2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

BOTTOM ASH IMPOUNDMENT LA CYGNE GENERATING STATION LA CYGNE, KANSAS

Presented To: Evergy Metro, Inc. (f/k/a Kansas City Power & Light Co.)

SCS ENGINEERS

27217233.19 | January 2020, Revised December 16, 2022

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CERTIFICATIONS

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



John R. Rockhold, P.G.

SCS Engineers

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



Douglas L. Doerr, P.E.

SCS Engineers

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

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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 Metro, Inc. (f/k/a Kansas City Power & Light Company) 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 Bottom Ash Impoundment at the La Cygne 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, 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 Bottom Ash Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Bottom Ash Impoundment groundwater monitoring program is provided as **Figure 1** in **Appendix A**.

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

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

No new monitoring wells were installed and no wells were decommissioned as part of the CCR groundwater monitoring program for the Bottom Ash Impoundment 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 sampling and analysis detection monitoring 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 $\S 257.90(e)$.

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

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

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

The following demonstration reports are included as Appendix C.

- C.1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Bottom Ash Impoundment, La Cygne Generating Station (June 2019)
- C.2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Bottom Ash Impoundment, La Cygne 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 montoring 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 La Cygne 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.

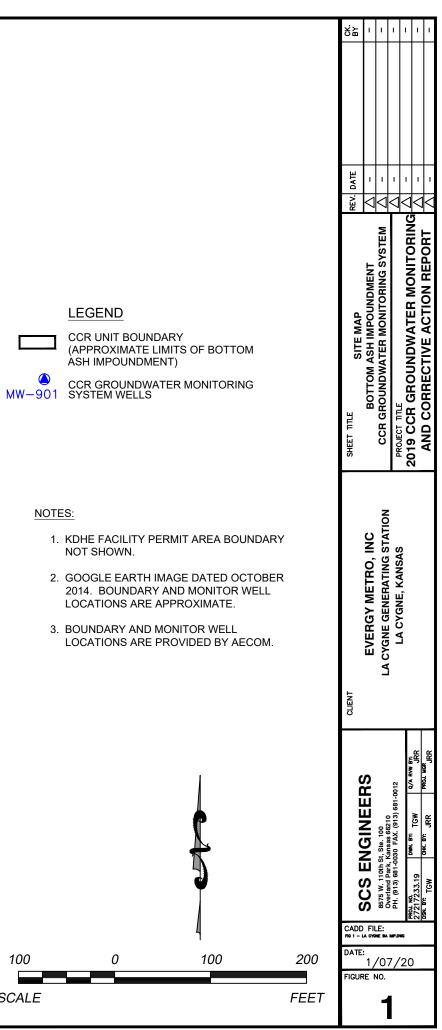
Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in 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 Metro, Inc. for specific application to the La Cygne Generating Station Bottom Ash Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map





APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1 Bottom Ash Impoundment Appendix III Detection Monitoring Results Evergy LaCygne Generating Station

			Appendix III Constituents						
Well Number	Sample Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	рН (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	
MW-901	5/23/2019	1.18	52.3	22.8	0.489	7.31	21.0	514	
MW-901	11/8/2019	1.09	53.4	23.2	0.481	7.37	21.2	502	
MW-902	1/14/2019					**6.98		*492	
MW-902	5/23/2019	1.24	66.5	32.8	0.441	7.26	29.4	511	
MW-902	11/8/2019	1.17	64.3	32.1	0.455	7.28	27.9	471	
MW-903	1/14/2019		*377			**6.58			
MW-903	3/11/2019		*375			**6.95			
MW-903	5/23/2019	0.494	367	24.5	0.130	6.86	1030	2030	
MW-903	7/17/2019		*373			**7.11			
MW-903	8/22/2019		*366			**6.73			
MW-903	11/8/2019	0.508	348	24.5	0.140	6.83	1050	1870	
MW-904	5/23/2019	1.11	68.2	33.4	0.382	7.23	81.7	696	
MW-904	11/8/2019	0.957	65.3	32.6	0.369	7.34	78.3	607	
MW-905	5/23/2019	1.87	46.4	52.0	0.494	7.36	28.7	621	
MW-905	11/8/2019	1.77	46.0	52.8	0.488	7.52	27.7	537	

* 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 2Bottom Ash ImpoundmentDetection Monitoring Field MeasurementsEvergy LaCygne Generating Station

Well Number	Sample Date	рН (S.U.)	Specific Conductivity (µS)	Temperature (°C)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	***Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-901	5/23/2019	7.31	1030	21.38	0.00	102	2.06	10.90	843.39
MW-901	11/8/2019	7.37	845	17.45	10.70	39	0.89	10.69	843.60
MW-902	1/14/2019	**6.98	856	14.35	8.40	415	0.00	12.68	842.39
MW-902	5/23/2019	7.26	1050	20.78	0.00	-17	2.54	12.89	842.18
MW-902	11/8/2019	7.28	821	16.23	0.80	-19	0.45	13.70	841.37
MW-903	1/14/2019	**6.58	2560	11.95	5.00	31	1.44	13.04	841.36
MW-903	3/11/2019	**6.95	2420	13.21	5.90	66	9.06	11.87	842.53
MW-903	5/23/2019	6.86	2840	17.86	0.00	27	2.47	11.89	842.51
MW-903	7/17/2019	**7.11	2410	22.85	0.00	109	1.77	12.03	842.37
MW-903	8/22/2019	**6.73	2370	20.58	0.50	214	0.19	12.63	841.77
MW-903	11/8/2019	6.83	2430	15.79	0.00	45	0.88	13.10	841.30
MW-904	5/23/2019	7.23	1340	17.84	5.20	-72	2.32	13.60	841.45
MW-904	11/8/2019	7.34	1070	16.58	9.10	-44	0.69	13.65	841.40
MW-905	5/23/2019	7.36	1250	17.15	21.5	24	2.47	9.98	844.24
MW-905	11/8/2019	7.52	1000	16.61	17.0	8	1.02	11.70	842.52

* 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

***Depth to water measured in all monitoring wells within 24 hour period prior to the sampling event

S.U. - Standard Units

 μS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

Appendix C

Alternative Source Demonstrations

- C.1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Bottom Ash Impoundment, La Cygne Generating Station (June 2019)
- C.2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, La Cygne Generating Station (December 2019)

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

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

BOTTOM ASH IMPOUNDMENT LA CYGNE GENERATING STATION LA CYGNE, KANSAS

Presented To:

Kansas City Power & Light Company

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

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June 2019

File No. 27217233.19

CERTIFICATIONS

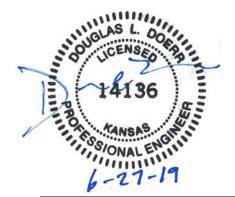
I, John R. Rockhold, being a qualified groundwater scientist and licensed Professional Geologist in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Bottom Ash Impoundment at the La Cygne Generating 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, P.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Bottom Ash Impoundment at the La Cygne 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.



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- Appendix B Box and Whiskers Plots
- Appendix C Time Series Plots
- Appendix D Piper Diagrams
- Appendix E Facility Wide Interwell Prediction Limits

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 gualified 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 Bottom Ash Impoundment at the La Cygne 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 29, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on January 12, 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 14, 2019 and March 11, 2019.

The completed statistical evaluation identified Appendix III constituent, calcium, above its prediction limit in monitoring well MW-903. The prediction limit for calcium in monitoring well MW-903 is 358.2 mg/L. The detection monitoring sample was reported at 375 mg/L. The first verification re-sample was collected on January 14, 2019 with a result of 377 mg/L. The second verification re-sample was collected on March 11, 2019 with a result of 375 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for calcium from monitoring well MW-903 exceeds its prediction limit and is a confirmed SSI over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified one SSI above the background prediction limit for calcium in monitoring well MW-903.

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 SSI for the Bottom Ash Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate the SSI was not caused by a release from the Bottom Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 BOTTOM ASH SPLP ANALYSIS

The Synthetic Precipitation Leaching Procedure (SPLP) is an Environmental Protection Agency (EPA) approved extraction procedure designed to simulate and then analyze leachate, which would be produced from rainfall passing through a contaminated material (assuming the rainfall is slightly acidic). The SPLP is used to assess the potential of a contaminated material (in or on top of the ground) to impact groundwater (or surface water), when exposed to normal weathering. A bottom ash sample was collected on September 17, 2018 and submitted to the laboratory for SPLP analysis for calcium. The calcium result for the SPLP extract (simulated leachate) was 73.7 mg/L. The prediction limit for calcium in monitoring well MW-903 is 358 mg/L and the detection monitoring sample was reported at 375 mg/L. The calcium concentration in the groundwater from MW-903 is significantly greater than what would be expected from bottom ash leachate. The comparison indicates the elevated calcium concentrations in monitoring well MW-903 are not from bottom ash leachate but from a source other than bottom ash, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The laboratory report is provided in **Appendix A.**

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.

Based on the bottom ash SPLP calcium analysis compared to the calcium results for MW-903, the calcium levels for additional wells at the LaCygne Generating Station (not part of the CCR Bottom Ash groundwater monitoring system) were reviewed for elevated calcium levels to determine if elevated calcium concentrations could occur naturally in the vicinity of the facility and if natural variability between wells occurred in the vicinity of the facility. Four wells were identified as exhibiting elevated calcium and one of them was an upgradient well. Box and whiskers plots for calcium for upgradient monitoring wells MW-13 and MW-602 and downgradient wells MW-707B, MW-805, and MW-903 were prepared for comparison. Upgradient monitoring well MW-602 does not have elevated calcium but is located in close proximity to MW-13, indicating natural variability of calcium over short distances occurs at the site. The comparison also indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the facility site and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from

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

3.3 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. 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.

Four wells were identified as exhibiting elevated calcium and one of them was an upgradient well. Of the four wells exhibiting elevated calcium, wells, MW-805 and MW-903 also exhibited a SSIs. Time series plots for calcium for upgradient monitoring wells MW-13 and MW-602 and downgradient wells MW-707B, MW-805, and MW-903 were prepared for comparison. Upgradient monitoring well MW-602 does not have elevated calcium but is located close to MW-13 indicating natural variability of calcium over short distances occurs at the site. The comparison indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the site and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

3.4 PIPER 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 samples from MW-903 and samples from MW-13 (upgradient well for the CCR Landfill and Lower AQC Impoundment) are provided in **Appendix D**. The samples plot near one another in the same hydrochemical facies indicating similar geochemical characteristics between an upgradient well in the vicinity of the facility and a downgradient well for the Bottom Ash Impoundment. The comparison indicates the hydrochemical characteristics (particularly calcium) of groundwater from monitoring well MW-903 are similar to the hydrochemical characteristics (particularly calcium) of background groundwater and are a similar range as that of an upgradient well at the facility and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The piper diagram plots are provided in **Appendix D**.

3.5 FACILITY WIDE INTERWELL PREDICTION LIMIT

Because of known complexities and heterogeneities of the water bearing zone at the facility, an intrawell prediction limit analysis with retesting was the selected statistical method for the Bottom Ash Impoundment. However, false positives (SSIs) may occur due to a limited background data set that may not truly represent the background population for that particular well until the number of background observations are increased to better represent the entire population. The CCR Rule preamble recommends a minimum of eight to ten independent background observations be collected before performing the first statistical test; but also states that background sample sets of at least 20 are considered optimal. To further demonstrate that an intrawell prediction limit exceedance (SSI) could be naturally occurring and likely the result of a limited background data set for a particular well, an interwell prediction limit analysis on a facility wide basis can be useful to further demonstrate natural variability across a site or in the vicinity of the site and that the potential true background population may not be represented.

An interwell prediction limit analysis on a facility wide basis was performed comparing the calcium concentration in MW-903 to the prediction limit calculated from the combined background calcium data from all of the background monitoring wells across the facility. For this scenario, the facility wide interwell prediction limit for calcium is 395 mg/L. The highest calcium concentration from MW-903 is 384 mg/L, which is below the facility wide interwell prediction limit for calcium. The interwell prediction limit analysis further indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the facility site. This demonstrates that a source other than the bottom ash could cause the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Facility wide interwell prediction limit outputs are provided in **Appendix E**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Bottom Ash Impoundment caused the SSI above background levels for calcium, or that the SSI 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 Bottom Ash Impoundment 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 for specific application to the La Cygne Generating Station. No warranties, express or implied, are intended or made.

The signature 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

Bottom Ash SPLP Laboratory Report



ANALYTICAL REPORT

October 01, 2018

SCS Engineers - KS

Sample Delivery Group:	L1027123
Samples Received:	09/19/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210

Entire Report Reviewed By:

Vubb land

Jeff Carr Project Manager

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

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*
¹ Cp
² Tc
³ Ss
4

TC
³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc

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Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
BOTTOM ASH L1027123-01	5
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Metals (ICP) by Method 6010B	7
GI: Glossary of Terms	8
Al: Accreditations & Locations	9
Sc: Sample Chain of Custody	10

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

BOTTOM ASH L1027123-01 GW			Collected by Jason R Franks	Collected date/time 09/17/18 12:00	Received date/time 09/19/18 11:50	1
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	2
Preparation by Method 1312	WG1169395	1	09/21/18 11:47	09/21/18 11:47	TM	L
Wet Chemistry by Method 9056A	WG1169693	1	09/24/18 20:14	09/24/18 20:14	NJM	
Metals (ICP) by Method 6010B	WG1170271	1	09/23/18 09:55	09/23/18 22:31	CCE	

Тс
^³ Ss
⁴ Cn
⁵Sr
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⁷ Gl
⁸ Al
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SDG: L1027123 DATE/TIME: 10/01/18 09:32 PAGE: 3 of 10

CASE NARRATIVE

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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.

Jubb land

Jeff Carr Project Manager

Τс Ss Cn Sr Qc GI AI Sc

PROJECT: 27217233.18

SDG: L1027123 DATE/TIME: 10/01/18 09:32

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SAMPLE RESULTS - 01 L1027123



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Preparation by Method 1312

					l'Cn	L
	Result	Qualifier	Prep	Batch	Cp	l
Analyte			date / time		2	i
SPLP Extraction	-		9/21/2018 11:47:27 AM	WG1169395	Tc	l

Wet Chemistry by Method 9056A

	Result	Qualifier	Flep		Balch					
Analyte			date / time							
SPLP Extraction	-		9/21/2018 11	I:47:27 AM	WG1169395					
Wet Chemistry by	Method 9056A									
	Result	Qualifier	RDL	Dilution	Analysis	Batch				
Analyte	ug/l		ug/l		date / time					
Chloride	ND		1000	1	09/24/2018 20:14	WG1169693				
Fluoride	118		100	1	09/24/2018 20:14	WG1169693				
Sulfate	51100		5000	1	09/24/2018 20:14	<u>WG1169693</u>				

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	959		200	1	09/23/2018 22:31	WG1170271
Calcium	73700		1000	1	09/23/2018 22:31	WG1170271

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3344732-1	09/24/18 17:59

(=)								
	MB Result	MB Qualifier	MB MDL	MB RDL				2
Analyte	ug/l		ug/l	ug/l				T
Chloride	U		51.9	1000				
Fluoride	U		9.90	100				³ S
Sulfate	U		77.4	5000				Ľ

L1027594-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1027594-11 09/24/	18 22:52 • (DUP)) R3344732-4	09/24/18	23:07		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	244	184	1	27.8	<u>J P1</u>	15
Sulfate	U	0.000	1	0.000		15

L1027715-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1027715-01 09/25/18 01:45 • (DUP) R3344732-7 09/25/18 02:00

(,	Original Result			DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	8430	8420	1	0.118		15
Sulfate	8690	8710	1	0.147		15

L1027594-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1027594-11 09/24/18 22:52 • (MS) R3344732-5 09/24/18 23:21 • (MSD) R3344732-6 09/24/18 23:36												
	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	244	50900	51100	101	102	1	80.0-120			0.435	15
Sulfate	50000	U	51800	51400	104	103	1	80.0-120			0.729	15

L1027715-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1027715-01 09/25/18	(OS) L1027715-01 09/25/18 01:45 • (MS) R3344732-8 09/25/18 02:14							
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier	
Analyte	ug/l	ug/l	ug/l	%		%		
Chloride	50000	8430	59200	102	1	80.0-120		
Sulfate	50000	8690	59100	101	1	80.0-120		

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
SCS Engineers - KS	27217233.18	L1027123	10/01/18 09:32	6 of 10

WG1170271

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY L1027123-01

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Method Blank (MB)

Method Blau	K (IVIB)				
(MB) R3344358-1	09/23/18 21:58				
	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) R3344358-2 09/23/	(LCS) R3344358-2 09/23/18 22:01 • (LCSD) R3344358-3 09/23/18 22:03											
	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	992	995	99.2	99.5	80.0-120			0.340	20		
Calcium	10000	10000	9930	100	99.3	80.0-120			0.917	20		

L1026826-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1026826-01 09/23/	18 22:06 • (MS)	R3344358-5 (09/23/18 22:12	• (MSD) R3344	358-6 09/23/	18 22:14							⁸ Al
	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	%	%		%			%	%	9
Boron	1000	155	1170	1170	101	102	1	75.0-125			0.133	20	SC
Calcium	10000	43500	53700	53700	102	102	1	75.0-125			0.0395	20	

ACCOUNT:
SCS Engineers - KS

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GLOSSARY OF TERMS

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

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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	Nebra
Alaska	17-026	Nevad
Arizona	AZ0612	New H
Arkansas	88-0469	New J
California	2932	New N
Colorado	TN00003	New Y
Connecticut	PH-0197	North
Florida	E87487	North
Georgia	NELAP	North
Georgia ¹	923	North
Idaho	TN00003	Ohio-
Illinois	200008	Oklah
Indiana	C-TN-01	Orego
lowa	364	Penns
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South
Louisiana	AI30792	Tenne
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virgini
Minnesota	047-999-395	Washi
Mississippi	TN00003	West \
Missouri	340	Wisco
Montana	CERT0086	Wyom

lebraska	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	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

SCS Engineers - KS

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.

