2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

CCR LANDFILL
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 16, 2022

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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 CCR Landfill 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
12-16-22
RG0092

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 CCR Landfill 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
LEE
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NUMBER
PE-28982

12-16-22

Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions
0	January 2020	NA	Original Report.
1	December 16, 2022	Addendum 1	Added Addendum 1

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

Addendum 1 2019 Annual Groundwater Monitoring and Corrective Action Report Addendum 1

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 CCR Landfill 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 CCR Landfill and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR Landfill 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 CCR Landfill in 2019.

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 in **Appendix C**:

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

C.2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill, 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 CCR Landfill. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

LEGEND:

● 506	CCR GROUNDWATER MONITORING SYSTEM WELLS
▬	CCR LANDFILL 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 SHOWN ARE APPROXIMATE.

200 0 200 400

SCALE FEET

REV.	DATE
-	-

SHEET TITLE

SITE MAP
CCR LANDFILL
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
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PROJ. NO. 27213167.19	DWN. BY: TGW	Q/A RVW BY: JRF
DSN. BY: TGW	CHK. BY: JRF	PROJ. MGR JRF

CADD FILE:
FIG 1 – SIBLEY LF V0.02.DWG

DATE:
1/07/20

FIGURE NO.
1

N:\KCPL\PROJECTS\GROUNDWATER\DWG\SIBLEY\ANNUAL CCR REPORTING\2017\FIG 1 - SIBLEY LF V0.02.DWG

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
CCR Landfill
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)	Total Dissolved Solids (mg/L)
MW-504	1/11/2019	---	*39.3	---	*0.179	**7.15	*33.2	---
MW-504	3/12/2019	---	*35.4	---	---	**6.34	*35.1	---
MW-504	5/22/2019	<0.200	33.1	<1.00	0.176	6.70	36.3	197
MW-504	7/16/2019	---	---	---	---	**7.53	*36.3	---
MW-504	8/21/2019	---	---	---	---	**6.85	*35.6	---
MW-504	11/6/2019	<0.200	34.1	<1.00	0.182	6.45	35.4	177
MW-505	1/11/2019	---	*29.5	---	---	**7.08	---	---
MW-505	3/12/2019	---	*24.9	---	---	**6.78	---	---
MW-505	5/22/2019	<0.200	26.4	<1.00	0.151	6.85	22.7	180
MW-505	11/6/2019	<0.200	28.2	<1.00	0.198	6.75	17.1	146
MW-506	1/11/2019	---	---	*6.39	---	**7.40	---	---
MW-506	5/22/2019	<0.200	91.7	7.05	0.336	7.16	74.2	453
MW-506	7/16/2019	---	---	*7.33	---	**7.43	---	---
MW-506	8/21/2019	---	---	*7.17	---	**7.11	---	---
MW-506	11/6/2019	<0.200	93.7	6.66	0.309	7.20	76.8	410
MW-510	5/22/2019	<0.200	117	3.39	0.326	7.01	13.8	480
MW-510	11/6/2019	<0.200	120	3.08	0.298	6.97	14.6	427
MW-512	1/11/2019	---	*110	*3.85	---	**7.34	*43.3	---
MW-512	3/12/2019	---	*108	*4.38	---	**7.23	*44.2	---
MW-512	5/22/2019	<0.200	104	4.17	0.315	7.25	40.1	445
MW-512	7/16/2019	---	---	*4.35	---	**7.70	*42.1	---
MW-512	8/21/2019	---	---	*4.91	---	**7.01	*41.0	---
MW-512	11/6/2019	<0.200	105	4.48	0.286	7.02	45.0	403
MW-601	5/22/2019	<0.200	97.4	3.19	0.264	6.97	8.74	404
MW-601	11/6/2019	<0.200	101	3.09	0.248	6.65	11.4	361

* 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
CCR Landfill
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-504	1/11/2019	**7.15	317	12.54	2.2	177	4.79	22.58	793.74
MW-504	3/12/2019	**6.34	440	13.12	0.4	213	4.89	21.38	794.94
MW-504	5/22/2019	6.70	789	15.93	0.0	225	5.21	9.87	806.45
MW-504	7/16/2019	**7.53	351	17.54	0.0	109	4.16	21.57	794.75
MW-504	8/21/2019	**6.85	297	16.20	0.0	214	3.36	21.54	794.78
MW-504	11/6/2019	6.45	436	15.41	0.0	204	3.32	21.78	794.54
MW-505	1/11/2019	**7.08	253	12.36	0.1	186	7.01	27.13	787.84
MW-505	3/12/2019	**6.78	338	12.80	0.0	219	6.08	25.95	789.02
MW-505	5/22/2019	6.85	254	15.68	0.0	256	9.00	12.41	802.56
MW-505	11/6/2019	6.75	359	15.80	0.0	226	7.23	27.52	787.45
MW-506	1/11/2019	**7.40	755	10.35	0.2	185	5.57	BTP	NA
MW-506	5/22/2019	7.16	745	17.98	0.0	204	7.96	BTP	NA
MW-506	7/16/2019	**7.43	772	19.01	0.0	102	6.55	BTP	NA
MW-506	8/21/2019	**7.11	703	21.17	0.0	218	5.24	BTP	NA
MW-506	11/6/2019	7.20	950	20.28	0.0	220	7.24	BTP	NA
MW-510	5/22/2019	7.01	850	14.75	0.0	10	0.00	36.70	749.09
MW-510	11/6/2019	6.97	799	19.55	15.2	-23	0.63	40.45	745.34
MW-512	1/11/2019	**7.34	805	10.76	3.9	134	3.52	31.05	739.08
MW-512	3/12/2019	**7.23	804	12.65	0.0	103	2.66	26.78	743.35
MW-512	5/22/2019	7.25	746	18.65	0.0	167	4.85	17.31	752.82
MW-512	7/16/2019	**7.70	788	18.48	0.0	100	5.54	26.49	743.64
MW-512	8/21/2019	**7.01	718	20.02	0.0	230	2.48	28.80	741.33
MW-512	11/6/2019	7.02	756	18.31	0.5	80	3.61	29.31	740.82
MW-601	5/22/2019	6.97	701	18.49	0.0	12	4.01	42.83	738.07
MW-601	11/6/2019	6.65	936	16.68	0.0	100	0.00	46.08	734.82

* 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

BTP - Below Top of Pump

APPENDIX C

ALTERNATIVE SOURCE DEMONSTRATIONS

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

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

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

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
NOVEMBER 2018 GROUNDWATER MONITORING EVENT

CCR LANDFILL
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. 27213169.18

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 CCR Landfill 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
6-25-19
RG0092

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 CCR Landfill 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
LEE
DOERR
NUMBER
PE-28982

6-25-19

Douglas L. Doerr, P.E.

SCS Engineers

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Appendices

Appendix A **Figure 1**
Appendix B **Box and Whiskers Plots**
Appendix C **Piper Diagram**
Appendix D **Time Series Plots**

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 CCR Landfill 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 four Appendix III constituents above their respective prediction limit in monitoring wells MW-504 and MW-512.

The prediction limit for calcium in monitoring well MW-512 is 107 mg/L. The detection monitoring sample was reported at 110 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 110 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 108 mg/L.

The prediction limit for chloride in monitoring well MW-512 is 3.826 mg/L. The detection monitoring sample was reported at 3.89 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 3.85 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 4.38 mg/L.

The prediction limit for sulfate in upgradient monitoring well MW-504 is 24.58 mg/L. The detection monitoring sample was reported at 33.9 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 33.2 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 35.1 mg/L.

The prediction limit for sulfate in monitoring well MW-512 is 29.55 mg/L. The detection monitoring sample was reported at 51.4 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 43.3 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 44.2 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for sulfate from monitoring well MW-504, and the detection monitoring sample for calcium, chloride, and sulfate from monitoring well MW-512 exceed their respective prediction limits and are confirmed statistically significant increases (SSIs) 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 four SSIs above the background prediction limits for sulfate in upgradient monitoring well MW-504, and calcium, chloride, and sulfate in downgradient monitoring well MW-512.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration (ASD) 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 CCR Landfill 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 CCR Landfill. 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 CCR Landfill at the time of sampling. As seen on the map, monitoring well MW-504 is located upgradient from the CCR Landfill indicating the SSI is not caused by a release from the CCR Landfill. This demonstrates that a source other than the CCR Landfill 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.

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.

Box and whiskers plots for calcium, chloride, and sulfate in monitoring wells MW-504 and MW-512 were compared to box and whisker plots for calcium, chloride, and sulfate in several upgradient and side-gradient non-CCR monitoring system wells installed for future state-permitted landfill expansion purposes. Sulfate comparisons indicate the concentrations in both MW-504 and MW-512 are well within or below expected concentration levels for non-impacted groundwater in the vicinity of the CCR Landfill. Chloride comparisons indicate the concentration in MW-512 is well within or below expected concentration levels for non-impacted groundwater in the vicinity of the CCR Landfill. The calcium comparison indicates the calcium concentration in MW-512 is a little above the expected concentration level for non-impacted groundwater wells such as PZ-03 but believed to still be in the range for natural variability within and between wells, especially given the location of MW-512 relative to the limestone gravel road and construction activities, including building additional limestone gravel roads (containing significant amounts of calcium) around MW-512. Refer to dated photographs below.

May 2016

June 2017

April 2018

Figure 1 in **Appendix A** shows these upgradient non-CCR monitoring system wells and their relationships to groundwater flow near and beneath the CCR Landfill. Because the non-CCR monitoring system wells are located in a nearby area that has not been impacted by the landfill, and exhibit variability that includes calcium, chloride, and sulfate concentrations similar to those seen at MW-504 and MW-512, the observed concentrations are within the range of expected natural spatial variation within and between wells. This demonstrates that a source other than the CCR Landfill caused the SSIs over background level, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for calcium, chloride, and sulfate 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 generated for MW-504, MW-512, and landfill leachate is provided in **Appendix C** and indicates the groundwater from these two wells does not exhibit the same geochemical characteristics as the leachate. The groundwater and the leachate plot in different hydrochemical facies indicating there is no mixing of the two types of water (groundwater and leachate). This demonstrates that a source other than the CCR Landfill caused the SSIs over background levels for sulfate, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.4 TIME SERIES PLOTS

Time series plots provide a graphical method to view changes in data at a particular well (monitoring point) or wells over time. Time series plots display the variability in concentration levels over time and can be used to indicate possible outliers or data errors (i.e. “spikes”). More than one well can be compared on the same plot to look for differences between wells. Non-detect data is plotted as censored data at one-half of the laboratory reporting limit. Time series plots can also be used to examine the data for trends.

Times series plots for calcium, chloride, and sulfate in monitoring wells MW-504 and MW-512 were compared to time series plots for calcium, chloride, and sulfate in several upgradient and side-gradient non-CCR monitoring system wells installed for future state-permitted landfill expansion purposes.

Sulfate concentrations for MW-504 and MW-512 were plotted against sulfate concentrations in several upgradient and side-gradient non-CCR monitoring system wells. The sulfate concentrations in both upgradient well MW-504 and downgradient well MW-512 exhibit similar trends, are well within expected concentration levels for non-impacted groundwater in the vicinity of the CCR Landfill and are even below side-gradient non-CCR monitoring system well MW-516.

Chloride comparisons indicate the concentration in MW-512 tracks similarly to that of side-gradient non-CCR monitoring well MW-516 and that there is unexplained or natural fluctuations in concentration levels for many of the wells in the vicinity of the CCR Landfill beginning in 2017. The calcium comparison indicates the calcium concentration in MW-512 is a little above the expected concentration level for non-impacted groundwater wells such as PZ-03 but believed to still be in the range for natural variability within and between wells, especially given the location of MW-512 relative to the limestone gravel road and construction activities including the construction of additional limestone gravel roads around MW-512 as discussed above. Time series plots for calcium, chloride, and sulfate are provided in Appendix D.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the CCR Landfill 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 ASD, the owner or operator of the CCR Landfill may continue with the detection monitoring program under § 257.94.

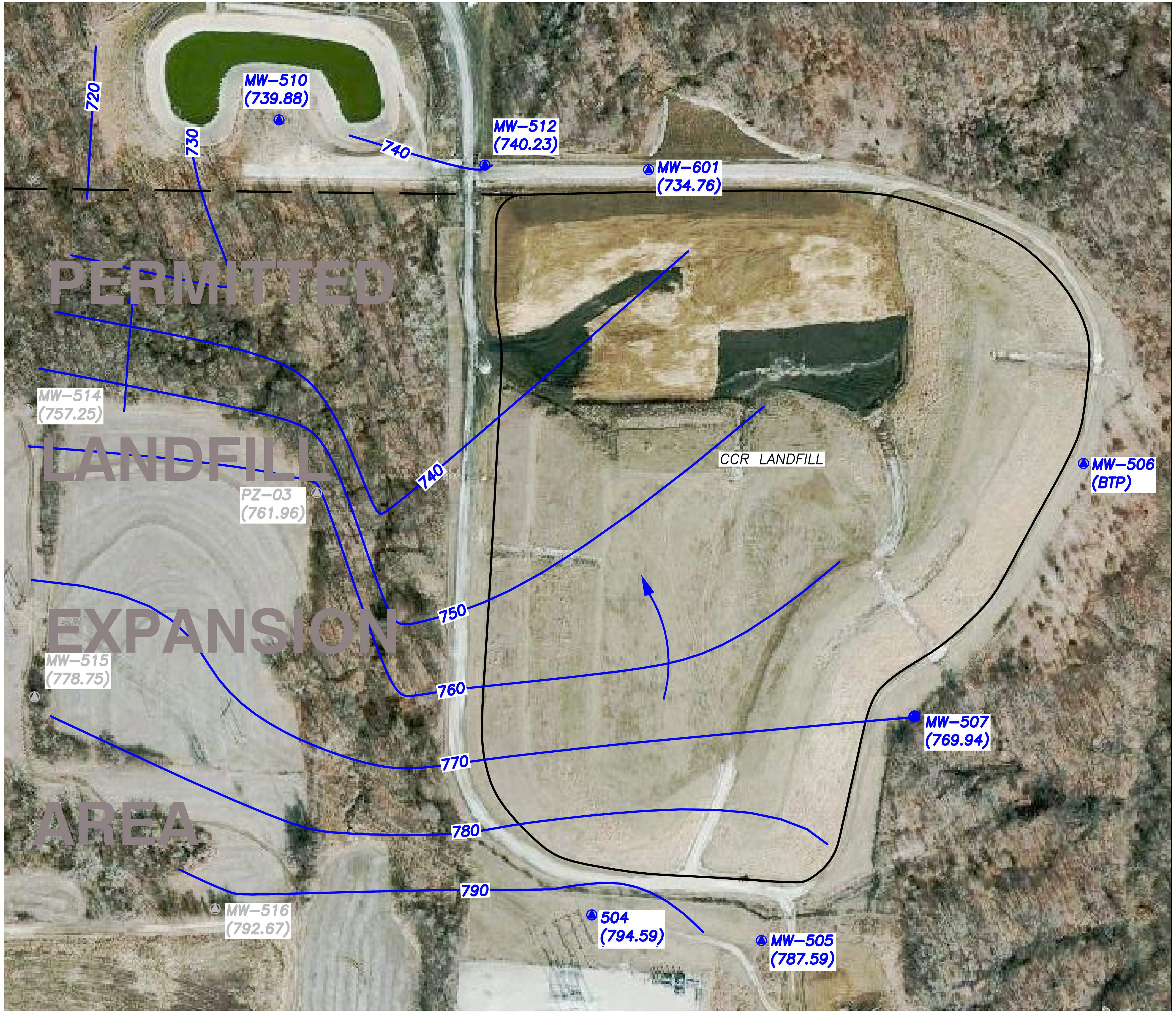
5 GENERAL COMMENTS

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 opinions 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

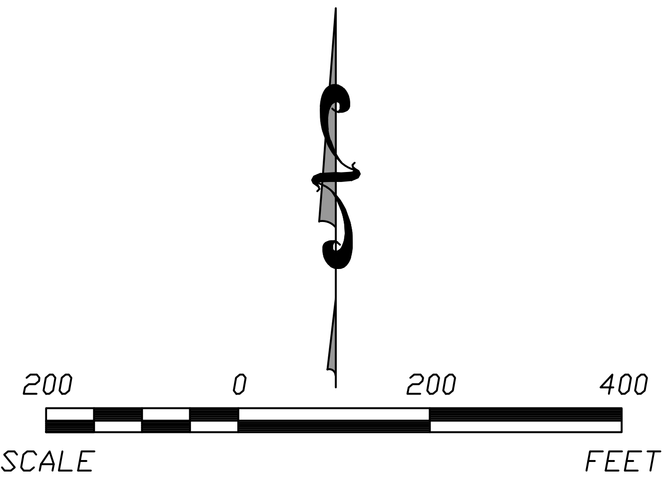


LEGEND:

760	GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
● 601 (734.55)	GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
←	GROUNDWATER FLOW DIRECTION
BTP	BELOW TOP OF PUMP
───	PERMITTED LANDFILL EXPANSION AREA
— —	PERMITTED LANDFILL EXPANSION AREA
■ 514 (756.11)	NON–CCR GROUNDWATER MONITORING WELLS

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 WELL LOCATIONS SHOWN ARE APPROXIMATE.



REV.	DATE
–	–

SHEET TITLE

POTENTIOMETRIC SURFACE MAP (NOV. 2018)
CCR LANDFILL

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. 27213169.18
DWN. BY: TGW
Q/A RVW BY: JRR
DSN. BY: TGW
CHK. BY: JRR
PROJ. MGR JRF

CADD FILE: 18–NOV_GW CCR ALTERNATIVE SOURCE DEMONSTRATION.DWG

DATE:

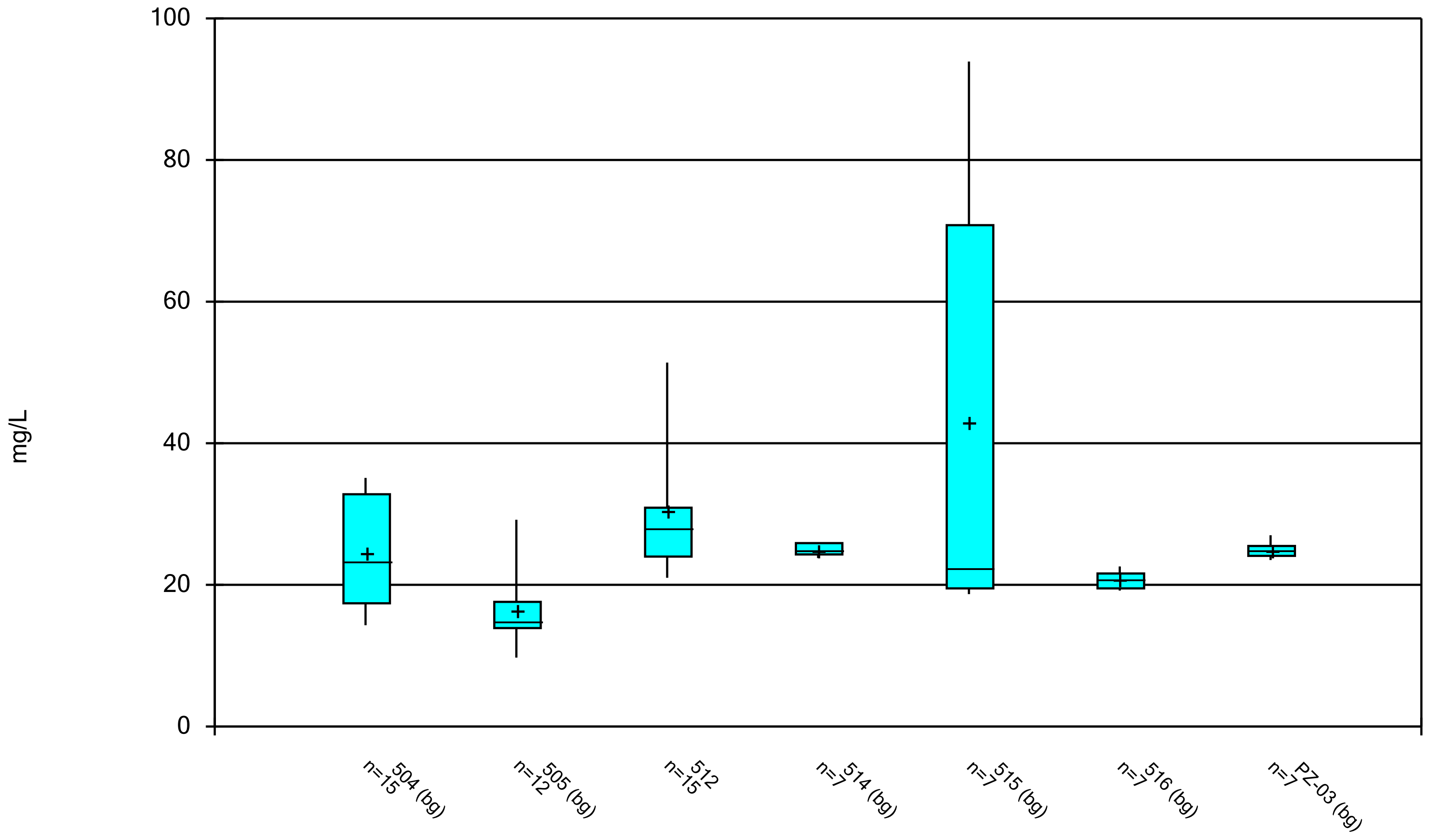
FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\Sibley\2018\GW\18-NOV_GW CCR Alternative Source Demonstration.dwg Apr 15, 2019 - 1:01pm Layout Name: Fig 2 By: 4470daw

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 4/12/2019 11:29 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Sulfate (mg/L)   Analysis Run 4/12/2019 11:30 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			23	25.9	22.1	22.6	25.5
12/16/2015	14.3	29.2					
2/18/2016	14.7	16	21				
5/25/2016	18.9	21.9	23.1				
5/26/2016				24.9			23.5
6/2/2016					22.3	21.6	
8/23/2016	15.4	9.73	24.4				
11/11/2016	17.4	15.9	24	25.2	19.5	21.1	24.7
2/8/2017	21	14.9	27.8				
5/3/2017			27.3				
5/4/2017	21.8	19.2		24.6	18.7	19.5	24.1
8/1/2017	23.3	14.4	28.1				
10/3/2017	24.3	13.4	28.2	23.8	54	19.2	24.2
5/16/2018				25.9	93.9	20.9	27
5/17/2018	32.8	14	29.6				
6/27/2018	31.8		30.3				
8/8/2018	32.3		30.9				
11/14/2018				24.3	70.8	19.6	25.4
11/15/2018	33.9	14.6	51.4				
1/11/2019	33.2	13.8	43.3				
3/12/2019	35.1		44.2				
Median	23.3	14.75	28.1	24.9	22.3	20.9	24.7
LowerQ.	17.4	13.9	24	24.3	19.5	19.5	24.1
UpperQ.	32.8	17.6	30.9	25.9	70.8	21.6	25.5
Min	14.3	9.73	21	23.8	18.7	19.2	23.5
Max	35.1	29.2	51.4	25.9	93.9	22.6	27
Mean	24.68	16.42	30.44	24.94	43.04	20.64	24.91

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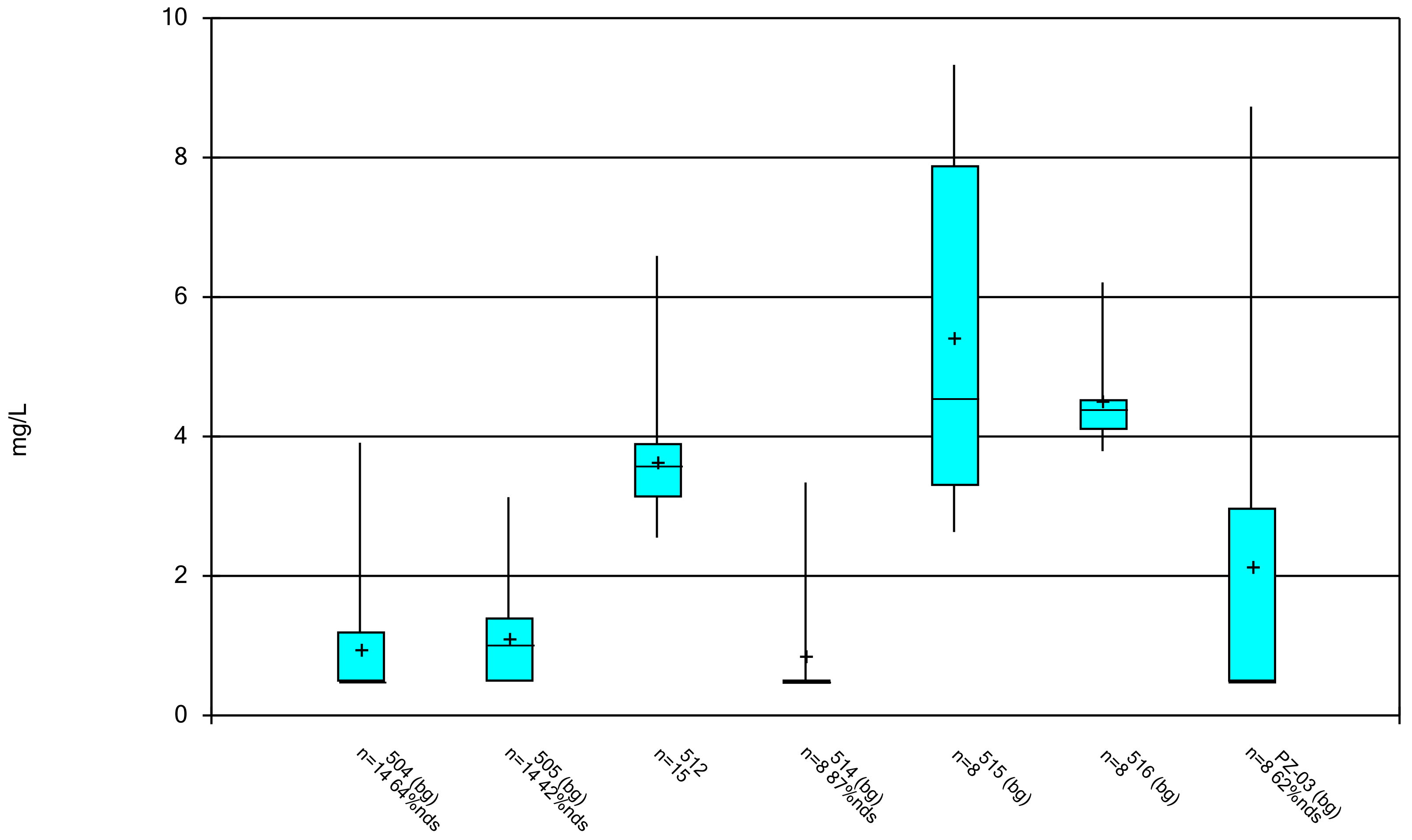
Box & Whiskers Plot



Constituent: Chloride Analysis Run 4/12/2019 11:29 AM View: LF III

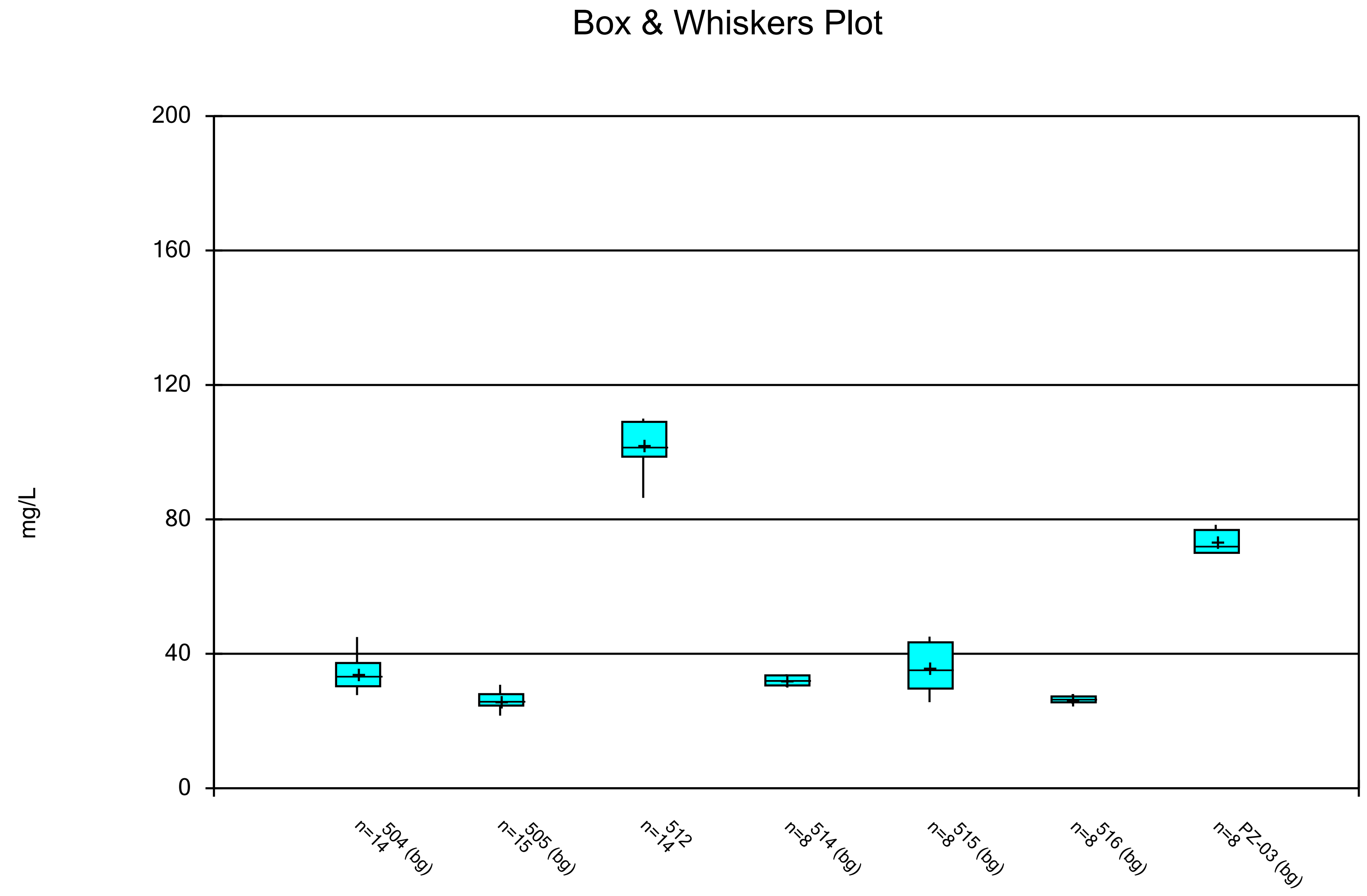
Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Chloride (mg/L)   Analysis Run 4/12/2019 11:30 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			2.72	<1	2.63	4.53	<1
12/16/2015	<1	<1					
2/18/2016	<1	1.05	2.78				
5/25/2016	<1	<1	2.55				
5/26/2016				<1			<1
6/2/2016					3.46	4.27	
8/23/2016	<1	1.19	3.23				
11/11/2016	<1	<1	3.17	<1	3.69	4.31	<1
2/8/2017	<1	<1	3.14				
5/3/2017			3.7				
5/4/2017	1.27	<1		<1	3.15	4.51	<1
8/1/2017	<1	1.18	3.53				
10/3/2017	3.91	3.13	6.59	3.34	8.75	6.21	8.73
11/16/2017	1.52	1.59	3.97	<1	9.33	4.45	1.3
12/28/2017	1	2.12	3.58				
5/16/2018				<1	7	3.95	4.63
5/17/2018	1.11	1.09	3.64				
11/14/2018				<1	5.43	3.79	<1
11/15/2018	<1	<1	3.89				
1/11/2019	<1	1	3.85				
3/12/2019			4.38				
Median	0.5	1.025	3.58	0.5	4.56	4.38	0.5
LowerQ.	0.5	0.5	3.14	0.5	3.305	4.11	0.5
UpperQ.	1.19	1.39	3.89	0.5	7.875	4.52	2.965
Min	0.5	0.5	2.55	0.5	2.63	3.79	0.5
Max	3.91	3.13	6.59	3.34	9.33	6.21	8.73
Mean	0.9507	1.096	3.648	0.855	5.43	4.503	2.145



Constituent: Calcium Analysis Run 4/12/2019 11:29 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Calcium (mg/L)   Analysis Run 4/12/2019 11:30 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

---

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			98.1	33.4	32	27.2	78.4
12/16/2015	31.5	28					
2/18/2016	34.3	25.4	100				
5/25/2016	30.2	24.6	98.9				
5/26/2016				33.9			77.6
6/2/2016					29.9	27.4	
8/23/2016	32.2	25.7	103				
11/11/2016	36.9	21.6	100	32.8	29.4	26.9	69.8
2/8/2017	29.6	23.5	86.4				
5/3/2017			98.4				
5/4/2017	27.7	23.2		30.2	25.6	25.1	70.3
8/1/2017	30.5	25.1	102				
10/3/2017	33.2	26.6	110	33.8	38.4	28	73.7
11/16/2017	37.6 (i)	26	101	30.5	44.9	25.1	71
5/16/2018				31.1	45.1	26.2	69.8
5/17/2018	33.3	28.2	104				
6/27/2018		25.8					
11/14/2018				30.7	41.9	26	76.1
11/15/2018	45	30.8	110				
1/11/2019	39.3	29.5	110				
3/12/2019	35.4	24.9	108				
Median	33.25	25.7	101.5	31.95	35.2	26.55	72.35
LowerQ.	30.35	24.6	98.65	30.6	29.65	25.55	70.05
UpperQ.	37.25	28	109	33.6	43.4	27.3	76.85
Min	27.7	21.6	86.4	30.2	25.6	25.1	69.8
Max	45	30.8	110	33.9	45.1	28	78.4
Mean	34.05	25.93	102.1	32.05	35.9	26.49	73.34

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 4/12/2019, 11:30 AM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Calcium (mg/L)	504 (bg)	14	34.05	4.547	1.215	33.25	27.7	45	0
Calcium (mg/L)	505 (bg)	15	25.93	2.425	0.6261	25.7	21.6	30.8	0
Calcium (mg/L)	512	14	102.1	6.342	1.695	101.5	86.4	110	0
Calcium (mg/L)	514 (bg)	8	32.05	1.578	0.5577	31.95	30.2	33.9	0
Calcium (mg/L)	515 (bg)	8	35.9	7.629	2.697	35.2	25.6	45.1	0
Calcium (mg/L)	516 (bg)	8	26.49	1.067	0.3772	26.55	25.1	28	0
Calcium (mg/L)	PZ-03 (bg)	8	73.34	3.611	1.277	72.35	69.8	78.4	0
Chloride (mg/L)	504 (bg)	14	0.9507	0.9215	0.2463	0.5	0.5	3.91	64.29
Chloride (mg/L)	505 (bg)	14	1.096	0.764	0.2042	1.025	0.5	3.13	42.86
Chloride (mg/L)	512	15	3.648	0.9598	0.2478	3.58	2.55	6.59	0
Chloride (mg/L)	514 (bg)	8	0.855	1.004	0.355	0.5	0.5	3.34	87.5
Chloride (mg/L)	515 (bg)	8	5.43	2.636	0.932	4.56	2.63	9.33	0
Chloride (mg/L)	516 (bg)	8	4.503	0.739	0.2613	4.38	3.79	6.21	0
Chloride (mg/L)	PZ-03 (bg)	8	2.145	3.019	1.067	0.5	0.5	8.73	62.5
Sulfate (mg/L)	504 (bg)	15	24.68	7.767	2.005	23.3	14.3	35.1	0
Sulfate (mg/L)	505 (bg)	12	16.42	5.026	1.451	14.75	9.73	29.2	0
Sulfate (mg/L)	512	15	30.44	8.858	2.287	28.1	21	51.4	0
Sulfate (mg/L)	514 (bg)	7	24.94	0.7892	0.2983	24.9	23.8	25.9	0
Sulfate (mg/L)	515 (bg)	7	43.04	30.26	11.44	22.3	18.7	93.9	0
Sulfate (mg/L)	516 (bg)	7	20.64	1.258	0.4755	20.9	19.2	22.6	0
Sulfate (mg/L)	PZ-03 (bg)	7	24.91	1.165	0.4405	24.7	23.5	27	0

Appendix C

Piper Diagram

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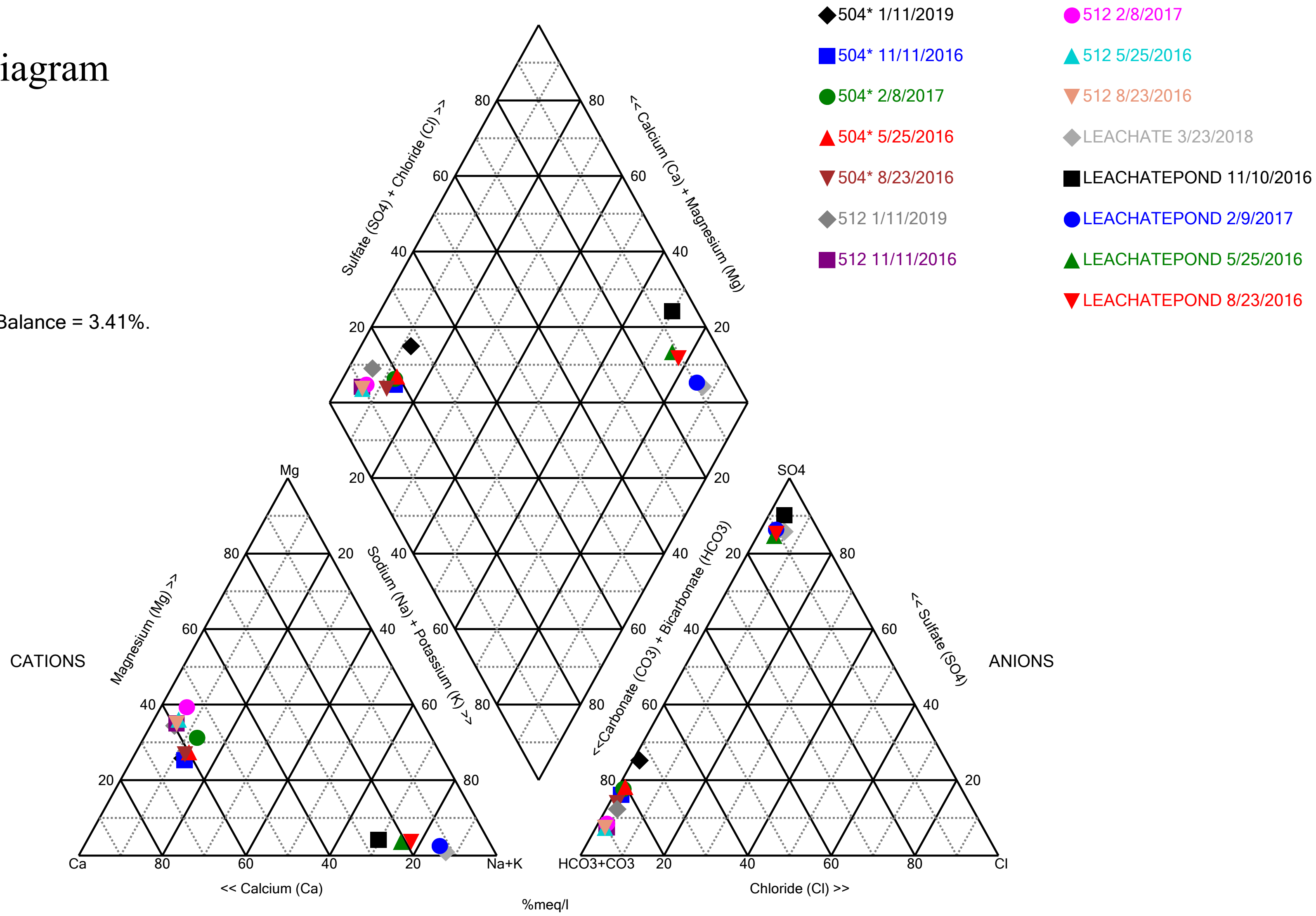
Piper Diagram

Cation-Anion Balance = 3.41%.



