2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

FLY ASH IMPOUNDMENT
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

Presented To:
Evergy Missouri West, Inc. (f/k/a KCP&L Greater Missouri Operations Co.)

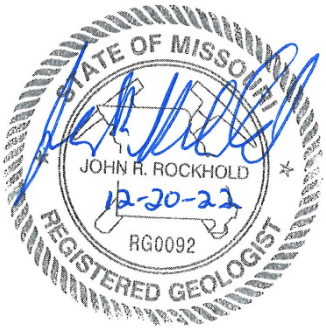
SCS ENGINEERS

27213169.19 | January 2020, Revised December 20, 2022

8575 W 110th Street, Suite 100
Overland Park, Kansas 66210
913-681-0030

CERTIFICATIONS

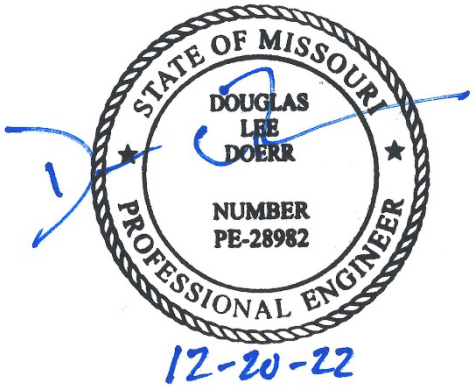
I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Fly Ash Impoundment at the Sibley Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



John R. Rockhold, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Fly Ash Impoundment at the Sibley Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions
0	January 2020	NA	Original Report.
1	December 20, 2022	Addendum 1	Added Addendum 1

Table of Contents

Section **Page**

Appendices

1 INTRODUCTION

This 2019 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015). Specifically, this report was prepared for Evergy Missouri West, Inc. (f/k/a KCP&L Greater Missouri Operations Company, Inc.) to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Fly Ash Impoundment at the Sibley Generating Station.

2 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:*

2.1 § 257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A site map with an aerial image showing the Fly Ash Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Fly Ash Impoundment groundwater monitoring program is provided as **Figure 1** in **Appendix A**.

2.2 § 257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed and no wells were decommissioned as part of the CCR groundwater monitoring program for the Fly Ash Impoundment in 2018.

2.3 § 257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Only detection monitoring was conducted during the reporting period (2019). Samples collected in 2019 were collected and analyzed for Appendix III detection monitoring constituents as indicated in **Appendix B**, **Table 1** (Appendix III Detection Monitoring Results, and **Table 2** (Detection Monitoring Field Measurements). The dates of sample collection, the monitoring program requiring the sample, and the results of the analyses are also provided in these tables. These tables include Fall 2018 semiannual detection monitoring event verification data taken in 2019; Spring 2019 semiannual detection monitoring data; and the initial Fall 2019 semiannual detection monitoring data.

2.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

There was no transition between monitoring programs in 2019. Only detection monitoring was conducted in 2019.

2.5 § 257.90(e)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

A summary of potentially required information and the corresponding section of the Rule is provided in the following sections. In addition, the information, if applicable, is provided.

2.5.1 § 257.90(e) Program Status

Status of Groundwater Monitoring and Corrective Action Program.

The groundwater monitoring and corrective action program is in detection monitoring.

Summary of Key Actions Completed.

a. completion of the Fall 2018 verification sampling and analyses per the certified statistical method,

b. completion of the statistical evaluation of the Fall 2018 semiannual detection monitoring sampling and analysis event per the certified statistical method,

c. completion of the 2018 Annual Groundwater Monitoring and Corrective Action Report,

d. completion of a successful alternative source demonstration for the Fall 2018 semiannual detection monitoring sampling and analysis event,

e. completion of the Spring 2019 semiannual detection monitoring sampling and analysis event, and subsequent verification sampling per the certified statistical method,

f. completion of the statistical evaluation of the Spring 2019 semiannual detection monitoring sampling and analysis event per the certified statistical method,

g. completion of a successful alternative source demonstration for the Spring 2019 semiannual detection monitoring sampling and analysis event, and

h. initiation of the Fall 2019 semiannual detection monitoring sampling and analysis event.

Description of Any Problems Encountered.

No noteworthy problems were encountered.

Discussion of Actions to Resolve the Problems.

Not applicable because no noteworthy problems were encountered.

Projection of Key Activities for the Upcoming Year (2020).

Completion of verification sampling and data analysis, and the statistical evaluation of Fall 2019 detection monitoring sampling and analysis event. Semiannual Spring and Fall 2020 groundwater sampling and analysis. Completion of the statistical evaluation of the Spring 2020 detection monitoring sampling and analysis event, and, if required, alternative source demonstration(s).

2.5.2 § 257.94(d)(3) Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because no alternative monitoring frequency for detection monitoring and certification was pursued.

2.5.3 § 257.94(e)(2) Detection Monitoring Alternate Source Demonstration

Demonstration that a source other than the CCR unit caused the statistically significant increase (SSI) over background levels for a constituent or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

The following demonstration reports are included as **Appendix C:**

C.1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (June 2019).

C.2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (December 2019).

2.5.4 § 257.95(c)(3) Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because there was no assessment monitoring conducted.

2.5.5 § 257.95(d)(3) Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the concentrations of Appendix III and detected Appendix IV constituents from the assessment monitoring, the established background concentrations, and the established groundwater protection standards.

Not applicable because there was no assessment monitoring conducted.

2.5.6 § 257.95(g)(3)(ii) Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

2.5.7 § 257.96(a) Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

3 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. The information contained in this report is a reflection of the conditions encountered at the Sibley Generating Station at the time of fieldwork. This report includes a review and compilation of the required information and does not reflect any variations of the subsurface, which may occur between sampling locations. Actual subsurface conditions may vary and the extent of such variations may not become evident without further investigation.

Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Missouri West, Inc. for specific application to the Sibley Generating Station Fly Ash Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

LEGEND:

506 CCR GROUNDWATER MONITORING SYSTEM WELLS

CCR UNIT BOUNDARY

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE, MARCH 2015. MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITORING WELL LOCATIONS ARE APPROXIMATE.

200 0 200 400

SCALE FEET

REV.	DATE
-	-

SHEET TITLE
SITE MAP
FLY ASH IMPOUNDMENT
CCR GROUNDWATER MONITORING SYSTEM

PROJECT TITLE
2019 GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT

CLIENT
EVERGY MISSOURI WEST, INC
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	QA/QC BY:	PROJ. MGR.
27213169.19	TGW	JRF	JRF	JRF

DSGN. BY: TGW

CADD FILE:
FIG 1 – SIBLEY FLY ASH IMP.DWG

DATE:
1/07/20

FIGURE NO.
1

N:\KCPL\PROJECTS\GROUNDWATER\DWG\SIBLEY\ANNUAL CCR REPORTING\2019\FIG 1 - SIBLEY FLY ASH IMP.DWG

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
Fly Ash Impoundment
Appendix III Detection Monitoring Results
Evergy Sibley Generating Station

Well Number	Sample Date	Appendix III Constituents						
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Dissolved Solids (mg/L)
MW-801	1/11/2019	---	---	*124	---	**6.58	---	---
MW-801	3/12/2019	---	---	*144	---	**6.84	---	---
MW-801	5/22/2019	0.549	178	154	0.151	6.87	88.3	817
MW-801	7/16/2019	*0.326	*152	*127	---	**6.71	*56.6	*613
MW-801	8/21/2019	---	---	*124	---	**6.65	---	---
MW-801	11/6/2019	0.278	144	109	0.172	6.69	59.0	567
MW-802	1/11/2019	---	*111	---	---	**6.66	---	---
MW-802	3/12/2019	---	*107	---	---	**6.91	---	---
MW-802	5/22/2019	<0.200	85.5	62.0	0.227	6.77	35.4	383
MW-802	11/6/2019	<0.200	52.2	32.0	0.157	6.46	49.9	285
MW-803	1/11/2019	---	---	*16.0	---	**7.14	---	---
MW-803	5/22/2019	2.77	119	15.9	0.272	7.01	120	535
MW-803	11/6/2019	2.74	112	17.7	0.300	7.11	107	495
MW-804	1/11/2019	*8.71	---	---	*0.234	**6.97	*31.8	---
MW-804	3/12/2019	*5.71	---	---	---	**7.11	*<5.00	---
MW-804	5/22/2019	7.64	169	17.7	0.233	6.93	<5.00	719
MW-804	7/16/2019	*7.59	---	---	---	**7.48	---	*585
MW-804	8/21/2019	*8.14	---	---	---	**6.95	---	---
MW-804	11/6/2019	8.31	151	19.2	0.269	7.32	<5.00	615
MW-805	5/22/2019	<0.200	98.7	8.65	0.201	7.03	51.1	357
MW-805	11/6/2019	<0.200	94.0	8.65	0.197	7.05	50.5	302
MW-806R	1/11/2019	*5.76	*175	---	---	**7.05	*237	*739
MW-806R	3/12/2019	*5.75	*173	---	---	**7.27	*256	*681
MW-806R	5/22/2019	5.58	171	28.7	0.215	6.99	238	731
MW-806R	7/16/2019	*5.64	*172	---	---	**7.37	*244	*671
MW-806R	8/21/2019	*5.66	*170	---	---	**7.08	*241	---
MW-806R	11/6/2019	5.62	164	28.2	0.213	7.17	249	691

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.
**Extra Sample for Quality Control Validation or per Standard Sampling Procedure
mg/L - miligrams per liter
pCi/L - picocuries per liter
S.U. - Standard Units
--- Not Sampled

Table 2
Fly Ash Impoundment
Detection Monitoring Field Measurements
Evergy Sibley Generating Station

Well Number	Sample Date	pH (S.U.)	Specific Conductivity (µS)	Temperature (°C)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-801	1/11/2019	**6.58	1080	10.98	2.1	160	0.97	20.72	709.64
MW-801	3/12/2019	**6.84	1120	11.92	0.0	164	1.52	21.05	709.31
MW-801	5/22/2019	6.87	1120	16.19	0.0	160	1.39	15.39	714.97
MW-801	7/16/2019	**6.71	1010	14.80	0.0	57	2.21	15.60	714.76
MW-801	8/21/2019	**6.65	995	15.47	0.0	254	1.83	16.78	713.58
MW-801	11/6/2019	6.69	1070	13.03	0.0	51	2.68	17.13	713.23
MW-802	1/11/2019	**6.66	817	11.11	4.6	100	0.00	14.06	717.11
MW-802	3/12/2019	**6.91	814	11.19	0.0	78	0.53	13.83	717.34
MW-802	5/22/2019	6.77	663	12.41	0.0	45	1.17	10.90	720.27
MW-802	11/6/2019	6.46	615	12.70	0.0	71	6.21	11.07	720.10
MW-803	1/11/2019	**7.14	825	11.69	1.4	-298	0.00	22.31	704.58
MW-803	5/22/2019	7.01	820	16.69	0.0	-127	1.98	14.14	712.75
MW-803	11/6/2019	7.11	750	14.81	0.0	-136	0.79	20.25	706.64
MW-804	1/11/2019	**6.97	1050	11.78	20.5	-312	0.00	29.10	699.36
MW-804	3/12/2019	**7.11	1010	13.65	23.1	-129	0.46	27.90	700.56
MW-804	5/22/2019	6.93	1110	17.20	12.2	-135	0.89	15.09	713.37
MW-804	7/16/2019	**7.48	1090	19.50	28.0	-148	5.17	21.05	707.41
MW-804	8/21/2019	**6.95	1020	20.19	25.5	-60	0.00	22.19	706.27
MW-804	11/6/2019	7.32	1120	15.09	10.4	-123	0.55	23.74	704.72
MW-805	5/22/2019	7.03	604	15.29	8.6	-65	6.93	14.08	714.71
MW-805	11/6/2019	7.05	540	14.79	0.0	-67	0.37	27.34	701.45
MW-806R	1/11/2019	**7.05	1070	11.70	5.1	-219	0.00	22.31	706.85
MW-806R	3/12/2019	**7.27	1110	12.93	0.0	-103	0.43	22.34	706.82
MW-806R	5/22/2019	6.99	1010	14.61	19.3	-99	7.65	14.25	714.91
MW-806R	7/16/2019	**7.37	1020	22.19	18.4	-99	5.84	18.17	710.99
MW-806R	8/21/2019	**7.08	987	20.33	0.0	-20	0.00	18.70	710.46
MW-806R	11/6/2019	7.17	1050	14.68	16.4	-78	0.66	19.53	709.63

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

S.U. - Standard Units

µS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

APPENDIX C

ALTERNATIVE SOURCE DEMONSTRATIONS

C.1 Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (June 2019)

C.2 Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (December 2019)

C.1 Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (June 2019)

CCR GROUNDWATER MONITORING

ALTERNATIVE SOURCE DEMONSTRATION REPORT

NOVEMBER 2018 GROUNDWATER MONITORING EVENT

FLY ASH IMPOUNDMENT

SIBLEY GENERATING STATION

SIBLEY, MISSOURI

Presented To:

KCP&L Greater Missouri Operations Company

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

June 2019

File No. 27213169.19

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.

John R. Rockhold, R.G.
SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.

Douglas L. Doerr, P.E.
SCS Engineers

Table of Contents

Section **Page**

Appendices

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels 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 or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the Fly Ash Impoundment at the Sibley Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on November 15, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on January 2, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a SSI over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on January 11, 2019 and March 12, 2019.

The completed statistical evaluation identified seven Appendix III constituents above their respective prediction limit in monitoring wells MW-801, MW-802, MW-804, and MW-806R.

The prediction limit for boron in monitoring well MW-804 is 5.133 mg/L. The detection monitoring sample was reported at 8.07 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 8.71 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 5.71 mg/L.

The prediction limit for boron in monitoring well MW-806R is 5.323 mg/L. The detection monitoring sample was reported at 5.56 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 5.76 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 5.75 mg/L.

The prediction limit for calcium in upgradient monitoring well MW-802 is 100.7 mg/L. The detection monitoring sample was reported at 101 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 111 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 107 mg/L.

The prediction limit for calcium in monitoring well MW-806R is 151.8 mg/L. The detection monitoring sample was reported at 168 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 175 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 173 mg/L.

The prediction limit for chloride in upgradient monitoring well MW-801 is 104.1 mg/L. The detection monitoring sample was reported at 115 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 124 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 144 mg/L.

The prediction limit for sulfate in monitoring well MW-806R is 191.9 mg/L. The detection monitoring sample was reported at 236 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 237 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 256 mg/L.

The prediction limit for total dissolved solids (TDS) in monitoring well MW-806R is 679.2 mg/L. The detection monitoring sample was reported at 699 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 739 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 681 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring samples for boron from monitoring wells MW-804 and MW-806R, for calcium in monitoring wells MW-802 and MW-806R, for chloride in monitoring well MW-801, and for sulfate and TDS in monitoring well MW-806R exceeds their respective prediction limits and are confirmed statistically significant increases (SSI) over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified SSIs above the background prediction limits for chloride in upgradient monitoring well MW-801, for calcium in upgradient monitoring well MW-802, for boron in monitoring wells MW-804, and for boron, calcium, sulfate, and TDS in monitoring well MW-806R.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above-identified SSIs for the Fly Ash Impoundment at the Sibley Generating Station, there are multiple lines of supporting evidence to indicate the above SSIs were not caused by a release from the Fly Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 UPGRADIENT WELL LOCATION

Figure 1 in **Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the Fly Ash Impoundment at the time of sampling. As seen on the map, monitoring wells MW-801 and MW-802 are located upgradient from the Fly Ash Impoundment indicating the SSI for chloride in MW-801 and the SSI for calcium in MW-802 are not caused by a release from the Fly Ash Impoundment. This demonstrates that a source other than the Fly Ash Impoundment caused the SSIs over background levels for chloride and calcium in these wells or that

the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.2 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

The box and whiskers plot for boron in monitoring well MW-806R was compared to the concentration of boron in ash impoundment pore water (sample ASD-1). The concentration of boron in sample ASD-1 plotted alongside the box and whiskers plot for boron in monitoring well MW-806R, shows the boron concentration in the ash impoundment pore water directly upgradient from MW-806R is less than the boron concentration in MW-806R. This demonstrates that a source other than the Fly Ash Impoundment (specifically ash impoundment pore water directly upgradient of MW-806R) caused the SSI over background levels for boron, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for boron are provided in Appendix B.

The box and whiskers plot for sulfate in monitoring well MW-806R was compared to the box and whiskers plot for sulfate from the river. The box and whiskers plots for sulfate from each location overlap significantly. This occurs even with a limited data set for sulfate from the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for sulfate are provided in Appendix B.

The box and whiskers plot for calcium in monitoring well MW-806R was compared to the box and whiskers plots for calcium from upgradient well MW-801, and from the river, and the calcium concentration from ash impoundment pore water (sample ASD-1). The box and whiskers plots for calcium from MW-806R significantly overlap the plots for upgradient well MW-801 and the river. Additionally, the calcium concentration of the ash impoundment pore water directly upgradient of MW-806R is less than the calcium concentrations of both monitoring wells and the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for calcium are provided in Appendix B.

The box and whiskers plot for TDS in monitoring well MW-806R was compared to the box and whiskers plots for TDS from upgradient well MW-801, and from water from the ash impoundment (sample FLYASHPOND). The box and whiskers plot for TDS from MW-806R overlaps the plot for upgradient well MW-801 and the water from the ash impoundment has TDS levels typically below that of water from MW-806R. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for TDS, or that the SSI resulted from error in

sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for TDS are provided in **Appendix B**.

3.3 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na), Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO4), Carbonate (CO3), and Bicarbonate (HCO3).

A piper diagram with plots for MW-801, MW-802, MW-804, and MW-806R was compared to piper diagram plots for three ash pore water samples (ASD-1, ASD-2, and ASD-3) collected in the Fly Ash Impoundment with a Geoprobe® screen-point 15 groundwater sampler. Sample locations are shown on **Figure 1** in **Appendix A**. Samples were collected on the same day for the ash pore water and wells MW-804 and MW-806R. The analytical reports are provided in **Appendix C** along with the piper diagram. The piper diagram plots indicate the groundwater from wells does not exhibit the same geochemical characteristics as the ash pore water. The groundwater and the ash pore water plot in different hydrochemical facies indicating there are two types of water (groundwater and ash pore water). This helps demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels for boron, calcium, TDS, and sulfate or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.5 BORON STABLE ISOTOPE RATIO EVALUATION

The boron stable isotope ratio in coal and coal ash generally vary significantly from the boron stable isotope ratio found in naturally occurring groundwater. The National Bureau of Standards standard reference material 951 (NBS SRM-951), which is a boric acid, is used as the isotopic standard for boron. Boron has two stable isotopes, ^{10}B and ^{11}B. Isotopic ratios of samples are reported as per mil (‰) differences from NBS SRM-951. The delta value for $^{11}B/^{10}B$ is expressed as $\delta^{11}B$, ‰. Previous studies have found $\delta^{11}B$ values for coal ash and coal ash leachate samples between -40 ‰ and +6.6 ‰ and most natural groundwaters have $\delta^{11}B$ values between +10 ‰ and +30 ‰ (Refs. 1, 2, and 3).

A groundwater sample was collected from MW-804 for boron and for $\delta^{11}B$ analysis on November 8, 2018. Additionally, ash pore water samples (ASD-1, ASD-2, and ASD-3) were collected with a Geoprobe® screen-point 15 groundwater sampler on the same day and for the same analysis. Sample locations are shown on **Figure 1** in **Appendix A**. The laboratory reports for the analysis are provided in **Appendix D**.

Boron concentration plotted against $\delta^{11}B$, ‰ for each of the samples are provided in **Appendix D.** The boron concentrations in ASD-1 (3.3 mg/L) and ASD-2 (3.56 mg/L) were less than the boron concentration in MW-804 (8.37 mg/L). The ash pore water from ASD-3 had the highest boron

concentration at 18.8 mg/L. Although groundwater from MW-804 had a boron concentration less than one of the ash pore water samples, the $\delta^{11}B$ for the boron from MW-804 was +12.9 ‰ and significantly greater than the $\delta^{11}B$ for the ash pore water which ranged from -6.18 ‰ to -10.11 ‰. The significantly higher and positive $\delta^{11}B$ for groundwater from MW-804 demonstrates an alternative source of boron at the site other than the Fly Ash Impoundment.

Below the boron vs $\delta^{11}B$ plot in **Appendix D**, is a figure (Ref. 4) showing $\delta^{11}B$ ranges for natural waters from various natural materials and waters impacted by anthropogenic sources. The figure further demonstrates based on $\delta^{11}B$ values for MW-804 that there is an alternative source of boron other than the Fly Ash Impoundment.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the successful ASDs, the owner or operator of the Fly Ash Impoundment may continue with the detection monitoring program under § 257.94.

5 REFERENCES

1. **Buska, Paul M., Fitzpatrick, John and Watson, Lee R. and Kay, Robert T.** *Evaluation of Ground-Water and Boron Sources by Use of Boron Stable-Isotope Ratios,Tritium, and Selected Water Chemistry Constituents near Beverly Shores, Northwestern Indiana*, 2004. U.S. Geological Survey Scientific Investigations Report 2007-5166. 2007).

2. *A Twenty-Month Geochemical and Isotopic Investigation into Environmental Impacts of the 2008 TVA Coal Ash Spill, - May*. **Ruhl, Laura S. and Vengosh, Avner and Dwyer, Gary S. and Hsu-Kim, Heileen and Deonarine, Amrika**. Denver, CO, USA : s.n., 2011. 2011 World of Coal Ash (WOCA) Conference - May 9-12, 2011.

3. *Boron and Strontium Isotopic Characterization of Coal Combustion Residuals: Validation of Novel Environmental Tracers,* Paper No. 30616-208920. **Ruhl, Laura.** Charlotte, NC : s.n., 2012. 2012 Geological Society of America Annual Meeting and Exposition, 4-7 November.

4. **Ruhl, Laura.** *Geochemical and Isotopic Characterization of Coal Combustion Residuals: Implications for Potential Environmental Impacts.* Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Earth and Ocean Sciences in the Graduate School of Duke University, 2012.

6 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive

use of KCP&L Greater Missouri Operations Company for specific application to the Sibley Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represents that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Figure 1

LEGEND:

- 760 — GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
- 801 — GROUNDWATER MONITORING SYSTEM WELL (GROUNDWATER ELEVATION)
- CCR SURFACE IMPOUNDEMENT UNIT BOUNDARY
- GROUNDWATER FLOW DIRECTION

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 165305111.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE. MARCH 2015.
3. BOUNDARY AND MONITORING WELL WELL LOCATIONS SHOWN ARE APPROXIMATE.

200 0 200 400
SCALE FEET

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (NOV. 2018)
CCR FLY ASH IMPOUNDMENT

PROJECT TITLE
CCR ALTERNATIVE SOURCE DEMONSTRATION

CLIENT
KCP&L GREATER MISSOURI OPERATIONS CO.
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St. Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27213169.19
DSN. BY: TGW
DWN. BY: TGW
CHK. BY: JRF
Q/A RVW BY: JRR
PRCL. MGR: JRF

CADD FILE:
18-NOV_ALTERNATIVE SOURCE DEMONSTRATION.DWG

DATE: 06/07/19

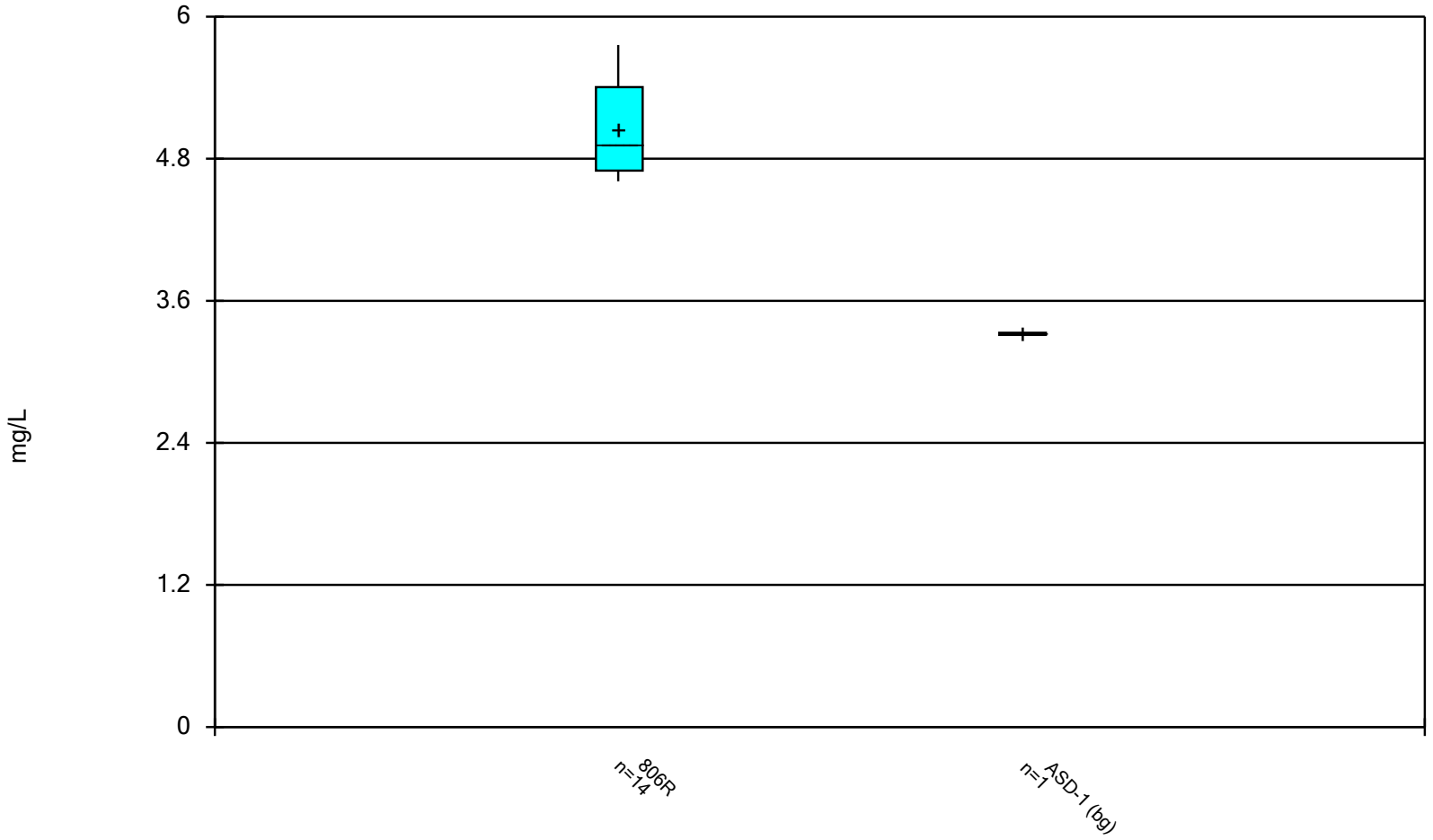
FIGURE NO. 1

N:\KCPL\Projects\Groundwater\DWG\Sibley\2018\GW\18-NOV_Alternative Source Demonstration.dwg Jun 26, 2019 - 8:49am Layout Name: Fig 2C By: 4336p_m

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Boron Analysis Run 5/23/2019 1:15 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Boron (mg/L) Analysis Run 5/23/2019 1:17 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

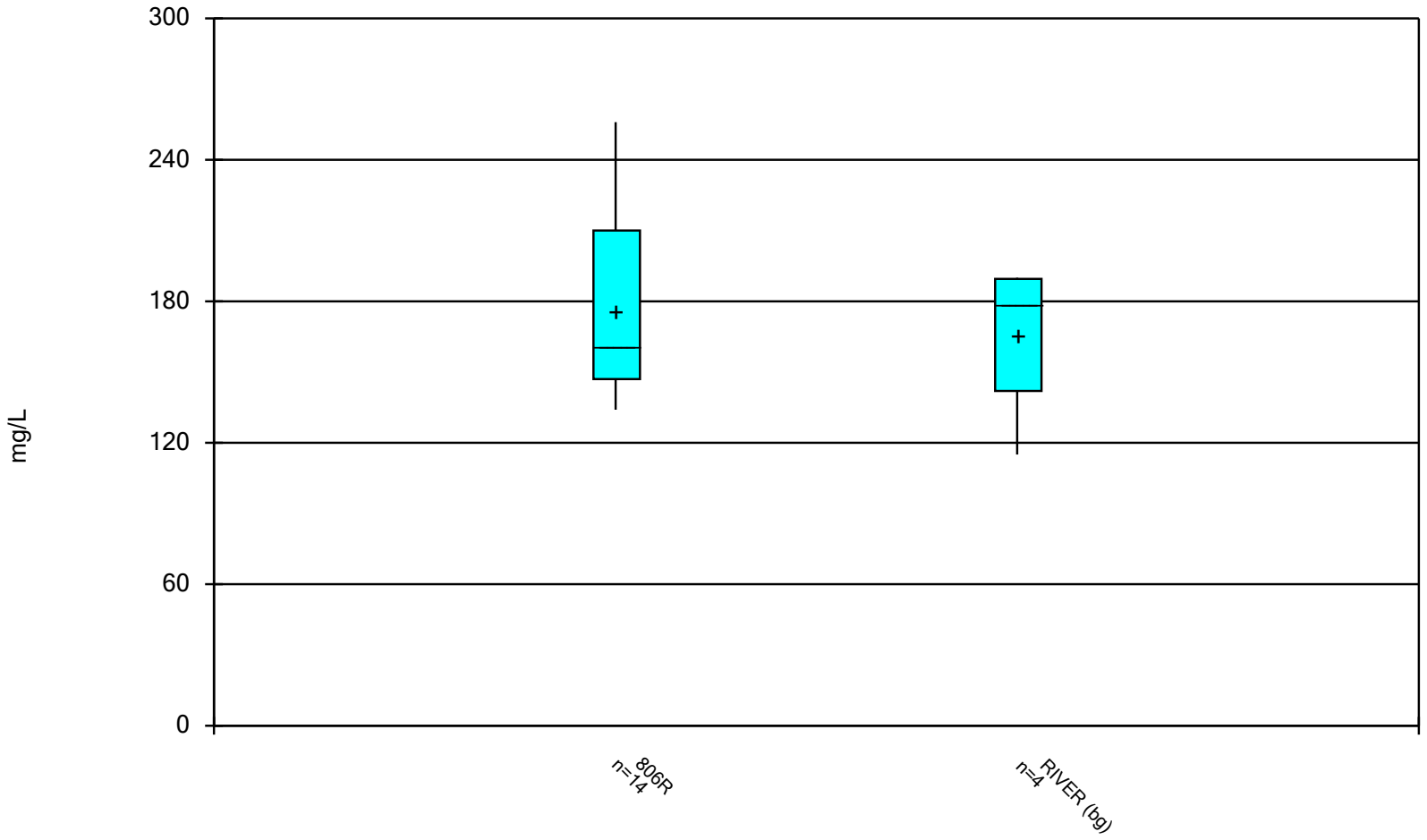
	806R	ASD-1 (bg)
6/2/2016	5.1	
7/19/2016	4.81	
8/23/2016	5.25	
11/11/2016	4.77	
2/9/2017	4.64	
3/22/2017	5.02	
5/3/2017	4.76	
8/1/2017	4.61	
10/4/2017	4.77	
5/16/2018	4.64	
11/8/2018	5.19	3.33
11/15/2018	5.56	
1/11/2019	5.76	
3/12/2019	5.75	
Median	4.915	3.33
LowerQ.	4.7	3.33
UpperQ.	5.405	3.33
Min	4.61	3.33
Max	5.76	3.33
Mean	5.045	3.33

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 1:17 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Boron (mg/L)	806R	14	5.045	0.4062	0.1086	4.915	4.61	5.76	0
Boron (mg/L)	ASD-1 (bg)	1	3.33	0	0	3.33	3.33	3.33	0

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 5/23/2019 1:04 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Sulfate (mg/L) Analysis Run 5/23/2019 1:05 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

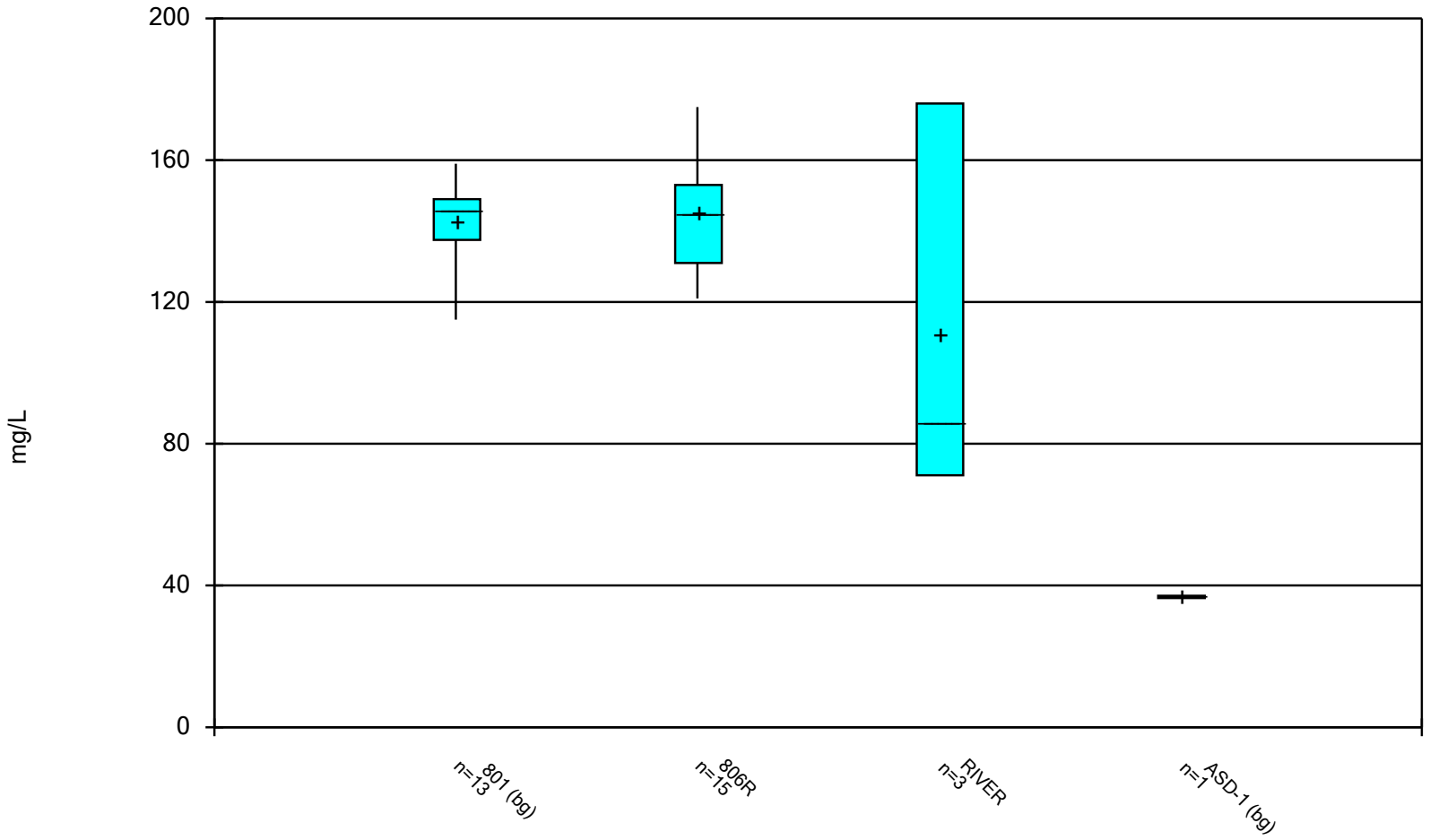
	806R	RIVER (bg)
5/26/2016		115
6/2/2016	182	
7/19/2016	139	169
8/23/2016	146	
11/10/2016		190
11/11/2016	134	
2/9/2017	165	189
3/22/2017	150	
5/3/2017	149	
8/1/2017	181	
10/4/2017	148	
5/16/2018	157	
11/8/2018	184	
11/15/2018	236	
1/11/2019	237	
3/12/2019	256	
Median	161	179
LowerQ.	147	142
UpperQ.	210	189.5
Min	134	115
Max	256	190
Mean	176	165.8

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 1:05 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Sulfate (mg/L)	806R	14	176	39.76	10.63	161	134	256	0
Sulfate (mg/L)	RIVER (bg)	4	165.8	35.19	17.59	179	115	190	0

Box & Whiskers Plot



Constituent: Calcium Analysis Run 5/23/2019 12:44 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Calcium (mg/L) Analysis Run 5/23/2019 12:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

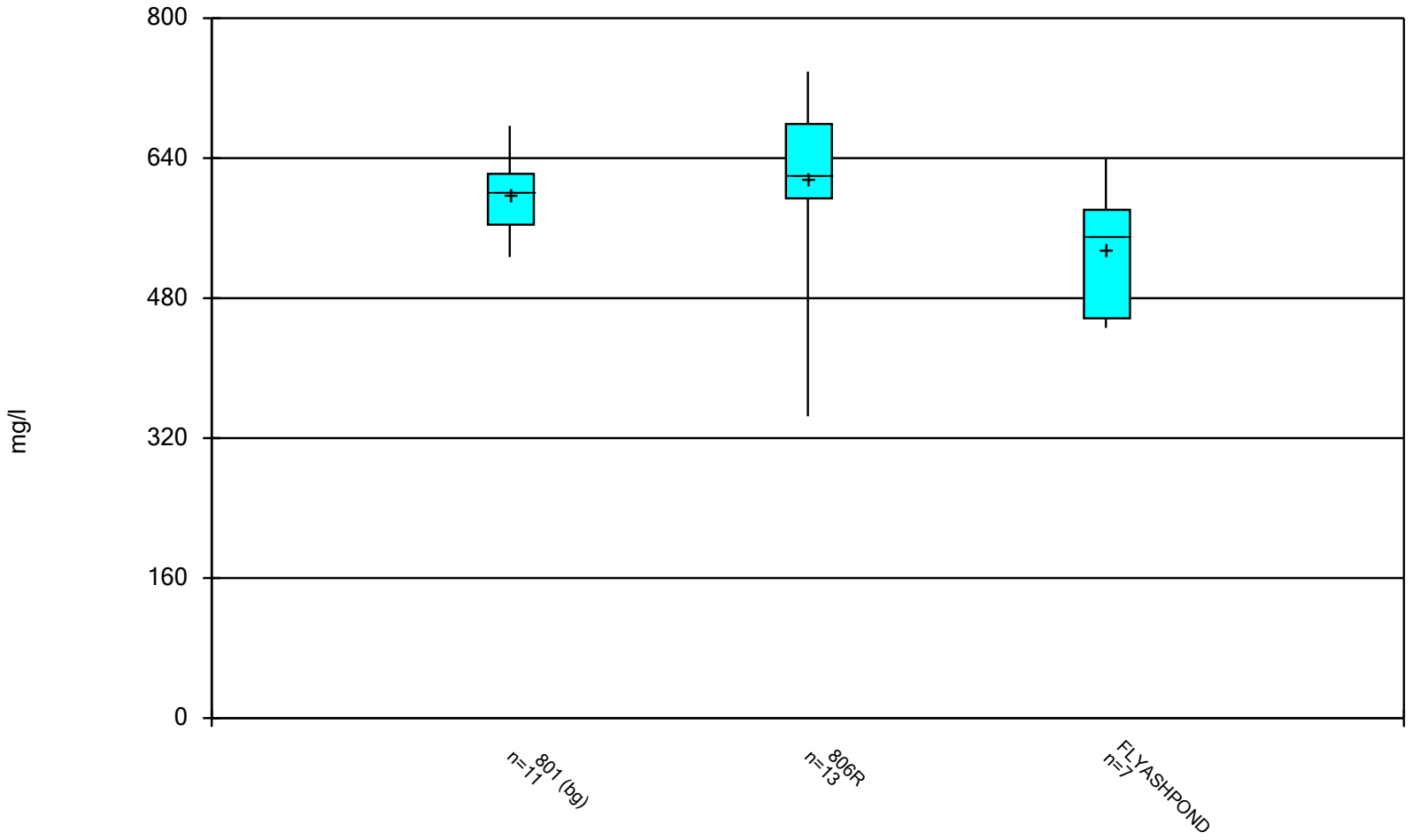
	801 (bg)	806R	RIVER	ASD-1 (bg)
12/16/2015	159			
2/17/2016	150			
5/26/2016	147		85.7	
6/2/2016		135		
7/19/2016		131		
8/23/2016	137	141		
11/10/2016	143		176	
11/11/2016		137		
2/9/2017	115	123	71.1	
3/22/2017		126		
5/3/2017	127	121		
8/1/2017	138	149		
10/4/2017	148	148		
11/16/2017	156			
11/17/2017		151		
5/16/2018	146	145		
11/8/2018		153		37.1
11/15/2018	143	168		
1/11/2019	146	175		
3/12/2019		173		
Median	146	145	85.7	37.1
LowerQ.	137.5	131	71.1	37.1
UpperQ.	149	153	176	37.1
Min	115	121	71.1	37.1
Max	159	175	176	37.1
Mean	142.7	145.1	110.9	37.1