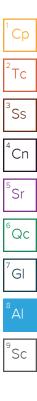


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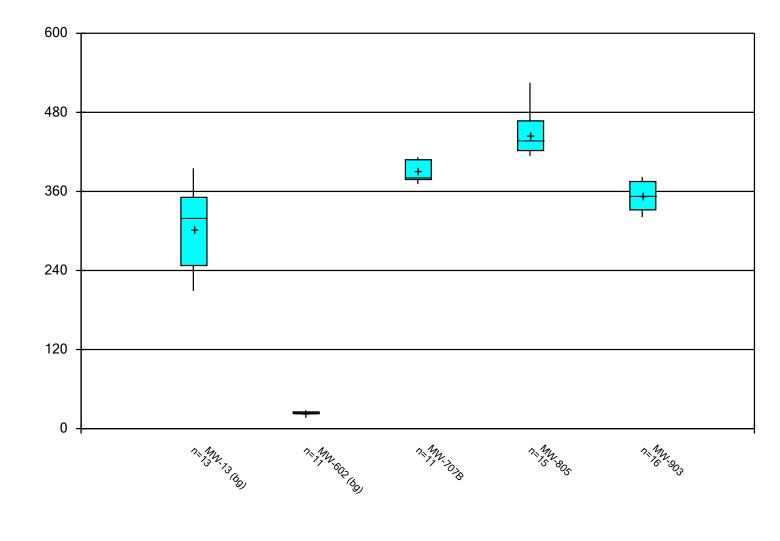
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Jason Franks Jay.martir				@kcpl.com;				1 12				10.8	12065 Lebanon Rd		
Project Description: KCPL - LaCygne Generating Station			Iterate and	City/State Collected: La CygNE, KS Lab Project # AQUAOPKS-LACYGNE P.O. #			16ozClr-NoPres						Phone: 615-758-58 Phone: 800-767-58	Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859	
Phone: 913-681-0030 Fax: 913-681-0012	Client Project # 27217233.18												L# L1027123 E242		
Collected by (print): JASON R. FRANKS	Site/Facility ID #											U.B.H			
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Next Day 5 Day (F		(Rad Only) y (Rad Only)	Date Res	Date Results Needed		metals /	-#5					TSR: 206 - Jeff	Prelogin: P672563 TSR: 206 - Jeff Carr PB:		
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	of Cntrs					100		Shipped Via:		
2 1	0			1 1 1		1	SPLP					1.1	Bemarks	Sample # (lab only)	
Bortom ASH	GRAB	SS	-	9/17/18	1200	1	x						1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	-01	
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			1011	200											
GW - Groundwater B - Bioassay WW - WasteWater	Remarks: SPLP - Extract for B, Ca, Cl, Fl, and SO4								рН	Temp	1.1	COC Seal	ample Receipt Ch 1 Present/Intact:	NP Y N	
	Samples returned via: UPSFedExCourierTracking #						Flow Other					COC Signed/Accurate:N Bottles arrive intact:N Correct bottles used:N Sufficient volume sent:N			
Relinquished by Astgnature		Date:	/ Th	and the second s	cking # :e/Ved hy: (Signat	ure)	9	-18-18	Trip Blank Re	ceived: Yes No	1. 18	VOA Zero	If Applicab) D Headspace: ation Correct/Che	v v	
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Relinquished by : (Signature) Date:		Tir	Received for lab by: (Signature)				8C1 9/19/18 1150				Hold: Condition				

Appendix B

Box and Whiskers Plots



Constituent: CALCIUM Analysis Run 5/15/2019 4:27 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

mg/l

Constituent: CALCIUM (mg/l) Analysis Run 5/15/2019 4:29 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

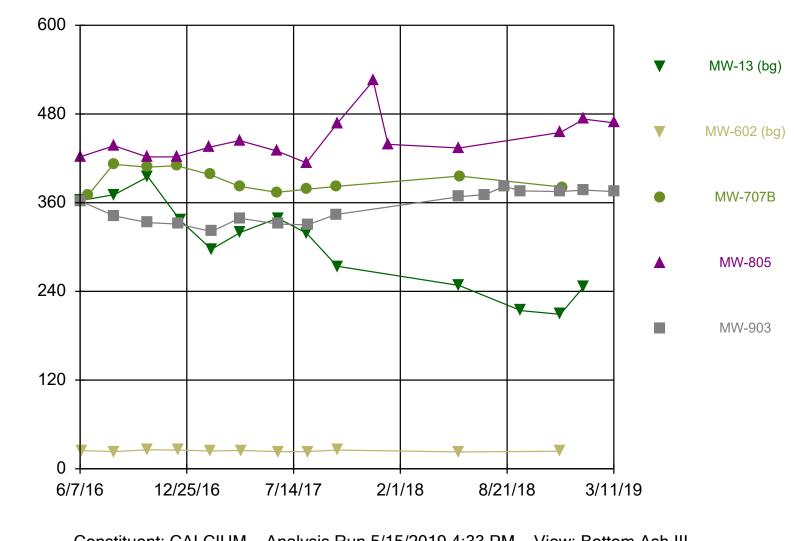
			200	, grio oliona oco	
0/7/0010	MW-13 (bg)	MW-602 (bg)	MW-707B	MW-805	MW-903
6/7/2016				422	
6/8/2016					362
6/9/2016	363				
6/10/2016		24.7			
6/23/2016			371		
8/9/2016		23.3	412		
8/10/2016				437	
8/11/2016	371				342
10/11/2016			408	422	
10/13/2016	395	25.7			333
12/6/2016			410	422	
12/9/2016		25.3			331
12/13/2016	336				
2/6/2017				435	
2/7/2017			398		
2/8/2017		24			
2/10/2017	297				321
4/4/2017			382	444	339
4/6/2017	320				
4/7/2017		24.9			
6/13/2017			374	430	
6/15/2017	339	23.2			
6/16/2017					331
8/8/2017	319		378	414	
8/10/2017		23.3			330
10/3/2017			382		344
10/5/2017	274	25.3		467	
12/12/2017				525	
1/9/2018				439	
5/23/2018	248	22.9		434	368
5/24/2018			396		
7/11/2018					371
8/16/2018					382
9/17/2018	214				376
11/29/2018					375
11/30/2018	209	23.7		455	
12/4/2018			381		
1/14/2019	247			473	377
3/11/2019				468	375
Median	319	24	382	437	353
LowerQ.	247.5	23.3	378	422	332
UpperQ.	351	25.3	408	467	375
Min	209	22.9	371	414	321
Max	395	25.7	412	525	382
Mean	302.5	24.21	390.2	445.8	353.6
	-		-		

	LaCygne (Client: SCS Er	ngineers	Data: LaC GW Data	Printed 5/15/2019,	4:29 PM			
Constituent	Well	<u>N</u>	<u>Mean</u>	Std. Dev.	Std. Err.	<u>Median</u>	Min.	Max.	<u>%NDs</u>
CALCIUM (mg/I)	MW-13 (bg)	13	302.5	60.15	16.68	319	209	395	0
CALCIUM (mg/I)	MW-602 (bg)	11	24.21	1	0.3016	24	22.9	25.7	0
CALCIUM (mg/l)	MW-707B	11	390.2	15.09	4.55	382	371	412	0
CALCIUM (mg/l)	MW-805	15	445.8	28.51	7.362	437	414	525	0
CALCIUM (mg/l)	MW-903	16	353.6	21.38	5.346	353	321	382	0

Appendix C

Time Series Plots

Time Series



Constituent: CALCIUM Analysis Run 5/15/2019 4:33 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

mg/l

Time Series

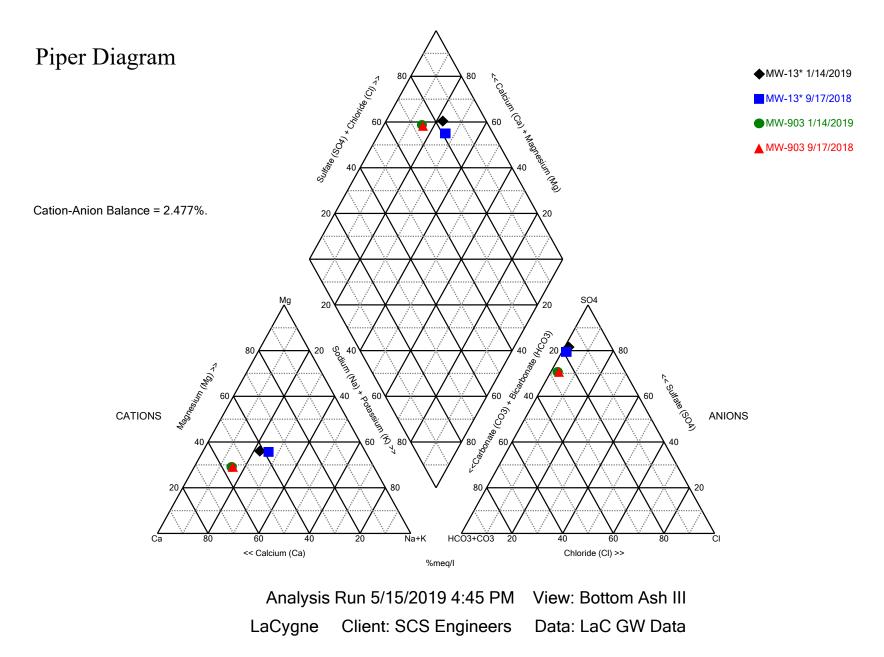
Constituent: CALCIUM (mg/l) Analysis Run 5/15/2019 4:34 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

			Lac	Sygne Chent. Ooc	
	MW-13 (bg)	MW-602 (bg)	MW-707B	MW-805	MW-903
6/7/2016				422	
6/8/2016					362
6/9/2016	363				
6/10/2016		24.7			
6/23/2016			371		
8/9/2016		23.3	412		
8/10/2016				437	
8/11/2016	371				342
10/11/2016			408	422	
10/13/2016	395	25.7			333
12/6/2016			410	422	
12/9/2016		25.3			331
12/13/2016	336				
2/6/2017				435	
2/7/2017			398		
2/8/2017		24			
2/10/2017	297				321
4/4/2017			382	444	339
4/6/2017	320				
4/7/2017		24.9			
6/13/2017			374	430	
6/15/2017	339	23.2			
6/16/2017					331
8/8/2017	319		378	414	
8/10/2017		23.3			330
10/3/2017			382		344
10/5/2017	274	25.3		467	
12/12/2017				525	
1/9/2018				439	
5/23/2018	248	22.9		434	368
5/24/2018			396		
7/11/2018					371
8/16/2018					382
9/17/2018	214				376
11/29/2018					375
11/30/2018	209	23.7		455	
12/4/2018			381		
1/14/2019	247			473	377
3/11/2019				468	375

Appendix D

Piper Diagrams



Analysis Run 5/15/2019 4:46 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

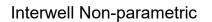
Totals (ppm)	Na	ĸ	Ca	Mg	Cl	SO4	HCO3	C03
MW-13* 9/17/2018	165	3.55	214	120	13.1	1010	295	10
MW-13* 1/14/2019	151	3.3	247	128	12.5	1120	289	10
MW-903 9/17/2018	116	6.47	376	117	26.1	1070	497	10
MW-903 1/14/2019	110	6.18	377	118	24.3	1070	501	10

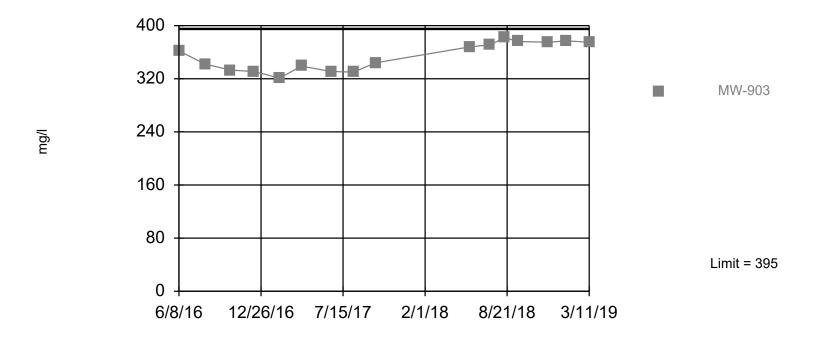
Appendix E

Facility Wide Interwell Prediction Limits

Within Limit

Prediction Limit





Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 82 background values. Annual per-constituent alpha = 0.0001433. Individual comparison alpha = 0.0001024 (1 of 3). Assumes 6 future values. Seasonality was not detected with 95% confidence.

Constituent: CALCIUM Analysis Run 5/15/2019 4:56 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 5/15/2019 5:17 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-703 (bg)	MW-701 (bg)	MW-903	MW-901 (bg)	MW-601 (bg)	MW-13 (bg)	MW-602 (bg)
6/6/2016	60.1							
6/7/2016		22	39.6					
6/8/2016				362	57.2			
6/9/2016						21.7	363	
6/10/2016								24.7
8/9/2016		17.9	35.3			20.3		23.3
8/11/2016	58.7			342	53.9		371	
10/11/2016		20.5	37.2					
10/12/2016	60.7							
10/13/2016				333		23.9	395	25.7
10/14/2016					52.1			
12/6/2016		19.8	37.2					
12/7/2016						22.5		
12/9/2016	59			331				25.3
12/12/2016					56.9			
12/13/2016							336	
2/7/2017		17.7	37.4					
2/8/2017	58.8					20.1		24
2/9/2017					55.7			
2/10/2017				321			297	
4/4/2017		22.4	36.3	339	57.6			
4/6/2017	57.4					21.3	320	
4/7/2017								24.9
6/13/2017			36.1					
6/14/2017		17.4						
6/15/2017	55.5					22	339	23.2
6/16/2017				331	56.7			
8/8/2017			36.3				319	
8/9/2017						20.9		
8/10/2017	56.1	17.5		330				23.3
8/11/2017					56			
10/3/2017			36.1	344	58.2			
10/4/2017	58.4							
10/5/2017		21.6					274	25.3
10/6/2017						21.1		
5/23/2018	54.1			368	57.1	17.6	248	22.9
5/24/2018		21.8	39.5					
7/11/2018				371				
8/16/2018				382				
9/17/2018				376			214	
11/29/2018				375	56.4			
11/30/2018	57.5					17.5	209	23.7
12/3/2018		17.7	44.8					
1/14/2019				377		17.9	247	
1/15/2019			40.2					
3/11/2019			44.2	375				

Prediction Limit

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 5/15/2019, 5:17 PM

<u>Constituent</u>	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method
CALCIUM (mg/l)	MW-903	395	n/a	3/11/2019	375	No	82	0	n/a	0.000	NP Inter (normality)

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

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

BOTTOM ASH IMPOUNDMENT LA CYGNE GENERATING STATION LA CYGNE, KANSAS

Presented To:

Evergy Metro, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100 Overland Park, Kansas 66210 (913) 681-0030 December 2019 File No. 27217233.19

CERTIFICATIONS

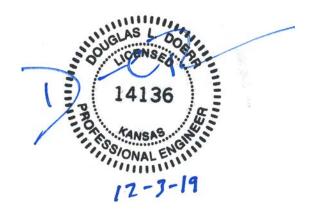
I, John R. Rockhold, being a qualified groundwater scientist and licensed Professional Geologist in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Bottom Ash Impoundment at the La Cygne Generating 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, P.G.

SCS Engineers

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



Douglas L. Doerr, P.E.

SCS Engineers

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Appendix A	Bottom Ash SPLP Laboratory Report
Appendix B	Box and Whiskers Plots
Appendix C	Time Series Plots
Appendix D	Piper Diagrams
Appendix E	Facility Wide Interwell Prediction Limits

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 Bottom Ash Impoundment at the La Cygne 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 23, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 5, 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 17, 2019 and August 22, 2019.

The completed statistical evaluation identified Appendix III constituent, calcium, above its prediction limit in monitoring well MW-903.

Constituent/Monitoring Well	*UPL	Observation May 23, 2019	1st Verification July 17, 2019	2nd Verification August 22, 2019	
Calcium					
MW-903	358.2	367	373	366	

*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 one SSI above the background prediction limit for calcium in monitoring well MW-903.

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 SSI for the Bottom Ash Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate the SSI was not caused by a release from the Bottom Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 BOTTOM ASH SPLP ANALYSIS

The Synthetic Precipitation Leaching Procedure (SPLP) is an Environmental Protection Agency (EPA) approved extraction procedure designed to simulate and then analyze leachate, which would be produced from rainfall passing through a contaminated material (assuming the rainfall is slightly acidic). The SPLP is used to assess the potential of a contaminated material (in or on top of the ground) to impact groundwater (or surface water), when exposed to normal weathering. A bottom ash sample was collected on September 17, 2018 and submitted to the laboratory for SPLP analysis for calcium. The calcium result for the SPLP extract (simulated leachate) was 73.7 mg/L. The prediction limit for calcium in monitoring well MW-903 is 358.2 mg/L and the detection monitoring sample was reported at 367 mg/L. The calcium concentration in the groundwater from MW-903 is significantly greater than what would be expected from bottom ash leachate. The comparison indicates the elevated calcium concentrations in monitoring well MW-903 are not from bottom ash leachate but from a source other than bottom ash, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The laboratory report is provided in **Appendix A**.

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.

Based on the bottom ash SPLP calcium analysis compared to the calcium results for MW-903, the calcium levels for additional wells at the La Cygne Generating Station (not part of the CCR Bottom Ash groundwater monitoring system) were reviewed for elevated calcium levels to determine if elevated calcium concentrations could occur naturally in the vicinity of the facility and if natural variability between wells occurred in the vicinity of the facility. Four wells were identified as exhibiting elevated calcium and one of them was an upgradient well. Box and whiskers plots for calcium for upgradient monitoring wells MW-13 and MW-602 and downgradient wells MW-707B, MW-805, and MW-903 were prepared for comparison. Upgradient monitoring well MW-602 does not have elevated calcium but is located in close proximity to MW-13, indicating natural variability of calcium over short distances occurs at the site. The comparison also indicates the calcium levels in monitoring well MW-903 are within the range of calcium

concentrations in upgradient wells at the facility site and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whiskers plots are provided in **Appendix B**.

3.3 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. 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.

Four wells were identified as exhibiting elevated calcium and one of them was an upgradient well. Of the four wells exhibiting elevated calcium, wells, MW-805 and MW-903 also exhibited a SSIs. Time series plots for calcium for upgradient monitoring wells MW-13 and MW-602 and downgradient wells MW-707B, MW-805, and MW-903 were prepared for comparison. Upgradient monitoring well MW-602 does not have elevated calcium but is located close to MW-13 indicating natural variability of calcium over short distances occurs at the site. The comparison indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the site and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

3.4 PIPER 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 samples from MW-903 and samples from MW-13 (upgradient well for the CCR Landfill and Lower AQC Impoundment) are provided in **Appendix D.** The samples plot near one another in the same hydrochemical facies indicating similar geochemical characteristics between an

upgradient well at the facility and a downgradient well for the Bottom Ash Impoundment. The comparison indicates the hydrochemical characteristics (particularly calcium) of groundwater from monitoring well MW-903 are similar to the hydrochemical characteristics (particularly calcium) of background groundwater and are a similar range as that of an upgradient well at the facility and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The piper diagram plots are provided in **Appendix D**.

3.5 FACILITY WIDE INTERWELL PREDICTION LIMIT

Because of known complexities and heterogeneities of the water bearing zone at the facility, an intrawell prediction limit analysis with retesting was the selected statistical method for the Bottom Ash Impoundment. However, false positives (SSIs) may occur due to a limited background data set that may not truly represent the background population for that particular well until the number of background observations are increased to better represent the entire population. The CCR Rule preamble recommends a minimum of eight to ten independent background observations be collected before performing the first statistical test; but also states that background sample sets of at least 20 are considered optimal. To further demonstrate that an intrawell prediction limit exceedance (SSI) could be naturally occurring and likely the result of a limited background data set for a particular well, an interwell prediction limit analysis on a facility wide basis can be useful to further demonstrate natural variability across a site or in the vicinity of the site and that the potential true background population may not be represented.

An interwell prediction limit analysis on a facility wide basis was performed comparing the calcium concentration in MW-903 to the prediction limit calculated from the combined background calcium data from all of the background (upgradient) monitoring wells across the facility. For this scenario, the facility wide interwell prediction limit for calcium is 395 mg/L. The highest calcium concentration from MW-903 is 382 mg/L, which is below the facility wide interwell prediction limit for calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the facility site. This demonstrates that a source other than the bottom ash could cause the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Facility wide interwell prediction limit outputs are provided in **Appendix E**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Bottom Ash Impoundment caused the SSI above background levels for calcium, or that the SSI 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 Bottom Ash Impoundment 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 Metro, Inc. for specific application to the La Cygne Generating Station. No warranties, express or implied, are intended or made.