Analysis Run 4/2/2019 3:32 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Piper Diagram

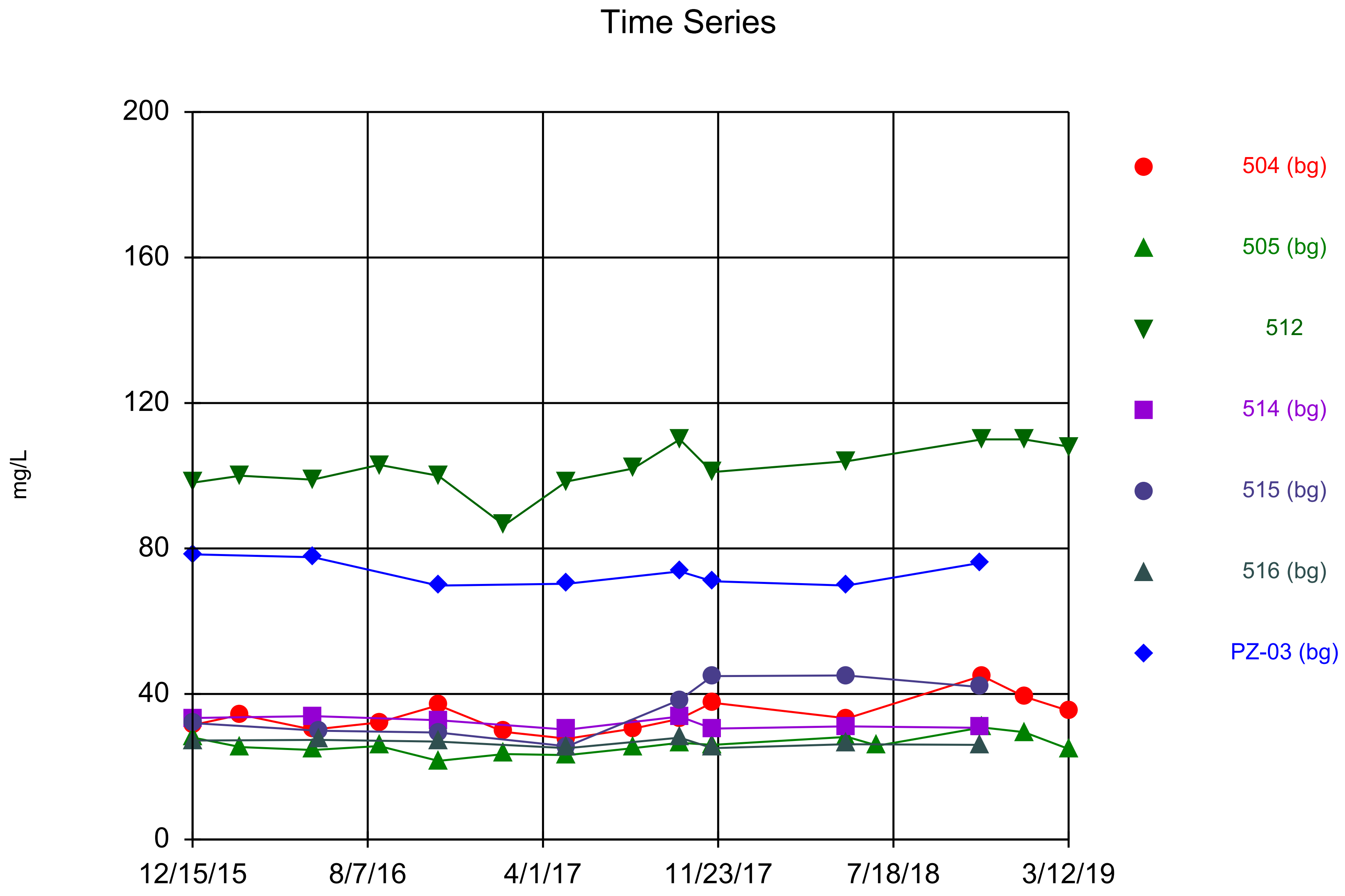
Analysis Run 4/2/2019 3:32 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
504* 5/25/2016	6.54	1.27	30.2	8.36	0.5	18.9	89	10
504* 8/23/2016	6.61	1.15	32.2	8.56	0.5	15.4	99.5	10
504* 11/11/2016	8.17	1.3	36.9	8.97	0.5	17.4	94.7	10
504* 2/8/2017	6.83	1.28	29.6	9.94	0.5	21	105	10
504* 1/11/2019	7.64	1.9	39.3	9.85	0.5	33.2	103	10
512 5/25/2016	10	2.24	98.9	36.8	2.55	23.1	356	10
512 8/23/2016	10.3	2.13	103	36.9	3.23	24.4	384	10
512 11/11/2016	9.96	2.16	100	35.6	3.17	24	352	10
512 2/8/2017	10	2.35	86.4	37.9	3.14	27.8	358	10
512 1/11/2019	10.6	2.25	110	37.8	3.85	43.3	366	10
LEACHATEPOND 5/25/2016	499	58.6	129	12.9	44.1	1440	10	119
LEACHATEPOND 8/23/2016	479	56.8	108	12.8	42.8	1320	10	104
LEACHATEPOND 11/10/2016	651	75.3	224	22.5	50.4	1820	30.5	68.3
LEACHATEPOND 2/9/2017	678	66.2	89.4	10.8	64.5	2200	38.9	146
LEACHATE 3/23/2018	741	70.3	88.5	4.66	79.1	1690	10	108

Appendix D

Time Series Plots



Constituent: Calcium Analysis Run 4/12/2019 11:24 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Time Series

Constituent: Calcium (mg/L)   Analysis Run 4/12/2019 11:25 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			98.1	33.4	32	27.2	78.4
12/16/2015	31.5	28					
2/18/2016	34.3	25.4	100				
5/25/2016	30.2	24.6	98.9				
5/26/2016				33.9			77.6
6/2/2016					29.9	27.4	
8/23/2016	32.2	25.7	103				
11/11/2016	36.9	21.6	100	32.8	29.4	26.9	69.8
2/8/2017	29.6	23.5	86.4				
5/3/2017			98.4				
5/4/2017	27.7	23.2		30.2	25.6	25.1	70.3
8/1/2017	30.5	25.1	102				
10/3/2017	33.2	26.6	110	33.8	38.4	28	73.7
11/16/2017	37.6 (i)	26	101	30.5	44.9	25.1	71
5/16/2018				31.1	45.1	26.2	69.8
5/17/2018	33.3	28.2	104				
6/27/2018		25.8					
11/14/2018				30.7	41.9	26	76.1
11/15/2018	45	30.8	110				
1/11/2019	39.3	29.5	110				
3/12/2019	35.4	24.9	108				

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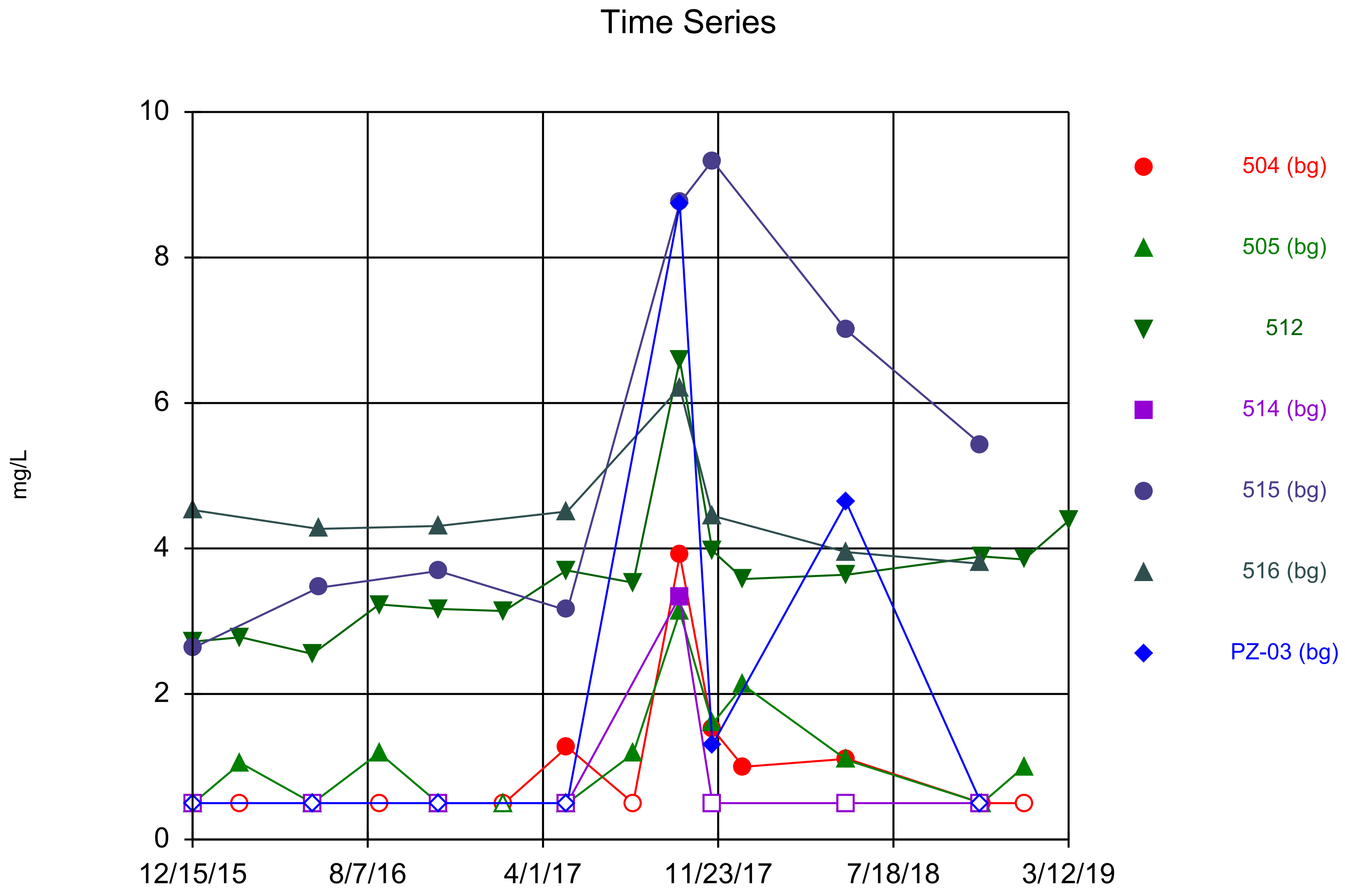
Hollow symbols indicate censored values.



Constituent: Chloride Analysis Run 4/12/2019 11:24 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

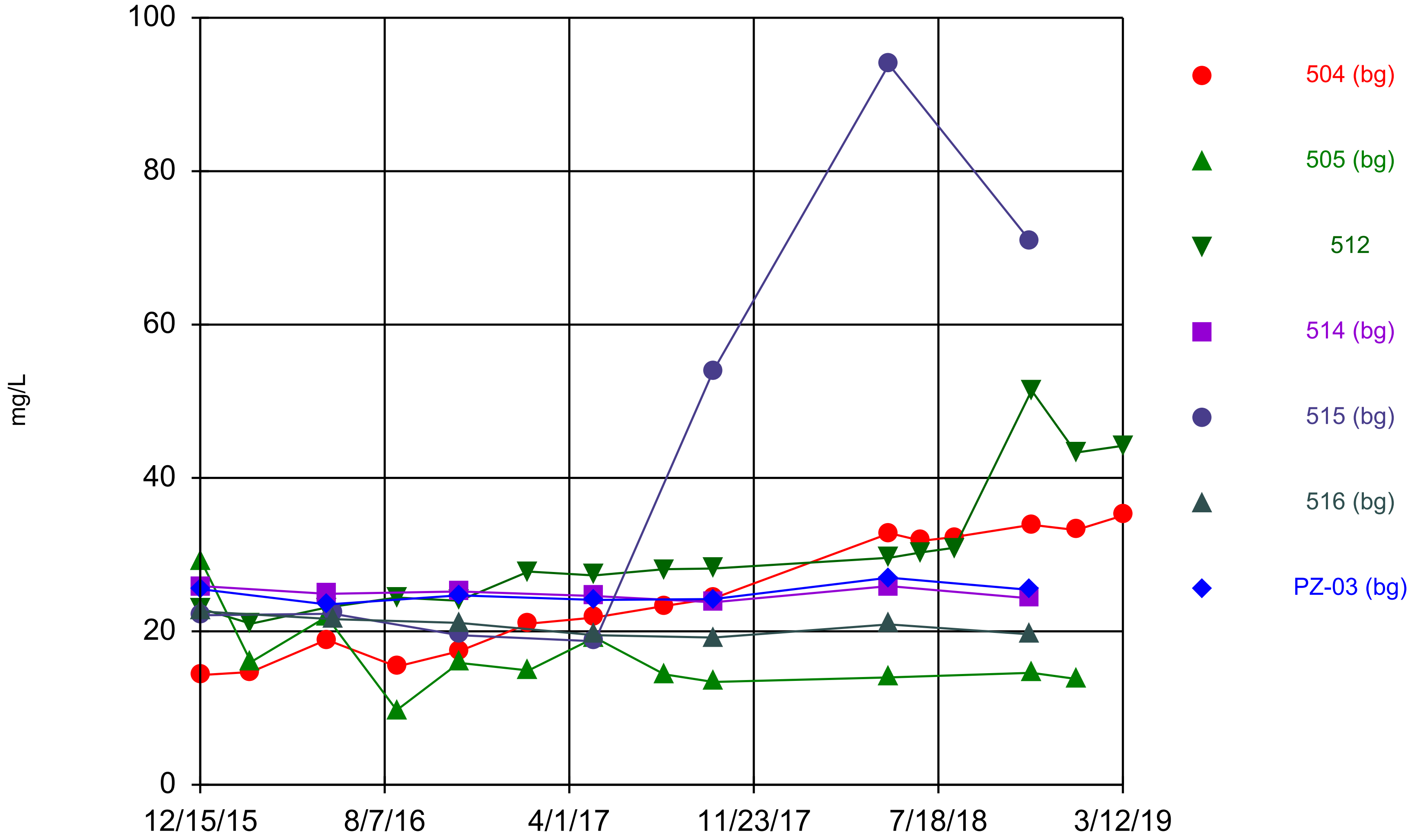
Time Series

Constituent: Chloride (mg/L)   Analysis Run 4/12/2019 11:25 AM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

---

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			2.72	<1	2.63	4.53	<1
12/16/2015	<1	<1					
2/18/2016	<1	1.05	2.78				
5/25/2016	<1	<1	2.55				
5/26/2016				<1			<1
6/2/2016					3.46	4.27	
8/23/2016	<1	1.19	3.23				
11/11/2016	<1	<1	3.17	<1	3.69	4.31	<1
2/8/2017	<1	<1	3.14				
5/3/2017			3.7				
5/4/2017	1.27	<1		<1	3.15	4.51	<1
8/1/2017	<1	1.18	3.53				
10/3/2017	3.91	3.13	6.59	3.34	8.75	6.21	8.73
11/16/2017	1.52	1.59	3.97	<1	9.33	4.45	1.3
12/28/2017	1	2.12	3.58				
5/16/2018				<1	7	3.95	4.63
5/17/2018	1.11	1.09	3.64				
11/14/2018				<1	5.43	3.79	<1
11/15/2018	<1	<1	3.89				
1/11/2019	<1	1	3.85				
3/12/2019			4.38				

Time Series



Constituent: Sulfate Analysis Run 4/12/2019 11:24 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Time Series

Constituent: Sulfate (mg/L)   Analysis Run 4/12/2019 11:25 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			23	25.9	22.1	22.6	25.5
12/16/2015	14.3	29.2					
2/18/2016	14.7	16	21				
5/25/2016	18.9	21.9	23.1				
5/26/2016				24.9			23.5
6/2/2016					22.3	21.6	
8/23/2016	15.4	9.73	24.4				
11/11/2016	17.4	15.9	24	25.2	19.5	21.1	24.7
2/8/2017	21	14.9	27.8				
5/3/2017			27.3				
5/4/2017	21.8	19.2		24.6	18.7	19.5	24.1
8/1/2017	23.3	14.4	28.1				
10/3/2017	24.3	13.4	28.2	23.8	54	19.2	24.2
5/16/2018				25.9	93.9	20.9	27
5/17/2018	32.8	14	29.6				
6/27/2018	31.8		30.3				
8/8/2018	32.3		30.9				
11/14/2018				24.3	70.8	19.6	25.4
11/15/2018	33.9	14.6	51.4				
1/11/2019	33.2	13.8	43.3				
3/12/2019	35.1		44.2				

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

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

CCR LANDFILL
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. 27213169.18

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 CCR Landfill 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
12-3-19
RG0092

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 CCR Landfill 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 LEE DOERR
NUMBER PE-28982

12-3-19

Douglas L. Doerr, P.E.

SCS Engineers

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2 Statistical Results **1**
3 Alternative Source Demonstration **2**
  3.1 Upgradient Well Location 2
  3.2 Box and Whiskers Plots 2
  3.3 Piper Diagram Plots 3
  3.4 Time Series Plots 3
4 Conclusion **4**
5 General Comments **4**

Appendices

Appendix A **Figure 1**
Appendix B **Box and Whiskers Plots**
Appendix C **Piper Diagram**
Appendix D **Time Series Plots**

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 CCR Landfill 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 two Appendix III constituents above their respective prediction limit in monitoring wells MW-504, MW-506, and MW-512.

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
Chloride				
506	6.573	7.05	7.33	7.17
512	3.826	4.17	4.35	4.91
Sulfate				
504	24.58	36.3	36.3	35.6
512	29.55	40.1	42.1	41.0

*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 four SSIs above the background prediction limits. These include chloride in downgradient monitoring wells MW-506 and MW-512 and sulfate in upgradient monitoring well MW-504 and downgradient monitoring well MW-512.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration (ASD) 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 CCR Landfill 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 CCR Landfill. 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 CCR Landfill at the time of sampling. As seen on the map, monitoring well MW-504 is located upgradient from the CCR Landfill indicating the SSI for sulfate is not caused by a release from the CCR Landfill. This demonstrates that a source other than the CCR Landfill 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.

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.

Box and whiskers plots for chloride in monitoring wells MW-506 and MW-512 were compared to box and whisker plots for chloride in several upgradient and side-gradient non-CCR monitoring system wells installed for future state-permitted landfill expansion purposes. Chloride comparisons indicate the concentrations in MW-506 and MW-512 are well within or below expected concentration levels for non-impacted groundwater in the vicinity of the CCR Landfill.

Box and whiskers plots for sulfate in monitoring wells MW-504 and MW-512 were compared to box and whisker plots for sulfate in several upgradient and side-gradient non-CCR monitoring system wells installed for future state-permitted landfill expansion purposes. Sulfate comparisons indicate the concentrations in MW-504 and MW-512 are well within or below expected concentration levels for non-impacted groundwater in the vicinity of the CCR Landfill.

Figure 1 in **Appendix A** shows these upgradient non-CCR monitoring system wells and their relationships to groundwater flow near and beneath the CCR Landfill. Because the non-CCR monitoring system wells are located in a nearby area that has not been impacted by the landfill, and exhibit variability that includes chloride and sulfate concentrations similar to those seen at MW-504, MW-506 and MW-512, the observed concentrations are within the range of expected natural spatial variation within and between wells. This demonstrates that a source other than the CCR Landfill caused the SSIs over background level, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for chloride and sulfate 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 generated for MW-504, MW-506, MW-512, and landfill leachate is provided in **Appendix C** and indicates the groundwater from these three wells does not exhibit the same geochemical characteristics as the leachate. The groundwater and the leachate plot in different hydrochemical facies indicating there is no mixing of the two types of water (groundwater and leachate). This demonstrates that a source other than the CCR Landfill caused the SSIs over background levels for sulfate, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.4 TIME SERIES PLOTS

Time series plots provide a graphical method to view changes in data at a particular well (monitoring point) or wells over time. Time series plots display the variability in concentration levels over time and can be used to indicate possible outliers or data errors (i.e. “spikes”). More than one well can be compared on the same plot to look for differences between wells. Non-detect data is plotted as censored data at one-half of the laboratory reporting limit. Time series plots can also be used to examine the data for trends.

Times series plots for chloride in monitoring wells MW-506 and MW-512 and sulfate in monitoring wells MW-504 and MW-512 were compared to time series plots for chloride and sulfate in several upgradient and side-gradient non-CCR monitoring system wells installed for future state-permitted landfill expansion purposes.

Sulfate concentrations for MW-504 and MW-512 were plotted against sulfate concentrations in several upgradient and side-gradient non-CCR monitoring system wells. The sulfate concentrations in both upgradient well MW-504 and downgradient well MW-512 exhibit similar trends, are well within expected concentration levels for non-impacted groundwater in the vicinity of the CCR Landfill, and are even below side-gradient non-CCR monitoring system well MW-516.

Chloride concentrations for MW-506 and MW-512 were plotted against chloride concentrations in several upgradient and side-gradient non-CCR monitoring system wells. Chloride comparisons indicate the concentration in MW-506 and MW-512 are within the range of natural variation in the area and track similarly to that of side-gradient non-CCR monitoring well MW-516. There are natural fluctuations in concentration levels for many of the wells in the vicinity of the CCR Landfill beginning in 2017.

These time series plots demonstrate that a source other than the CCR Landfill caused the SSIs over background levels for chloride and sulfate or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots for calcium, chloride, and sulfate are provided in **Appendix D**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the CCR Landfill 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 ASD, the owner or operator of the CCR Landfill may continue with the detection monitoring program under § 257.94.

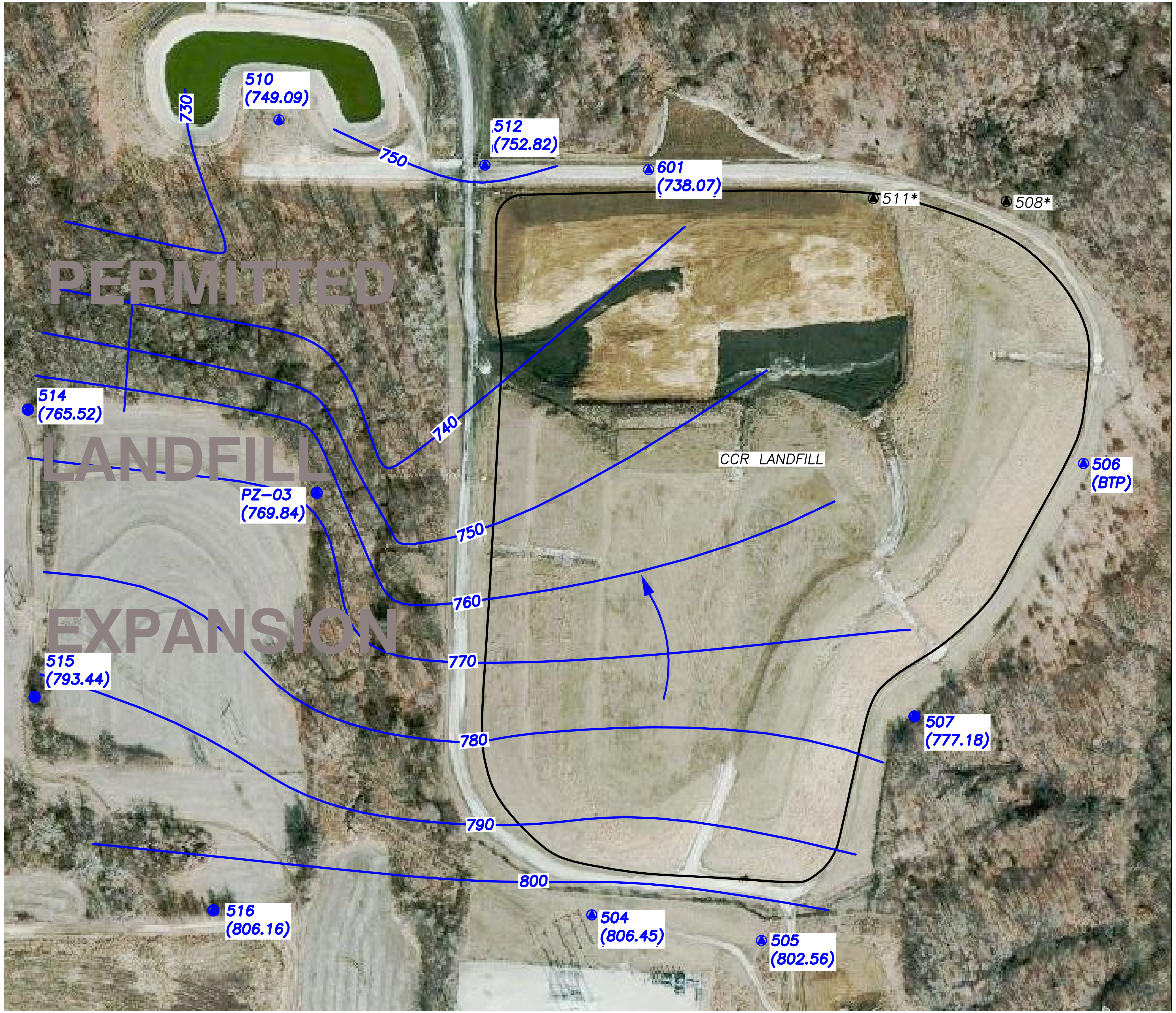
5 GENERAL COMMENTS

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 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 opinions 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

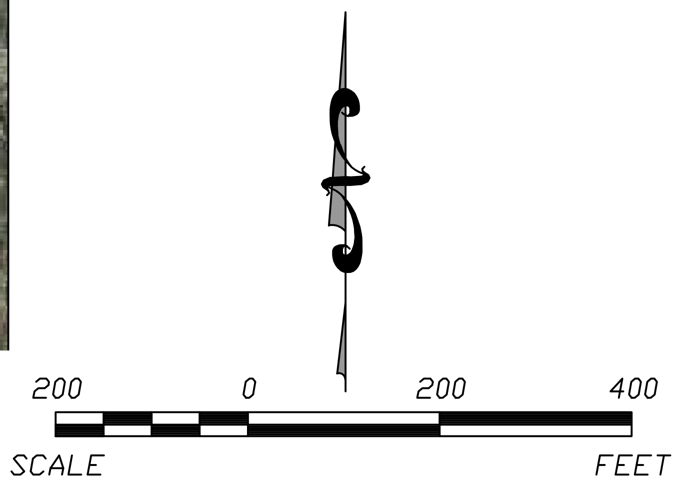


LEGEND:

760	GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
● 601 (738.07)	GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
―	CCR LANDFILL UNIT BOUNDARY
←	GROUNDWATER FLOW DIRECTION
*	WELL(S) ABANDONED APRIL 2017 DUE TO INSUFFICIENT WATER
BTP	BELOW TOP OF PUMP

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 WELL LOCATIONS SHOWN ARE APPROXIMATE.



REV. DATE
-
-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (MAY 2019)
CCR LANDFILL

PROJECT TITLE
ALTERNATIVE SOURCE
DEMONSTRATION

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.	27213167.19	DSN. BY:	TGW
DWN. BY:	DAW	CHK. BY:	JRR
Q/A RVW BY:	JRR	PROJ. MGR	JRF

CADD FILE:
ALTERNATIVE SOURCE DEMONSTRATION.DWG

DATE:
11/01/19

FIGURE NO.
1

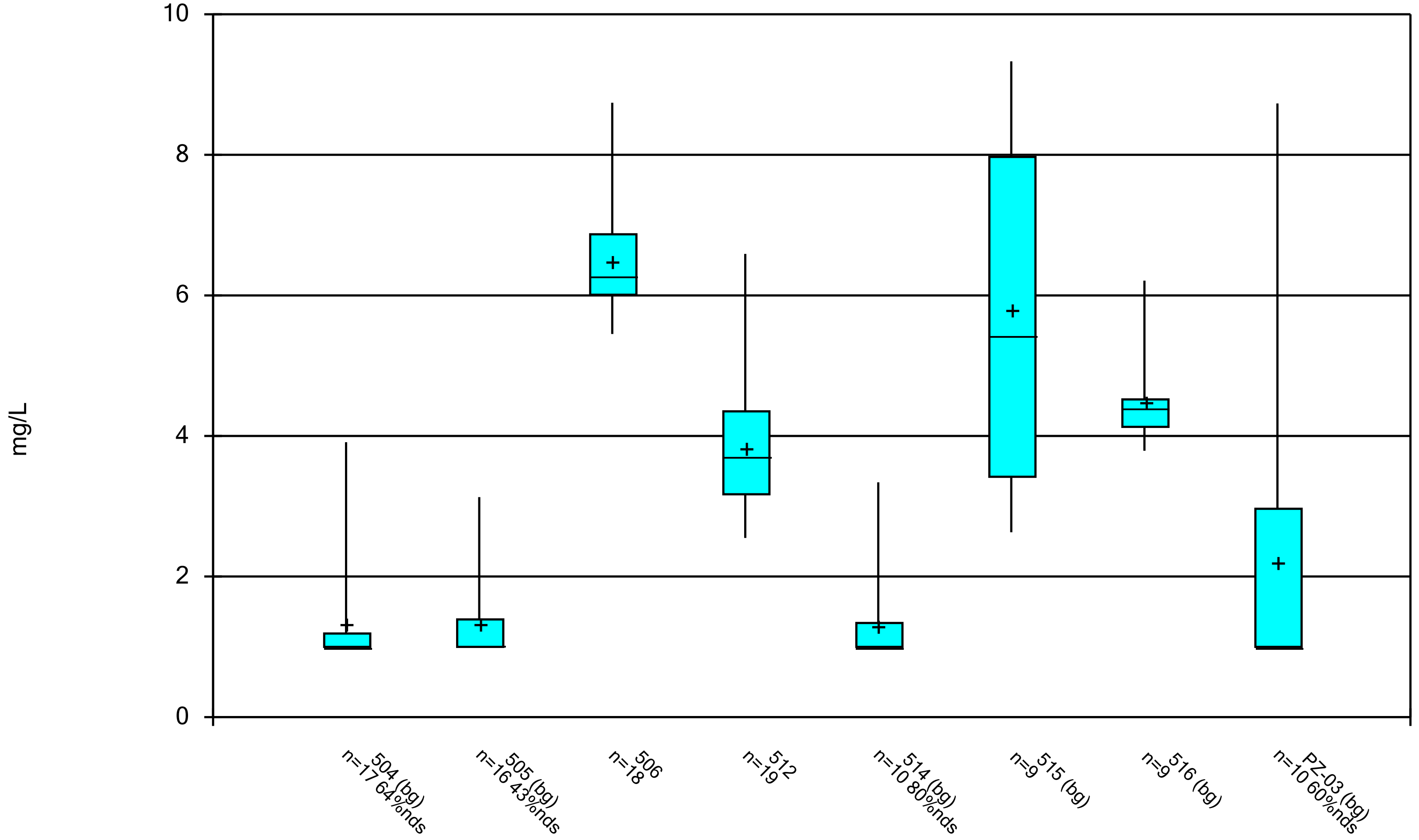
N:\KCPL\Projects\Groundwater\DWG\Sibley\2019\GW\Alternative Source Demonstration.dwg Nov 01, 2019 - 2:32pm Layout Name: Fig 2 By: 4470daw

Appendix B

Box and Whiskers Plots

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Box & Whiskers Plot



Constituent: Chloride   Analysis Run 11/1/2019 10:20 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

Box & Whiskers Plot

Constituent: Chloride (mg/L) Analysis Run 11/1/2019 10:21 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	504 (bg)	505 (bg)	506	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			6.45	2.72	<1	2.63	4.53	<1
12/16/2015	<1	<1						
2/18/2016	<1	1.05	6.15	2.78				
5/25/2016	<1	<1	5.76	2.55				
5/26/2016					<1			<1
8/23/2016	<1	1.19	6.16	3.23				
11/11/2016	<1	<1	6.13	3.17	<1	3.69	4.31	<1
2/8/2017	<1	<1	5.89	3.14				
5/3/2017				3.7				
5/4/2017	1.27	<1	6.15		<1	3.15	4.51	<1
8/1/2017	<1	1.18		3.53				
8/4/2017			5.45					
10/3/2017	3.91	3.13	8.74	6.59	3.34	8.75	6.21	8.73
10/5/2017	2.52	2.06	6.47	4.68	1.68	7.19	4.39	1.29
11/16/2017	1.52	1.59	6.15	3.97	<1	9.33	4.45	1.3
12/28/2017	1	2.12		3.58				
5/16/2018					<1	7	3.95	4.63
5/17/2018	1.11	1.09	6.69	3.64				
6/27/2018			5.8					
11/14/2018					<1	5.43	3.79	<1
11/15/2018	<1	<1	6.69	3.89				
1/11/2019	<1	1	6.39	3.85				
3/12/2019				4.38				
5/22/2019	<1	<1	7.05	4.17	<1	5.05	4.33	<1
7/16/2019	<1 (i)		7.33	4.35				
8/21/2019			7.17	4.91				
Median	1	1.025	6.275	3.7	1	5.43	4.39	1
LowerQ.	1	1	6.01	3.17	1	3.42	4.13	1
UpperQ.	1.19	1.39	6.87	4.35	1.34	7.97	4.52	2.965
Min	1	1	5.45	2.55	1	2.63	3.79	1
Max	3.91	3.13	8.74	6.59	3.34	9.33	6.21	8.73
Mean	1.314	1.338	6.479	3.833	1.302	5.802	4.497	2.195