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 12:46 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Calcium (mg/L)	801 (bg)	13	142.7	11.66	3.235	146	115	159	0
Calcium (mg/L)	806R	15	145.1	17.19	4.437	145	121	175	0
Calcium (mg/L)	RIVER	3	110.9	56.82	32.81	85.7	71.1	176	0
Calcium (mg/L)	ASD-1 (bg)	1	37.1	0	0	37.1	37.1	37.1	0

Box & Whiskers Plot



Constituent: Dissolved Solids Analysis Run 5/23/2019 12:59 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Dissolved Solids (mg/l) Analysis Run 5/23/2019 1:00 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801 (bg)	806R	FLYASHPOND
12/16/2015	601		
2/17/2016	589		
5/26/2016	669		457
6/2/2016		677	
7/19/2016		624	
8/23/2016	544	605	641
11/10/2016	602		552
11/11/2016		589	
2/9/2017	564	633	581
3/22/2017		568	
5/3/2017	622	620	
5/4/2017			446
8/1/2017	527	599	559
10/4/2017	677	621	521
5/16/2018	609	345	
11/15/2018	586	699	
1/11/2019		739	
3/12/2019		681	
Median	601	621	552
LowerQ.	564	594	457
UpperQ.	622	679	581
Min	527	345	446
Max	677	739	641
Mean	599.1	615.4	536.7

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 1:00 PM

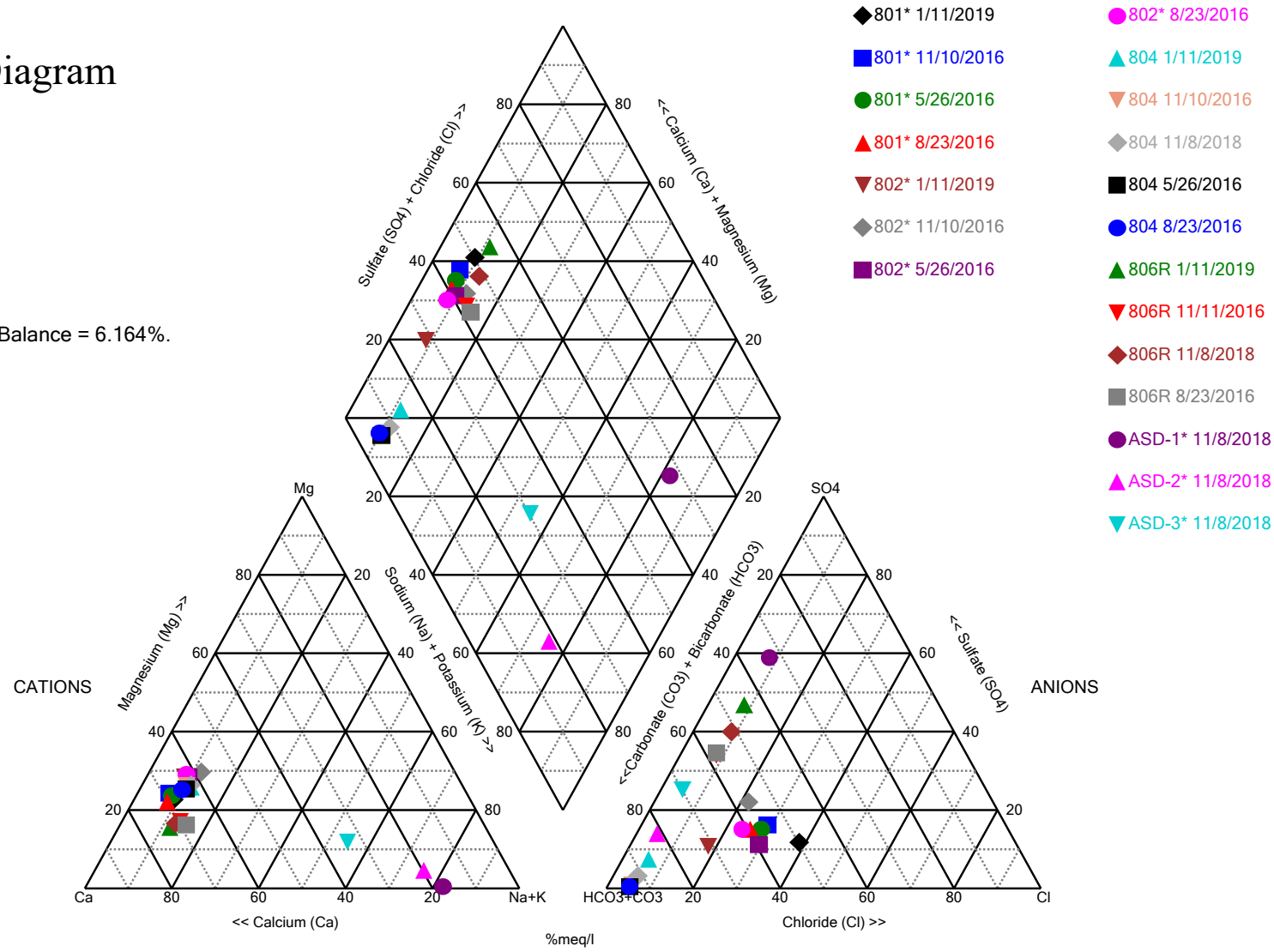
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Dissolved Solids (mg/l)	801 (bg)	11	599.1	46.18	13.92	601	527	677	0
Dissolved Solids (mg/l)	806R	13	615.4	94.53	26.22	621	345	739	0
Dissolved Solids (mg/l)	FLYASHPOND	7	536.7	68.8	26	552	446	641	0

Appendix C

Piper Diagram and Laboratory Results

Piper Diagram

Cation-Anion Balance = 6.164%.



Analysis Run 4/2/2019 3:54 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Piper Diagram

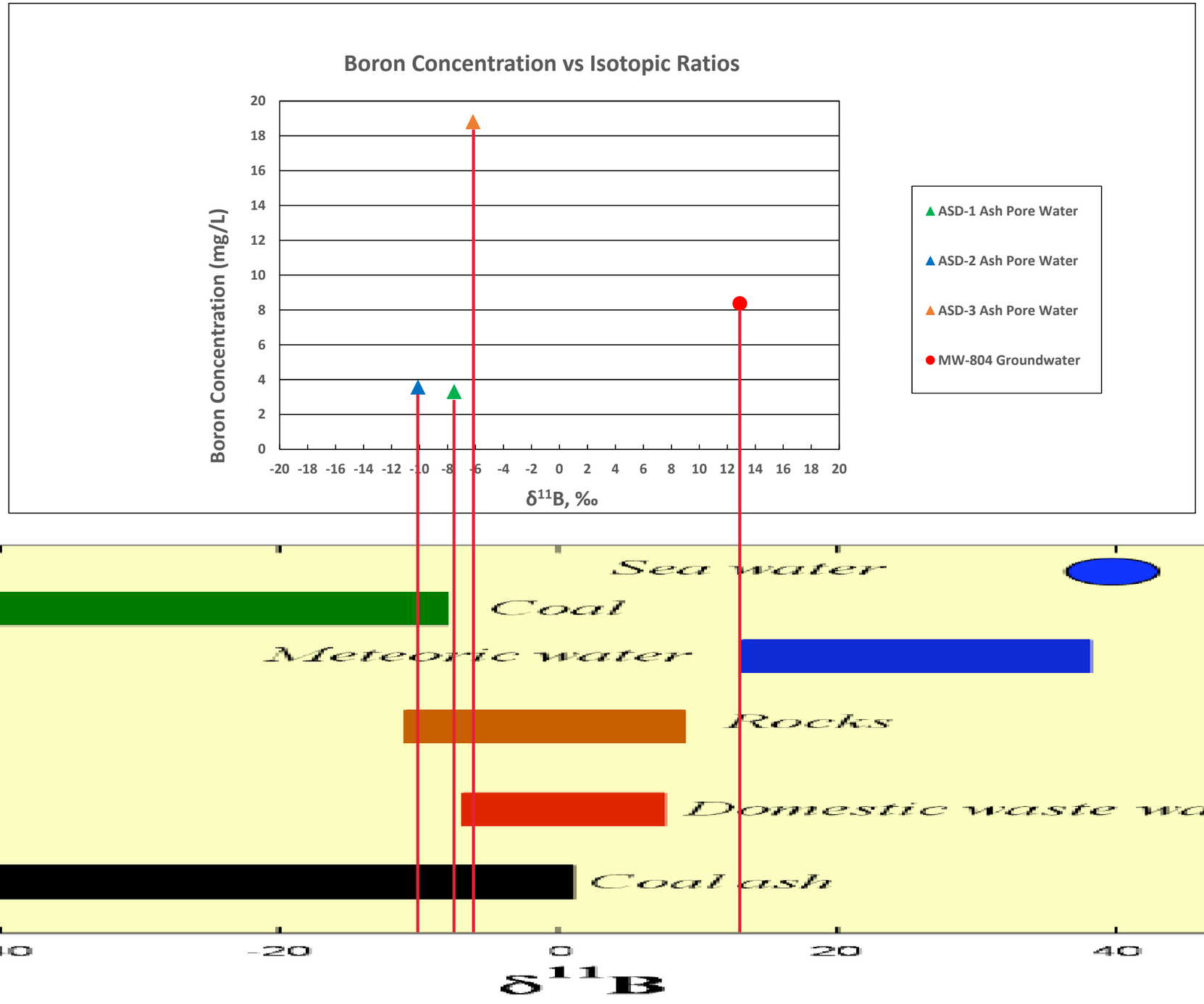
Analysis Run 4/2/2019 3:55 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
801* 5/26/2016	19.1	1.43	147	31	88.2	65.2	304	10
801* 8/23/2016	16.9	1.15	137	25.8	73.8	58.6	288	10
801* 11/10/2016	17	1.21	143	30	88.2	66.5	282	10
801* 1/11/2019	21.9	1.28	146	29	124	52.3	271	10
802* 5/26/2016	10.6	2.43	68.9	19.3	50.5	26.1	161	10
802* 8/23/2016	11.5	2.67	82.2	23.2	46.3	41.2	199	10
802* 11/10/2016	9.98	2.56	49.6	15.1	26.6	38	106	10
802* 1/11/2019	15.3	3.3	111	30.1	44.2	37.1	304	10
804 5/26/2016	27.8	5.99	167	39.8	15.5	2.5	596	10
804 8/23/2016	24.9	4.62	157	37	14.4	2.5	551	10
804 11/10/2016	26.2	4.71	155	39	14.2	2.5	525	10
804 11/8/2018	30.1	5.76	158	39.8	18.3	14.1	561	10
804 1/11/2019	26.8	5.58	145	35.7	17.6	31.8	479	10
806R 8/23/2016	34.5	3.75	141	19.7	22.9	146	298	10
806R 11/11/2016	29.1	3.49	137	20.2	22.9	134	277	10
806R 11/8/2018	29	3.46	153	21.4	27.2	184	287	10
806R 1/11/2019	30.1	3.69	175	22.8	28.4	237	274	10
ASD-1* 11/8/2018	178	38.6	37.1	0.5	29.3	303	10	104
ASD-2* 11/8/2018	497	82.4	124	17	43.8	211	10	795
ASD-3* 11/8/2018	365	42.2	208	43.8	41.5	336	10	592

Appendix D

Boron and Stable Isotope Plots and Laboratory Results


Boron Concentration vs Isotopic Ratios
Boron Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20
δ11B, ‰
ASD-1 Ash Pore Water
ASD-2 Ash Pore Water
ASD-3 Ash Pore Water
MW-804 Groundwater
Sea water
Coal
Meteoric water
Rocks
Domestic waste water
Coal ash
-40
-20
0
20
40
δ11B

Report

L1836000

17HVXQ17MHY

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

Analysis: IR

Your ID	**MW-804**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535495

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Web: www.alsglobal.se
Email: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

The digitally signed PDF file represents the original report. Any printouts are to be considered as copies.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1836000
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
MW-804	U11535495	12.89	*0.74*
MW-804, r.2	U11535495	13.26	*0.82*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Report

L1833729

17HW78DG7V0

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

This report replaces any previous report with the same number.

Analysis: IR

Your ID	**ASD-1**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535491

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-2**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535492

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-3**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535493

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1833729
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
ASD-1	U11535491	-7.53	*0.89*
ASD-1, r.2	U11535491	-7.08	*0.77*
ASD-2	U11535492	-10.11	*0.90*
ASD-3	U11535493	-6.18	*0.81*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042982
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-804 L1042982-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 15:35	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:32	ST

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

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8370		200	1	11/14/2018 13:32	WG1194483

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description

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

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

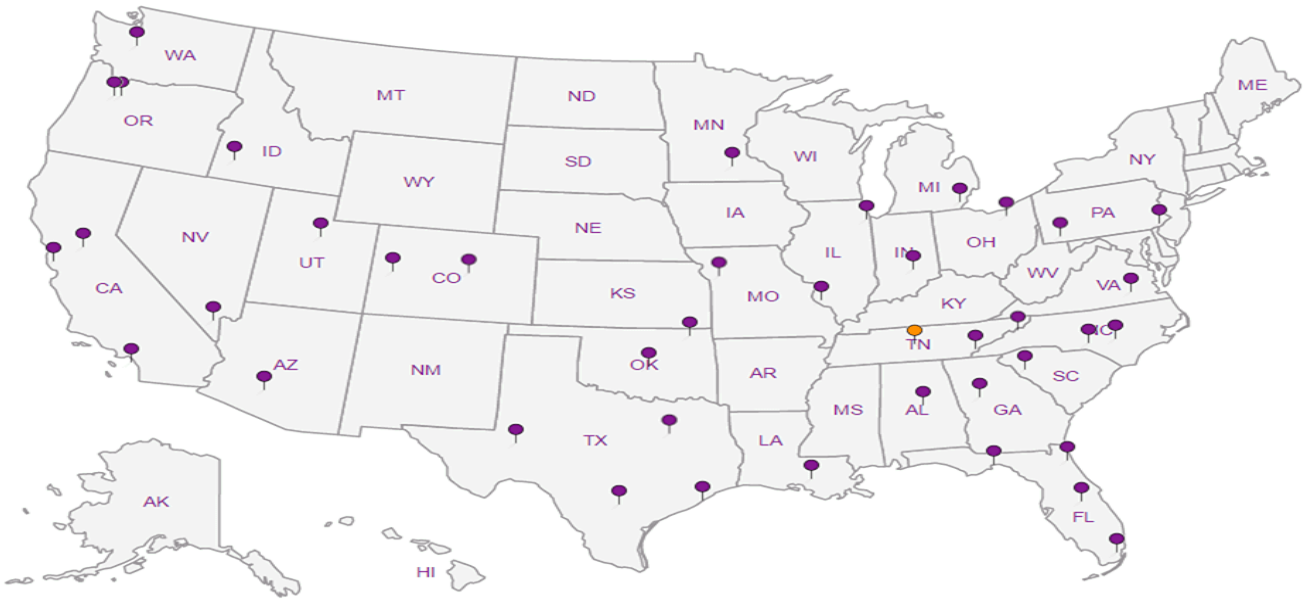
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:

Report to: **Jason Franks**

Email To: **Jfranks@scsengineers.com**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: Sibley, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.18**

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	Boron 250ml HDPE - HNO3
MW-804	GRAB	GW	-	11/8/18	1535	1		X

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042982

C184

Acctnum: **AQUAOPKS**

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks	Sample # (lab only)
	-01

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH ___ Temp ___

Flow ___ Other ___

Samples returned via:
___ UPS ✓ FedEx ___ Courier ___

Tracking # 4510 1661 7507

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 1 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Sample Receipt Checklist

COC Seal Present/Intact:	NP	___Y ___N
COC Signed/Accurate:		✓Y ___N
Bottles arrive intact:		✓Y ___N
Correct bottles used:		✓Y ___N
Sufficient volume sent:		✓Y ___N
If Applicable		
VOA Zero Headspace:		___Y ___N
Preservation Correct/Checked:		✓Y ___N

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042995
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

ASD-1 L1042995-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 11:20	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:53	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:56	WBD

ASD-2 L1042995-02 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 12:20	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:00	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:59	WBD

ASD-3 L1042995-03 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 13:20	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:03	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 16:02	WBD

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

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3330		200	1	11/14/2018 13:53	WG1194483
Boron,Dissolved	3160		200	1	11/10/2018 15:56	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3560		200	1	11/14/2018 14:00	WG1194483
Boron,Dissolved	2750		200	1	11/10/2018 15:59	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	18800		200	1	11/14/2018 14:03	WG1194483
Boron,Dissolved	17600		200	1	11/10/2018 16:02	WG1194495

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Method Blank (MB)

(MB) R3358770-1 11/10/18 14:50

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron,Dissolved	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3358770-2 11/10/18 14:53 • (LCSD) R3358770-3 11/10/18 14:55

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron,Dissolved	1000	1000	989	100	98.9	80.0-120			1.14	20

L1042719-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042719-01 11/10/18 14:58 • (MS) R3358770-5 11/10/18 15:03 • (MSD) R3358770-6 11/10/18 15:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron,Dissolved	1000	ND	1130	1180	95.7	101	1	75.0-125			4.35	20

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

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Qualifier	Description

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

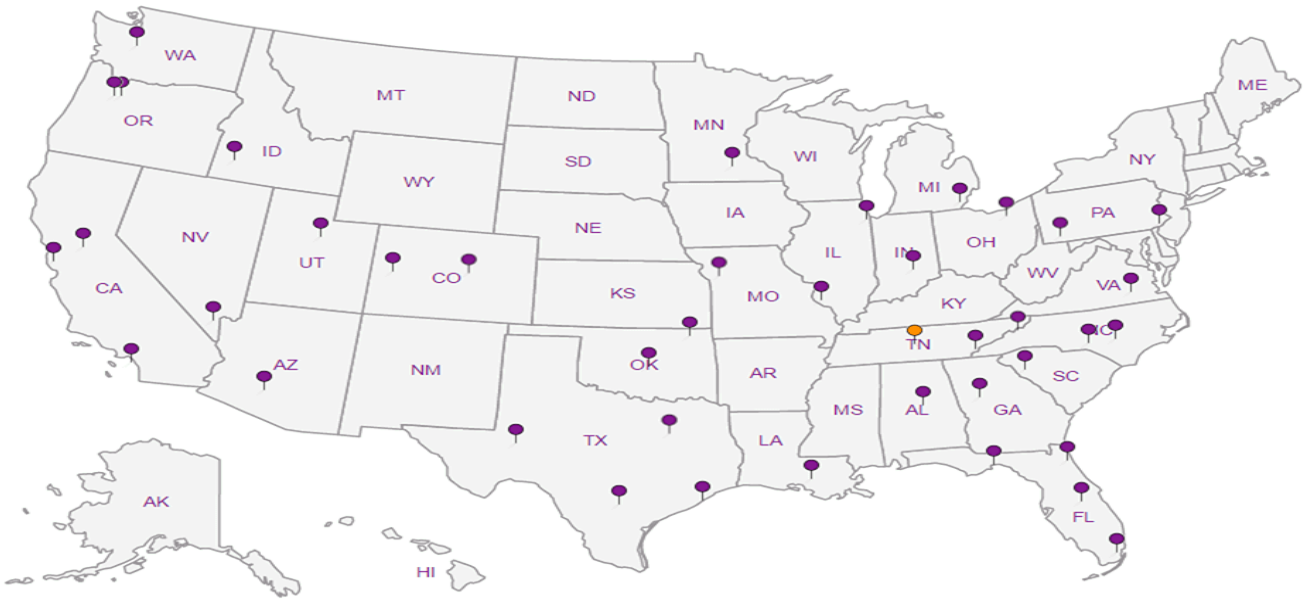
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS
8575W. 110th Street
Overland Park, KS 66210

Billing Information:

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042995

C188

Report to: Jason Franks

Email To: Jfranks@scsengineers.com

Project Description: KCP&L Sibley Generating Station

City/State Collected: Sibley, MO

Phone: 913-681-0030
Fax: 913-681-0012

Client Project #

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Acctnum: AQUAOPKS

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Diss Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
ASD-1	Grab	GW	-	11/8/18	1120	2	X	X		-01
ASD-2	↓	GW	-		1220	2	X	X		02
ASD-3	↓	GW	-	↓	1320	2	X	X		03

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

Remarks: RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS ✓ FedEx __ Courier _____

Tracking # 4510 1661 7507

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 2.1/2.0 °C Bottles Received: 6 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

C.2 Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (December 2019)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
MAY 2019 GROUNDWATER MONITORING EVENT

FLY ASH IMPOUNDMENT
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

Presented To:

Evergy Missouri West, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

December 2019

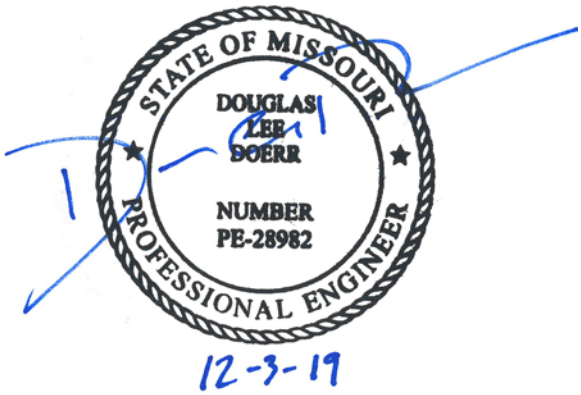
File No. 27213169.19

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.

John R. Rockhold, R.G.
SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.



Douglas L. Doerr, P.E.
SCS Engineers

Table of Contents

Section **Page**

Appendices

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels 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 or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the Fly Ash Impoundment at the Sibley Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on May 22, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 3, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on July 16, 2019 and August 21, 2019.

The completed statistical evaluation identified four Appendix III constituents above their respective prediction limit (background value) in monitoring wells MW-801, MW-804, and MW-806R.

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
Boron				
804	5.133	7.64	7.59	8.14
806R	5.323	5.58	5.64	5.66
Calcium				
806R	151.8	171	172	170
Chloride				

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
801	104.1	154	127	124
Sulfate				
806R	191.9	238	244	241

*UPL – Upper Prediction Limit

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation confirmed five SSIs above the background prediction limits. These include boron in downgradient monitoring wells MW-804 and MW-806R; calcium in monitoring well MW-806R; chloride in upgradient monitoring well MW-801; and, sulfate in monitoring well MW-806R.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above-identified SSIs for the Fly Ash Impoundment at the Sibley Generating Station, there are multiple lines of supporting evidence to indicate the above SSIs were not caused by a release from the Fly Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 UPGRADIENT WELL LOCATION

Figure 1 in **Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the Fly Ash Impoundment at the time of sampling. As seen on the map, monitoring well MW-801 is located upgradient from the Fly Ash Impoundment indicating the SSI for chloride in MW-801 was not caused by a release from the Fly Ash Impoundment. This demonstrates that a source other than the Fly Ash Impoundment caused the SSI over background levels for chloride in this well or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.2 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

The box and whiskers plot for boron in monitoring well MW-806R was compared to the concentration of boron in Ash Impoundment pore water (sample ASD-1). The concentration of boron in sample ASD-1 plotted alongside the box and whiskers plot for boron in monitoring well MW-806R, shows the boron

concentration in the ash impoundment pore water directly upgradient from MW-806R is less than the boron concentration in MW-806R. This demonstrates that a source other than the Fly Ash Impoundment (specifically Ash Impoundment pore water directly upgradient of MW-806R) caused the SSI over background levels for boron, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for boron are provided in **Appendix B**.

The box and whiskers plot for sulfate in monitoring well MW-806R was compared to the box and whiskers plot for sulfate from the river. The box and whiskers plots for sulfate from each location overlap significantly. This occurs even with a limited data set for sulfate from the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for sulfate are provided in **Appendix B**.

The box and whiskers plot for calcium in monitoring well MW-806R was compared to the box and whiskers plots for calcium from upgradient well MW-801, and from the river, and the calcium concentration from ash impoundment pore water (sample ASD-1). The box and whiskers plots for calcium from MW-806R significantly overlap the plots for upgradient well MW-801 and the river. Additionally, the calcium concentration of the ash impoundment pore water directly upgradient of MW-806R is less than the calcium concentrations of both monitoring wells and the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for calcium are provided in **Appendix B**.

3.3 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na), Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO4), Carbonate (CO3), and Bicarbonate (HCO3).

A piper diagram with plots for MW-801, MW-802, MW-804, and MW-806R was compared to piper diagram plots for three ash pore water samples (ASD-1, ASD-2, and ASD-3) collected in the Fly Ash Impoundment with a Geoprobe® screen-point 15 groundwater sampler. Sample locations are shown on **Figure 1** in **Appendix A**. Samples were collected on the same day for the ash pore water and wells MW-804 and MW-806R. The analytical reports are provided in **Appendix C** along with the piper diagram.

The piper diagram plots indicate the groundwater from the wells does not exhibit the same geochemical characteristics as the ash pore water. The groundwater and the ash pore water plot in different hydrochemical facies indicating there are two types of water (groundwater and ash pore water) and that the waters are not mixing. This helps demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels for boron, calcium, chloride, and sulfate or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.4 BORON STABLE ISOTOPE RATIO EVALUATION

The boron stable isotope ratio in coal and coal ash generally vary significantly from the boron stable isotope ratio found in naturally occurring groundwater. The National Bureau of Standards standard reference material 951 (NBS SRM-951), which is a boric acid, is used as the isotopic standard for boron. Boron has two stable isotopes, ^{10}B and ^{11}B. Isotopic ratios of samples are reported as per mil (‰) differences from NBS SRM-951. The delta value for $^{11}B/^{10}B$ is expressed as $\delta^{11}B$, ‰. Previous studies have found $\delta^{11}B$ values for coal ash and coal ash leachate samples between -40 ‰ and +6.6 ‰ and most natural groundwaters have $\delta^{11}B$ values between +10 ‰ and +30 ‰ (Refs. 1, 2, and 3).

A groundwater sample was collected from MW-804 and MW-806R for boron and for $\delta^{11}B$ analysis on November 8, 2018. Additionally, ash pore water samples (ASD-1, ASD-2, and ASD-3) were collected with a Geoprobe® Screen-Point 15 groundwater sampler on the same day and for the same analysis. Sample locations are shown on **Figure 1** in **Appendix A**. The laboratory reports for the analysis are provided in **Appendix D**.

Boron concentration plotted against $\delta^{11}B$, ‰ for each of the samples are provided in **Appendix D.** The boron concentrations in ASD-1 (3.3 mg/L) and ASD-2 (3.56 mg/L) were less than the boron concentrations in both MW-804 (8.37 mg/L) and MW-806R (5.19). The ash pore water from ASD-3 had the highest boron concentration at 18.8 mg/L. Although groundwater from MW-804 and MW-806R had boron concentrations less than one of the ash pore water samples, the $\delta^{11}B$ for the boron from MW-804 and MW-806R were +12.9 ‰ and -2.08 ‰, respectively. These values were significantly greater than the $\delta^{11}B$ for the ash pore water which ranged from -6.18 ‰ to -10.11 ‰. The significantly higher $\delta^{11}B$ for groundwater from MW-806R and positive $\delta^{11}B$ for groundwater from MW-804 demonstrates an alternative source of boron at the site other than the Fly Ash Impoundment.

Below the boron vs $\delta^{11}B$ plot in **Appendix D**, is a figure (Ref. 4) showing $\delta^{11}B$ ranges for natural waters from various natural materials and waters impacted by anthropogenic sources. The figure further demonstrates based on $\delta^{11}B$ values for MW-804 and MW-806R that there is an alternative source of boron other than the Fly Ash Impoundment.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the successful ASDs, the owner or operator of the Fly Ash Impoundment may continue with the detection monitoring program under § 257.94.

5 REFERENCES

1. **Buska, Paul M., Fitzpatrick, John and Watson, Lee R. and Kay, Robert T**. *Evaluation of Ground-Water and Boron Sources by Use of Boron Stable-Isotope Ratios, Tritium, and Selected Water Chemistry Constituents near Beverly Shores, Northwestern Indiana*, 2004. U.S. Geological Survey Scientific Investigations Report 2007-5166. 2007).

2. **Ruhl, Laura S. and Vengosh, Avner and Dwyer, Gary S. and Hsu-Kim, Heileen and Deonarine, Amrika**. *A Twenty-Month Geochemical and Isotopic Investigation into Environmental Impacts of the 2008 TVA Coal Ash Spill, - May*. Denver, CO, USA : s.n., 2011. 2011 World of Coal Ash (WOCA) Conference - May 9-12, 2011.

3. **Ruhl, Laura.** *Boron and Strontium Isotopic Characterization of Coal Combustion Residuals: Validation of Novel Environmental Tracers,* Paper No. 30616-208920. Charlotte, NC : s.n., 2012. 2012 Geological Society of America Annual Meeting and Exposition, 4-7 November.

4. **Ruhl, Laura.** *Geochemical and Isotopic Characterization of Coal Combustion Residuals: Implications for Potential Environmental Impacts.* Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Earth and Ocean Sciences in the Graduate School of Duke University, 2012.

6 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Missouri West, Inc. for specific application to the Sibley Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represent that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Figure 1

LEGEND:

- 760 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
- 601 (734.55) — GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- ASD–2 — GEOPROBE® PORE WATER SAMPLE LOCATION
- FLY ASH IMPOUNDMENT UNIT BOUNDARY
- GROUNDWATER FLOW DIRECTION

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE. APRIL 2018.
3. BOUNDARY AND MONITORING WELL WELL LOCATIONS SHOWN ARE APPROXIMATE.

200 0 200 400
SCALE FEET

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (MAY 2019)
CCR FLY ASH IMPOUNDMENT

PROJECT TITLE
CCR ALTERNATIVE SOURCE DEMONSTRATION

CLIENT
Evergy Missouri West, Inc.
(operator Evergy Metro, Inc.)
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW BY:
27213167.18	DAW	DLD
DSN. BY:	**CHK. BY:**	**PROJ. MGR.**
DAW	JRR	JRF

CADD FILE:
POTENTIOMETRIC SURFACE MAP (MAY 2019).DWG

DATE:
10/22/19

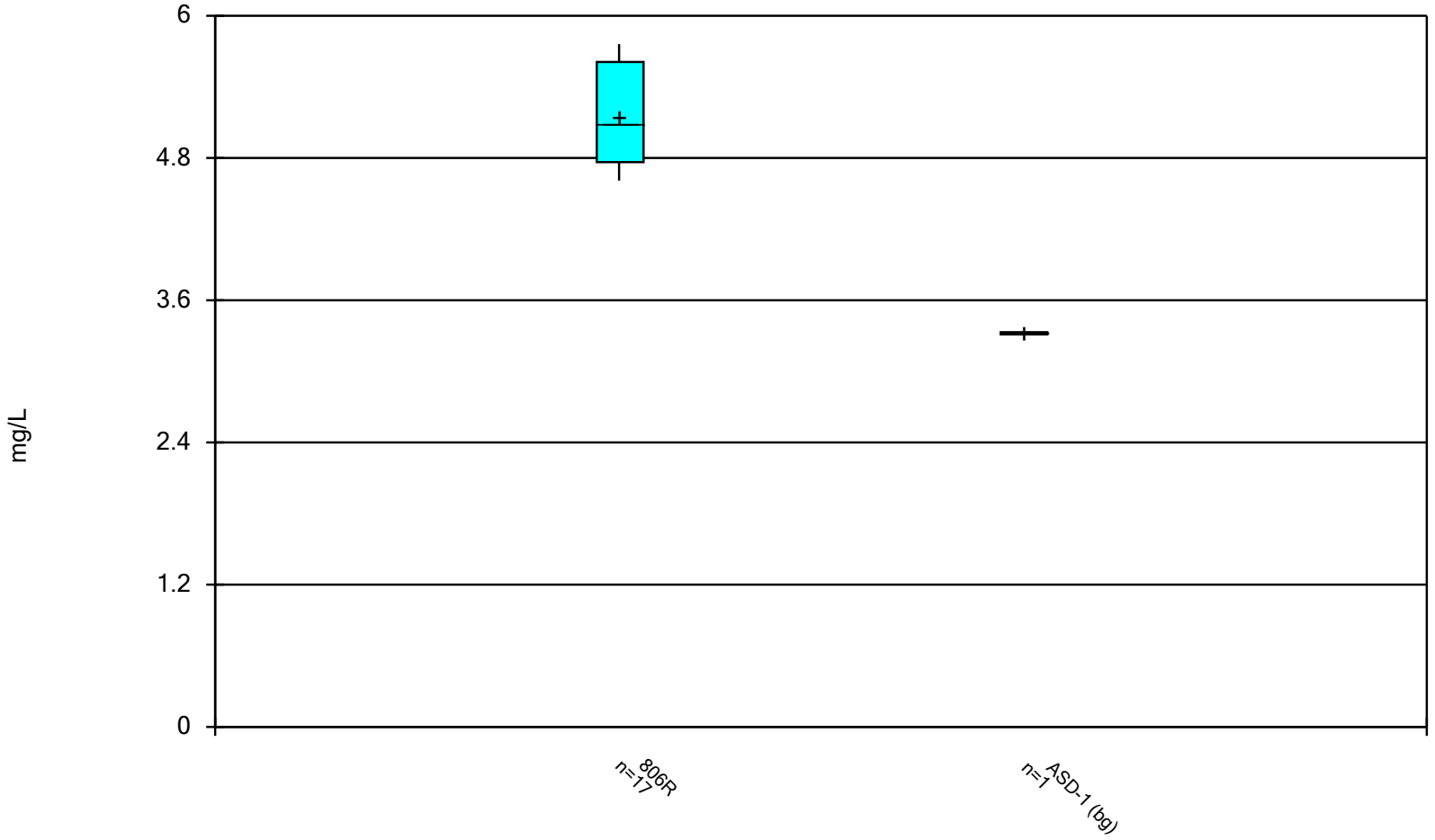
FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\Sibley\2018\GW\Potentiometric Surface Map (May 2019).dwg Oct 22, 2019 - 3:49pm Layout Name: 1 By: 4470daw

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Boron Analysis Run 10/22/2019 2:17 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Boron (mg/L) Analysis Run 10/22/2019 2:18 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

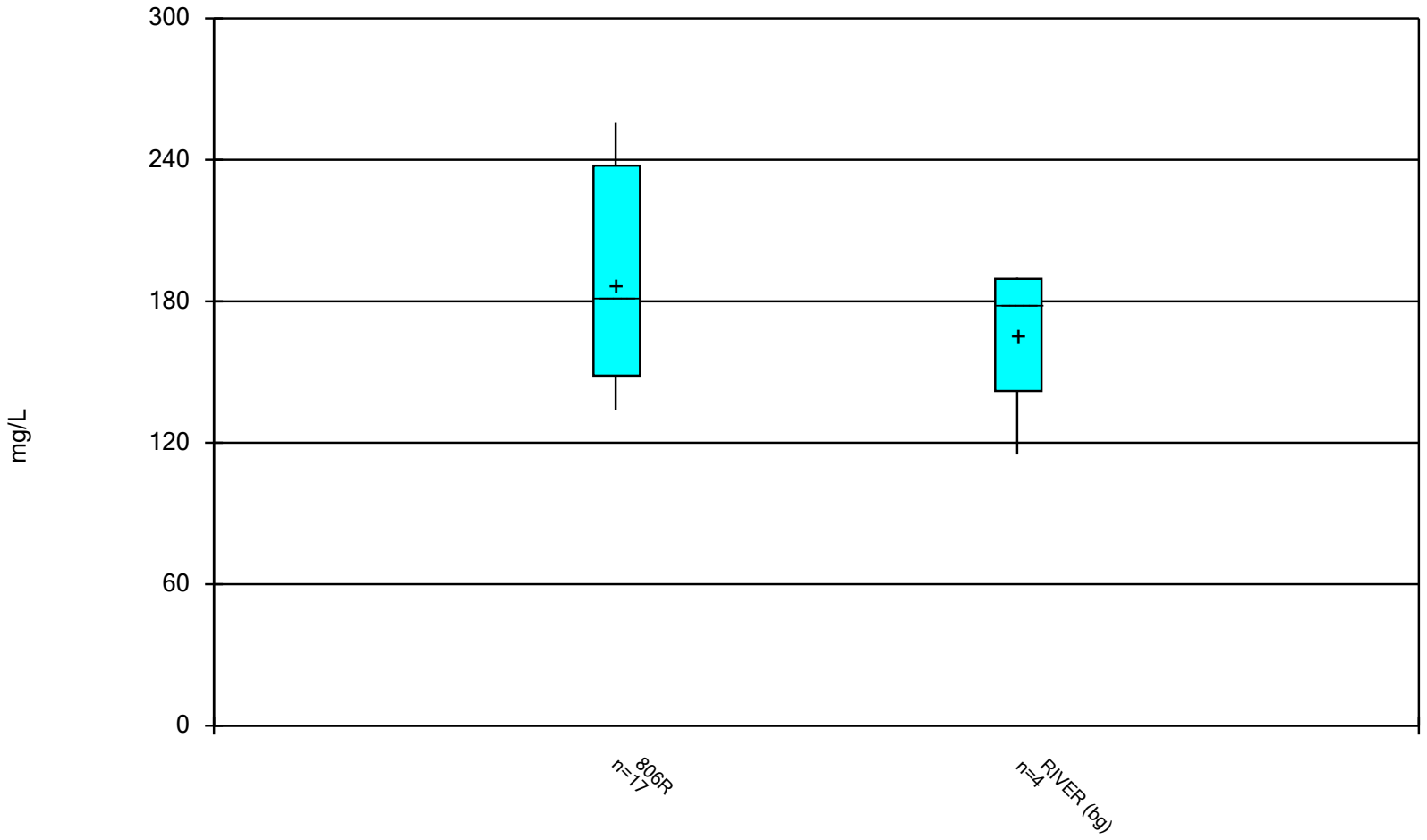
	806R	ASD-1 (bg)
6/2/2016	5.1	
7/19/2016	4.81	
8/23/2016	5.25	
11/11/2016	4.77	
2/9/2017	4.64	
3/22/2017	5.02	
5/3/2017	4.76	
8/1/2017	4.61	
10/4/2017	4.77	
5/16/2018	4.64	
11/8/2018	5.19	3.33
11/15/2018	5.56	
1/11/2019	5.76	
3/12/2019	5.75	
5/22/2019	5.58	
7/16/2019	5.64	
8/21/2019	5.66	
Median	5.1	3.33
LowerQ.	4.765	3.33
UpperQ.	5.61	3.33
Min	4.61	3.33
Max	5.76	3.33
Mean	5.148	3.33