The signature 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

Bottom Ash SPLP Laboratory Report



ANALYTICAL REPORT

October 01, 2018

SCS Engineers - KS

Sample Delivery Group:	L1027123
Samples Received:	09/19/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210

Entire Report Reviewed By:

Vubb law

Jeff Carr Project Manager

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

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*
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² Tc
³ Ss
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TC
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⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

BOTTOM ASH L1027123-01 GW			Collected by Jason R Franks	Collected date/time 09/17/18 12:00	Received date/time 09/19/18 11:50	1
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	2
Preparation by Method 1312	WG1169395	1	09/21/18 11:47	09/21/18 11:47	TM	L
Wet Chemistry by Method 9056A	WG1169693	1	09/24/18 20:14	09/24/18 20:14	NJM	
Metals (ICP) by Method 6010B	WG1170271	1	09/23/18 09:55	09/23/18 22:31	CCE	

Тс
³Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

*

Ср

SDG: L1027123 DATE/TIME: 10/01/18 09:32 PAGE: 3 of 10

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.

Jubb land

Jeff Carr Project Manager

Τс Ss Cn Sr Qc GI AI Sc

PROJECT: 27217233.18

SDG: L1027123 DATE/TIME: 10/01/18 09:32

PAGE: 4 of 10

SAMPLE RESULTS - 01 L1027123



Qc

Gl

Â

Sc

Preparation by Method 1312

					l'Cn	L
	Result	Qualifier	Prep	Batch	Cp	l
Analyte			date / time		2	i
SPLP Extraction	-		9/21/2018 11:47:27 AM	WG1169395	Tc	l

Wet Chemistry by Method 9056A

	Result	Qualifier	Flep		Balch				
Analyte			date / time						
SPLP Extraction	-		9/21/2018 11	I:47:27 AM	WG1169395				
Wet Chemistry by	Method 9056A								
	Result	Qualifier	RDL	Dilution	Analysis	Batch			
Analyte	ug/l		ug/l		date / time				
Chloride	ND		1000	1	09/24/2018 20:14	WG1169693			
Fluoride	118		100	1	09/24/2018 20:14	WG1169693			
Sulfate	51100		5000	1	09/24/2018 20:14	<u>WG1169693</u>			

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	959		200	1	09/23/2018 22:31	WG1170271
Calcium	73700		1000	1	09/23/2018 22:31	WG1170271

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

Ср

⁴Cn

Sr

Qc

GI

Â

Sc

Method Blank (MB)

(MB) R3344732-1	09/24/18 17:59

(=)								
	MB Result	MB Qualifier	MB MDL	MB RDL				2
Analyte	ug/l		ug/l	ug/l				T
Chloride	U		51.9	1000				
Fluoride	U		9.90	100				³ S
Sulfate	U		77.4	5000				Ľ

L1027594-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1027594-11 09/24/	18 22:52 • (DUP)) R3344732-4	09/24/18	23:07		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	244	184	1	27.8	<u>J P1</u>	15
Sulfate	U	0.000	1	0.000		15

L1027715-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1027715-01 09/25/18 01:45 • (DUP) R3344732-7 09/25/18 02:00

(,	Original Result			DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	8430	8420	1	0.118		15
Sulfate	8690	8710	1	0.147		15

L1027594-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1027594-11 09/24/1	8 22:52 • (MS) F	R3344732-5 0	9/24/18 23:21	• (MSD) R33447	732-6 09/24/1	8 23:36						
	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	244	50900	51100	101	102	1	80.0-120			0.435	15
Sulfate	50000	U	51800	51400	104	103	1	80.0-120			0.729	15

L1027715-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1027715-01 09/25/18	3 01:45 • (MS) R	3344732-8 09	/25/18 02:14				
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	ug/l	ug/l	ug/l	%		%	
Chloride	50000	8430	59200	102	1	80.0-120	
Sulfate	50000	8690	59100	101	1	80.0-120	

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
SCS Engineers - KS	27217233.18	L1027123	10/01/18 09:32	6 of 10

WG1170271

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY L1027123-01

⁺Cn

Sr

Qc

GI

Method Blank (MB)

Method Blau	K (IVIB)						
(MB) R3344358-1 09/23/18 21:58							
	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) R3344358-2 09/23/18 22:01 • (LCSD) R3344358-3 09/23/18 22:03										
	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	992	995	99.2	99.5	80.0-120			0.340	20
Calcium	10000	10000	9930	100	99.3	80.0-120			0.917	20

L1026826-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1026826-01 09/23/	S) L1026826-01 09/23/18 22:06 • (MS) R3344358-5 09/23/18 22:12 • (MSD) R3344358-6 09/23/18 22:14									⁸ Al			
	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	%	%		%			%	%	9
Boron	1000	155	1170	1170	101	102	1	75.0-125			0.133	20	SC
Calcium	10000	43500	53700	53700	102	102	1	75.0-125			0.0395	20	

ACCOUNT:
SCS Engineers - KS

PROJECT: 27217233.18

SDG: L1027123

DATE/TIME: 10/01/18 09:32

PAGE: 7 of 10

GLOSSARY OF TERMS

*

Τс

Ss

Cn

Sr

*Q*c

GI

Al

Sc

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

PROJECT: 27217233.18

SDG: L1027123 DATE/TIME: 10/01/18 09:32

PAGE: 8 of 10

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	Nebra
Alaska	17-026	Nevad
Arizona	AZ0612	New H
Arkansas	88-0469	New J
California	2932	New N
Colorado	TN00003	New Y
Connecticut	PH-0197	North
Florida	E87487	North
Georgia	NELAP	North
Georgia ¹	923	North
Idaho	TN00003	Ohio-
Illinois	200008	Oklah
Indiana	C-TN-01	Orego
lowa	364	Penns
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South
Louisiana	AI30792	Tenne
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virgini
Minnesota	047-999-395	Washi
Mississippi	TN00003	West \
Missouri	340	Wisco
Montana	CERT0086	Wyom

lebraska	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 ¹⁴	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	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

SCS Engineers - KS

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.

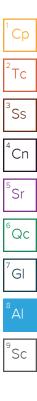


27217233.18

L1027123

PAGE: 9 of 10

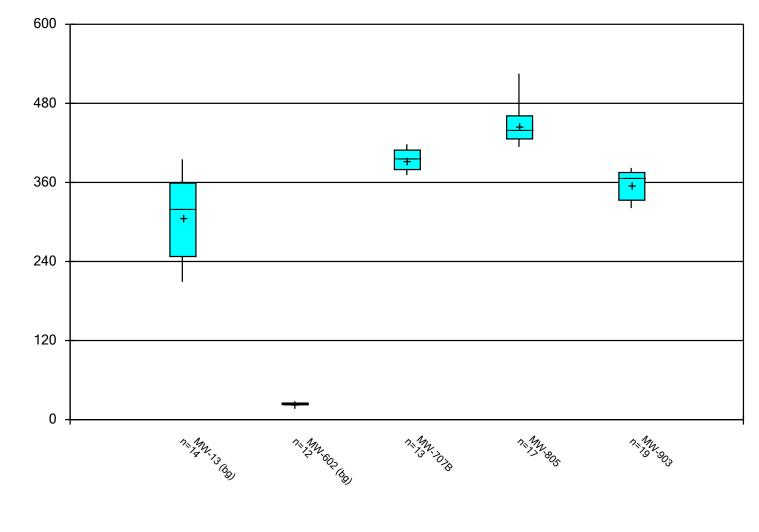
10/01/18 09:32



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SCS Engineers - KS 8575 West 110th Street Suite 100 Overland Park, KS 65210		Accounts Payable			Pres	1		Analysis / Co	ntainer / Preserva	tive	1 1	Chain of Custod	y Page of			
		8575 West 110th Street				1.33	1.00	1.1		100		\$7				
			Suite 10		-	1	1			-		1 300	Analysian"			
		Overlan	Overland Park, KS 66210						1	1.1		/	even er deteg Grands			
Report to:	2.5.1	1211	Email To:	franks@scsenging	ers.com:	-							and the second	1997 - Ser - 1997		
Jason Franks			jay.martir	To: Jfranks@scsengineers.com; artin@kcpl.com;				1 12					12065 Lebanon Rd			
Project Description: KCPL - LaCygne Gen	erating Stat	ion	Iterate and	City/State Collected:			NoPres						Mount Juliet, TN 3 Phone: 615-758-58 Phone: 800-767-58 Fax: 615-758-5859	158 159		
Phone: 913-681-0030 Fax: 913-681-0012	Client Project 27217233.			Lab Project # AQUAOPKS-LACYGNE		10	16ozClr-No	2					L# L10	27:23		
Collected by (print): JASON R. FRANKS	Site/Facility I	D#	8	P.O. #		53					1		C. Barris			
JASON R. FRANKS Collected by (signature):	Rush? (I	ab MUST Be		Quote #			'anions				2.Ft		and the second second second	Acctnum: AQUAOPKS Template:T140691		
Immediately Packed on Ice N Y	Wext Da Two Day Three D	y 5 Day 10 Da	(Rad Only) y (Rad Only)	Date Res	ults Needed	No. of	metals ,	-19						TSR: 206 - Jeff	Prelogin: P672563 TSR: 206 - Jeff Carr PB:	
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cotrs							Shipped Via:			
2 1	0			1 1 1		1	SPLP					1.10	Bemarks	Sample # (lab only)		
Bortom ASH	GRAB	SS	-	9/17/18	1200	1	x						1.11.14	-01		
	-			1.1.1	1.1.1.1.1	-					1			Sector and		
THE STATE			21					_	12.0				1			
	1.			1	1.	31					-		545			
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	-		_													
				1	Carl Conse		1.2							- A CONTRACT		
			1011	200												
GW - Groundwater B - Bioassay	Remarks: SPI	.P - Extract	for B, Ca, C	I, FI, and SO4	1			pHTemp				Sample Receipt Checklist COC Seal Present/Intact: _NP _Y _N				
WW - WasteWater DW - Drinking Water OT - Other	Samples return UPSFed	ed via: IEx Cour	er				Flow Other					Bottles Correct	ned/Accurate: arrive intact: bottles used: ent volume sent:			
Relinquished by Astgnature		Date:	/ Th	and the second s	cking # :e/Ved by: (Signat	ure)	9	-18-18	Trip Blank Re	ceived: Yes No	1. 18	VOA Zero	If Applicab) o Headspace: ation Correct/Che	v v		
Relinquished by : (Sighature)		9/19/1 Date:	-	The: Rec	eived by: (Signat	loa	-	1505		HCL/N TBR	Леон					
Relinquished by : (Signature)	-	Data			1.2.	T			Temp: 1	°C Bottles Rece	ived:	If preserva	ation required by Log	in: Date/Time		
Demilation of a failuren of		Date:	Tir	ne:	elved for lab.by:	(Signatu	re) 80	ā	Date: 9/19/18	Time:		Hold:		Condition NCF / OK		

Appendix B

Box and Whiskers Plots



Constituent: CALCIUM Analysis Run 10/30/2019 9:12 AM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

mg/l

Constituent: CALCIUM (mg/l) Analysis Run 10/30/2019 9:13 AM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

				,,	с С
	MW-13 (bg)	MW-602 (bg)	MW-707B	MW-805	MW-903
6/7/2016				422	
6/8/2016					362
6/9/2016	363				
6/10/2016		24.7			
6/23/2016			371		
8/9/2016		23.3	412		
8/10/2016				437	
8/11/2016	371				342
10/11/2016	6		408	422	
10/13/2016	6 395	25.7			333
12/6/2016			410	422	
12/9/2016		25.3			331
12/13/2016	6 336				
2/6/2017				435	
2/7/2017			398		
2/8/2017		24			
2/10/2017	297				321
4/4/2017			382	444	339
4/6/2017	320				
4/7/2017		24.9			
6/13/2017			374	430	
6/15/2017	339	23.2			
6/16/2017					331
8/8/2017	319		378	414	
8/10/2017		23.3			330
10/3/2017			382		344
10/5/2017	274	25.3		467	
12/12/2017	7			525	
1/9/2018				439	
5/23/2018	248	22.9		434	368
5/24/2018			396		
7/11/2018					371
8/16/2018					382
9/17/2018	214				376
11/29/2018	8				375
11/30/2018	8 209	23.7		455	
12/4/2018			381		
1/14/2019	247			473	377
3/11/2019				468	375
5/23/2019	355	23.1	418	442	367
7/17/2019			406 (i)	453 (i)	373
8/22/2019					366
Median	319.5	23.85	396	439	366
LowerQ.	247.5	23.25	379.5	426	333
UpperQ.	359	25.1	409	461	375
Min	209	22.9	371	414	321
Max	395	25.7	418	525	382
Mean	306.2	24.12	393.5	446	355.9

Box & Whiskers Plot

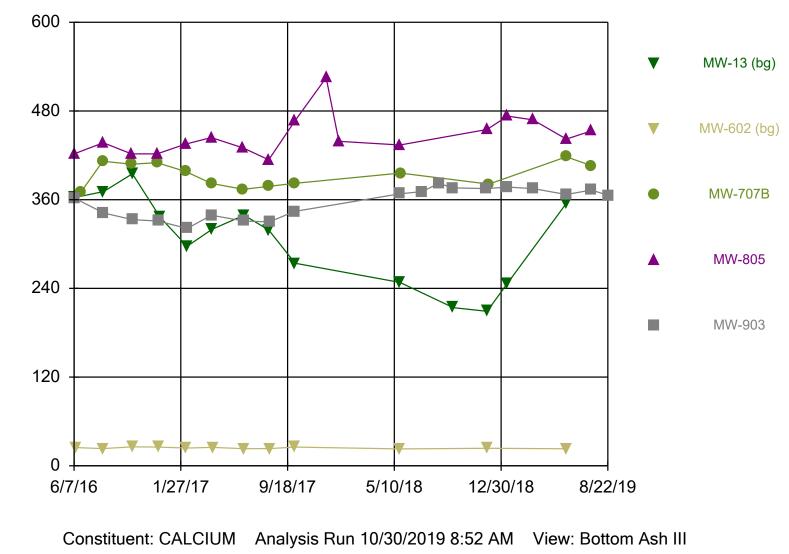
	LaCygne Clier	nt: SCS Engi	neers Data: La	aC GW Data Prir	nted 10/30/2019, 9:	13 AM			
Constituent	Well	<u>N</u>	<u>Mean</u>	Std. Dev.	Std. Err.	<u>Median</u>	<u>Min.</u>	<u>Max.</u>	<u>%NDs</u>
CALCIUM (mg/l)	MW-13 (bg)	14	306.2	59.47	15.89	319.5	209	395	0
CALCIUM (mg/l)	MW-602 (bg)	12	24.12	1.006	0.2905	23.85	22.9	25.7	0
CALCIUM (mg/l)	MW-707B	13	393.5	16.22	4.497	396	371	418	0
CALCIUM (mg/l)	MW-805	17	446	26.75	6.488	439	414	525	0
CALCIUM (mg/l)	MW-903	19	355.9	20.36	4.671	366	321	382	0

Appendix C

Time Series Plots

mg/l

Time Series



LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

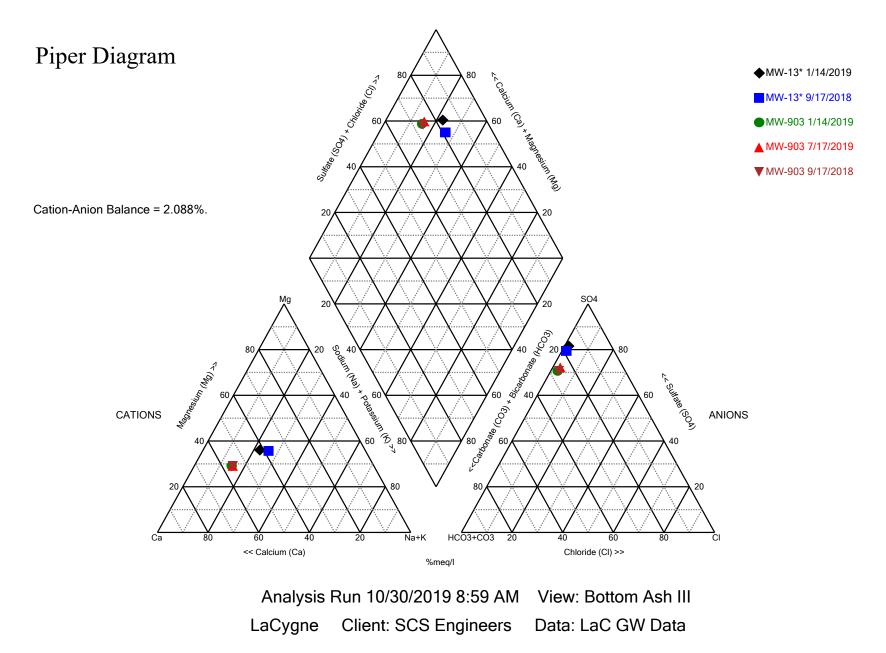
Constituent: CALCIUM (mg/l) Analysis Run 10/30/2019 8:53 AM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

			Lac	ygne Client. 303	Eligineers Data. Lac Giv Data
	MW-13 (bg)	MW-602 (bg)	MW-707B	MW-805	MW-903
6/7/2016				422	
6/8/2016					362
6/9/2016	363				
6/10/2016		24.7			
6/23/2016			371		
8/9/2016		23.3	412		
8/10/2016				437	
8/11/2016	371				342
10/11/2016			408	422	
10/13/2016	395	25.7			333
12/6/2016			410	422	
12/9/2016		25.3			331
12/13/2016	336				
2/6/2017				435	
2/7/2017			398		
2/8/2017		24			
2/10/2017	297				321
4/4/2017			382	444	339
4/6/2017	320				
4/7/2017		24.9			
6/13/2017			374	430	
6/15/2017	339	23.2			
6/16/2017					331
8/8/2017	319		378	414	
8/10/2017		23.3			330
10/3/2017			382		344
10/5/2017	274	25.3		467	
12/12/2017				525	
1/9/2018				439	
5/23/2018	248	22.9		434	368
5/24/2018			396		
7/11/2018					371
8/16/2018					382
9/17/2018	214				376
11/29/2018					375
11/30/2018	209	23.7		455	
12/4/2018			381		
1/14/2019	247			473	377
3/11/2019				468	375
5/23/2019	355	23.1	418	442	367
7/17/2019			406 (i)	453 (i)	373
8/22/2019					366

Appendix D

Piper Diagrams



Piper Diagram

Analysis Run 10/30/2019 9:01 AM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

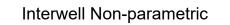
Totals (p	ppm)	Na	К	Ca	Mg	Cl	SO4	HCO3	CO3
MW-13* 9/	/17/2018	165	3.55	214	120	13.1	1010	295	10
MW-13* 1/	/14/2019	151	3.3	247	128	12.5	1120	289	10
MW-903 9/	/17/2018	116	6.47	376	117	26.1	1070	497	10
MW-903 1/	/14/2019	110	6.18	377	118	24.3	1070	501	10
MW-903 7/	/17/2019	114	6.45	373	117	25.6	1140	495	10

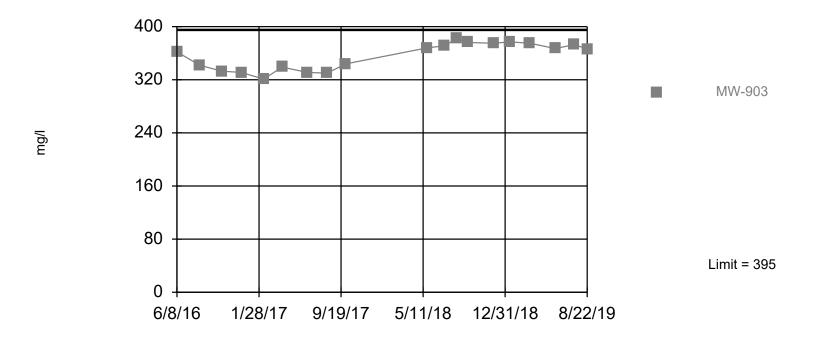
Appendix E

Facility Wide Interwell Prediction Limits

Within Limit

Prediction Limit





Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 105 background values. Annual per-constituent alpha = 0.0000709. Individual comparison alpha = 0.00005064 (1 of 3). Assumes 6 future values. Seasonality was not detected with 95% confidence.