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 11/1/2019, 10:21 AM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Chloride (mg/L)	504 (bg)	17	1.314	0.769	0.1865	1	1	3.91	64.71
Chloride (mg/L)	505 (bg)	16	1.338	0.6062	0.1516	1.025	1	3.13	43.75
Chloride (mg/L)	506	18	6.479	0.7542	0.1778	6.275	5.45	8.74	0
Chloride (mg/L)	512	19	3.833	0.933	0.214	3.7	2.55	6.59	0
Chloride (mg/L)	514 (bg)	10	1.302	0.7473	0.2363	1	1	3.34	80
Chloride (mg/L)	515 (bg)	9	5.802	2.418	0.8059	5.43	2.63	9.33	0
Chloride (mg/L)	516 (bg)	9	4.497	0.6902	0.2301	4.39	3.79	6.21	0
Chloride (mg/L)	PZ-03 (bg)	10	2.195	2.557	0.8085	1	1	8.73	60

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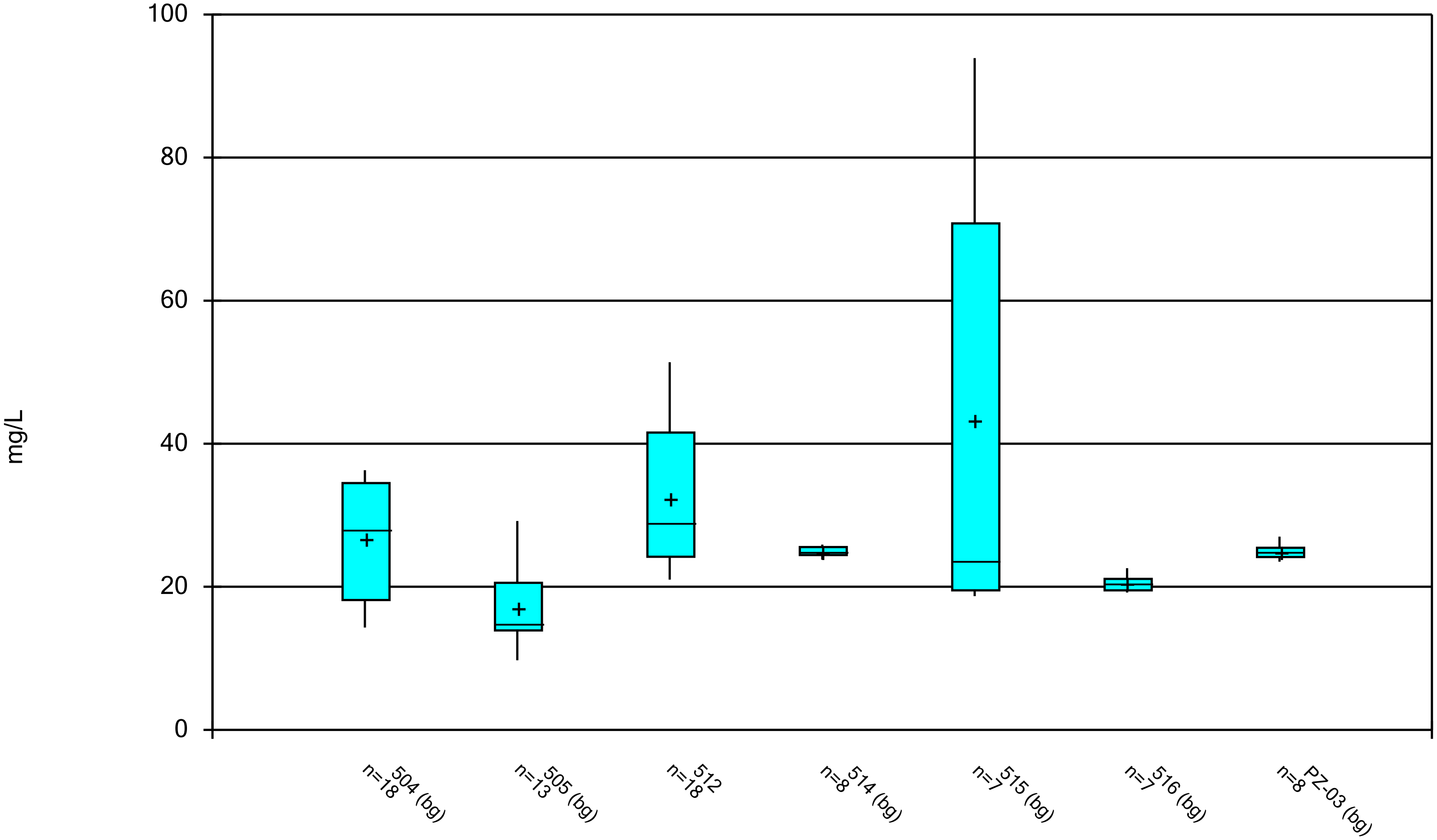
Box & Whiskers Plot



Constituent: Sulfate Analysis Run 11/1/2019 10:22 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Sulfate (mg/L) Analysis Run 11/1/2019 10:23 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			23	25.9	22.1	22.6	25.5
12/16/2015	14.3	29.2					
2/18/2016	14.7	16	21				
5/25/2016	18.9	21.9	23.1				
5/26/2016				24.9			23.5
8/23/2016	15.4	9.73	24.4				
11/11/2016	17.4	15.9	24	25.2	19.5	21.1	24.7
2/8/2017	21	14.9	27.8				
5/3/2017			27.3				
5/4/2017	21.8	19.2		24.6	18.7	19.5	24.1
8/1/2017	23.3	14.4	28.1				
10/3/2017	24.3	13.4	28.2	23.8	54	19.2	24.2
5/16/2018				25.9	93.9	20.9	27
5/17/2018	32.8	14	29.6				
6/27/2018	31.8		30.3				
8/8/2018	32.3		30.9				
11/14/2018				24.3	70.8	19.6	25.4
11/15/2018	33.9	14.6	51.4				
1/11/2019	33.2	13.8	43.3				
3/12/2019	35.1		44.2				
5/22/2019	36.3	22.7	40.1	24.7	23.7	20.4	25.1
7/16/2019	36.3		42.1				
8/21/2019	35.6		41				
Median	28.05	14.9	28.9	24.8	23.7	20.4	24.9
LowerQ.	18.15	13.9	24.2	24.45	19.5	19.5	24.15
UpperQ.	34.5	20.55	41.55	25.55	70.8	21.1	25.45
Min	14.3	9.73	21	23.8	18.7	19.2	23.5
Max	36.3	29.2	51.4	25.9	93.9	22.6	27
Mean	26.58	16.9	32.21	24.91	43.24	20.47	24.94

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 11/1/2019, 10:23 AM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Sulfate (mg/L)	504 (bg)	18	26.58	8.293	1.955	28.05	14.3	36.3	0
Sulfate (mg/L)	505 (bg)	13	16.9	5.117	1.419	14.9	9.73	29.2	0
Sulfate (mg/L)	512	18	32.21	9.019	2.126	28.9	21	51.4	0
Sulfate (mg/L)	514 (bg)	8	24.91	0.7357	0.2601	24.8	23.8	25.9	0
Sulfate (mg/L)	515 (bg)	7	43.24	30.1	11.38	23.7	18.7	93.9	0
Sulfate (mg/L)	516 (bg)	7	20.47	1.186	0.4481	20.4	19.2	22.6	0
Sulfate (mg/L)	PZ-03 (bg)	8	24.94	1.081	0.3822	24.9	23.5	27	0

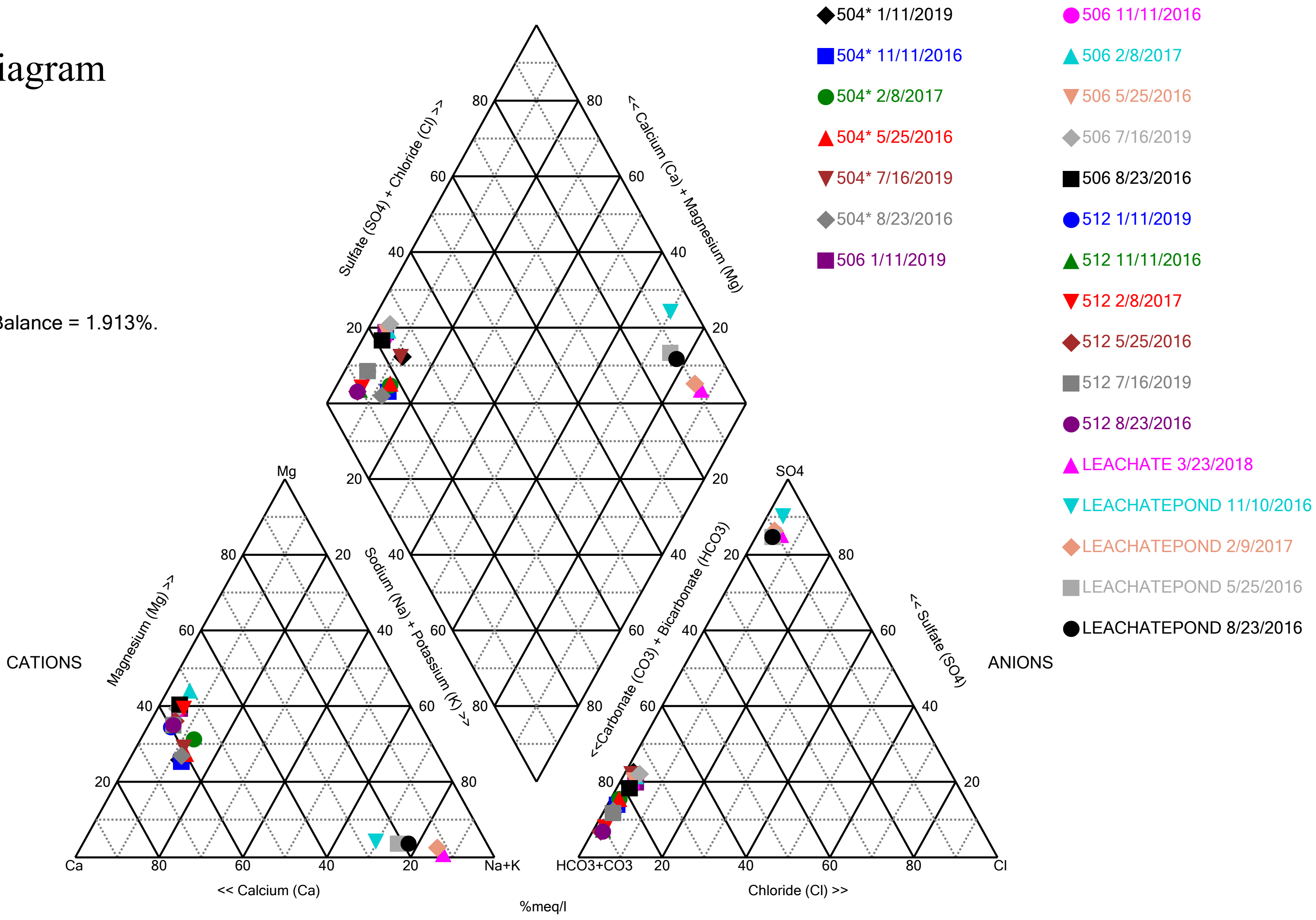
Appendix C

Piper Diagram

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Piper Diagram

Cation-Anion Balance = 1.913%.



Analysis Run 11/1/2019 10:36 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

Piper Diagram

Analysis Run 11/1/2019 10:38 AM   View: LF III

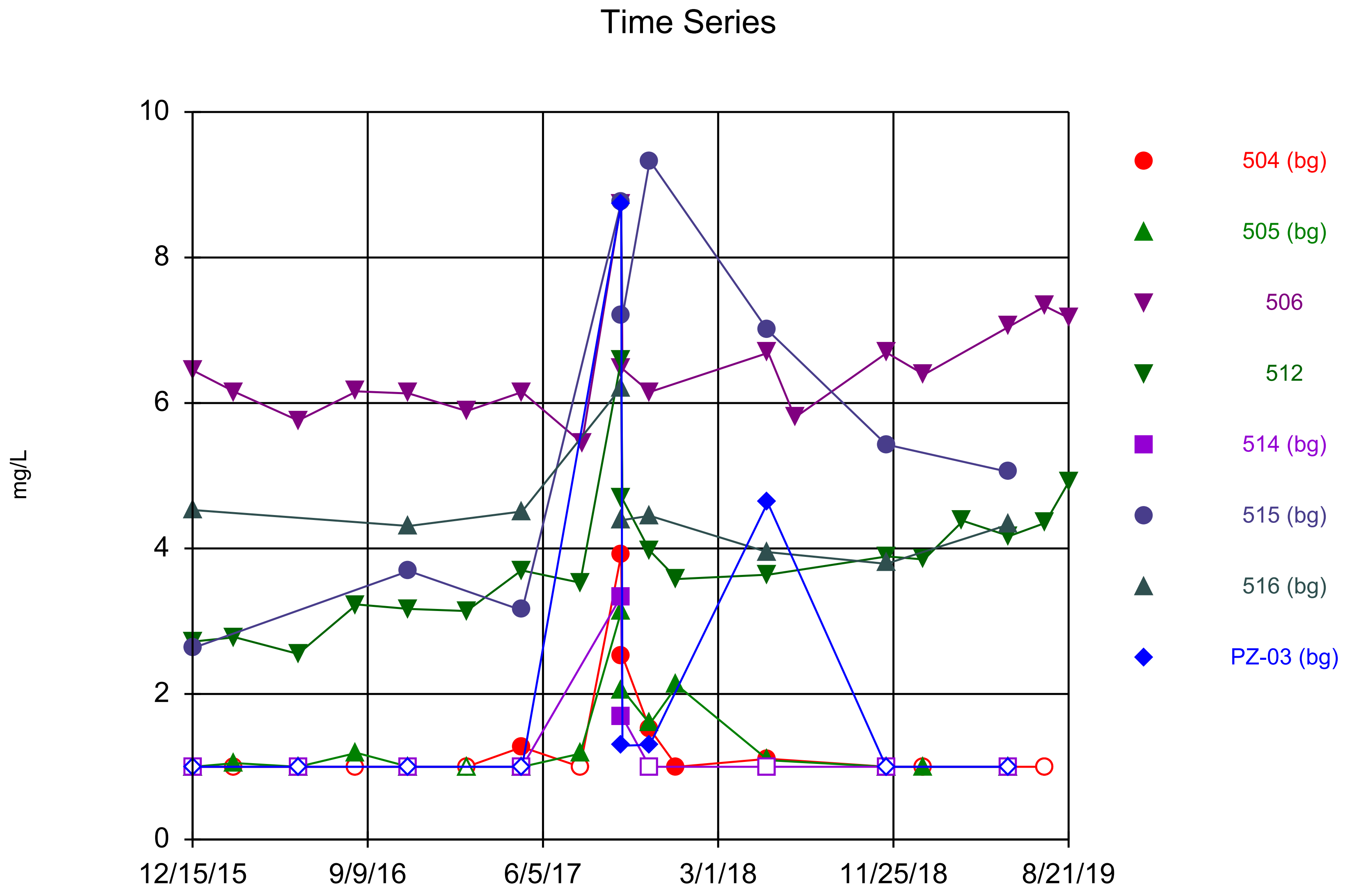
Sibley   Client: SCS Engineers   Data: Sibley

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
504* 5/25/2016	6.54	1.27	30.2	8.36	1	18.9	89	20
504* 8/23/2016	6.61	1.15	32.2	8.56	1	15.4	99.5	20
504* 11/11/2016	8.17	1.3	36.9	8.97	1	17.4	94.7	20
504* 2/8/2017	6.83	1.28	29.6	9.94	1	21	105	20
504* 1/11/2019	7.64	1.9	39.3	9.85	1	33.2	103	20
504* 7/16/2019	7.92	1.49	40.6	11.8	1	36.3	124	20
506 5/25/2016	8.51	2.19	98.3	43.6	5.76	71	304	20
506 8/23/2016	8.28	1.79	97.2	42.8	6.16	65.8	326	20
506 11/11/2016	8.44	2.37	96.5	41.2	6.13	65	312	20
506 2/8/2017	8.25	2.04	83.6	43.9	5.89	76.5	307	20
506 1/11/2019	8.21	1.85	93	39.7	6.39	67.3	292	20
506 7/16/2019	8.24	1.89	95.3	40.7	7.33	76.1	291	20
512 5/25/2016	10	2.24	98.9	36.8	2.55	23.1	356	20
512 8/23/2016	10.3	2.13	103	36.9	3.23	24.4	384	20
512 11/11/2016	9.96	2.16	100	35.6	3.17	24	352	20
512 2/8/2017	10	2.35	86.4	37.9	3.14	27.8	358	20
512 1/11/2019	10.6	2.25	110	37.8	3.85	43.3	366	20
512 7/16/2019	10.4	2.33	108	38.6	4.35	42.1	363	20
LEACHATEPOND 5/25/2016	499	58.6	129	12.9	44.1	1440	20	119
LEACHATEPOND 8/23/2016	479	56.8	108	12.8	42.8	1320	20	104
LEACHATEPOND 11/10/2016	651	75.3	224	22.5	50.4	1820	30.5	68.3
LEACHATEPOND 2/9/2017	678	66.2	89.4	10.8	64.5	2200	38.9	146
LEACHATE 3/23/2018	741	70.3	88.5	4.66	79.1	1690	20	108

Appendix D

Time Series Plots

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Chloride   Analysis Run 11/1/2019 10:21 AM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

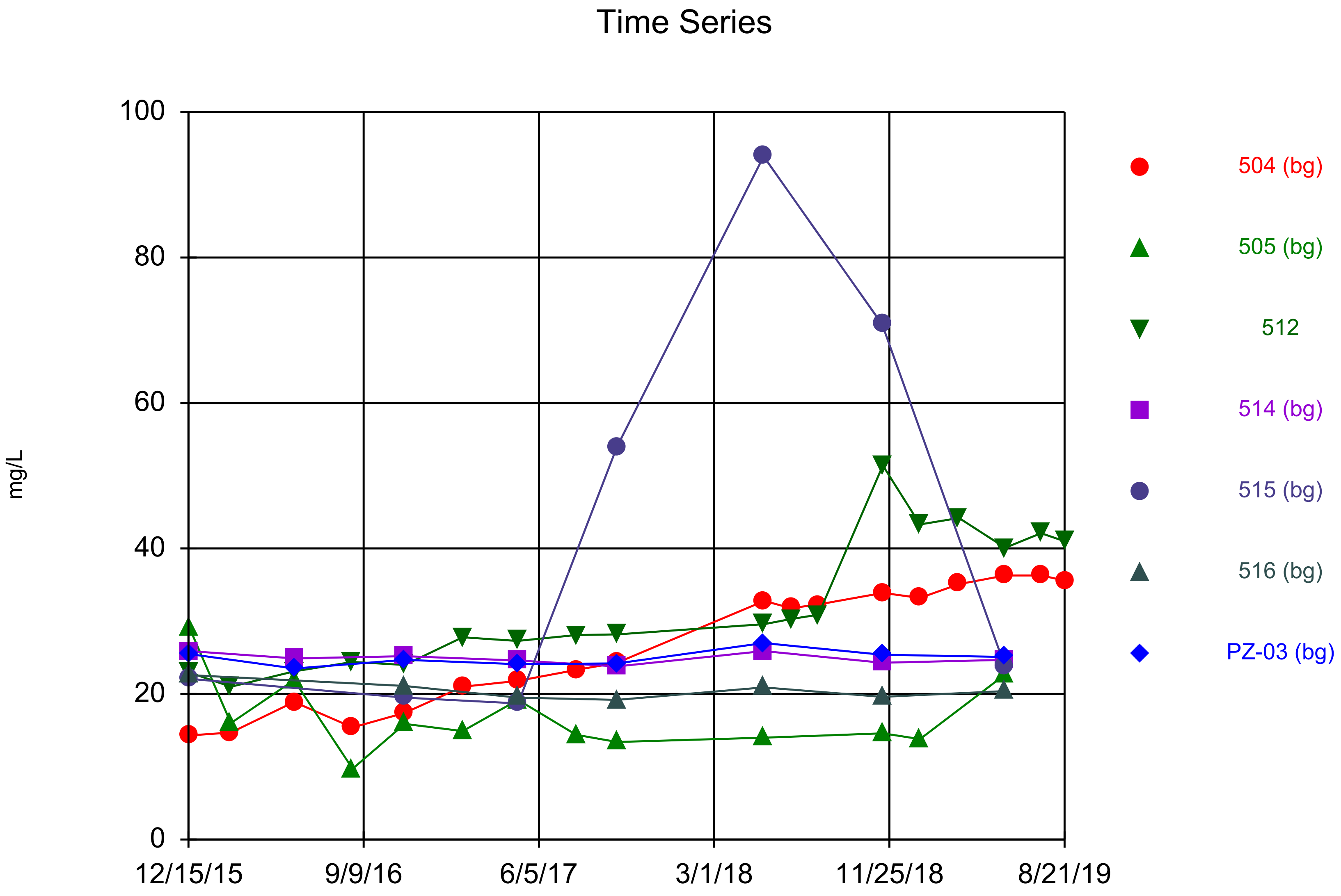
Time Series

Constituent: Chloride (mg/L)   Analysis Run 11/1/2019 10:22 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504 (bg)	505 (bg)	506	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			6.45	2.72	<1	2.63	4.53	<1
12/16/2015	<1	<1						
2/18/2016	<1	1.05	6.15	2.78				
5/25/2016	<1	<1	5.76	2.55				
5/26/2016					<1			<1
8/23/2016	<1	1.19	6.16	3.23				
11/11/2016	<1	<1	6.13	3.17	<1	3.69	4.31	<1
2/8/2017	<1	<1	5.89	3.14				
5/3/2017				3.7				
5/4/2017	1.27	<1	6.15		<1	3.15	4.51	<1
8/1/2017	<1	1.18		3.53				
8/4/2017			5.45					
10/3/2017	3.91	3.13	8.74	6.59	3.34	8.75	6.21	8.73
10/5/2017	2.52	2.06	6.47	4.68	1.68	7.19	4.39	1.29
11/16/2017	1.52	1.59	6.15	3.97	<1	9.33	4.45	1.3
12/28/2017	1	2.12		3.58				
5/16/2018					<1	7	3.95	4.63
5/17/2018	1.11	1.09	6.69	3.64				
6/27/2018			5.8					
11/14/2018					<1	5.43	3.79	<1
11/15/2018	<1	<1	6.69	3.89				
1/11/2019	<1	1	6.39	3.85				
3/12/2019				4.38				
5/22/2019	<1	<1	7.05	4.17	<1	5.05	4.33	<1
7/16/2019	<1 (i)		7.33	4.35				
8/21/2019			7.17	4.91				

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG



Constituent: Sulfate   Analysis Run 11/1/2019 10:23 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

Time Series

Constituent: Sulfate (mg/L)   Analysis Run 11/1/2019 10:24 AM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

	504 (bg)	505 (bg)	512	514 (bg)	515 (bg)	516 (bg)	PZ-03 (bg)
12/15/2015			23	25.9	22.1	22.6	25.5
12/16/2015	14.3	29.2					
2/18/2016	14.7	16	21				
5/25/2016	18.9	21.9	23.1				
5/26/2016				24.9			23.5
8/23/2016	15.4	9.73	24.4				
11/11/2016	17.4	15.9	24	25.2	19.5	21.1	24.7
2/8/2017	21	14.9	27.8				
5/3/2017			27.3				
5/4/2017	21.8	19.2		24.6	18.7	19.5	24.1
8/1/2017	23.3	14.4	28.1				
10/3/2017	24.3	13.4	28.2	23.8	54	19.2	24.2
5/16/2018				25.9	93.9	20.9	27
5/17/2018	32.8	14	29.6				
6/27/2018	31.8		30.3				
8/8/2018	32.3		30.9				
11/14/2018				24.3	70.8	19.6	25.4
11/15/2018	33.9	14.6	51.4				
1/11/2019	33.2	13.8	43.3				
3/12/2019	35.1		44.2				
5/22/2019	36.3	22.7	40.1	24.7	23.7	20.4	25.1
7/16/2019	36.3		42.1				
8/21/2019	35.6		41				

Addendum 1

2019 Annual Groundwater Monitoring and Corrective Action Report
Addendum 1

SCS ENGINEERS
Environmental Consulting & Contracting

December 16, 2022
File No. 27213167.19

STATE OF MISSOURI
JOHN R. ROCKHOLD
12-16-22
RG0092
REGISTERED GEOLOGIST

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.
CCR Landfill
Sibley Generating Station – Sibley, Missouri

The CCR Landfill 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 CCR Landfill 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.

ATTACHMENT 1

Laboratory Analytical Reports

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

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9 Sc

MW-504 L1060639-01 GW

Collected by	Collected date/time	Received date/time
G. Penaflor	01/11/19 10:20	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 09:45	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 11:10	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 11:45	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 11:50	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 09:30	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 10:10	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 10:55	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 11:35	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 12:20	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	Collected date/time	Received date/time
G. Penaflor	01/11/19 12:20	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

CASE NARRATIVE

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

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

Metals (ICP) by Method 6010B

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

Wet Chemistry by Method 9056A

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

Wet Chemistry by Method 9056A

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

DUPLICATE 1

Collected date/time: 01/11/19 11:50

SAMPLE RESULTS - 05

L1060639

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

Wet Chemistry by Method 9056A

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

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

Wet Chemistry by Method 9056A

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

Wet Chemistry by Method 9056A

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

Gravimetric Analysis by Method 2540 C-2011

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	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

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

DUPLICATE 2

Collected date/time: 01/11/19 12:20

Gravimetric Analysis by Method 2540 C-2011

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	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

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

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 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

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

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

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
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 ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
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 ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
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

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	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

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	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

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	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 ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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 ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
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 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 %
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

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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.

ACCREDITATIONS & LOCATIONS

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

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

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1,6]	90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana [1]	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	n/a
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee [1,4]	2006
Texas	T 104704245-17-14
Texas [5]	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

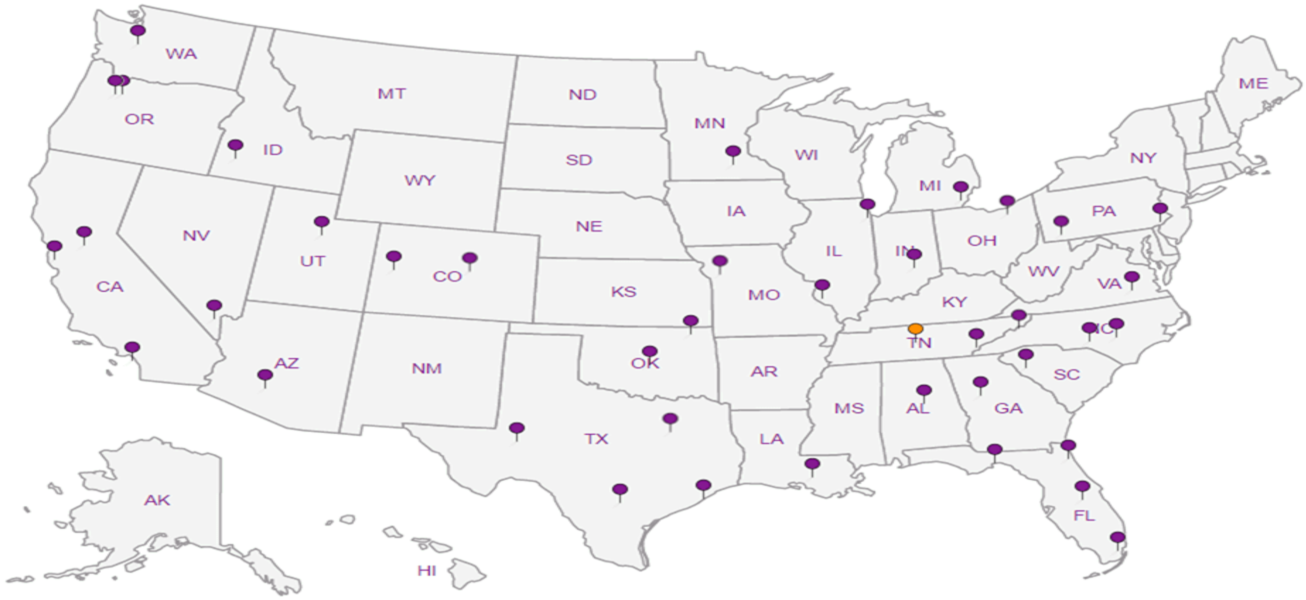
A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003

AIHA-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[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

Analysis / Container / Preservative

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

F050

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

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca - 6010 250mlHDPE-HNO3	Boron - 6010 250mlHDPE-HNO3 <2	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 ______

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 # 451016558695

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

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

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

If preservation required by Login: Date/Time

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

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

Date: 1/12/19
Time: 0830

Hold:

Condition: NCF / [✓ OK]

Chain of Custody Page ___ of ___

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

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: L2

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

Report to:
Jason Franks

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):

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

Immediately Packed on Ice N ___ Y X

L# L1060639

Table #

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

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
806R **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 #

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: 1/11/19 Time: 1250

Received by: (Signature)

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

Relinquished by: (Signature)
Date: Time:

Received by: (Signature)

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

If preservation required by Login: Date/Time

Relinquished by: (Signature)
Date: Time:

Received for lab by: (Signature)

Date: 1/12/19 Time: 0830

Hold:

Condition: NCF / [✓ OK]

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

ATTACHMENT 1-2

March 2019 Sampling Event Laboratory Report

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

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9 Sc

MW-504 L1078397-01 GW

Collected by	Collected date/time	Received date/time
Whit Martin	03/12/19 09:55	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	Collected date/time	Received date/time
Whit Martin	03/12/19 10:40	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	Collected date/time	Received date/time
Whit Martin	03/12/19 11:25	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	Collected date/time	Received date/time
Whit Martin	03/12/19 11:25	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	Collected date/time	Received date/time
Whit Martin	03/12/19 12:10	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	Collected date/time	Received date/time
Whit Martin	03/12/19 12:45	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	Collected date/time	Received date/time
Whit Martin	03/12/19 14:05	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	Collected date/time	Received date/time
Whit Martin	03/12/19 13:20	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

	Collected by	Collected date/time	Received date/time
DUPLICATE 2 L1078397-09 GW	Whit Martin	03/12/19 13:20	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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	35100		5000	1	03/19/2019 22:06	WG1251927

Metals (ICP) by Method 6010B

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

Metals (ICP) by Method 6010B

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

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	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

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

Wet Chemistry by Method 9056A

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

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

MW-806R

Collected date/time: 03/12/19 13:20

SAMPLE RESULTS - 08

L1078397

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

Gravimetric Analysis by Method 2540 C-2011

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

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

Wet Chemistry by Method 9056A

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

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	ug/l		ug/l	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

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

Laboratory Control Sample (LCS)

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

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

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

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

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	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

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	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

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	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

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	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.

ACCREDITATIONS & LOCATIONS

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

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

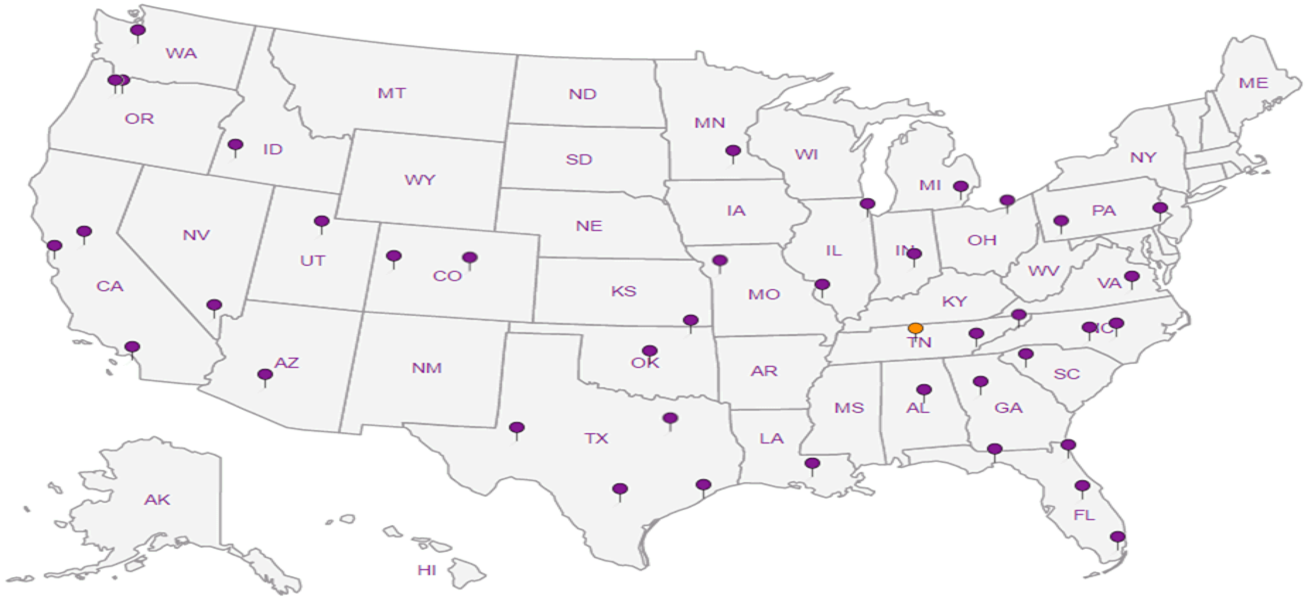
Third Party Federal Accreditations

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 ________

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) Whit Martin
Date: 3/12/19
Time: 1555
Received by: (Signature)

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

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

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

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature) Mallk T.