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 10/22/2019, 2:18 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Boron (mg/L)	806R	17	5.148	0.4319	0.1047	5.1	4.61	5.76	0
Boron (mg/L)	ASD-1 (bg)	1	3.33	0	0	3.33	3.33	3.33	0

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 10/22/2019 2:23 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Sulfate (mg/L) Analysis Run 10/22/2019 2:23 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

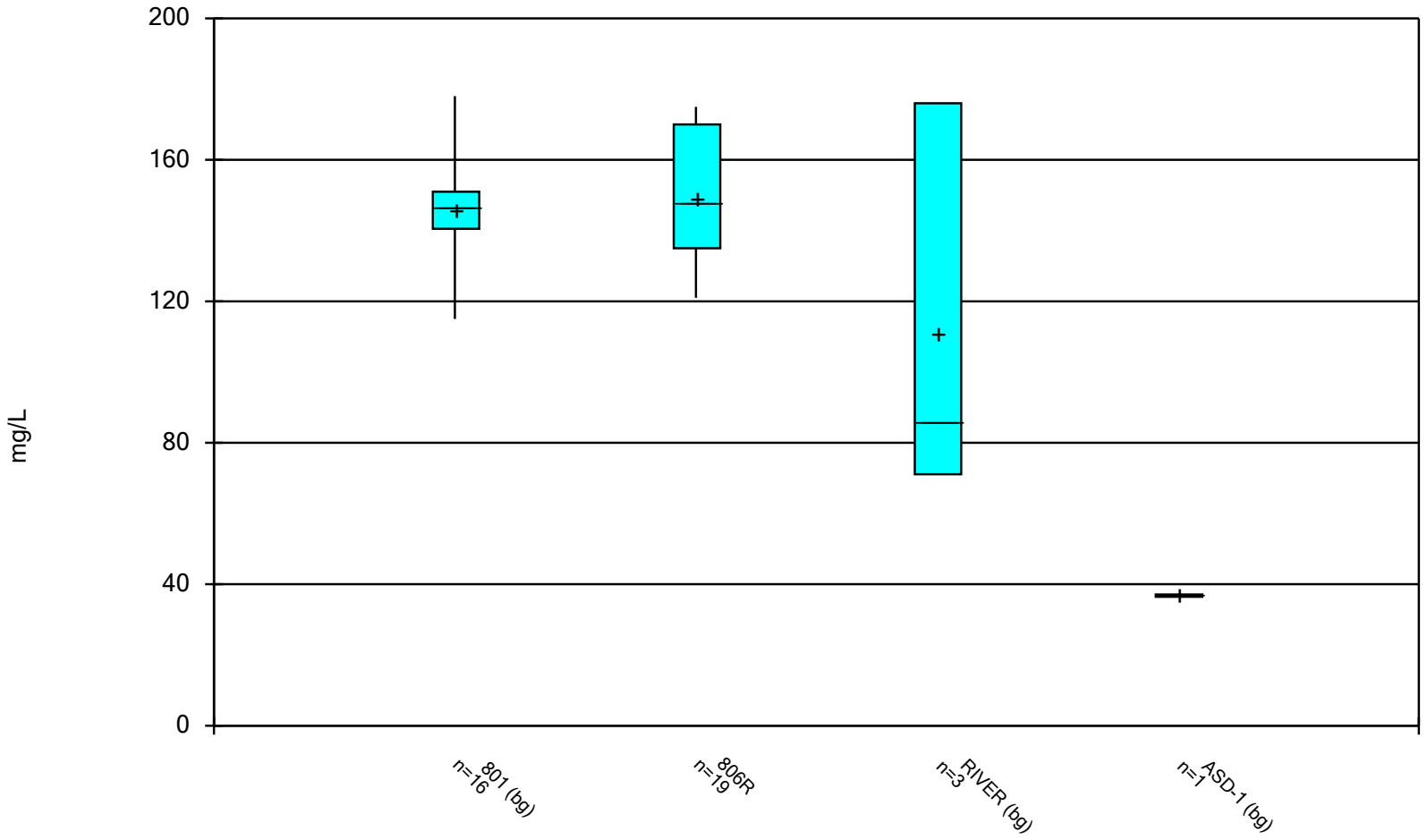
	806R	RIVER (bg)
5/26/2016		115
6/2/2016	182	
7/19/2016	139	169
8/23/2016	146	
11/10/2016		190
11/11/2016	134	
2/9/2017	165	189
3/22/2017	150	
5/3/2017	149	
8/1/2017	181	
10/4/2017	148	
5/16/2018	157	
11/8/2018	184	
11/15/2018	236	
1/11/2019	237	
3/12/2019	256	
5/22/2019	238	
7/16/2019	244	
8/21/2019	241	
Median	181	179
LowerQ.	148.5	142
UpperQ.	237.5	189.5
Min	134	115
Max	256	190
Mean	187.5	165.8

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 10/22/2019, 2:23 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Sulfate (mg/L)	806R	17	187.5	44.02	10.68	181	134	256	0
Sulfate (mg/L)	RIVER (bg)	4	165.8	35.19	17.59	179	115	190	0

Box & Whiskers Plot



Constituent: Calcium Analysis Run 10/22/2019 2:27 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Calcium (mg/L) Analysis Run 10/22/2019 2:31 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801 (bg)	806R	RIVER (bg)	ASD-1 (bg)
12/16/2015	159			
2/17/2016	150			
5/26/2016	147		85.7	
6/2/2016		135		
7/19/2016		131		
8/23/2016	137	141		
11/10/2016	143		176	
11/11/2016		137		
2/9/2017	115	123	71.1	
3/22/2017		126		
5/3/2017	127	121		
8/1/2017	138	149		
10/4/2017	148	148		
10/5/2017	148	142		
11/16/2017	156			
11/17/2017		151		
5/16/2018	146	145		
11/8/2018		153		37.1
11/15/2018	143	168		
1/11/2019	146	175		
3/12/2019		173		
5/22/2019	178	171		
7/16/2019	152	172		
8/21/2019		170		
Median	146.5	148	85.7	37.1
LowerQ.	140.5	135	71.1	37.1
UpperQ.	151	170	176	37.1
Min	115	121	71.1	37.1
Max	178	175	176	37.1
Mean	145.8	149	110.9	37.1

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 10/22/2019, 2:31 PM

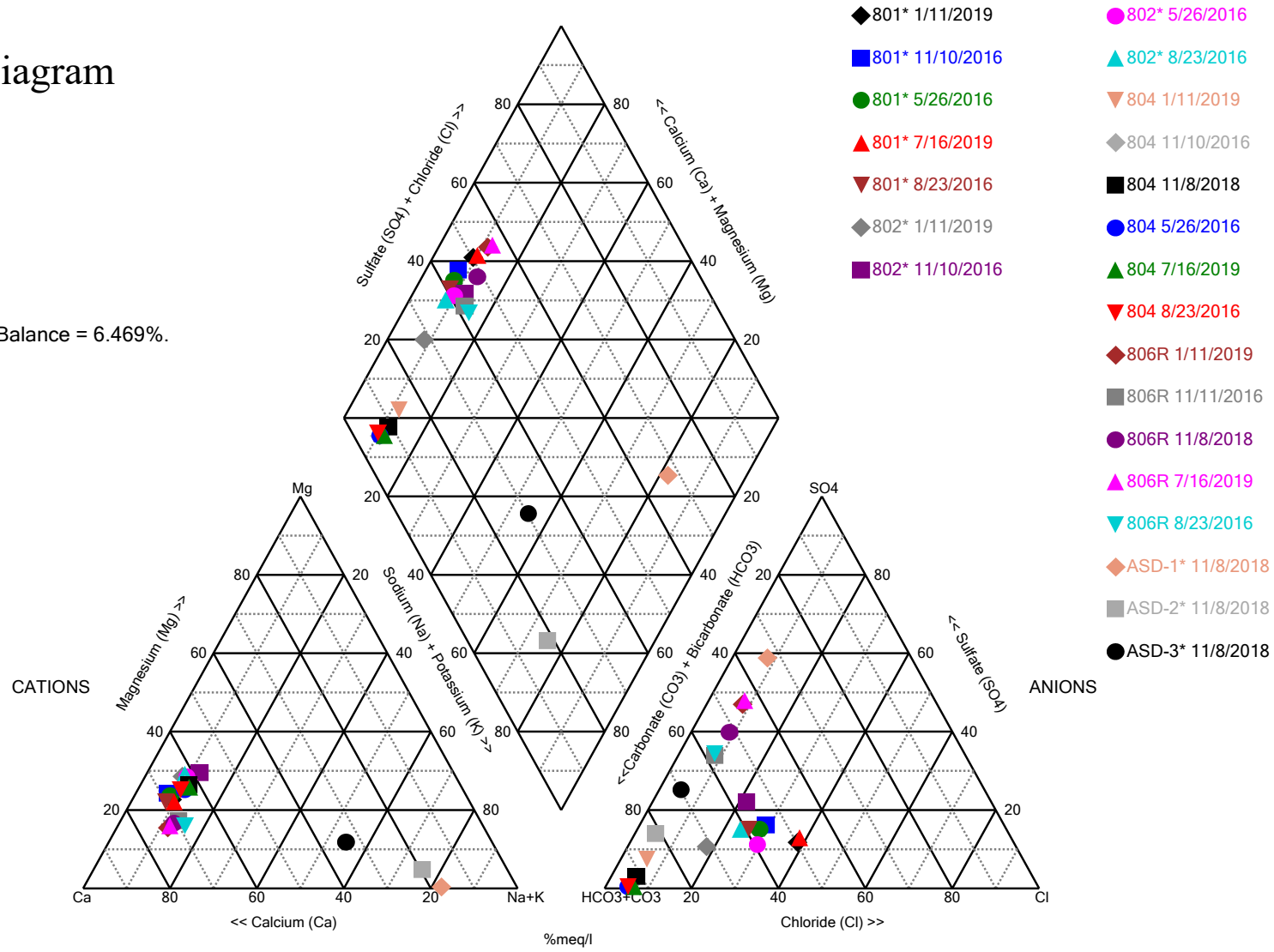
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Calcium (mg/L)	801 (bg)	16	145.8	13.76	3.439	146.5	115	178	0
Calcium (mg/L)	806R	19	149	18.06	4.143	148	121	175	0
Calcium (mg/L)	RIVER (bg)	3	110.9	56.82	32.81	85.7	71.1	176	0
Calcium (mg/L)	ASD-1 (bg)	1	37.1	0	0	37.1	37.1	37.1	0

Appendix C

Piper Diagram and Laboratory Results

Piper Diagram

Cation-Anion Balance = 6.469%.



Analysis Run 10/22/2019 2:39 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Piper Diagram

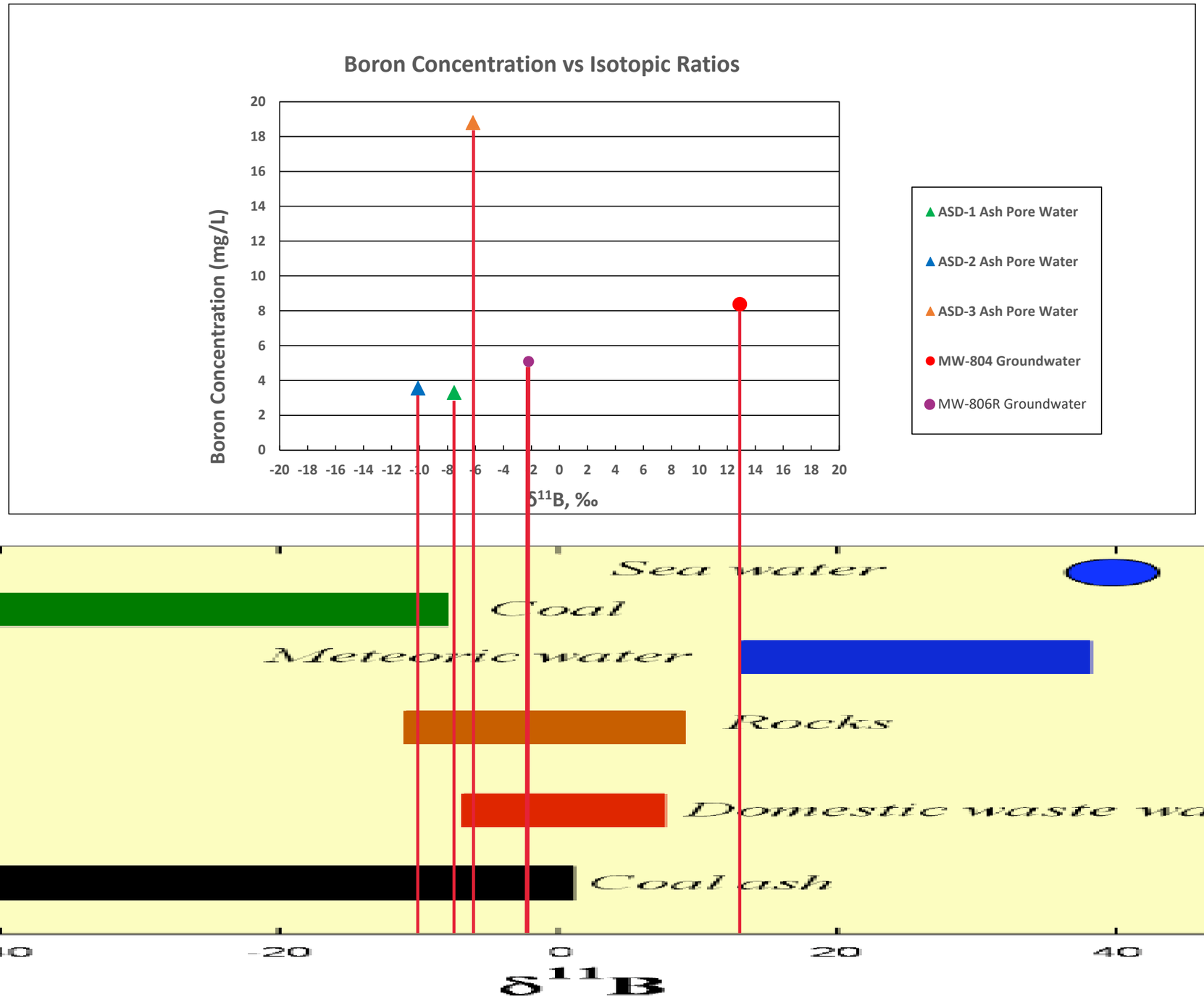
Analysis Run 10/22/2019 2:42 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
801* 5/26/2016	19.1	1.43	147	31	88.2	65.2	304	10
801* 8/23/2016	16.9	1.15	137	25.8	73.8	58.6	288	10
801* 11/10/2016	17	1.21	143	30	88.2	66.5	282	10
801* 1/11/2019	21.9	1.28	146	29	124	52.3	271	10
801* 7/16/2019	24.4	1.28	152	29.3	127	56.6	266	10
802* 5/26/2016	10.6	2.43	68.9	19.3	50.5	26.1	161	10
802* 8/23/2016	11.5	2.67	82.2	23.2	46.3	41.2	199	10
802* 11/10/2016	9.98	2.56	49.6	15.1	26.6	38	106	10
802* 1/11/2019	15.3	3.3	111	30.1	44.2	37.1	304	10
804 5/26/2016	27.8	5.99	167	39.8	15.5	2.5	596	10
804 8/23/2016	24.9	4.62	157	37	14.4	2.5	551	10
804 11/10/2016	26.2	4.71	155	39	14.2	2.5	525	10
804 11/8/2018	30.1	5.76	158	39.8	18.3	14.1	561	10
804 1/11/2019	26.8	5.58	145	35.7	17.6	31.8	479	10
804 7/16/2019	28.6	6.68	158	39.3	18.6	2.5	545	10
806R 8/23/2016	34.5	3.75	141	19.7	22.9	146	298	10
806R 11/11/2016	29.1	3.49	137	20.2	22.9	134	277	10
806R 11/8/2018	29	3.46	153	21.4	27.2	184	287	10
806R 1/11/2019	30.1	3.69	175	22.8	28.4	237	274	10
806R 7/16/2019	30.9	3.89	172	23.3	29.2	244	268	10
ASD-1* 11/8/2018	178	38.6	37.1	0.5	29.3	303	10	104
ASD-2* 11/8/2018	497	82.4	124	17	43.8	211	10	795
ASD-3* 11/8/2018	365	42.2	208	43.8	41.5	336	10	592

Appendix D

Boron and Stable Isotope Plots and Laboratory Results


Boron Concentration vs Isotopic Ratios
Boron Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20
δ11B, ‰
ASD-1 Ash Pore Water
ASD-2 Ash Pore Water
ASD-3 Ash Pore Water
MW-804 Groundwater
MW-806R Groundwater
Sea water
Coal
Meteoric water
Rocks
Domestic waste water
Coal ash
-40
-20
0
20
40
δ11B

Report

L1836000

17HVXQ17MHY

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

Analysis: IR

Your ID	**MW-804**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535495

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Web: www.alsglobal.se
Email: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

The digitally signed PDF file represents the original report. Any printouts are to be considered as copies.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1836000
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
MW-804	U11535495	12.89	*0.74*
MW-804, r.2	U11535495	13.26	*0.82*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Report

L1835999

17HW1HNB94B

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

Analysis: IR

Your ID	**MW-806R**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535494

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Web: www.alsglobal.se
Email: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1835999
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
MW-806R	U11535494	-2.08	*0.79*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature

Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Report

L1833729

17HW78DG7V0

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

This report replaces any previous report with the same number.

Analysis: IR

Your ID	**ASD-1**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535491

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-2**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535492

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-3**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535493

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1833729
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
ASD-1	U11535491	-7.53	*0.89*
ASD-1, r.2	U11535491	-7.08	*0.77*
ASD-2	U11535492	-10.11	*0.90*
ASD-3	U11535493	-6.18	*0.81*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042982
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-804 L1042982-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 15:35	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:32	ST

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

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8370		200	1	11/14/2018 13:32	WG1194483

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description

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

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

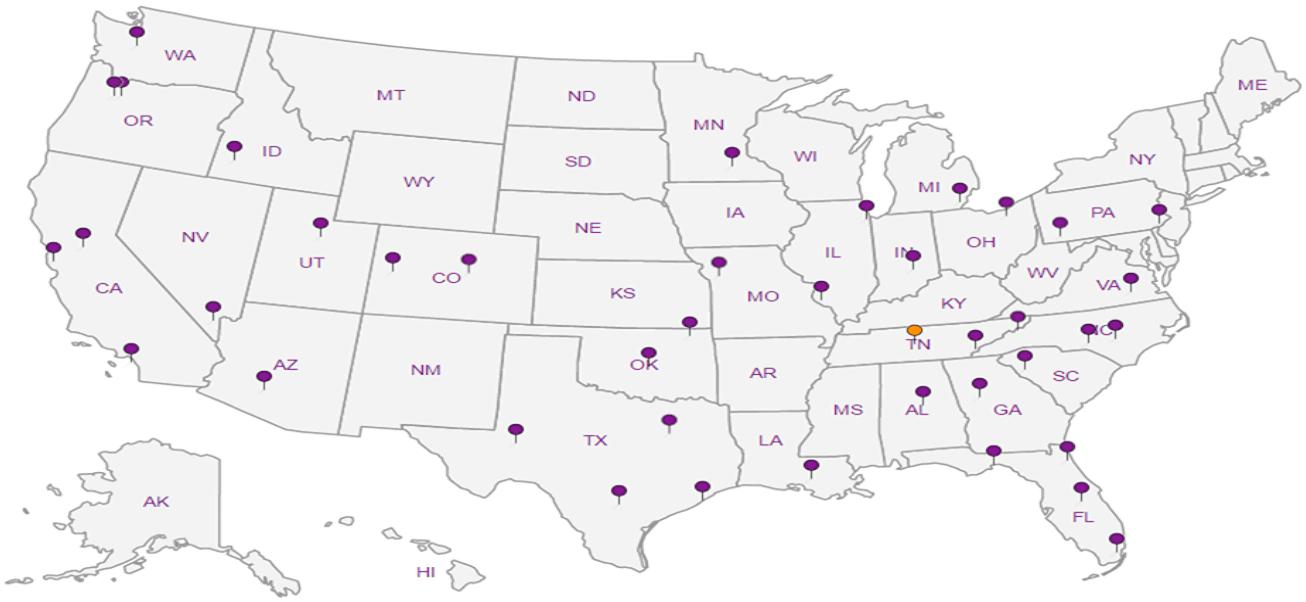
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:

Report to: **Jason Franks**

Email To: **Jfranks@scsengineers.com**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: Sibley, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.18**

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	Boron 250ml HDPE - HNO3
MW-804	GRAB	GW	-	11/8/18	1535	1		X

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042982

C184

Acctnum: **AQUAOPKS**

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks	Sample # (lab only)
	-01

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH ___ Temp ___

Flow ___ Other ___

Samples returned via:
___ UPS ✓ FedEx ___ Courier ___

Tracking # 4510 1661 7507

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 1 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Sample Receipt Checklist

COC Seal Present/Intact:	NP	___Y ___N
COC Signed/Accurate:		✓Y ___N
Bottles arrive intact:		✓Y ___N
Correct bottles used:		✓Y ___N
Sufficient volume sent:		✓Y ___N
If Applicable		
VOA Zero Headspace:		___Y ___N
Preservation Correct/Checked:		✓Y ___N

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042981
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-806R L1042981-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 14:10	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:29	ST

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Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5190		200	1	11/14/2018 13:29	WG1194483

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

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

Qualifier	Description

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

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

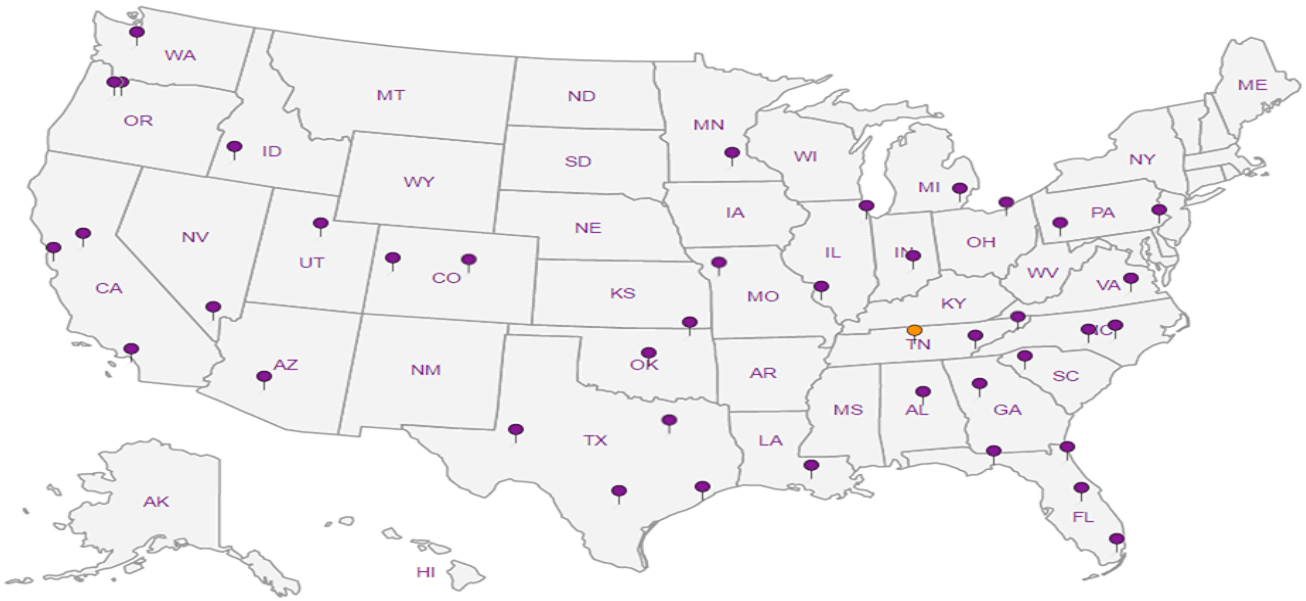
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042981

C185

Acctnum: AQUAOPKS

Template:

Prelogin:

TSR:

PB:

Shipped Via:

SCSE ngineers - KS
8575 W. 110th Street
Overl and Park, KS 66210

Billing Information:

Report to: Jason Franks

Email To: Jfranks@scsengineers.com

Project Description: KCP&L Sibley Generating Station

City/State Collected: SIBLEY, MO

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27213169.18

Lab Project #

Collected by (print): Jason FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

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

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ___

Analysis / Container / Preservative

Pres Chk

Boron 250ml HDPE - HNO3

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
MW-806R	GRAB	GW	-	11/8/18	1410	1	X		-01

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH ____ Temp ____

Flow ____ Other ____

Samples returned via:
__ UPS ✓ FedEx __ Courier __

Tracking # 4510 1661 7507

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N

	Date:	Time:		
Relinquished by: (Signature)	11/8/18	1647	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.1 °C Bottles Received: 1 BSE
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042995
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

ASD-1 L1042995-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 11:20	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:53	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:56	WBD

ASD-2 L1042995-02 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 12:20	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:00	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:59	WBD

ASD-3 L1042995-03 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 13:20	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:03	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 16:02	WBD

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

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3330		200	1	11/14/2018 13:53	WG1194483
Boron,Dissolved	3160		200	1	11/10/2018 15:56	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3560		200	1	11/14/2018 14:00	WG1194483
Boron,Dissolved	2750		200	1	11/10/2018 15:59	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	18800		200	1	11/14/2018 14:03	WG1194483
Boron,Dissolved	17600		200	1	11/10/2018 16:02	WG1194495

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Method Blank (MB)

(MB) R3358770-1 11/10/18 14:50

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron,Dissolved	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3358770-2 11/10/18 14:53 • (LCSD) R3358770-3 11/10/18 14:55

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron,Dissolved	1000	1000	989	100	98.9	80.0-120			1.14	20

L1042719-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042719-01 11/10/18 14:58 • (MS) R3358770-5 11/10/18 15:03 • (MSD) R3358770-6 11/10/18 15:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron,Dissolved	1000	ND	1130	1180	95.7	101	1	75.0-125			4.35	20

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

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

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

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Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

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EPA–Crypto	TN00003		

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

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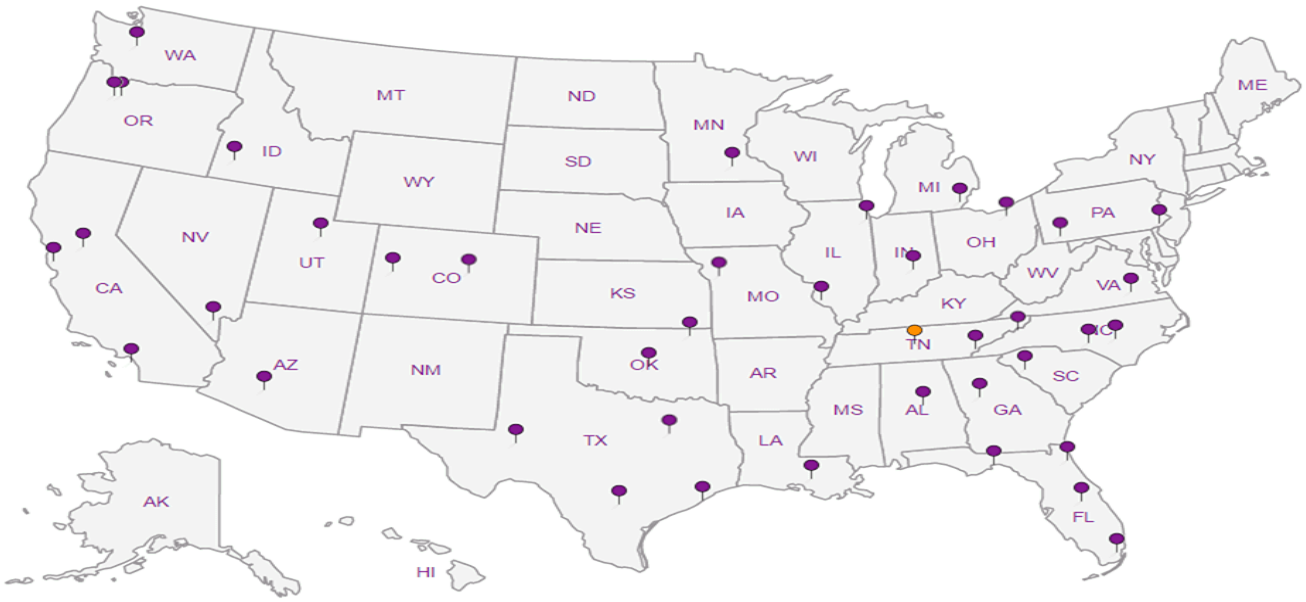


SCS Engineers - KS
8575W. 110th Street
Overland Park, KS 66210

Billing Information:

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042995

C188

Report to: Jason Franks

Email To: Jfranks@scsengineers.com

Project Description: KCP&L Sibley Generating Station

City/State Collected: Sibley, MO

Phone: 913-681-0030
Fax: 913-681-0012

Client Project #

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Acctnum: AQUAOPKS

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Diss Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
ASD-1	Grab	GW	-	11/8/18	1120	2	X	X		-01
ASD-2	↓	GW	-		1220	2	X	X		02
ASD-3	↓	GW	-	↓	1320	2	X	X		03

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

Remarks: RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS ✓ FedEx __ Courier _____

Tracking # 4510 1661 7507

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 2.1/2.0 °C Bottles Received: 6 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Addendum 1

2019 Annual Groundwater Monitoring and Corrective Action Report Addendum 1

December 20, 2022
File No. 27213167.19

To: Evergy Metro, Inc.
Jared Morrison – Director, Water and Waste Programs

From: SCS Engineers
Douglas L. Doerr, P.E.
John R. Rockhold, P.G.

Subject: 2019 Annual Groundwater Monitoring and Corrective Action Report Addendum 1
Evergy Missouri West, Inc.
Fly Ash Impoundment
Sibley Generating Station – Sibley, Missouri

The Fly Ash Impoundment at the Sibley Generating Station is subject to the groundwater monitoring and corrective action requirements of the "Coal Combustion Residuals (CCR) Final Rule" (Rule); as described in CFR 40 257.90 through CFR 40 257.98. An Annual Groundwater Monitoring and Corrective Action (GWMCA) Report documenting activities completed in 2019 for the Fly Ash Impoundment was completed and placed in the facility's operating record on January 30, 2020, as required by the Rule. The Annual GWMCA report was to fulfill the requirements specified in 40 CFR 257.90(e).

This Addendum has been prepared to supplement the operating record in recognition of comments received by Evergy from the U.S. Environmental Protection Agency (USEPA) on January 11, 2022. In addition to the information listed in 40 CFR 257.90(e), the USEPA indicated in their comments that the GWMCA Report contain the following:

- Results of laboratory analysis of groundwater or other environmental media samples for 40 CFR 257 Appendix III and Appendix IV constituents or other constituents, such as those supporting characterization of site conditions that may ultimately affect a remedy'
- Required statistical analysis performed on laboratory analysis results; and
- Calculated groundwater flow rate and direction.

This information is not specifically referred to in 40 CFR 257.90(e) for inclusion in the GWMCA Reports; however, it is routinely collected, determined and maintained in Evergy's files and is being provided in the attachments to this addendum.

The attachments to this addendum are as follows:

- Attachment 1 – Laboratory Analytical Reports:

  Includes laboratory data packages with supporting information such as case narrative, sample and method summary, analytical results, quality control, and chain-of-custody documentation. The laboratory data packages for the following sampling events are provided:

  - January 2019 – First verification sampling for the Fall 2018 detection monitoring sampling event.
  - March 2019 – Second verification sampling for the Fall 2018 detection monitoring sampling event.
  - May 2019 – Spring 2019 semiannual detection monitoring sampling event.
  - July 2019 – First verification sampling for the Spring 2019 detection monitoring sampling event.
  - August 2019 – Second verification sampling for the Spring 2019 detection monitoring sampling event.
  - November 2019 - Fall 2019 semiannual detection monitoring sampling event.

- Attachment 2 - Statistical Analyses:

  Includes summary of statistical results, prediction limit plots, prediction limit background data, detection sample results, first and second verification re-sample results (when applicable), extra sample results for pH (collected as part of the approved sampling procedures), input parameters, and a Prediction Limit summary table. Statistical analyses completed in 2019 included the following:

  - Fall 2018 semiannual detection monitoring statistical analyses.
  - Spring 2019 semiannual detection monitoring statistical analyses.

- Attachment 3 - Groundwater Potentiometric Surface Maps:

  Includes groundwater potentiometric surface maps with the measured groundwater elevations at each well and the generalized groundwater flow direction and the calculated groundwater flow rate. Maps for the following sampling events are provided:

  - May 2019 - Spring 2019 semiannual detection monitoring sampling event.
  - November 2019 - Fall 2019 semiannual detection monitoring sampling event.

Jared Morrison
December 20, 2022

ATTACHMENT 1

Laboratory Analytical Reports

Jared Morrison
December 20, 2022

ATTACHMENT 1-1

January 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

January 21, 2019

SCS Engineers - KS

Sample Delivery Group:	L1060639
Samples Received:	01/12/2019
Project Number:	27213168.19
Description:	Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-504 L1060639-01 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 10:20 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224997	1	01/18/19 17:28	01/18/19 17:28	ELN
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 16:15	TRB

MW-505 L1060639-02 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 09:45 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 16:18	TRB

MW-506 L1060639-03 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 11:10 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224997	1	01/18/19 17:43	01/18/19 17:43	ELN

MW-512 L1060639-04 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 11:45 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224700	1	01/18/19 17:25	01/18/19 17:25	ELN
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 15:40	TRB

DUPLICATE 1 L1060639-05 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 11:50 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224700	1	01/18/19 18:20	01/18/19 18:20	ELN
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 16:21	TRB

MW-801 L1060639-06 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 09:30 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224700	5	01/18/19 18:41	01/18/19 18:41	ELN

MW-802 L1060639-07 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 10:10 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 16:24	TRB

MW-803 L1060639-08 GW

Collected by: G. Penaflor | Collected date/time: 01/11/19 10:55 | Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224700	1	01/18/19 18:52	01/18/19 18:52	ELN

MW-804 L1060639-09 GW

Collected by: G. Penaflor
Collected date/time: 01/11/19 11:35
Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1224700	1	01/18/19 19:03	01/18/19 19:03	ELN
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 16:26	TRB

MW-806R L1060639-10 GW

Collected by: G. Penaflor
Collected date/time: 01/11/19 12:20
Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1224054	1	01/16/19 15:53	01/16/19 16:19	AJS
Wet Chemistry by Method 9056A	WG1224997	5	01/19/19 10:54	01/19/19 10:54	ELN
Metals (ICP) by Method 6010B	WG1223747	1	01/16/19 09:51	01/16/19 12:51	TRB

DUPLICATE 2 L1060639-11 GW

Collected by: G. Penaflor
Collected date/time: 01/11/19 12:20
Received date/time: 01/12/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1224054	1	01/16/19 15:53	01/16/19 16:19	AJS
Wet Chemistry by Method 9056A	WG1224700	5	01/19/19 10:43	01/19/19 10:43	ELN
Metals (ICP) by Method 6010B	WG1223402	1	01/15/19 08:53	01/15/19 16:29	TRB

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

Jeff Carr
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Fluoride	179		100	1	01/18/2019 17:28	WG1224997
Sulfate	33200		5000	1	01/18/2019 17:28	WG1224997

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	39300		1000	1	01/15/2019 16:15	WG1223402

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	29500		1000	1	01/15/2019 16:18	WG1223402

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	6390		1000	1	01/18/2019 17:43	WG1224997

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	3850		1000	1	01/18/2019 17:25	WG1224700
Sulfate	43300		5000	1	01/18/2019 17:25	WG1224700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	110000	O1	1000	1	01/15/2019 15:40	WG1223402

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	3810		1000	1	01/18/2019 18:20	WG1224700
Sulfate	42200		5000	1	01/18/2019 18:20	WG1224700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	110000		1000	1	01/15/2019 16:21	WG1223402

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	124000		5000	5	01/18/2019 18:41	WG1224700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	111000		1000	1	01/15/2019 16:24	WG1223402

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	16000		1000	1	01/18/2019 18:52	WG1224700

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Fluoride	234		100	1	01/18/2019 19:03	WG1224700
Sulfate	31800		5000	1	01/18/2019 19:03	WG1224700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8710		200	1	01/15/2019 16:26	WG1223402

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	739000		13300	1	01/16/2019 16:19	WG1224054

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	237000		25000	5	01/19/2019 10:54	WG1224997

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5760		200	1	01/16/2019 12:51	WG1223747
Calcium	175000	V	1000	1	01/16/2019 12:51	WG1223747

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	723000		13300	1	01/16/2019 16:19	WG1224054

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	239000		25000	5	01/19/2019 10:43	WG1224700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5920		200	1	01/15/2019 16:29	WG1223402
Calcium	178000		1000	1	01/15/2019 16:29	WG1223402

Method Blank (MB)

(MB) R3376679-1 01/16/19 16:19

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		2820	10000

L1060411-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1060411-05 01/16/19 16:19 • (DUP) R3376679-3 01/16/19 16:19

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	400000	384000	1	4.08		5

Laboratory Control Sample (LCS)

(LCS) R3376679-2 01/16/19 16:19

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8820000	100	85.0-115	

Method Blank (MB)

(MB) R3377160-1 01/18/19 15:30

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1060639-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1060639-05 01/18/19 18:20 • (DUP) R3377160-7 01/18/19 18:31

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	3810	3810	1	0.0288		15
Fluoride	239	242	1	1.46		15
Sulfate	42200	42400	1	0.437		15

L1060642-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1060642-08 01/18/19 20:52 • (DUP) R3377160-8 01/18/19 21:03

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	17600	17600	1	0.327		15
Fluoride	192	288	1	39.9	P1	15
Sulfate	31900	32000	1	0.396		15

Laboratory Control Sample (LCS)

(LCS) R3377160-2 01/18/19 15:41

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	37700	94.4	80.0-120	
Fluoride	8000	7770	97.1	80.0-120	
Sulfate	40000	38200	95.6	80.0-120	

L1060634-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060634-08 01/18/19 16:31 • (MS) R3377160-3 01/18/19 16:42 • (MSD) R3377160-4 01/18/19 16:53

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	17200	64400	64900	94.3	95.4	1	80.0-120			0.836	15
Fluoride	5000	133	4720	4760	91.8	92.6	1	80.0-120			0.892	15
Sulfate	50000	878000	900000	911000	43.6	65.4	1	80.0-120	E V	E V	1.20	15

L1060639-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060639-04 01/18/19 17:25 • (MS) R3377160-5 01/18/19 17:36 • (MSD) R3377160-6 01/18/19 18:09

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	3850	51800	51600	95.8	95.4	1	80.0-120			0.364	15
Fluoride	5000	243	5120	5110	97.5	97.4	1	80.0-120			0.0938	15
Sulfate	50000	43300	88100	88000	89.5	89.3	1	80.0-120			0.103	15

Method Blank (MB)

(MB) R3377122-1 01/18/19 16:42

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1060639-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1060639-03 01/18/19 17:43 • (DUP) R3377122-3 01/18/19 17:59

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	6390	6420	1	0.442		15
Fluoride	300	300	1	0.0667		15
Sulfate	72800	73100	1	0.368		15

L1061236-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1061236-05 01/18/19 21:50 • (DUP) R3377122-6 01/18/19 22:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	4840	4840	1	0.134		15
Fluoride	102	101	1	1.19		15
Sulfate	911	928	1	1.85	J	15

Laboratory Control Sample (LCS)

(LCS) R3377122-2 01/18/19 16:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	38800	96.9	80.0-120	
Fluoride	8000	7960	99.6	80.0-120	
Sulfate	40000	39200	97.9	80.0-120	