Constituent: CALCIUM Analysis Run 10/30/2019 9:04 AM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 10/30/2019 9:07 AM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

					,0	0				
		MW-10 (bg)	MW-703 (bg)	MW-701 (bg)	MW-903	MW-901 (bg)	MW-702 (bg)	MW-601 (bg)	MW-13 (bg)	MW-602 (bg)
6	/6/2016	60.1								
6	/7/2016		22	39.6						
6	/8/2016				362	57.2	17.3			
6	/9/2016							21.7	363	
6	/10/2016									24.7
8	/9/2016		17.9	35.3			11.2	20.3		23.3
8	/11/2016	58.7			342	53.9			371	
1	0/11/2016		20.5	37.2			14.9			
1	0/12/2016	60.7								
1	0/13/2016				333			23.9	395	25.7
1	0/14/2016					52.1				
	2/6/2016		19.8	37.2						
	2/7/2016							22.5		
	2/8/2016						19.4			
	2/9/2016	59			331		1011			25.3
	2/12/2016	00			001	56.9				20.0
	2/13/2016					30.9			336	
			177	27.4					330	
	/7/2017	50.0	17.7	37.4			10.1	00.1		24
	/8/2017	58.8					18.1	20.1		24
	/9/2017					55.7				
	/10/2017				321				297	
	/4/2017		22.4	36.3	339	57.6				
	/5/2017						18.5			
	/6/2017	57.4						21.3	320	
	/7/2017									24.9
	/13/2017			36.1						
6	/14/2017		17.4							
6	/15/2017	55.5					15.1	22	339	23.2
6	/16/2017				331	56.7				
8	/8/2017			36.3					319	
8	/9/2017						20.3	20.9		
8	/10/2017	56.1	17.5		330					23.3
8	/11/2017					56				
1	0/3/2017			36.1	344	58.2	19.6			
1	0/4/2017	58.4								
1	0/5/2017		21.6						274	25.3
1	0/6/2017							21.1		
5	/23/2018	54.1			368	57.1		17.6	248	22.9
5	/24/2018		21.8	39.5			7.13			
7	/11/2018				371					
	/16/2018				382					
	/17/2018				376				214	
	1/29/2018				375	56.4				
	1/30/2018	57.5						17.5	209	23.7
	2/3/2018	-	17.7	44.8			3.24	-		
	/14/2019				377		11.2	17.9	247	
	/15/2019			40.2						
	/13/2019			40.2	375					
	/23/2019	52.9	19.3	44.2	367	52.3	5.7	17.7	355	23.1
		52.3	13.3			JZ.J	5.7		555	23.1
	/17/2019			45	373			18.2 (i)		
	/22/2019			20.0	366					
8	/23/2019			39.9						

Prediction Limit

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 10/30/2019, 9:07 AM

<u>Constituent</u>	<u>Well</u>	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
CALCIUM (mg/l)	MW-903	395	n/a	8/22/2019	366	No	105	0	n/a	0.000	NP Inter (normality)

Addendum 1

2019 Annual Groundwater Monitoring and Corrective Action Report Addendum 1

SCS ENGINEERS

Evergy Metro, Inc.

Douglas L. Doerr, P.E. John R. Rockhold, P.G.

SCS Engineers

December 16, 2022 File No. 27217233.19

To:

From:



Subject: 2019 Annual Groundwater Monitoring and Corrective Action Report Addendum 1 Evergy Metro, Inc. Bottom Ash Impoundment La Cygne Generating Station - La Cygne, Kansas

Jared Morrison - Director, Water and Waste Programs

The Bottom Ash Impoundment at the La Cygne Generating Station are 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 Bottom Ash Impoundment was completed and placed in the facility's operating record on January 30, 2020, as required by the Rule. The Annual GWMCA report was to fulfill the requirements specified in 40 CFR 257.90(e).

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

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

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

The attachments to this addendum are as follows:

• Attachment 1 – Laboratory Analytical Reports:

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

3

- 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 Revised Groundwater Potentiometric Surface Maps:

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

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

Jared Morrison December 16, 2022

ATTACHMENT 1

Laboratory Analytical Reports

Jared Morrison December 16, 2022

ATTACHMENT 1-1 January 2019 Sampling Event Laboratory Report



ANALYTICAL REPORT

January 23, 2019

SCS Engineers - KS

Sample Delivery Group:	L1061523
Samples Received:	01/16/2019
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210

Entire Report Reviewed By:

Jubb law

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 approach of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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PROJECT: 27217233.18

SDG: L1061523

SAMPLE SUMMARY

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	SAMFLE SC		X I		
MW-13 L1061523-01 GW			Collected by Jason R. Franks	Collected date/time 01/14/19 16:25	Received date/time 01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1225451	1	01/22/19 14:30	01/22/19 14:30	ST
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 10:54	TRB
			Collected by	Collected date/time	Received date/time
DUPLICATE 1 L1061523-02 GW			Jason R. Franks	01/14/19 16:25	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1225451	1	01/22/19 15:16	01/22/19 15:16	ST
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:25	TRB
			Collected by	Collected date/time	Received date/time
MW-14R L1061523-03 GW			Jason R. Franks	01/14/19 16:35	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1225457	1	01/19/19 18:09	01/19/19 18:09	ELN
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:04	TRB
			Collected by	Collected date/time	Received date/time
DUPLICATE 2 L1061523-04 GW			Jason R. Franks	01/14/19 16:40	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1225451	1	01/22/19 15:32	01/22/19 15:32	ST
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:28	TRB
			Collected by	Collected date/time	Received date/time
MW-15 L1061523-05 GW			Jason R. Franks	01/14/19 15:50	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:30	TRB
			Collected by	Collected date/time	Received date/time
MW-601 L1061523-06 GW			Jason R. Franks	01/14/19 16:00	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1225463	1	01/22/19 19:04	01/22/19 19:04	ELN
			Collected by	Collected date/time	Received date/time
DUPLICATE 3 L1061523-07 GW			Jason R. Franks	01/14/19 16:00	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1225451	1	01/22/19 15:47	01/22/19 15:47	ST
			Collected by	Collected date/time	Received date/time
MW-701 L1061523-08 GW			Jason R. Franks	01/15/19 12:05	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:18	TRB

 ACCOUNT:
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 SCS Engineers - KS
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 3 of 32

SAMPLE SUMMARY

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	SAMPLE SU		T	ON	L LAD. NATIONWI
DUPLICATE 4 L1061523-09 GW			Collected by Jason R. Franks	Collected date/time 01/15/19 12:05	Received date/time 01/16/19 08:30
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:33	TRB
			Collected by	Collected date/time	Received date/time
MW-702 L1061523-10 GW			Jason R. Franks	01/14/19 15:05	01/16/19 08:30
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Wet Chemistry by Method 9056A	WG1225451	1	01/22/19 16:03	01/22/19 16:03	ST
			Collected by	Collected date/time	Received date/time
MW-706 L1061523-11 GW			Jason R. Franks	01/15/19 11:55	01/16/19 08:30
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Wet Chemistry by Method 9056A	WG1225451	1	01/22/19 16:33	01/22/19 16:33	ST
			Collected by	Collected date/time	Received date/time
MW-804 L1061523-12 GW			Jason R. Franks	01/14/19 14:05	01/16/19 08:30
Method	Batch	Dilution	Preparation	Analysis	Analyst
Metals (ICP) by Method 6010B	WG1224609	1	date/time 01/23/19 08:04	date/time 01/23/19 11:36	TRB
MW-805 L1061523-13 GW			Collected by Jason R. Franks	Collected date/time 01/14/19 14:05	Received date/time 01/16/19 08:30
Method	Batch	Dilution	Preparation	Analysis	Analyst
	WC1224C00	1	date/time	date/time	TDD
Metals (ICP) by Method 6010B	WG1224609	1	01/23/19 08:04	01/23/19 11:38	TRB
			Collected by	Collected date/time	Received date/time
MW-902 L1061523-14 GW			Jason R. Franks	01/14/19 13:15	01/16/19 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1224723	1	01/19/19 18:11	01/19/19 20:53	AJS
			Collocted by	Colloptod data Him	Dopping data H
			Collected by Jason R. Franks	Collected date/time 01/14/19 13:15	Received date/time 01/16/19 08:30
DUPLICATE 5 L1061523-15 GW	D · · ·	<u> </u>			
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1224723	1	01/19/19 18:11	01/19/19 20:53	AJS
			Collected by	Collected date/time	Received date/time
MW-903 L1061523-16 GW			Jason R. Franks	01/14/19 13:15	01/16/19 08:30
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	

PROJECT: 27217233.18

SDG: L1061523 DATE/TIME: 01/23/19 15:51

CASE NARRATIVE

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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.

Jubb land

Jeff Carr Project Manager

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PROJECT: 27217233.18

SDG: L1061523 DATE/TIME: 01/23/19 15:51

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SAMPLE RESULTS - 01

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Wet Chemistry by Method 9056A

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		-p
Analyte	ug/l		ug/l		date / time		2	
Fluoride	208		100	1	01/22/2019 14:30	<u>WG1225451</u>	ĹΤ	Гс
Metals (ICP) by	Method 6010B						³ S	Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch		

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01/23/2019 10:54

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Wet Chemistry by Method 9056A

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Fluoride	214		100	1	01/22/2019 15:16	WG1225451	Tc
Metals (ICP) by	Method 6010B						 ³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		4 Cp

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Wet Chemistry by Method 9056A

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Chloride	5960		1000	1	01/19/2019 18:09	WG1225457	Tc
Metals (ICP) by	Method 6010B						³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		⁴Cn
Boron	859		200	1	01/23/2019 11:04	WG1224609	

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Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Chloride	5960		1000	1	01/22/2019 15:32	WG1225451	
Metals (ICP) by I	Vethod 6010B						
Metals (ICP) by I	Method 6010B Result	Qualifier	RDL	Dilution	Analysis	Batch	
Metals (ICP) by I		Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch	

SAMPLE RESULTS - 05 L1061523



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Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch	— ҐСр
Analyte	ug/l		ug/l		date / time		2
Boron	288		200	1	01/23/2019 11:30	WG1224609	Tc

SDG: L1061523

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Wet Chemistry by Method 9056A

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		Ср
Analyte	ug/l		ug/l		date / time			2
Sulfate	5970		5000	1	01/22/2019 19:04	WG1225463		⁻Tc

ACCOUNT:
SCS Engineers - KS

SDG: L1061523 DATE/TIME: 01/23/19 15:51

SAMPLE RESULTS - 07 L1061523

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Wet Chemistry by Method 9056A

	Result	Qualifier RDL	Dilution	Analysis	Batch	 Ср
Analyte	ug/l	ug/l		date / time		2
Sulfate	6650	5000	1	01/22/2019 15:47	WG1225451	⁻Tc



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Metals (ICP) by Method 6010B

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		Cp
Analyte	ug/l		ug/l		date / time			2
Calcium	40200		1000	1	01/23/2019 11:18	WG1224609		⁻Tc

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Metals (ICP) by Method 6010B

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		C
Analyte	ug/l		ug/l		date / time		2	_
Calcium	40500		1000	1	01/23/2019 11:33	WG1224609		Т



SAMPLE RESULTS - 10 L1061523

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Wet Chemistry by Method 9056A

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	F	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ι	ıg/l		ug/l		date / time		2
Fluoride	1	200		100	1	01/22/2019 16:03	WG1225451	⁻Tc

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Wet Chemistry by Method 9056A

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		Ср
Analyte	ug/l		ug/l		date / time			2
Sulfate	7730		5000	1	01/22/2019 16:33	WG1225451		Tc

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Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 'Ср
Analyte	ug/l		ug/l		date / time		2
Boron	1730		200	1	01/23/2019 11:36	WG1224609	⁻Tc



Metals (ICP) by Method 6010B

						1 Cn		
	Result	Qualifier	RDL	Dilution	Analysis	Batch		СР
Analyte	ug/l		ug/l		date / time			2
Calcium	473000		1000	1	01/23/2019 11:38	WG1224609		⁻Tc

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Gravimetric Analysis by Method 2540 C-2011

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		Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte		ug/l		ug/l		date / time		2
Dissolved Solids		492000		10000	1	01/19/2019 20:53	WG1224723	-

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Gravimetric Analysis by Method 2540 C-2011

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	R	lesult	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	u	g/l		ug/l		date / time		2
Dissolved Solids	4	90000		10000	1	01/19/2019 20:53	WG1224723	-

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Metals (ICP) by Method 6010B

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Calcium	377000		1000	1	01/23/2019 11:41	WG1224609	⁻Tc

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY

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Method Blank (MB)

MB) R3377316-1 01/19/19 20:53								
	MB Result	MB Qualifier	MB MDL	MB RDL				
Analyte	ug/l		ug/l	ug/l				
Dissolved Solids	U		2820	10000				

Laboratory Control Sample (LCS)

(LCS) R3377316-2 01/19/19 20:53										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier					
Analyte	ug/l	ug/l	%	%						
Dissolved Solids	8800000	8810000	100	85.0-115						

PROJECT: 27217233.18

SDG: L1061523 DATE/TIME: 01/23/19 15:51 PAGE: 22 of 32 Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1061523-01,02,04,07,10,11

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Method Blank (MB)

(MB) R3377912-1 01/22/1	19 10:37
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(1010) 1(3577512-1 0	//22/10 10.5/				
	MB Result	MB Qualifier	MB MDL	MB RDL	2
Analyte	ug/l		ug/l	ug/l	Tc
Chloride	U		51.9	1000	
Fluoride	U		9.90	100	³ Ss
Sulfate	U		77.4	5000	L

L1061734-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1061734-03 01/22/19 19:38 • (DUP) R3377912-6 01/22/19 19:54

	· · · ·					
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	2790	2800	1	0.565		15
Fluoride	ND	89.4	1	0.673	J	15
Sulfate	104000	104000	1	0.162	E	15

L1061734-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1061734-03 01/23/19	(OS) L1061734-03 01/23/19 09:13 • (DUP) R3377912-8 01/23/19 09:28										
Original Result DUP Result Dilution DUP RPD <u>DUP Qualifier</u>											
Analyte	ug/l	ug/l		%		%					
Sulfate	98700	98500	5	0.272		15					

L1061523-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1061523-10 01/22/19 16:03 • (DUP) R3377912-5 01/22/19 16:18											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits					
Analyte	ug/l	ug/l		%		%					
Chloride	44000	44000	1	0.114		15					
Fluoride	1200	1210	1	0.612		15					
Sulfate	ND	1690	1	0.000		15					

Laboratory Control Sample (LCS)

(LCS) R3377912-2 01/22/19	CS) R3377912-2 01/22/19 11:08											
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier							
Analyte	ug/l	ug/l	%	%								
Chloride	40000	38600	96.4	80.0-120								
Fluoride	8000	7960	99.5	80.0-120								

ACCOUNT: SDG: DATE/TIME: PROJECT: PAGE: SCS Engineers - KS 27217233.18 L1061523 01/23/19 15:51 23 of 32 Ср

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Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

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Laboratory Control Sample (LCS)

(LCS) R3377912-2 01/22/19 11:08												
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier							
Analyte	ug/l	ug/l	%	%								
Sulfate	40000	39000	97.4	80.0-120								

L1061734-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1061734-03 01/22/19 19:38 • (MS) R3377912-7 01/22/19 20:40											
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier				
Analyte	ug/l	ug/l	ug/l	%		%					
Chloride	50000	2790	53800	102	1	80.0-120					
Fluoride	5000	ND	5060	99.5	1	80.0-120					
Sulfate	50000	104000	151000	93.3	1	80.0-120	E				

L1061523-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1061523-01 01/22/19 14:30 • (MS) R3377912-3 01/22/19 14:46 • (MSD) R3377912-4 01/22/19 15:01												
	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	12600	62900	62300	101	99.4	1	80.0-120			1.05	15
Fluoride	5000	208	4760	4680	91.0	89.4	1	80.0-120			1.69	15
Sulfate	50000	1140000	1150000	1150000	32.3	29.1	1	80.0-120	EV	EV	0.138	15

ACCOUNT:	
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Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1061523-03

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Method Blank (MB)

(MB) R3377661-1 01/	19/19 17:17			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	ug/l		ug/l	ug/l
Chloride	U		51.9	1000

L1061779-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1061779-01 01/19/19	9 20:31 • (DUP) R	3377661-5 0	1/19/19 20:4	41		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	18600	18700	1	0.287		15

L1061818-01 Original Sample (OS) • Duplicate (DUP)

L1061818-01 C	Priginal Sample (OS) • Dup	licate (D	OUP)			⁷ Gl
(OS) L1061818-01 (01/20/19 00:08 • (DUP)	R3377661-6	01/20/19 0	0:19			
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	⁸ Al
Analyte	ug/l	ug/l		%		%	
Chloride	17600	17600	1	0.140		15	⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3377661-2 01/19/1	9 17:27				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Chloride	40000	37900	94.9	80.0-120	

L1061523-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1061523-03 01/19/1	9 18:09 • (MS) R	3377661-3 01/	19/19 18:20 • (N	1SD) R3377661-	4 01/19/19 18:3	31						
	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	5960	54400	54200	97.0	96.5	1	80.0-120			0.392	15

L1061818-01 Original Sample (OS) • Matrix Spike (MS)

Spike Amount Original Result MS Result MS Rec. Dilution Rec. Limits MS Qualifier Analyte ug/l ug/l % % % % % MS Qualifier	(OS) L1061818-01 01/20/19	00:08 • (MS) R	3377661-7 01/2	20/19 00:30			
Analyte ug/l ug/l % %		Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits
	Analyte	ug/l	ug/l	ug/l	%		%
Chloride 50000 17600 64900 94.7 1 80.0-120	Chloride	50000	17600	64900	94.7	1	80.0-120

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3377995-1 01/	/22/19 17:08				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	ug/l		ug/l	ug/l	
Sulfate	U		77.4	5000	

Laboratory Control Sample (LCS)

(LCS) R3377995-2 01/2	22/19 17:18				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Sulfate	40000	38400	96.0	80.0-120	