Date: 3/13
Time: 8:45

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
- ____ Next Day
- ____ Two Day
- ____ Three Day
- ____ Five Day
- ____ 5 Day (Rad Only)
- ____ 10 Day (Rad Only)

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

Table #

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 ✓✓	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride - 9056 125mlHDPE-NoPres	Chloride, SO4 - 9056 125mlHDPE-NoPres	Sulfate - 9056 125mlHDPE-NoPres	TDS 250mlHDPE-NoPres				Remarks	Sample # (lab only)
MW806R **MS / MSD**	Grab	**GW**		3/12/19	1325	**3**	**X**					**X**	**X**					

* 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) Whit Martin — Date: 3/12/19 — Time: 1555 — Received by: (Signature)

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

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

Temp: 2.3+.1=2.4 °C — Bottles Received: 2 2

If preservation required by Login: Date/Time

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

Date: 3/13 — Time: 8:45

Hold:

Condition: NCF / [✓ OK]

ATTACHMENT 1-3

May 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 04, 2019

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

SCS Engineers - KS

Sample Delivery Group:	L1102438
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

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MW-504 L1102438-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 10:45	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287422	1	05/29/19 11:45	05/29/19 12:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/03/19 22:34	06/03/19 22:34	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 19:01	CCE	Mt. Juliet, TN

MW-505 L1102438-02 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 11:55	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287422	1	05/29/19 11:45	05/29/19 12:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/03/19 22:52	06/03/19 22:52	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 19:04	CCE	Mt. Juliet, TN

MW-506 L1102438-03 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 12:35	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287422	1	05/29/19 11:45	05/29/19 12:33	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/03/19 23:09	06/03/19 23:09	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 19:06	CCE	Mt. Juliet, TN

MW-510 L1102438-04 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 15:35	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287425	1	05/29/19 09:09	05/29/19 10:01	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/03/19 23:27	06/03/19 23:27	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 19:09	CCE	Mt. Juliet, TN

MW-512 L1102438-05 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 14:25	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287425	1	05/29/19 09:09	05/29/19 10:01	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/03/19 23:45	06/03/19 23:45	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 19:11	CCE	Mt. Juliet, TN

MW-601 L1102438-06 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 13:25	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287425	1	05/29/19 09:09	05/29/19 10:01	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/03/19 18:28	06/03/19 18:28	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 18:36	CCE	Mt. Juliet, TN

DUPLICATE L1102438-07 GW

Collected by	Collected date/time	Received date/time
Jason Franks	05/22/19 13:35	05/24/19 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1287425	1	05/29/19 09:09	05/29/19 10:01	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290105	1	06/04/19 00:02	06/04/19 00:02	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287640	1	05/29/19 10:08	05/29/19 19:14	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

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	197000		10000	1	05/29/2019 12:33	WG1287422

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	ND		1000	1	06/03/2019 22:34	WG1290105
Fluoride	176		100	1	06/03/2019 22:34	WG1290105
Sulfate	36300		5000	1	06/03/2019 22:34	WG1290105

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	ND		200	1	05/29/2019 19:01	WG1287640
Calcium	33100		1000	1	05/29/2019 19:01	WG1287640

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	180000		10000	1	05/29/2019 12:33	WG1287422

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	ND		1000	1	06/03/2019 22:52	WG1290105
Fluoride	151		100	1	06/03/2019 22:52	WG1290105
Sulfate	22700		5000	1	06/03/2019 22:52	WG1290105

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	05/29/2019 19:04	WG1287640
Calcium	26400		1000	1	05/29/2019 19:04	WG1287640

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	453000		10000	1	05/29/2019 12:33	WG1287422

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	7050		1000	1	06/03/2019 23:09	WG1290105
Fluoride	336		100	1	06/03/2019 23:09	WG1290105
Sulfate	74200		5000	1	06/03/2019 23:09	WG1290105

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	05/29/2019 19:06	WG1287640
Calcium	91700		1000	1	05/29/2019 19:06	WG1287640

MW-510

Collected date/time: 05/22/19 15:35

SAMPLE RESULTS - 04

L1102438

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	480000		10000	1	05/29/2019 10:01	WG1287425

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	3390		1000	1	06/03/2019 23:27	WG1290105
Fluoride	326		100	1	06/03/2019 23:27	WG1290105
Sulfate	13800		5000	1	06/03/2019 23:27	WG1290105

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	05/29/2019 19:09	WG1287640
Calcium	117000		1000	1	05/29/2019 19:09	WG1287640

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

MW-512

Collected date/time: 05/22/19 14:25

SAMPLE RESULTS - 05

L1102438

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	445000		10000	1	05/29/2019 10:01	WG1287425

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	4170		1000	1	06/03/2019 23:45	WG1290105
Fluoride	315		100	1	06/03/2019 23:45	WG1290105
Sulfate	40100		5000	1	06/03/2019 23:45	WG1290105

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	05/29/2019 19:11	WG1287640
Calcium	104000		1000	1	05/29/2019 19:11	WG1287640

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	404000		10000	1	05/29/2019 10:01	WG1287425

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	3190		1000	1	06/03/2019 18:28	WG1290105
Fluoride	264		100	1	06/03/2019 18:28	WG1290105
Sulfate	8740		5000	1	06/03/2019 18:28	WG1290105

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	ND		200	1	05/29/2019 18:36	WG1287640
Calcium	97400		1000	1	05/29/2019 18:36	WG1287640

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	402000		10000	1	05/29/2019 10:01	WG1287425

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	3200		1000	1	06/04/2019 00:02	WG1290105
Fluoride	265		100	1	06/04/2019 00:02	WG1290105
Sulfate	9720		5000	1	06/04/2019 00:02	WG1290105

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	ND		200	1	05/29/2019 19:14	WG1287640
Calcium	99400		1000	1	05/29/2019 19:14	WG1287640

Method Blank (MB)

(MB) R3416808-1 05/29/19 12:33

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

L1102435-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1102435-04 05/29/19 12:33 • (DUP) R3416808-3 05/29/19 12:33

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	361000	351000	1	2.81		5

Laboratory Control Sample (LCS)

(LCS) R3416808-2 05/29/19 12:33

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8500000	96.6	85.0-115	

Method Blank (MB)

(MB) R3416415-1 05/29/19 10:01

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

L1102662-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1102662-04 05/29/19 10:01 • (DUP) R3416415-3 05/29/19 10:01

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	2700000	2510000	1	7.49	J3	5

Laboratory Control Sample (LCS)

(LCS) R3416415-2 05/29/19 10:01

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8810000	100	85.0-115	

Method Blank (MB)

(MB) R3417495-1 06/03/19 14:39

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

L1102438-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1102438-06 06/03/19 18:28 • (DUP) R3417495-3 06/03/19 18:45

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	3190	3170	1	0.695		15
Fluoride	264	263	1	0.418		15
Sulfate	8740	8690	1	0.562		15

L1102624-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1102624-03 06/04/19 02:41 • (DUP) R3417495-6 06/04/19 02:58

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	32700	32600	1	0.216		15
Fluoride	383	382	1	0.236		15
Sulfate	7440	7460	1	0.170		15

Laboratory Control Sample (LCS)

(LCS) R3417495-2 06/03/19 14:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	40000	99.9	80.0-120	
Fluoride	8000	8050	101	80.0-120	
Sulfate	40000	40100	100	80.0-120	

L1102438-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102438-06 06/03/19 18:28 • (MS) R3417495-4 06/03/19 19:03 • (MSD) R3417495-5 06/03/19 19:20

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	3190	53900	53900	102	102	1	80.0-120			0.00445	15
Fluoride	5000	264	5330	5330	101	101	1	80.0-120			0.0563	15
Sulfate	50000	8740	58600	58600	99.7	99.7	1	80.0-120			0.0729	15

L1102624-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1102624-03 06/04/19 02:41 • (MS) R3417495-7 06/04/19 03:16

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	32700	81900	98.5	1	80.0-120	
Fluoride	5000	383	5430	101	1	80.0-120	
Sulfate	50000	7440	57200	99.6	1	80.0-120	

Method Blank (MB)

(MB) R3416044-1 05/29/19 18:28

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Boron	U		12.6	200
Calcium	48.1	J	46.3	1000

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

(LCS) R3416044-2 05/29/19 18:31 • (LCSD) R3416044-3 05/29/19 18:33

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Boron	1000	1010	984	101	98.4	80.0-120			2.75	20
Calcium	10000	10000	10000	100	100	80.0-120			0.190	20

L1102438-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102438-06 05/29/19 18:36 • (MS) R3416044-5 05/29/19 18:41 • (MSD) R3416044-6 05/29/19 18:43

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 %
Boron	1000	ND	1060	1020	99.8	96.1	1	75.0-125			3.54	20
Calcium	10000	97400	106000	106000	86.9	81.1	1	75.0-125			0.548	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
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.

ACCREDITATIONS & LOCATIONS

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

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

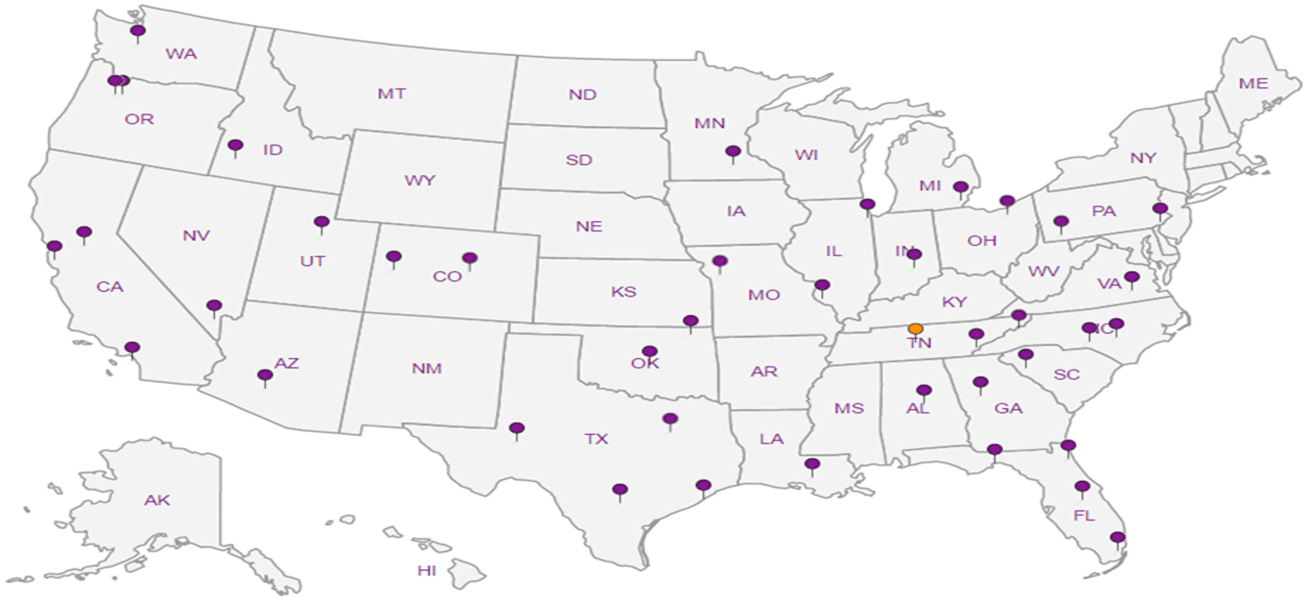
Third Party Federal Accreditations

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:

Pres Chk

Report to: **Jason Franks**

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

Project Description: **KCP&L Sibley Generationg 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

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# L1102438

1215

Acctnum: **AQUAOPKS**
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions(Cld,F,SO4) 125ml HDPE- NoPres	B,Ca - 6010 250ml HDPE - HNO3	TDS 250ml HDPE -NoPres	Remarks	Sample # (lab only)
MW-504	GRAB	GW	–	5/22/19	1045	3	X	X	X		-01
MW-505		GW	–		1155	3	X	X	X		02
MW-506		GW	–		1235	3	X	X	X		03
MW-510		GW	–		1535	3	X	X	X		04
MW-512		GW	–		1425	3	X	X	X		05
MW-601		GW	–		1325	3	X	X	X		06
DUPLICATE		GW	–		1330	3	X	X	X		07
601 MS/MSD		GW	–		1335	3	X	X	X		06
MSD		GW	–			3	X	X	X		

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) Jason R. Franks
Date: 5/23/19
Time: 1220
Received by: (Signature) 5-23-19 1220

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature)
Date: 5/23/19
Time: 1700
Received by: (Signature) SWA

Temp: °C 1.0+0=1.0
Bottles Received: 27

If preservation required by Login: Date/Time

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

Date: 5/24/19
Time: 8:05

Hold:

Condition: NCF / [✓ OK]

ATTACHMENT 1-4

July 2019 Sampling Event Laboratory Report

ANALYTICAL REPORT

July 29, 2019

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

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

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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MW-504 L1119586-01 GW

Collected by	Collected date/time	Received date/time
Whit Martin	07/16/19 10:55	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	Collected date/time	Received date/time
Whit Martin	07/16/19 11:47	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	Collected date/time	Received date/time
Whit Martin	07/16/19 12:30	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	Collected date/time	Received date/time
Whit Martin	07/16/19 12:40	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	Collected date/time	Received date/time
Whit Martin	07/16/19 13:15	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	Collected date/time	Received date/time
Whit Martin	07/16/19 13:15	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	Collected date/time	Received date/time
Whit Martin	07/16/19 13:55	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	Collected date/time	Received date/time
Whit Martin	07/16/19 13:55	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

Collected by	Collected date/time	Received date/time
Whit Martin	07/16/19 13:20	07/17/19 08:45

MW-804 L1119586-09 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	07/16/19 14:05	07/17/19 08:45

MW-806R L1119586-10 GW

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

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

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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	36300		5000	1	07/22/2019 20:43	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	7330		1000	1	07/22/2019 20:57	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	11100		5000	1	07/22/2019 21:42	WG1314866

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	613000		13300	1	07/19/2019 07:42	WG1313293

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	612000		13300	1	07/19/2019 07:42	WG1313293

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	585000		13300	1	07/19/2019 07:42	WG1313293

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	7590		200	1	07/19/2019 18:51	WG1313404

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	671000		13300	1	07/19/2019 07:42	WG1313293

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Sulfate	244000		25000	5	07/26/2019 17:29	WG1317958

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	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	

WG1314866

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

L1119586-01,02,03,04,05,06,07,08

Method Blank (MB)

(MB) R3433129-1 07/22/19 19:56

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	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

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	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

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	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

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	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 ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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 ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
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 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 %
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.

ACCREDITATIONS & LOCATIONS

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

State Accreditations

Alabama	40660	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

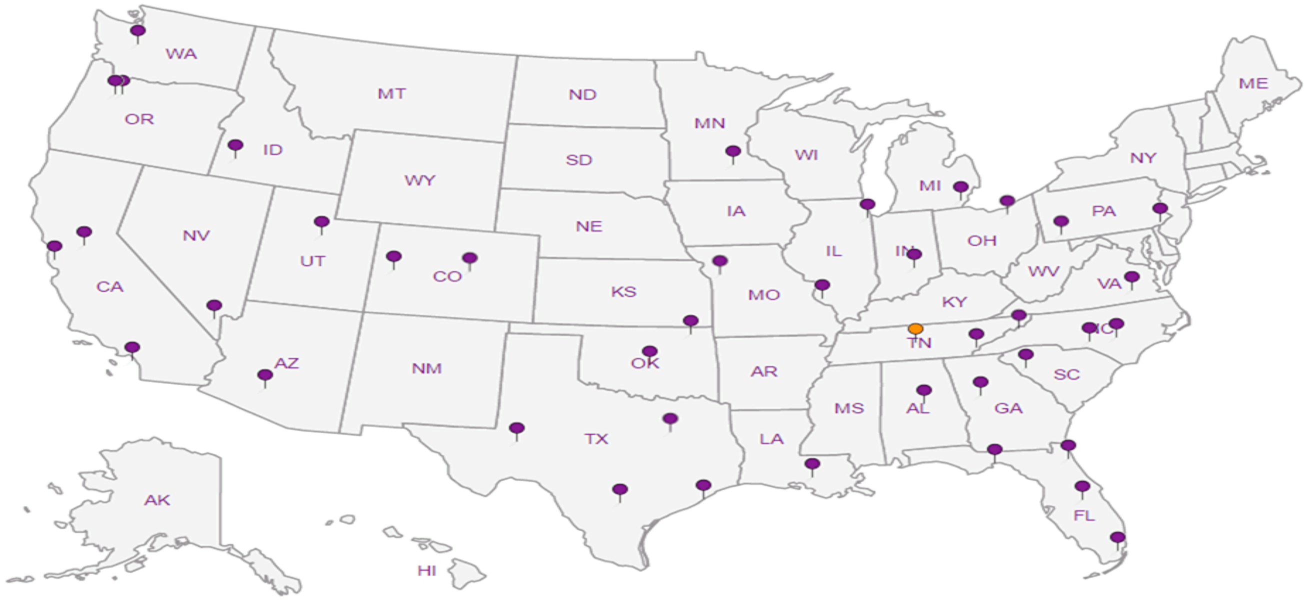
Third Party Federal Accreditations

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: ✓ ✓

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

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**

L# L1119586

J222

Acctnum: **AQUAOPKS**
Template: **T129789**
Prelogin: **P719408**
TSR: **206 - Jeff Carr**
PB:
Shipped Via:

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	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-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:

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		Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR
Relinquished by : (Signature)	Date: 7/16/19	Time: 1800	Received by: (Signature)	Temp: °C 1.7-0.1=1.6 ~~2.0~~ 13 Bottles Received: 21
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 7/17/19 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

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

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**

L# L1119586

Table #

Acctnum: **AQUAOPKS**
Template: **T129789**
Prelogin: **P719408**
TSR: **206 - Jeff Carr**
PB:
Shipped Via:

Collected by (print): Whit Martin

Site/Facility ID #

P.O. #

Collected by (signature): Whit Martin

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

Immediately Packed on Ice N ___ Y X

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)
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

* 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) Whit Martin
Date: 7/16/19
Time: 1515
Received by: (Signature)

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature)
Date: 7-16-19
Time: 1800
Received by: (Signature)

Temp: °C 1.9-0.1=1.8
Bottles Received: 21

If preservation required by Login: Date/Time

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

Date: 7/17/19
Time: 8:45

Hold:

Condition: NCF / [✓ OK]

ATTACHMENT 1-5

August 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

August 30, 2019

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

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

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Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 16:20	08/23/19 08:45

MW-504 L1132073-01 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 13:10	08/23/19 08:45

MW-506 L1132073-02 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 13:50	08/23/19 08:45

MW-512 L1132073-03 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 11:50	08/23/19 08:45

MW-703 L1132073-04 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 12:20	08/23/19 08:45

MW-704 L1132073-05 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 14:20	08/23/19 08:45

MW-801 L1132073-06 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 15:00	08/23/19 08:45

MW-804 L1132073-07 GW

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

Collected by	Collected date/time	Received date/time
Whit Martin	08/21/19 15:30	08/23/19 08:45

MW-806R L1132073-08 GW

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

	Collected by	Collected date/time	Received date/time
DUPLICATE 1 L1132073-09 GW	Whit Martin	08/21/19 12:20	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

	Collected by	Collected date/time	Received date/time
DUPLICATE 2 L1132073-10 GW	Whit Martin	08/21/19 15:30	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

CASE NARRATIVE

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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	35600		5000	1	08/23/2019 22:09	WG1333739

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	7170		1000	1	08/23/2019 22:24	WG1333739

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	5730		5000	1	08/24/2019 12:29	WG1334249

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	15200		1000	1	08/24/2019 13:02	WG1334249

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	124000		5000	5	08/24/2019 14:07	WG1334249

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	8140		200	1	08/25/2019 08:57	WG1334216

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	241000		25000	5	08/25/2019 14:32	WG1334249

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	16500		1000	1	08/24/2019 15:46	WG1334249

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Sulfate	243000		25000	5	08/24/2019 16:19	WG1334249

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
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

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	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

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	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

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	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

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	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

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	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

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
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

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	ug/l	ug/l	ug/l	%		%	
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 ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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 ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
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 ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
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 ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
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 ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
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 ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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 ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
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 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 %
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.

ACCREDITATIONS & LOCATIONS

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

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1,6]	90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana [1]	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	n/a
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee [1,4]	2006
Texas	T104704245-18-15
Texas [5]	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

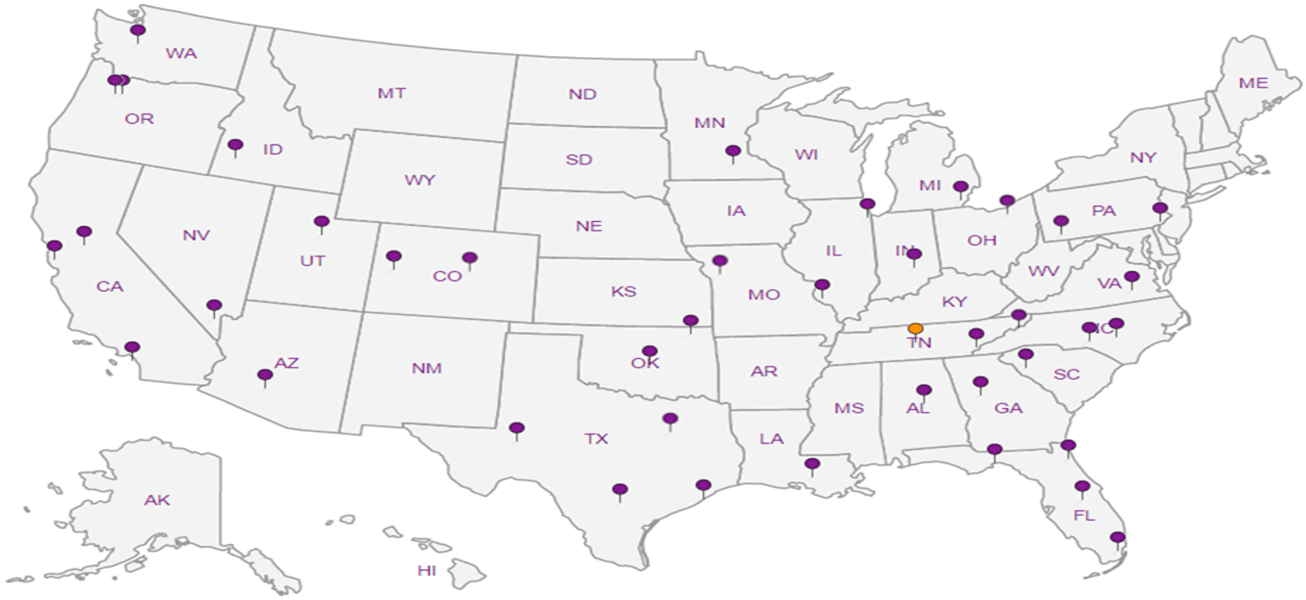
A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003

AIHA-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[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

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

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

SDG # 132073

Table # A050

Acctnum: **AQUAOPKS**

Template: **T129789**

Prelogin: **P724464**

PM: **206 - Jeff Carr**

PB:

Shipped Via:

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	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)
Pres Chk							22	22										
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									

* 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) Whit Martin	Date: 8/22/19	Time: 0955	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR
Relinquished by : (Signature)	Date: 8/22/19	Time: 1700	Received by: (Signature)	Temp: [illegible] °C 2.7±0=2.7 Bottles Received: 11
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 08/23 Time: 8145

~~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 Desciption: 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

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 #

Immediately Packed on Ice N___ Y X

Date Results Needed: Std

Analysis / Container / Preservative

L2

Chain of Custody Page ___ of ___

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

SDG # ~~L1132098~~ N 8/23/19

A048

Acctnum: L1132073
Template: T129789
Prelogin: P724464
PM: 206 - Jeff Carr
PB:
Shipped Via:

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 -70
MW-806R MS/MSD	Grab	GW		8/21/19	1530	2		X			X		-2 -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) Whit Martin
Date: 8/22/19
Time: 0955
Received by: (Signature)

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature)
Date: 8/22/19
Time: 1600
Received by: (Signature)

Temp: A3BF °C 2.7±0=2.7
Bottles Received: 4

If preservation required by Login: Date/Time

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

Date: 08/23
Time: 8:45

Hold:

Condition: NCF / [✓ OK]

ATTACHMENT 1-6

November 2019 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2019

SCS Engineers - KS

Sample Delivery Group:	L1158865
Samples Received:	11/08/2019
Project Number:	27213169.10
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

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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MW-504 L1158865-01 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 11:20	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 15:10	11/12/19 15:10	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 01:43	EL	Mt. Juliet, TN

MW-505 L1158865-02 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 12:10	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 15:26	11/12/19 15:26	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 01:46	EL	Mt. Juliet, TN

MW-506 L1158865-03 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 14:00	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 15:42	11/12/19 15:42	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 01:49	EL	Mt. Juliet, TN

MW-510 L1158865-04 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 14:05	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 16:14	11/12/19 16:14	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 01:57	EL	Mt. Juliet, TN

MW-512 L1158865-05 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 15:35	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 17:17	11/12/19 17:17	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 02:00	EL	Mt. Juliet, TN

MW-601 L1158865-06 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 15:20	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 17:33	11/12/19 17:33	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 02:03	EL	Mt. Juliet, TN

MW-601 (MS/MSD) L1158865-07 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 15:30	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 18:05	11/12/19 18:05	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 02:06	EL	Mt. Juliet, TN

DUPLICATE 1 L1158865-08 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	11/06/19 15:25	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 18:21	11/12/19 18:21	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380311	1	11/14/19 20:36	11/15/19 02:08	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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	177000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	ND		1000	1	11/12/2019 15:10	WG1378892
Fluoride	182		100	1	11/12/2019 15:10	WG1378892
Sulfate	35400		5000	1	11/12/2019 15:10	WG1378892

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 01:43	WG1380311
Calcium	34100		1000	1	11/15/2019 01:43	WG1380311

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	146000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	ND		1000	1	11/12/2019 15:26	WG1378892
Fluoride	198		100	1	11/12/2019 15:26	WG1378892
Sulfate	17100		5000	1	11/12/2019 15:26	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	11/15/2019 01:46	WG1380311
Calcium	28200		1000	1	11/15/2019 01:46	WG1380311

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	410000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	6660		1000	1	11/12/2019 15:42	WG1378892
Fluoride	309		100	1	11/12/2019 15:42	WG1378892
Sulfate	76800		5000	1	11/12/2019 15:42	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	11/15/2019 01:49	WG1380311
Calcium	93700		1000	1	11/15/2019 01:49	WG1380311

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	427000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	3080		1000	1	11/12/2019 16:14	WG1378892
Fluoride	298		100	1	11/12/2019 16:14	WG1378892
Sulfate	14600		5000	1	11/12/2019 16:14	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	11/15/2019 01:57	WG1380311
Calcium	120000		1000	1	11/15/2019 01:57	WG1380311

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	403000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	4480		1000	1	11/12/2019 17:17	WG1378892
Fluoride	286		100	1	11/12/2019 17:17	WG1378892
Sulfate	45000		5000	1	11/12/2019 17:17	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	11/15/2019 02:00	WG1380311
Calcium	105000		1000	1	11/15/2019 02:00	WG1380311

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	361000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	3090		1000	1	11/12/2019 17:33	WG1378892
Fluoride	248		100	1	11/12/2019 17:33	WG1378892
Sulfate	11400		5000	1	11/12/2019 17:33	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	11/15/2019 02:03	WG1380311
Calcium	101000		1000	1	11/15/2019 02:03	WG1380311

MW-601 (MS/MSD)

Collected date/time: 11/06/19 15:30

SAMPLE RESULTS - 07

L1158865

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	380000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	3120		1000	1	11/12/2019 18:05	WG1378892
Fluoride	248		100	1	11/12/2019 18:05	WG1378892
Sulfate	12300		5000	1	11/12/2019 18:05	WG1378892

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	ND		200	1	11/15/2019 02:06	WG1380311
Calcium	101000		1000	1	11/15/2019 02:06	WG1380311

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	366000		10000	1	11/11/2019 08:05	WG1378166

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	3080		1000	1	11/12/2019 18:21	WG1378892
Fluoride	247		100	1	11/12/2019 18:21	WG1378892
Sulfate	11500		5000	1	11/12/2019 18:21	WG1378892

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	ND		200	1	11/15/2019 02:08	WG1380311
Calcium	100000		1000	1	11/15/2019 02:08	WG1380311

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	

WG1378892
Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY
L1158865-01,02,03,04,05,06,07,08

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) R3472206-1 11/15/19 00:51

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

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

(LCS) R3472206-2 11/15/19 00:54 • (LCSD) R3472206-3 11/15/19 00:56

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Boron	1000	1000	999	100	99.9	80.0-120			0.402	20
Calcium	10000	10000	9900	100	99.0	80.0-120			1.43	20

L1158861-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158861-12 11/15/19 00:59 • (MS) R3472206-5 11/15/19 01:04 • (MSD) R3472206-6 11/15/19 01:07

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 %
Boron	1000	ND	1040	1030	102	101	1	75.0-125			1.26	20
Calcium	10000	99800	109000	108000	88.7	83.7	1	75.0-125			0.461	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.

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
J	The identification of the analyte is acceptable; the reported value is an estimate.

ACCREDITATIONS & LOCATIONS

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

State Accreditations

Alabama	40660	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

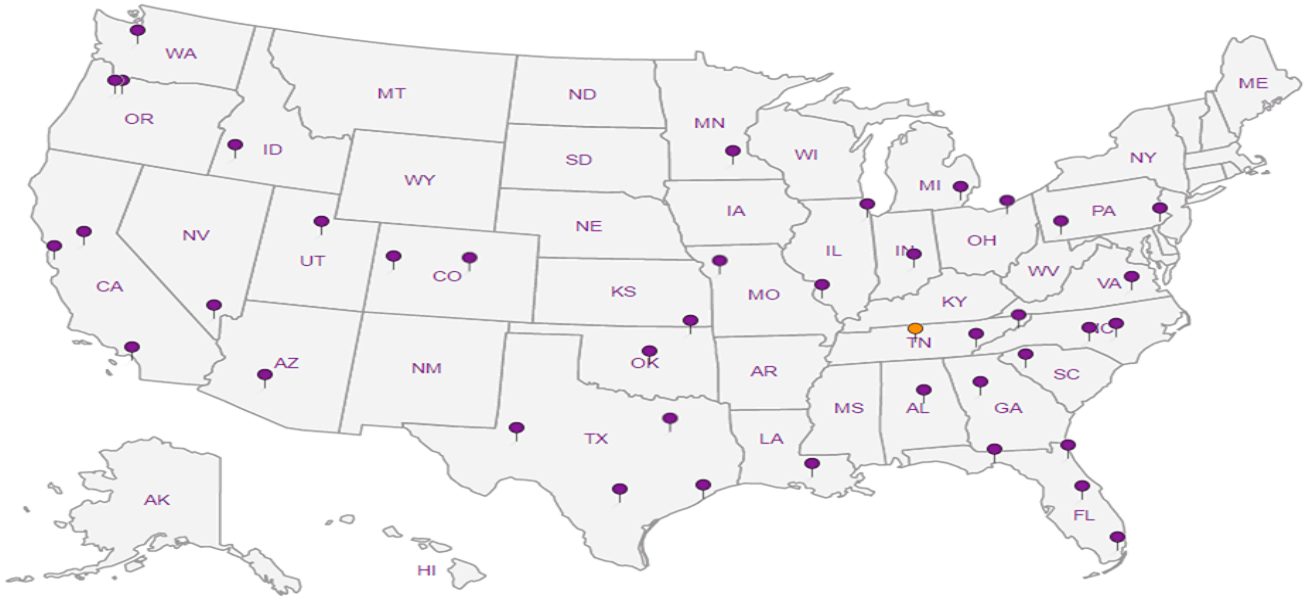
Third Party Federal Accreditations

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

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

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 # **27213169.18** 9

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

SDG # 1158865

B183

Table #

Acctnum: **AQUAOPKS**
Template: **T136014**
Prelogin: **P736937**
PM: **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 ✓6	TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-504	GRAB	GW	–	11/6/19	1120	3	X	X	X		-01
MW-505		GW	–		1210	3	X	X	X		-02
MW-506		GW	–		1400	3	X	X	X		-03
MW-510		GW	–		1405	3	X	X	X		-04
MW-512		GW	–		1535	3	X	X	X		-05
MW-601		GW	–		1520	3	X	X	X		-06
MW-601 (MS/MSD)		GW	–		1530	3	X	X	X		-07
DUPLICATE 1		GW	–		1525	3	X	X	X		-06

* 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 # SW

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) Jason R. Franks
Date: 11/6/19
Time: 1455
Received by: (Signature) Allan Nelson 11-7-19 1455

Trip Blank Received: Yes / [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature) Allan Nelson
Date: 11/7/19
Time: 1800
Received by: (Signature)

Temp: A25 °C 0.1+.3=0.4
Bottles Received: JH

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]

ATTACHMENT 2

Statistical Analyses

ATTACHMENT 2-1

Fall 2018 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

STATE OF MISSOURI
JOHN R. ROCKHOLD
3-29-19
RG0092
REGISTERED GEOLOGIST

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 - CCR Landfill**
Fall 2018 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the CCR Landfill 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 four Appendix III constituents above their respective prediction limit in monitoring wells MW-504 and MW-512.

The prediction limit for calcium in monitoring well MW-512 is 107 mg/L. The detection monitoring sample was reported at 110 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 110 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 108 mg/L.

The prediction limit for chloride in monitoring well MW-512 is 3.826 mg/L. The detection monitoring sample was reported at 3.89 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 3.85 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 4.38 mg/L.

The prediction limit for sulfate in upgradient monitoring well MW-504 is 24.58 mg/L. The detection monitoring sample was reported at 33.9 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 33.2 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 35.1 mg/L.

The prediction limit for sulfate in monitoring well MW-512 is 29.55 mg/L. The detection monitoring sample was reported at 51.4 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 43.3 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 44.2 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for sulfate from monitoring well MW-504, and the detection monitoring sample for calcium, chloride, and sulfate from monitoring well MW-512 exceed their respective prediction limits and are confirmed statistically significant increases (SSIs) 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 four SSIs above the background prediction limits for sulfate in upgradient monitoring well MW-504, and calcium, chloride, and sulfate in downgradient monitoring well MW-512.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas^{TM} Output:

Statistical evaluation output from Sanitas^{TM} 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^{TM} Configuration Settings:

Screen shots of the applicable Sanitas^{TM} 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

ATTACHMENT 1

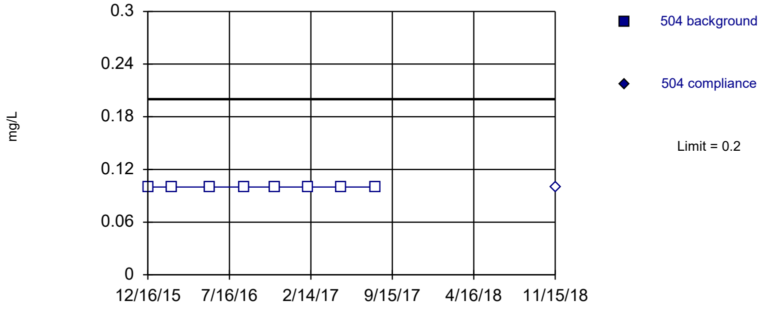
Sanitas^{TM} Output

Sanitas™ v.9.6.12 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%. 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.

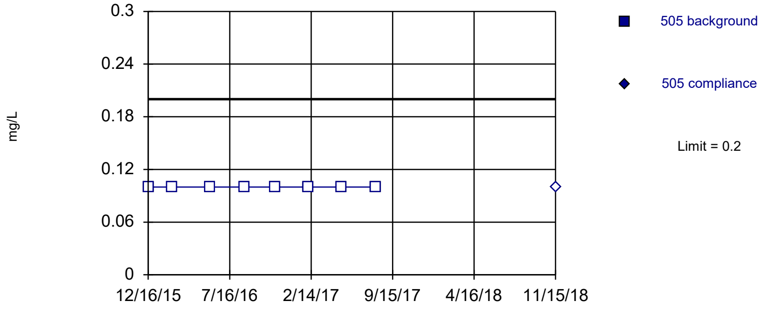
Constituent: Boron Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 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%. 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.

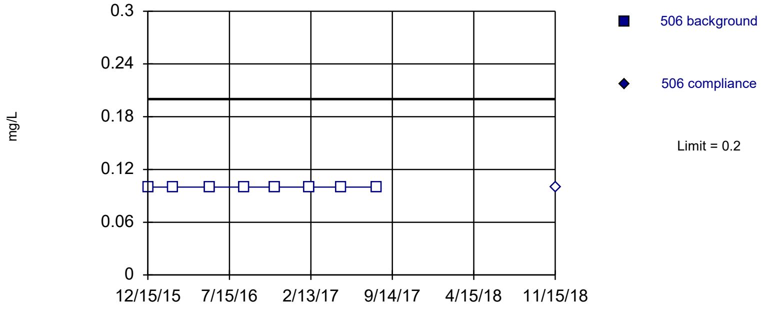
Constituent: Boron Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 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%. 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.

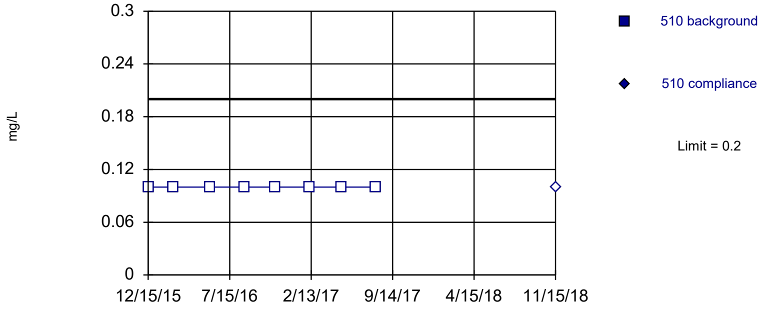
Constituent: Boron Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 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%. 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 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504
12/16/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/4/2017	<0.2	
8/1/2017	<0.2	
11/15/2018		<0.2

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	505	505
12/16/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/4/2017	<0.2	
8/1/2017	<0.2	
11/15/2018		<0.2

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506
12/15/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/4/2017	<0.2	
8/4/2017	<0.2	
11/15/2018		<0.2

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

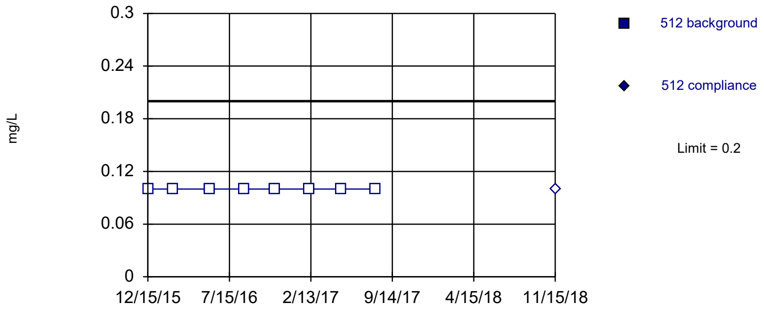
	510	510
12/15/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/10/2016	<0.2	
2/8/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
11/15/2018		<0.2

Sanitas™ v.9.6.12 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%. 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.

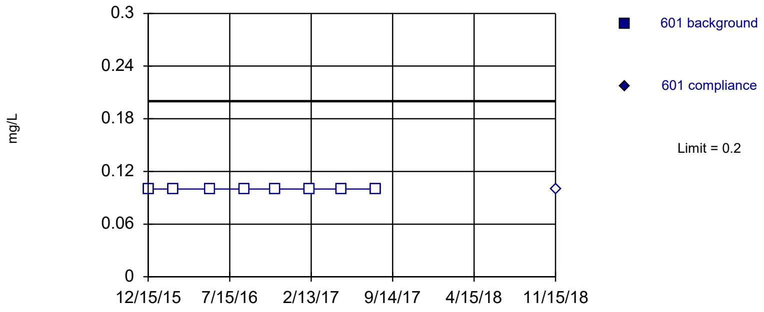
Constituent: Boron Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 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%. 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.