L1060639-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060639-10 01/18/19 18:14 • (MS) R3377122-4 01/18/19 18:29 • (MSD) R3377122-5 01/18/19 18:45

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	28300	77600	77700	98.5	98.9	1	80.0-120			0.257	15
Fluoride	5000	205	5030	4990	96.4	95.7	1	80.0-120			0.741	15
Sulfate	50000	244000	286000	286000	83.0	82.9	1	80.0-120	E	E	0.00953	15

L1061236-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1061236-05 01/18/19 21:50 • (MS) R3377122-7 01/18/19 22:51

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	4840	54700	99.7	1	80.0-120	
Fluoride	5000	102	4950	97.1	1	80.0-120	
Sulfate	50000	911	50000	98.2	1	80.0-120	

Method Blank (MB)

(MB) R3376059-1 01/15/19 15:32

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3376059-2 01/15/19 15:35 • (LCSD) R3376059-3 01/15/19 15:37

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1040	1010	104	101	80.0-120			2.89	20
Calcium	10000	10200	10200	102	102	80.0-120			0.416	20

L1060639-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060639-04 01/15/19 15:40 • (MS) R3376059-5 01/15/19 15:45 • (MSD) R3376059-6 01/15/19 15:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	ND	1160	1160	104	104	1	75.0-125			0.251	20
Calcium	10000	110000	118000	118000	83.0	85.8	1	75.0-125			0.234	20

Method Blank (MB)

(MB) R3376257-1 01/16/19 12:43

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3376257-2 01/16/19 12:46 • (LCSD) R3376257-3 01/16/19 12:49

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1000	979	100	97.9	80.0-120			2.19	20
Calcium	10000	10100	9860	101	98.6	80.0-120			2.04	20

L1060639-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1060639-10 01/16/19 12:51 • (MS) R3376257-5 01/16/19 12:57 • (MSD) R3376257-6 01/16/19 12:59

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	5760	6690	6690	93.0	93.3	1	75.0-125			0.0442	20
Calcium	10000	175000	181000	181000	68.3	64.8	1	75.0-125	V	V	0.195	20

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

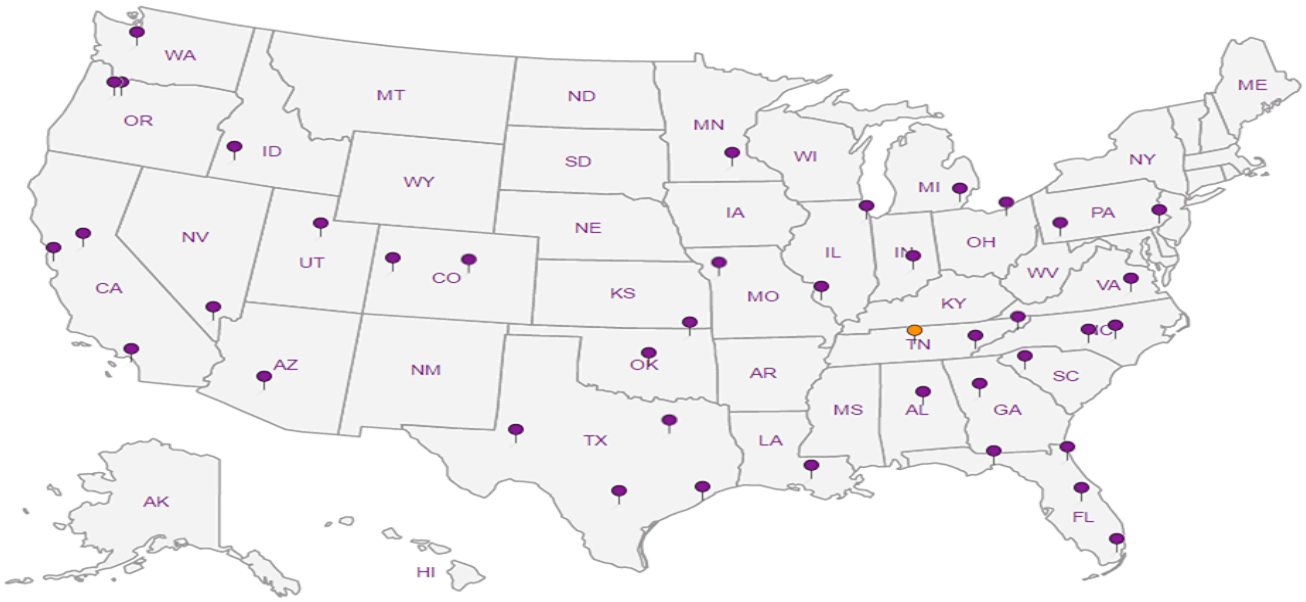
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCP&L Sibley Generating Station

City/State Collected:

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27213168.19

Lab Project # AQUAOPKS-SIBLEY

Collected by (print): G. Penaflor

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: STD

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca - 6010 250mlHDPE-HNO3	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Fluoride, SO4 - 9056 125mlHDPE-NoPres	Sulfate 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-504	Comp	GW		1/11/19	1020	2			X		X				-01
MW-505		GW			0945	1			X						02
MW-506		GW			1110	1				X					03
MW-512		GW			1145	2			X		X				04
DUPLICATE 1		GW			1150	2			X		X				05
512 MS / MSD		GW			1155	2			X		X				04
MW-801		GW			0930	1				X					06
MW-802		GW			1010	1			X						07
MW-803		GW			1055	1				X				RAD SCREEN: <0.5	08
MW-804		GW			1135	2		X			X				09

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

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via: ___ UPS ___ FedEx ___ Courier ___

Tracking # 451016556695

	Date:	Time:	
Relinquished by: (Signature)	1/11/19	1250	Received by: (Signature)
Relinquished by: (Signature)			Received by: (Signature)
Relinquished by: (Signature)			Received for lab by: (Signature)

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 1.7-1=1.6 °C Bottles Received: 24

Date: 1/12/19 Time: 0830

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

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

Chain of Custody Page ___ of ___

Pace Analytical

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1060639

F050

Acctnum: AQUAOPKS
Template: T129789
Prelogin: P689274
TSR: 206 - Jeff Carr
PB:
Shipped Via:

SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCP&L Sibley Generating Station

City/State Collected:

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27213168.19

Lab Project # AQUAOPKS-SIBLEY

Collected by (print): W. Martin

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: STD

Pres Chk: 2

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca - 6010 250mlHDPE-HNO3	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Fluoride, SO4 - 9056 125mlHDPE-NoPres	Sulfate 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-86R	Comp	GW		1/11/19	1220	3	X					X	X		10
DUPLICATE 2	↓	GW		↓	1220	3	X					X	X		11
80608 MS / MSD	↓	GW		↓	1225	3	X					X	X		10

RAD SCREEN: <0.5

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

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via:
__ UPS __ FedEx __ Courier __ ___

Tracking #

Relinquished by: (Signature) — Date: 1/11/19 — Time: 1250 — Received by: (Signature)

Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)

Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.7 °C Bottles Received: 24

Date: 1/12/19 Time: 0830

Hold:

Condition: NCF / OK

If preservation required by Login: Date/Time

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

Chain of Custody Page ___ of ___

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1060639

Table #

Acctnum: AQUAOPKS

Template: T129789

Prelogin: P689274

TSR: 206 - Jeff Carr

PB:

Shipped Via:

Jeff Carr

From: Franks, Jason <JFranks@scsengineers.com>
Sent: Monday, January 14, 2019 11:35 AM
To: Jeff Carr
Subject: Re: Pace Analytical National Login for 27213168.19 Sibley Generating Station L1060639

512 ms mad duplicate should be analyzed for chloride not fluoride.

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Jeff Carr <jcarr@pacenational.com>
Date: 1/12/19 4:51 PM (GMT-06:00)
To: "Franks, Jason" <JFranks@scsengineers.com>, bob.beck@kcpl.com, jay.martin@kcpl.com, "Rockhold, John" <JRockhold@scsengineers.com>
Subject: Pace Analytical National Login for 27213168.19 Sibley Generating Station L1060639

Thank you for choosing Pace National! Please find enclosed PDF files containing your laboratory login confirmation and chain of custody.

Pace National is leading the laboratory industry with our On-line Data Management tools. Please contact your Project Manager to learn how to create historical Excel tables or access data in real time using powerful and intuitive software that is only available at https://www.pacenational.com.

Visit Pace National's secure data management web site - myData - for all your reporting and data management needs at https://www.pacenational.com/login

Pace National ... "Your Lab of Choice"

Jeff Carr
Technical Service Representative
615-773-9667

Pace Analytical National
12065 Lebanon Rd.
Mt. Juliet, TN 37122

Jared Morrison
December 20, 2022

ATTACHMENT 1-2

March 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 20, 2019

SCS Engineers - KS

Sample Delivery Group:	L1078397
Samples Received:	03/13/2019
Project Number:	27213168.18
Description:	Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-504 L1078397-01 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 09:55 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1251927	1	03/19/19 22:06	03/19/19 22:06	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 17:53	CCE	Mt. Juliet, TN

MW-505 L1078397-02 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 10:40 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 17:56	CCE	Mt. Juliet, TN

MW-512 L1078397-03 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 11:25 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1251927	1	03/19/19 18:56	03/19/19 18:56	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 16:56	CCE	Mt. Juliet, TN

DUPLICATE 1 L1078397-04 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 11:25 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1251927	1	03/19/19 22:22	03/19/19 22:22	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 17:59	CCE	Mt. Juliet, TN

MW-801 L1078397-05 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 12:10 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1251927	5	03/19/19 22:38	03/19/19 22:38	ELN	Mt. Juliet, TN

MW-802 L1078397-06 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 12:45 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 18:01	CCE	Mt. Juliet, TN

MW-804 L1078397-07 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 14:05 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1251927	1	03/19/19 22:54	03/19/19 22:54	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 18:04	CCE	Mt. Juliet, TN

MW-806R L1078397-08 GW

Collected by: Whit Martin | Collected date/time: 03/12/19 13:20 | Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1251060	1	03/18/19 10:51	03/18/19 13:36	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1251927	5	03/20/19 04:12	03/20/19 04:12	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 17:06	CCE	Mt. Juliet, TN

DUPLICATE 2 L1078397-09 GW

Collected by: Whit Martin
Collected date/time: 03/12/19 13:20
Received date/time: 03/13/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1251060	1	03/18/19 10:51	03/18/19 13:36	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1251927	5	03/19/19 23:58	03/19/19 23:58	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1249633	1	03/16/19 08:36	03/19/19 18:07	CCE	Mt. Juliet, TN

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

Jeff Carr
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	35100		5000	1	03/19/2019 22:06	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	35400		1000	1	03/19/2019 17:53	WG1249633

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	24900		1000	1	03/19/2019 17:56	WG1249633

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	4380		1000	1	03/19/2019 18:56	WG1251927
Sulfate	44200		5000	1	03/19/2019 18:56	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	108000		1000	1	03/19/2019 16:56	WG1249633

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	4360		1000	1	03/19/2019 22:22	WG1251927
Sulfate	44400		5000	1	03/19/2019 22:22	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	109000		1000	1	03/19/2019 17:59	WG1249633

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	144000		5000	5	03/19/2019 22:38	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	107000		1000	1	03/19/2019 18:01	WG1249633

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	ND		5000	1	03/19/2019 22:54	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5710		200	1	03/19/2019 18:04	WG1249633

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	681000		13300	1	03/18/2019 13:36	WG1251060

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	256000		25000	5	03/20/2019 04:12	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5750		200	1	03/19/2019 17:06	WG1249633
Calcium	173000	V	1000	1	03/19/2019 17:06	WG1249633

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	717000		13300	1	03/18/2019 13:36	WG1251060

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	256000		25000	5	03/19/2019 23:58	WG1251927

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5670		200	1	03/19/2019 18:07	WG1249633
Calcium	171000		1000	1	03/19/2019 18:07	WG1249633

Method Blank (MB)

(MB) R3393128-1 03/18/19 13:36

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		2820	10000

L1079558-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1079558-03 03/18/19 13:36 • (DUP) R3393128-3 03/18/19 13:36

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	301000	295000	1	2.01		5

Laboratory Control Sample (LCS)

(LCS) R3393128-2 03/18/19 13:36

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8480000	96.4	85.0-115	

Method Blank (MB)

(MB) R3393205-1 03/19/19 18:05

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000
Sulfate	U		77.4	5000

L1078397-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1078397-03 03/19/19 18:56 • (DUP) R3393205-3 03/19/19 19:11

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4380	4380	1	0.0206		15
Sulfate	44200	44300	1	0.134		15

L1078452-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1078452-04 03/20/19 02:37 • (DUP) R3393205-10 03/20/19 02:53

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4740	4710	1	0.722		15
Sulfate	52100	52000	1	0.195		15

Laboratory Control Sample (LCS)

(LCS) R3393205-2 03/19/19 18:21

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	40700	102	80.0-120	
Sulfate	40000	41100	103	80.0-120	

L1078397-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078397-03 03/19/19 18:56 • (MS) R3393205-4 03/19/19 19:27 • (MSD) R3393205-5 03/19/19 19:43

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	4380	55100	55700	101	103	1	80.0-120			1.19	15
Sulfate	50000	44200	93500	94100	98.6	99.8	1	80.0-120			0.615	15

L1078397-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078397-08 03/19/19 23:10 • (MS) R3393205-6 03/19/19 23:26 • (MSD) R3393205-7 03/19/19 23:42

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	29300	79400	79000	100	99.4	1	80.0-120			0.470	15
Sulfate	50000	257000	288000	288000	62.2	62.4	1	80.0-120	E V	E V	0.0316	15

L1078452-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078452-01 03/20/19 01:33 • (MS) R3393205-8 03/20/19 01:49 • (MSD) R3393205-9 03/20/19 02:05

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	15700	66200	66200	101	101	1	80.0-120			0.00423	15
Sulfate	50000	1420000	1360000	1360000	0.000	0.000	1	80.0-120	E V	E V	0.0425	15

Method Blank (MB)

(MB) R3393175-1 03/19/19 16:48

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3393175-2 03/19/19 16:51 • (LCSD) R3393175-3 03/19/19 16:53

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	975	987	97.5	98.7	80.0-120			1.16	20
Calcium	10000	9790	9750	97.9	97.5	80.0-120			0.431	20

L1078397-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078397-03 03/19/19 16:56 • (MS) R3393175-5 03/19/19 17:01 • (MSD) R3393175-6 03/19/19 17:04

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	ND	1070	1070	97.1	97.8	1	75.0-125			0.681	20
Calcium	10000	108000	118000	117000	93.2	86.7	1	75.0-125			0.554	20

L1078397-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078397-08 03/19/19 17:06 • (MS) R3393175-7 03/19/19 17:09 • (MSD) R3393175-8 03/19/19 17:11

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	5750	6630	6610	88.0	85.8	1	75.0-125			0.334	20
Calcium	10000	173000	179000	182000	60.0	88.1	1	75.0-125	V		1.56	20

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

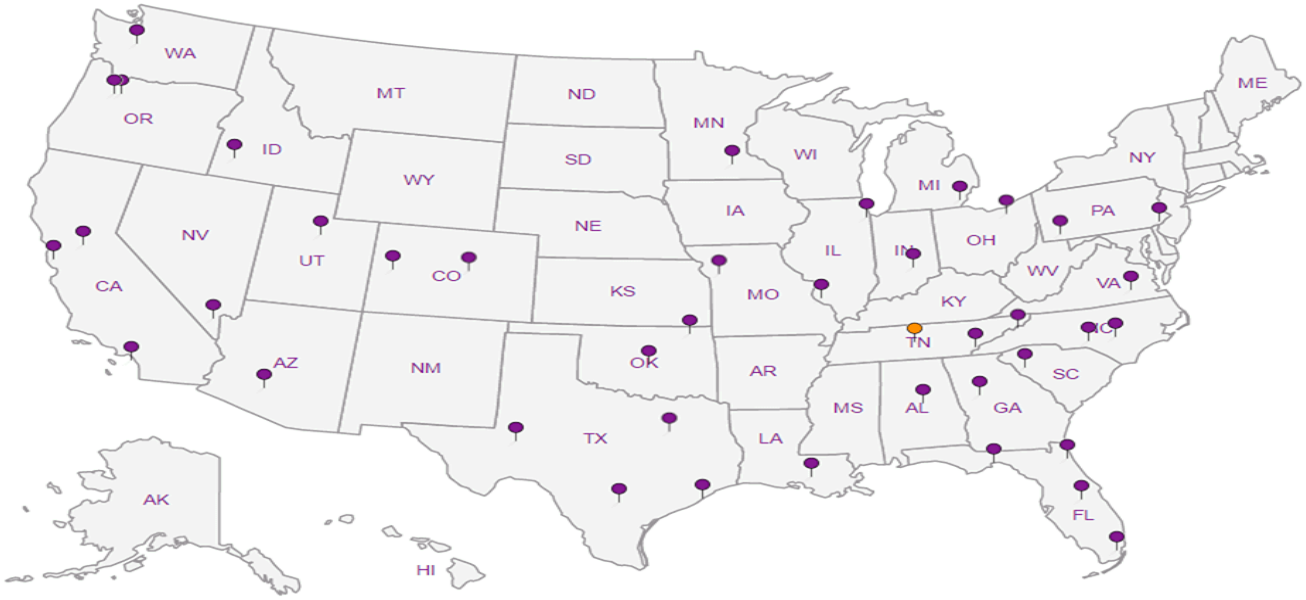
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to: **Jason Franks**

Email To: **jfranks@scsengineers.com; jay.martin@kcpl.com;**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected:

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213168.18**

Lab Project # **AQUAOPKS-SIBLEY**

Collected by (print): Whit Martin

Site/Facility ID #

P.O. #

Collected by (signature): Whit Martin

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: Std

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1078397
1023

Acctnum: **AQUAOPKS**
Template: **T129789**
Prelogin: **P698295**
TSR: **206 - Jeff Carr**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca - 6010 250mlHDPE-HNO3<2	Boron - 6010 250mlHDPE-HNO3<2	Calcium - 6010 250mlHDPE-HNO3<2	Chloride - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres				Remarks	Sample # (lab only)
MW-504	Grab	GW		3/12/19	0955	2			X			X						-01
MW-505	Grab	GW		3/12/19	1040	1			X									-02
MW-512	Grab	GW		3/12/19	1125	2			X		X							-03
DUPLICATE 1	Grab	GW		3/12/19	1125	2			X		X							-04
MW-512 MS/MSD	Grab	GW		3/12/19	1130	2			X		X							
MW-801	Grab	GW		3/12/19	1210	1				X								-05
MW-802	Grab	GW		3/12/19	1245	1			X									-06
MW-804	Grab	GW		3/12/19	1405	2		X				X						-07
MW-806R	Grab	GW		3/12/19	1320	3	X					X	X					-08
DUPLICATE 2	Grab	GW		3/12/19	1320	3	X					X	X					-09

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Whit Martin	3/12/19	1555	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Malphe T.

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.3+.1-2.4 °C Bottles Received: 22

Date: 3/13 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to: **Jason Franks**

Email To: **jfranks@scsengineers.com; jay.martin@kcpl.com;**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected:

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213168.18**

Lab Project # **AQUAOPKS-SIBLEY**

Collected by (print): Whit Martin

Site/Facility ID #

P.O. #

Collected by (signature): Whit Martin

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: Std

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca - 6010 250mlHDPE-HNO3 <2	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres				
MW806R MS / MSD	Grab	GW		3/12/19	1325	3	X					X	X				

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L1078397

Table #

Acctnum: **AQUAOPKS**

Template: **T129789**

Prelogin: **P698295**

TSR: **206 - Jeff Carr**

PB:

Shipped Via:

Remarks | Sample # (lab only)

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Whit Martin	3/12/19	1555		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 2.3+.1=2.4 22
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/13 Time: 8:45
			Melik T.	Hold: Condition: NCF / OK

Jared Morrison
December 20, 2022

ATTACHMENT 1-3

May 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 04, 2019

SCS Engineers - KS

Sample Delivery Group:	L1102423
Samples Received:	05/24/2019
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To:

Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-701 L1102423-01 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 14:20 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287420	1	05/29/19 14:17	05/29/19 15:02	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 16:35	06/03/19 16:35	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 20:54	CCE	Mt. Juliet, TN

MW-702 L1102423-02 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 12:40 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287420	1	05/29/19 14:17	05/29/19 15:02	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 17:32	06/03/19 17:32	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 20:56	CCE	Mt. Juliet, TN

MW-703 L1102423-03 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 13:15 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287420	1	05/29/19 14:17	05/29/19 15:02	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 17:47	06/03/19 17:47	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:04	CCE	Mt. Juliet, TN

MW-704 L1102423-04 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 13:45 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287420	1	05/29/19 14:17	05/29/19 15:02	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 18:03	06/03/19 18:03	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:07	CCE	Mt. Juliet, TN

MW-801 L1102423-05 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 16:05 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 18:19	06/03/19 18:19	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	5	06/03/19 19:07	06/03/19 19:07	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:09	CCE	Mt. Juliet, TN

MW-802 L1102423-06 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 15:20 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 19:23	06/03/19 19:23	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:12	CCE	Mt. Juliet, TN

MW-803 L1102423-07 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 16:50 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 19:39	06/03/19 19:39	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	5	06/04/19 10:10	06/04/19 10:10	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:14	CCE	Mt. Juliet, TN

MW-804 L1102423-08 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 17:25 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 19:55	06/03/19 19:55	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:17	CCE	Mt. Juliet, TN

MW-805 L1102423-09 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 17:15 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 20:10	06/03/19 20:10	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:19	CCE	Mt. Juliet, TN

MW-806R L1102423-10 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 16:35 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 20:26	06/03/19 20:26	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	5	06/03/19 21:14	06/03/19 21:14	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 20:20	RDS	Mt. Juliet, TN

DUPLICATE 2 L1102423-11 GW

Collected by: Jason R. Franks | Collected date/time: 05/22/19 16:35 | Received date/time: 05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287421	1	05/29/19 12:36	05/29/19 13:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	1	06/03/19 21:30	06/03/19 21:30	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290091	5	06/04/19 10:26	06/04/19 10:26	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1286570	1	05/26/19 18:31	05/28/19 21:22	CCE	Mt. Juliet, TN

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

Jeff Carr
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	312000		10000	1	05/29/2019 15:02	WG1287420

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	8360		1000	1	06/03/2019 16:35	WG1290091
Fluoride	144		100	1	06/03/2019 16:35	WG1290091
Sulfate	13400		5000	1	06/03/2019 16:35	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	05/28/2019 20:54	WG1286570
Calcium	86900		1000	1	05/28/2019 20:54	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	301000		10000	1	05/29/2019 15:02	WG1287420

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	8090		1000	1	06/03/2019 17:32	WG1290091
Fluoride	142		100	1	06/03/2019 17:32	WG1290091
Sulfate	17000		5000	1	06/03/2019 17:32	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	05/28/2019 20:56	WG1286570
Calcium	88400		1000	1	05/28/2019 20:56	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	381000		10000	1	05/29/2019 15:02	WG1287420

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	15000		1000	1	06/03/2019 17:47	WG1290091
Fluoride	251		100	1	06/03/2019 17:47	WG1290091
Sulfate	17800		5000	1	06/03/2019 17:47	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	535		200	1	05/28/2019 21:04	WG1286570
Calcium	89900		1000	1	05/28/2019 21:04	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	376000		10000	1	05/29/2019 15:02	WG1287420

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	18100		1000	1	06/03/2019 18:03	WG1290091
Fluoride	177		100	1	06/03/2019 18:03	WG1290091
Sulfate	37600		5000	1	06/03/2019 18:03	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	05/28/2019 21:07	WG1286570
Calcium	101000		1000	1	05/28/2019 21:07	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	817000		13300	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	154000		5000	5	06/03/2019 19:07	WG1290091
Fluoride	151		100	1	06/03/2019 18:19	WG1290091
Sulfate	88300		5000	1	06/03/2019 18:19	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	549		200	1	05/28/2019 21:09	WG1286570
Calcium	178000		1000	1	05/28/2019 21:09	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	383000		10000	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	62000		1000	1	06/03/2019 19:23	WG1290091
Fluoride	227		100	1	06/03/2019 19:23	WG1290091
Sulfate	35400		5000	1	06/03/2019 19:23	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	05/28/2019 21:12	WG1286570
Calcium	85500		1000	1	05/28/2019 21:12	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	535000		10000	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	15900		1000	1	06/03/2019 19:39	WG1290091
Fluoride	272		100	1	06/03/2019 19:39	WG1290091
Sulfate	120000		25000	5	06/04/2019 10:10	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	2770		200	1	05/28/2019 21:14	WG1286570
Calcium	119000		1000	1	05/28/2019 21:14	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	719000		13300	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	17700		1000	1	06/03/2019 19:55	WG1290091
Fluoride	233		100	1	06/03/2019 19:55	WG1290091
Sulfate	ND		5000	1	06/03/2019 19:55	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	7640		200	1	05/28/2019 21:17	WG1286570
Calcium	169000		1000	1	05/28/2019 21:17	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	357000		10000	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	8650		1000	1	06/03/2019 20:10	WG1290091
Fluoride	201		100	1	06/03/2019 20:10	WG1290091
Sulfate	51100		5000	1	06/03/2019 20:10	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	05/28/2019 21:19	WG1286570
Calcium	98700		1000	1	05/28/2019 21:19	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	731000		13300	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	28700		1000	1	06/03/2019 20:26	WG1290091
Fluoride	215		100	1	06/03/2019 20:26	WG1290091
Sulfate	238000		25000	5	06/03/2019 21:14	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5580		200	1	05/28/2019 20:20	WG1286570
Calcium	171000	V	1000	1	05/28/2019 20:20	WG1286570

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	726000		10000	1	05/29/2019 13:33	WG1287421

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	28700		1000	1	06/03/2019 21:30	WG1290091
Fluoride	214		100	1	06/03/2019 21:30	WG1290091
Sulfate	231000		25000	5	06/04/2019 10:26	WG1290091

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5630		200	1	05/28/2019 21:22	WG1286570
Calcium	171000		1000	1	05/28/2019 21:22	WG1286570

Method Blank (MB)

(MB) R3416932-1 05/29/19 15:02

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		2820	10000

L1102352-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1102352-08 05/29/19 15:02 • (DUP) R3416932-3 05/29/19 15:02

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1940000	1920000	1	1.30		5

Laboratory Control Sample (LCS)

(LCS) R3416932-2 05/29/19 15:02

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8700000	98.9	85.0-115	

Method Blank (MB)

(MB) R3416805-1 05/29/19 13:33

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Dissolved Solids	U		2820	10000

L1102435-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1102435-02 05/29/19 13:33 • (DUP) R3416805-3 05/29/19 13:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Dissolved Solids	168000	168000	1	0.000		5

Laboratory Control Sample (LCS)

(LCS) R3416805-2 05/29/19 13:33

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Dissolved Solids	8800000	8890000	101	85.0-115	

Method Blank (MB)

(MB) R3417535-1 06/03/19 14:52

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1102430-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1102430-03 06/03/19 22:50 • (DUP) R3417535-7 06/03/19 23:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	8620	8620	1	0.0395		15
Fluoride	ND	58.0	1	0.000		15
Sulfate	105000	105000	1	0.0563	E	15

Laboratory Control Sample (LCS)

(LCS) R3417535-2 06/03/19 15:07

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	40500	101	80.0-120	
Fluoride	8000	8490	106	80.0-120	
Sulfate	40000	40200	100	80.0-120	

L1102400-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1102400-09 06/03/19 15:48 • (MS) R3417535-4 06/03/19 16:19

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Chloride	50000	ND	51200	102	1	80.0-120	
Fluoride	5000	ND	5190	104	1	80.0-120	
Sulfate	50000	ND	50900	102	1	80.0-120	

L1102423-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102423-10 06/03/19 20:26 • (MS) R3417535-5 06/03/19 20:42 • (MSD) R3417535-6 06/03/19 20:58

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Chloride	50000	28700	80000	80300	103	103	1	80.0-120			0.379	15
Fluoride	5000	215	5410	5440	104	105	1	80.0-120			0.612	15

L1102423-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102423-10 06/03/19 20:26 • (MS) R3417535-5 06/03/19 20:42 • (MSD) R3417535-6 06/03/19 20:58

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	250000	293000	293000	84.4	84.8	1	80.0-120	E	E	0.0739	15

Method Blank (MB)

(MB) R3415615-1 05/28/19 20:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3415615-2 05/28/19 20:04 • (LCSD) R3415615-3 05/28/19 20:07

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1010	979	101	97.9	80.0-120			2.94	20
Calcium	10000	9880	9680	98.8	96.8	80.0-120			2.10	20

L1102021-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102021-01 05/28/19 20:09 • (MS) R3415615-5 05/28/19 20:15 • (MSD) R3415615-6 05/28/19 20:17

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	ND	1010	1030	95.9	97.2	1	75.0-125			1.23	20
Calcium	10000	5970	15200	15300	92.7	93.7	1	75.0-125			0.656	20

L1102423-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102423-10 05/28/19 20:20 • (MS) R3415615-7 05/28/19 20:22 • (MSD) R3415615-8 05/28/19 20:24

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	5580	6480	6500	90.4	92.1	1	75.0-125			0.258	20
Calcium	10000	171000	178000	178000	75.9	71.3	1	75.0-125		V	0.256	20

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

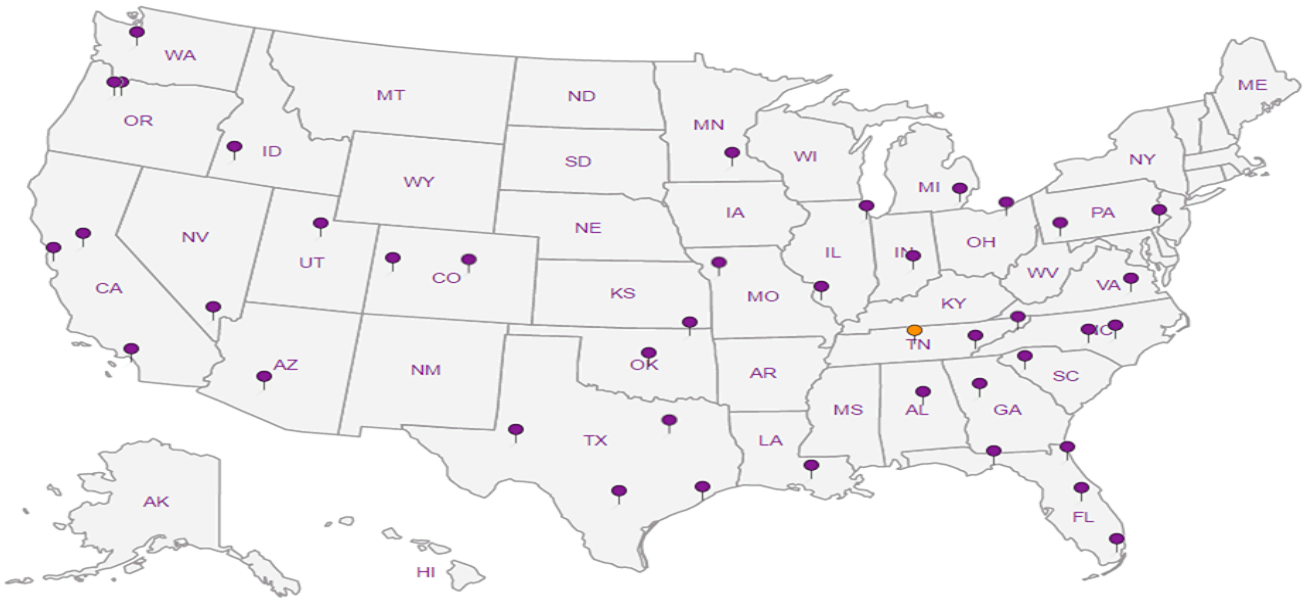
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Report to: Jason Franks
Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCP&L Sibley Generating Station
City/State Collected: SIBLEY, MO

Phone: 913-681-0030
Fax: 913-681-0012
Client Project # 27213169.18
Lab Project # AQUAOPKS-SIBLEY

Collected by (print): JASON R. FRANKS
Site/Facility ID #
P.O. #

Collected by (signature): Jason R. Franks
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day
Quote #
Date Results Needed

Chain of Custody Page 1 of 2

National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1162423
1214

Acctnum: AQUAOPKS
Template: T136014
Prelogin: P709155
TSR: 206 - Jeff Carr
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions (Cld, F, SO4) 125mlHDPE-NoPres	B, Ca - 6010 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres								Remarks	Sample # (lab only)
MW-701	GRAB	GW	-	5/22/19	1420	3	X	X	X									-01
MW-702		GW	-		1240	3	X	X	X									02
MW-703		GW	-		1315	3	X	X	X									03
MW-704		GW	-		1345	3	X	X	X									04
MW-801		GW	-		1605	3	X	X	X									05
MW-802		GW	-		1520	3	X	X	X									06
MW-803		GW	-		1650	3	X	X	X									07
MW-804		GW	-		1725	3	X	X	X									08
MW-805		GW	-		1715	3	X	X	X									09
MW-806R		GW	-		1635	3	X	X	X									10

RAD SCREEN: <0.5 mR/hr

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

Remarks:
pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier __ _____
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP ___Y ___N
COC Signed/Accurate: ___Y ___N
Bottles arrive intact: ___Y ___N
Correct bottles used: ___Y ___N
Sufficient volume sent: ___Y ___N
If Applicable
VOA Zero Headspace: ___Y ___N
Preservation Correct/Checked: ___Y ___N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Jason R. Franks	5/23/19	1220	Alan Hebron	5-23-19 1220
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.0 °C Bottles Received: 36
	5/23/19	1700	SWA	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Hold: Condition: NCF / OK
				Date: 5/24/19 Time: 8:00

2 2

SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to: **Jason Franks**

Email To: **jfranks@scsengineers.com; jay.martin@kcpl.com;**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: SIBLEY, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.18**

Lab Project # **AQUAOPKS-SIBLEY**

Collected by (print): JASON R. FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions (Cld, F, SO4) 125mlHDPE-NoPres	B, Ca - 6010 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres								Remarks	Sample # (lab only)
806R MS / MSD	GRAB	GW	–	5/22/19	1635	3	X	X	X						RAD SCREEN: <0.5 mR/hr			-10
DUPLICATE #2	↓	GW	–	↓	1635	3	X	X	X									11

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1102423

Table #

Acctnum: **AQUAOPKS**

Template: **T136014**

Prelogin: **P709155**

TSR: **206 - Jeff Carr**

PB:

Shipped Via:

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Jason R. Franks	5/23/19	1220	[signature] 5-23-19 1220	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
[signature]	5/23/19	1700	SWA	1.0 +0.1=1.1 PM 36
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:
			[signature]	5/24/19 8:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Jared Morrison
December 20, 2022

ATTACHMENT 1-4

July 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

July 29, 2019

SCS Engineers - KS

Sample Delivery Group:	L1119586
Samples Received:	07/17/2019
Project Number:	27213168.18
Description:	Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-504 L1119586-01 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 10:55 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 20:43	07/22/19 20:43	LDC	Mt. Juliet, TN

MW-506 L1119586-02 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 11:47 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 20:57	07/22/19 20:57	LDC	Mt. Juliet, TN

MW-512 L1119586-03 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 12:30 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 21:27	07/22/19 21:27	LDC	Mt. Juliet, TN

MW-703 L1119586-04 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 12:40 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 21:42	07/22/19 21:42	LDC	Mt. Juliet, TN

MW-704 L1119586-05 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 13:15 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 21:57	07/22/19 21:57	LDC	Mt. Juliet, TN

DUPLICATE 1 L1119586-06 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 13:15 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 23:11	07/22/19 23:11	LDC	Mt. Juliet, TN

MW-801 L1119586-07 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 13:55 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1313293	1	07/19/19 07:21	07/19/19 07:42	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1314866	1	07/22/19 23:26	07/22/19 23:26	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1314866	5	07/23/19 00:11	07/23/19 00:11	LDC	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1313404	1	07/18/19 17:12	07/19/19 18:36	EL	Mt. Juliet, TN

DUPLICATE 2 L1119586-08 GW

Collected by: Whit Martin | Collected date/time: 07/16/19 13:55 | Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1313293	1	07/19/19 07:21	07/19/19 07:42	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1314866	1	07/23/19 00:26	07/23/19 00:26	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1314866	5	07/23/19 00:41	07/23/19 00:41	LDC	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1313404	1	07/18/19 17:12	07/19/19 18:48	EL	Mt. Juliet, TN

MW-804 L1119586-09 GW

Collected by: Whit Martin
Collected date/time: 07/16/19 13:20
Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1313293	1	07/19/19 07:21	07/19/19 07:42	TH	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1313404	1	07/18/19 17:12	07/19/19 18:51	EL	Mt. Juliet, TN

MW-806R L1119586-10 GW

Collected by: Whit Martin
Collected date/time: 07/16/19 14:05
Received date/time: 07/17/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1313293	1	07/19/19 07:21	07/19/19 07:42	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1317958	5	07/26/19 17:29	07/26/19 17:29	LDC	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1313404	1	07/18/19 17:12	07/19/19 18:59	EL	Mt. Juliet, TN

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

Jeff Carr
Project Manager

Project Narrative

This report has been revised. Sample L1119586-10 was re-analyzed for Sulfate and the results of the second run are presented within this report.