L1061523-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1061523-06 01/22/1	9 19:04 • (MS) F	3377995-3 01	/22/19 19:14 • (MSD) R337799	5-4 01/22/19 1	9:25						
	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	%	%		%			%	%
Sulfate	50000	5970	50000	50200	88.2	88.5	1	80.0-120			0.360	15

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Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY L1061523-01,02,03,04,05,08,09,12,13,16

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Method Blank (MB)

(MB) R3378022-1 01/23/1	9 10:46				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	ug/l		ug/l	ug/l	
Boron	20.0	J	12.6	200	
Calcium	U		46.3	1000	

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

(LCS) R3378022-2 01/23/1	9 10:49 • (LCSE	D) R3378022-3	01/23/19 10:51							
	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	1010	999	101	99.9	80.0-120			1.37	20
Calcium	10000	9950	9750	99.5	97.5	80.0-120			1.99	20

L1061523-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1061523-01 01/23/19	10:54 • (MS) R3	3378022-5 01/	23/19 10:59 • (I	MSD) R337802	2-6 01/23/19 1	1:01							8
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	L
Analyte	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%	ç
Boron	1000	539	1570	1530	103	99.0	1	75.0-125			2.40	20	
Calcium	10000	246000	255000	255000	92.7	89.0	1	75.0-125			0.148	20	

L1061523-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1061523-03 01/23/19	9 11:04 • (MS) R3	3378022-7 01/	23/19 11:06 • (N	/ISD) R3378022	2-8 01/23/19 11	:09						
	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	859	1890	1900	103	104	1	75.0-125			0.267	20
Calcium	10000	52900	67500	67700	145	148	1	75.0-125	$\underline{\vee}$	V	0.305	20

L1061523-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1061523-08 01/23/19	9 11:18 • (MS) R3	378022-9 01/2	23/19 11:20 • (N	ISD) R3378022	2-10 01/23/19 1	1:23						
	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	987	1970	1960	98.6	97.6	1	75.0-125			0.488	20
Calcium	10000	40200	48600	48600	84.0	83.8	1	75.0-125			0.0320	20

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GLOSSARY OF TERMS

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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 resu 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
	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial

Quanner	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.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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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
Alaska	17-026	Nevada
Arizona	AZ0612	New Hampshi
Arkansas	88-0469	New Jersey-1
California	2932	New Mexico ¹
Colorado	TN00003	New York
Connecticut	PH-0197	North Carolina
Florida	E87487	North Carolina
Georgia	NELAP	North Carolina
Georgia ¹	923	North Dakota
Idaho	TN00003	Ohio–VAP
Illinois	200008	Oklahoma
Indiana	C-TN-01	Oregon
lowa	364	Pennsylvania
Kansas	E-10277	Rhode Island
Kentucky ¹⁶	90010	South Carolin
Kentucky ²	16	South Dakota
Louisiana	AI30792	Tennessee ¹⁴
Louisiana 1	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washington
Mississippi	TN00003	West Virginia
Missouri	340	Wisconsin
Montana	CERT0086	Wyoming

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
Dhio-VAP	CL0069
Oklahoma	9915
Dregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ¹⁴	2006
Гехаs	T 104704245-17-14
「exas ⁵	LAB0152
Jtah	TN00003
/ermont	VT2006
/irginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	Δ2Ι Δ

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

SCS Engineers - KS

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.



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lason Franks						· · · · ·					10.5			Mount Juliet, TN 3 Phone: 615-758-58	SI ISTATION	
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JASON R. FRANKS	Site/Facility I	D#	-12.4	P.O. #				250mlHDP		Fluoride 200miHDPE-NoPres	MIHDPE-NoPres	NoPre		Acctnum: AQ		
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mmediatelyY	Next D	Y 10 Da	(Rad Only) y (Rad Only)	Date	Date Results Needed			· • .	Chloride 125mHDPE-NoPres	rideZ	Sulfate	MMHDPE-NoPres		PB:	and the second se	
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	Boron	Calcium	Chio	Inor	Sulfa	tos		Shipped Via: Remarks	Sample # (tab only)	
WW-13	GRAS	GW	-	1/14/1	9 1625	2	x			X	5.				-01	
DUPLICATE 1	9	GW	-		1625	2	X			X				S. 4. 25 . 27	-01	
13 MS/MSD		GW	-		1625	2	x	10-1		x	1	1943		1. 2	-0]	
WW-14R		GW	-		1635	- 2	X		x	1.1				Carley (S)	-03	
DUPLICATE 2		GW	-		1640		X		x	20/2					- 04	
WI4R MS/MSD		GW	-		1645	2	X	-	X	1-52					-03	
MW-15	1	GW	1.5	a start	1550	1	x			1995		6			-05	
MW-601		GW	-		1600	1	1	1	1		x			1.2.33	.06	
DUPLICATE 3		GW	-		1600			1.2		1 2	x			-	-07	
MW601 MS/MSD	A	GW	1	A	1600	10000				1.22	X	12	0	with the states	.06	
Matrix: \$5 - Soil AIR - Air F - Filter \$W - Groundwater B - Bioassay WW - WasteWater	Remarks:						AND A			pH		Temp	COC Sea COC Sig Bottles	Sample Receipt C 1 Present/Intact med/Accurate: arrive intact:	hecklist t: _NP _Y _N _Y _N _Y _N	
DW - Drinking Water Samples returned via: OT - Other UPSFedExCourier T						510	16	[0]	76	-		- outer	Suffici	bottles used: ent volume sent <u>If Applica</u> o Headspace:		
Resimption by: (Signature) Date: Time: Ber				Beceived by: (Store	iture)	-				ink Rece	tived: No HCL/Meol TBR	Preserv	n contract/d			
				Received by: (Signa	ature)			1	Temp: [-0 ⁺ -]	=1.12	°C Bottles Received:	If presen	vation required by Lo	ogin: Date/Time		
Relinquished by : (Signature)		Date:		Time:	Received for lab by		sture)			Date:	1/19	Time: 08:39	Hold:		Condition: NCF / K	

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eport to: ason Franks	-		-	Email To: jf jay.martini	@kcpl.con		ers.com;											Mou Phor	65 Lebanon Rd unt Juliet, TN 371 me: 615-758-5851 me: 800-767-5855	123.31								
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hone: 913-681-0030 ax: 913-681-0012	CARDON CO	Project # 7233.1			Lab Proj AQUA		PKS-LACYGNE		250mlHDPE-HNO3	250mlHDPE-HNO3	loPres	loPres	Pres	sa				-	ble #	161523								
ollected by (print): JASON R. FRANK	Site/Fi	acility ID	"	P.O. #			P.O. #			50mlH	Chioride 125miHDPE-NoPres	IDPE-N	DPE-No	MMIHDPE-NoPres					ctnum: AQU									
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Sample ID	Com	p/Grab	Matrix *	Depth	D	Date Time C			Boron	Calc	Chio	Flue	Sulfa						Remarks	Sample # (lab only)								
/W-701	Gre	AG	GW	-	1/1:	5/19	1205	1	-	X		1						-		- 08								
UPLICATE 4		1	GW	-	1/1:	5/19	1205	1		X		1.85	-			-				-69								
W70 MS/MSD	1		GW	-	1/15	119	1205	1	1	X	-	1.336	-	Gar		-	-	100	11-11-	- 08								
1W-702			GW	-	1/14	1/19	1505	1	-	1	-	X	-	-				100	-	-10								
1W-700	-		GW	-	1/1	5/19	1155	1			100	-	X	-		-												
WW-804			GW	-	1/14	119	1405	1	X	1.2.5		1	-	-				-		-12								
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WW-902		-	GW	-	1/14	119	1315	1	1	129				X	-			-	15-1-1-1-1	_14								
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MW 902 MS/MSD		Y	GW	1	1.1.	1/19	1315	1						X	13.8	-			121-52-56	-14								
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roject escription: KCPL - LaCygne Gene	Client Project #			Collected: La CHANE, KS				250miHDPE-HN03	EONH	s	vi					L	# []	061523		
hone: 913-681-0030 ax: 913-681-0012	27217233.1				S-LACYGNE						HDPE-	NoPre	NoPre	oPres	res				able #	
JASON R. FRANK	Site/Facility ID	A		P.O. #					[m]	HDPE-	HDPE-	DPE-N	-NoP				Acctnum: AQU Template:T136			
Collected by (signature):	Same Day	b MUST Be I	ау					6010 25	6010 250miHDPE-HNO3	125mlHDPE-NoPres	25mlh	Sulfate 125mlHDPE-NoPres	50mlHDPE-NoPres			_	Prelogin: P689385 TSR: 206 - Jeff Carr			
	Next Day Two Day Two Day Three Da	10 Da	(Rad Only) y (Rad Only)	Date	e Results Needed No of				Calcium - 6	Chloride 1	Fluoride 125mlHDPE-NoPres	ate 12	N			1	PB: Shipped Via:			
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	e Cr	Intrs	Boron	Calc	Chlo	Fluo	Sulf	TDS				Remarks	Sample # (lab only)		
WW-903 GKAS GW	-	1/14/	9 131	15	1		x				5					-15				
				1	-	-			-	-										
			-			-			200	1	1						31.5			
and the second s		Carrier -			and the second	-			12		-						1.			
	1 4 4		-	1. 50		354					1		1.1	-						
all and	Bern	2						-			-	-	-		-	-	-			
The second she	1.6.0	256	-	100	1	-	_1	-	-	1	-	-	-	-	-					
	1		1928	10000		5			-	-			-			1932	2.5			
	Remarks:		A Stress	-	1.10		10-11	-	1	-	1	-	5		[mail	Samp	le Receipt C	hecklist		
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay	Remarks:			1000							P Fli	H	Tem		COC Bott Corr	Signed/ les arr ect bot	Accurate: ive intact: tles used:			
WW - WasteWater DW - Drinking Water Samples returned via: UPSFedExCourier Tracking #												1 100	VOA	Zero He	volume sent <u>If Applical</u> adspace: on Correct/C	ble _Y _!				
Relinguished by : (Signature)	1	Date:	1.0	Time: 1430							Trip 8	siarik Re	ceived: `	HCL / MeoH TBR			(1997) (1997) (1997)	-in the		
Rephquished by : (Signature)	the	Date:	111	Time:	Received by:	(Signat	ure)				Temp	2: -1=1-14m	1944	tles Received: 27	If pre	eservatio	n required by L	ogin: Date/Time		
Relinquished by : (Signature)		Date:		Time:	Received for	lab by:	-	ture)	-		Date		Tir	ne: 08:30	Hold	i:		Condition: NCF / OK		

-

Jared Morrison December 16, 2022

ATTACHMENT 1-2 March 2019 Sampling Event Laboratory Report



ANALYTICAL REPORT

SCS Engineers - KS

078452
3/13/2019
7217233.18
CPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210

Entire Report Reviewed By:

Vubb law

Jeff Carr Project Manager

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

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

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Ss: Sample Summary
Cn: Case Narrative
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MW-13 L1078452-01
DUPLICATE 1 L1078452-02
MW-14R L1078452-03
DUPLICATE 2 L1078452-04
MW-601 L1078452-05
DUPLICATE 3 L1078452-06
MW-701 L1078452-07
DUPLICATE 4 L1078452-08
MW-706 L1078452-09
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Wet Chemistry by Method 9056A
Metals (ICP) by Method 6010B
GI: Glossary of Terms
Al: Accreditations & Locations
Sc: Sample Chain of Custody

Cp: Cover Page

SDG: L1078452 DATE/TIME: 03/21/19 08:39

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

*

Ср

Tc

Ss

Cn

Sr

Qc

GI

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Sc

Chemistry by Method 9056A als (ICP) by Method 6010B JPLICATE 1 L1078452-02 GW nod Chemistry by Method 9056A als (ICP) by Method 9056A A JPLICATE 3 L1078452-06 GW nod Chemistry by Method 9056A JPLICATE 3 L1078452-06 GW nod INTERNATIONAL INTERNATIONAL IN			Collected by Whit Martin	Collected date/time 03/11/19 13:50	03/13/19 08:4	
fethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
/et Chemistry by Method 9056A	WG1251927	1	03/20/19 01:33	03/20/19 01:33	ELN	Mt. Juliet, TN
etals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 17:07	CCE	Mt. Juliet, TN
			Collected by Whit Martin	Collected date/time 03/11/19 13:50	Received da	
lethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
/et Chemistry by Method 9056A	WG1251927	1	03/20/19 02:21	03/20/19 02:21	ELN	Mt. Juliet, TN
etals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 18:13	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
/W-14R L1078452-03 GW			Whit Martin	03/11/19 13:00	03/13/19 08:4	45
lethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Vet Chemistry by Method 9056A	WG1251930	1	03/20/19 01:39	03/20/19 01:39	ELN	Mt. Juliet, TN
letals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 17:18	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
DUPLICATE 2 L1078452-04 GW			Whit Martin	03/11/19 13:00	03/13/19 08:	45
lethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
/et Chemistry by Method 9056A	WG1251927	1	03/20/19 02:37	03/20/19 02:37	ELN	Mt. Juliet, TN
letals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 18:16	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
NW-601 L1078452-05 GW			Whit Martin	03/11/19 11:55	03/13/19 08:	45
lethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
/et Chemistry by Method 9056A	WG1251930	1	03/20/19 02:39	03/20/19 02:39	ELN	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
DUPLICATE 3 L1078452-06 GW			Whit Martin	03/11/19 11:55	03/13/19 08:4	45
fethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Vet Chemistry by Method 9056A	WG1251927	1	03/20/19 03:09	03/20/19 03:09	ELN	Mt. Juliet, TN
			Collected by	Collected date/time	Pacaluad da	te/time
/W-701 L1078452-07 GW			Whit Martin	03/11/19 14:55	03/13/19 08:	
lethod	Batch	Dilution	Preparation	Analysis	Analyst	Location
Actals (ICP) by Mathad 6010P	WG1249634	1	date/time 03/16/19 14:14	date/time 03/20/19 17:32	CCE	Mt. Juliet, TN
	WG1249034	I	03/10/13/14.14	UJIZUI IJ 17.3Z	UUE	wit. Juliët, TN
			Collected by	Collected date/time	Received da	
DUPLICATE 4 L1078452-08 GW			Whit Martin	03/11/19 14:55	03/13/19 08:4	45
lethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Aretals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 18:19	CCE	Mt. Juliet, TN

 ACCOUNT:
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 SCS Engineers - KS
 27217233.18
 L1078452
 03/21/19 08:39
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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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Ср

Tc

Ss

Cn

Sr

Qc

GI

ΆI

Sc

MW-706 L1078452-09 GW			Collected by Whit Martin	Collected date/time 03/11/19 15:50	Received da 03/13/19 08:-	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Net Chemistry by Method 9056A	WG1251927	1	03/20/19 03:56	03/20/19 03:56	ELN	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-804 L1078452-10 GW			Whit Martin	03/11/19 10:55	03/13/19 08:4	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 18:21	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-805 L1078452-11 GW			Whit Martin	03/11/19 10:15	03/13/19 08:4	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 18:24	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-903 L1078452-12 GW			Whit Martin	03/11/19 09:05	03/13/19 08:4	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1249634	1	03/16/19 14:14	03/20/19 18:27	CCE	Mt. Juliet, TN

CASE NARRATIVE

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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.

Jubb land

Jeff Carr Project Manager

Τс Ss Cn Sr Qc GI AI Sc

SDG: L1078452 DATE/TIME: 03/21/19 08:39 **PAGE**: 5 of 25 Boron

SAMPLE RESULTS - 01 L1078452

Cn

Qc

Gl

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Sc

Wet Chemistry by Method 9056A

470

							10
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Fluoride	194		100	1	03/20/2019 01:33	WG1251927	Tc
Metals (ICP) by I	Method 6010B						 ³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		4 Cn

1

03/20/2019 17:07

WG1249634

200

Boron

SAMPLE RESULTS - 02 L1078452

1

Qc

Gl

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Sc

Wet Chemistry by Method 9056A

475

· · · · · · · · · · · · · · · · · · ·	- ,						L'On
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Fluoride	202		100	1	03/20/2019 02:21	<u>WG1251927</u>	Tc
Metals (ICP) by	Method 6010B						³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		⁴ Cn
Boron	475		200	1	03/20/2019 18:13	WG1249634	

1

03/20/2019 18:13

WG1249634

200

SAMPLE RESULTS - 03 L1078452

Qc

GI

Â

Sc

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	(`c
Analyte	ug/l	Quaimer	ug/l	Dilution	date / time	Bach	
Chloride	4440		1000	1	03/20/2019 01:39	WG1251930	2
Metals (ICP) by I	Method 6010B						3
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		4
Boron	591		200	1	03/20/2019 17:18	WG1249634	

SAMPLE RESULTS - 04 L1078452

Qc

Gl

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Sc

Wet Chemistry by Method 9056A

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		Ср
Analyte	ug/l		ug/l		date / time		-	2
Chloride	4740		1000	1	03/20/2019 02:37	WG1251927	2	Тс
Metals (ICP) by N	lethod 6010B						3	^³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch		
Analyte	ug/l		ug/l		date / time		4	⁴Cn
Boron	604		200	1	03/20/2019 18:16	WG1249634		

SDG: L1078452

*

Ср

Тс

Wet Chemistry by Method 9056A

							1' 0
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Sulfate	5890		5000	1	03/20/2019 02:39	WG1251930	T



SAMPLE RESULTS - 06 L1078452



Wet Chemistry by Method 9056A

	Result	Qualifier RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l	ug/l		date / time		2
Sulfate	5740	5000	1	03/20/2019 03:09	WG1251927	⁻Tc

10
³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc



Ср

Тс

Metals (ICP) by Method 6010B

							1'0
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Calcium	44200		1000	1	03/20/2019 17:32	WG1249634	T





Metals (ICP) by Method 6010B

							1 Cn	L
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср	l
Analyte	ug/l		ug/l		date / time		2	ī
Calcium	44200		1000	1	03/20/2019 18:19	WG1249634	⁻Tc	

³Ss
⁴Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.18

SDG: L1078452

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Τс

Wet Chemistry by Method 9056A

							1' 0
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Sulfate	6960		5000	1	03/20/2019 03:56	WG1251927	T

³Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
[°] Al
⁹ Sc

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.18

SDG: L1078452 DATE/TIME: 03/21/19 08:39 PAGE: 14 of 25



Ср

Тс

Metals (ICP) by Method 6010B

						 1'	
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Boron	1740		200	1	03/20/2019 18:21	WG1249634	

³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

PROJECT: 27217233.18

SDG: L1078452 DATE/TIME: 03/21/19 08:39 PAGE: 15 of 25



Тс

Metals (ICP) by Method 6010B

							 1'
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Calcium	468000		1000	1	03/20/2019 18:24	WG1249634	T

³ Ss
⁴Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc

SAMPLE RESULTS - 12 $_{L1078452}$



Ср

Тс

Metals (ICP) by Method 6010B

							 10
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Calcium	375000		1000	1	03/20/2019 18:27	WG1249634	1

³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

SDG: L1078452 Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1078452-01,02,04,06,09

Ср

⁴Cn

Sr

Qc

GI

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Sc

Method Blank (MB)