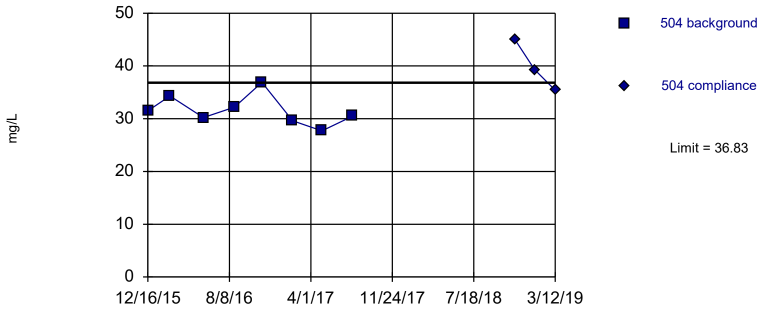
Constituent: Boron Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=31.61, Std. Dev.=2.882, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9573, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

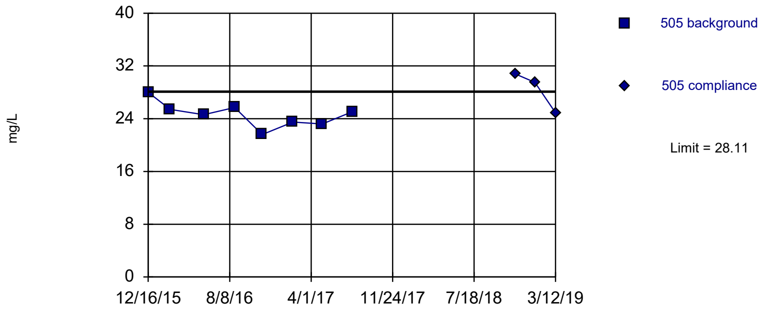
Constituent: Calcium Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=24.64, Std. Dev.=1.921, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9774, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Calcium Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	512	512
12/15/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<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 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	<0.2	
2/18/2016	<0.2	
5/26/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
11/15/2018		<0.2

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	504	504	
12/16/2015	31.5		
2/18/2016	34.3		
5/25/2016	30.2		
8/23/2016	32.2		
11/11/2016	36.9		
2/8/2017	29.6		
5/4/2017	27.7		
8/1/2017	30.5		
11/15/2018		45	
1/11/2019		39.3	1st verification re-sample
3/12/2019		35.4	2nd verification re-sample

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	505	505	
12/16/2015	28		
2/18/2016	25.4		
5/25/2016	24.6		
8/23/2016	25.7		
11/11/2016	21.6		
2/8/2017	23.5		
5/4/2017	23.2		
8/1/2017	25.1		
11/15/2018		30.8	
1/11/2019		29.5	1st verification re-sample
3/12/2019		24.9	2nd verification re-sample

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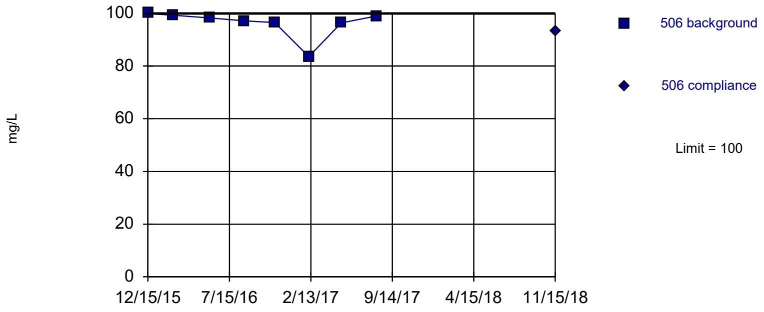
Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. 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.

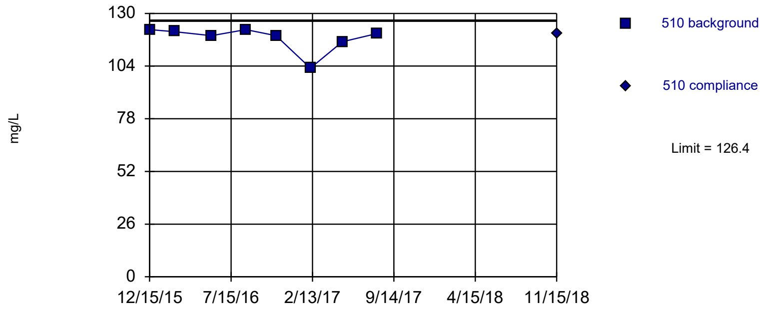
Constituent: Calcium Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on x^5 transformation): Mean=2.3e10, Std. Dev.=5.1e9, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7559, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Calcium Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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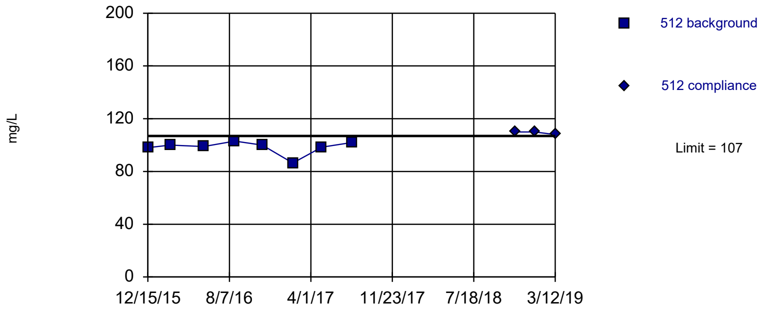
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on square transformation): Mean=9696, Std. Dev.=964.4, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7552, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

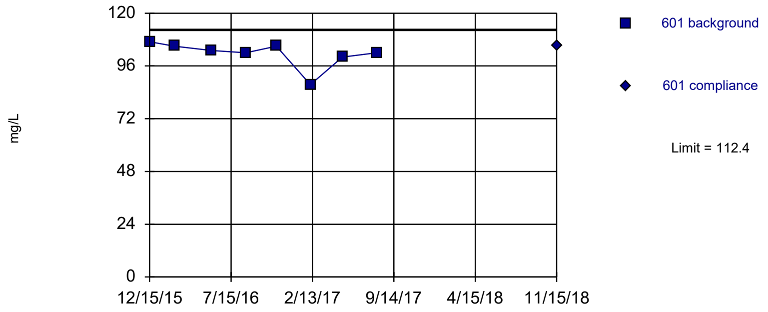
Constituent: Calcium Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=101.4, Std. Dev.=6.044, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7624, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Calcium Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Calcium (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506
12/15/2015	100	
2/18/2016	99.3	
5/25/2016	98.3	
8/23/2016	97.2	
11/11/2016	96.5	
2/8/2017	83.6	
5/4/2017	96.4	
8/4/2017	99	
11/15/2018		93.4

Prediction Limit

Constituent: Calcium (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	122	
2/18/2016	121	
5/25/2016	119	
8/23/2016	122	
11/10/2016	119	
2/8/2017	103	
5/3/2017	116	
8/1/2017	120	
11/15/2018		120

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512	
12/15/2015	98.1		
2/18/2016	100		
5/25/2016	98.9		
8/23/2016	103		
11/11/2016	100		
2/8/2017	86.4		
5/3/2017	98.4		
8/1/2017	102		
11/15/2018		110	
1/11/2019		110	1st verification re-sample
3/12/2019		108	2nd verification re-sample

Prediction Limit

Constituent: Calcium (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

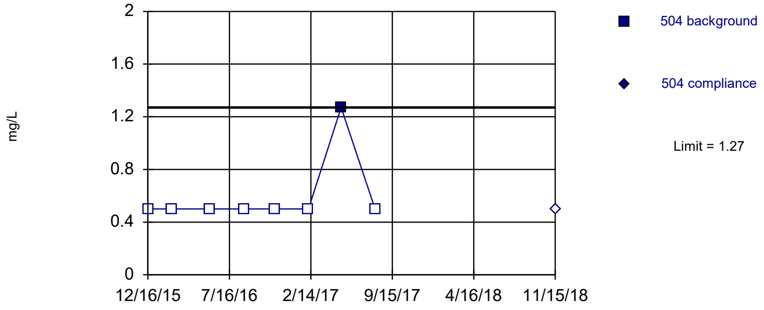
	601	601
12/15/2015	107	
2/18/2016	105	
5/26/2016	103	
8/23/2016	102	
11/11/2016	105	
2/8/2017	87.5	
5/3/2017	100	
8/1/2017	102	
11/15/2018		105

Sanitas™ v.9.6.12 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.

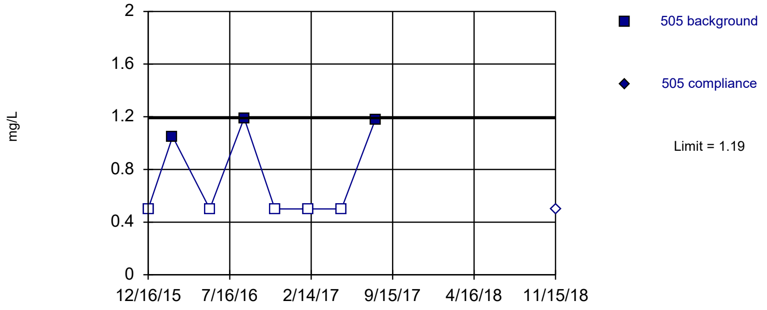
Constituent: Chloride Analysis Run 3/28/2019 8:28 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 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. 62.5% 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.

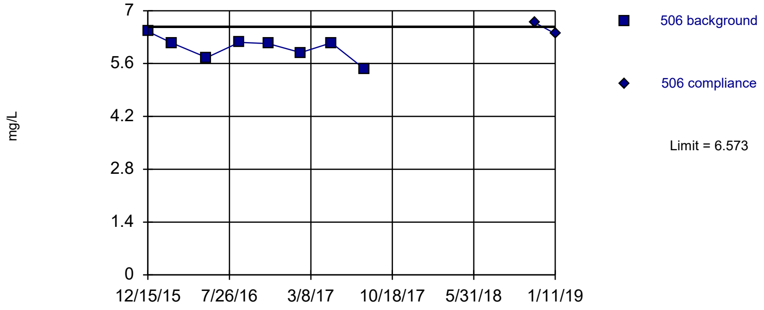
Constituent: Chloride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.018, Std. Dev.=0.307, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9179, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

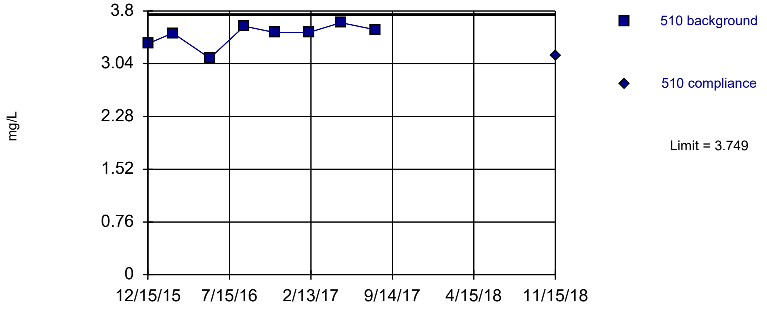
Constituent: Chloride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.456, Std. Dev.=0.1616, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8599, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Chloride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504
12/16/2015	<1	
2/18/2016	<1	
5/25/2016	<1	
8/23/2016	<1	
11/11/2016	<1	
2/8/2017	<1	
5/4/2017	1.27	
8/1/2017	<1	
11/15/2018		<1

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	<1	
2/18/2016	1.05	
5/25/2016	<1	
8/23/2016	1.19	
11/11/2016	<1	
2/8/2017	<1	
5/4/2017	<1	
8/1/2017	1.18	
11/15/2018		<1

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	506	506	
12/15/2015	6.45		
2/18/2016	6.15		
5/25/2016	5.76		
8/23/2016	6.16		
11/11/2016	6.13		
2/8/2017	5.89		
5/4/2017	6.15		
8/4/2017	5.45		
11/15/2018		6.69	
1/11/2019		6.39	1st verification re-sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	510	510
12/15/2015	3.33	
2/18/2016	3.48	
5/25/2016	3.12	
8/23/2016	3.58	
11/10/2016	3.49	
2/8/2017	3.49	
5/3/2017	3.63	
8/1/2017	3.53	
11/15/2018		3.15

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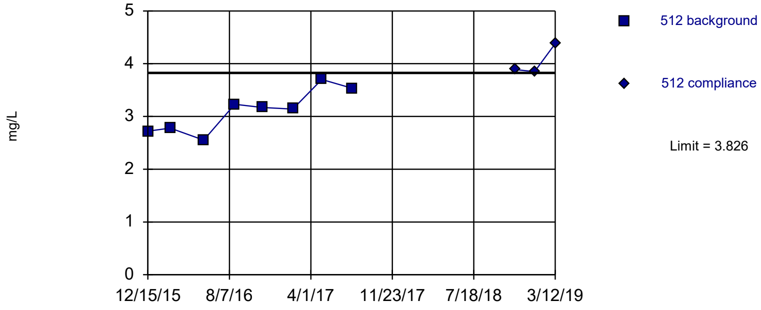
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.103, Std. Dev.=0.3996, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9537, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Chloride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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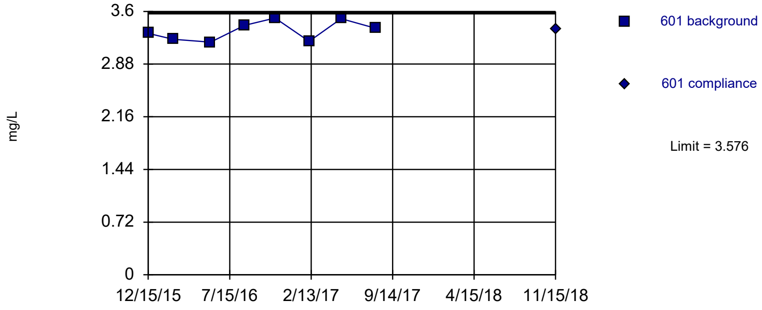
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.335, Std. Dev.=0.1332, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9027, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Chloride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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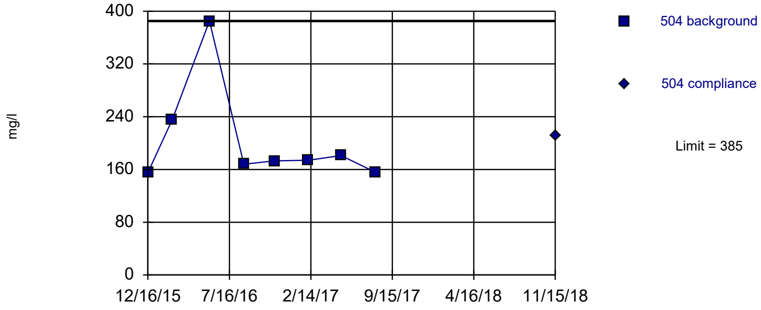
Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. 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: Dissolved Solids Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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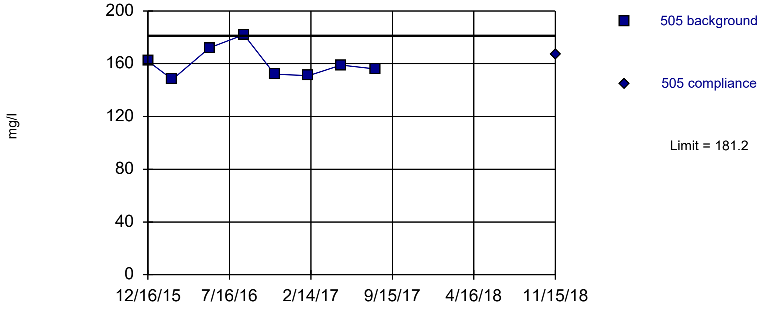
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=160.3, Std. Dev.=11.57, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9053, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

	512	512	
12/15/2015	2.72		
2/18/2016	2.78		
5/25/2016	2.55		
8/23/2016	3.23		
11/11/2016	3.17		
2/8/2017	3.14		
5/3/2017	3.7		
8/1/2017	3.53		
11/15/2018		3.89	
1/11/2019		3.85	1st verification re-sample
3/12/2019		4.38	2nd verification re-sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	3.3	
2/18/2016	3.22	
5/26/2016	3.18	
8/23/2016	3.41	
11/11/2016	3.51	
2/8/2017	3.19	
5/3/2017	3.5	
8/1/2017	3.37	
11/15/2018		3.35

Prediction Limit

Constituent: Dissolved Solids (mg/l)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504
12/16/2015	155	
2/18/2016	236	
5/25/2016	385	
8/23/2016	168	
11/11/2016	173	
2/8/2017	174	
5/4/2017	181	
8/1/2017	156	
11/15/2018		211

Prediction Limit

Constituent: Dissolved Solids (mg/l)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	162	
2/18/2016	148	
5/25/2016	172	
8/23/2016	182	
11/11/2016	152	
2/8/2017	151	
5/4/2017	159	
8/1/2017	156	
11/15/2018		167

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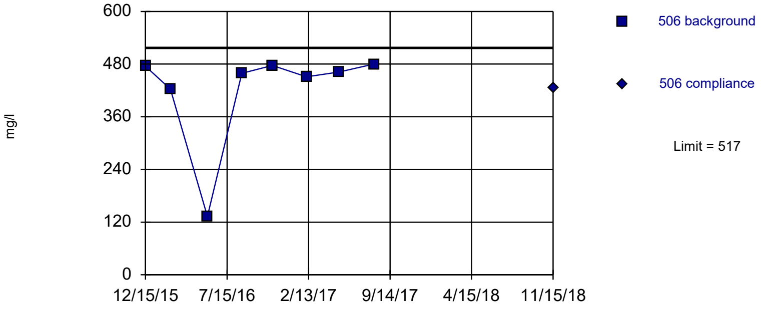
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on x^4 transformation): Mean=4.0e10, Std. Dev.=1.7e10, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7517, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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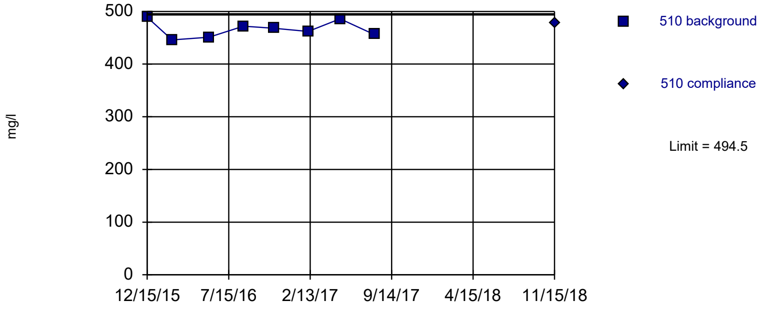
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=466.3, Std. Dev.=15.63, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9464, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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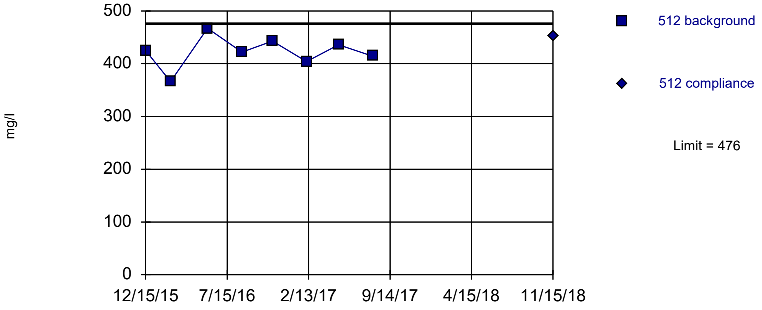
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=422.1, Std. Dev.=29.75, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9687, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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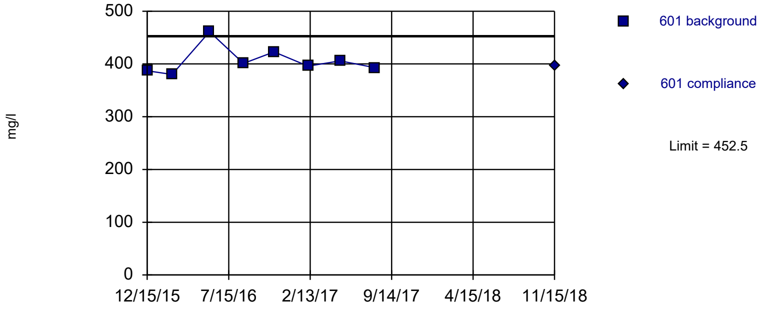
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=405.9, Std. Dev.=25.76, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8534, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Dissolved Solids (mg/l)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506
12/15/2015	475	
2/18/2016	423	
5/25/2016	133	
8/23/2016	459	
11/11/2016	477	
2/8/2017	451	
5/4/2017	462	
8/4/2017	480	
11/15/2018		426

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	510	510
12/15/2015	489	
2/18/2016	446	
5/25/2016	451	
8/23/2016	472	
11/10/2016	468	
2/8/2017	462	
5/3/2017	486	
8/1/2017	456	
11/15/2018		478

Prediction Limit

Constituent: Dissolved Solids (mg/l)　Analysis Run 3/28/2019 8:31 AM　View: LF III

Sibley　Client: SCS Engineers　Data: Sibley

	512	512
12/15/2015	425	
2/18/2016	366	
5/25/2016	467	
8/23/2016	422	
11/11/2016	443	
2/8/2017	404	
5/3/2017	436	
8/1/2017	414	
11/15/2018		452

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	387	
2/18/2016	380	
5/26/2016	461	
8/23/2016	401	
11/11/2016	423	
2/8/2017	396	
5/3/2017	406	
8/1/2017	393	
11/15/2018		397

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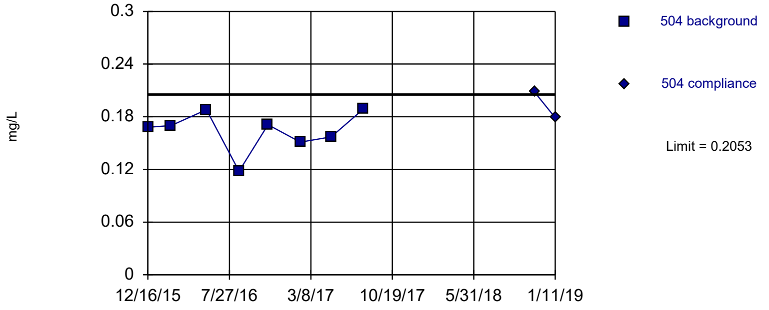
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.164, Std. Dev.=0.02279, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9007, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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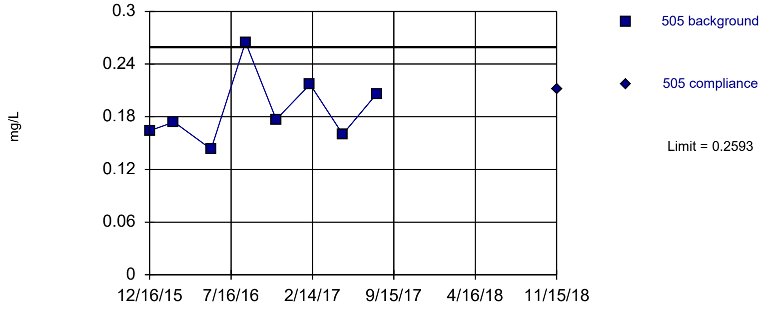
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.1883, Std. Dev.=0.03927, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9145, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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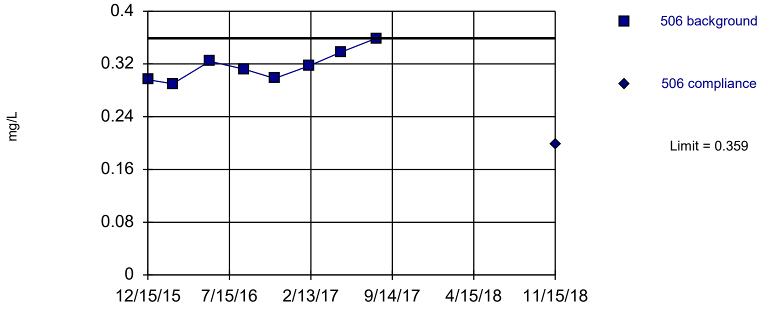
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.3168, Std. Dev.=0.02333, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9406, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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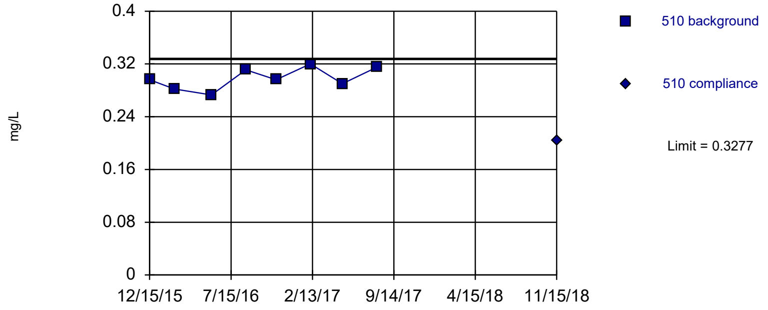
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.2979, Std. Dev.=0.01645, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9553, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504	
12/16/2015	0.168		
2/18/2016	0.17		
5/25/2016	0.188		
8/23/2016	0.118		
11/11/2016	0.171		
2/8/2017	0.151		
5/4/2017	0.157		
8/1/2017	0.189		
11/15/2018		0.208	
1/11/2019		0.179	1st verification re-sample

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	0.164	
2/18/2016	0.174	
5/25/2016	0.143	
8/23/2016	0.265	
11/11/2016	0.177	
2/8/2017	0.217	
5/4/2017	0.16	
8/1/2017	0.206	
11/15/2018		0.212

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506
12/15/2015	0.296	
2/18/2016	0.29	
5/25/2016	0.324	
8/23/2016	0.312	
11/11/2016	0.298	
2/8/2017	0.317	
5/4/2017	0.338	
8/4/2017	0.359	
11/15/2018		0.199

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	0.296	
2/18/2016	0.282	
5/25/2016	0.273	
8/23/2016	0.311	
11/10/2016	0.296	
2/8/2017	0.32	
5/3/2017	0.29	
8/1/2017	0.315	
11/15/2018		0.204

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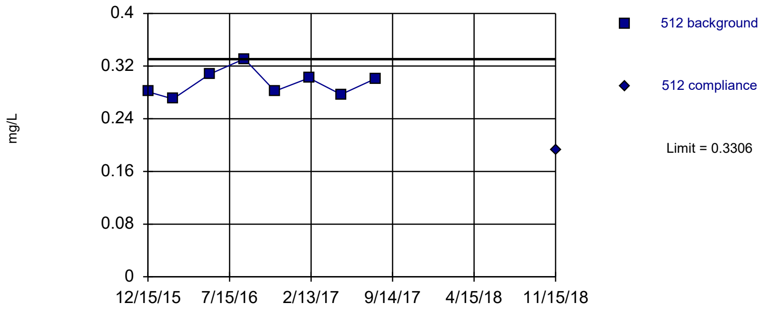
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.294, Std. Dev.=0.0202, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9269, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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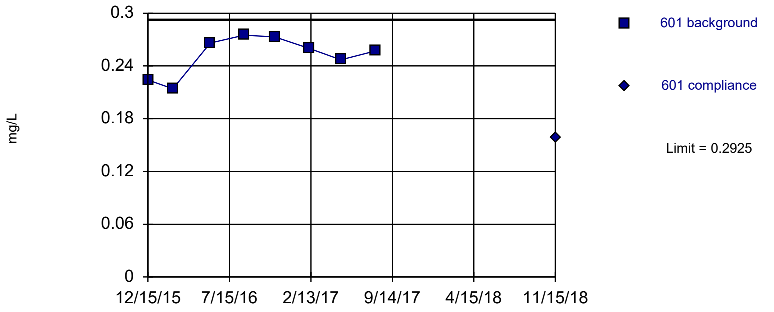
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.252, Std. Dev.=0.02239, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8908, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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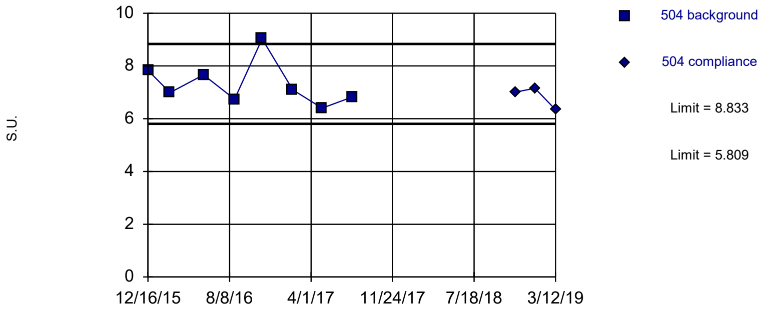
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.321, Std. Dev.=0.8353, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8916, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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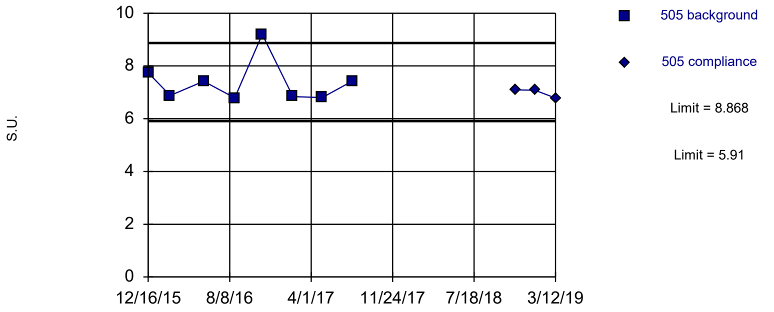
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.389, Std. Dev.=0.817, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7651, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	512	512
12/15/2015	0.281	
2/18/2016	0.27	
5/25/2016	0.308	
8/23/2016	0.331	
11/11/2016	0.282	
2/8/2017	0.302	
5/3/2017	0.277	
8/1/2017	0.301	
11/15/2018		0.192

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	601	601
12/15/2015	0.224	
2/18/2016	0.214	
5/26/2016	0.266	
8/23/2016	0.275	
11/11/2016	0.273	
2/8/2017	0.26	
5/3/2017	0.247	
8/1/2017	0.257	
11/15/2018		0.158

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504	
12/16/2015	7.83		
2/18/2016	6.99		
5/25/2016	7.66		
8/23/2016	6.74		
11/11/2016	9.03		
2/8/2017	7.09		
5/4/2017	6.4		
8/1/2017	6.83		
11/15/2018		7.01	
1/11/2019		7.15	extra sample
3/12/2019		6.34	extra sample

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 3/28/2019 8:31 AM   View: LF III

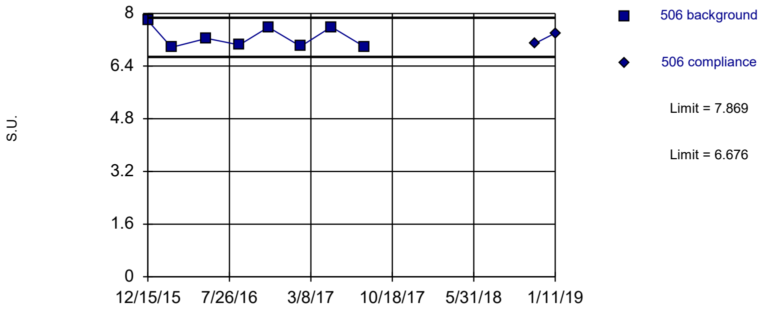
Sibley   Client: SCS Engineers   Data: Sibley

	505	505	
12/16/2015	7.74		
2/18/2016	6.88		
5/25/2016	7.42		
8/23/2016	6.79		
11/11/2016	9.2		
2/8/2017	6.84		
5/4/2017	6.8		
8/1/2017	7.44		
11/15/2018		7.09	
1/11/2019		7.08	extra sample
3/12/2019		6.78	extra sample

Within Limits

Prediction Limit

Intrawell Parametric



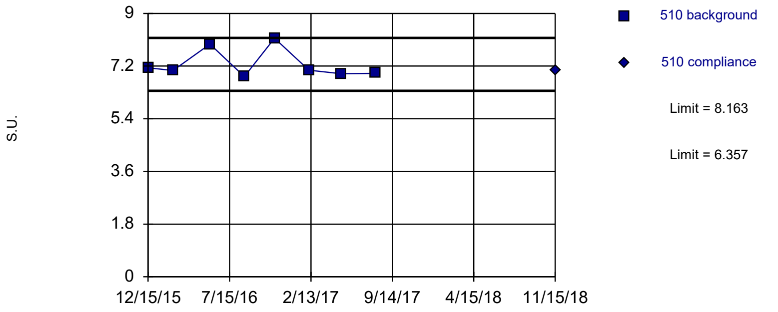
Background Data Summary: Mean=7.273, Std. Dev.=0.3294, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8334, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limits

Prediction Limit

Intrawell Parametric



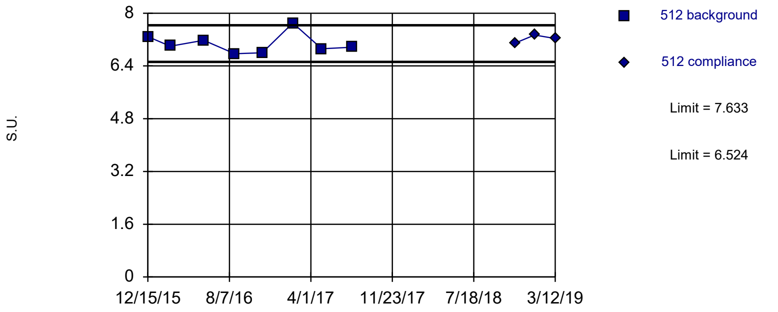
Background Data Summary: Mean=7.26, Std. Dev.=0.4988, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7542, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limits

Prediction Limit

Intrawell Parametric



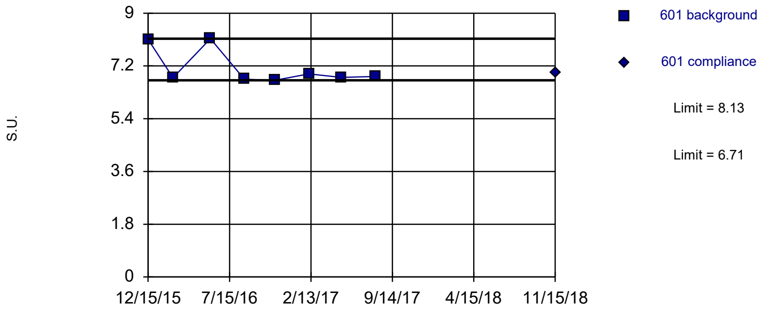
Background Data Summary: Mean=7.079, Std. Dev.=0.3064, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8903, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limits

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.02358. Individual comparison alpha = 0.01182 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: pH Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	506	506	
12/15/2015	7.78		
2/18/2016	6.97		
5/25/2016	7.24		
8/23/2016	7.04		
11/11/2016	7.58		
2/8/2017	7		
5/4/2017	7.59		
8/4/2017	6.98		
11/15/2018		7.08	
1/11/2019		7.4	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	510	510
12/15/2015	7.14	
2/18/2016	7.05	
5/25/2016	7.95	
8/23/2016	6.84	
11/10/2016	8.15	
2/8/2017	7.06	
5/3/2017	6.94	
8/1/2017	6.95	
11/15/2018		7.05

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512	
12/15/2015	7.29		
2/18/2016	7		
5/25/2016	7.18		
8/23/2016	6.77		
11/11/2016	6.8		
2/8/2017	7.7		
5/3/2017	6.92		
8/1/2017	6.97		
11/15/2018		7.09	
1/11/2019		7.34	extra sample
3/12/2019		7.23	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

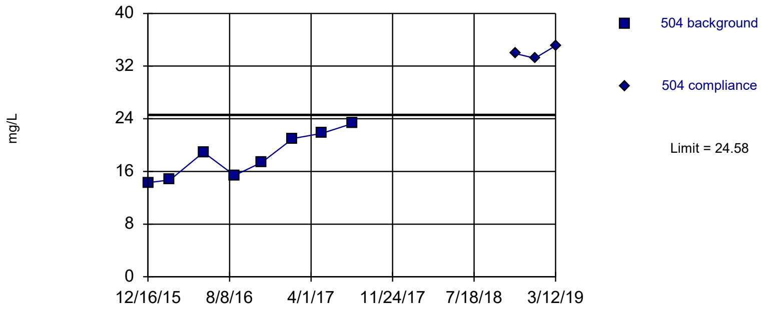
	601	601
12/15/2015	8.11	
2/18/2016	6.8	
5/26/2016	8.13	
8/23/2016	6.75	
11/11/2016	6.71	
2/8/2017	6.93	
5/4/2017	6.81	
8/1/2017	6.84	
11/15/2018		6.96