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	36300		5000	1	07/22/2019 20:43	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	7330		1000	1	07/22/2019 20:57	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	4350		1000	1	07/22/2019 21:27	WG1314866
Sulfate	42100		5000	1	07/22/2019 21:27	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	11100		5000	1	07/22/2019 21:42	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	19500		1000	1	07/22/2019 21:57	WG1314866
Fluoride	157		100	1	07/22/2019 21:57	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	19500		1000	1	07/22/2019 23:11	WG1314866
Fluoride	160		100	1	07/22/2019 23:11	WG1314866

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	613000		13300	1	07/19/2019 07:42	WG1313293

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	127000		5000	5	07/23/2019 00:11	WG1314866
Sulfate	56600		5000	1	07/22/2019 23:26	WG1314866

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	326		200	1	07/19/2019 18:36	WG1313404
Calcium	152000	V	1000	1	07/19/2019 18:36	WG1313404

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	612000		13300	1	07/19/2019 07:42	WG1313293

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	128000		5000	5	07/23/2019 00:41	WG1314866
Sulfate	56700		5000	1	07/23/2019 00:26	WG1314866

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	321		200	1	07/19/2019 18:48	WG1313404
Calcium	152000		1000	1	07/19/2019 18:48	WG1313404

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	585000		13300	1	07/19/2019 07:42	WG1313293

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	7590		200	1	07/19/2019 18:51	WG1313404

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	671000		13300	1	07/19/2019 07:42	WG1313293

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	244000		25000	5	07/26/2019 17:29	WG1317958

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5640		200	1	07/19/2019 18:59	WG1313404
Calcium	172000		1000	1	07/19/2019 18:59	WG1313404

Method Blank (MB)

(MB) R3432683-1 07/19/19 07:42

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		2820	10000

L1119481-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1119481-01 07/19/19 07:42 • (DUP) R3432683-3 07/19/19 07:42

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	93000	97000	1	4.21		5

Laboratory Control Sample (LCS)

(LCS) R3432683-2 07/19/19 07:42

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8470000	96.3	85.0-115	

Method Blank (MB)

(MB) R3433129-1 07/22/19 19:56

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1119586-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1119586-02 07/22/19 20:57 • (DUP) R3433129-3 07/22/19 21:12

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	7330	7360	1	0.475		15
Fluoride	325	325	1	0.0924		15
Sulfate	75900	75800	1	0.120		15

L1119894-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1119894-04 07/23/19 04:10 • (DUP) R3433129-8 07/23/19 04:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	4090	4170	1	1.98		15
Fluoride	ND	0.000	1	0.000		15
Sulfate	ND	0.000	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3433129-2 07/22/19 20:10

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	39800	99.4	80.0-120	
Fluoride	8000	8090	101	80.0-120	
Sulfate	40000	41000	102	80.0-120	

L1119586-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1119586-05 07/22/19 21:57 • (MS) R3433129-4 07/22/19 22:12 • (MSD) R3433129-5 07/22/19 22:27

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	19500	70100	70200	101	101	1	80.0-120			0.177	15
Fluoride	5000	157	5270	5300	102	103	1	80.0-120			0.594	15
Sulfate	50000	43000	91600	91900	97.1	97.7	1	80.0-120			0.359	15

L1119586-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1119586-07 07/22/19 23:26 • (MS) R3433129-6 07/22/19 23:41 • (MSD) R3433129-7 07/22/19 23:56

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	5000	170	5170	5280	100	102	1	80.0-120			2.01	15
Sulfate	50000	56600	104000	104000	94.0	95.4	1	80.0-120	E	E	0.660	15

Method Blank (MB)

(MB) R3434874-1 07/26/19 09:08

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Sulfate	U		77.4	5000

L1122561-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1122561-11 07/26/19 14:11 • (DUP) R3434874-6 07/26/19 14:29

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	62000	61800	1	0.310		15

L1121946-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1121946-01 07/26/19 17:48 • (DUP) R3434874-8 07/26/19 18:06

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	20900	20800	1	0.554		15

Laboratory Control Sample (LCS)

(LCS) R3434874-2 07/26/19 09:25

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	40200	100	80.0-120	

L1122561-11 Original Sample (OS) • Matrix Spike (MS)

(OS) L1122561-11 07/26/19 14:11 • (MS) R3434874-7 07/26/19 14:46

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	62000	109000	94.1	1	80.0-120	E

L1121946-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1121946-01 07/26/19 17:48 • (MS) R3434874-9 07/26/19 18:23 • (MSD) R3434874-10 07/26/19 18:41

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	20900	70800	70600	99.8	99.3	1	80.0-120			0.326	15

Method Blank (MB)

(MB) R3432671-1 07/19/19 18:29

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3432671-2 07/19/19 18:31 • (LCSD) R3432671-3 07/19/19 18:33

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	963	995	96.3	99.5	80.0-120			3.26	20
Calcium	10000	9800	9910	98.0	99.1	80.0-120			1.17	20

L1119586-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1119586-07 07/19/19 18:36 • (MS) R3432671-5 07/19/19 18:41 • (MSD) R3432671-6 07/19/19 18:43

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	326	1280	1300	95.5	97.8	1	75.0-125			1.79	20
Calcium	10000	152000	158000	158000	60.2	60.3	1	75.0-125	V	V	0.00424	20

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

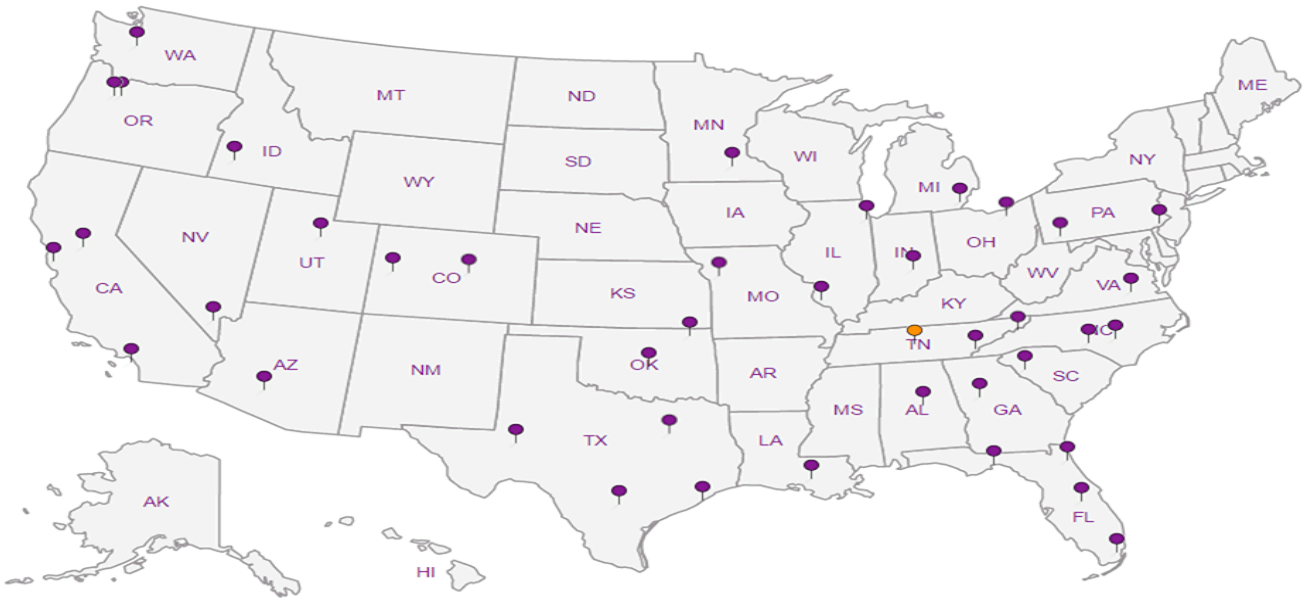
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



Chain of Custody Page 1 of 2

SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: Sibley Generating Station

City/State Collected:

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27213168.18

Lab Project # AQUAOPKS-SIBLEY

Collected by (print): Whit Martin

Site/Facility ID #

P.O. #

Collected by (signature): Whit Martin

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: Std

National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1119586
J222

Acctnum: AQUAOPKS
Template: T129789
Prelogin: P719408
TSR: 206 - Jeff Carr
PB:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron - 6010 250mlHDPE-HNO3	Ca, B - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Chloride, F - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres				Remarks	Sample # (lab only)
Pres Chk							L2	L2										
MW-504	Grab	GW		7/16/19	1055	1						X						-01
MW-506	Grab	GW		7/16/19	1147	1			X									02
MW-512	Grab	GW		7/16/19	1230	1					X							03
MW-703	Grab	GW		7/16/19	1240	1						X						04
MW-704	Grab	GW		7/16/19	1315	1				X								05
MW-704 MS/MSD	Grab	GW		7/16/19	1315	1				X								05
DUPLICATE 1	Grab	GW		7/16/19	1315	1				X								06
MW-801	Grab	GW		7/16/19	1355	3		X			X		X					07
MW-801 MS/MSD	Grab	GW		7/16/19	1355	3		X			X		X					07
DUPLICATE 2	Grab	GW		7/16/19	1355	3		X			X		X					08

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

Remarks:

pH ______ Temp ______
Flow ______ Other ______

RAD SCREEN: <0.5 mR/hr

Samples returned via:
__ UPS __ FedEx __ Courier __ ______

Tracking # 4794 8839 2426

Sample Receipt Checklist
COC Seal Present/Intact: ✓ NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received:
Whit Martin	7/16/19	1515	[signature]	Yes / No (circled No); HCL / MeoH; TBR

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C	Bottles Received:	If preservation required by Login: Date/Time
[signature]	7/16/19	1800		1.7-0.1=1.6	21	

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition:
			[signature]	7/17/19	8:45		NCF / OK (circled OK)

SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Report to: Jason Franks
Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: Sibley Generating Station
City/State Collected:

Phone: 913-681-0030
Fax: 913-681-0012
Client Project # 27213169.18
Lab Project # AQUAOPKS-SIBLEY

Collected by (print): Whit Martin
Collected by (signature):
Immediately Packed on Ice N ___ Y X
Site/Facility ID #
P.O. #
Quote #

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Date Results Needed: Std

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	Boron - 6010 250mlHDPE-HNO3	Ca, B - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Chloride, F - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres				Remarks	Sample # (lab only)
MW-804	Grab	GW		7/16/19	1320	2		X						X					-09
MW-806R	Grab	GW		7/16/19	1405	3			X				X	X					10

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1119586
Table #
Acctnum: AQUAOPKS
Template: T129789
Prelogin: P719408
TSR: 206 - Jeff Carr
PB:
Shipped Via:

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

Remarks: RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____
Tracking # 4794 8839 2426

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Whit Martin	7/16/19	1515	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	7-16-19	1800	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			JA

Trip Blank Received: Yes (No) HCL / MeoH TBR
Temp: 1.9 -0.1 1.8 °C Bottles Received: 21
Date: 7/17/19 Time: 8:45

If preservation required by Login: Date/Time
Hold:
Condition: NCF / (OK)

Jared Morrison
December 20, 2022

ATTACHMENT 1-5

August 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

August 30, 2019

SCS Engineers - KS

Sample Delivery Group:	L1132073
Samples Received:	08/23/2019
Project Number:	27213168.18
Description:	Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jason Romer
Project Manager

TABLE OF CONTENTS

MW-504 L1132073-01 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 16:20 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1333739	1	08/23/19 22:09	08/23/19 22:09	LDC	Mt. Juliet, TN

MW-506 L1132073-02 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 13:10 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1333739	1	08/23/19 22:24	08/23/19 22:24	LDC	Mt. Juliet, TN

MW-512 L1132073-03 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 13:50 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1333739	1	08/23/19 22:39	08/23/19 22:39	LDC	Mt. Juliet, TN

MW-703 L1132073-04 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 11:50 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334249	1	08/24/19 12:29	08/24/19 12:29	ST	Mt. Juliet, TN

MW-704 L1132073-05 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 12:20 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334249	1	08/24/19 13:02	08/24/19 13:02	ST	Mt. Juliet, TN

MW-801 L1132073-06 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 14:20 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334249	5	08/24/19 14:07	08/24/19 14:07	ST	Mt. Juliet, TN

MW-804 L1132073-07 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 15:00 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1334216	1	08/24/19 11:18	08/25/19 08:57	EL	Mt. Juliet, TN

MW-806R L1132073-08 GW

Collected by: Whit Martin | Collected date/time: 08/21/19 15:30 | Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334249	5	08/25/19 14:32	08/25/19 14:32	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1334216	1	08/24/19 11:18	08/25/19 08:17	EL	Mt. Juliet, TN

DUPLICATE 1 L1132073-09 GW

Collected by: Whit Martin
Collected date/time: 08/21/19 12:20
Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334249	1	08/24/19 15:46	08/24/19 15:46	ST	Mt. Juliet, TN

DUPLICATE 2 L1132073-10 GW

Collected by: Whit Martin
Collected date/time: 08/21/19 15:30
Received date/time: 08/23/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334249	5	08/24/19 16:19	08/24/19 16:19	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1334216	1	08/24/19 11:18	08/25/19 09:00	EL	Mt. Juliet, TN

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

Jason Romer
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	35600		5000	1	08/23/2019 22:09	WG1333739

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	7170		1000	1	08/23/2019 22:24	WG1333739

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	4910		1000	1	08/23/2019 22:39	WG1333739
Sulfate	41000		5000	1	08/23/2019 22:39	WG1333739

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	5730		5000	1	08/24/2019 12:29	WG1334249

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	15200		1000	1	08/24/2019 13:02	WG1334249

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	124000		5000	5	08/24/2019 14:07	WG1334249

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8140		200	1	08/25/2019 08:57	WG1334216

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	241000		25000	5	08/25/2019 14:32	WG1334249

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5660		200	1	08/25/2019 08:17	WG1334216
Calcium	170000		1000	1	08/25/2019 08:17	WG1334216

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	16500		1000	1	08/24/2019 15:46	WG1334249

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Sulfate	243000		25000	5	08/24/2019 16:19	WG1334249

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5720		200	1	08/25/2019 09:00	WG1334216
Calcium	172000		1000	1	08/25/2019 09:00	WG1334216

Method Blank (MB)

(MB) R3443601-1 08/23/19 08:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chloride	U		51.9	1000
Sulfate	U		77.4	5000

L1131956-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1131956-01 08/23/19 13:42 • (DUP) R3443601-3 08/23/19 13:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	271000	271000	1	0.0581	E	15
Sulfate	161000	160000	1	0.0640	E	15

L1131956-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1131956-01 08/23/19 14:12 • (DUP) R3443601-4 08/23/19 14:27

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	271000	318000	5	15.7	J3	15
Sulfate	160000	161000	5	0.579		15

L1131992-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1131992-01 08/23/19 19:10 • (DUP) R3443601-7 08/23/19 19:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	4190	4140	1	1.20		15
Sulfate	ND	2500	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3443601-2 08/23/19 08:15

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	39200	98.0	80.0-120	
Sulfate	40000	40200	101	80.0-120	

L1131956-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1131956-02 08/23/19 15:11 • (MS) R3443601-5 08/23/19 15:26 • (MSD) R3443601-6 08/23/19 15:41

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	267000	303000	304000	71.9	73.2	1	80.0-120	E V	E V	0.206	15
Sulfate	50000	151000	193000	193000	83.8	83.2	1	80.0-120	E	E	0.153	15

L1132011-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1132011-01 08/23/19 19:40 • (MS) R3443601-8 08/23/19 19:55

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	54100	102000	95.6	1	80.0-120	E
Sulfate	50000	276000	309000	66.8	1	80.0-120	E V

Method Blank (MB)

(MB) R3443951-1 08/24/19 09:56

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chloride	U		51.9	1000
Sulfate	U		77.4	5000

L1132073-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1132073-05 08/24/19 13:02 • (DUP) R3443951-4 08/24/19 13:18

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	15200	15100	1	0.528		15
Sulfate	26000	26000	1	0.219		15

L1132269-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1132269-02 08/24/19 20:08 • (DUP) R3443951-9 08/24/19 20:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	185000	184000	20	0.549		15
Sulfate	11400	11300	20	1.53	J	15

Laboratory Control Sample (LCS)

(LCS) R3443951-3 08/24/19 10:45

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	38400	96.1	80.0-120	
Sulfate	40000	38400	96.1	80.0-120	

L1132073-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1132073-05 08/24/19 13:02 • (MS) R3443951-5 08/24/19 13:35

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Chloride	50000	15200	65200	100	1	80.0-120	
Sulfate	50000	26000	76200	100	1	80.0-120	

L1132073-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132073-08 08/24/19 14:57 • (MS) R3443951-7 08/24/19 15:13 • (MSD) R3443951-8 08/24/19 15:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	28500	79100	79000	101	101	1	80.0-120			0.0506	15
Sulfate	50000	254000	297000	297000	86.6	85.7	1	80.0-120	E	E	0.149	15

Method Blank (MB)

(MB) R3443985-1 08/25/19 08:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3443985-2 08/25/19 08:12 • (LCSD) R3443985-3 08/25/19 08:15

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	955	954	95.5	95.4	80.0-120			0.149	20
Calcium	10000	9720	9920	97.2	99.2	80.0-120			2.08	20

L1132073-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132073-08 08/25/19 08:17 • (MS) R3443985-5 08/25/19 08:22 • (MSD) R3443985-6 08/25/19 08:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	5660	6550	6640	89.2	98.5	1	75.0-125			1.41	20
Calcium	10000	170000	179000	181000	83.7	106	1	75.0-125			1.22	20

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

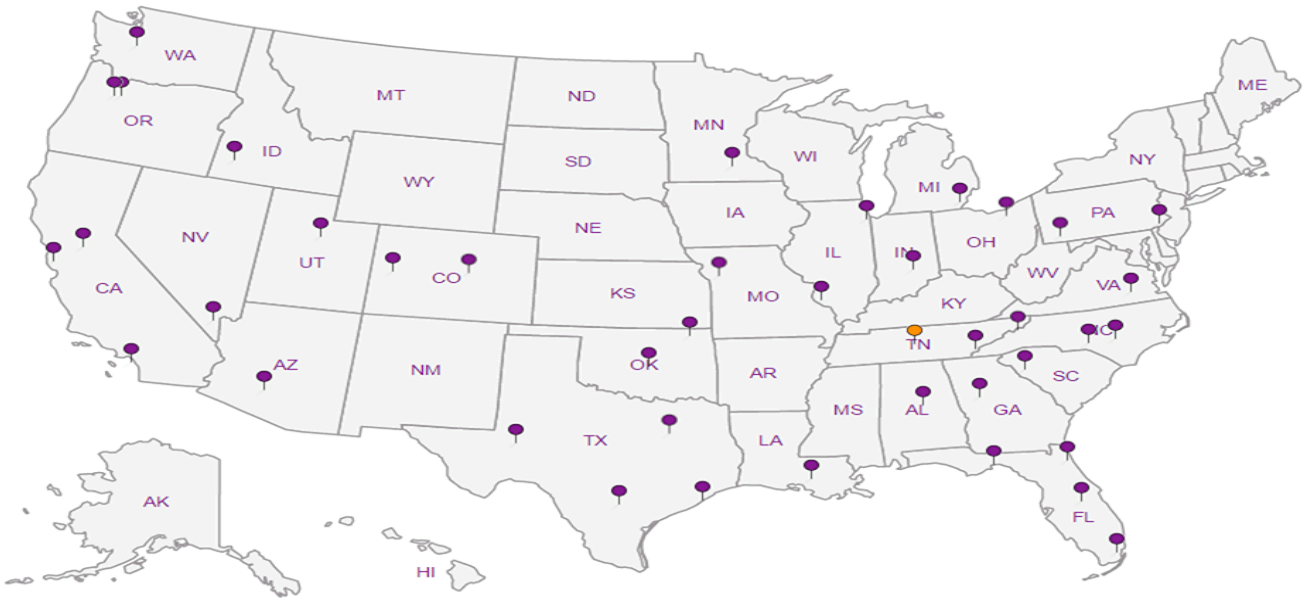
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: Sibley Generating Station

City/State Collected: Sibley, MO

Please Circle: PT MT CT ET

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27213168.18

Lab Project # AQUAOPKS-SIBLEY

Collected by (print): Whit Martin

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Site/Facility ID #

P.O. #

Quote #

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

Date Results Needed: Std

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron - 6010 250mlHDPE-HNO3	Ca, B - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-504	Grab	GW		8/21/19	1620	1					X		-1
MW-506	Grab	GW		8/21/19	1310	1			X				-2
MW-512	Grab	GW		8/21/19	1350	1				X			-3
MW-703	Grab	GW		8/21/19	1150	1					X		-4
MW-704	Grab	GW		8/21/19	1220	1			X				-5
MW-801	Grab	GW		8/21/19	1420	1			X				-6
MW-804	Grab	GW		8/21/19	1500	1	X						-7
MW-806R	Grab	GW		8/21/19	1530	2		X			X		-8
DUPLICATE 1	Grab	GW		8/21/19	1220	1			X				-9
704 MS/MSD	Grab	GW		8/21/19	1220	1			X				

Chain of Custody Page ___ of ___

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 132073

Table # A050

Acctnum: AQUAOPKS

Template: T129789

Prelogin: P724464

PM: 206 - Jeff Carr

PB:

Shipped Via:

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Whit Martin	8/22/19	0955	
	8/22/19	1400	

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 4.3°F °C 2.7±0=2.7

Bottles Received: 11

If preservation required by Login: Date/Time

Received for lab by: (Signature)

Date: 08/23 Time: 8145

Hold:

Condition: NCF / OK

SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: Sibley Generating Station

City/State Collected: Sibley, MO

Please Circle: PT MT CT ET (CT circled)

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27213168.18

Lab Project # AQUAOPKS-SIBLEY

Collected by (print): Whit Martin

Collected by (signature): Whit Martin

Site/Facility ID #

P.O. #

Immediately Packed on Ice N____ Y X

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

Quote #

Date Results Needed: Std

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron - 6010 250mlHDPE-HNO3	Ca, B - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	Remarks	Sample # (lab only)
DUPLICATE 2	Grab	GW		8/21/19	1530	2		X			X		-1
MW-806R MS/MSD	Grab	GW		8/21/19	1530	2		X			X		-2

Pres Chk: L2

Chain of Custody Page ___ of ___

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1132098

A048

Acctnum: AQUAOPKS

Template: T129789

Prelogin: P724464

PM: 206 - Jeff Carr

PB:

Shipped Via:

-70
-03

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

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No (circled) HCL / MeoH TBR
Whit Martin	8/22/19	0955	[signature]	
Relinquished by : (Signature) [signature]	8/22/19	1600	Received by: (Signature)	Temp: 43BF °C 2.7±0=2.7 Bottles Received: 4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 08/23 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK (circled)

N 8/23/19

Jared Morrison
December 20, 2022

ATTACHMENT 1-6

November 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 18, 2019

SCS Engineers - KS

Sample Delivery Group:	L1158873
Samples Received:	11/08/2019
Project Number:	27213169.19
Description:	Evergy - Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

MW-701 L1158873-01 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 10:08 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378166	1	11/11/19 06:34	11/11/19 08:05	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378892	1	11/12/19 18:37	11/12/19 18:37	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:02	TRB	Mt. Juliet, TN

MW-702 L1158873-02 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 10:50 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378166	1	11/11/19 06:34	11/11/19 08:05	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378892	1	11/12/19 18:53	11/12/19 18:53	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:04	TRB	Mt. Juliet, TN

MW-703 L1158873-03 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 11:30 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378166	1	11/11/19 06:34	11/11/19 08:05	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378892	1	11/12/19 19:09	11/12/19 19:09	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:07	TRB	Mt. Juliet, TN

MW-704 L1158873-04 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 12:10 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378166	1	11/11/19 06:34	11/11/19 08:05	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 14:38	11/12/19 14:38	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:10	TRB	Mt. Juliet, TN

MW-801 L1158873-05 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 13:20 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378166	1	11/11/19 06:34	11/11/19 08:05	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 15:06	11/12/19 15:06	ST	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	5	11/12/19 15:50	11/12/19 15:50	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 05:20	TRB	Mt. Juliet, TN

MW-802 L1158873-06 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 14:10 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378167	1	11/13/19 00:33	11/13/19 01:52	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 16:04	11/12/19 16:04	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:19	TRB	Mt. Juliet, TN

MW-803 L1158873-07 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 14:25 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378167	1	11/13/19 00:33	11/13/19 01:52	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 16:18	11/12/19 16:18	ST	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	5	11/13/19 00:10	11/13/19 00:10	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:21	TRB	Mt. Juliet, TN

MW-804 L1158873-08 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 14:55 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378167	1	11/13/19 00:33	11/13/19 01:52	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 17:02	11/12/19 17:02	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:24	TRB	Mt. Juliet, TN

MW-805 L1158873-09 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 15:10 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378167	1	11/13/19 00:33	11/13/19 01:52	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 17:16	11/12/19 17:16	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:27	TRB	Mt. Juliet, TN

MW-806R L1158873-10 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 15:40 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378167	1	11/13/19 00:33	11/13/19 01:52	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 17:31	11/12/19 17:31	ST	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	5	11/12/19 17:45	11/12/19 17:45	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:30	TRB	Mt. Juliet, TN

DUPLICATE 2 L1158873-11 GW

Collected by: Jason R. Franks | Collected date/time: 11/06/19 13:20 | Received date/time: 11/08/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378167	1	11/13/19 00:33	11/13/19 01:52	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	1	11/12/19 17:59	11/12/19 17:59	ST	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1378924	5	11/12/19 18:14	11/12/19 18:14	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1379882	1	11/14/19 09:03	11/15/19 06:33	TRB	Mt. Juliet, TN

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

Jeff Carr
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	275000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	7910		1000	1	11/12/2019 18:37	WG1378892
Fluoride	145		100	1	11/12/2019 18:37	WG1378892
Sulfate	12600		5000	1	11/12/2019 18:37	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 06:02	WG1379882
Calcium	82800		1000	1	11/15/2019 06:02	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	266000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	8300		1000	1	11/12/2019 18:53	WG1378892
Fluoride	131		100	1	11/12/2019 18:53	WG1378892
Sulfate	17000		5000	1	11/12/2019 18:53	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 06:04	WG1379882
Calcium	82800		1000	1	11/15/2019 06:04	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	512000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	22200		1000	1	11/12/2019 19:09	WG1378892
Fluoride	353		100	1	11/12/2019 19:09	WG1378892
Sulfate	ND		5000	1	11/12/2019 19:09	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	476		200	1	11/15/2019 06:07	WG1379882
Calcium	129000		1000	1	11/15/2019 06:07	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	303000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	13700		1000	1	11/12/2019 14:38	WG1378924
Fluoride	172		100	1	11/12/2019 14:38	WG1378924
Sulfate	20100		5000	1	11/12/2019 14:38	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 06:10	WG1379882
Calcium	88500		1000	1	11/15/2019 06:10	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	567000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	109000		5000	5	11/12/2019 15:50	WG1378924
Fluoride	172		100	1	11/12/2019 15:06	WG1378924
Sulfate	59000		5000	1	11/12/2019 15:06	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	278		200	1	11/15/2019 05:20	WG1379882
Calcium	144000		1000	1	11/15/2019 05:20	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	285000		10000	1	11/13/2019 01:52	WG1378167

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	32000		1000	1	11/12/2019 16:04	WG1378924
Fluoride	157		100	1	11/12/2019 16:04	WG1378924
Sulfate	49900		5000	1	11/12/2019 16:04	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 06:19	WG1379882
Calcium	52200		1000	1	11/15/2019 06:19	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	495000		10000	1	11/13/2019 01:52	WG1378167

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	17700		1000	1	11/12/2019 16:18	WG1378924
Fluoride	300		100	1	11/12/2019 16:18	WG1378924
Sulfate	107000		25000	5	11/13/2019 00:10	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	2740		200	1	11/15/2019 06:21	WG1379882
Calcium	112000		1000	1	11/15/2019 06:21	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	615000		10000	1	11/13/2019 01:52	WG1378167

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	19200		1000	1	11/12/2019 17:02	WG1378924
Fluoride	269		100	1	11/12/2019 17:02	WG1378924
Sulfate	ND		5000	1	11/12/2019 17:02	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8310		200	1	11/15/2019 06:24	WG1379882
Calcium	151000		1000	1	11/15/2019 06:24	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	302000		10000	1	11/13/2019 01:52	WG1378167

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	8650		1000	1	11/12/2019 17:16	WG1378924
Fluoride	197		100	1	11/12/2019 17:16	WG1378924
Sulfate	50500		5000	1	11/12/2019 17:16	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 06:27	WG1379882
Calcium	94000		1000	1	11/15/2019 06:27	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	691000		10000	1	11/13/2019 01:52	WG1378167

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	28200		1000	1	11/12/2019 17:31	WG1378924
Fluoride	213		100	1	11/12/2019 17:31	WG1378924
Sulfate	249000		25000	5	11/12/2019 17:45	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5620		200	1	11/15/2019 06:30	WG1379882
Calcium	164000		1000	1	11/15/2019 06:30	WG1379882

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	603000		10000	1	11/13/2019 01:52	WG1378167

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	110000		5000	5	11/12/2019 18:14	WG1378924
Fluoride	215		100	1	11/12/2019 17:59	WG1378924
Sulfate	59800		5000	1	11/12/2019 17:59	WG1378924

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	272		200	1	11/15/2019 06:33	WG1379882
Calcium	143000		1000	1	11/15/2019 06:33	WG1379882

Method Blank (MB)

(MB) R3470987-1 11/11/19 08:05

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	3000	J	2820	10000

L1158861-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1158861-04 11/11/19 08:05 • (DUP) R3470987-3 11/11/19 08:05

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	197000	198000	1	0.506		5

L1158873-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1158873-05 11/11/19 08:05 • (DUP) R3470987-4 11/11/19 08:05

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	567000	585000	1	3.13		5

Laboratory Control Sample (LCS)

(LCS) R3470987-2 11/11/19 08:05

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8270000	94.0	85.0-115	

Method Blank (MB)

(MB) R3472048-1 11/13/19 01:52

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Dissolved Solids	U		2820	10000

L1158914-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158914-01 11/13/19 01:52 • (DUP) R3472048-3 11/13/19 01:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Dissolved Solids	300000	303000	1	0.995		5

L1158930-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158930-01 11/13/19 01:52 • (DUP) R3472048-4 11/13/19 01:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Dissolved Solids	259000	293000	1	12.3	J3	5

Sample Narrative:

OS: Choosing to report in hold data as 1st result confirmed.

Laboratory Control Sample (LCS)

(LCS) R3472048-2 11/13/19 01:52

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Dissolved Solids	8800000	8730000	99.2	85.0-115	

Method Blank (MB)

(MB) R3471242-1 11/12/19 09:25

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1158858-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158858-01 11/12/19 11:27 • (DUP) R3471242-3 11/12/19 11:43

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	19900	19900	1	0.177		15
Fluoride	309	312	1	0.838		15

L1158865-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1158865-03 11/12/19 15:42 • (DUP) R3471242-6 11/12/19 15:58

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	6660	6640	1	0.329		15
Fluoride	309	310	1	0.259		15
Sulfate	76800	76700	1	0.163		15

L1158858-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158858-01 11/12/19 19:25 • (DUP) R3471242-8 11/12/19 20:12

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	181000	180000	5	0.212		15

Laboratory Control Sample (LCS)

(LCS) R3471242-2 11/12/19 09:40

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	38400	96.1	80.0-120	
Fluoride	8000	8040	101	80.0-120	
Sulfate	40000	38900	97.2	80.0-120	

L1158861-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158861-01 11/12/19 12:31 • (MS) R3471242-4 11/12/19 12:47 • (MSD) R3471242-5 11/12/19 13:03

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	1720	50900	51100	98.4	98.8	1	80.0-120			0.420	15
Fluoride	5000	193	5040	5160	97.0	99.4	1	80.0-120			2.36	15
Sulfate	50000	38900	88100	88100	98.4	98.4	1	80.0-120			0.0267	15

L1158865-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1158865-04 11/12/19 16:14 • (MS) R3471242-7 11/12/19 17:01

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	3080	52000	97.9	1	80.0-120	
Fluoride	5000	298	5210	98.1	1	80.0-120	
Sulfate	50000	14600	63800	98.5	1	80.0-120	

Method Blank (MB)

(MB) R3471252-1 11/12/19 12:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1158873-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1158873-04 11/12/19 14:38 • (DUP) R3471252-3 11/12/19 14:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	13700	13700	1	0.0466		15
Fluoride	172	166	1	3.37		15
Sulfate	20100	20100	1	0.132		15

L1159002-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1159002-02 11/12/19 20:38 • (DUP) R3471252-6 11/12/19 20:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	1350	1340	1	0.268		15
Fluoride	157	176	1	11.4		15
Sulfate	117000	119000	1	1.82	E	15

Laboratory Control Sample (LCS)

(LCS) R3471252-2 11/12/19 12:25

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	38900	97.3	80.0-120	
Fluoride	8000	7980	99.8	80.0-120	
Sulfate	40000	40400	101	80.0-120	

L1158873-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158873-05 11/12/19 15:06 • (MS) R3471252-4 11/12/19 15:21 • (MSD) R3471252-5 11/12/19 15:35

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	111000	154000	154000	86.9	87.8	1	80.0-120	E	E	0.273	15
Fluoride	5000	172	4990	5150	96.4	99.6	1	80.0-120			3.13	15
Sulfate	50000	59000	107000	107000	95.6	95.4	1	80.0-120	E	E	0.0755	15

L1159002-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1159002-03 11/12/19 21:07 • (MS) R3471252-7 11/12/19 21:21

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	1450	51100	99.3	1	80.0-120	
Fluoride	5000	174	5340	103	1	80.0-120	
Sulfate	50000	124000	162000	76.2	1	80.0-120	E J6

Method Blank (MB)

(MB) R3472373-1 11/15/19 05:12

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3472373-2 11/15/19 05:14 • (LCSD) R3472373-3 11/15/19 05:17

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	947	919	94.7	91.9	80.0-120			2.98	20
Calcium	10000	9560	9390	95.6	93.9	80.0-120			1.84	20

L1158873-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158873-05 11/15/19 05:20 • (MS) R3472373-5 11/15/19 05:25 • (MSD) R3472373-6 11/15/19 05:28

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	278	1230	1240	94.9	96.0	1	75.0-125			0.900	20
Calcium	10000	144000	152000	151000	85.9	77.5	1	75.0-125			0.552	20

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

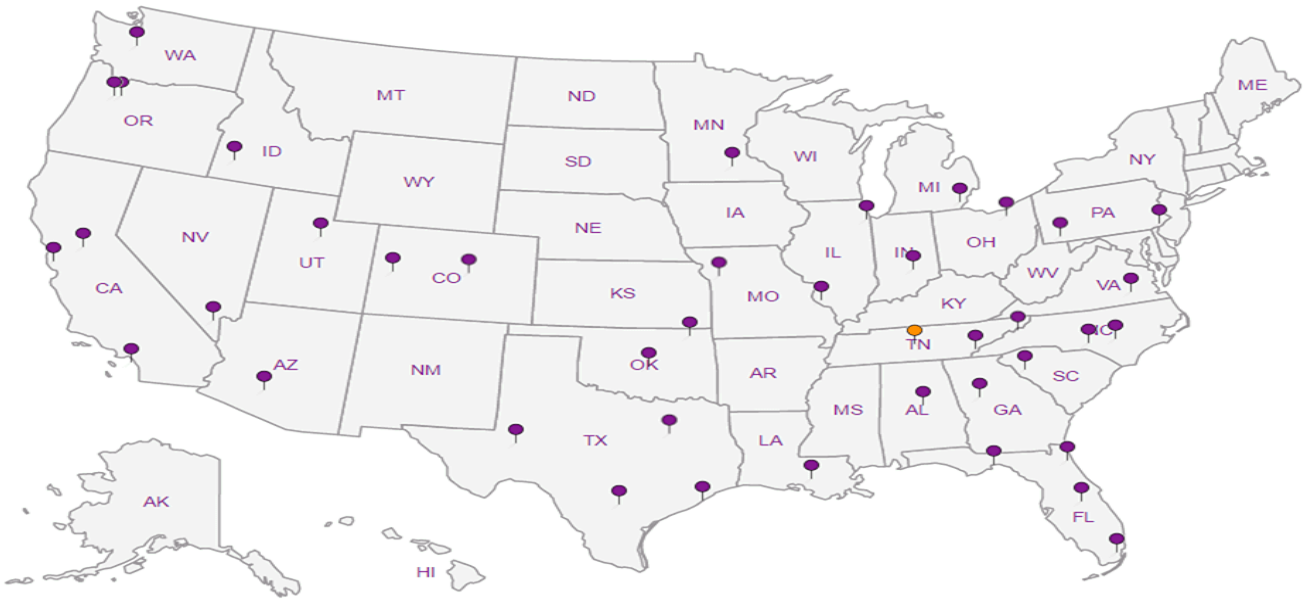
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

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



Page 1 of 2

SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to: **Jason Franks**

Email To: **jfranks@scsengineers.com; jay.martin@kcpl.com;**

Project Description: EVERGY **KCP&L Sibley Generating Statio**

City/State Collected: SIBLEY, MO

Please Circle: PT MT CT ET

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.18**

Lab Project # **AQUAOPKS-SIBLEY**

Collected by (print): JASON R. FRANKS

Site/Facility ID #

P.O. #

Collected by (signature): Jason R. Franks

Immediately Packed on Ice N ___ Y ___

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

Quote #

Date Results Needed

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions (Cld, F, SO4) 125mlHDPE-NoPres	B, Ca - 6010 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-701	GRAB	GW	-	11/6/19	1008	3	X	X	X		-01
MW-702		GW	-		1050	3	X	X	X		-02
MW-703		GW	-		1130	3	X	X	X		-03
MW-704		GW	-		1210	3	X	X	X		-04
MW-801		GW	-		1320	3	X	X	X		-05
MW-802		GW	-		1410	3	X	X	X		-06
MW-803		GW	-		1425	3	X	X	X		-07
MW-804		GW	-		1455	3	X	X	X		-08
MW-805		GW	-		1510	3	X	X	X		-09
MW-806R		GW	-		1540	3	X	X	X		-10

Chain of Custody

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 1158873

Tat B185

Acctnum: **AQUAOPKS**
Template: **T136014**
Prelogin: **P736940**
PM: **206 - Jeff Carr**
PB:
Shipped Via:

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Jason R. Franks	11/7/19	1455	Allan Nelson	11-7-19 1455
Allan Nelson	11/7/19	1800		Temp: 1.2 °C 0.1+.3=0.4 Bottles Received: 12
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/8 Time: 0830

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

SCS Engineers - KS

8575 W. 110th Street
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 W. 110th Street
Overland Park, KS 66210

Pres Chk

Report to:
Jason Franks

Email To: **jfranks@scsengineers.com; jay.martin@kcpl.com;**

Project Description: **KCP&L Sibley Generating Statio** EVERGY

City/State Collected: SIBLEY, MO

Please Circle: PT MT (CT) ET

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.19**

Lab Project # **AQUAOPKS-SIBLEY**

Collected by (print): **JASON R. FRANKS**

Site/Facility ID #

P.O. #

Collected by (signature): Jason R. Franks

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions (Cld, F, SO4) 125mlHDPE-NoPres	B, Ca - 6010 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres							Remarks	Sample # (lab only)
801 MS/MSD	GRAB	GW	-	11/6/19	1325	3	X	X	X								
DUPLICATE 2	GRAB	GW	-	11/6/19	1320	3	X	X	X								-12

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 1159873

Table #

Acctnum: **AQUAOPKS**

Template: **T136014**

Prelogin: **P736940**

PM: **206 - Jeff Carr**

PB:

Shipped Via:

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Jason R. Franks	11/7/19	1455	Ellen Nelson	11-7-19 1455
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2,4 °C 0.1+3=0.4 Bottles Received: 18
Ellen Nelson	11/7/19	1800		If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/8 Time: 0830 Hold: Condition: NCF / OK

Jared Morrison
December 20, 2022

ATTACHMENT 2

Statistical Analyses

Jared Morrison
December 20, 2022

ATTACHMENT 2-1

Fall 2018 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

March 29, 2019

To: Sibley Generating Station
33200 E Johnson Road
Sibley, Missouri 64088
KCP&L Greater Missouri Operations Company

From: SCS Engineers

RE: Determination of Statistically Significant Increases - Fly Ash Impoundment
Fall 2018 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the Fly Ash Impoundment at the Sibley Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on November 15, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on January 2, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on January 11, 2019 and March 12, 2019.

The completed statistical evaluation identified seven Appendix III constituents above their respective prediction limit in monitoring wells MW-801, MW-802, MW-804, and MW-806R.

The prediction limit for boron in monitoring well MW-804 is 5.133 mg/L. The detection monitoring sample was reported at 8.07 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 8.71 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 5.71 mg/L.

The prediction limit for boron in monitoring well MW-806R is 5.323 mg/L. The detection monitoring sample was reported at 5.56 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 5.76 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 5.75 mg/L.

The prediction limit for calcium in upgradient monitoring well MW-802 is 100.7 mg/L. The detection monitoring sample was reported at 101 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 111 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 107 mg/L.

The prediction limit for calcium in monitoring well MW-806R is 151.8 mg/L. The detection monitoring sample was reported at 168 mg/L. The first verification re-sample was collected on

January 11, 2019 with a result of 175 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 173 mg/L.

The prediction limit for chloride in upgradient monitoring well MW-801 is 104.1 mg/L. The detection monitoring sample was reported at 115 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 124 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 144 mg/L.

The prediction limit for sulfate in monitoring well MW-806R is 191.9 mg/L. The detection monitoring sample was reported at 236 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 237 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 256 mg/L.