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

(1110) 1(3535203-1 05	13/13 10.05				
	MB Result	MB Qualifier	MB MDL	MB RDL	2
Analyte	ug/l		ug/l	ug/l	T
Chloride	U		51.9	1000	
Fluoride	U		9.90	100	³ Ss
Sulfate	U		77.4	5000	

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

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

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	4380	4380	1	0.0206		15
Fluoride	301	299	1	0.500		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										
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits				
Analyte	ug/l	ug/l		%		%				
Chloride	4740	4710	1	0.722		15				
Fluoride	258	253	1	2.07		15				
Sulfate	52100	52000	1	0.195		15				

Laboratory Control Sample (LCS)

(LCS) R3393205-2 03/19	9/19 18:21				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Chloride	40000	40700	102	80.0-120	
Fluoride	8000	8300	104	80.0-120	
Sulfate	40000	41100	103	80.0-120	

ACCOUNT:
SCS Engineers - KS

PROJECT: 27217233.18

SDG: L1078452

DATE/TIME: 03/21/19 08:39

PAGE: 18 of 25 Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

Τс

Ss

Cn

Sr

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Sc

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												
	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	4380	55100	55700	101	103	1	80.0-120			1.19	15
Fluoride	5000	301	5350	5430	101	103	1	80.0-120			1.37	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	9 23:10 • (MS) F	3393205-6 0	3/19/19 23:26 •	(MSD) R33932	05-7 03/19/19	23:42						
	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	29300	79400	79000	100	99.4	1	80.0-120			0.470	15
Fluoride	5000	210	5290	5280	102	101	1	80.0-120			0.231	15
Sulfate	50000	257000	288000	288000	62.2	62.4	1	80.0-120	EV	EV	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										[
	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	15700	66200	66200	101	101	1	80.0-120			0.00423	15	
Fluoride	5000	194	4910	4900	94.4	94.2	1	80.0-120			0.151	15	
Sulfate	50000	1420000	1360000	1360000	0.000	0.000	1	80.0-120	EV	EV	0.0425	15	

ACCOUNT:	
SCS Engineers - I	<s< th=""></s<>

PROJECT: 27217233.18

SDG: L1078452 DATE/TIME: 03/21/19 08:39 PAGE: 19 of 25

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3393348-1 03	3/20/19 00:36			
	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

L1078452-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1078452-03 0	3/20/19 01:39 • (DUF	P) R3393348-3	3 03/20/19	01:54		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	4440	4440	1	0.00901		15
Sulfate	51600	51700	1	0.0116		15

Laboratory Control Sample (LCS)

(LCS) R3393348-2 03/20/	19 00:51					
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	
Analyte	ug/l	ug/l	%	%		
Chloride	40000	40000	99.9	80.0-120		
Sulfate	40000	40500	101	80.0-120		

L1078452-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078452-03 03/20/	19 01:39 • (MS)	R3393348-4 C	3/20/19 02:09	9 • (MSD) R3393	3348-5 03/20	/19 02:24						
	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	4440	55400	55600	102	102	1	80.0-120			0.206	15
Sulfate	50000	51600	102000	102000	100	101	1	80.0-120	E	E	0.167	15

L1078452-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078452-05 03/20	/19 02:39 • (MS)	R3393348-6	03/20/19 02:5	4 • (MSD) R339	3348-7 03/20	0/19 03:09						
	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	166000	209000	209000	84.5	84.2	1	80.0-120	E	E	0.0679	15
Sulfate	50000	5890	56200	56200	101	101	1	80.0-120			0.0114	15

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
SCS Engineers - KS	27217233.18	L1078452	03/21/19 08:39	20 of 25

Sr

Qc

GI

Method Blank (MB) (MB) R3393602-1 03/20/19 17:00

Analyte

Calcium

Boron

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

²Tc

³Ss ⁴Cn

ÅI

°Sc

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

MB MDL

ug/l

12.6

46.3

MB Qualifier

(LCS) R3393602-2 03/20)/19 17:02 • (LCS	D) R3393602	-3 03/20/19 17	:05							
	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	991	982	99.1	98.2	80.0-120			0.996	20	
Calcium	10000	10100	10100	101	101	80.0-120			0.241	20	

MB RDL

ug/l

200

1000

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

MB Result

ug/l

U

U

(OS) L1078452-01 03/20/1	9 17:07 • (MS) R	3393602-5 03	3/20/19 17:13				
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	ug/l	ug/l	ug/l	%		%	
Boron	1000	470	1470	99.9	1	75.0-125	
Calcium	10000	310000	315000	51.6	1	75.0-125	$\underline{\vee}$

L1078452-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078452-03 03/20/1	9 17:18 • (MS) R	3393602-7 03	3/20/19 17:21 •	(MSD) R339360	02-8 03/20/19	17:23						
	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	591	1590	1570	100	98.3	1	75.0-125			1.13	20
Calcium	10000	61300	70000	70400	86.6	90.9	1	75.0-125			0.616	20

L1078452-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1078452-07 03/20/1	19 17:32 • (MS) I	R3393602-9 C	3/20/19 17:34	• (MSD) R3393	602-10 03/20/	/19 17:37						
	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	1020	1990	1990	97.4	97.6	1	75.0-125			0.0895	20
Calcium	10000	44200	53400	53800	92.6	96.1	1	75.0-125			0.641	20

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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GLOSSARY OF TERMS

*

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Ss

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*Q*c

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Sc

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
J	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 resu 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.
Jncertainty 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.

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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	Nebras
Alaska	17-026	Nevad
Arizona	AZ0612	New H
Arkansas	88-0469	New J
California	2932	New M
Colorado	TN00003	New Y
Connecticut	PH-0197	North
Florida	E87487	North
Georgia	NELAP	North
Georgia ¹	923	North
Idaho	TN00003	Ohio-Y
Illinois	200008	Oklaho
Indiana	C-TN-01	Orego
lowa	364	Penns
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South
Louisiana	AI30792	Tenne
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virgini
Minnesota	047-999-395	Washir
Mississippi	TN00003	West V
Missouri	340	Wiscor
Montana	CERT0086	Wyom

Vebraska	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 ¹⁴	2006
Texas	T104704245-18-15
Texas⁵	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	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

SCS Engineers - KS

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.



27217233.18

L1078452

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engineers - KS west 110th Street			Suite 100	st 110th Stree	t	Pres Chk									ter for Testing & Innovatio						
rt to: Franks		3			ers.com;	1	N	22						12065 Lebanon Rd Mount Juliet, TN 371 Phone: 615-758-5858 Phone: 800-767-5855							
ect cription: KCPL - LaCygne Gen	erating Statio	n		City/State Collected:			03 <					de la compañía		Fax: 615-758-5859	152						
ne: 913-681-0030	Client Project # 27217233.1	ent Project #		Lab Project # AQUAOPKS-LACYGNE				 A second s		and the second			PE-HNO	250mIHDPE-HNO3	loPres	loPres	E-NoPres			ג# 1078י 1026	
nected by (print):	Site/Facility ID	#		P.O. #		P.O. #			OmlHDP	Soml	25mlHDPE-NoPres	IDPE-N	DPE-NG			Acctnum: AQU					
Mected by (signature):	Same Day	b MUST Be / Five I 5 Day	Day	Quote #	ults Needed	ast T	6010 25	6010	125mlh	125mIHDPE-NoPres	25mIHDP			Prelogin: P698 TSR: 206 - Jeff (8300						
mmediately backed on Ice N Y X	Two Day Three Day	y10 Da	ay (Rad Only)	51	d	No. of Cntrs	- 40	alcium -	Chloride	Fluoride :	Sulfate 1.			PB: Shipped Via:							
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	<u> </u>	Bo	Ca	5		Su			Remarks	Sample # (lab o						
WW-13	Grab	GW		3/11/19	1350	2	X	1.84		X					-01						
DUPLICATE 1	Grab	GW		3/11/19	1350	2	X			X					-02						
MW-13 MS/MSD	Grab	GW		3/11/19	1355	2	X			X					-01						
MW-14R	Grab	GW		3/11/19	1300	2	X		X						-03						
DUPLICATE 2	Grab	GW		3/11/19	1300	2	X		X						-04						
MW-14R MS/MSD	Grab	GW		3/11/19	1305	2	X		X						-03						
MW-601	Grab	GW		3/11/19	1155	1	-		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		X				-05						
DUPLICATE 3	Grab	GW		3/11/19	1155	1	1		-		X				-06						
MW-601 MS/MSD	Grab	GW		3/11/19	1200	1					X	Periodical State			-05						
MW-701	Grab	GW		3/11/19	1455	1	1	X						1	-07						
* Matrix: S5 - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay - MA - WasteWater	Remarks:	Ż								pH Flo	i	Temp Other	COC Sea COC Sig Bottles Correct	Sample Receipt C al Present/Intact gned/Accurate: s arrive intact: t bottles used: ient volume sent							
pW - Drinking Water of - Other	Samples retur UPSFe	rned via: edExCo	urier		Fracking #								VOA Zer	If Applica ro Headspace: vation Correct/Cl	ble _Y						
Relinquished by : (Signature)		Date: 3/12	/19	1555	Received by: (Signa					Trip Bl		ived: Yes / No HCL / MeoH TBR	RAD	SCREEN: <0.	5 mR/hr						
Relinquished by : (Signature)		Date:		Time:	Received by: (Signa	ature)				Temp: 0.31		C Bottles Received:		vation required by L							
Relinquished by : (Signature)	and a second	Date:		Time:	Received for lab by					Date:	iz	Time: 8:45	Hold:		Condition NCF						

S

600 F			Billing Info	ormation:							Analysis	/ Conta	ainer / Preservative		Chain of Custody Page of							
SCS Engineers - KS 8575 West 110th Street Suite 100 Overland Park KS 66210			8575 W Suite 10	ts Payable est 110th S 0 d Park, KS			Pres Chk								National	Center for Testing & Innovati						
Report to: Jason Franks				@kcpl.com;	Pkcpl.com;				«cpl.com;				N						12065 Lebanon Ro Mount Juliet, TN 3	7122		
Project Description: KCPL - LaCygne Ge	nerating Stat	ion	Therefore and	City/State Collected:	City/State		City/State		City/State		ate			3 2 4	03~					*	Phone: 615-758-5 Phone: 800-767-5 Fax: 615-758-5855	859
Phone: 913-681-0030 Fax: 913-681-0012	Client Project 27217233.			Lab Project # AQUAOPKS-LA		ab Project # AQUAOPKS-LACYGNE		250mlHDPE-HNO	250mlHDPE-HNO3	Pres	Pres	oPres			L# 107	8452						
Collected by (print): Whit Martin	Site/Facility II	D #		P.O. #		P.O. #		P.O. #		mIHDP	OmIHD	DPE-No	PE-No	E-N			Table # Acctnum: AQ	UAOPKS				
Collected by (signature): AMAT AMATA Immediately Packed on Ice N Y X	Same D	Lab MUST Be ay Five D y 5 Day y 10 Da ay	Day (Rad Only)		Date Results Needed			- 6010	- 6010	de 125mlHDPE-NoPres	de 125mlHDPE-NoPres	te 125mlHDP			Template: T1 Prelogin: P69 TSR: 206 - Jef PB:	98300						
Sample ID	Comp/Grab	Matrix *	Depth	- A			Cntrs	Boron	Calcium	Chloride	Fluoride	Sulfat			Shipped Via: Remarks	Sample # (lab only)						
DUPLICATE 4	Grab	GW		3/11/1	19	1455	1		x		Line .					-08						
MW-701 MS/MSD	Grab	GW			19	1500	1		x							-07						
WW-706	Grab	GW		3/11/1	9	1550	1					X				-09						
WW-804	Grab	GW		3/11/1	19	1055	1	x								-10						
WW-805	Grab	GW		3/11/	19	1015	1		x							-11						
WW-903	Grab	GW			19	0905	1		x							-12						
									- 2		and											
Matrix: S - Soil AIR - Air F - Filter W - Groundwater B - Bioassay W - WasteWater	Remarks:										pH Flow		Temp Other	COC Seal COC Signe Bottles a	mple Receipt C Present/Intact ed/Accurate: arrive intact:							
DW - Drinking Water DT - Other	Samples retur UPS Fe	ned via: dEx Cour	ier		[TOW			Sufficien	oottles used: nt volume sent: <u>If Applical</u>	$\sum_{Y=N}^{Y}$						
telinquished by : (Signature)		Date: 3/12/	1	^{ime:}							Trip Blar	nk Rece	eived: Yes / No HCL / MeoH TBR	Preservat	Headspace: tion Correct/Ch CREEN: <0.5	$\frac{1}{2} = \frac{1}{2} $						
elinquished by : (Signature)		Date:	the same literative sector is a sector where the	ime:	the second s						Temp: ().31,1	=0.4	°C Bottles Received:	If preservat	tion required by Lo	gin: Date/Time						
telinquished by : (Signature)		Date:	Т	ime:	Received for lab by: (S			ure)			Date:	2	Time: 8:45	Hold:		Condition: NCF / ØK						

ATTACHMENT 1-3 May 2019 Sampling Event Laboratory Report



ANALYTICAL REPORT

SCS Engineers - KS

Sample Delivery Group: Samples Received: Project Number: Description: L1102793 05/25/2019 27217233.19 KCPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210 ¹Cp ²Tc ³Ss ⁴Cn ⁵Sr ⁶Qc ⁷Gl ⁸Al ⁹Sc

Entire Report Reviewed By:

Wubb law

Jeff Carr Project Manager

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

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.19

SDG: L1102793 DATE/TIME: 06/07/19 15:00 PAGE: 1 of 19

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

Sc

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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MW-901 L1102793-01 GW			Collected by Jason R. Franks	Collected date/time 05/23/19 13:30	Received da 05/25/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1288054	1	05/30/19 20:53	05/30/19 23:30	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1291176	1	06/06/19 17:50	06/06/19 17:50	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287651	1	05/29/19 15:30	05/30/19 15:03	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	
MW-902 L1102793-02 GW			Jason R. Franks	05/23/19 12:50	05/25/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1288054	1	05/30/19 20:53	05/30/19 23:30	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290621	1	06/06/19 11:23	06/06/19 11:23	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287651	1	05/29/19 15:30	05/30/19 15:14	CCE	Mt. Juliet, TN
			Collected by	Collected date/time		
MW-903 L1102793-03 GW			Jason R. Franks	05/23/19 12:05	05/25/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1288054	1	05/30/19 20:53	05/30/19 23:30	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290621	1	06/06/19 11:34	06/06/19 11:34	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1290621	20	06/06/19 12:29	06/06/19 12:29	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287651	1	05/29/19 15:30	05/30/19 15:16	CCE	Mt. Juliet, TN
			Collected by	Collected date/time		
MW-904 L1102793-04 GW			Jason R. Franks	05/23/19 11:20	05/25/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1288054	1	05/30/19 20:53	05/30/19 23:30	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1291176	1	06/06/19 18:38	06/06/19 18:38	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287651	1	05/29/19 15:30	05/30/19 15:19	CCE	Mt. Juliet, TN
MW-905 L1102793-05 GW			Collected by Jason R. Franks	Collected date/time 05/23/19 12:30	Received da 05/25/19 08:	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1288054	1	05/30/19 20:53	05/30/19 23:30	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1291176	1	06/06/19 19:41	06/06/19 19:41	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287651	1	05/29/19 15:30	05/30/19 15:22	CCE	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	
DUPLICATE1 L1102793-06 GW			Jason R. Franks	05/23/19 13:35	05/25/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1288054	1	05/30/19 20:53	05/30/19 23:30	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1291176	1	06/06/19 19:57	06/06/19 19:57	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1287651	1	05/29/19 15:30	05/30/19 15:24	CCE	Mt. Juliet, TN

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.19

SDG: L1102793 DATE/TIME: 06/07/19 15:00 PAGE: 3 of 19

CASE NARRATIVE

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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.

Jubb land

Jeff Carr Project Manager

Τс Ss Cn Sr Qc GI AI Sc

PROJECT: 27217233.19

SDG: L1102793 DATE/TIME: 06/07/19 15:00

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SAMPLE RESULTS - 01 L1102793

Qc

Gl

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ср
Analyte	ug/l		ug/l		date / time		2
Dissolved Solids	514000		10000	1	05/30/2019 23:30	WG1288054	Tc

Wet Chemistry by Method 9056A

Wet Chemistry by	y Method 9056A	4					³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		⁴ Cn
Chloride	22800		1000	1	06/06/2019 17:50	WG1291176	CII
Fluoride	489		100	1	06/06/2019 17:50	WG1291176	5
Sulfate	21000		5000	1	06/06/2019 17:50	WG1291176	Sr

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	1180		200	1	05/30/2019 15:03	WG1287651
Calcium	52300		1000	1	05/30/2019 15:03	WG1287651

SAMPLE RESULTS - 02 L1102793

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	– Cp	
Analyte	ug/l		ug/l		date / time		2	٦
Dissolved Solids	511000		10000	1	05/30/2019 23:30	<u>WG1288054</u>	Tc	

Wet Chemistry by Method 9056A

Collected date/time: 05/23/19 12:50

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Chloride	32800		1000	1	06/06/2019 11:23	WG1290621	
Fluoride	441		100	1	06/06/2019 11:23	WG1290621	
Sulfate	29400		5000	1	06/06/2019 11:23	WG1290621	

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	1240		200	1	05/30/2019 15:14	WG1287651
Calcium	66500		1000	1	05/30/2019 15:14	WG1287651

SAMPLE RESULTS - 03 L1102793

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Gravimetric Analysis by Method 2540 C-2011

								1°
	Result	Qualifier	RDL	Dilution	Analysis	Batch		C
Analyte	ug/l		ug/l		date / time		ſ	2
Dissolved Solids	2030000		25000	1	05/30/2019 23:30	WG1288054		² To
Wet Chemistry by	Method 9056A	A]	³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch		
Analyte	ug/l		ug/l		date / time			⁴ Cı
Chloride	24500		1000	1	06/06/2019 11:34	WG1290621		
F 1 1 1	10.0		10.0		0.010.010.010.11.01		-	

Wet Chemistry by Method 9056A

Collected date/time: 05/23/19 12:05

							1 33
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		4 Cn
Chloride	24500		1000	1	06/06/2019 11:34	WG1290621	
Fluoride	130		100	1	06/06/2019 11:34	WG1290621	5
Sulfate	1030000		100000	20	06/06/2019 12:29	WG1290621	Sr

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	494		200	1	05/30/2019 15:16	WG1287651
Calcium	367000		1000	1	05/30/2019 15:16	WG1287651

SAMPLE RESULTS - 04 L1102793

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ср
Analyte	ug/l		ug/l		date / time		 2
Dissolved Solids	696000		13300	1	05/30/2019 23:30	WG1288054	Tc

Wet Chemistry by Method 9056A

Collected date/time: 05/23/19 11:20

Wet Chemistry I	by Method 90564	4					
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Chloride	33400		1000	1	06/06/2019 18:38	WG1291176	
luoride	382		100	1	06/06/2019 18:38	WG1291176	
Sulfate	81700		5000	1	06/06/2019 18:38	WG1291176	

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	1110		200	1	05/30/2019 15:19	WG1287651
Calcium	68200		1000	1	05/30/2019 15:19	WG1287651

SAMPLE RESULTS - 05 L1102793

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Dissolved Solids	621000		13300	1	05/30/2019 23:30	WG1288054	Tc