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=18.35, Std. Dev.=3.445, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9225, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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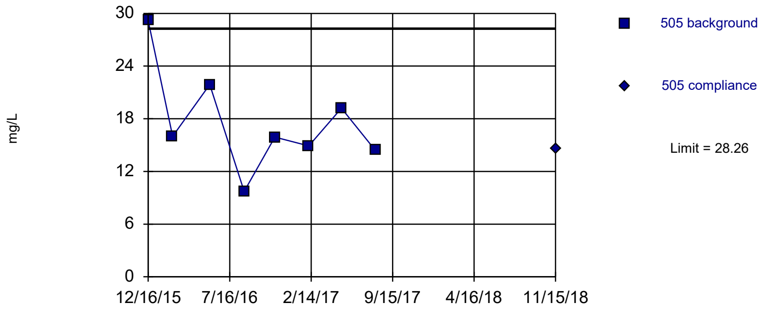
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=17.65, Std. Dev.=5.862, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9245, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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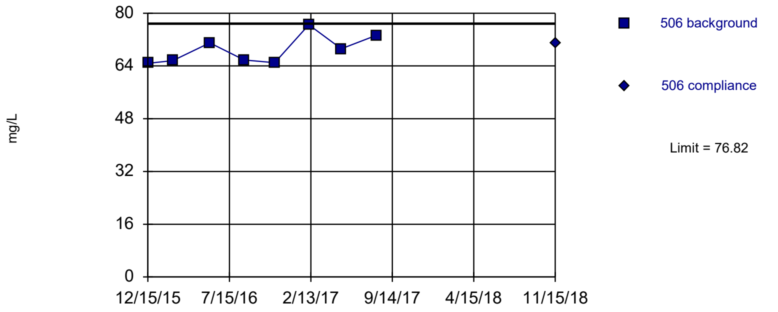
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=68.9, Std. Dev.=4.378, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8758, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

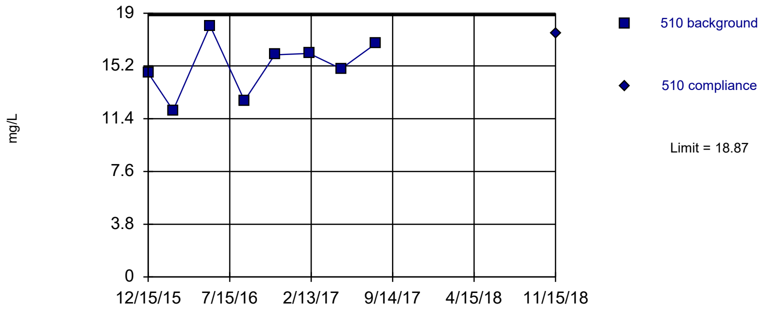
Constituent: Sulfate Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=15.18, Std. Dev.=2.042, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9582, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	504	504	
12/16/2015	14.3		
2/18/2016	14.7		
5/25/2016	18.9		
8/23/2016	15.4		
11/11/2016	17.4		
2/8/2017	21		
5/4/2017	21.8		
8/1/2017	23.3		
11/15/2018		33.9	
1/11/2019		33.2	1st verification re-sample
3/12/2019		35.1	2nd verification re-sample

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	29.2	
2/18/2016	16	
5/25/2016	21.9	
8/23/2016	9.73	
11/11/2016	15.9	
2/8/2017	14.9	
5/4/2017	19.2	
8/1/2017	14.4	
11/15/2018		14.6

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	506	506
12/15/2015	64.8	
2/18/2016	65.6	
5/25/2016	71	
8/23/2016	65.8	
11/11/2016	65	
2/8/2017	76.5	
5/4/2017	69.2	
8/4/2017	73.3	
11/15/2018		70.8

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

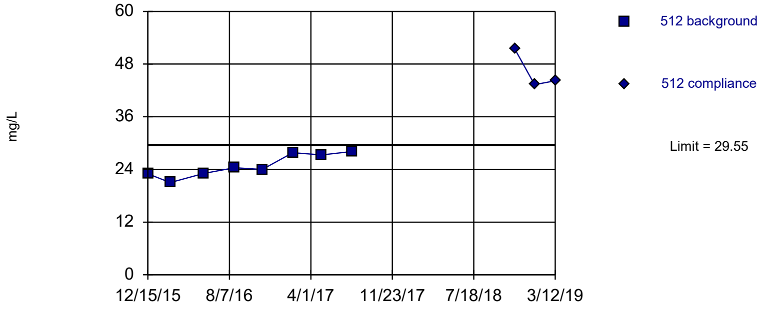
Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	14.7	
2/18/2016	12	
5/25/2016	18.1	
8/23/2016	12.7	
11/10/2016	16	
2/8/2017	16.1	
5/3/2017	15	
8/1/2017	16.8	
11/15/2018		17.5

Exceeds Limit

Prediction Limit

Intrawell Parametric



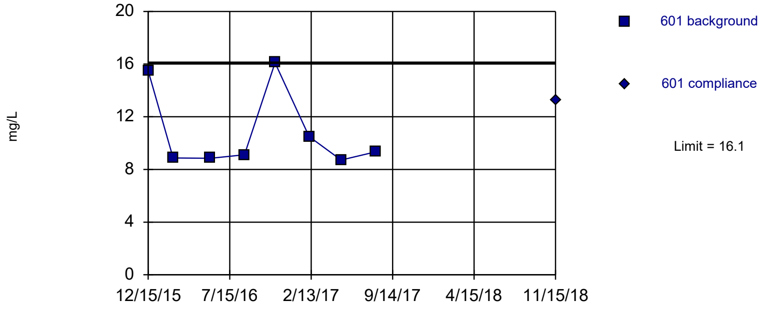
Background Data Summary: Mean=24.84, Std. Dev.=2.605, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9088, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 3/28/2019 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. 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 8:29 AM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 3/28/2019 8:31 AM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512	
12/15/2015	23		
2/18/2016	21		
5/25/2016	23.1		
8/23/2016	24.4		
11/11/2016	24		
2/8/2017	27.8		
5/3/2017	27.3		
8/1/2017	28.1		
11/15/2018		51.4	
1/11/2019		43.3	1st verification re-sample
3/12/2019		44.2	2nd verification re-sample

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 3/28/2019 8:31 AM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	601	601
12/15/2015	15.5	
2/18/2016	8.87	
5/26/2016	8.85	
8/23/2016	9.11	
11/11/2016	16.1	
2/8/2017	10.5	
5/3/2017	8.71	
8/1/2017	9.33	
11/15/2018		13.3

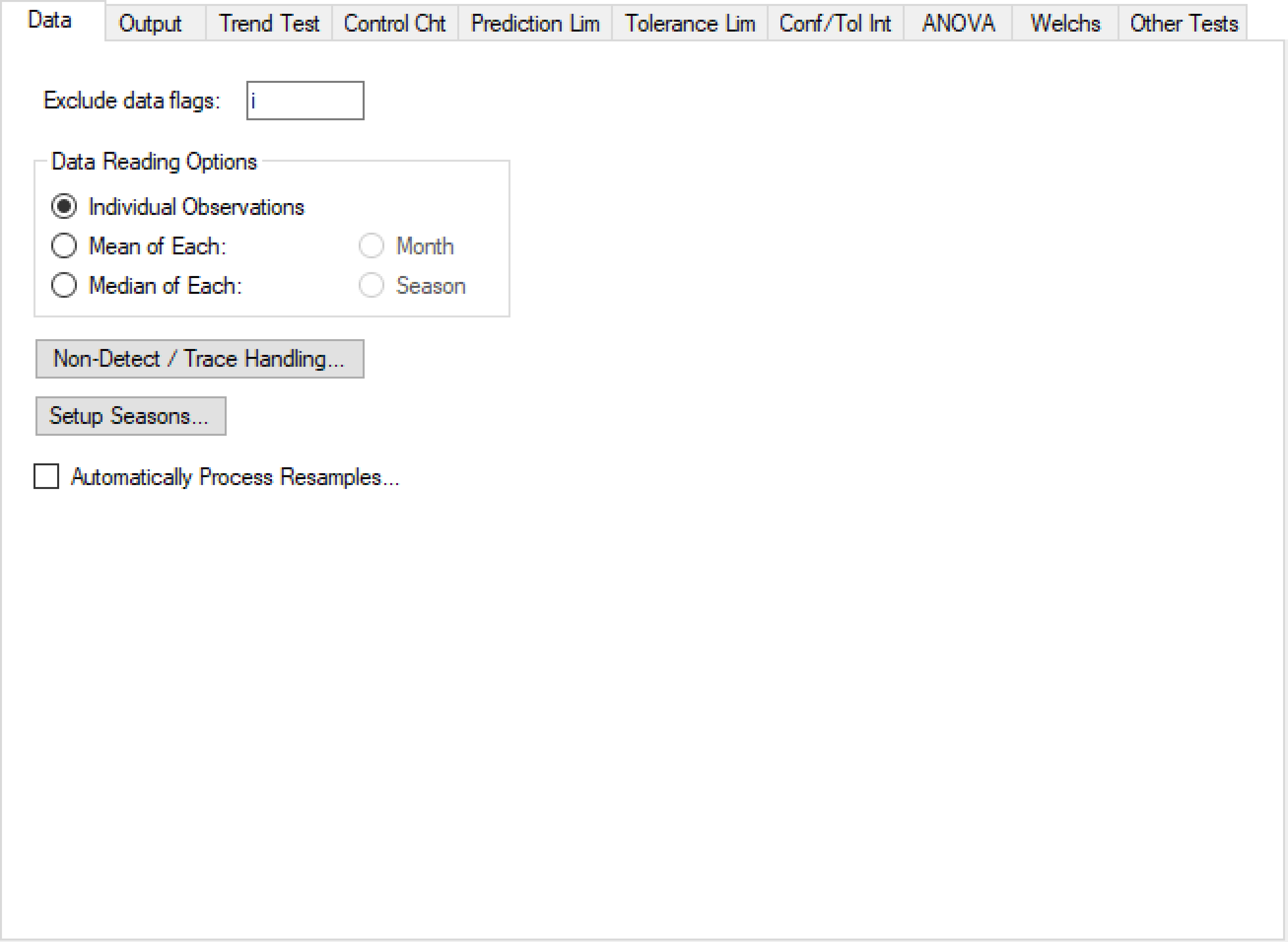
Prediction Limit

Sibley   Client: SCS Engineers   Data: Sibley   Printed 3/28/2019, 8:31 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	504	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)	505	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)	506	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)	510	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)	512	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)	601	0.2	n/a	11/15/2018	0.1ND	No	8	100	n/a	0.005912	NP Intra (NDs) 1 of 3
Calcium (mg/L)	504	36.83	n/a	3/12/2019	35.4	No	8	0	No	0.00188	Param Intra 1 of 3
Calcium (mg/L)	505	28.11	n/a	3/12/2019	24.9	No	8	0	No	0.00188	Param Intra 1 of 3
Calcium (mg/L)	506	100	n/a	11/15/2018	93.4	No	8	0	n/a	0.005912	NP Intra (normality) ...
Calcium (mg/L)	510	126.4	n/a	11/15/2018	120	No	8	0	x^5	0.00188	Param Intra 1 of 3
Calcium (mg/L)	**512**	**107**	**n/a**	**3/12/2019**	**108**	**Yes**	**8**	**0**	**x^2**	**0.00188**	**Param Intra 1 of 3**
Calcium (mg/L)	601	112.4	n/a	11/15/2018	105	No	8	0	No	0.00188	Param Intra 1 of 3
Chloride (mg/L)	504	1.27	n/a	11/15/2018	0.5ND	No	8	87.5	n/a	0.005912	NP Intra (NDs) 1 of 3
Chloride (mg/L)	505	1.19	n/a	11/15/2018	0.5ND	No	8	62.5	n/a	0.005912	NP Intra (NDs) 1 of 3
Chloride (mg/L)	506	6.573	n/a	1/11/2019	6.39	No	8	0	No	0.00188	Param Intra 1 of 3
Chloride (mg/L)	510	3.749	n/a	11/15/2018	3.15	No	8	0	No	0.00188	Param Intra 1 of 3
Chloride (mg/L)	**512**	**3.826**	**n/a**	**3/12/2019**	**4.38**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Chloride (mg/L)	601	3.576	n/a	11/15/2018	3.35	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	504	385	n/a	11/15/2018	211	No	8	0	n/a	0.005912	NP Intra (normality) ...
Dissolved Solids (mg/l)	505	181.2	n/a	11/15/2018	167	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	506	517	n/a	11/15/2018	426	No	8	0	x^4	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	510	494.5	n/a	11/15/2018	478	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	512	476	n/a	11/15/2018	452	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	601	452.5	n/a	11/15/2018	397	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	504	0.2053	n/a	1/11/2019	0.179	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	505	0.2593	n/a	11/15/2018	0.212	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	506	0.359	n/a	11/15/2018	0.199	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	510	0.3277	n/a	11/15/2018	0.204	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	512	0.3306	n/a	11/15/2018	0.192	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	601	0.2925	n/a	11/15/2018	0.158	No	8	0	No	0.00188	Param Intra 1 of 3
pH (S.U.)	504	8.833	5.809	3/12/2019	6.34	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	505	8.868	5.91	3/12/2019	6.78	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	506	7.869	6.676	1/11/2019	7.4	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	510	8.163	6.357	11/15/2018	7.05	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	512	7.633	6.524	3/12/2019	7.23	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	601	8.13	6.71	11/15/2018	6.96	No	8	0	n/a	0.01182	NP Intra (normality) ...
Sulfate (mg/L)	**504**	**24.58**	**n/a**	**3/12/2019**	**35.1**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Sulfate (mg/L)	505	28.26	n/a	11/15/2018	14.6	No	8	0	No	0.00188	Param Intra 1 of 3
Sulfate (mg/L)	506	76.82	n/a	11/15/2018	70.8	No	8	0	No	0.00188	Param Intra 1 of 3
Sulfate (mg/L)	510	18.87	n/a	11/15/2018	17.5	No	8	0	No	0.00188	Param Intra 1 of 3
Sulfate (mg/L)	**512**	**29.55**	**n/a**	**3/12/2019**	**44.2**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Sulfate (mg/L)	601	16.1	n/a	11/15/2018	13.3	No	8	0	n/a	0.005912	NP Intra (normality) ...

ATTACHMENT 2

Sanitas^{TM} Configuration Settings



Exclude data flags: i

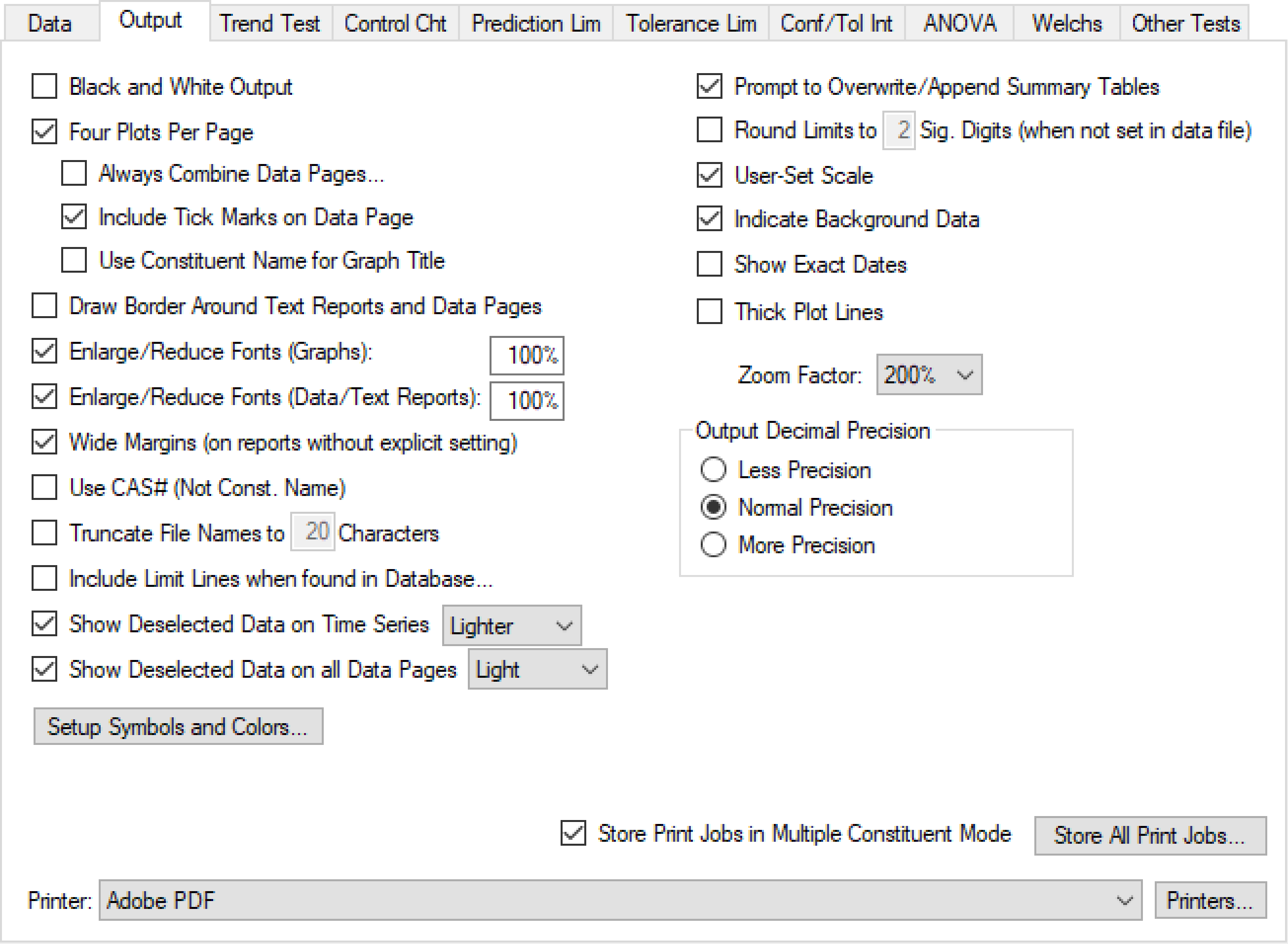
Data Reading Options

● Individual Observations

○ Mean of Each: ○ Month

○ Median of Each: ○ Season

☐ Automatically Process Resamples...



☐ Black and White Output

☑ Four Plots Per Page

  ☐ Always Combine Data Pages...

  ☑ Include Tick Marks on Data Page

  ☐ Use Constituent Name for Graph Title

☐ Draw Border Around Text Reports and Data Pages

☑ Enlarge/Reduce Fonts (Graphs): 100%

☑ Enlarge/Reduce Fonts (Data/Text Reports): 100%

☑ 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...

☑ Show Deselected Data on Time Series: Lighter

☑ Show Deselected Data on all Data Pages: Light

☑ Prompt to Overwrite/Append Summary Tables

☐ Round Limits to 2 Sig. Digits (when not set in data file)

☑ User-Set Scale

☑ Indicate Background Data

☐ Show Exact Dates

☐ Thick Plot Lines

Zoom Factor: 200%

Output Decimal Precision

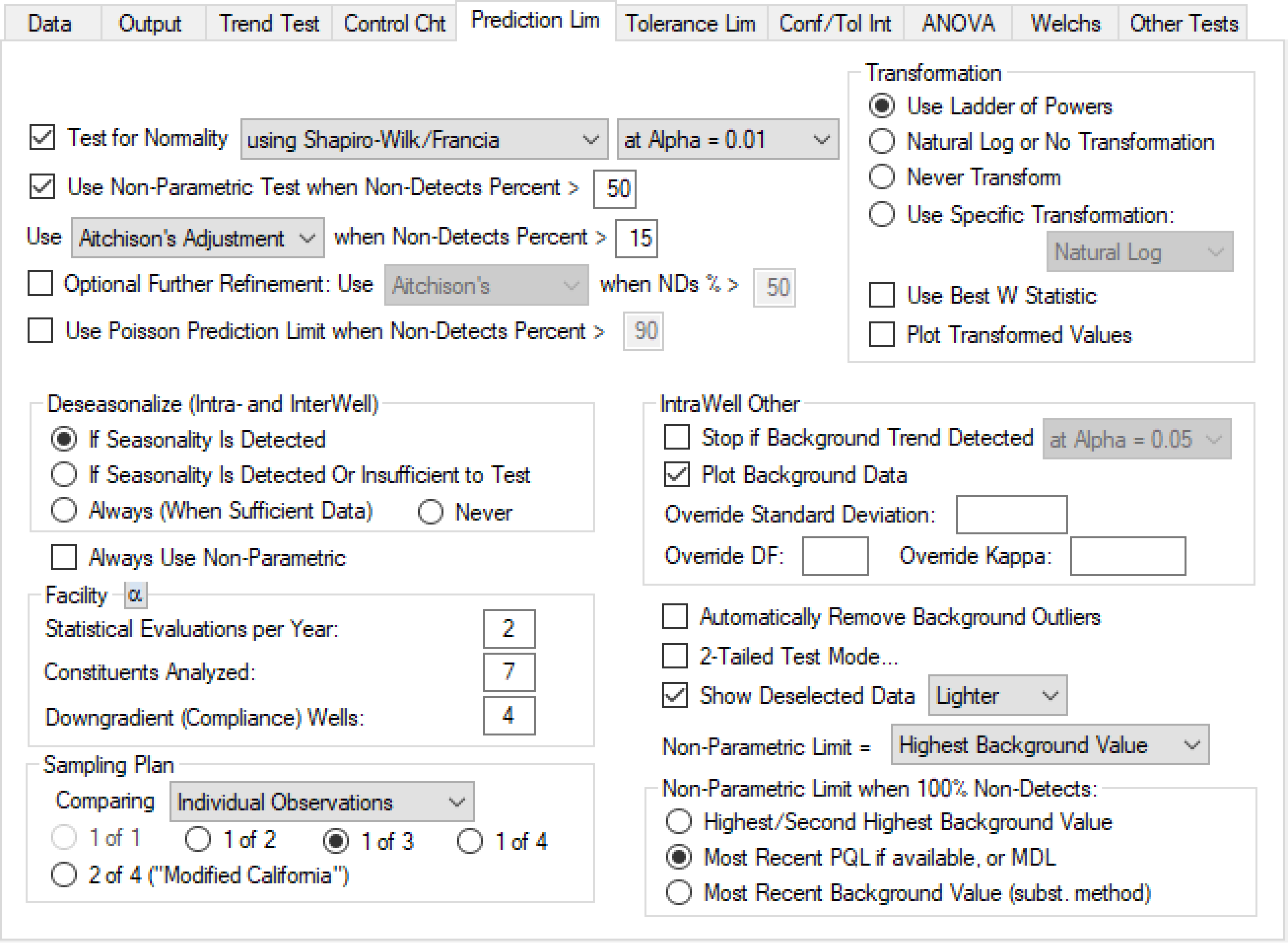
○ Less Precision

● Normal Precision

○ More Precision

☑ Store Print Jobs in Multiple Constituent Mode

Printer: Adobe PDF



☑ 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: 4

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:

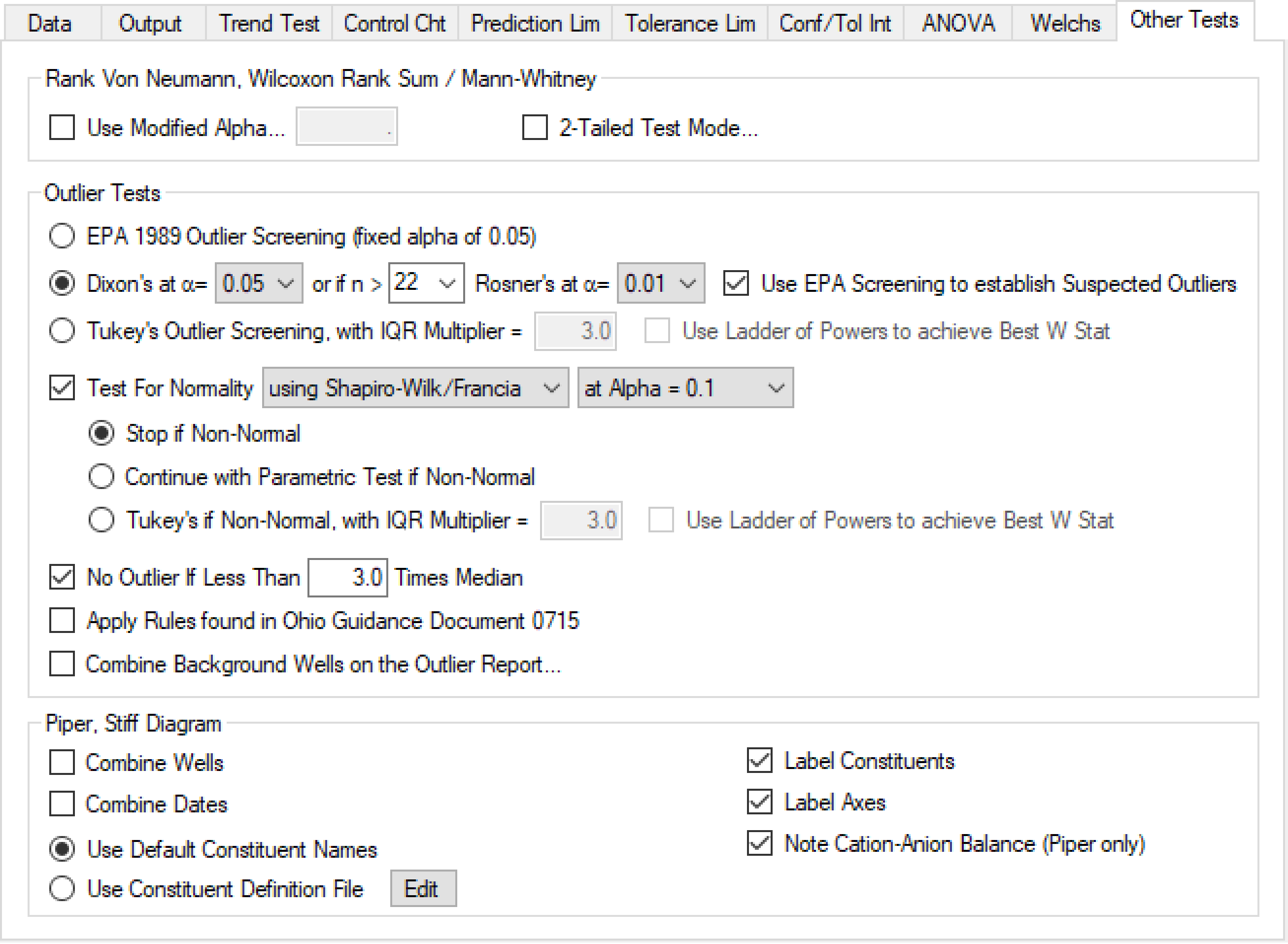
☐ Automatically Remove Background Outliers

☐ 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)



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 ☑ 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

☑ 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

☑ 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

☑ Label Constituents

☑ Label Axes

☑ Note Cation-Anion Balance (Piper only)

ATTACHMENT 2-2

Spring 2019 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

September 27, 2019

STATE OF MISSOURI
JOHN R. ROCKHOLD
9-27-19
RG0092
REGISTERED GEOLOGIST

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 - CCR Landfill
Spring 2019 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the CCR Landfill 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 two Appendix III constituents above their respective prediction limit in monitoring wells MW-504, MW-506, and MW-512.

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
Chloride				
506	6.573	7.05	7.33	7.17
512	3.826	4.17	4.35	4.91
Sulfate				
504	24.58	36.3	36.3	35.6
512	29.55	40.1	42.1	41.0

*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 four SSIs above the background prediction limits. These include chloride in downgradient monitoring wells MW-506 and MW-512 and sulfate in upgradient monitoring well MW-504 and downgradient monitoring well MW-512.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas^{TM} Output:

Statistical evaluation output from Sanitas^{TM} 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^{TM} Configuration Settings:

Screen shots of the applicable Sanitas^{TM} 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
CCR Landfill
September 27, 2019

ATTACHMENT 1

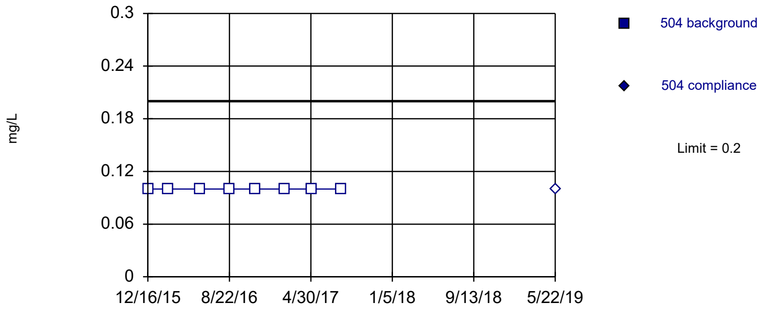
Sanitas^{TM} Output

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%. 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.

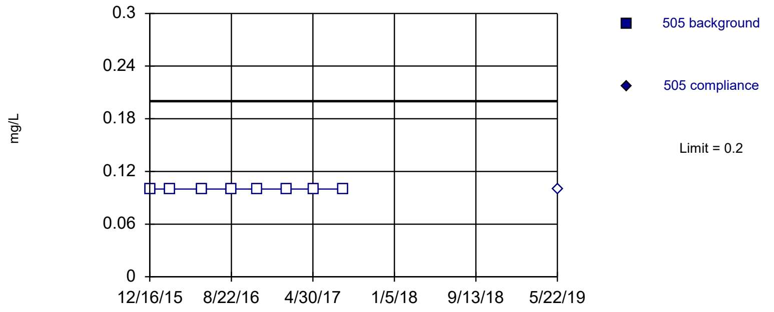
Constituent: Boron Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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%. 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.

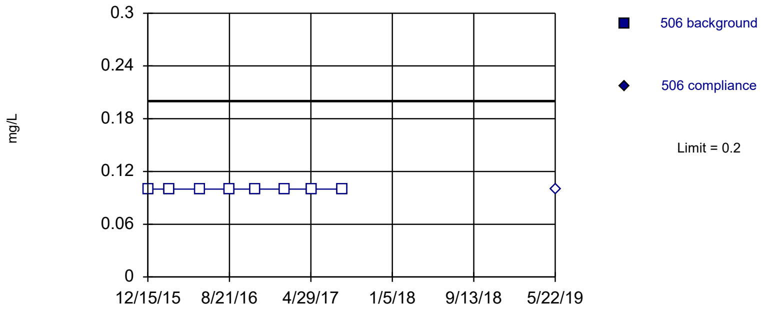
Constituent: Boron Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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%. 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.

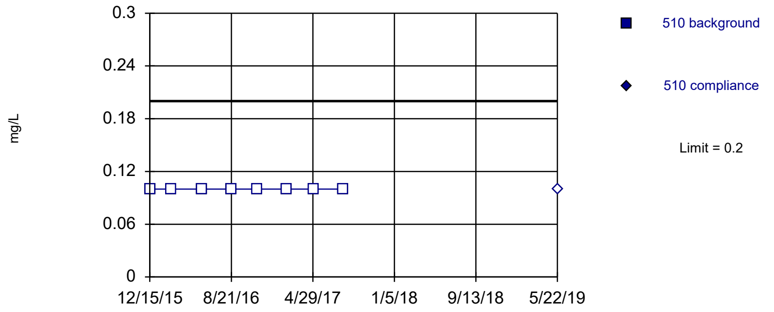
Constituent: Boron Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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%. 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 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 9/23/2019 1:59 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504
12/16/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/4/2017	<0.2	
8/1/2017	<0.2	
5/22/2019		<0.2

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 9/23/2019 1:59 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/4/2017	<0.2	
8/1/2017	<0.2	
5/22/2019		<0.2

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 9/23/2019 1:59 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506
12/15/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/4/2017	<0.2	
8/4/2017	<0.2	
5/22/2019		<0.2

Prediction Limit

Constituent: Boron (mg/L)   Analysis Run 9/23/2019 1:59 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/10/2016	<0.2	
2/8/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
5/22/2019		<0.2

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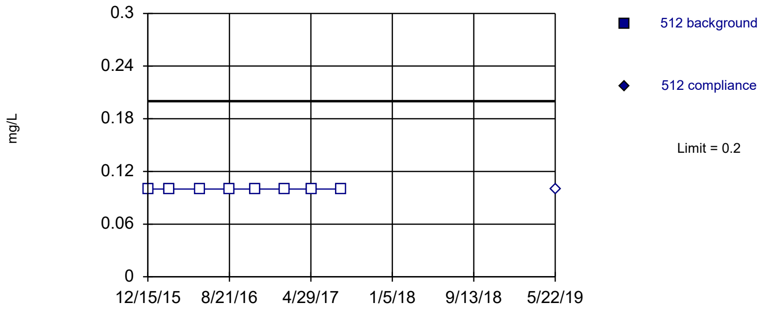
Hollow symbols indicate censored values.

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.