The prediction limit for total dissolved solids (TDS) in monitoring well MW-806R is 679.2 mg/L. The detection monitoring sample was reported at 699 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 739 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 681 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring samples for boron from monitoring wells MW-804 and MW-806R, for calcium in monitoring wells MW-802 and MW-806R, for chloride in monitoring well MW-801, and for sulfate and TDS in monitoring well MW-806R exceeds their respective prediction limit and are confirmed statistically significant increase (SSI) over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified SSIs above the background prediction limits for chloride in upgradient monitoring well MW-801, for calcium in upgradient monitoring well MW-802, for boron in monitoring wells MW-804, and for boron, calcium, sulfate, and TDS in monitoring well MW-806R.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas™ Output:

Statistical evaluation output from Sanitas™ for the prediction limit analysis. This includes prediction limit plots, prediction limit background data, detection sample result, 1st verification re-sample result (when applicable), 2nd verification re-sample result (when applicable), extra sample results for pH because pH is collected as part of the sampling procedure, and a Prediction Limit summary table. Output documentation includes the analytical data used for the statistical analyses.

Attachment 2: Sanitas™ Configuration Settings:

Screen shots of the applicable Sanitas™ configuration settings for the statistical prediction limit analysis. This includes data configuration, output configuration, prediction limit configuration and other tests configuration.

Revision Number	Revision Date	Attachment Revised	Summary of Revisions

Sibley Generating Station
Determination of Statistically Significant Increases
Fly Ash Impoundment
March 29, 2019

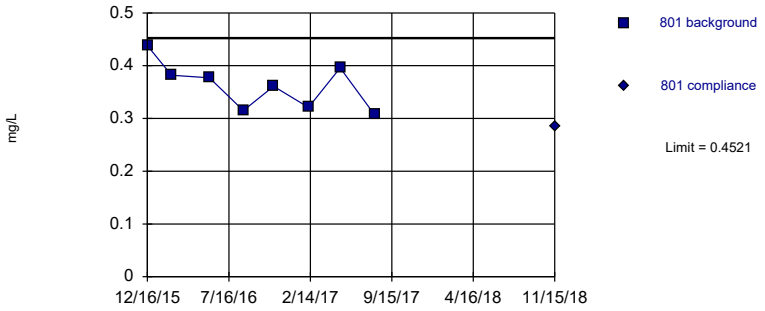
ATTACHMENT 1

Sanitas™ Output

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.3621, Std. Dev.=0.04547, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9368, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Boron Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

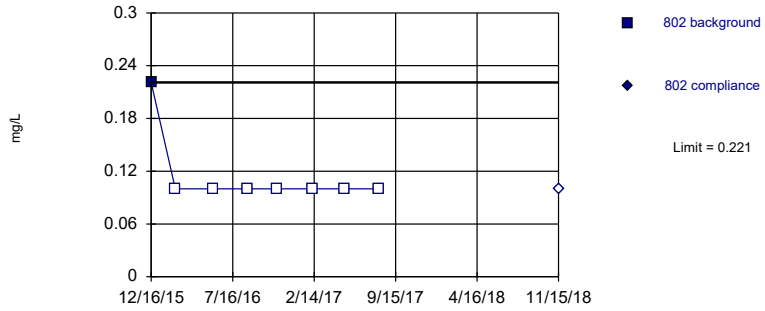
Sibley Client: SCS Engineers Data: Sibley

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 87.5% NDs. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

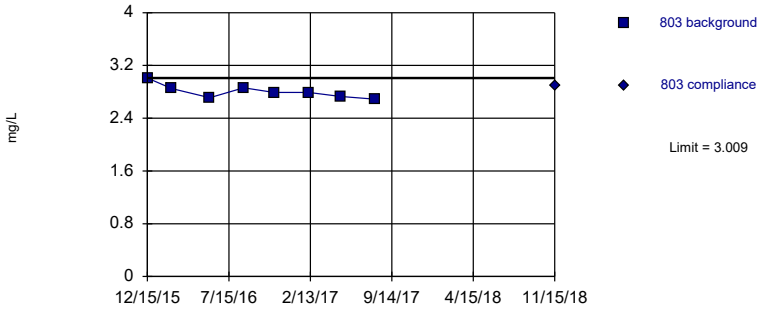
Constituent: Boron Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=2.804, Std. Dev.=0.1038, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9108, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

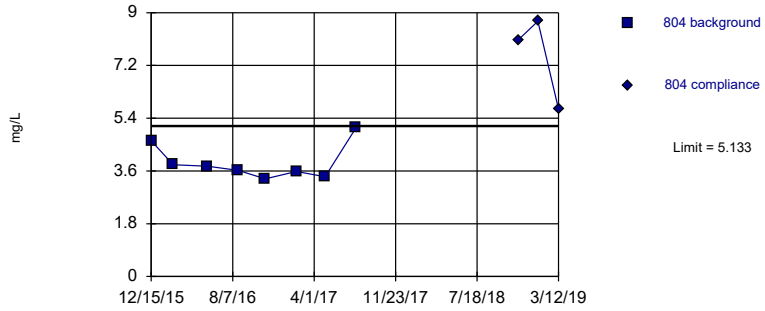
Constituent: Boron Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.901, Std. Dev.=0.6221, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8265, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Boron Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801
12/16/2015	0.438	
2/17/2016	0.382	
5/26/2016	0.377	
8/23/2016	0.315	
11/10/2016	0.361	
2/9/2017	0.321	
5/3/2017	0.396	
8/1/2017	0.307	
11/15/2018		0.285

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	0.221	
2/17/2016	<0.2	
5/26/2016	<0.2	
8/23/2016	<0.2	
11/10/2016	<0.2	
2/9/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
11/15/2018		<0.2

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	3.01	
2/17/2016	2.85	
5/26/2016	2.71	
8/23/2016	2.86	
11/10/2016	2.79	
2/9/2017	2.79	
5/3/2017	2.73	
8/1/2017	2.69	
11/15/2018		2.9

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

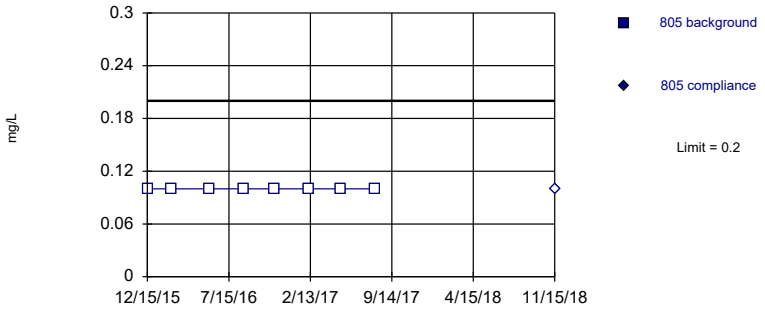
	804	804	
12/15/2015	4.63		
2/17/2016	3.81		
5/26/2016	3.76		
8/23/2016	3.62		
11/10/2016	3.33		
2/9/2017	3.58		
5/3/2017	3.4		
8/1/2017	5.08		
11/15/2018		8.07	
1/11/2019		8.71	1st verification re-sample
3/12/2019		5.71	2nd verification re-sample

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 8) were censored; limit is most recent reporting limit. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

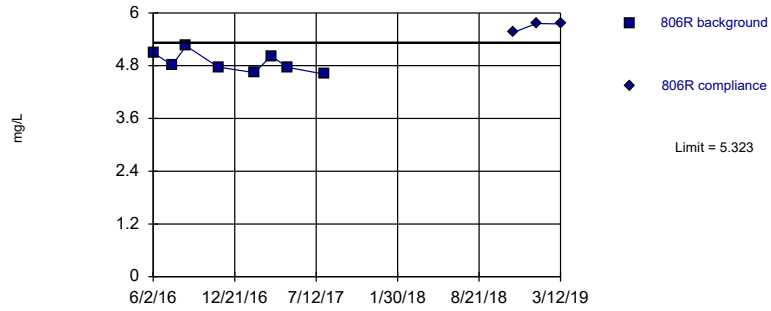
Constituent: Boron Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=4.87, Std. Dev.=0.2287, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9205, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

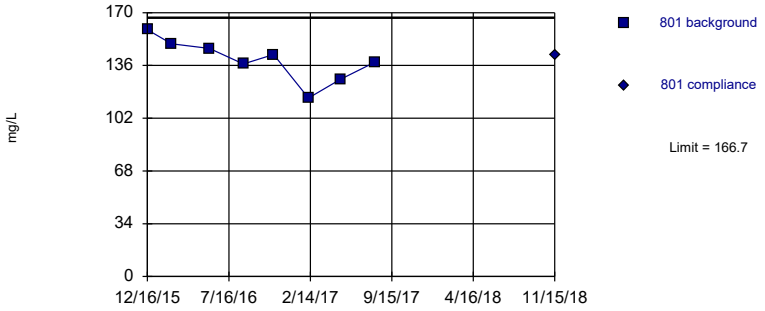
Constituent: Boron Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=139.5, Std. Dev.=13.75, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.975, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

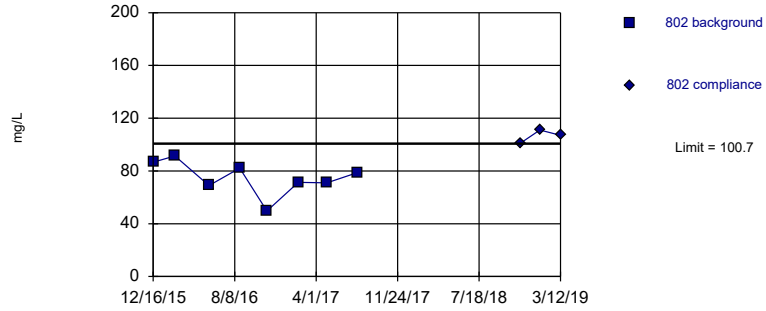
Constituent: Calcium Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=75, Std. Dev.=12.99, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9366, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	<0.2	
2/17/2016	<0.2	
5/26/2016	<0.2	
8/23/2016	<0.2	
11/10/2016	<0.2	
2/9/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
11/15/2018		<0.2

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	5.1		
7/19/2016	4.81		
8/23/2016	5.25		
11/11/2016	4.77		
2/9/2017	4.64		
3/22/2017	5.02		
5/3/2017	4.76		
8/1/2017	4.61		
11/15/2018		5.56	
1/11/2019		5.76	1st verification re-sample
3/12/2019		5.75	2nd verification re-sample

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801
12/16/2015	159	
2/17/2016	150	
5/26/2016	147	
8/23/2016	137	
11/10/2016	143	
2/9/2017	115	
5/3/2017	127	
8/1/2017	138	
11/15/2018		143

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

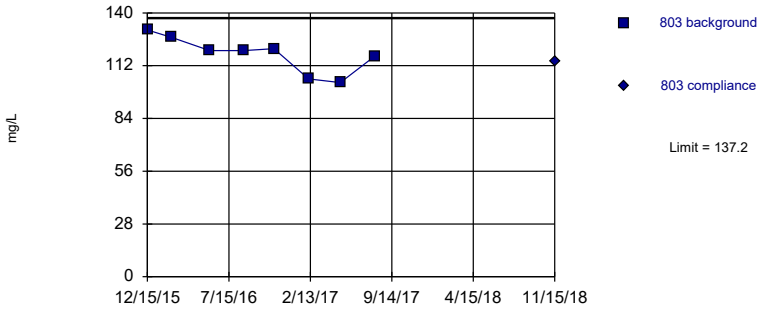
Sibley Client: SCS Engineers Data: Sibley

	802	802	
12/16/2015	86.6		
2/17/2016	91.4		
5/26/2016	68.9		
8/23/2016	82.2		
11/10/2016	49.6		
2/9/2017	71.4		
5/3/2017	71		
8/1/2017	78.9		
11/15/2018		101	
1/11/2019		111	1st verification re-sample
3/12/2019		107	2nd verification re-sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=118, Std. Dev.=9.725, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9144, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

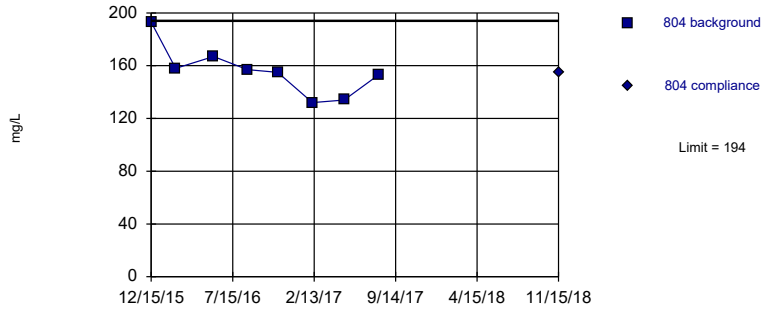
Constituent: Calcium Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=156.1, Std. Dev.=19.14, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9111, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

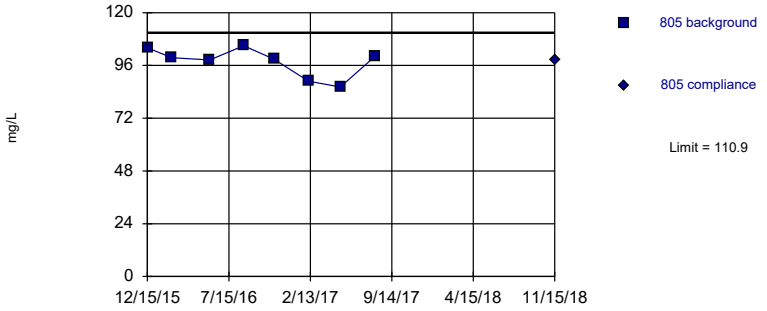
Constituent: Calcium Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=97.61, Std. Dev.=6.708, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8624, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

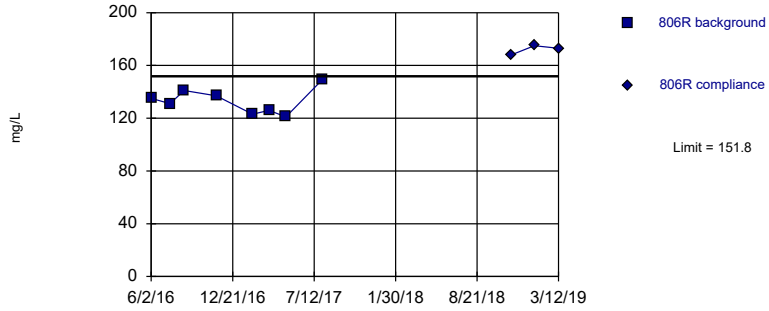
Constituent: Calcium Analysis Run 3/28/2019 9:06 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=132.9, Std. Dev.=9.538, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9644, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	131	
2/17/2016	127	
5/26/2016	120	
8/23/2016	120	
11/10/2016	121	
2/9/2017	105	
5/3/2017	103	
8/1/2017	117	
11/15/2018		114

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	804	804
12/15/2015	193	
2/17/2016	158	
5/26/2016	167	
8/23/2016	157	
11/10/2016	155	
2/9/2017	132	
5/3/2017	134	
8/1/2017	153	
11/15/2018		155

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	104	
2/17/2016	99.5	
5/26/2016	98.5	
8/23/2016	105	
11/10/2016	98.9	
2/9/2017	88.8	
5/3/2017	86.2	
8/1/2017	100	
11/15/2018		98.5

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

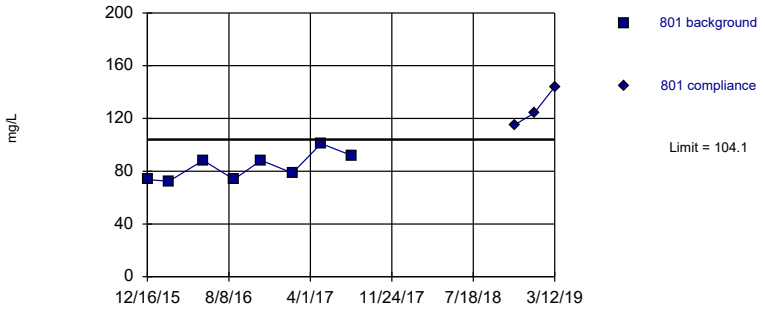
Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	135		
7/19/2016	131		
8/23/2016	141		
11/11/2016	137		
2/9/2017	123		
3/22/2017	126		
5/3/2017	121		
8/1/2017	149		
11/15/2018		168	
1/11/2019		175	1st verification re-sample
3/12/2019		173	2nd verification re-sample

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=83.45, Std. Dev.=10.41, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.899, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

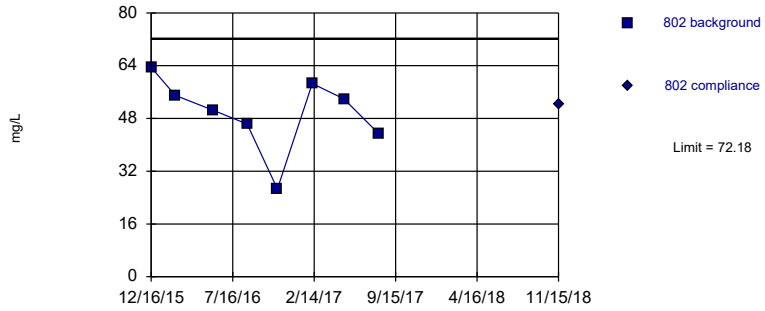
Constituent: Chloride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=49.74, Std. Dev.=11.34, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9231, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

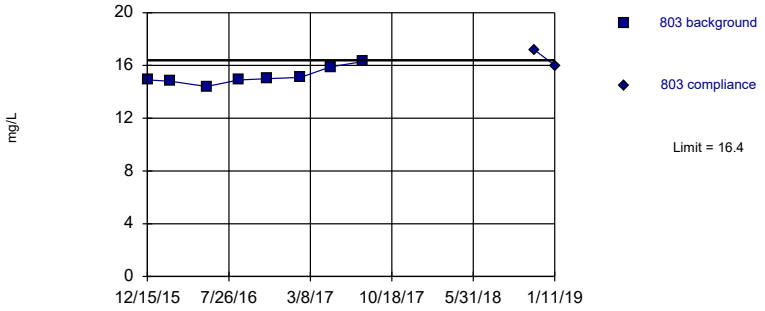
Constituent: Chloride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=15.16, Std. Dev.=0.6232, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8705, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

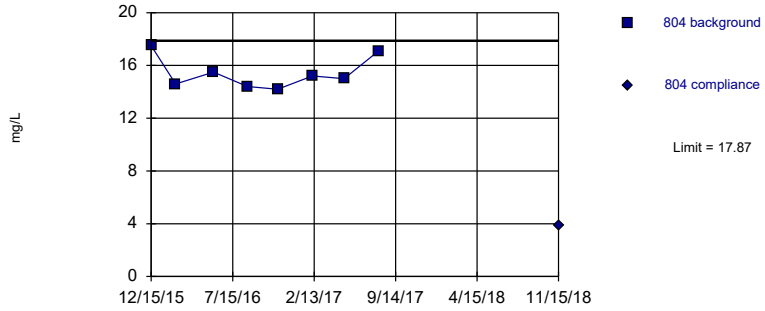
Constituent: Chloride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=15.44, Std. Dev.=1.229, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8619, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Chloride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	73.6		
2/17/2016	72.4		
5/26/2016	88.2		
8/23/2016	73.8		
11/10/2016	88.2		
2/9/2017	78.6		
5/3/2017	101		
8/1/2017	91.8		
11/15/2018		115	
1/11/2019		124	1st verification re-sample
3/12/2019		144	2nd verification re-sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	63.5	
2/17/2016	55	
5/26/2016	50.5	
8/23/2016	46.3	
11/10/2016	26.6	
2/9/2017	58.6	
5/3/2017	53.9	
8/1/2017	43.5	
11/15/2018		52.3

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803	
12/15/2015	14.9		
2/17/2016	14.8		
5/26/2016	14.4		
8/23/2016	14.9		
11/10/2016	15		
2/9/2017	15.1		
5/3/2017	15.9		
8/1/2017	16.3		
11/15/2018		17.2	
1/11/2019		16	1st verification re-sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

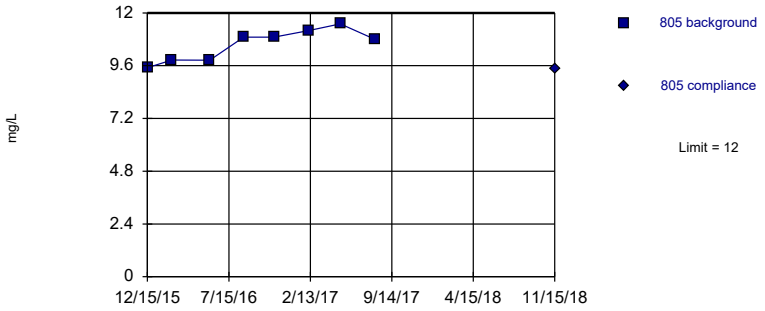
Sibley Client: SCS Engineers Data: Sibley

	804	804
12/15/2015	17.5	
2/17/2016	14.6	
5/26/2016	15.5	
8/23/2016	14.4	
11/10/2016	14.2	
2/9/2017	15.2	
5/3/2017	15	
8/1/2017	17.1	
11/15/2018		3.9

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=10.57, Std. Dev.=0.7249, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8989, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

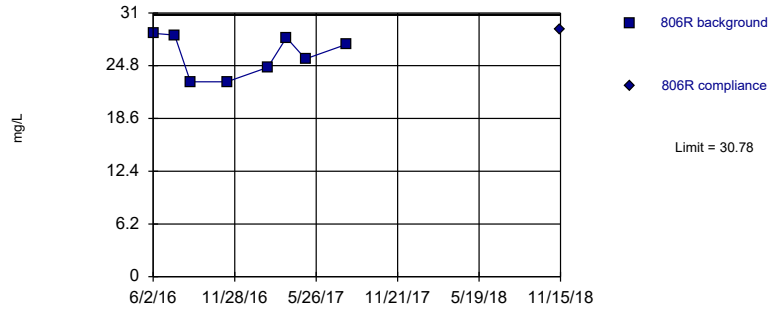
Constituent: Chloride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=26.05, Std. Dev.=2.389, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8702, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

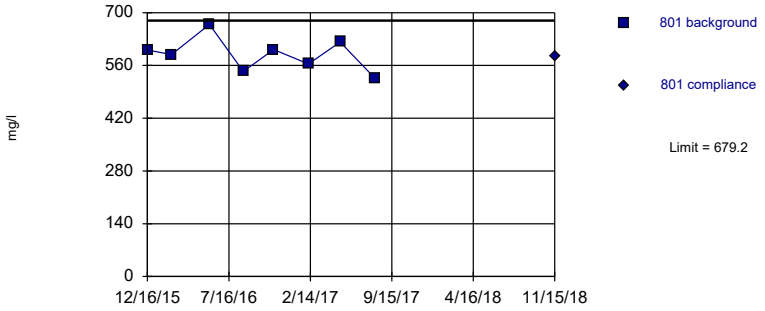
Constituent: Chloride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=589.8, Std. Dev.=45.18, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9729, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

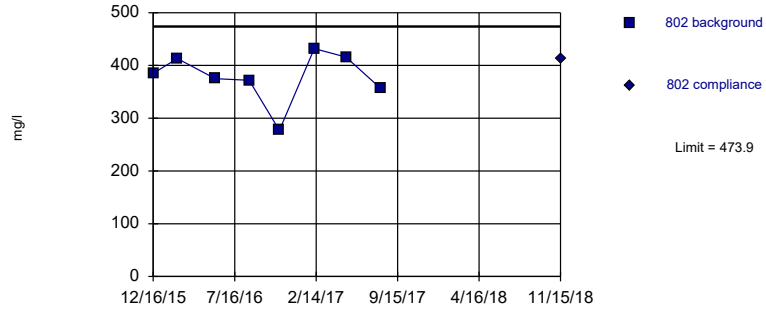
Constituent: Dissolved Solids Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=378.4, Std. Dev.=48.28, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.885, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	9.51	
2/17/2016	9.86	
5/26/2016	9.85	
8/23/2016	10.9	
11/10/2016	10.9	
2/9/2017	11.2	
5/3/2017	11.5	
8/1/2017	10.8	
11/15/2018		9.45

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R
6/2/2016	28.6	
7/19/2016	28.4	
8/23/2016	22.9	
11/11/2016	22.9	
2/9/2017	24.6	
3/22/2017	28.1	
5/3/2017	25.6	
8/1/2017	27.3	
11/15/2018		29

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801
12/16/2015	601	
2/17/2016	589	
5/26/2016	669	
8/23/2016	544	
11/10/2016	602	
2/9/2017	564	
5/3/2017	622	
8/1/2017	527	
11/15/2018		586

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

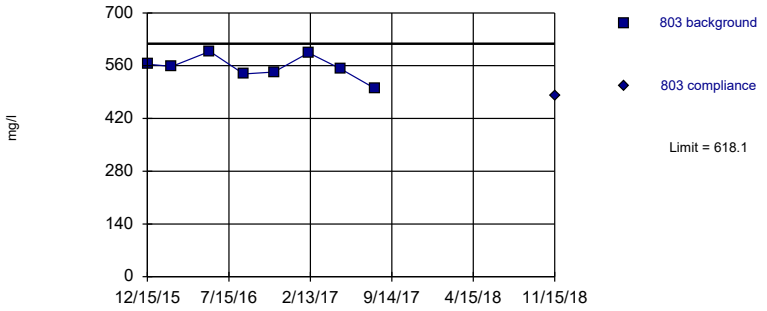
Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	385	
2/17/2016	413	
5/26/2016	375	
8/23/2016	372	
11/10/2016	277	
2/9/2017	432	
5/3/2017	416	
8/1/2017	357	
11/15/2018		412

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=555.9, Std. Dev.=31.44, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9486, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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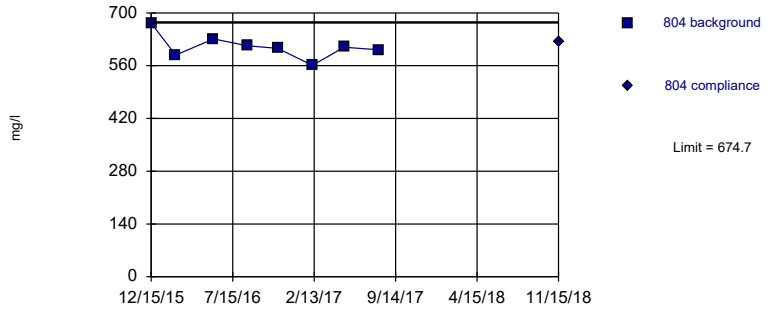
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=610.4, Std. Dev.=32.48, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9436, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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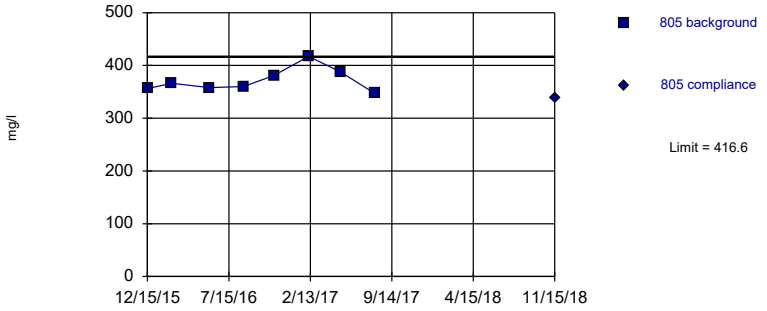
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=371.6, Std. Dev.=22.73, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8928, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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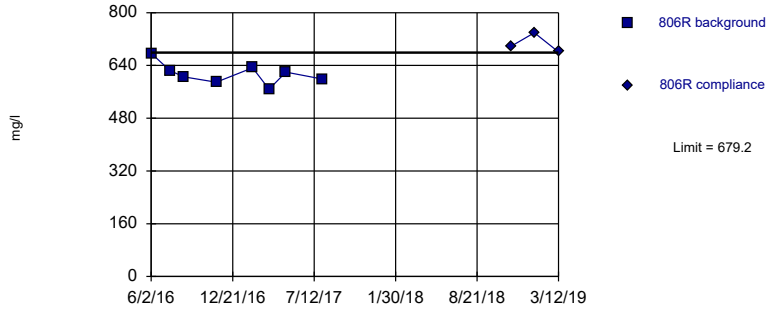
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=614.4, Std. Dev.=32.76, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9638, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	564	
2/17/2016	558	
5/26/2016	598	
8/23/2016	538	
11/10/2016	543	
2/9/2017	594	
5/3/2017	552	
8/1/2017	500	
11/15/2018		480

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	804	804
12/15/2015	673	
2/17/2016	588	
5/26/2016	631	
8/23/2016	613	
11/10/2016	606	
2/9/2017	561	
5/3/2017	609	
8/1/2017	602	
11/15/2018		625

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	356	
2/17/2016	366	
5/26/2016	358	
8/23/2016	360	
11/10/2016	381	
2/9/2017	417	
5/3/2017	388	
8/1/2017	347	
11/15/2018		339

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

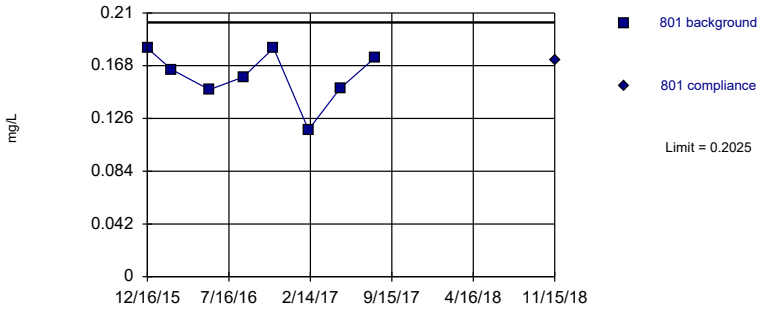
Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	677		
7/19/2016	624		
8/23/2016	605		
11/11/2016	589		
2/9/2017	633		
3/22/2017	568		
5/3/2017	620		
8/1/2017	599		
11/15/2018		699	
1/11/2019		739	1st verification re-sample
3/12/2019		681	2nd verification re-sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1598, Std. Dev.=0.02158, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9046, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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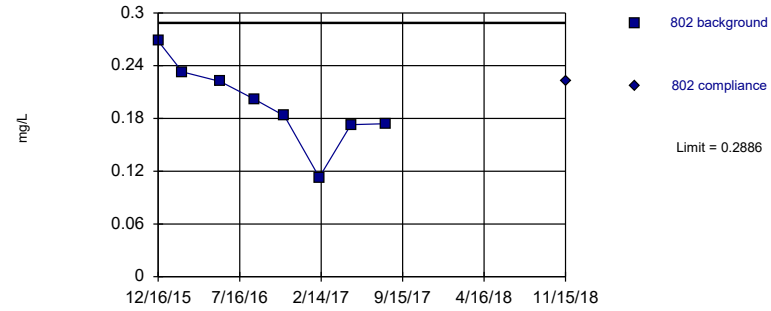
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.196, Std. Dev.=0.04681, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9741, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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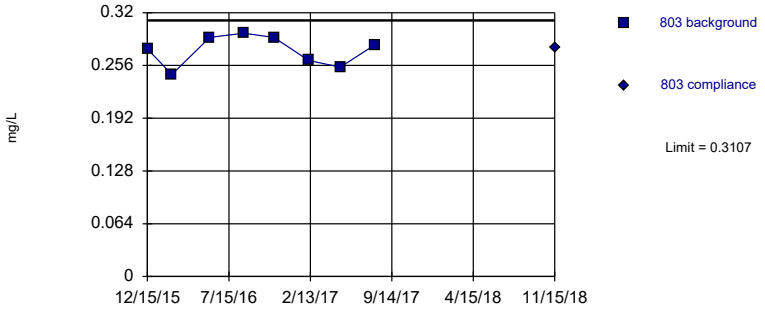
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.2741, Std. Dev.=0.01848, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9165, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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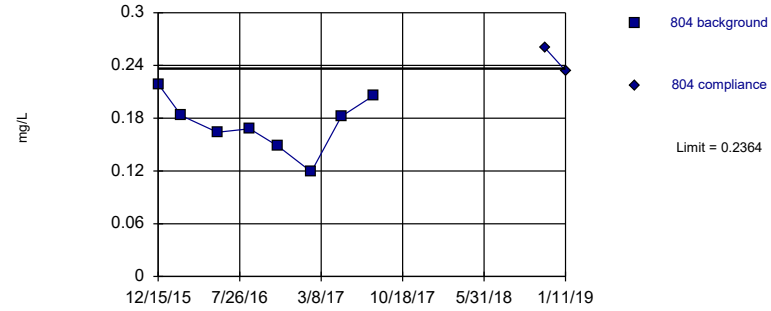
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1736, Std. Dev.=0.03169, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9792, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801
12/16/2015	0.182	
2/17/2016	0.165	
5/26/2016	0.149	
8/23/2016	0.159	
11/10/2016	0.182	
2/9/2017	0.117	
5/3/2017	0.15	
8/1/2017	0.174	
11/15/2018		0.172

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	0.268	
2/17/2016	0.233	
5/26/2016	0.222	
8/23/2016	0.202	
11/10/2016	0.183	
2/9/2017	0.113	
5/3/2017	0.173	
8/1/2017	0.174	
11/15/2018		0.222

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	0.276	
2/17/2016	0.245	
5/26/2016	0.29	
8/23/2016	0.295	
11/10/2016	0.29	
2/9/2017	0.262	
5/3/2017	0.254	
8/1/2017	0.281	
11/15/2018		0.278

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

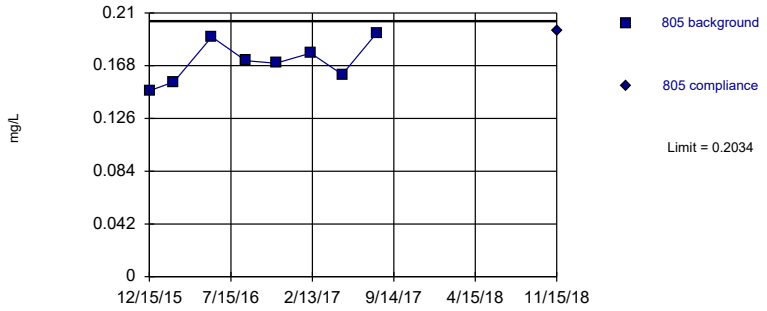
Sibley Client: SCS Engineers Data: Sibley

	804	804	
12/15/2015	0.219		
2/17/2016	0.183		
5/26/2016	0.164		
8/23/2016	0.168		
11/10/2016	0.148		
2/9/2017	0.119		
5/3/2017	0.182		
8/1/2017	0.206		
11/15/2018		0.26	
1/11/2019		0.234	1st verification re-sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1711, Std. Dev.=0.01632, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9597, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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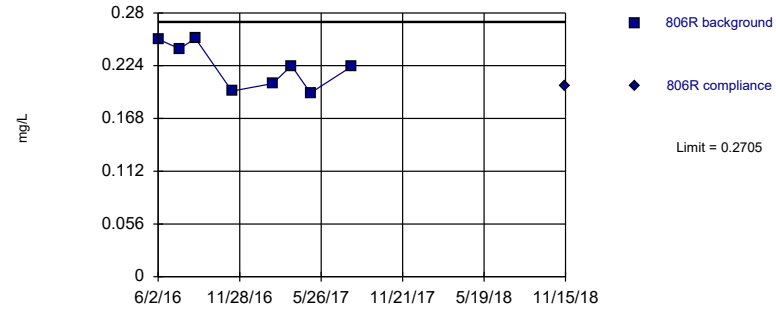
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.2239, Std. Dev.=0.02355, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8972, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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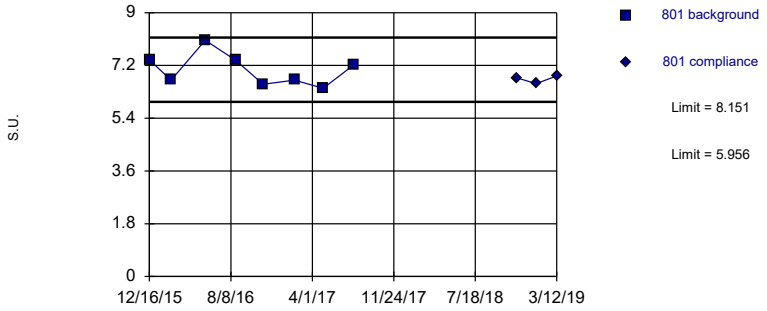
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.054, Std. Dev.=0.5545, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9128, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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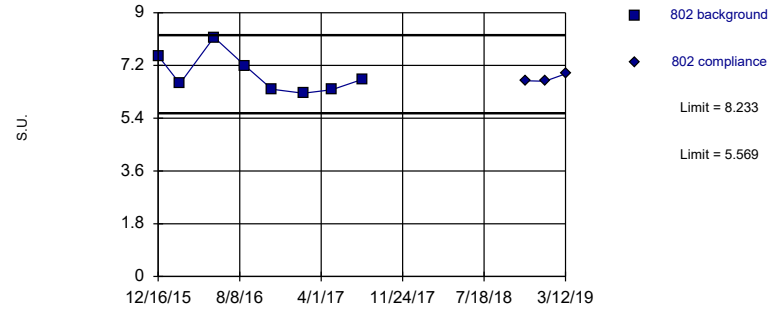
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.901, Std. Dev.=0.6729, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8827, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	0.148	
2/17/2016	0.155	
5/26/2016	0.191	
8/23/2016	0.172	
11/10/2016	0.17	
2/9/2017	0.178	
5/3/2017	0.161	
8/1/2017	0.194	
11/15/2018		0.196

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R
6/2/2016	0.252	
7/19/2016	0.242	
8/23/2016	0.253	
11/11/2016	0.197	
2/9/2017	0.205	
3/22/2017	0.224	
5/3/2017	0.195	
8/1/2017	0.223	
11/15/2018		0.202

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	7.39		
2/17/2016	6.7		
5/26/2016	8.06		
8/23/2016	7.37		
11/10/2016	6.56		
2/9/2017	6.7		
5/3/2017	6.42		
8/1/2017	7.23		
11/15/2018		6.78	
1/11/2019		6.58	extra sample
3/12/2019		6.84	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

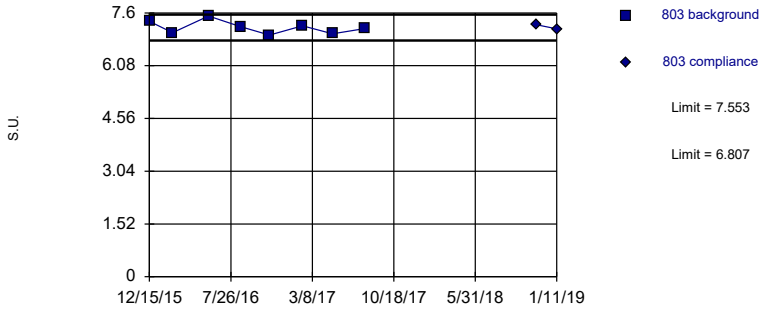
Sibley Client: SCS Engineers Data: Sibley

	802	802	
12/16/2015	7.53		
2/17/2016	6.58		
5/26/2016	8.16		
8/23/2016	7.2		
11/10/2016	6.39		
2/9/2017	6.25		
5/3/2017	6.37		
8/1/2017	6.73		
11/15/2018		6.68	
1/11/2019		6.66	extra sample
3/12/2019		6.91	extra sample

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.18, Std. Dev.=0.1884, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9447, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

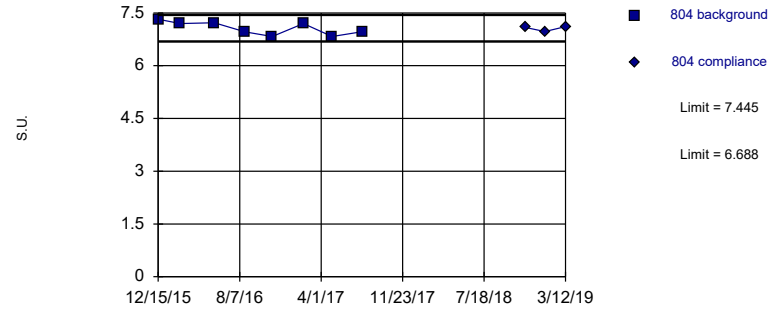
Constituent: pH Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.066, Std. Dev.=0.1912, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8802, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