Wet Chemistry by Method 9056A

Collected date/time: 05/23/19 12:30

Wet Chemistry	by Method 9056A	Ą					
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Chloride	52000		1000	1	06/06/2019 19:41	WG1291176	
luoride	494		100	1	06/06/2019 19:41	<u>WG1291176</u>	
Sulfate	28700		5000	1	06/06/2019 19:41	WG1291176	

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Boron	1870		200	1	05/30/2019 15:22	WG1287651	
Calcium	46400		1000	1	05/30/2019 15:22	WG1287651	



SAMPLE RESULTS - 06 L1102793

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		2
Dissolved Solids	517000		10000	1	05/30/2019 23:30	WG1288054	¯Тс

Wet Chemistry by Method 9056A

Wet Chemistry by	y Method 90564	4					
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Chloride	22800		1000	1	06/06/2019 19:57	<u>WG1291176</u>	
Fluoride	489		100	1	06/06/2019 19:57	WG1291176	
Sulfate	21100		5000	1	06/06/2019 19:57	WG1291176	

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Boron	1160		200	1	05/30/2019 15:24	WG1287651	
Calcium	52100		1000	1	05/30/2019 15:24	WG1287651	

WG1288054

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3417295-1 05/3	30/19 23:30			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	ug/l		ug/l	ug/l
Dissolved Solids	U		2820	10000

L1102793-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1102793-05 05	5/30/19 23:30 • (DU	JP) R3417295-3	3 05/30/19	23:30		
	Original Resu	It DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Dissolved Solids	621000	617000	1	0.646		5

Laboratory Control Sample (LCS)

(LCS) R3417295-2 05	5/30/19 23:30				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Dissolved Solids	8800000	8840000	100	85.0-115	

ACCOUNT:
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QUALITY CONTROL SUMMARY L1102793-02,03

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Method Blank (MB)

(MB) R3418444-1	06/06/19 03:03

(MD) K3418444-1 00/00	15 05.05				
	MB Result	MB Qualifier	MB MDL	MB RDL	2
Analyte	ug/l		ug/l	ug/l	Tc
Chloride	U		51.9	1000	
Fluoride	U		9.90	100	³Ss
Sulfate	U		77.4	5000	

L1102791-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1102791-08 06/06/	19 04:50 • (DUP) R3418444-5	06/06/19	05:01		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	34200	34200	1	0.0410		15
Fluoride	816	812	1	0.455		15
Sulfate	ND	0.000	1	0.000		15

L1102792-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1102792-05 06/06/19 08:17 • (DUP) R3418444-6 06/06/19 08:28										
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits				
Analyte	ug/l	ug/l		%		%				
Chloride	41800	40800	1	2.50		15				
Fluoride	1210	1220	1	0.255		15				
Sulfate	ND	2370	1	2.78	J	15				

Laboratory Control Sample (LCS)

(LCS) R3418444-2 06/06	6/19 03:14				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Chloride	40000	40200	100	80.0-120	
Fluoride	8000	8280	104	80.0-120	
Sulfate	40000	40600	101	80.0-120	

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L1102791-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102791-07 06/06/19 04:07 • (MS) R3418444-3 06/06/19 04:17 • (MSD) R3418444-4 06/06/19 04:28												
	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	89400	136000	136000	92.4	93.0	1	80.0-120	E	E	0.201	15
Fluoride	5000	922	6150	6160	104	105	1	80.0-120			0.242	15
Sulfate	50000	ND	51700	51800	96.6	96.8	1	80.0-120			0.190	15

L1102792-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1102792-05 06/06/	/19 08:17 • (MS) F	R3418444-7 06	6/06/19 08:39	1			
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	ug/l	ug/l	ug/l	%		%	
Chloride	50000	41800	89200	94.8	1	80.0-120	
Fluoride	5000	1210	6480	105	1	80.0-120	
Sulfate	50000	ND	51600	98.4	1	80.0-120	

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QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3418770-1 06	6/06/19 15:59
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	MB Result	MB Qualifier	MB MDL	MB RDL	
nalyte	ug/l		ug/l	ug/l	
Chloride	U		51.9	1000	
Fluoride	U		9.90	100	
Sulfate	U		77.4	5000	

L1102793-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1102793-04 06/06	/19 18:38 • (DUP)	R3418770-7	06/06/19 1	19:26		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	33400	33600	1	0.590		15
Fluoride	382	383	1	0.497		15
Sulfate	81700	82100	1	0.565		15

L1103234-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1103234-05 06/06/1	OS) L1103234-05 06/06/19 22:36 • (DUP) R3418770-8 06/06/19 22:52											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits						
Analyte	ug/l	ug/l		%		%						
Chloride	5450	5470	1	0.496		15						
Fluoride	214	217	1	1.21		15						
Sulfate	15700	15800	1	0.658		15						

Laboratory Control Sample (LCS)

(LCS) R3418770-2 06/06	.CS) R3418770-2 06/06/19 16:15											
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier							
Analyte	ug/l	ug/l	%	%								
Chloride	40000	40300	101	80.0-120								
Fluoride	8000	8470	106	80.0-120								
Sulfate	40000	40000	100	80.0-120								

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L1102792-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102792-07 06/06/1	(OS) L1102792-07 06/06/19 16:46 • (MS) R3418770-3 06/06/19 17:02 • (MSD) R3418770-4 06/06/19 17:18												
	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	87200	134000	135000	94.4	95.2	1	80.0-120	E	E	0.302	15	
Fluoride	5000	828	6030	6060	104	105	1	80.0-120			0.501	15	
Sulfate	50000	170000	213000	214000	87.1	88.2	1	80.0-120	E	E	0.265	15	

L1102793-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102793-01 06/06/1	DS) L1102793-01 06/06/19 17:50 • (MS) R3418770-5 06/06/19 18:06 • (MSD) R3418770-6 06/06/19 18:22													
	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	22800	73000	70400	101	95.2	1	80.0-120			3.68	15		
Fluoride	5000	489	5650	5430	103	98.8	1	80.0-120			3.98	15		
Sulfate	50000	21000	72100	69400	102	96.8	1	80.0-120			3.81	15		

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WG1287651

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

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Method Blank (MB)

Method Bidi	k (IVID)				
(MB) R3416282-1	05/30/19 12:44				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	ug/l		ug/l	ug/l	
Boron	U		12.6	200	
Calcium	67.5	J	46.3	1000	

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

(LCS) R3416282-2 05/30/	(LCS) R3416282-2 05/30/19 12:47 • (LCSD) R3416282-3 05/30/19 12:49											
	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	985	974	98.5	97.4	80.0-120			1.11	20		
Calcium	10000	9970	9920	99.7	99.2	80.0-120			0.512	20		

L1102792-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102792-07 05/30/1	9 12:52 • (MS) F	R3416282-5 05	5/30/19 12:57 •	(MSD) R34162	82-6 05/30/19	13:00							8
	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	%	%		%			%	%	ç
Boron	1000	2030	2950	2960	92.2	93.1	1	75.0-125			0.281	20	
Calcium	10000	21900	31200	31500	92.2	95.2	1	75.0-125			0.960	20	

L1102793-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102793-01 05/30/19	OS) L1102793-01 05/30/19 15:03 • (MS) R3416282-7 05/30/19 15:05 • (MSD) R3416282-8 05/30/19 15:08												
	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	1180	2120	2150	94.5	97.4	1	75.0-125			1.38	20	
Calcium	10000	52300	60900	60800	85.5	85.2	1	75.0-125			0.0488	20	

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GLOSSARY OF TERMS

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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.

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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	Nebras
Alaska	17-026	Nevad
Arizona	AZ0612	New H
Arkansas	88-0469	New Je
California	2932	New M
Colorado	TN00003	New Y
Connecticut	PH-0197	North (
Florida	E87487	North (
Georgia	NELAP	North (
Georgia ¹	923	North I
ldaho	TN00003	Ohio-V
Illinois	200008	Oklaho
Indiana	C-TN-01	Oregor
lowa	364	Pennsy
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South I
Louisiana	AI30792	Tennes
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virginia
Minnesota	047-999-395	Washir
Mississippi	TN00003	West V
Missouri	340	Wiscor
Montana	CERT0086	Wyomi

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	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

SCS Engineers - KS

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.



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06/07/19 15:00

SCS Engineers VS	Billing Information:				Analysis / Container / Preservative					Chain of	Custody	Page of					
SCS Engineers - KS 8575 West 110th Street, Ste. Overland Park, KS 66210	100		Accounts Payable 8575 West 110th Street, Ste. 100 Overland Park, KS 66210					42								<u>k</u> F	ESC
Report to: Jason Franks					mail To: jfranks@scsengineers.com; ay.martin@kcpl.com;												
Project Description: KCPL - LaCygne Generating Station			The she also	City/State Collected: La Cygne, Kansa			E-NoPres						Filmer		Phone: 80 Fax: 615-	00-767-585 758-5859	
Phone: 913-681-0030 Fax: 913-681-0012	Client Project			Lab Project # AQUAOPKS	-LACYGNE		125mlHDPE-N	EONH-								,11 J156	62793
Collected by (print): Jason R. Franks	Site/Facility ID	#		P.O. #				250mIHDPE-HNO3	250mIHDPE-NoPres						Acctnu	m: AQL	JAOPKS
Collected by (signature):	0		N	Quote #			S04)						144		10.5	te: T13	
Classon Franka	and the second se	ab MUST Be		цинет			Ľ,	25(DPI						Prelogi	alessed and a state of the second	
Immediately Packed on Ice N Y _X	Next Day Two Day	Same DayFive DayS Day (Rad Only)Two Day10 Day (Rad Only)Three Day		Date Results Needed			s (Cld,	- 6010	SomiH					1	TSR: 206 - Jeff Carr		
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	of Cntrs	Anions	Ca	S						Shippe		
MW-901	Grab	GW	NA	05/23/19	1330	3	×	В Ж	X TD						Ker	marks	Sample # (lab only)
MW-902	Grab	GW	NA	05/23/19	1250	3	X	X	X								-61
MW-903	Grab	GW	NA	05/23/19	1205	3	X	X	X							2010 - 2010 2010 - 2010 2010 - 2010 2010 - 2010	03
MW-904	Grab	GW	NA	05/23/19	1120	3	X	X	X								64
MW-905	Grab	GW	NA	05/23/19	1230	3	x	x	x					2			05
901 MS/MSD	Grab	GW	NA	05/23/19	1340	3	X	x	x		-						61
DUPLICATE 1	Grab	GW	NA	05/23/19	1335	3	X	X	x								04
	te en		10										-				
		and the second sec			Sall All												
	Sandhan		1	1 S2.53			-	1.1.4				A Long				e de la composition de la comp	
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater DW - Drinking Water DT - Other	Remarks:			A T						pH Temp Flow Other			Sample Receipt Checklist COC Seal Present/Intact: APP COC Signed/Accurate: Bottles arrive intact: Correct bottles used: Sufficient volume sent: If Applicable			:	
Relinguished by : (Signature)	ales	Date: 5/24	19	Time: 1500	Received by: (Sign	lon	6	-24-	(Trip Blan	D	TBF	t/MeoH	Preserv	ro Headspac vation Corr	ect/Ch	
Relinduished by : (Signature)		Date: 1 5/24	119	Time: 1600 F	Received by: (Sign	ature)				Temp:	1.)	3 R	Received:	If preser	vation require	ed by Lo	gin: Date/Time
Relinquished by : (Signature)	3	Date:	115	and the second se	Received for lab b	v-Isignat	ture)	1/		Date:	n	Time:	n	Hold:			Condition: NCF / OK

ATTACHMENT 1-4 July 2019 Sampling Event Laboratory Report



ANALYTICAL REPORT

SCS Engineers - KS

Sample Delivery Group: Samples Received: Project Number: Description: L1120582 07/19/2019 27217233.19 KCPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210 ¹ Cp ² Tc ³ Ss ⁴ Cn ⁵ Sr ⁶ Qc ⁷ Gl ⁸ Al ⁹ Sc

Entire Report Reviewed By:

Wubb law

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.

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.19

SDG: L1120582 DATE/TIME: 07/25/19 15:54

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SDG: L1120582

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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Ср

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MW-14R L1120582-01 GW			Collected by Whit Martin	Collected date/time 07/17/19 10:35	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1316426	1	07/24/19 15:58	07/24/19 15:58	ST	Mt. Juliet, TN
DUPLICATE 1 L1120582-02 GW			Collected by Whit Martin	Collected date/time 07/17/19 10:35	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Net Chemistry by Method 9056A	WG1316426	1	07/24/19 16:57	07/24/19 16:57	ST	Mt. Juliet, TN
MW-601 L1120582-03 GW			Collected by Whit Martin	Collected date/time 07/17/19 11:20	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1316426	1	07/24/19 17:12	07/24/19 17:12	ST	Mt. Juliet, TN
MW-701 L1120582-04 GW			Collected by Whit Martin	Collected date/time 07/17/19 12:45	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1314696	1	07/22/19 11:47	07/23/19 20:12	EL	Mt. Juliet, TN
MW-704 L1120582-05 GW			Collected by Whit Martin	Collected date/time 07/17/19 12:05	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1316426	1	07/24/19 18:12	07/24/19 18:12	ST	Mt. Juliet, TN
MW-706 L1120582-06 GW			Collected by Whit Martin	Collected date/time 07/17/19 13:55	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Net Chemistry by Method 9056A	WG1316426	1	07/24/19 18:27	07/24/19 18:27	ST	Mt. Juliet, TN
MW-707B L1120582-07 GW			Collected by Whit Martin	Collected date/time 07/17/19 13:10	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1316426	50	07/24/19 18:42	07/24/19 18:42	ST	Mt. Juliet, TN
DUPLICATE 3 L1120582-08 GW			Collected by Whit Martin	Collected date/time 07/17/19 13:15	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1316426	100	07/25/19 01:38	07/25/19 01:38	LDC	Mt. Juliet, TN

PROJECT: 27217233.19

SDG: L1120582 DATE/TIME: 07/25/19 15:54 PAGE: 3 of 25

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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			Callestadia	Collected date him o	Densities de la	h = /h: =
MW-804 L1120582-09 GW			Collected by Whit Martin	Collected date/time 07/17/19 12:07	Received da 07/19/19 08:	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
Metals (ICP) by Method 6010B	WG1314696	1	date/time 07/22/19 11:47	date/time 07/23/19 19:22	EL	Mt. Juliet, TN
vietais (ICP) by method 6010b	WG1314090	I	07/22/19 11.47	07/23/19 19.22	EL	wit. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
DUPLICATE 2 L1120582-10 GW			Whit Martin	07/17/19 12:15	07/19/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1314696	1	07/22/19 11:47	07/23/19 20:21	EL	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-805 L1120582-11 GW			Whit Martin	07/17/19 11:20	07/19/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1314696	1	07/22/19 11:47	07/23/19 20:24	EL	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-903 L1120582-12 GW			Whit Martin	07/17/19 09:45	07/19/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1314696	1	07/22/19 11:47	07/23/19 19:33	EL	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
DUPLICATE 4 L1120582-13 GW			Whit Martin	07/17/19 09:45	07/19/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1314696	1	07/22/19 11:47	07/23/19 20:27	EL	Mt. Juliet, TN

SDG: L1120582 DATE/TIME: 07/25/19 15:54

CASE NARRATIVE

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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.

Jubb land

Jeff Carr Project Manager

Τс Ss Cn Sr Qc GI AI Sc

PROJECT: 27217233.19

SDG: L1120582 DATE/TIME: 07/25/19 15:54

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SAMPLE RESULTS - 01

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wet enemistry b		`					 Cn	L
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Cp	l
Analyte	ug/l		ug/l		date / time		2	i
Chloride	6140		1000	1	07/24/2019 15:58	WG1316426	⁻Tc	

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SAMPLE RESULTS - 02 L1120582

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ср
Analyte	ug/l		ug/l		date / time		2
Chloride	6010		1000	1	07/24/2019 16:57	WG1316426	Tc



SAMPLE RESULTS - 03 L1120582

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Wet Chemistry by Method 9056A

	, ,						Cn l
	Res	ult Qualifier	RDL	Dilution	Analysis	Batch	CP
Analyte	ug/		ug/l		date / time		2
Sulfate	575	0	5000	1	07/24/2019 17:12	WG1316426	⁻Tc

ACCOUNT:	
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Collected date/time: 07/17/19 12:45

SAMPLE RESULTS - 04 L1120582



Metals (ICP) by Method 6010B								1 CD
	Result	Qualifier	RDL	Dilution	Analysis	Batch		Ср
Analyte	ug/l		ug/l		date / time			2
Calcium	45000		1000	1	07/23/2019 20:12	WG1314696		⁻Tc

³ Ss	
⁴ Cn	
⁵ Sr	
⁶ Qc	
⁷ Gl	
⁸ Al	
⁹ Sc	

SAMPLE RESULTS - 05 L1120582

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	 'Ср
Analyte	ug/l		ug/l		date / time		 2
Chloride	89700		1000	1	07/24/2019 18:12	WG1316426	¯Тс

SAMPLE RESULTS - 06

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	, ,							 1'C
		Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte		ug/l		ug/l		date / time		 2
Sulfate		8270		5000	1	07/24/2019 18:27	WG1316426	T

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³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ SC

SAMPLE RESULTS - 07 L1120582

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	Cp
Analyte	ug/l		ug/l		date / time		2
Sulfate	4920000	$\underline{\vee}$	250000	50	07/24/2019 18:42	WG1316426	Tc



SAMPLE RESULTS - 08 L1120582

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	-	Ср
Analyte	ug/l		ug/l		date / time			2
Sulfate	4880000		500000	100	07/25/2019 01:38	WG1316426		Tc

Collected date/time: 07/17/19 12:07

SAMPLE RESULTS - 09 L1120582



Metals (ICP) by Method 6010B

	00.02						1 Cn
	Result	Qualifier	RDL	Dilution	Analysis	Batch	CP
Analyte	ug/l		ug/l		date / time		 2
Boron	1710	<u>O1</u>	200	1	07/23/2019 19:22	WG1314696	Tc





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Metals (ICP) by Method 6010B

							 1'7
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Boron	1720		200	1	07/23/2019 20:21	WG1314696	-

³ Ss
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Metals (ICP) by Method 6010B

							 1 C 1
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	ug/l		ug/l		date / time		 2
Boron	550		200	1	07/23/2019 20:24	WG1314696	⁻Tc



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SAMPLE RESULTS - 12 L1120582



Metals (ICP) by Method 6010B

	00108						Cn
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Cp
Analyte	ug/l		ug/l		date / time		2
Calcium	373000	$\underline{\vee}$	1000	1	07/23/2019 19:33	WG1314696	⁻Tc



ACCOUNT: SCS Engineers - KS

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Metals (ICP) by Method 6010B

							1' 0
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Calcium	379000		1000	1	07/23/2019 20:27	WG1314696	T



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WG1316426

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1120582-01,02,03,05,06,07,08

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Method Blank (MB)

Method Biai	k (IVID)			
(MB) R3433988-1	07/24/19 14:56			
	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

L1120582-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1120582-01 07/24/19	9 15:58 • (DUP)	R3433988-3	07/24/19 1	16:13		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	6140	5950	1	3.25		15
Sulfate	59300	59300	1	0.0944		15

L1120583-09 Original Sample (OS) • Duplicate (DUP)

L1120583-09 Or	iginal Sample	e (OS) • Du	plicate ((DUP)			8
(OS) L1120583-09 07/	/24/19 22:25 • (DL	JP) R3433988-	8 07/24/19	22:40			
	Original Resu	It DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	9 5 6
Analyte	ug/l	ug/l		%		%	50
Chloride	25600	25700	1	0.319		15	

L1120583-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1120583-09 07/25/	DS) L1120583-09 07/25/19 02:08 • (DUP) R3433988-9 07/25/19 02:23							
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits		
Analyte	ug/l	ug/l		%		%		
Sulfate	1140000	1200000	20	5.12		15		

Laboratory Control Sample (LCS)

.