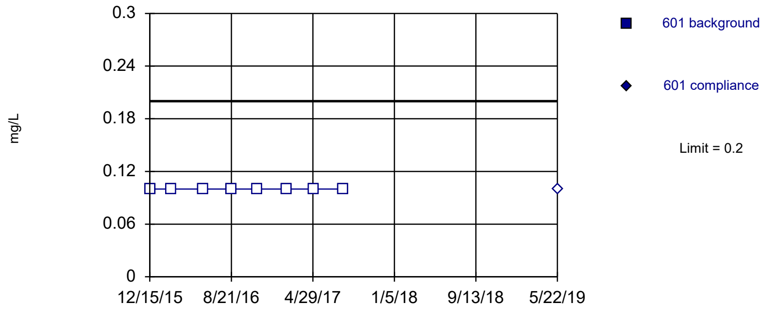
Constituent: Boron Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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%. 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 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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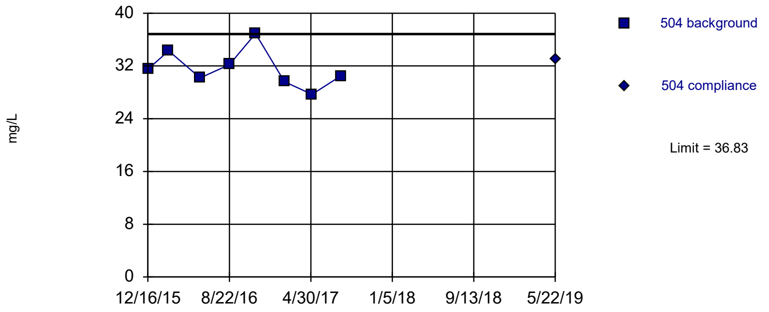
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=31.61, Std. Dev.=2.882, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9573, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

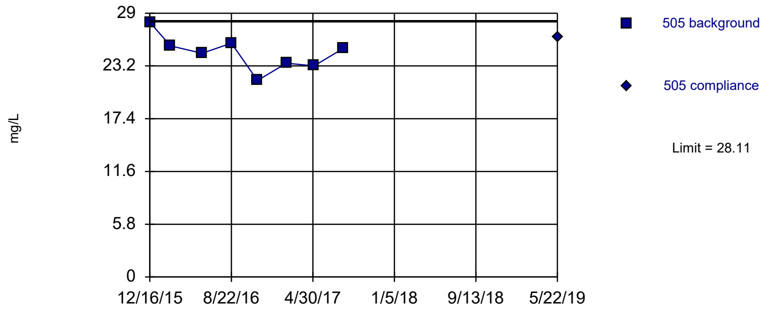
Constituent: Calcium Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=24.64, Std. Dev.=1.921, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9774, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Calcium Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512
12/15/2015	<0.2	
2/18/2016	<0.2	
5/25/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<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 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	<0.2	
2/18/2016	<0.2	
5/26/2016	<0.2	
8/23/2016	<0.2	
11/11/2016	<0.2	
2/8/2017	<0.2	
5/3/2017	<0.2	
8/1/2017	<0.2	
5/22/2019		<0.2

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	504	504
12/16/2015	31.5	
2/18/2016	34.3	
5/25/2016	30.2	
8/23/2016	32.2	
11/11/2016	36.9	
2/8/2017	29.6	
5/4/2017	27.7	
8/1/2017	30.5	
5/22/2019		33.1

Prediction Limit

Constituent: Calcium (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	28	
2/18/2016	25.4	
5/25/2016	24.6	
8/23/2016	25.7	
11/11/2016	21.6	
2/8/2017	23.5	
5/4/2017	23.2	
8/1/2017	25.1	
5/22/2019		26.4

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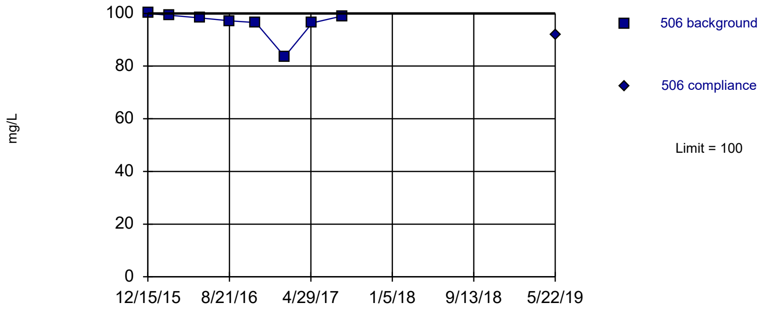
Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. 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: Calcium Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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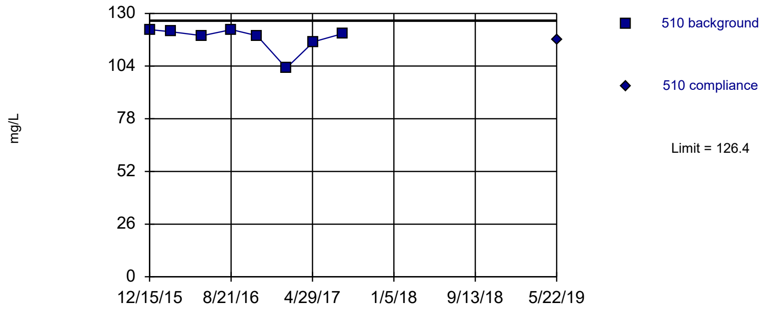
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on x^5 transformation): Mean=2.3e10, Std. Dev.=5.1e9, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7559, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Calcium Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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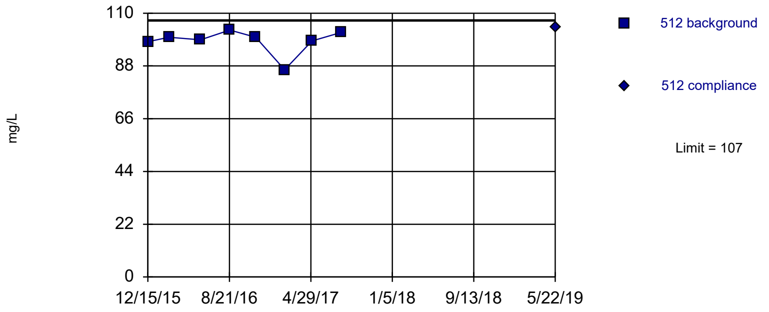
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on square transformation): Mean=9696, Std. Dev.=964.4, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7552, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

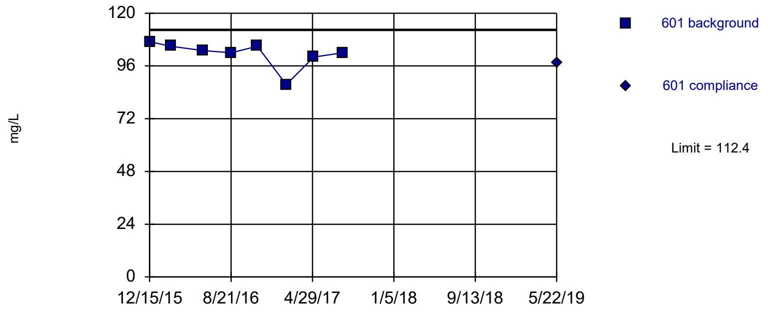
Constituent: Calcium Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=101.4, Std. Dev.=6.044, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7624, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Calcium Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

	506	506
12/15/2015	100	
2/18/2016	99.3	
5/25/2016	98.3	
8/23/2016	97.2	
11/11/2016	96.5	
2/8/2017	83.6	
5/4/2017	96.4	
8/4/2017	99	
5/22/2019		91.7

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	510	510
12/15/2015	122	
2/18/2016	121	
5/25/2016	119	
8/23/2016	122	
11/10/2016	119	
2/8/2017	103	
5/3/2017	116	
8/1/2017	120	
5/22/2019		117

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512
12/15/2015	98.1	
2/18/2016	100	
5/25/2016	98.9	
8/23/2016	103	
11/11/2016	100	
2/8/2017	86.4	
5/3/2017	98.4	
8/1/2017	102	
5/22/2019		104

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	107	
2/18/2016	105	
5/26/2016	103	
8/23/2016	102	
11/11/2016	105	
2/8/2017	87.5	
5/3/2017	100	
8/1/2017	102	
5/22/2019		97.4

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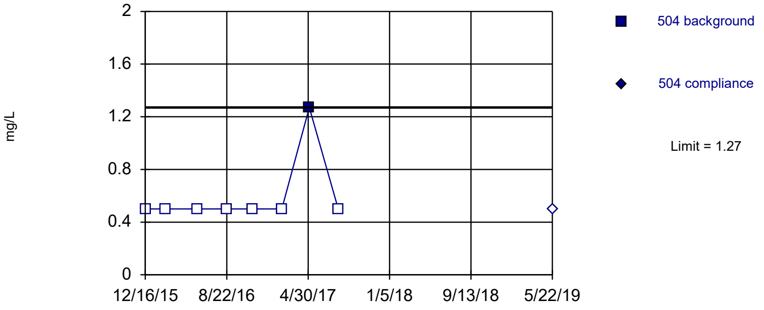
Hollow symbols indicate censored values.

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.

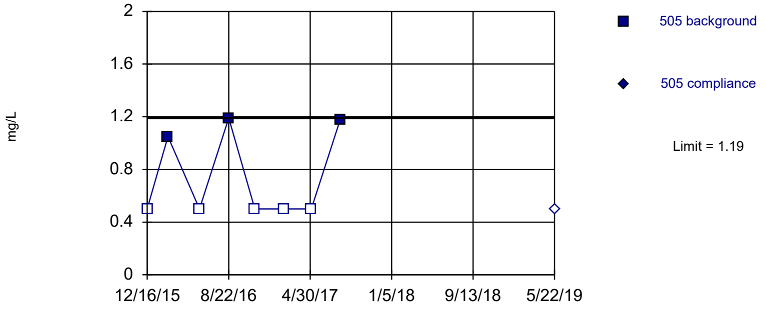
Constituent: Chloride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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. 62.5% 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.

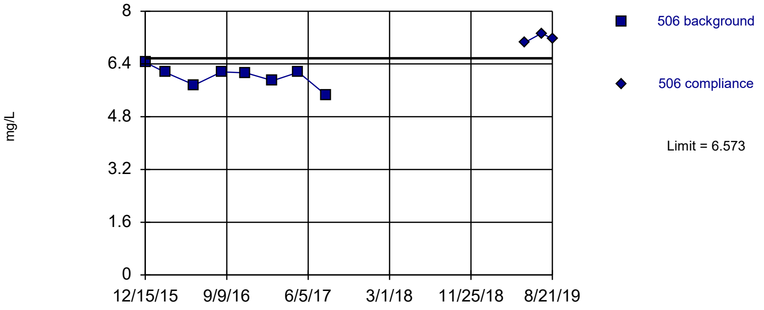
Constituent: Chloride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.018, Std. Dev.=0.307, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9179, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

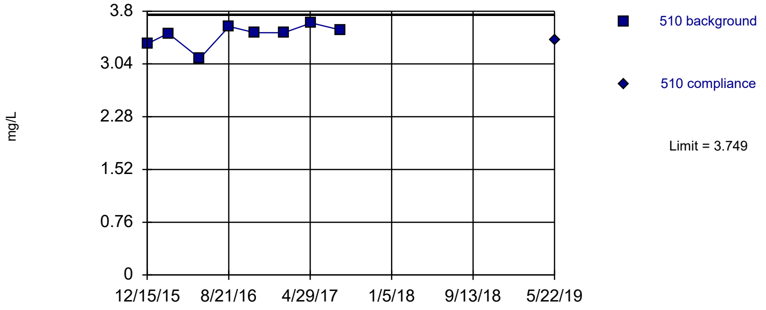
Constituent: Chloride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.456, Std. Dev.=0.1616, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8599, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Chloride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	504	504
12/16/2015	<1	
2/18/2016	<1	
5/25/2016	<1	
8/23/2016	<1	
11/11/2016	<1	
2/8/2017	<1	
5/4/2017	1.27	
8/1/2017	<1	
5/22/2019		<1

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	<1	
2/18/2016	1.05	
5/25/2016	<1	
8/23/2016	1.19	
11/11/2016	<1	
2/8/2017	<1	
5/4/2017	<1	
8/1/2017	1.18	
5/22/2019		<1

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506	
12/15/2015	6.45		
2/18/2016	6.15		
5/25/2016	5.76		
8/23/2016	6.16		
11/11/2016	6.13		
2/8/2017	5.89		
5/4/2017	6.15		
8/4/2017	5.45		
5/22/2019		7.05	
7/16/2019		7.33	1st verification sample
8/21/2019		7.17	2nd verification sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

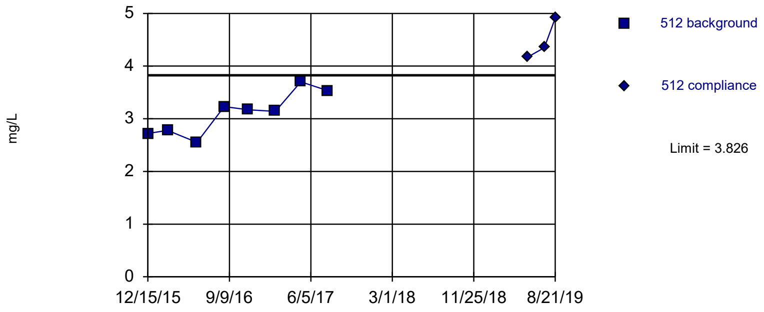
Sibley Client: SCS Engineers Data: Sibley

	510	510
12/15/2015	3.33	
2/18/2016	3.48	
5/25/2016	3.12	
8/23/2016	3.58	
11/10/2016	3.49	
2/8/2017	3.49	
5/3/2017	3.63	
8/1/2017	3.53	
5/22/2019		3.39

Exceeds Limit

Prediction Limit

Intrawell Parametric



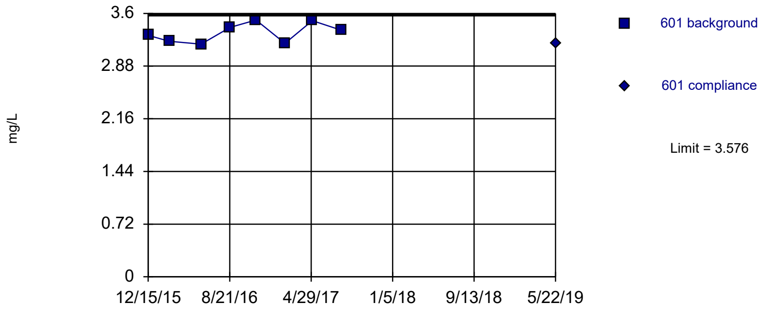
Background Data Summary: Mean=3.103, Std. Dev.=0.3996, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9537, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Chloride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



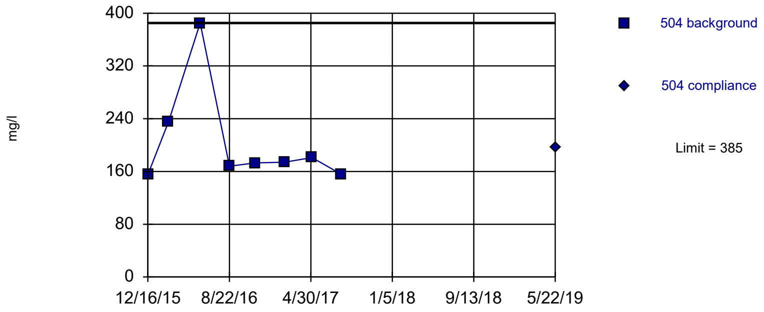
Background Data Summary: Mean=3.335, Std. Dev.=0.1332, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9027, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Chloride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Non-parametric



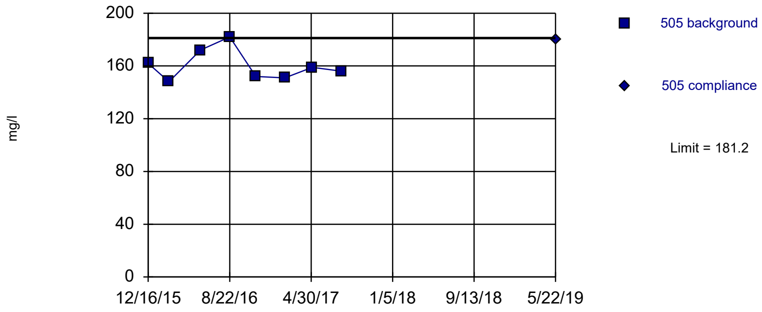
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=160.3, Std. Dev.=11.57, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9053, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	512	512	
12/15/2015	2.72		
2/18/2016	2.78		
5/25/2016	2.55		
8/23/2016	3.23		
11/11/2016	3.17		
2/8/2017	3.14		
5/3/2017	3.7		
8/1/2017	3.53		
5/22/2019		4.17	
7/16/2019		4.35	1st verification sample
8/21/2019		4.91	2nd verification sample

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	3.3	
2/18/2016	3.22	
5/26/2016	3.18	
8/23/2016	3.41	
11/11/2016	3.51	
2/8/2017	3.19	
5/3/2017	3.5	
8/1/2017	3.37	
5/22/2019		3.19

Prediction Limit

Constituent: Dissolved Solids (mg/l)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504
12/16/2015	155	
2/18/2016	236	
5/25/2016	385	
8/23/2016	168	
11/11/2016	173	
2/8/2017	174	
5/4/2017	181	
8/1/2017	156	
5/22/2019		197

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	505	505
12/16/2015	162	
2/18/2016	148	
5/25/2016	172	
8/23/2016	182	
11/11/2016	152	
2/8/2017	151	
5/4/2017	159	
8/1/2017	156	
5/22/2019		180

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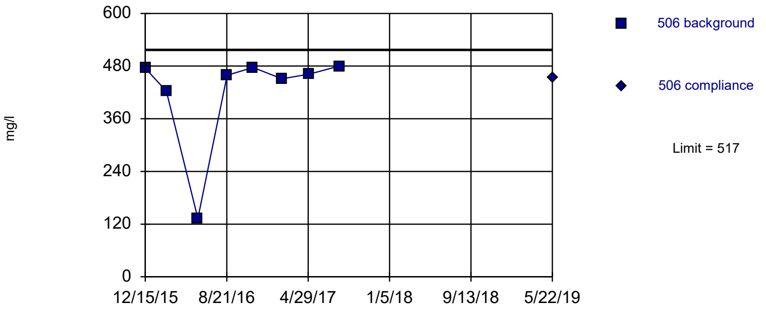
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on x^4 transformation): Mean=4.0e10, Std. Dev.=1.7e10, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7517, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:57 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

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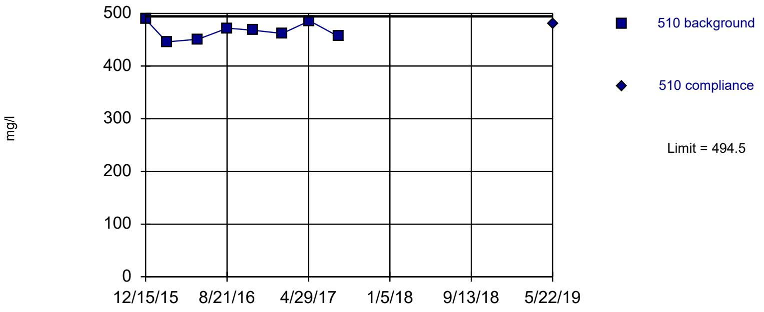
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=466.3, Std. Dev.=15.63, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9464, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:57 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

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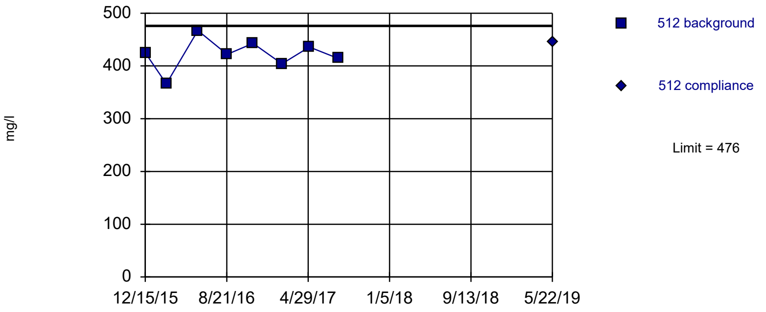
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=422.1, Std. Dev.=29.75, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9687, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:57 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

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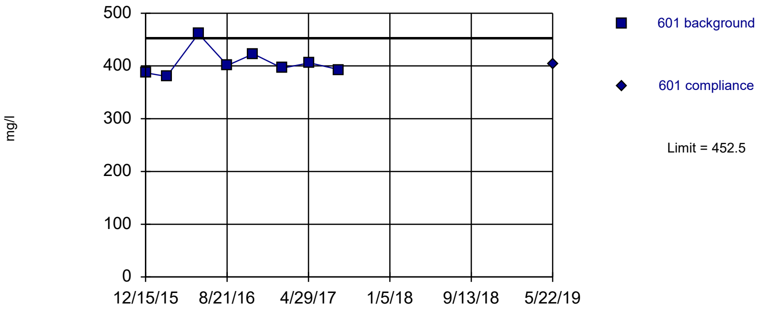
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=405.9, Std. Dev.=25.76, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8534, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Dissolved Solids Analysis Run 9/23/2019 1:57 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	506	506
12/15/2015	475	
2/18/2016	423	
5/25/2016	133	
8/23/2016	459	
11/11/2016	477	
2/8/2017	451	
5/4/2017	462	
8/4/2017	480	
5/22/2019		453

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	510	510
12/15/2015	489	
2/18/2016	446	
5/25/2016	451	
8/23/2016	472	
11/10/2016	468	
2/8/2017	462	
5/3/2017	486	
8/1/2017	456	
5/22/2019		480

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512
12/15/2015	425	
2/18/2016	366	
5/25/2016	467	
8/23/2016	422	
11/11/2016	443	
2/8/2017	404	
5/3/2017	436	
8/1/2017	414	
5/22/2019		445

Prediction Limit

Constituent: Dissolved Solids (mg/l) Analysis Run 9/23/2019 2:00 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	387	
2/18/2016	380	
5/26/2016	461	
8/23/2016	401	
11/11/2016	423	
2/8/2017	396	
5/3/2017	406	
8/1/2017	393	
5/22/2019		404

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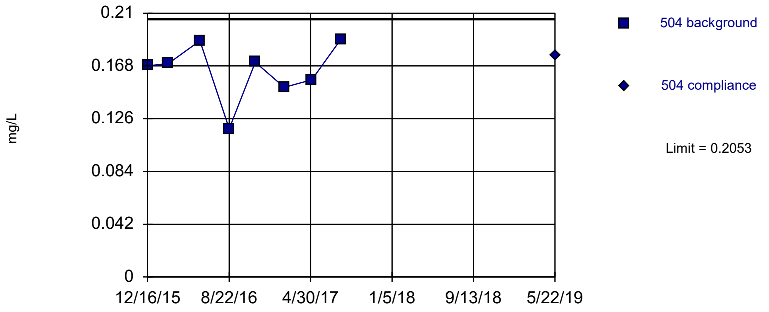
Within Limit

Prediction Limit

Intrawell Parametric



Limit = 0.2053

Background Data Summary: Mean=0.164, Std. Dev.=0.02279, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9007, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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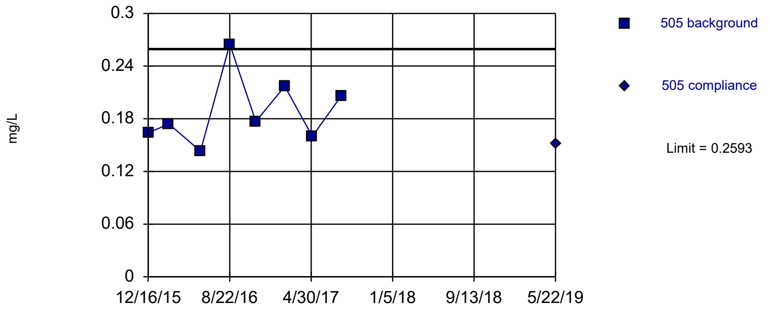
Within Limit

Prediction Limit

Intrawell Parametric



Limit = 0.2593

Background Data Summary: Mean=0.1883, Std. Dev.=0.03927, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9145, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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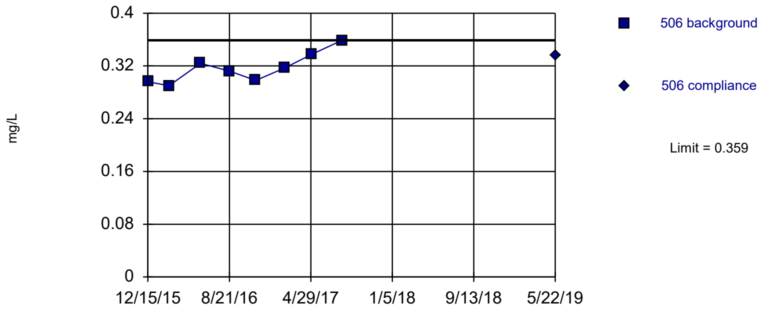
Within Limit

Prediction Limit

Intrawell Parametric



Limit = 0.359

Background Data Summary: Mean=0.3168, Std. Dev.=0.02333, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9406, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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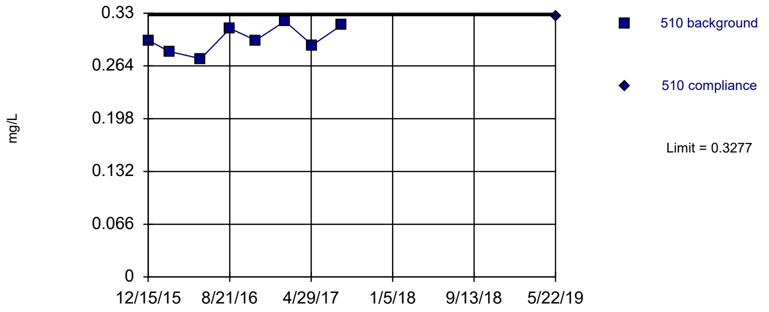
Within Limit

Prediction Limit

Intrawell Parametric



Limit = 0.3277

Background Data Summary: Mean=0.2979, Std. Dev.=0.01645, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9553, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504
12/16/2015	0.168	
2/18/2016	0.17	
5/25/2016	0.188	
8/23/2016	0.118	
11/11/2016	0.171	
2/8/2017	0.151	
5/4/2017	0.157	
8/1/2017	0.189	
5/22/2019		0.176

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	505	505
12/16/2015	0.164	
2/18/2016	0.174	
5/25/2016	0.143	
8/23/2016	0.265	
11/11/2016	0.177	
2/8/2017	0.217	
5/4/2017	0.16	
8/1/2017	0.206	
5/22/2019		0.151

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	506	506
12/15/2015	0.296	
2/18/2016	0.29	
5/25/2016	0.324	
8/23/2016	0.312	
11/11/2016	0.298	
2/8/2017	0.317	
5/4/2017	0.338	
8/4/2017	0.359	
5/22/2019		0.336

Prediction Limit

Constituent: Fluoride (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	0.296	
2/18/2016	0.282	
5/25/2016	0.273	
8/23/2016	0.311	
11/10/2016	0.296	
2/8/2017	0.32	
5/3/2017	0.29	
8/1/2017	0.315	
5/22/2019		0.326

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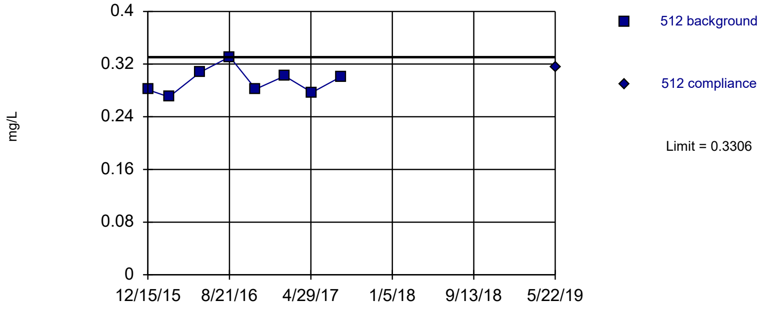
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.294, Std. Dev.=0.0202, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9269, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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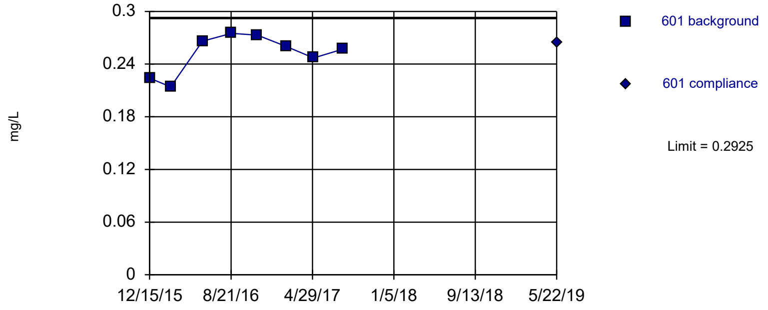
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.252, Std. Dev.=0.02239, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8908, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Fluoride Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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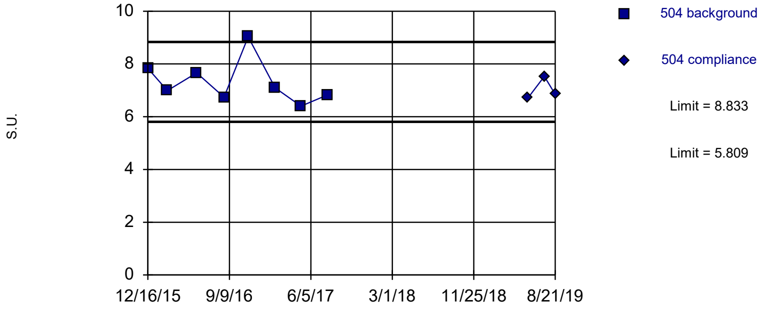
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.321, Std. Dev.=0.8353, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8916, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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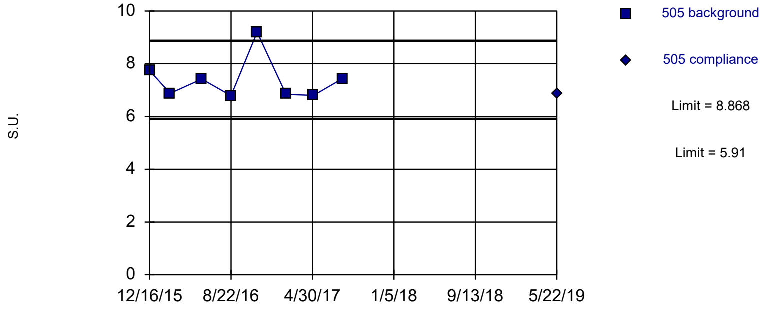
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.389, Std. Dev.=0.817, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7651, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512
12/15/2015	0.281	
2/18/2016	0.27	
5/25/2016	0.308	
8/23/2016	0.331	
11/11/2016	0.282	
2/8/2017	0.302	
5/3/2017	0.277	
8/1/2017	0.301	
5/22/2019		0.315

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	0.224	
2/18/2016	0.214	
5/26/2016	0.266	
8/23/2016	0.275	
11/11/2016	0.273	
2/8/2017	0.26	
5/3/2017	0.247	
8/1/2017	0.257	
5/22/2019		0.264

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 9/23/2019 2:00 PM   View: LF III
Sibley   Client: SCS Engineers   Data: Sibley

	504	504	
12/16/2015	7.83		
2/18/2016	6.99		
5/25/2016	7.66		
8/23/2016	6.74		
11/11/2016	9.03		
2/8/2017	7.09		
5/4/2017	6.4		
8/1/2017	6.83		
5/22/2019		6.7	
7/16/2019		7.53	extra sample
8/21/2019		6.85	extra sample

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	7.74	
2/18/2016	6.88	
5/25/2016	7.42	
8/23/2016	6.79	
11/11/2016	9.2	
2/8/2017	6.84	
5/4/2017	6.8	
8/1/2017	7.44	
5/22/2019		6.85

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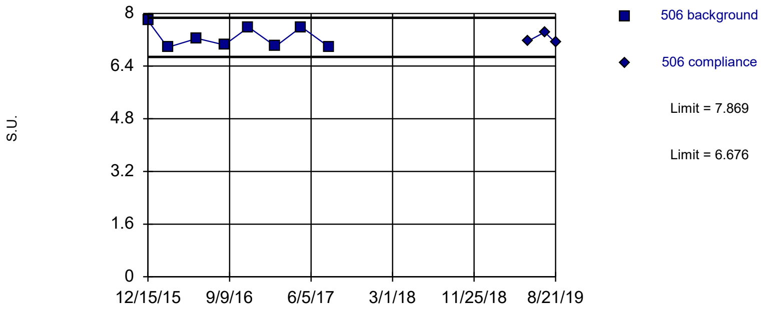
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.273, Std. Dev.=0.3294, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8334, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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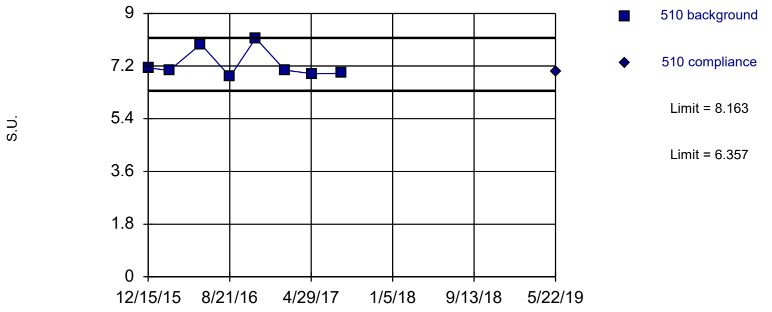
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.26, Std. Dev.=0.4988, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7542, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 9/23/2019 1:57 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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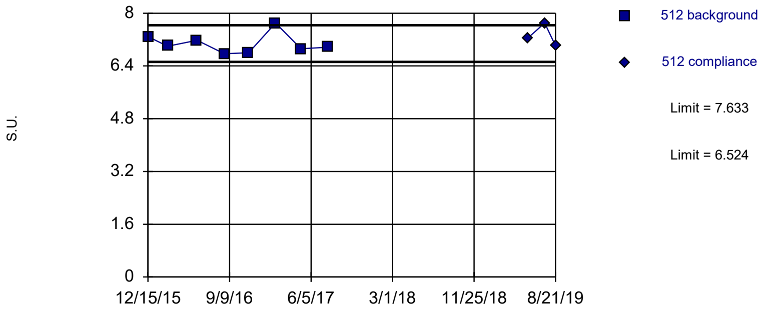
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.079, Std. Dev.=0.3064, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8903, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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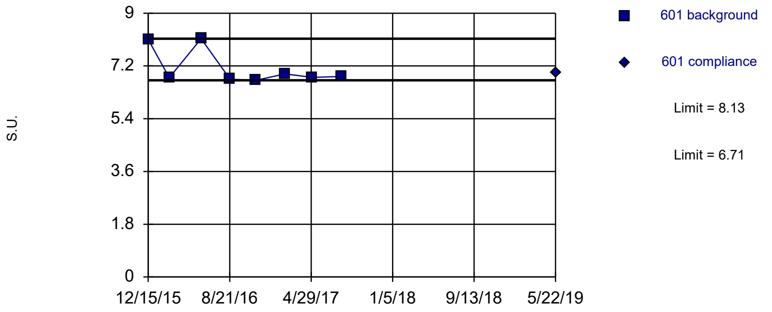
Within Limits

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.02358. Individual comparison alpha = 0.01182 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: pH Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: pH (S.U.) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	506	506	
12/15/2015	7.78		
2/18/2016	6.97		
5/25/2016	7.24		
8/23/2016	7.04		
11/11/2016	7.58		
2/8/2017	7		
5/4/2017	7.59		
8/4/2017	6.98		
5/22/2019		7.16	
7/16/2019		7.43	extra sample
8/21/2019		7.11	extra sample

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	7.14	
2/18/2016	7.05	
5/25/2016	7.95	
8/23/2016	6.84	
11/10/2016	8.15	
2/8/2017	7.06	
5/3/2017	6.94	
8/1/2017	6.95	
5/22/2019		7.01

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	512	512	
12/15/2015	7.29		
2/18/2016	7		
5/25/2016	7.18		
8/23/2016	6.77		
11/11/2016	6.8		
2/8/2017	7.7		
5/3/2017	6.92		
8/1/2017	6.97		
5/22/2019		7.25	
7/16/2019		7.7	extra sample
8/21/2019		7.01	extra sample

Prediction Limit

Constituent: pH (S.U.)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

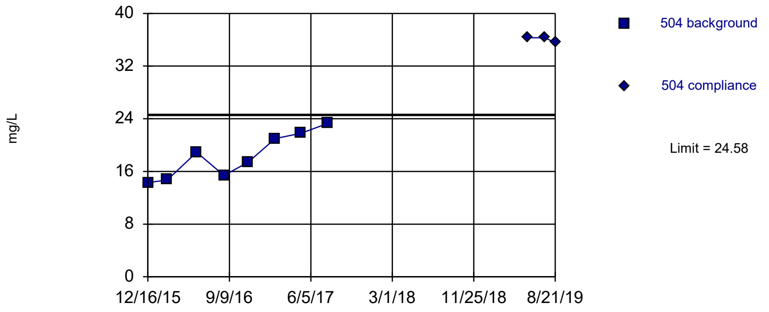
	601	601
12/15/2015	8.11	
2/18/2016	6.8	
5/26/2016	8.13	
8/23/2016	6.75	
11/11/2016	6.71	
2/8/2017	6.93	
5/4/2017	6.81	
8/1/2017	6.84	
5/22/2019		6.97

Sanitas™ v.9.6.23 Sanitas software licensed to SCS Engineers. UG

Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=18.35, Std. Dev.=3.445, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9225, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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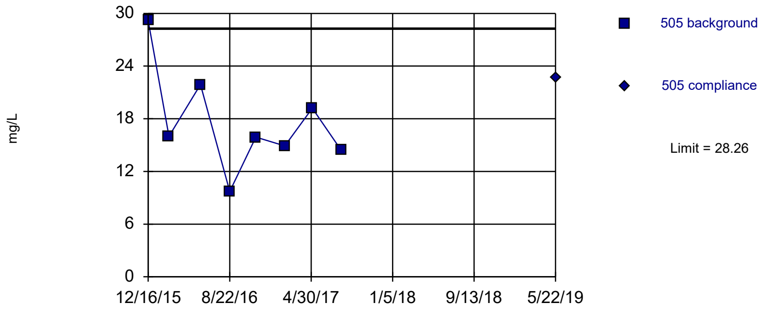
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=17.65, Std. Dev.=5.862, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9245, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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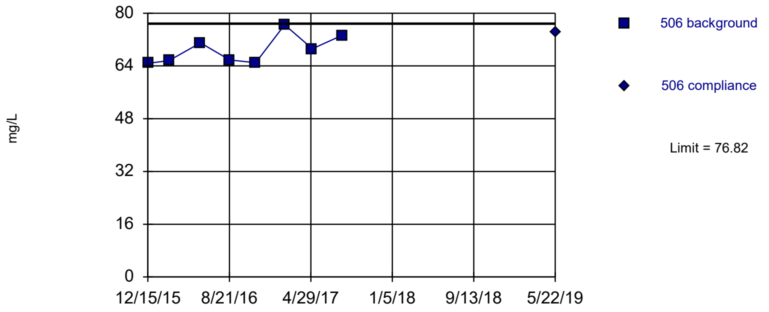
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=68.9, Std. Dev.=4.378, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8758, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

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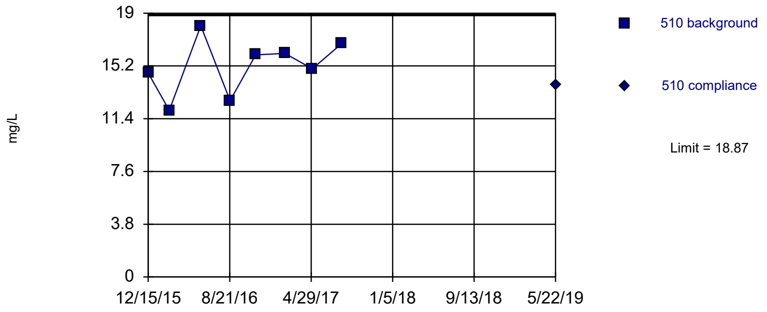
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=15.18, Std. Dev.=2.042, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9582, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	504	504	
12/16/2015	14.3		
2/18/2016	14.7		
5/25/2016	18.9		
8/23/2016	15.4		
11/11/2016	17.4		
2/8/2017	21		
5/4/2017	21.8		
8/1/2017	23.3		
5/22/2019		36.3	
7/16/2019		36.3	1st verification sample
8/21/2019		35.6	2nd verification sample