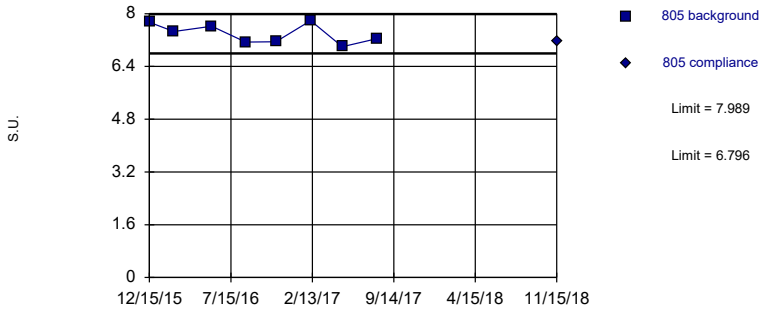
Constituent: pH Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.393, Std. Dev.=0.3012, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.915, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

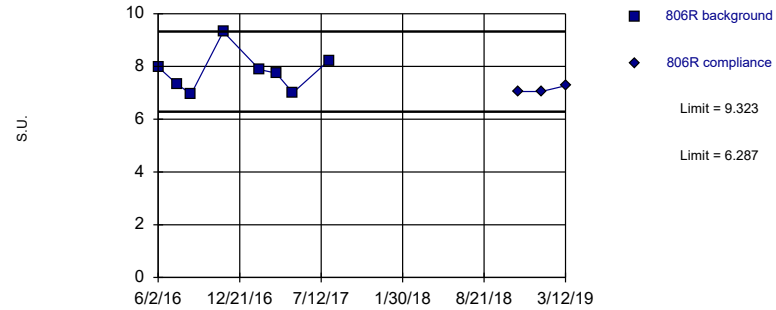
Constituent: pH Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.805, Std. Dev.=0.7672, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9174, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803	
12/15/2015	7.36		
2/17/2016	7.03		
5/26/2016	7.51		
8/23/2016	7.2		
11/10/2016	6.96		
2/9/2017	7.23		
5/3/2017	7		
8/1/2017	7.15		
11/15/2018		7.26	
1/11/2019		7.14	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	804	804	
12/15/2015	7.32		
2/17/2016	7.2		
5/26/2016	7.22		
8/23/2016	6.96		
11/10/2016	6.83		
2/9/2017	7.2		
5/3/2017	6.83		
8/1/2017	6.97		
11/15/2018		7.09	
1/11/2019		6.97	extra sample
3/12/2019		7.11	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	7.74	
2/17/2016	7.46	
5/26/2016	7.62	
8/23/2016	7.14	
11/10/2016	7.15	
2/9/2017	7.79	
5/3/2017	7	
8/1/2017	7.24	
11/15/2018		7.18

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

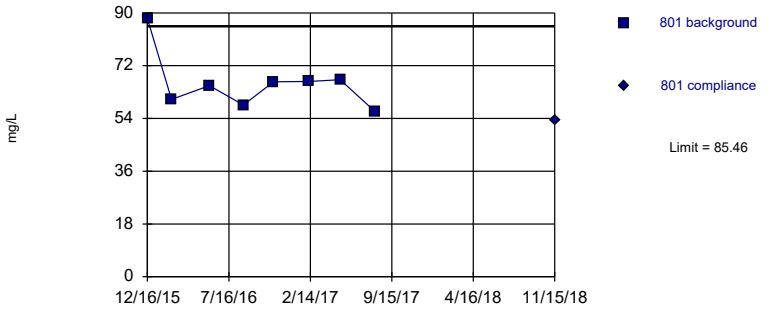
Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	7.98		
7/19/2016	7.33		
8/23/2016	6.95		
11/11/2016	9.32		
2/9/2017	7.88		
3/22/2017	7.75		
5/3/2017	7		
8/1/2017	8.23		
11/15/2018		7.05	
1/11/2019		7.05	extra sample
3/12/2019		7.27	extra sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=66.15, Std. Dev.=9.755, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7928, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

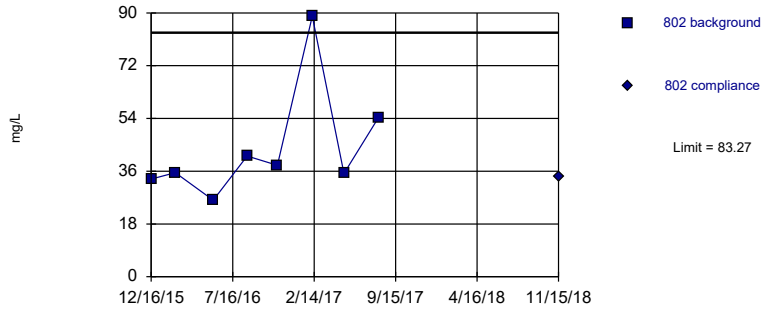
Constituent: Sulfate Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=44.05, Std. Dev.=19.82, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7634, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

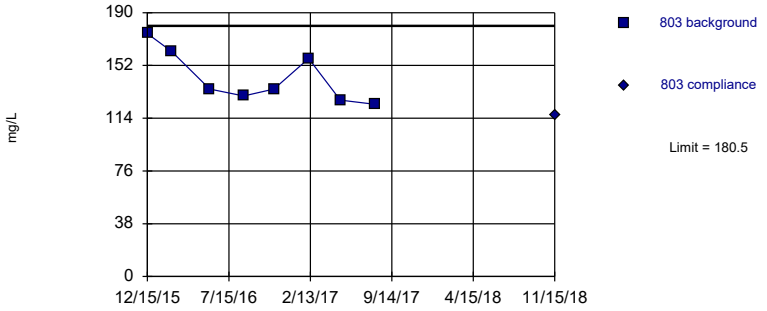
Constituent: Sulfate Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=143.1, Std. Dev.=18.88, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8721, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Sulfate Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

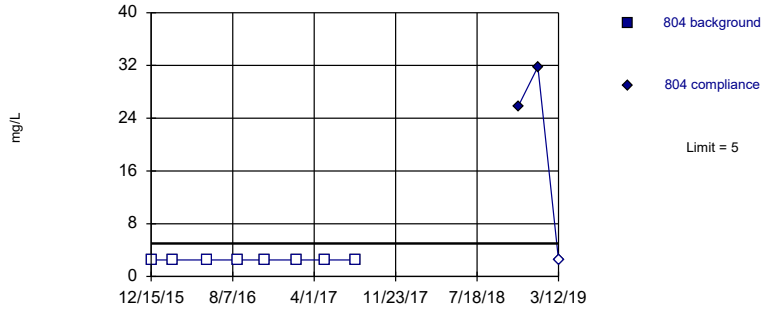
Sibley Client: SCS Engineers Data: Sibley

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 8) were censored; limit is most recent reporting limit. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: Sulfate Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801
12/16/2015	88.1	
2/17/2016	60.5	
5/26/2016	65.2	
8/23/2016	58.6	
11/10/2016	66.5	
2/9/2017	66.6	
5/3/2017	67.2	
8/1/2017	56.5	
11/15/2018		53.4

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	33.3	
2/17/2016	35.5	
5/26/2016	26.1	
8/23/2016	41.2	
11/10/2016	38	
2/9/2017	88.9	
5/3/2017	35.2	
8/1/2017	54.2	
11/15/2018		34

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	175	
2/17/2016	162	
5/26/2016	135	
8/23/2016	130	
11/10/2016	135	
2/9/2017	157	
5/3/2017	127	
8/1/2017	124	
11/15/2018		116

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

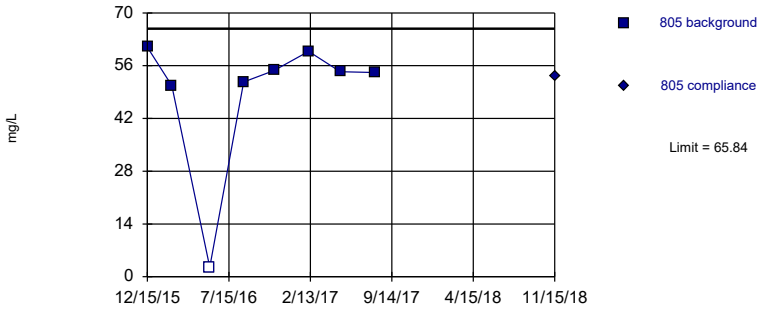
	804	804	
12/15/2015	<5		
2/17/2016	<5		
5/26/2016	<5		
8/23/2016	<5		
11/10/2016	<5		
2/9/2017	<5		
5/3/2017	<5		
8/1/2017	<5		
11/15/2018		25.8	
1/11/2019		31.8	1st verification re-sample
3/12/2019		<5	2nd verification re-sample

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on cube transformation): Mean=149015, Std. Dev.=68909, n=8, 12.5% NDs. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8456, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Sulfate Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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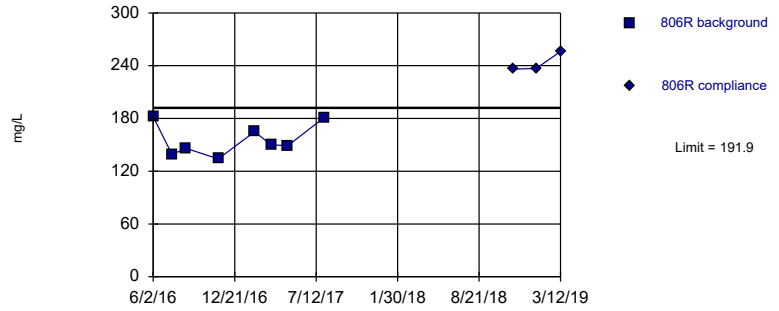
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=155.8, Std. Dev.=18.28, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.893, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Sulfate Analysis Run 3/28/2019 9:07 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	60.9	
2/17/2016	50.7	
5/26/2016	<5	
8/23/2016	51.7	
11/10/2016	54.7	
2/9/2017	59.8	
5/3/2017	54.4	
8/1/2017	54.2	
11/15/2018		53.2

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 9:17 AM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	182		
7/19/2016	139		
8/23/2016	146		
11/11/2016	134		
2/9/2017	165		
3/22/2017	150		
5/3/2017	149		
8/1/2017	181		
11/15/2018		236	
1/11/2019		237	1st verification re-sample
3/12/2019		256	2nd verification re-sample

Prediction Limit

Sibley Client: SCS Engineers Data: Sibley Printed 3/28/2019, 9:17 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	801	0.4521	n/a	11/15/2018	0.285	No	8	0	No	0.001254	Param Intra 1 of 3
Boron (mg/L)	802	0.221	n/a	11/15/2018	0.1ND	No	8	87.5	n/a	0.005912	NP Intra (NDs) 1 of 3
Boron (mg/L)	803	3.009	n/a	11/15/2018	2.9	No	8	0	No	0.001254	Param Intra 1 of 3
Boron (mg/L)	**804**	**5.133**	**n/a**	**3/12/2019**	**5.71**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Boron (mg/L)	805	0.2	n/a	11/15/2018	0.1ND	No	8	100	n/a	0.005912	NP Intra (NDs) 1 of 3
Boron (mg/L)	**806R**	**5.323**	**n/a**	**3/12/2019**	**5.75**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Calcium (mg/L)	801	166.7	n/a	11/15/2018	143	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	**802**	**100.7**	**n/a**	**3/12/2019**	**107**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Calcium (mg/L)	803	137.2	n/a	11/15/2018	114	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	804	194	n/a	11/15/2018	155	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	805	110.9	n/a	11/15/2018	98.5	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	**806R**	**151.8**	**n/a**	**3/12/2019**	**173**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Chloride (mg/L)	**801**	**104.1**	**n/a**	**3/12/2019**	**144**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Chloride (mg/L)	802	72.18	n/a	11/15/2018	52.3	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	803	16.4	n/a	1/11/2019	16	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	804	17.87	n/a	11/15/2018	3.9	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	805	12	n/a	11/15/2018	9.45	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	806R	30.78	n/a	11/15/2018	29	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	801	679.2	n/a	11/15/2018	586	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	802	473.9	n/a	11/15/2018	412	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	803	618.1	n/a	11/15/2018	480	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	804	674.7	n/a	11/15/2018	625	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	805	416.6	n/a	11/15/2018	339	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	**806R**	**679.2**	**n/a**	**3/12/2019**	**681**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Fluoride (mg/L)	801	0.2025	n/a	11/15/2018	0.172	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	802	0.2886	n/a	11/15/2018	0.222	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	803	0.3107	n/a	11/15/2018	0.278	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	804	0.2364	n/a	1/11/2019	0.234	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	805	0.2034	n/a	11/15/2018	0.196	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	806R	0.2705	n/a	11/15/2018	0.202	No	8	0	No	0.001254	Param Intra 1 of 3
pH (S.U.)	801	8.151	5.956	3/12/2019	6.84	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	802	8.233	5.569	3/12/2019	6.91	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	803	7.553	6.807	1/11/2019	7.14	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	804	7.445	6.688	3/12/2019	7.11	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	805	7.989	6.796	11/15/2018	7.18	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	806R	9.323	6.287	3/12/2019	7.27	No	8	0	No	0.000...	Param Intra 1 of 3
Sulfate (mg/L)	801	85.46	n/a	11/15/2018	53.4	No	8	0	No	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	802	83.27	n/a	11/15/2018	34	No	8	0	No	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	803	180.5	n/a	11/15/2018	116	No	8	0	No	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	804	5	n/a	3/12/2019	2.5ND	No	8	100	n/a	0.005912	NP Intra (NDs) 1 of 3
Sulfate (mg/L)	805	65.84	n/a	11/15/2018	53.2	No	8	12.5	x^3	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	**806R**	**191.9**	**n/a**	**3/12/2019**	**256**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**

Sibley Generating Station
Determination of Statistically Significant Increases
Fly Ash Impoundment
March 29, 2019

ATTACHMENT 2

Sanitas™ Configuration Settings

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Exclude data flags: i

Data Reading Options

- (•) Individual Observations
- ( ) Mean of Each: ( ) Month
- ( ) Median of Each: ( ) Season

Non-Detect / Trace Handling...

Setup Seasons...

[ ] Automatically Process Resamples...

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

- [ ] Black and White Output
- [x] Four Plots Per Page
  - [ ] Always Combine Data Pages...
  - [x] Include Tick Marks on Data Page
  - [ ] Use Constituent Name for Graph Title
- [ ] Draw Border Around Text Reports and Data Pages
- [x] Enlarge/Reduce Fonts (Graphs): 100%
- [x] Enlarge/Reduce Fonts (Data/Text Reports): 100%
- [x] Wide Margins (on reports without explicit setting)
- [ ] Use CAS# (Not Const. Name)
- [ ] Truncate File Names to 20 Characters
- [ ] Include Limit Lines when found in Database...
- [x] Show Deselected Data on Time Series: Lighter
- [x] Show Deselected Data on all Data Pages: Light

Setup Symbols and Colors...

- [x] Prompt to Overwrite/Append Summary Tables
- [ ] Round Limits to 2 Sig. Digits (when not set in data file)
- [x] User-Set Scale
- [x] Indicate Background Data
- [ ] Show Exact Dates
- [ ] Thick Plot Lines

Zoom Factor: 200%

Output Decimal Precision

- ( ) Less Precision
- (•) Normal Precision
- ( ) More Precision

- [x] Store Print Jobs in Multiple Constituent Mode

Store All Print Jobs...

Printer: Adobe PDF

Printers...

Data | Output | Trend Test | Control Cht | **Prediction Lim** | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

☑ Test for Normality using Shapiro-Wilk/Francia at Alpha = 0.01

☑ Use Non-Parametric Test when Non-Detects Percent > 50

Use Aitchison's Adjustment when Non-Detects Percent > 15

☐ Optional Further Refinement: Use Aitchison's when NDs % > 50

☐ Use Poisson Prediction Limit when Non-Detects Percent > 90

Transformation

- ◉ Use Ladder of Powers
- ○ Natural Log or No Transformation
- ○ Never Transform
- ○ Use Specific Transformation: Natural Log

☐ Use Best W Statistic

☐ Plot Transformed Values

Deseasonalize (Intra- and InterWell)

- ◉ If Seasonality Is Detected
- ○ If Seasonality Is Detected Or Insufficient to Test
- ○ Always (When Sufficient Data)
- ○ Never

☐ Always Use Non-Parametric

Facility α

Statistical Evaluations per Year: 2

Constituents Analyzed: 7

Downgradient (Compliance) Wells: 6

Sampling Plan

Comparing Individual Observations

○ 1 of 1 ○ 1 of 2 ◉ 1 of 3 ○ 1 of 4

○ 2 of 4 ("Modified California")

IntraWell Other

☐ Stop if Background Trend Detected at Alpha = 0.05

☑ Plot Background Data

Override Standard Deviation:

Override DF: Override Kappa:

☐ Automatically Remove Background Outliers

☐ 2-Tailed Test Mode...

☑ Show Deselected Data Lighter

Non-Parametric Limit = Highest Background Value

Non-Parametric Limit when 100% Non-Detects:

- ○ Highest/Second Highest Background Value
- ◉ Most Recent PQL if available, or MDL
- ○ Most Recent Background Value (subst. method)

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Rank Von Neumann, Wilcoxon Rank Sum / Mann-Whitney

- [ ] Use Modified Alpha...
- [ ] 2-Tailed Test Mode...

Outlier Tests

- ( ) EPA 1989 Outlier Screening (fixed alpha of 0.05)
- (•) Dixon's at α= 0.05 or if n > 22 Rosner's at α= 0.01 [x] Use EPA Screening to establish Suspected Outliers
- ( ) Tukey's Outlier Screening, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] Test For Normality using Shapiro-Wilk/Francia at Alpha = 0.1
  - (•) Stop if Non-Normal
  - ( ) Continue with Parametric Test if Non-Normal
  - ( ) Tukey's if Non-Normal, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] No Outlier If Less Than 3.0 Times Median
- [ ] Apply Rules found in Ohio Guidance Document 0715
- [ ] Combine Background Wells on the Outlier Report...

Piper, Stiff Diagram

- [ ] Combine Wells
- [ ] Combine Dates
- (•) Use Default Constituent Names
- ( ) Use Constituent Definition File Edit

- [x] Label Constituents
- [x] Label Axes
- [x] Note Cation-Anion Balance (Piper only)

Jared Morrison
December 20, 2022

ATTACHMENT 2-2

Spring 2019 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

September 27, 2019

To: Sibley Generating Station
33200 E Johnson Road
Sibley, Missouri 64088
KCP&L Greater Missouri Operations Company

From: SCS Engineers

RE: Determination of Statistically Significant Increases - Fly Ash Impoundment
Spring 2019 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the Fly Ash Impoundment at the Sibley Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on May 22, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 3, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on July 16, 2019 and August 21, 2019.

The completed statistical evaluation identified four Appendix III constituents above their respective prediction limit in monitoring wells MW-801, MW-804, and MW-806R.

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
Boron				
804	5.133	7.64	7.59	8.14
806R	5.323	5.58	5.64	5.66
Calcium				
806R	151.8	171	172	170
Chloride				
801	104.1	154	127	124
Sulfate				
806R	191.9	238	244	241

*UPL – Upper Prediction Limit

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The

statistical evaluation confirmed five SSIs above the background prediction limits. These include boron in downgradient monitoring wells MW-804 and MW-806R; calcium in monitoring well MW-806R; chloride in upgradient monitoring well MW-801; and, sulfate in monitoring well MW-806R.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas™ Output:

Statistical evaluation output from Sanitas™ for the prediction limit analysis. This includes prediction limit plots, prediction limit background data, detection sample result, 1st verification re-sample result (when applicable), 2nd verification re-sample result (when applicable), extra sample results for pH because pH is collected as part of the sampling procedure, and a Prediction Limit summary table. Output documentation includes the analytical data used for the statistical analyses.

Attachment 2: Sanitas™ Configuration Settings:

Screen shots of the applicable Sanitas™ configuration settings for the statistical prediction limit analysis. This includes data configuration, output configuration, prediction limit configuration and other tests configuration.

Revision Number	Revision Date	Attachment Revised	Summary of Revisions

Sibley Generating Station
Determination of Statistically Significant Increases
Fly Ash Impoundment
September 27, 2019

ATTACHMENT 1

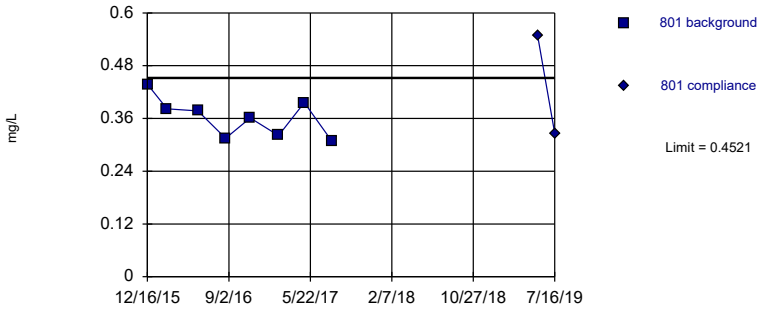
Sanitas™ Output

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.3621, Std. Dev.=0.04547, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9368, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Boron Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

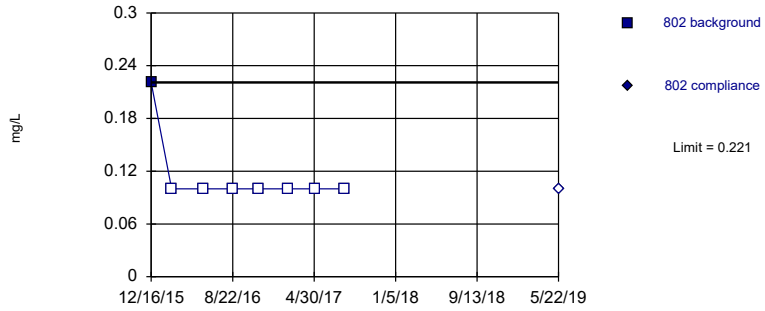
Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 87.5% NDs. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: Boron Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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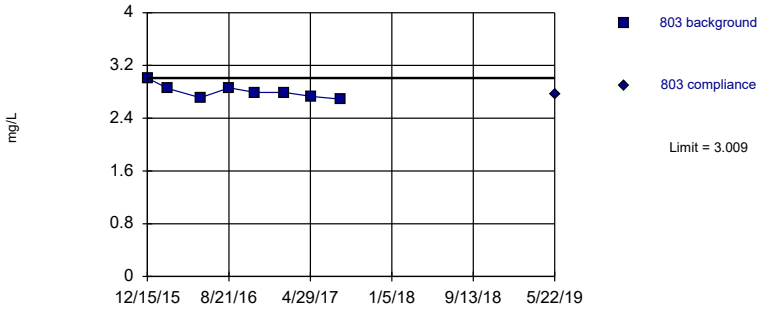
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=2.804, Std. Dev.=0.1038, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9108, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Boron Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

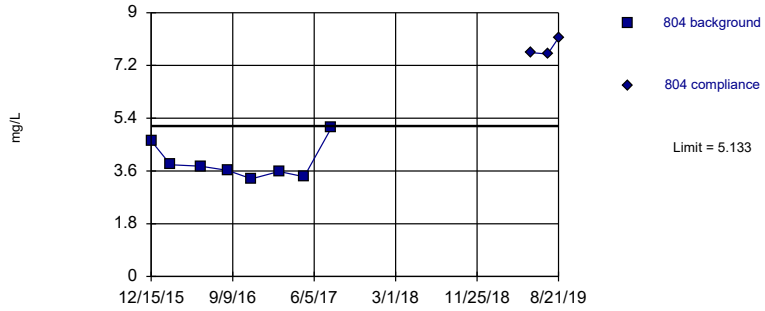
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.901, Std. Dev.=0.6221, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8265, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Boron Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	0.438		
2/17/2016	0.382		
5/26/2016	0.377		
8/23/2016	0.315		
11/10/2016	0.361		
2/9/2017	0.321		
5/3/2017	0.396		
8/1/2017	0.307		
5/22/2019		0.549	
7/16/2019		0.326	1st verification sample

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	0.221	
2/17/2016	<0.2	
5/26/2016	<0.2	
8/23/2016	<0.2	
11/10/2016	<0.2	
2/9/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
5/22/2019		<0.2

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	3.01	
2/17/2016	2.85	
5/26/2016	2.71	
8/23/2016	2.86	
11/10/2016	2.79	
2/9/2017	2.79	
5/3/2017	2.73	
8/1/2017	2.69	
5/22/2019		2.77

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

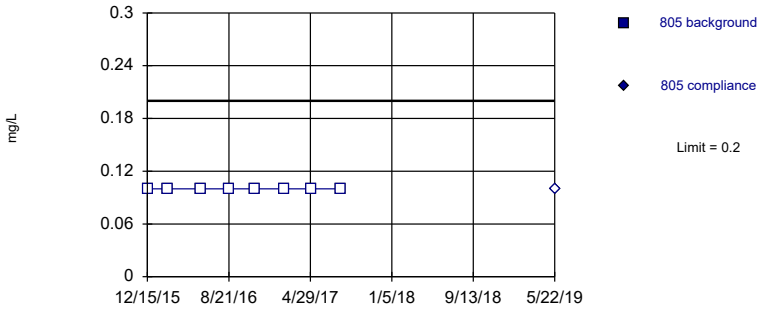
	804	804	
12/15/2015	4.63		
2/17/2016	3.81		
5/26/2016	3.76		
8/23/2016	3.62		
11/10/2016	3.33		
2/9/2017	3.58		
5/3/2017	3.4		
8/1/2017	5.08		
5/22/2019		7.64	
7/16/2019		7.59	1st verification sample
8/21/2019		8.14	2nd verification sample

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 8) were censored; limit is most recent reporting limit. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

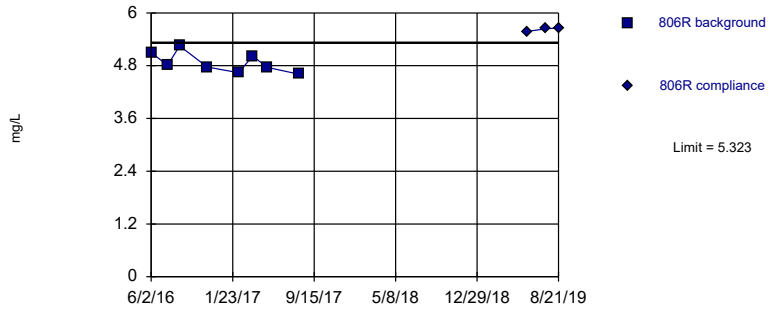
Constituent: Boron Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=4.87, Std. Dev.=0.2287, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9205, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

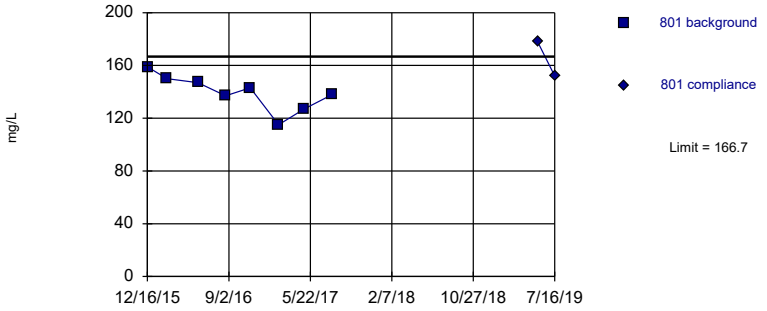
Constituent: Boron Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=139.5, Std. Dev.=13.75, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.975, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

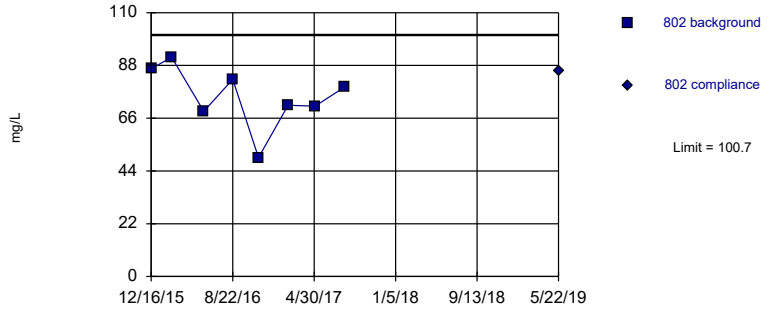
Constituent: Calcium Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=75, Std. Dev.=12.99, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9366, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	<0.2	
2/17/2016	<0.2	
5/26/2016	<0.2	
8/23/2016	<0.2	
11/10/2016	<0.2	
2/9/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
5/22/2019		<0.2

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	5.1		
7/19/2016	4.81		
8/23/2016	5.25		
11/11/2016	4.77		
2/9/2017	4.64		
3/22/2017	5.02		
5/3/2017	4.76		
8/1/2017	4.61		
5/22/2019		5.58	
7/16/2019		5.64	1st verification sample
8/21/2019		5.66	2nd verification sample

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	159		
2/17/2016	150		
5/26/2016	147		
8/23/2016	137		
11/10/2016	143		
2/9/2017	115		
5/3/2017	127		
8/1/2017	138		
5/22/2019		178	
7/16/2019		152	1st verification sample

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

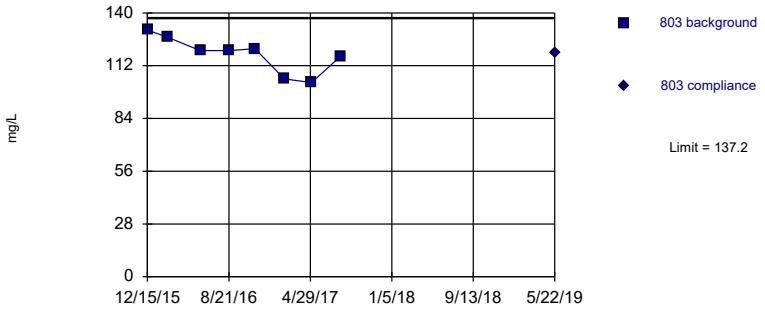
Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	86.6	
2/17/2016	91.4	
5/26/2016	68.9	
8/23/2016	82.2	
11/10/2016	49.6	
2/9/2017	71.4	
5/3/2017	71	
8/1/2017	78.9	
5/22/2019		85.5

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=118, Std. Dev.=9.725, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9144, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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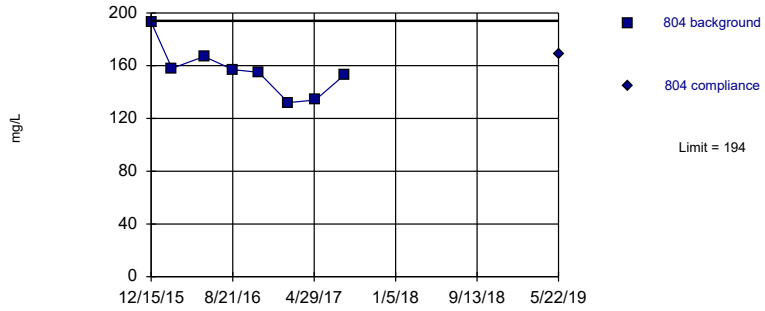
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=156.1, Std. Dev.=19.14, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9111, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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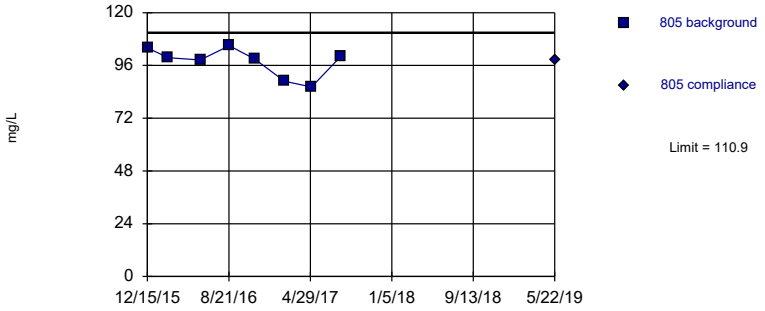
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=97.61, Std. Dev.=6.708, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8624, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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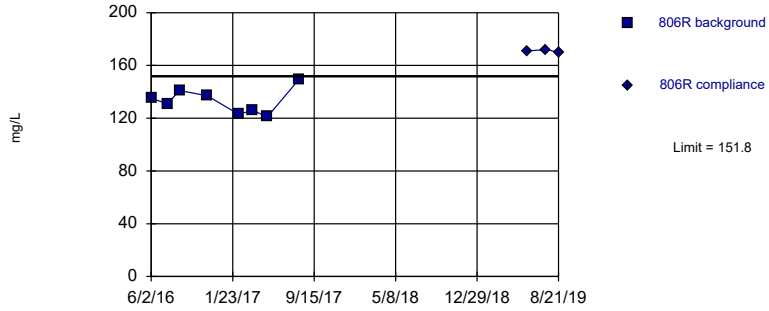
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=132.9, Std. Dev.=9.538, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9644, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Calcium Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	131	
2/17/2016	127	
5/26/2016	120	
8/23/2016	120	
11/10/2016	121	
2/9/2017	105	
5/3/2017	103	
8/1/2017	117	
5/22/2019		119

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	804	804
12/15/2015	193	
2/17/2016	158	
5/26/2016	167	
8/23/2016	157	
11/10/2016	155	
2/9/2017	132	
5/3/2017	134	
8/1/2017	153	
5/22/2019		169

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	104	
2/17/2016	99.5	
5/26/2016	98.5	
8/23/2016	105	
11/10/2016	98.9	
2/9/2017	88.8	
5/3/2017	86.2	
8/1/2017	100	
5/22/2019		98.7

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

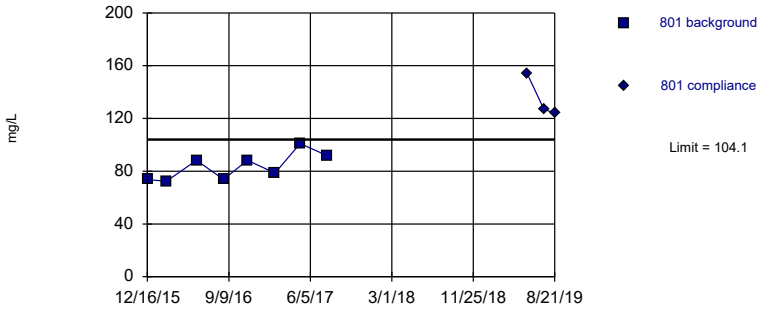
Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	135		
7/19/2016	131		
8/23/2016	141		
11/11/2016	137		
2/9/2017	123		
3/22/2017	126		
5/3/2017	121		
8/1/2017	149		
5/22/2019		171	
7/16/2019		172	1st verification sample
8/21/2019		170	2nd verification sample

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=83.45, Std. Dev.=10.41, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.899, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

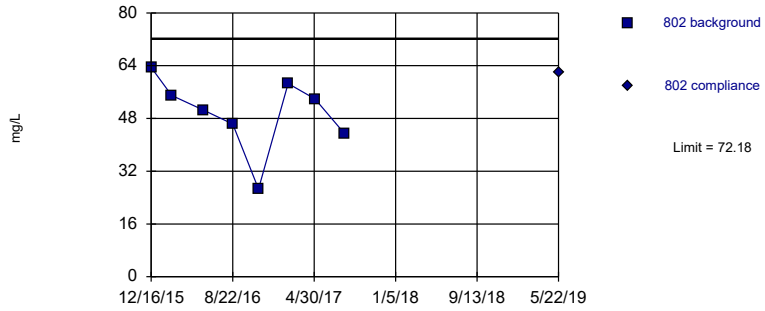
Constituent: Chloride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=49.74, Std. Dev.=11.34, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9231, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

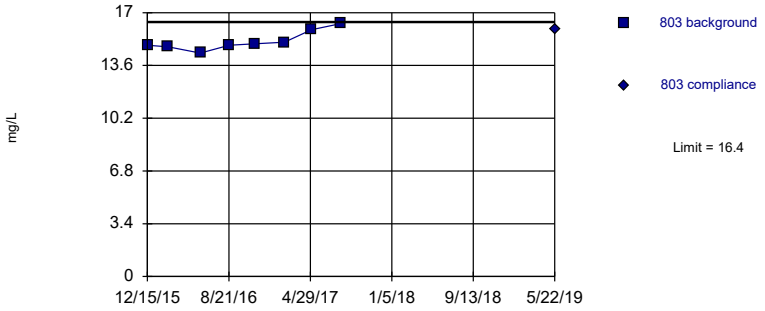
Constituent: Chloride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=15.16, Std. Dev.=0.6232, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8705, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

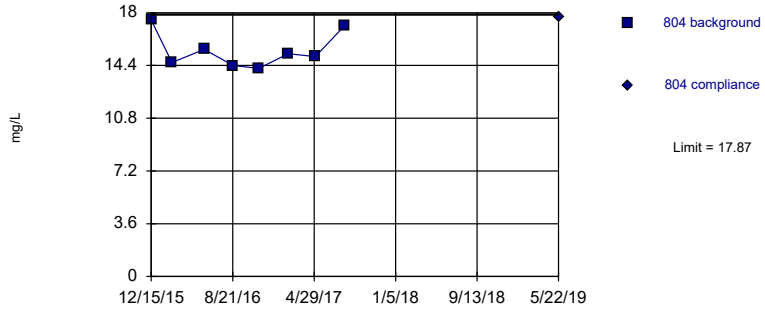
Constituent: Chloride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=15.44, Std. Dev.=1.229, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8619, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Chloride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	73.6		
2/17/2016	72.4		
5/26/2016	88.2		
8/23/2016	73.8		
11/10/2016	88.2		
2/9/2017	78.6		
5/3/2017	101		
8/1/2017	91.8		
5/22/2019		154	
7/16/2019		127	1st verification sample
8/21/2019		124	2nd verification sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	63.5	
2/17/2016	55	
5/26/2016	50.5	
8/23/2016	46.3	
11/10/2016	26.6	
2/9/2017	58.6	
5/3/2017	53.9	
8/1/2017	43.5	
5/22/2019		62

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	14.9	
2/17/2016	14.8	
5/26/2016	14.4	
8/23/2016	14.9	
11/10/2016	15	
2/9/2017	15.1	
5/3/2017	15.9	
8/1/2017	16.3	
5/22/2019		15.9

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

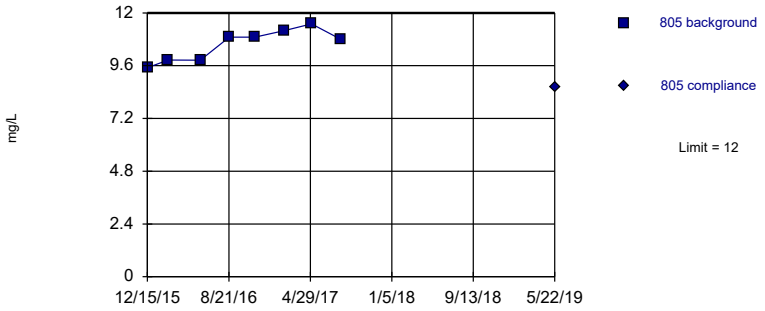
Sibley Client: SCS Engineers Data: Sibley

	804	804
12/15/2015	17.5	
2/17/2016	14.6	
5/26/2016	15.5	
8/23/2016	14.4	
11/10/2016	14.2	
2/9/2017	15.2	
5/3/2017	15	
8/1/2017	17.1	
5/22/2019		17.7

