processing		OT Other		ya mi	Miles
Z1	ZIP Code Census - 19	e Centroid Interpolation 190 I1 Topo Map	F	PL Pile RD Road		UN NF	Unknown Site not found at
C1	Block Ce	ntroid I2 Aerial Photography (DOQQ)	, , , , , , , , , , , , , , , , , , ,	TK Tank, Standpipe,	or Tower	NI\/	database position
C3	Tract Ce	ntroid		UN Unknown		NV.	verified

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Scott County, sheet 4 of 4



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162 potential contaminant sources							
Map C.No.	CARES ID	Site Name	Туре	Location Code	Accuracy Code	Method Code	Database Code
C151	385455	Sikeston Seed Co., Inc.	Feed/Fertilizer/Co-op	BL	33 ft	12	CARES
C152	385456	H & H Small Engine Repair	Auto repair shop	BL	33 ft	12	CARES
C153	385457	Auto Repair	Auto repair shop	BL	33 ft	12	CARES
C154	385458	J J Auto Sales	Automotive dealership	BL	33 ft	12	CARES
C155	385459	Sikeston City Dump	Dumping and/or burning site	CF	33 ft	12	CARES
C156	385460	William Farr and Purnell Funeral Home	Funeral service and crematory	BL	33 ft	12	CARES
C157	385461		Well (abandoned)	BL	33 ft	12	CARES
C158	385462		Well (abandoned)	BI	33 ft	12	CARES
C159	385463	Sikeston Fire Station	Fire station	BI	33 ft	12	CARES
C160	385464		Tank (above-ground fuel)	тк	33 ft	12	CARES
C161	385465	Sikeston Highway Maintenence Facility	Highway maintenance facility	CE	33 ft	12	CARES
C162	385466	Shell	Petroleum production or storage	BI	33 ft	12	CARES
0102	000400	Shell	r etoleum production of storage	DL	55 H	12	OAREO

			Method Codes				Location Codes	Accuracy Codes		
Code A2 A3 A4 A5 A6 A0 Z1 C1 C2 C3	Address Matching (Geocoding) Block/Group Street Centerline Nearest Street Intersection Primary Street Name Digitization Other Address Matching ZIP Code Centroid Census - 1990 Block Centroid Block/Group Centroid Tract Centroid	Code G1 G2 G3 G4 G5 G6 I1 I2 I3	Global Positioning System Static Mode Kinematic Mode Differential Post Processing Precise Positioning Service Signal Averaging Real Time Differential Processing Interpolation Topo Map Aerial Photography (DOQQ) Satellite Imagery	Code P1 S2 UN	Other Land Survey Quarter Description Unknown	BL CF LS MA OT PL RD KL UN	Building Center of Facility Intersection Lagoon or Pond Main Access Point (Gate) Main Office Other Pile Road Tank, Standpipe, or Tower Well Unknown	Code m km ft yd mi UN NF NV	Metric Meters English Feet Yards Miles Unknown Site not found at database position Site position not verified	

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**Contaminant Summary Sheet** 

162 potential contaminant sources



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Missouri Department of **a** Natural Resources

162 Potential Contaminant Sources in the Listed Databases:								
	AFS (EPA AIRS Facility Sites)		Perchlo (MoDNR Perchlorate Sites in Missouri)					
16	APCP (MoDNR Air Pollution Control Program Sites)		Pest Ap (MDA Licensed Pesticide Applicators)					
	APE (MoDNR Active Permitted Landfills & Transfer Stations)		RCRIS (EPA Resource Conservation and Recovery Information System)					
2	CERCUS (EPA CERCUS)		Silos (USGS Minuteman II Missile Silos)					
3	Chemcov (VA Selected Chemical Sites)	1	SMARS (MoDNR Superfund Management and Registry System)					
1	Dealcov (MDA Resticide Dealer Lecations)	10	Tanks (MoDNR Superiorid Management and Registry System)					
- '	Diaxin (MoDND Confirmed Diaxin Lint)	40	Tier 2 (MEDC Tier II Deporte)					
	Crain D. (LICDA Former Crain Din Sites)		Tier 2 (MERC TIEFTI Reports)					
	Grain B (USDA Former Grain Bin Sites)		The D (MoDNR Resolved and Unresolved waste The Dumps)					
31	HW Gen (MoDNR Hazardous Waste Generators)		TRI (EPA Toxic Release Inventory)					
	HW Tran (MoDNR Hazardous Waste Transporters)		VCP (MoDNR Voluntary Cleanup Program Sites)					
	LUST (MoDNR Leaking Underground Storage Tanks)		WQIS (MoDNR Water Quality Information System)					
	MoDOT (MoDOT Highway Maintenance Facilities)							
	PADS (EPA PCB Activity Data Base System)	60	SWIP Field Inventory (see below)					
60	Potential Contaminant Sources in the SWIP Field Inve	ntory						
0	Airport or abandoned airfield	0	Machine or metalworking shop					
0	Animal feedlot	2	Manufacturing (general)					
0	Apartments and condominiums	0	Material stockpile (industrial)					
0	Asphalt plant	0	Medical institution					
6	Auto repair shop	0	Metal production facility					
8	Automotive dealership	0	Mining operation					
0	Barber and beauty shop	7	Other					
0	Boat yard and marina	1	Paint store					
	CAFO	0	Park land					
0	Campground	1	Parking lot Petroloum production or storage					
2	Can wash	0	Pharmacies					
	Cemetery	0	Photography shop or processing lab					
l õ	Communication equipment mfg	Ő	Pit toilet					
0	Country club	0	Plastic material and synthetic mfg					
3	Dry cleaner	1	Print shop					
1	Dumping and/or burning site	0	Railroad yard					
0	Electric equipment mfg or storage	0	Recycling/reduction facility					
0	Electric substation	0	Research lab					
0	Farm machinery storage	0	Restaurant					
3	Feed/Fertilizer/Co-op	1	Sawdust pile					
2	Fire station	0	School					
2	Funeral service and crematory	0	Sports and hobby shop					
0	Furniture renair or finishing shop	0	Tailing pool					
0	Garden and/or nurserv	5	Tank (above-ground fuel)					
Ő	Garden, nursery, and/or florist	0	Tank (other)					
Ō	Gasoline service station	Õ	Tank (pesticide)					
0	Golf courses	6	Tank (underground fuel)					
0	Government office	0	Trucking terminal					
0	Grain bin	1	Veterinary service					
3	Hardware and lumber store	0	Wastewater treatment facility					
0	Hazardous waste (Federal facility)	2	Well (abandoned)					
1	Highway maintenance facility	1	Well (domestic)					
	Jeweiry or metal plating shop	0	vveii (irrigation)					
	Julik yalu ul salvaye yalu Lagoon (commercial)	0	Well (monitoring)					
	Lagoon (commercial)	0	Well (nublic water supply)					
	Lagoon (municipal)	0	Well (unknown)					
Ő	Lagoon (residential)	5						
0	Landfill (municipal)							
0	Laundromat							
0	Livestock auction							