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

Sibley   Client: SCS Engineers   Data: Sibley

	505	505
12/16/2015	29.2	
2/18/2016	16	
5/25/2016	21.9	
8/23/2016	9.73	
11/11/2016	15.9	
2/8/2017	14.9	
5/4/2017	19.2	
8/1/2017	14.4	
5/22/2019		22.7

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	506	506
12/15/2015	64.8	
2/18/2016	65.6	
5/25/2016	71	
8/23/2016	65.8	
11/11/2016	65	
2/8/2017	76.5	
5/4/2017	69.2	
8/4/2017	73.3	
5/22/2019		74.2

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 9/23/2019 2:00 PM   View: LF III

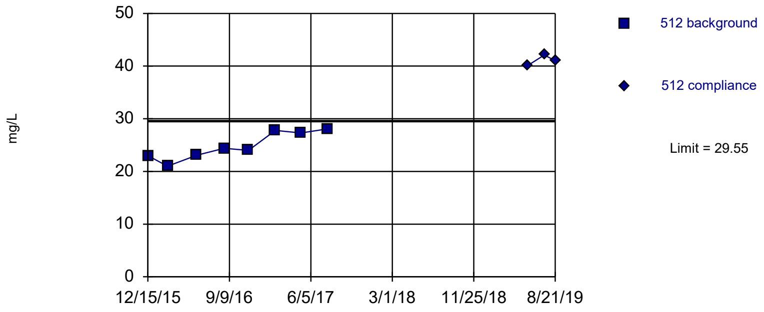
Sibley   Client: SCS Engineers   Data: Sibley

	510	510
12/15/2015	14.7	
2/18/2016	12	
5/25/2016	18.1	
8/23/2016	12.7	
11/10/2016	16	
2/8/2017	16.1	
5/3/2017	15	
8/1/2017	16.8	
5/22/2019		13.8

Exceeds Limit

Prediction Limit

Intrawell Parametric



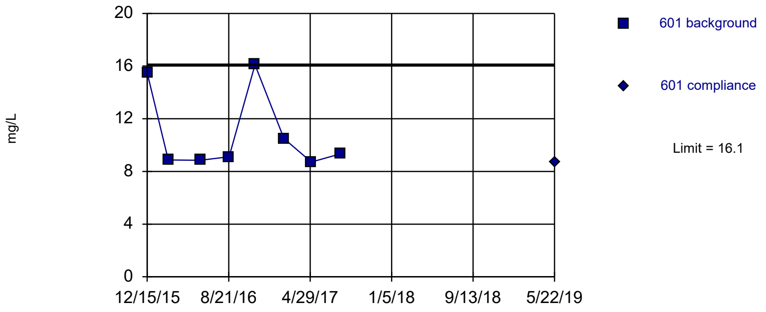
Background Data Summary: Mean=24.84, Std. Dev.=2.605, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9088, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: Sulfate Analysis Run 9/23/2019 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. 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 1:58 PM View: LF III
Sibley Client: SCS Engineers Data: Sibley

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	512	512	
12/15/2015	23		
2/18/2016	21		
5/25/2016	23.1		
8/23/2016	24.4		
11/11/2016	24		
2/8/2017	27.8		
5/3/2017	27.3		
8/1/2017	28.1		
5/22/2019		40.1	
7/16/2019		42.1	1st verification sample
8/21/2019		41	2nd verification sample

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/23/2019 2:00 PM View: LF III

Sibley Client: SCS Engineers Data: Sibley

	601	601
12/15/2015	15.5	
2/18/2016	8.87	
5/26/2016	8.85	
8/23/2016	9.11	
11/11/2016	16.1	
2/8/2017	10.5	
5/3/2017	8.71	
8/1/2017	9.33	
5/22/2019		8.74

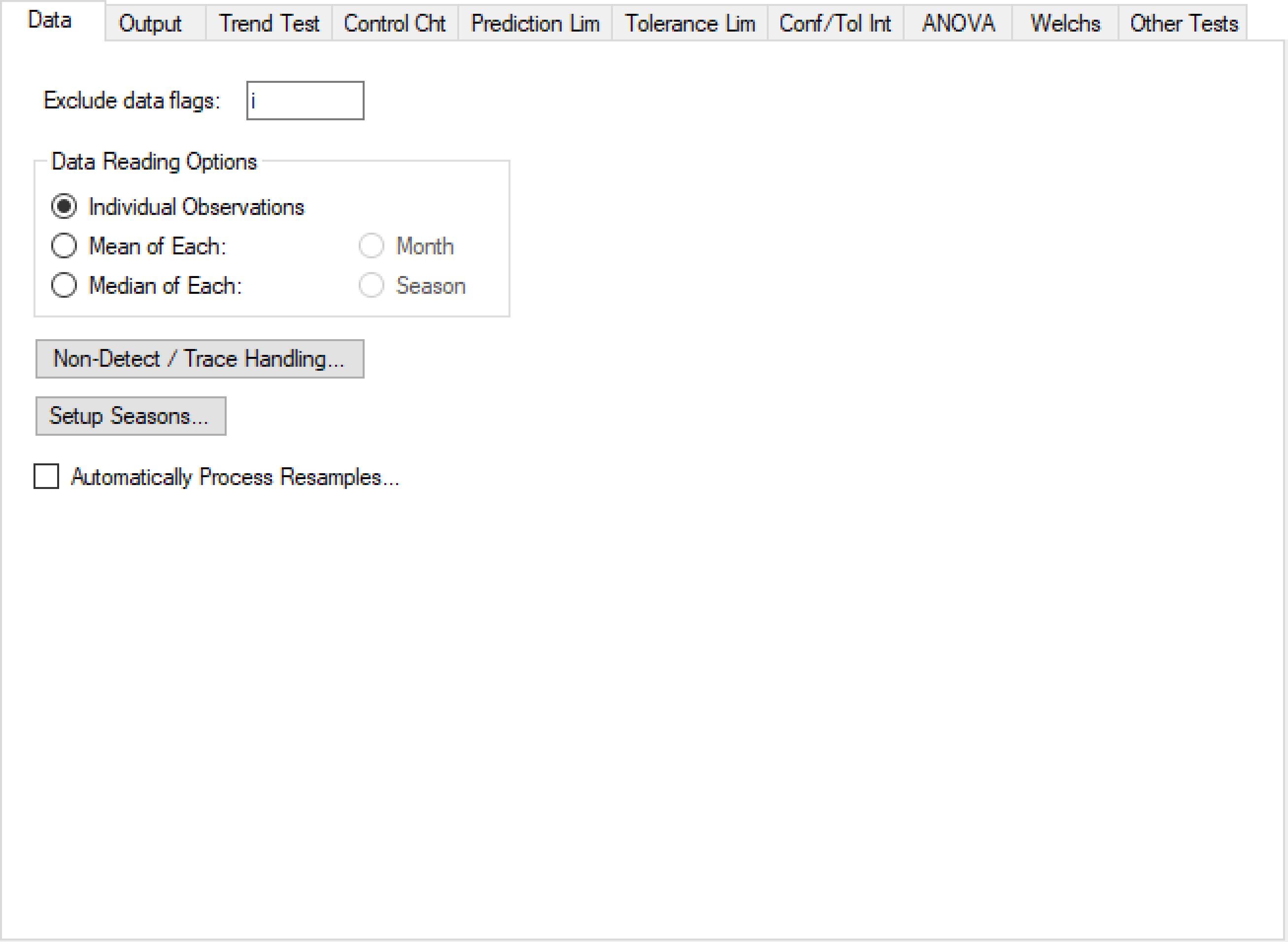
Prediction Limit

Sibley   Client: SCS Engineers   Data: Sibley   Printed 9/23/2019, 2:00 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	504	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)	505	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)	506	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)	510	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)	512	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)	601	0.2	n/a	5/22/2019	0.1ND	No	8	100	n/a	0.005912	NP Intra (NDs) 1 of 3
Calcium (mg/L)	504	36.83	n/a	5/22/2019	33.1	No	8	0	No	0.00188	Param Intra 1 of 3
Calcium (mg/L)	505	28.11	n/a	5/22/2019	26.4	No	8	0	No	0.00188	Param Intra 1 of 3
Calcium (mg/L)	506	100	n/a	5/22/2019	91.7	No	8	0	n/a	0.005912	NP Intra (normality) ...
Calcium (mg/L)	510	126.4	n/a	5/22/2019	117	No	8	0	x^5	0.00188	Param Intra 1 of 3
Calcium (mg/L)	512	107	n/a	5/22/2019	104	No	8	0	x^2	0.00188	Param Intra 1 of 3
Calcium (mg/L)	601	112.4	n/a	5/22/2019	97.4	No	8	0	No	0.00188	Param Intra 1 of 3
Chloride (mg/L)	504	1.27	n/a	5/22/2019	0.5ND	No	8	87.5	n/a	0.005912	NP Intra (NDs) 1 of 3
Chloride (mg/L)	505	1.19	n/a	5/22/2019	0.5ND	No	8	62.5	n/a	0.005912	NP Intra (NDs) 1 of 3
Chloride (mg/L)	**506**	**6.573**	**n/a**	**8/21/2019**	**7.17**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Chloride (mg/L)	510	3.749	n/a	5/22/2019	3.39	No	8	0	No	0.00188	Param Intra 1 of 3
Chloride (mg/L)	**512**	**3.826**	**n/a**	**8/21/2019**	**4.91**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Chloride (mg/L)	601	3.576	n/a	5/22/2019	3.19	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	504	385	n/a	5/22/2019	197	No	8	0	n/a	0.005912	NP Intra (normality) ...
Dissolved Solids (mg/l)	505	181.2	n/a	5/22/2019	180	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	506	517	n/a	5/22/2019	453	No	8	0	x^4	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	510	494.5	n/a	5/22/2019	480	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	512	476	n/a	5/22/2019	445	No	8	0	No	0.00188	Param Intra 1 of 3
Dissolved Solids (mg/l)	601	452.5	n/a	5/22/2019	404	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	504	0.2053	n/a	5/22/2019	0.176	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	505	0.2593	n/a	5/22/2019	0.151	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	506	0.359	n/a	5/22/2019	0.336	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	510	0.3277	n/a	5/22/2019	0.326	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	512	0.3306	n/a	5/22/2019	0.315	No	8	0	No	0.00188	Param Intra 1 of 3
Fluoride (mg/L)	601	0.2925	n/a	5/22/2019	0.264	No	8	0	No	0.00188	Param Intra 1 of 3
pH (S.U.)	504	8.833	5.809	8/21/2019	6.85	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	505	8.868	5.91	5/22/2019	6.85	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	506	7.869	6.676	8/21/2019	7.11	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	510	8.163	6.357	5/22/2019	7.01	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	512	7.633	6.524	8/21/2019	7.01	No	8	0	No	0.000...	Param Intra 1 of 3
pH (S.U.)	601	8.13	6.71	5/22/2019	6.97	No	8	0	n/a	0.01182	NP Intra (normality) ...
Sulfate (mg/L)	**504**	**24.58**	**n/a**	**8/21/2019**	**35.6**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Sulfate (mg/L)	505	28.26	n/a	5/22/2019	22.7	No	8	0	No	0.00188	Param Intra 1 of 3
Sulfate (mg/L)	506	76.82	n/a	5/22/2019	74.2	No	8	0	No	0.00188	Param Intra 1 of 3
Sulfate (mg/L)	510	18.87	n/a	5/22/2019	13.8	No	8	0	No	0.00188	Param Intra 1 of 3
Sulfate (mg/L)	**512**	**29.55**	**n/a**	**8/21/2019**	**41**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
Sulfate (mg/L)	601	16.1	n/a	5/22/2019	8.74	No	8	0	n/a	0.005912	NP Intra (normality) ...

ATTACHMENT 2

Sanitas^{TM} Configuration Settings



Exclude data flags: i

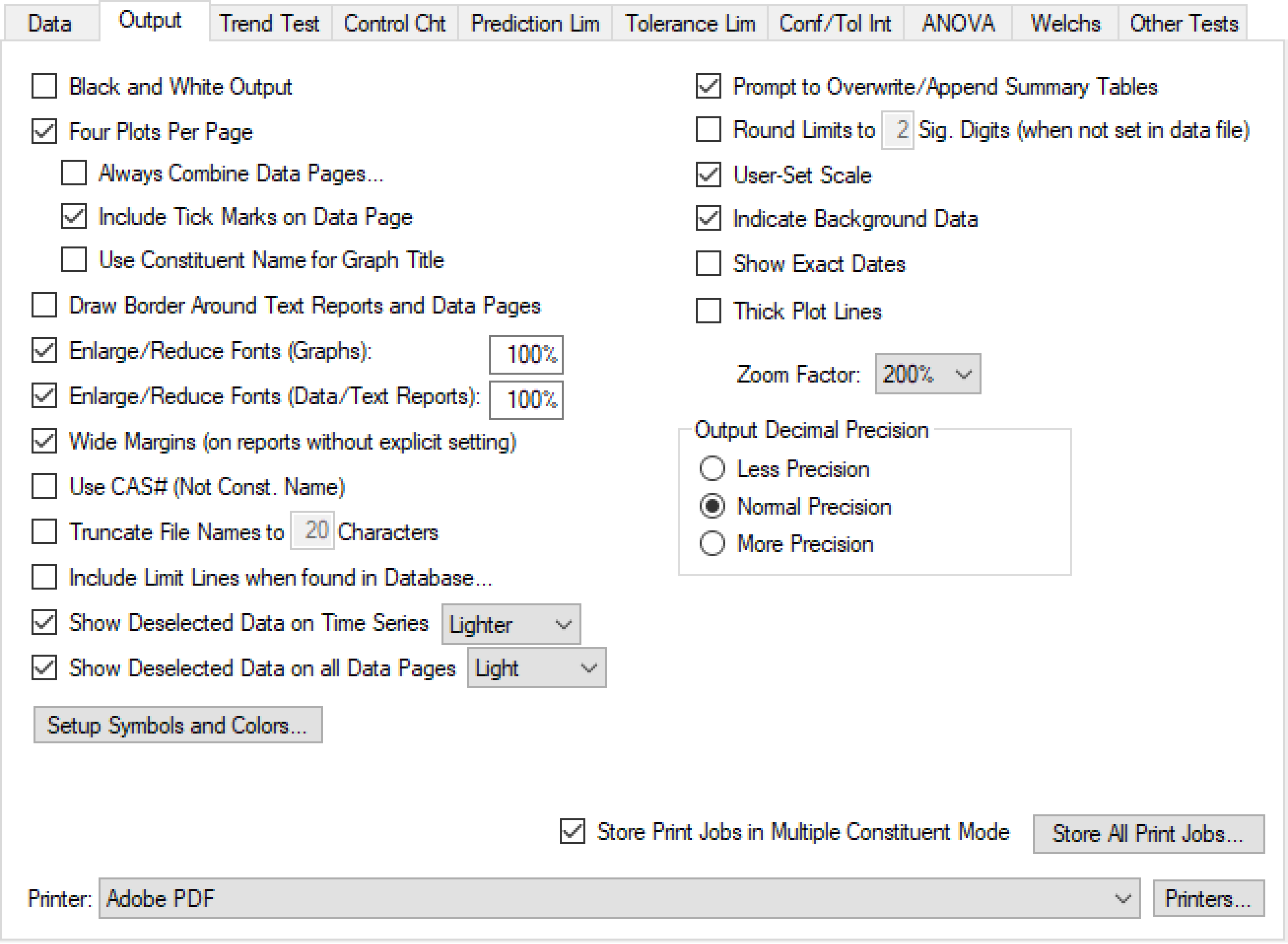
Data Reading Options

● Individual Observations

○ Mean of Each: ○ Month

○ Median of Each: ○ Season

☐ Automatically Process Resamples...



☐ Black and White Output
☑ Four Plots Per Page
  ☐ Always Combine Data Pages...
  ☑ Include Tick Marks on Data Page
  ☐ Use Constituent Name for Graph Title
☐ Draw Border Around Text Reports and Data Pages
☑ Enlarge/Reduce Fonts (Graphs): 100%
☑ Enlarge/Reduce Fonts (Data/Text Reports): 100%
☑ 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...
☑ Show Deselected Data on Time Series: Lighter
☑ Show Deselected Data on all Data Pages: Light

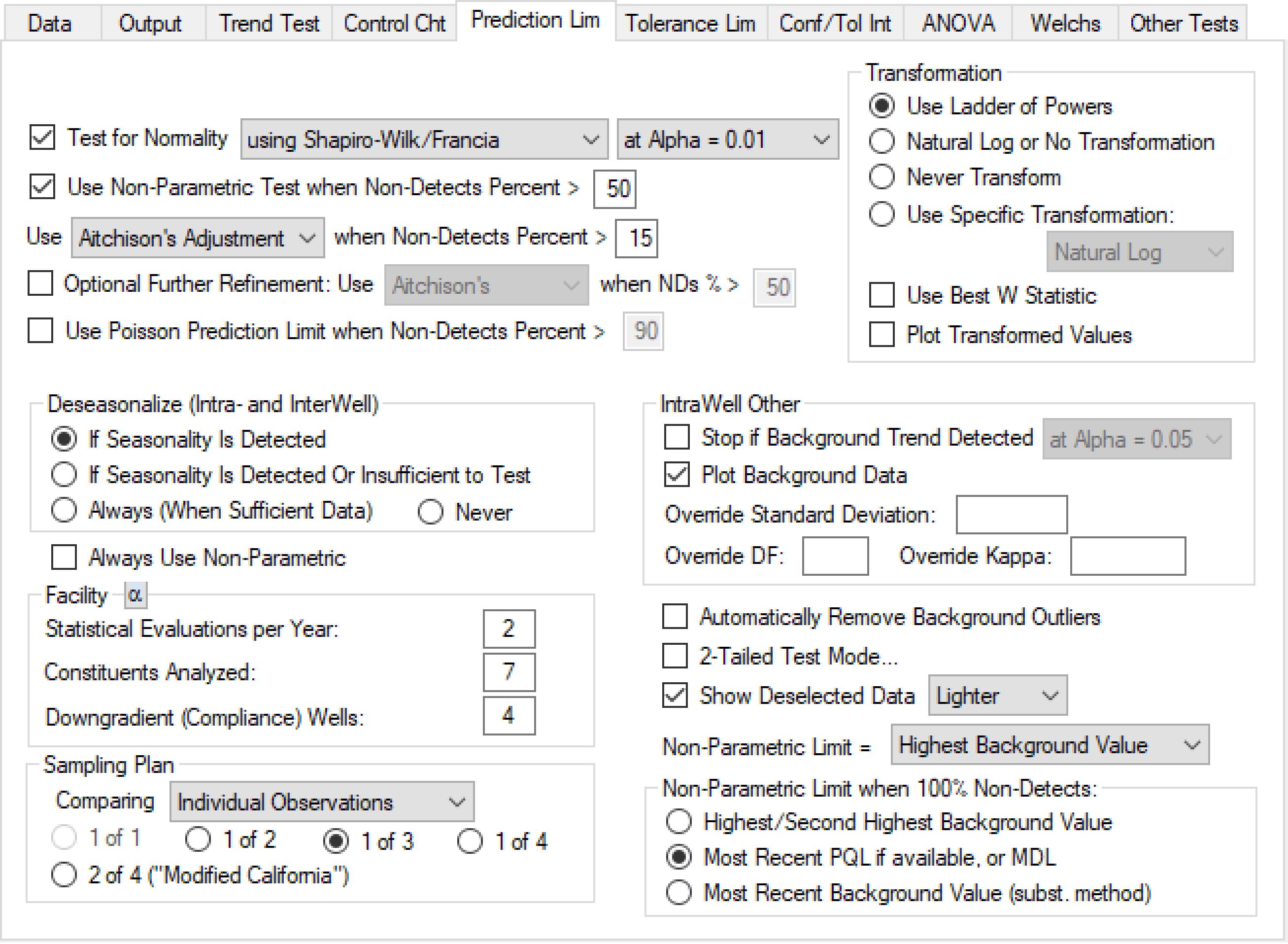
☑ Prompt to Overwrite/Append Summary Tables
☐ Round Limits to 2 Sig. Digits (when not set in data file)
☑ User-Set Scale
☑ Indicate Background Data
☐ Show Exact Dates
☐ Thick Plot Lines

Zoom Factor: 200%

Output Decimal Precision
○ Less Precision
● Normal Precision
○ More Precision

☑ Store Print Jobs in Multiple Constituent Mode

Printer: Adobe PDF



☑ 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: 4

Sampling Plan

Comparing Individual Observations
○ 1 of 1 ○ 1 of 2 ● 1 of 3 ○ 1 of 4
○ 2 of 4 ("Modified California")

IntraWell Other

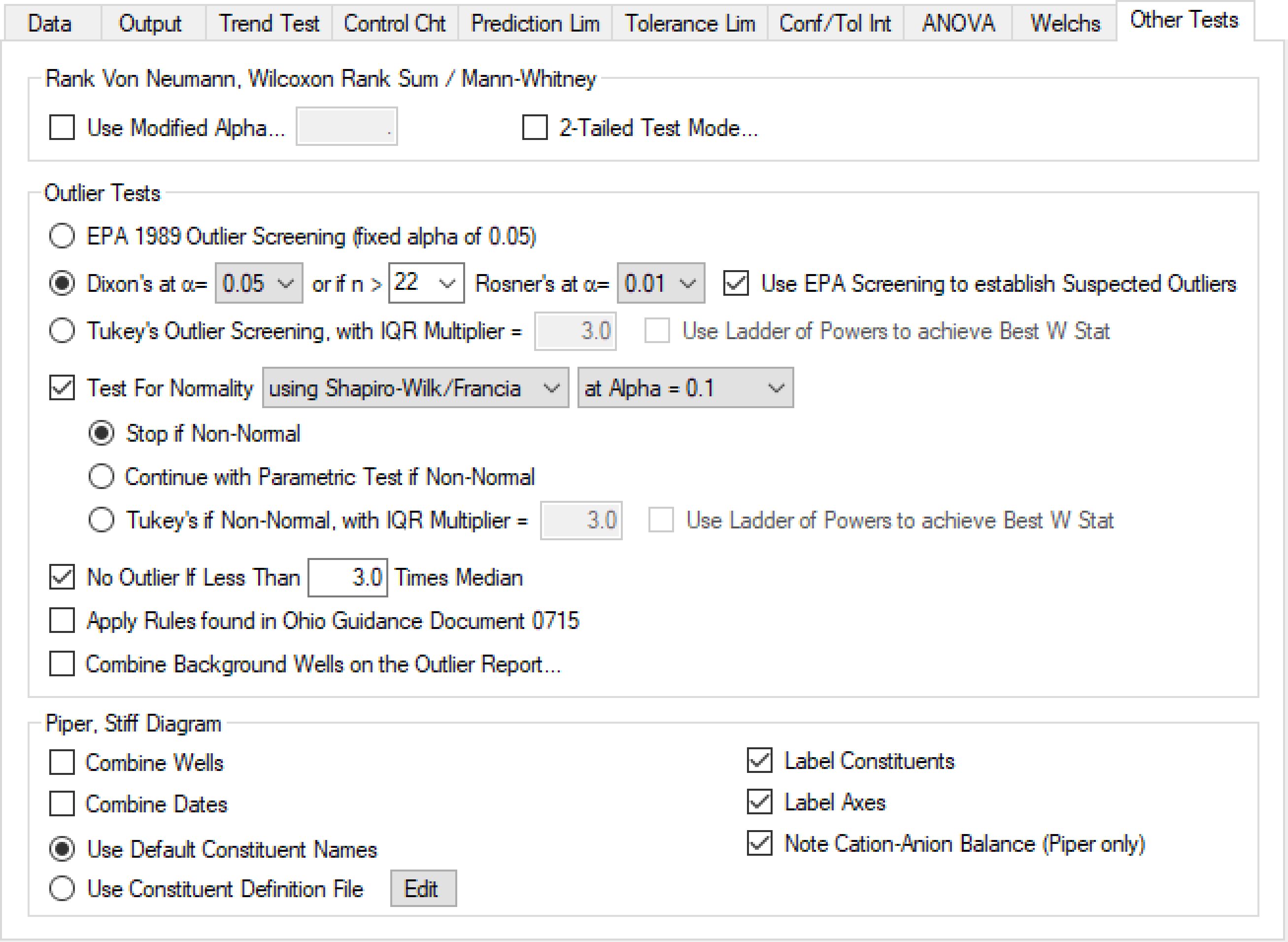
☐ Stop if Background Trend Detected at Alpha = 0.05
☑ Plot Background Data
Override Standard Deviation:
Override DF: Override Kappa:

☐ 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)



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 ☑ 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

☑ 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

☑ 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

☑ Label Constituents

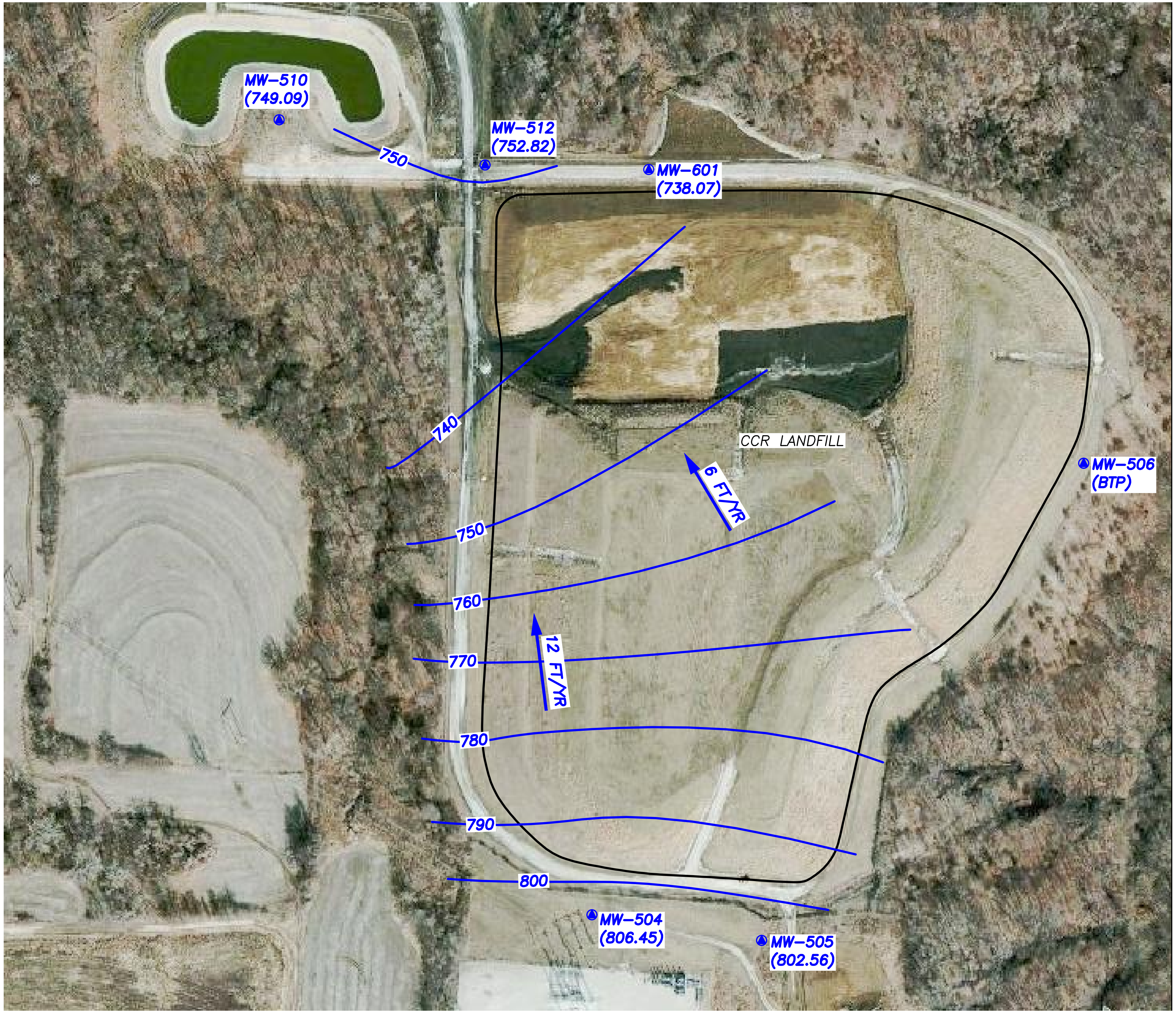
☑ Label Axes

☑ Note Cation-Anion Balance (Piper only)

ATTACHMENT 3

Groundwater Potentiometric Surface Maps

N:\KCPL\Projects\Groundwater\DWG\Sibley\2019\GW\Alternative Source Demonstration.dwg Dec 14, 2022 - 1:56pm Layout Name: Fig 2 By: swyly

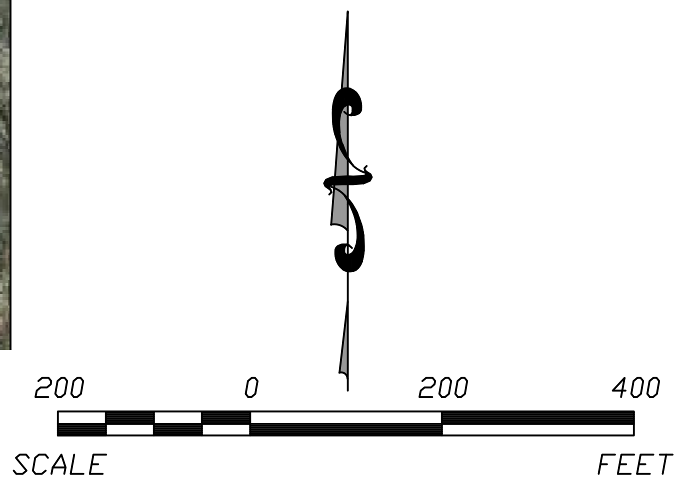


LEGEND:

760	GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
● 601 (738.07)	GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
	CCR LANDFILL UNIT BOUNDARY
12 FT/YR	GROUNDWATER FLOW DIRECTION AND FLOW RATE (FEET/YEAR)
BTP	BELOW TOP OF PUMP

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 WELL LOCATIONS SHOWN ARE APPROXIMATE.
4. WATER LEVEL MEASUREMENTS COMPLETED ON MAY 22, 2019.



REV. | DATE
– | –

SHEET TITLE
POTENTIOMETRIC SURFACE MAP
(MAY 2019)
CCR LANDFILL

PROJECT TITLE
2019 GROUNDWATER MONITORING AND
CORRECTIVE ACTION REPORT ADDENDUM

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

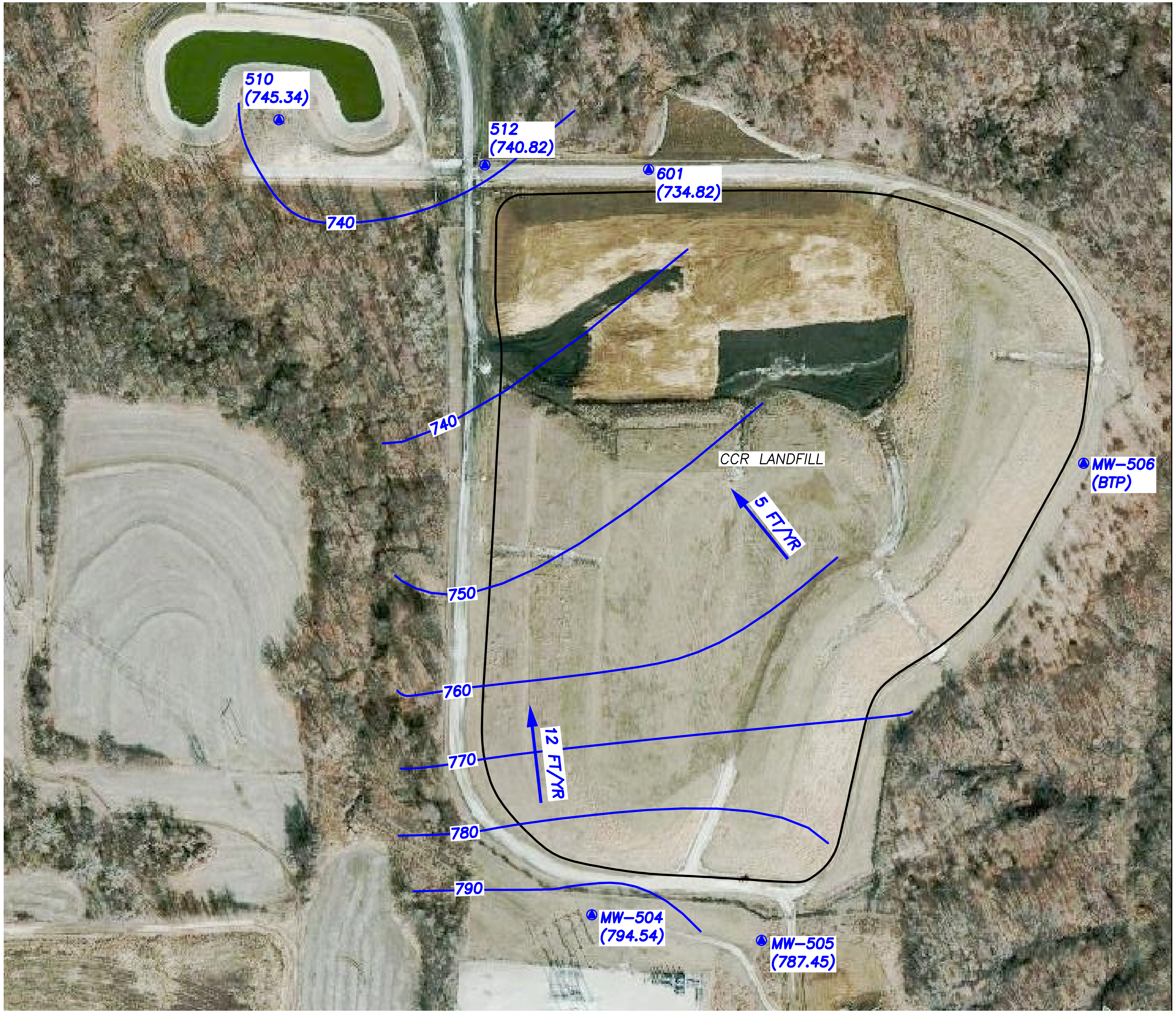
SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

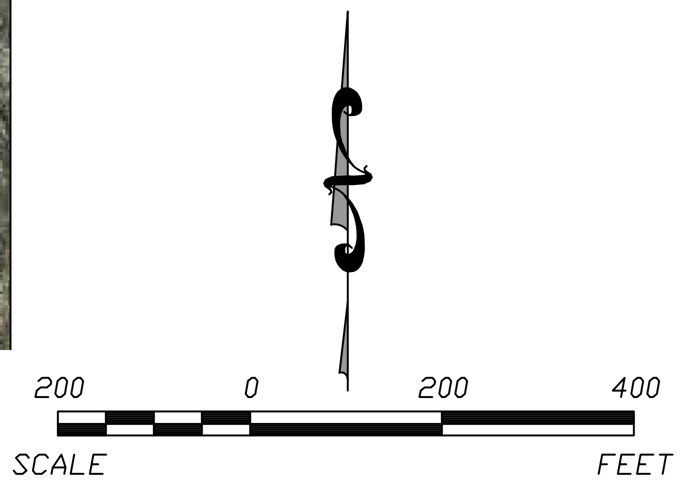
PROJ. NO. 27213167.19	DWN. BY: MBJ	Q/A RVW BY: JRR
DSN. BY: TGW	CHK. BY: JRR	PROJ. MGR JRF

CADD FILE:
ALTERNATIVE SOURCE DEMONSTRATION.DWG

DATE:
12/13/22

FIGURE NO.
1





LEGEND:

760	GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
● 601 (738.07)	GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
▬	CCR LANDFILL UNIT BOUNDARY
← 12 FT/YR	GROUNDWATER FLOW DIRECTION AND FLOW RATE (FEET/YEAR)
BTP	BELOW TOP OF PUMP

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 WELL LOCATIONS SHOWN ARE APPROXIMATE.
4. WATER LEVEL MEASUREMENTS COMPLETED ON NOVEMBER 6, 2019.

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP
(NOVEMBER 2019)
CCR LANDFILL

PROJECT TITLE
2019 GROUNDWATER MONITORING AND
CORRECTIVE ACTION REPORT ADDENDUM

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

SCS ENGINEERS
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PROJ. NO. 27213167.19	DWN. BY: DAW	Q/A RVW BY: JRR
DSN. BY: TGW	CHK. BY: JRR	PROJ. MGR JRF

CADD FILE:
19 - NOV_GW ALTERNATIVE SOURCE DEMONSTRATION.DWG

DATE:
12/13/22

FIGURE NO.
2

N:\KCPL\Projects\Groundwater\DWG\Sibley\2019\GW\19 - NOV_GW Alternative Source Demonstration.dwg Dec 14, 2022 - 1:57pm Layout Name: 1 By: swyly