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=10.57, Std. Dev.=0.7249, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8989, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Chloride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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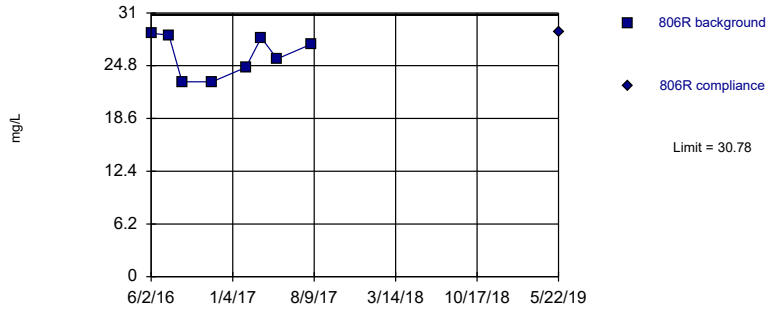
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=26.05, Std. Dev.=2.389, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8702, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Chloride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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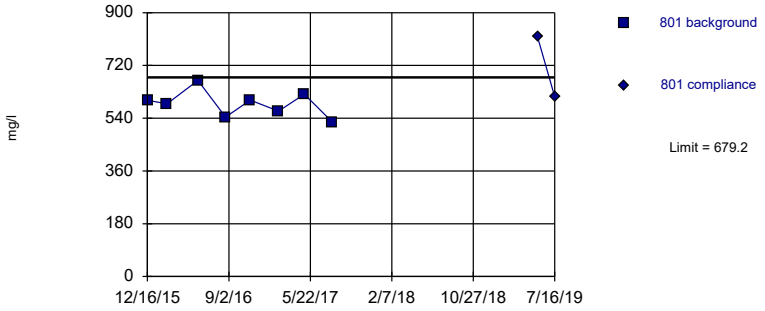
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=589.8, Std. Dev.=45.18, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9729, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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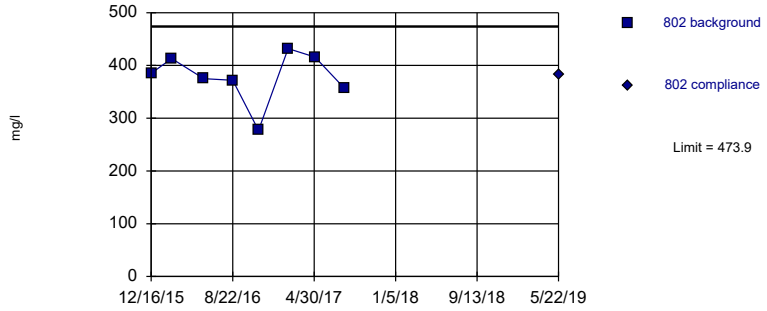
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=378.4, Std. Dev.=48.28, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.885, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	9.51	
2/17/2016	9.86	
5/26/2016	9.85	
8/23/2016	10.9	
11/10/2016	10.9	
2/9/2017	11.2	
5/3/2017	11.5	
8/1/2017	10.8	
5/22/2019		8.65

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R
6/2/2016	28.6	
7/19/2016	28.4	
8/23/2016	22.9	
11/11/2016	22.9	
2/9/2017	24.6	
3/22/2017	28.1	
5/3/2017	25.6	
8/1/2017	27.3	
5/22/2019		28.7

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	601		
2/17/2016	589		
5/26/2016	669		
8/23/2016	544		
11/10/2016	602		
2/9/2017	564		
5/3/2017	622		
8/1/2017	527		
5/22/2019		817	
7/16/2019		613	1st verification sample

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

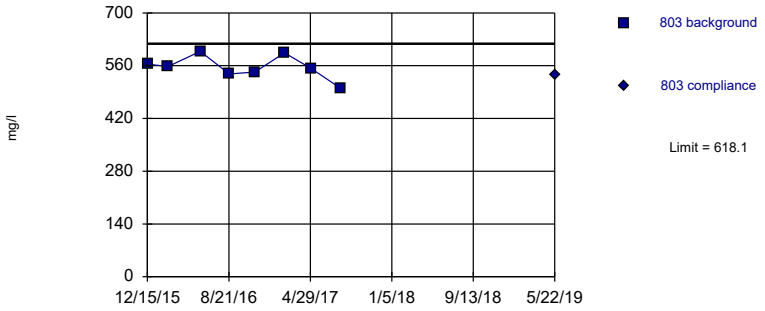
Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	385	
2/17/2016	413	
5/26/2016	375	
8/23/2016	372	
11/10/2016	277	
2/9/2017	432	
5/3/2017	416	
8/1/2017	357	
5/22/2019		383

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=555.9, Std. Dev.=31.44, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9486, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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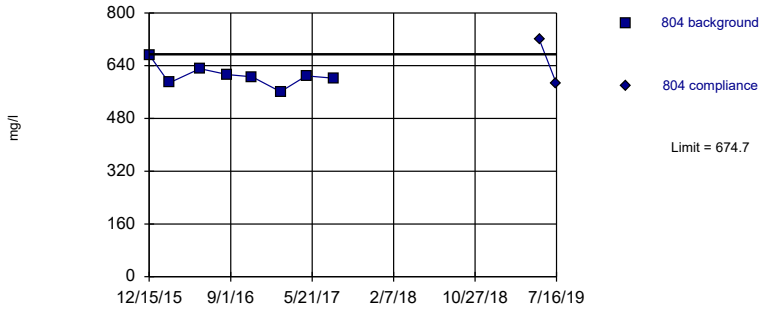
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=610.4, Std. Dev.=32.48, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9436, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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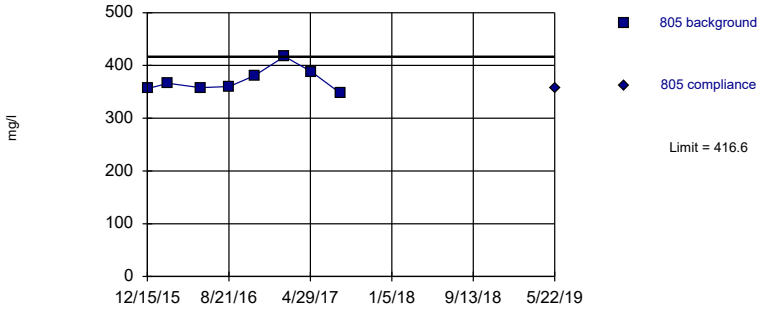
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=371.6, Std. Dev.=22.73, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8928, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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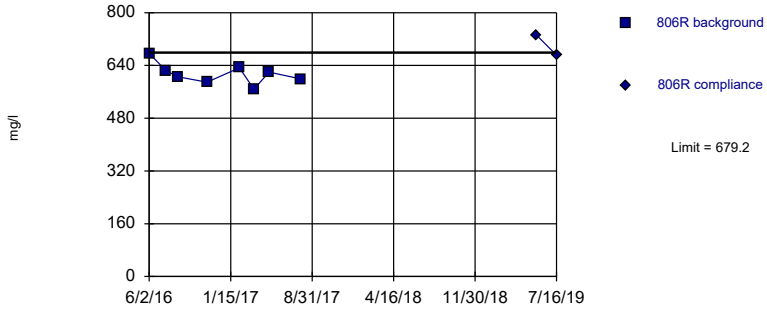
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=614.4, Std. Dev.=32.76, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9638, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	564	
2/17/2016	558	
5/26/2016	598	
8/23/2016	538	
11/10/2016	543	
2/9/2017	594	
5/3/2017	552	
8/1/2017	500	
5/22/2019		535

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	804	804	
12/15/2015	673		
2/17/2016	588		
5/26/2016	631		
8/23/2016	613		
11/10/2016	606		
2/9/2017	561		
5/3/2017	609		
8/1/2017	602		
5/22/2019		719	
7/16/2019		585	1st verification sample

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	356	
2/17/2016	366	
5/26/2016	358	
8/23/2016	360	
11/10/2016	381	
2/9/2017	417	
5/3/2017	388	
8/1/2017	347	
5/22/2019		357

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

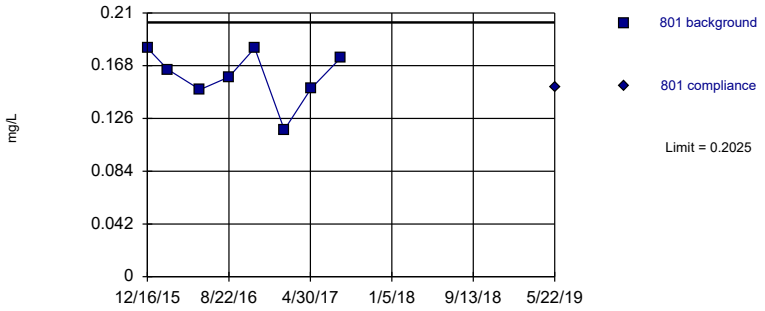
Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	677		
7/19/2016	624		
8/23/2016	605		
11/11/2016	589		
2/9/2017	633		
3/22/2017	568		
5/3/2017	620		
8/1/2017	599		
5/22/2019		731	
7/16/2019		671	1st verification sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1598, Std. Dev.=0.02158, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9046, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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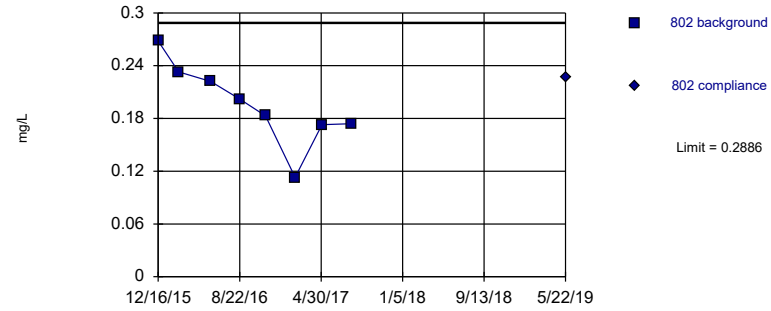
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.196, Std. Dev.=0.04681, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9741, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 9/23/2019 1:45 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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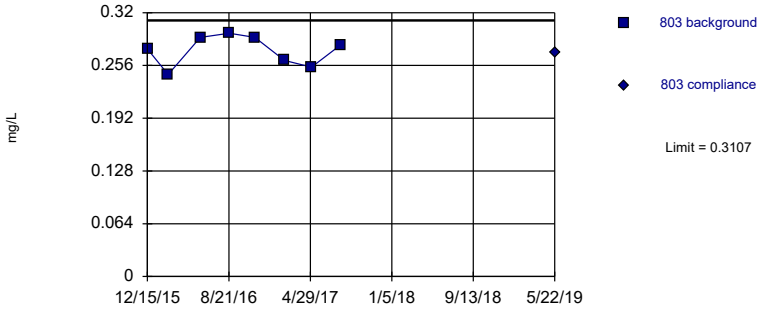
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.2741, Std. Dev.=0.01848, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9165, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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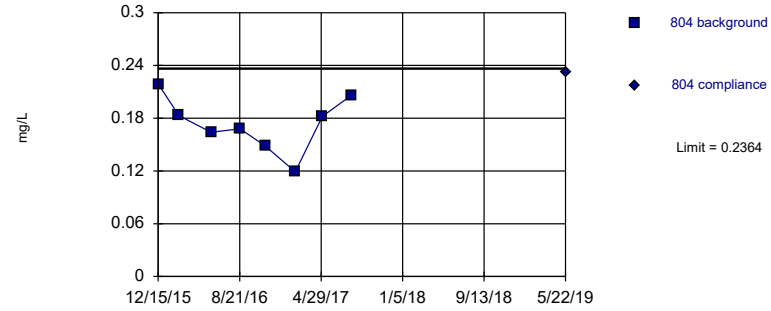
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1736, Std. Dev.=0.03169, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9792, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801
12/16/2015	0.182	
2/17/2016	0.165	
5/26/2016	0.149	
8/23/2016	0.159	
11/10/2016	0.182	
2/9/2017	0.117	
5/3/2017	0.15	
8/1/2017	0.174	
5/22/2019		0.151

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	0.268	
2/17/2016	0.233	
5/26/2016	0.222	
8/23/2016	0.202	
11/10/2016	0.183	
2/9/2017	0.113	
5/3/2017	0.173	
8/1/2017	0.174	
5/22/2019		0.227

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	0.276	
2/17/2016	0.245	
5/26/2016	0.29	
8/23/2016	0.295	
11/10/2016	0.29	
2/9/2017	0.262	
5/3/2017	0.254	
8/1/2017	0.281	
5/22/2019		0.272

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

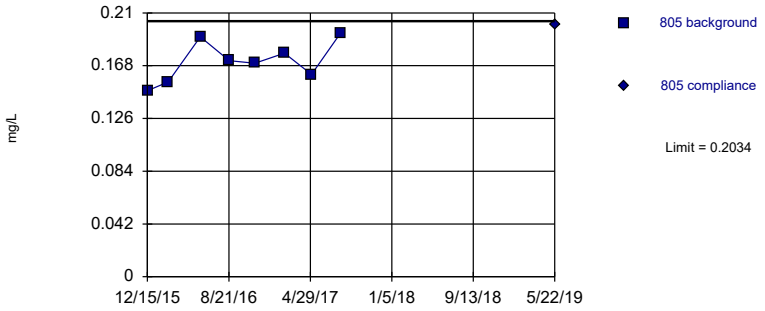
Sibley Client: SCS Engineers Data: Sibley

	804	804
12/15/2015	0.219	
2/17/2016	0.183	
5/26/2016	0.164	
8/23/2016	0.168	
11/10/2016	0.148	
2/9/2017	0.119	
5/3/2017	0.182	
8/1/2017	0.206	
5/22/2019		0.233

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1711, Std. Dev.=0.01632, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9597, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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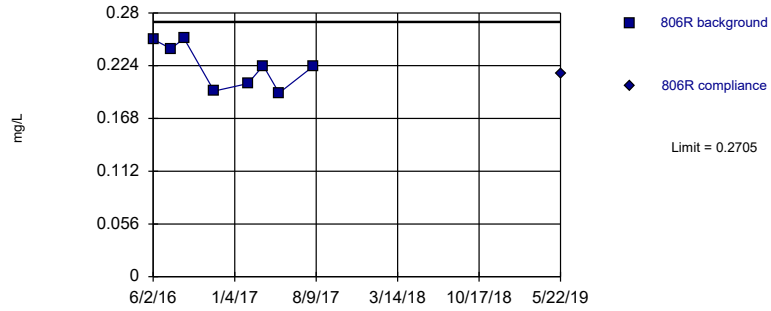
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.2239, Std. Dev.=0.02355, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8972, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Fluoride Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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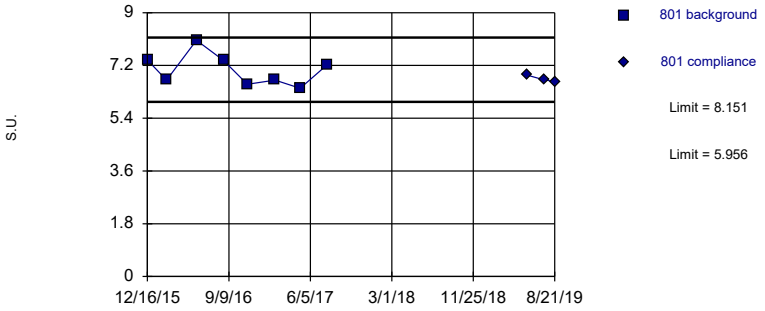
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.054, Std. Dev.=0.5545, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9128, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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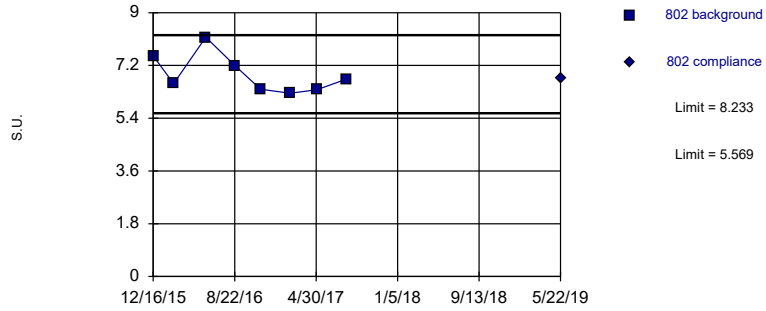
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.901, Std. Dev.=0.6729, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8827, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	0.148	
2/17/2016	0.155	
5/26/2016	0.191	
8/23/2016	0.172	
11/10/2016	0.17	
2/9/2017	0.178	
5/3/2017	0.161	
8/1/2017	0.194	
5/22/2019		0.201

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R
6/2/2016	0.252	
7/19/2016	0.242	
8/23/2016	0.253	
11/11/2016	0.197	
2/9/2017	0.205	
3/22/2017	0.224	
5/3/2017	0.195	
8/1/2017	0.223	
5/22/2019		0.215

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	7.39		
2/17/2016	6.7		
5/26/2016	8.06		
8/23/2016	7.37		
11/10/2016	6.56		
2/9/2017	6.7		
5/3/2017	6.42		
8/1/2017	7.23		
5/22/2019		6.87	
7/16/2019		6.71	extra sample
8/21/2019		6.65	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

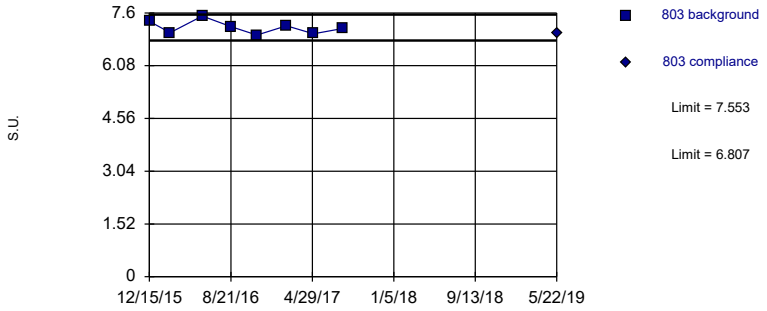
Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	7.53	
2/17/2016	6.58	
5/26/2016	8.16	
8/23/2016	7.2	
11/10/2016	6.39	
2/9/2017	6.25	
5/3/2017	6.37	
8/1/2017	6.73	
5/22/2019		6.77

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.18, Std. Dev.=0.1884, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9447, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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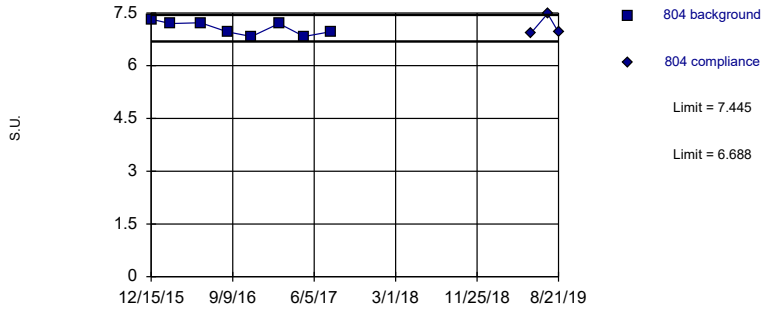
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.066, Std. Dev.=0.1912, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8802, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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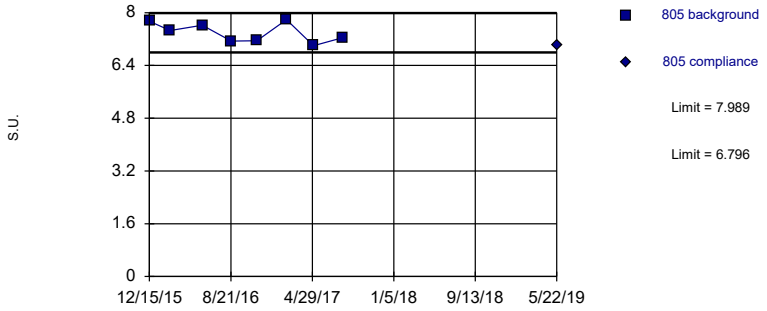
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.393, Std. Dev.=0.3012, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.915, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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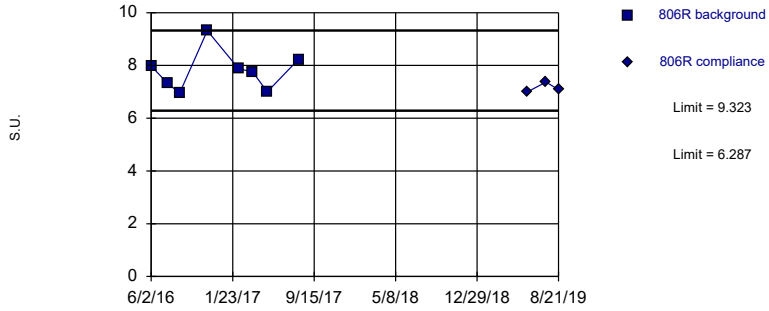
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.805, Std. Dev.=0.7672, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9174, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: pH Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	7.36	
2/17/2016	7.03	
5/26/2016	7.51	
8/23/2016	7.2	
11/10/2016	6.96	
2/9/2017	7.23	
5/3/2017	7	
8/1/2017	7.15	
5/22/2019		7.01

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	804	804	
12/15/2015	7.32		
2/17/2016	7.2		
5/26/2016	7.22		
8/23/2016	6.96		
11/10/2016	6.83		
2/9/2017	7.2		
5/3/2017	6.83		
8/1/2017	6.97		
5/22/2019		6.93	
7/16/2019		7.48	extra sample
8/21/2019		6.95	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	7.74	
2/17/2016	7.46	
5/26/2016	7.62	
8/23/2016	7.14	
11/10/2016	7.15	
2/9/2017	7.79	
5/3/2017	7	
8/1/2017	7.24	
5/22/2019		7.03

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

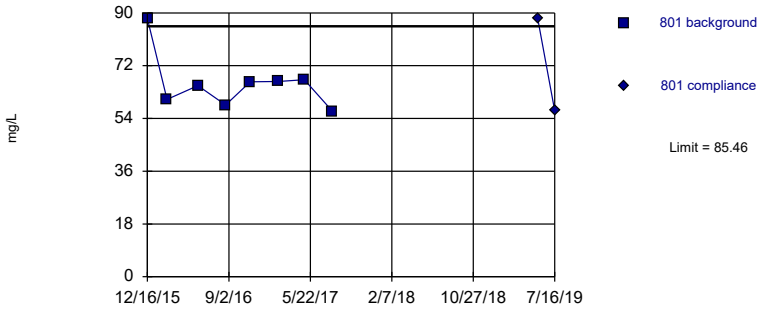
Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	7.98		
7/19/2016	7.33		
8/23/2016	6.95		
11/11/2016	9.32		
2/9/2017	7.88		
3/22/2017	7.75		
5/3/2017	7		
8/1/2017	8.23		
5/22/2019		6.99	
7/16/2019		7.37	extra sample
8/21/2019		7.08	extra sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=66.15, Std. Dev.=9.755, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7928, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

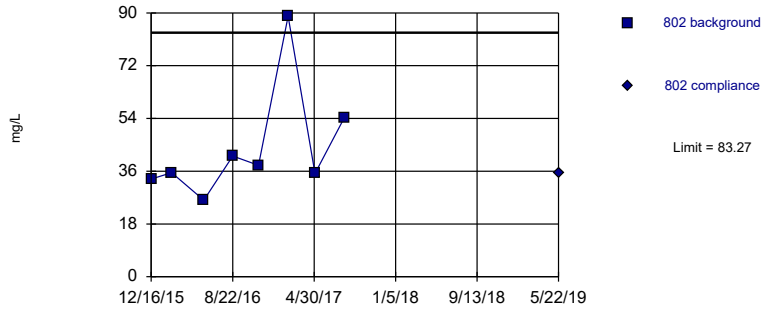
Constituent: Sulfate Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=44.05, Std. Dev.=19.82, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7634, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

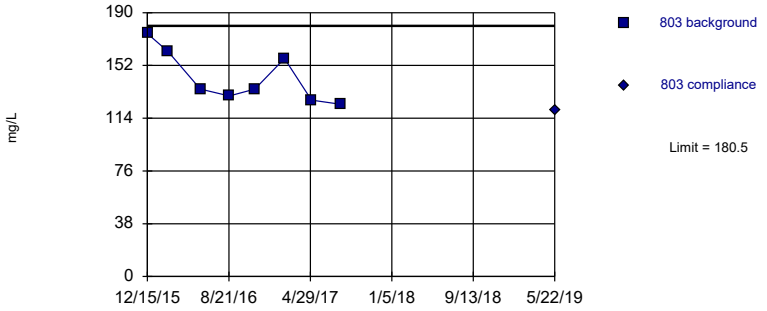
Constituent: Sulfate Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=143.1, Std. Dev.=18.88, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8721, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Sulfate Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

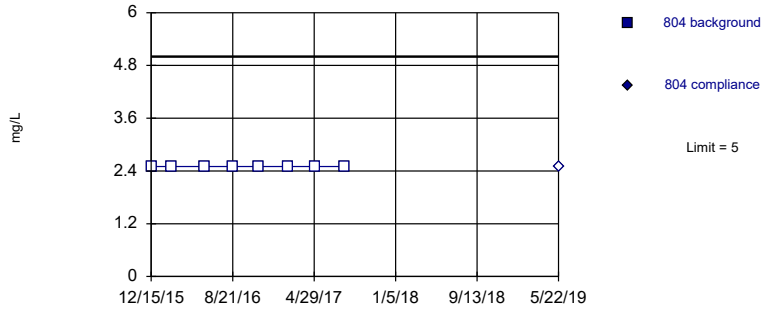
Sibley Client: SCS Engineers Data: Sibley

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 8) were censored; limit is most recent reporting limit. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: Sulfate Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801	801	
12/16/2015	88.1		
2/17/2016	60.5		
5/26/2016	65.2		
8/23/2016	58.6		
11/10/2016	66.5		
2/9/2017	66.6		
5/3/2017	67.2		
8/1/2017	56.5		
5/22/2019		88.3	
7/16/2019		56.6	1st verification sample

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	802	802
12/16/2015	33.3	
2/17/2016	35.5	
5/26/2016	26.1	
8/23/2016	41.2	
11/10/2016	38	
2/9/2017	88.9	
5/3/2017	35.2	
8/1/2017	54.2	
5/22/2019		35.4

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	803	803
12/15/2015	175	
2/17/2016	162	
5/26/2016	135	
8/23/2016	130	
11/10/2016	135	
2/9/2017	157	
5/3/2017	127	
8/1/2017	124	
5/22/2019		120

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

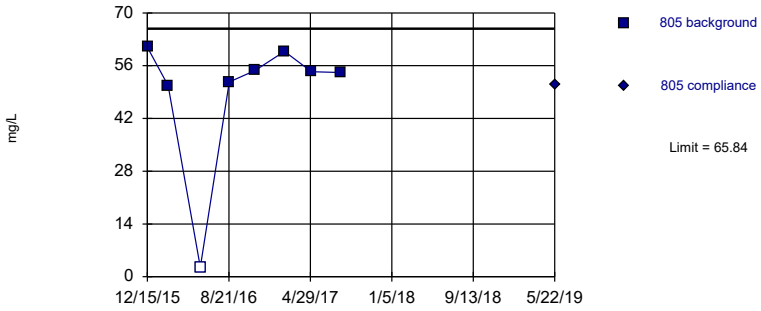
	804	804
12/15/2015	<5	
2/17/2016	<5	
5/26/2016	<5	
8/23/2016	<5	
11/10/2016	<5	
2/9/2017	<5	
5/3/2017	<5	
8/1/2017	<5	
5/22/2019		<5

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on cube transformation): Mean=149015, Std. Dev.=68909, n=8, 12.5% NDs. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8456, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Sulfate Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

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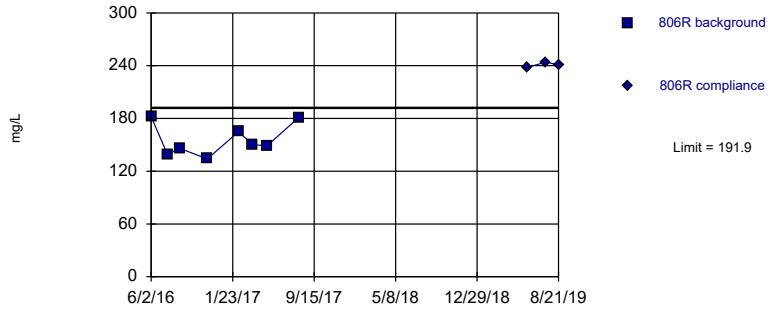
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=155.8, Std. Dev.=18.28, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.893, critical = 0.749. Kappa = 1.979 (c=7, w=6, 1 of 3, event alpha = 0.05132). Report alpha = 0.001254.

Constituent: Sulfate Analysis Run 9/23/2019 1:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	805	805
12/15/2015	60.9	
2/17/2016	50.7	
5/26/2016	<5	
8/23/2016	51.7	
11/10/2016	54.7	
2/9/2017	59.8	
5/3/2017	54.4	
8/1/2017	54.2	
5/22/2019		51.1

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 1:47 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	806R	806R	
6/2/2016	182		
7/19/2016	139		
8/23/2016	146		
11/11/2016	134		
2/9/2017	165		
3/22/2017	150		
5/3/2017	149		
8/1/2017	181		
5/22/2019		238	
7/16/2019		244	1st verification sample
8/21/2019		241	2nd verification sample

Prediction Limit

Sibley Client: SCS Engineers Data: Sibley Printed 9/23/2019, 1:47 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	801	0.4521	n/a	7/16/2019	0.326	No	8	0	No	0.001254	Param Intra 1 of 3
Boron (mg/L)	802	0.221	n/a	5/22/2019	0.1ND	No	8	87.5	n/a	0.005912	NP Intra (NDs) 1 of 3
Boron (mg/L)	803	3.009	n/a	5/22/2019	2.77	No	8	0	No	0.001254	Param Intra 1 of 3
Boron (mg/L)	**804**	**5.133**	**n/a**	**8/21/2019**	**8.14**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Boron (mg/L)	805	0.2	n/a	5/22/2019	0.1ND	No	8	100	n/a	0.005912	NP Intra (NDs) 1 of 3
Boron (mg/L)	**806R**	**5.323**	**n/a**	**8/21/2019**	**5.66**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Calcium (mg/L)	801	166.7	n/a	7/16/2019	152	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	802	100.7	n/a	5/22/2019	85.5	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	803	137.2	n/a	5/22/2019	119	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	804	194	n/a	5/22/2019	169	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	805	110.9	n/a	5/22/2019	98.7	No	8	0	No	0.001254	Param Intra 1 of 3
Calcium (mg/L)	**806R**	**151.8**	**n/a**	**8/21/2019**	**170**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Chloride (mg/L)	**801**	**104.1**	**n/a**	**8/21/2019**	**124**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**
Chloride (mg/L)	802	72.18	n/a	5/22/2019	62	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	803	16.4	n/a	5/22/2019	15.9	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	804	17.87	n/a	5/22/2019	17.7	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	805	12	n/a	5/22/2019	8.65	No	8	0	No	0.001254	Param Intra 1 of 3
Chloride (mg/L)	806R	30.78	n/a	5/22/2019	28.7	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	801	679.2	n/a	7/16/2019	613	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	802	473.9	n/a	5/22/2019	383	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	803	618.1	n/a	5/22/2019	535	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	804	674.7	n/a	7/16/2019	585	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	805	416.6	n/a	5/22/2019	357	No	8	0	No	0.001254	Param Intra 1 of 3
Dissolved Solids (mg/l)	806R	679.2	n/a	7/16/2019	671	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	801	0.2025	n/a	5/22/2019	0.151	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	802	0.2886	n/a	5/22/2019	0.227	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	803	0.3107	n/a	5/22/2019	0.272	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	804	0.2364	n/a	5/22/2019	0.233	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	805	0.2034	n/a	5/22/2019	0.201	No	8	0	No	0.001254	Param Intra 1 of 3
Fluoride (mg/L)	806R	0.2705	n/a	5/22/2019	0.215	No	8	0	No	0.001254	Param Intra 1 of 3
pH (S.U.)	801	8.151	5.956	8/21/2019	6.65	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	802	8.233	5.569	5/22/2019	6.77	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	803	7.553	6.807	5/22/2019	7.01	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	804	7.445	6.688	8/21/2019	6.95	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	805	7.989	6.796	5/22/2019	7.03	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	806R	9.323	6.287	8/21/2019	7.08	No	8	0	No	0.000...	Param Intra 1 of 3
Sulfate (mg/L)	801	85.46	n/a	7/16/2019	56.6	No	8	0	No	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	802	83.27	n/a	5/22/2019	35.4	No	8	0	No	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	803	180.5	n/a	5/22/2019	120	No	8	0	No	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	804	5	n/a	5/22/2019	2.5ND	No	8	100	n/a	0.005912	NP Intra (NDs) 1 of 3
Sulfate (mg/L)	805	65.84	n/a	5/22/2019	51.1	No	8	12.5	x^3	0.001254	Param Intra 1 of 3
Sulfate (mg/L)	**806R**	**191.9**	**n/a**	**8/21/2019**	**241**	**Yes**	**8**	**0**	**No**	**0.001254**	**Param Intra 1 of 3**

ATTACHMENT 2

Sanitas™ Configuration Settings

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Exclude data flags: i

Data Reading Options

- (•) Individual Observations
- ( ) Mean of Each: ( ) Month
- ( ) Median of Each: ( ) Season

Non-Detect / Trace Handling...

Setup Seasons...

[ ] Automatically Process Resamples...

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

- [ ] Black and White Output
- [x] Four Plots Per Page
  - [ ] Always Combine Data Pages...
  - [x] Include Tick Marks on Data Page
  - [ ] Use Constituent Name for Graph Title
- [ ] Draw Border Around Text Reports and Data Pages
- [x] Enlarge/Reduce Fonts (Graphs): 100%
- [x] Enlarge/Reduce Fonts (Data/Text Reports): 100%
- [x] Wide Margins (on reports without explicit setting)
- [ ] Use CAS# (Not Const. Name)
- [ ] Truncate File Names to 20 Characters
- [ ] Include Limit Lines when found in Database...
- [x] Show Deselected Data on Time Series: Lighter
- [x] Show Deselected Data on all Data Pages: Light

Setup Symbols and Colors...

- [x] Prompt to Overwrite/Append Summary Tables
- [ ] Round Limits to 2 Sig. Digits (when not set in data file)
- [x] User-Set Scale
- [x] Indicate Background Data
- [ ] Show Exact Dates
- [ ] Thick Plot Lines

Zoom Factor: 200%

Output Decimal Precision

- ( ) Less Precision
- (•) Normal Precision
- ( ) More Precision

- [x] Store Print Jobs in Multiple Constituent Mode

Store All Print Jobs...

Printer: Adobe PDF

Printers...

Data | Output | Trend Test | Control Cht | **Prediction Lim** | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

☑ Test for Normality using Shapiro-Wilk/Francia at Alpha = 0.01

☑ Use Non-Parametric Test when Non-Detects Percent > 50

Use Aitchison's Adjustment when Non-Detects Percent > 15

☐ Optional Further Refinement: Use Aitchison's when NDs % > 50

☐ Use Poisson Prediction Limit when Non-Detects Percent > 90

Transformation

- ◉ Use Ladder of Powers
- ○ Natural Log or No Transformation
- ○ Never Transform
- ○ Use Specific Transformation: Natural Log

☐ Use Best W Statistic

☐ Plot Transformed Values

Deseasonalize (Intra- and InterWell)

- ◉ If Seasonality Is Detected
- ○ If Seasonality Is Detected Or Insufficient to Test
- ○ Always (When Sufficient Data)
- ○ Never

☐ Always Use Non-Parametric

Facility α

Statistical Evaluations per Year: 2

Constituents Analyzed: 7

Downgradient (Compliance) Wells: 6

Sampling Plan

Comparing Individual Observations

○ 1 of 1 ○ 1 of 2 ◉ 1 of 3 ○ 1 of 4

○ 2 of 4 ("Modified California")

IntraWell Other

☐ Stop if Background Trend Detected at Alpha = 0.05

☑ Plot Background Data

Override Standard Deviation:

Override DF: Override Kappa:

☐ Automatically Remove Background Outliers

☐ 2-Tailed Test Mode...

☑ Show Deselected Data Lighter

Non-Parametric Limit = Highest Background Value

Non-Parametric Limit when 100% Non-Detects:

- ○ Highest/Second Highest Background Value
- ◉ Most Recent PQL if available, or MDL
- ○ Most Recent Background Value (subst. method)

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Rank Von Neumann, Wilcoxon Rank Sum / Mann-Whitney

- [ ] Use Modified Alpha...
- [ ] 2-Tailed Test Mode...

Outlier Tests

- ( ) EPA 1989 Outlier Screening (fixed alpha of 0.05)
- (•) Dixon's at α= 0.05 or if n > 22 Rosner's at α= 0.01 [x] Use EPA Screening to establish Suspected Outliers
- ( ) Tukey's Outlier Screening, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] Test For Normality using Shapiro-Wilk/Francia at Alpha = 0.1
  - (•) Stop if Non-Normal
  - ( ) Continue with Parametric Test if Non-Normal
  - ( ) Tukey's if Non-Normal, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] No Outlier If Less Than 3.0 Times Median
- [ ] Apply Rules found in Ohio Guidance Document 0715
- [ ] Combine Background Wells on the Outlier Report...

Piper, Stiff Diagram

- [ ] Combine Wells
- [ ] Combine Dates
- (•) Use Default Constituent Names
- ( ) Use Constituent Definition File Edit

- [x] Label Constituents
- [x] Label Axes
- [x] Note Cation-Anion Balance (Piper only)

Jared Morrison
December 20, 2022

ATTACHMENT 3

Groundwater Potentiometric Surface Maps

LEGEND:

- 760 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
- 801 GROUNDWATER MONITORING SYSTEM WELL (GROUNDWATER ELEVATION)
- CCR UNIT BOUNDARY
- 50 FT/YR GROUNDWATER FLOW DIRECTION AND CALCULATED GROUNDWATER FLOW RATE (FEET/YEAR)

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE. MARCH 2015.
3. BOUNDARY AND MONITORING WELL LOCATIONS SHOWN ARE APPROXIMATE.
4. WATER LEVEL MEASUREMENTS COMPLETED ON MAY 22, 2019

200 0 200 400
SCALE FEET

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP
(MAY 2019)
FLY ASH IMPOUNDEMENT

PROJECT TITLE
2019 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT ADDENDUM

CLIENT
EVERGY MISSOURI WEST, INC.
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St. Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW BY:
27213167.19	MBJ	JRF
DSN. BY:	CHK. BY:	PROJ. MGR.
TGW	JRF	JRF

CADD FILE: 19-MAY_GW V1.DWG

DATE: 12/15/22

FIGURE NO. 1

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LEGEND:

- 760 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
- 801 GROUNDWATER MONITORING SYSTEM WELL (GROUNDWATER ELEVATION)
- CCR UNIT BOUNDARY
- 449 FT/YR GROUNDWATER FLOW DIRECTION AND CALCULATED GROUNDWATER FLOW RATE (FEET/YEAR)

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE. MARCH 2015.
3. BOUNDARY AND MONITORING WELL LOCATIONS SHOWN ARE APPROXIMATE.
4. WATER LEVEL MEASUREMENTS COMPLETED ON NOVEMBER 6, 2019

200 0 200 400
SCALE FEET

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP
(NOVEMBER 2019)
FLY ASH IMPOUNDEMENT

PROJECT TITLE
2019 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT ADDENDUM

CLIENT
EVERGY MISSOURI WEST, INC.
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	QA RVW BY:
27213167.19	DAW	JRF
DSN. BY:	CHK. BY:	PROJ. MGR.
TGW	JRF	JRF

CADD FILE:
19 - NOV_GW 2A-C V1.DWG

DATE:
12/15/22

FIGURE NO.
2

N:\KCPL\Projects\Groundwater\DWG\Sibley\2019\GW\19 - NOV_GW 2A-C V1.dwg Dec 15, 2022 - 11:19am Layout Name: Fig 2C By: swyly