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Susceptibility Determination Sheet



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Sheet Update: Mar 14, 2014

Missouri Department of

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The Missouri Department of Natural Resources (MoDNR) has assembled this information to assess the susceptibility of drinking water sources to contamination. There are many unforseen and unpredictable factors that may cause a source to be contaminated. MoDNR routinely monitors all public supplies to ensure public health is protected. Public water systems and local communities are encouraged to take all measures possible to reduce the susceptibility of their drinking water source to chemical contamination. For more information, call 1-800-361-4827.	Not Susceptible	Moderately Susceptible	Highly Susceptible	Incomplete Data
A system is highly susceptible because of construction deficiencies if:				
A well was not constructed according to plans approved by MoDNR-PDWB,				Х
A well was not cased to a depth approved by MoDNR,				Х
A well casing is not of sufficient weight,				X
A well is not sufficiently sealed (grouted) around the casing, or A well has developed holes in the casing or other flaws that compromise its integrity.				х
A system is highly susceptible due to direct influence of surface water if:				
A well has tested positive for surface water indicators such as algae or high turbidity.				X
A system is highly susceptible to surface contaminants if:				
A well casing does not extend 12 inches above the well house floor, or 18 inches above the ground surface,				х
A well casing does not extend four feet above the 100-year flood level, or four feet above the highest known flood elevation,				Х
A well is not provided with a properly screened vent, or				Х
All openings in a well casing are not properly sealed.				Х
A system is highly susceptible based on detection histories if:				
Volatile Organic Chemicals (VOCs) have been detected in a well,	Х			
Synthetic Organic Chemicals (SOCs) have been detected in a well,				Х
Inorganic Chemicals (IOCs) have been detected in a well above naturally occurring levels,				Х
Nitrates have been detected at or above one-half the MCL,	Х			
Bacteria has been consistently detected in a well, or				Х
Viruses or microbiological contaminants are detected in a well.				Х
A system is highly susceptible to weather, vandalism, and sabotage if:				
A well is not in a locked well house of adequate construction.				X (1)
A system is moderately susceptible due to local geology if:				
A producing aquifer is less than 100 feet below the surface,	Х			
A producing aquifer has conduit flow conditions due to surficial karst topography,				Х
A producing aquifer is not overlain by an impermeable confining layer,				Х
A producing aquifer is overlain by a conductive (>5X10e-4) formation (including soil), or				Х
A producing aquifer is confined, but there are open wells nearby penetrating that layer.				Х
A system is moderately susceptible to contaminants if:				
Any contaminants listed in Appendix F-a are found in the source water area,		X (2)		
Septic systems are present in the source water area,				Х
A well is indirectly connected to a surface water body,				Х
A submersible well pump cannot be ruled out from containing PCBs or PHAs, or				Х
There is a high density of transportation corridors in the source water area.				Х
A system is highly susceptible to contamination if:				
Any contaminant sites identified in the source water area are known to have contaminated groundwater that may migrate toward a well.				х
<ul> <li>(1) This system was not assessed to determine if adequate security devices such as padlocks, gates, and lighting are in place to deter vandals and have this type of protection in place.</li> <li>(2) A well (or wells) serving this system has been determined to be susceptible due to the presence of potential contaminant sources. The water si team should take extra care to ensure that all potential contaminants in the source water area are handled properly to avoid contamination of the determined to be susceptible.</li> </ul>	I saboteur ystem and Irinking wa	s. All wat the wellh ter supply	er system ead prote /.	s should