(LCS) R3433988-2 07/24	/19 15:11 Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Chloride	40000	40200	100	80.0-120	
Sulfate	40000	41600	104	80.0-120	

ACCOUNT:
SCS Engineers - KS

PROJECT: 27217233.19

SDG: L1120582

DATE/TIME: 07/25/19 15:54

PAGE: 19 of 25 Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

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(OS) L1120582-01 07/24/19 15:58 • (MS) R3433988-4 07/24/19 16:27 • (MSD) R3433988-5 07/24/19 16:42

(C	3) L1120302-01 07/24/13	13.30 • (IVI3) K	3433300-4 07	/24/19 10.27 • (NJD) KJ4JJJC	07/24/19	10.42						
		Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Ar	nalyte	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Cł	lloride	50000	6140	56400	56200	100	100	1	80.0-120			0.223	15
Su	Ifate	50000	59300	106000	106000	93.3	93.5	1	80.0-120	E	E	0.132	15

L1120582-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

L1120582-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1120582-07 07/24/1	9 18:42 • (MS) F	3433988-6 0	7/24/19 18:57 •	(MSD) R34339	88-7 07/24/19	19:12						
	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	1000	198000	2750000	2730000	5110	5070	50	80.0-120	<u>J5</u>	<u>J5</u>	0.672	15
Sulfate	1000	4920000	7170000	7140000	4510	4450	50	80.0-120	EV	EV	0.422	15

PROJECT: 27217233.19

SDG: L1120582 DATE/TIME: 07/25/19 15:54 PAGE: 20 of 25

WG1314696

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

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Method Blank (MB)

Method Diai					
(MB) R3433521-1	07/23/19 19:14				
	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) R3433521-2 07/23/1	9 19:16 • (LCSD) R3433521-3	07/23/19 19:19							
	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	1020	1020	102	102	80.0-120			0.807	20
Calcium	10000	10100	10200	101	102	80.0-120			0.807	20

L1120582-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1120582-09 07/23/1	9 19:22 • (MS) F	83433521-5 07	7/23/19 19:27 •	(MSD) R34335	21-6 07/23/19	19:30							8
	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	%	%		%			%	%	9
Boron	1000	1710	2700	2680	99.5	97.9	1	75.0-125			0.600	20	
Calcium	10000	66300	75700	75100	93.8	87.9	1	75.0-125			0.781	20	

L1120582-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1120582-12 07/23/19	9 19:33 • (MS) R	3433521-7 07/	/23/19 19:35 • (MSD) R343352	21-8 07/23/19 1	19:38						
	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	539	1550	1570	102	103	1	75.0-125			1.15	20
Calcium	10000	373000	378000	380000	47.5	77.4	1	75.0-125	$\underline{\vee}$		0.788	20

PROJECT: 27217233.19

SDG: L1120582 DATE/TIME: 07/25/19 15:54 PAGE: 21 of 25

GLOSSARY OF TERMS

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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.
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).
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

PROJECT: 27217233.19

SDG: L1120582 DATE/TIME: 07/25/19 15:54 PAGE: 22 of 25

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	Nebras
Alaska	17-026	Nevad
Arizona	AZ0612	New H
Arkansas	88-0469	New Je
California	2932	New M
Colorado	TN00003	New Y
Connecticut	PH-0197	North (
Florida	E87487	North (
Georgia	NELAP	North (
Georgia ¹	923	North I
ldaho	TN00003	Ohio-V
Illinois	200008	Oklaho
Indiana	C-TN-01	Oregor
lowa	364	Pennsy
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South I
Louisiana	AI30792	Tennes
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virginia
Minnesota	047-999-395	Washir
Mississippi	TN00003	West V
Missouri	340	Wiscor
Montana	CERT0086	Wyomi

lebraska	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 ¹⁴	2006
Texas	T104704245-18-15
Texas⁵	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	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

SCS Engineers - KS

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.



27217233.19

L1120582

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	Viest 110th Street 100			rmation:						Α	Analysis / Co	ntainer / Pres	ervative	1		Chain of Custody	Page of
SCS Engineers - KS 575 Viest 110th Street uite 1)0			Account 8575 W Suite 10 Overlan	est 110t 0	h Stre		Pres Chk		42							Redonel Cert	ter for Testing & Innovatio
eport to					10-1 T 1	eers.com;								- ^k		12065 Lebanon Rd Mount Juliet, TN 371	
ason franks			Jay.martir	City/Sta			<u></u>	4	1						100	Phone: 615-758-5858 Phone: 800-767-5859	Set Set
Project Description: KCPL - LaCygne Ger	erating Statio	on		Collecte				33	103						1	Fax: 615-758-5859	
hone: 913-681-0030 ax: 913-681-0012	Client Project # 27217233.1		e et.orge	Lab Project # AQUAOPKS-LACYGNE				250mlHDPE-HNO3	250mlHDPE-HNO3	oPres	Pres					L# L112 H094	
ollected by (print): Whit Martin	Site/Facility ID	#		P.O. #			OmIHDI	SomIH	HDPE-N	125mlHDPE-NoPres					Acctnum: AQU		
collected by (signature):		ab MUST Be y Five	1	Quote	#		Æ	0 25	0	mlF	HE					Prelogin: P719	
mmediately Packed on Ice N Y X	Next Day Two Day Three Da	5 Da 10 D	y (Rad Only) ay (Rad Only)	Date Results Neede		esults Needed		- 601	cium - 601	Chloride 125mlHDPE-NoPres						TSR: 206 - Jeff (PB:	
Sample ID Comp/Grab Ma		Matrix *	Depth	D	ate	Time	Cntr	oron	Calciu	hlor	Sulfate				and the	Shipped Via: Remarks	Sample # (lab only)
VIW-14R	IC.I	GW	1	17/1	-11	7 1035	1	8	0	X	N.					Nemarks	-01
UPLICATE 1	Grab	GW	1	7/1	7/10	1035	1			X					in the second	1772 Mar 13	-07
W-14R MS/MSD	Grab	GW		1-11	-110	1035	1			X							01
AW-601	Grab	GW	1	17/1-	7/10	1120	1				x						03
/W-701	Grab	GW	1	7/1-	7/19	1245	1	-	x					2	1	1	04
WW-704	Grab	GW		7/1-	119	1205	1	-		X					1		05
WW-706	Grab	GW	-	7/1-	7/19	1355	1	-			X		State of the second				06
WW-707B	Grab	GW		7/1-	1/19	1310	1		1		X	12/24			An and a second		07
DUPLICATE 3	Grab	GW		7/17	119	1315	1		P		X	The second					08
MW-707B MS/MSD	Grab	GW		7/17	1/19	1320	1	1	1.40		X					· 注意	10
Matrix: S - Soil AIR - Air F - Filter W - Groundwater B - Bioassay WW - WasteWater	Remarks:										pH	Temp Othe		COC S Bott	Seal Pr Signed, les ar:	ole Receipt Ch resent/Intact /Accurate: rive intact: ttles used:	iecklist :NPY Y
DW - Drinking Water DT - Other	Samples return UPSFe			M		Tracking #			° ₽	C		- A		Suff: VOA	icient Zero H	volume sent: <u>If Applicab</u> eadspace:	$\sum_{1e} \sum_{y}$
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Refinquished by : (Signature)	Refinquished by: (Signature) Date: Date: 1-18-19		Time: 180						Temp: 5.64./;	5.752	Ies Received:	If preservation required by Login: Date/T					
Relinquished by : (Signature)		Date:		Time:		Received for lab b	y: (Sign	ature)			Date: 7/14/1	Tim 'S	ચ્ચ:સુ	Hold:			Condition: NCF / OK

			Billing Info	ormation:	1	- ¥		12.22	1.59	Analysis / Container / Preservative Chain of					Chain of Custody	Page 2 of 2					
SCS Engineers - KS 8575 West 110th Street Suite 100 Overland Park KS 66210			Suite 100 Overland Park, KS 66			est 110th Street Chk			8575 West 110th Street			CZ.								Retioned Ger	tter for Testing & Innovation
Report to: Jason Franks	Email To: jfran jay.martin@ku				1	ers.com;			4							4.5	12065 Lebanon Rd Mount Juliet, TN 371 Phone: 615-758-585				
Project Description: KCPL - LaCygne Gen	nerating Stati	on		City/State Collected	1			03	103			164				Phone: 800-767-585 Fax: 615-758-5859					
Phone: 913-681-0030 Fax: 913-681-0012				Lab Project		LACYGNE		250mlHDPE-HNO3	250mlHDPE-HNO3	E-NoPres	Pres	Pres				ġ.	L # Table #				
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Sample ID	Comp/Grab	Matrix *	Depth	Dat	e	Time	Cntr	Boron	Calcium	Chloride	Sulfate						Shipped Via: Remarks	Sample # (lab only)			
MW-804	Grab	GW	1	7/17	lia	1207	1	X	0	0	S	R.					include as a second sec	-08			
DUPLICATE 2	Grab	GW		7/17	119	1215	1	-										69			
WW-804 MS/MSD	Grab	GW		7/17	119	1210	1				21.5							08			
/W-805	Grab	GW	Mar.	7/17/	119	1120	1	x								17.12.12 17.12 - 10		10			
VW-903	Grab	GW		7/17	119	0945	1		X	ing!		it in						il			
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MW-903 MS/MSD	Grab	GW		7/17/	19	0950	1		X					12							
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											•			192 <u>1</u> 242	2			1			
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater										pH .		Temp		COC S Bottl	eal Pri igned, es arr	Dele Receipt Ch resent/Intact /Accurate: rive intact:					
DW - Drinking Water OT - Other		Samples returned via: UPSFedExCourier Tracking #						Flow Other					Suffi	Correct bottles used: Sufficient volume sent: <u>If Applicable</u>							
Relinquished by: (Signature) Date: 7/18/19 Time: 14/9			R	ceived by: Signa	ature)	7-1	8-19		Trip Blan	k Rece	ived: Yes, HC TBF	L/MeoH	Prese	VOA Zero Headspace: Y _N Preservation Correct/Checked: Y _N RAD SCREEN: <0.5 mR/hr							
			R	eceived by: (Signa	ature)		Temp: °C Bottles Received: If preservation required b			n required by Lo	gin: Date/Time										
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Jared Morrison December 16, 2022

ATTACHMENT 1-5 August 2019 Sampling Event Laboratory Report



ANALYTICAL REPORT

September 03, 2019

SCS Engineers - KS

Sample Delivery Group: Samples Received: Project Number: Description: L1132586 08/24/2019 27217233.19 KCPL - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210

Тс Ss Cn Śr ʹQc Gl ΆI Sc

Entire Report Reviewed By:

Jason Romer 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.

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.19

SDG: L1132586 DATE/TIME: 09/03/19 15:00

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6	³ Ss
6	⁴ Cn
7	CIT
8	⁵Sr
9	6
10	⁶ Qc
11	⁷ Gl
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13	⁸ Al
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DATE/TIME: 09/03/19 15:00

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

MW-14R L1132586-01 GW			Collected by Jason Franks	Collected date/time 08/23/19 12:25	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334824	1	08/26/19 19:31	08/26/19 19:31	LDC	Mt. Juliet, TN
DUPLICATE 1 L1132586-02 GW			Collected by Jason Franks	Collected date/time 08/23/19 12:25	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Vet Chemistry by Method 9056A	WG1334824	1	08/26/19 20:57	08/26/19 20:57	LDC	Mt. Juliet, TN
MW-601 L1132586-03 GW			Collected by Jason Franks	Collected date/time 08/23/19 13:05	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1334824	1	08/27/19 09:07	08/27/19 09:07	LDC	Mt. Juliet, TN
MW-701 L1132586-04 GW			Collected by Jason Franks	Collected date/time 08/23/19 11:50	Received da 08/24/19 08:	
Nethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1334773	1	08/26/19 09:59	08/27/19 11:40	EL	Mt. Juliet, TN
MW-704 L1132586-05 GW			Collected by Jason Franks	Collected date/time 08/23/19 11:20	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Net Chemistry by Method 9056A	WG1334824	5	08/26/19 21:26	08/26/19 21:26	LDC	Mt. Juliet, TN
MW-706 L1132586-06 GW			Collected by Jason Franks	Collected date/time 08/23/19 10:40	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Net Chemistry by Method 9056A	WG1334824	1	08/26/19 21:41	08/26/19 21:41	LDC	Mt. Juliet, TN
DUPLICATE 3 L1132586-07 GW			Collected by Jason Franks	Collected date/time 08/23/19 10:40	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Net Chemistry by Method 9056A	WG1334824	1	08/27/19 09:21	08/27/19 09:21	LDC	Mt. Juliet, TN
MW-804 L1132586-08 GW			Collected by Jason Franks	Collected date/time 08/22/19 16:05	Received da 08/24/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location

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SDG: L1132586 DATE/TIME: 09/03/19 15:00 PAGE:

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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DUPLICATE 2 L1132586-09 GW			Collected by Jason Franks	Collected date/time 08/22/19 16:05	Received da 08/24/19 08	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1334773	1	08/26/19 09:59	08/27/19 11:43	EL	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-805 L1132586-10 GW			Jason Franks	08/22/19 15:35	08/24/19 08	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1334773	1	08/26/19 09:59	08/27/19 11:46	EL	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-903 L1132586-11 GW			Jason Franks	08/22/19 15:00	08/24/19 08	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1334773	1	08/26/19 09:59	08/27/19 10:44	EL	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
DUPLICATE 4 L1132586-12 GW			Jason Franks	08/22/19 15:00	08/24/19 08	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010B	WG1334774	1	08/28/19 12:40	08/28/19 23:51	EL	Mt. Juliet, TN

SDG: L1132586 DATE/TIME: 09/03/19 15:00

CASE NARRATIVE

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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

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

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.19

SDG: L1132586 DATE/TIME: 09/03/19 15:00 PAGE: 5 of 25

SAMPLE RESULTS - 01 L1132586

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		Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср	
Analyte		ug/l		ug/l		date / time		2	i
Chloride		6080		1000	1	08/26/2019 19:31	WG1334824	⁻Tc	

³ Ss
⁴ Cn
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⁸ Al
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	Result	Qualifier RDL	Dilution	Analysis	Batch	Ľ	
Analyte	ug/l	ug/l		date / time		 2	_
Chloride	6080	1000	1	08/26/2019 20:57	WG1334824		T



SAMPLE RESULTS - 03 L1132586

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	, ,						Cp
	Resu	lt Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Sulfate	6320		5000	1	08/27/2019 09:07	WG1334824	⁻Tc

Collected date/time: 08/23/19 11:50

SAMPLE RESULTS - 04 L1132586



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Metals (ICP) by Method 6010B

							Co	L	
	Result	Qualifier	RDL	Dilution	Analysis	Batch		Ср	
Analyte	ug/l		ug/l		date / time			2	i
Calcium	39900		1000	1	08/27/2019 11:40	WG1334773		⁻Tc	

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Wet Chemistry by Method 9056A

							l'c
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Chloride	89200		5000	5	08/26/2019 21:26	WG1334824	T

	² Tc
	³ Ss
	⁴ Cn
	⁵Sr
	⁶ Qc
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	⁷ Gl
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SAMPLE RESULTS - 06 L1132586

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Wet Chemistry by Method 9056A

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	Resu	lt <u>Qualifier</u>	RDL	Dilution	Analysis	Batch	CP
Analyte	ug/l		ug/l		date / time		2
Sulfate	8790		5000	1	08/26/2019 21:41	WG1334824	⁻Tc

SDG: L1132586

SAMPLE RESULTS - 07 L1132586

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	, ,							'Cn
		Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte		ug/l		ug/l		date / time		2
Sulfate		8550		5000	1	08/27/2019 09:21	WG1334824	⁻Tc

³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc



Ср

Тс

Metals (ICP) by Method 6010B

							 l'c
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Boron	1630		200	1	08/27/2019 10:33	WG1334773	T



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SDG: L1132586

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SAMPLE RESULTS - 09 L1132586



Metals (ICP) by Method 6010B

Metals (ICP) by	Method 6010B						1
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Boron	1640		200	1	08/27/2019 11:43	WG1334773	Tc

³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
°Sc

SAMPLE RESULTS - 10 L1132586



Metals (ICP) by Method 6010B

							L'Ca	
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср	
Analyte	ug/l		ug/l		date / time		2	ī
Boron	537		200	1	08/27/2019 11:46	WG1334773	Tc	

³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

ACCOUNT: SCS Engineers - KS

PROJECT: 27217233.19

SDG: L1132586

DATE/TIME: 09/03/19 15:00

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Ср

Тс

Metals (ICP) by Method 6010B

							 1'0
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Calcium	366000	$\underline{\vee}$	1000	1	08/27/2019 10:44	WG1334773	T





Τс

Metals (ICP) by Method 6010B

							1.0
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		2
Calcium	358000	<u>01 V</u>	1000	1	08/28/2019 23:51	WG1334774	T

³ Ss
⁴ Cn
⁵Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

WG1334824

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1132586-01,02,03,05,06,07

Method Blank (MB)

(MB) R3444477-1 08/26/19 14:56							
(MB) R3444477-1	08/26/19 14:56						
	MB Result	MB Qualifier	MB MDL	MB RDL		2	
Analyte	ug/l		ug/l	ug/l			
Chloride	U		51.9	1000			
Sulfate	U		77.4	5000		35	
						Ľ	

L1132563-07 Original Sample (OS) • Duplicate (DUP)

(OS) I	L1132563-07 08/26/1	9 16:09 • (DUP)	R3444477-3	08/26/19	16:24		
		Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyt	te	ug/l	ug/l		%		%
Chlori	de	38700	38400	1	0.568		15
Sulfate	e	86800	86700	1	0.133		15

L1132586-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1132586-01 08/2	6/19 19:31 • (DUP)	R3444477-4	08/26/19 19	9:45			
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	9
Analyte	ug/l	ug/l		%		%	L
Chloride	6080	6030	1	0.755		15	
Sulfate	60600	60400	1	0.232		15	

Laboratory Control Sample (LCS)

(LCS) R3444477-2 08/2	6/19 15:10				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Chloride	40000	39500	98.8	80.0-120	
Sulfate	40000	39700	99.2	80.0-120	

L1132586-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132586-01 08/26/19	9 19:31 • (MS) R3	3444477-5 08/	/26/19 20:00 •	(MSD) R34444	77-6 08/26/19	20:14						
	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	6080	52700	52900	93.2	93.7	1	80.0-120			0.414	15
Sulfate	50000	60600	99100	98900	77.0	76.7	1	80.0-120	J6	J6	0.128	15

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
SCS Engineers - KS	27217233.19	L1132586	09/03/19 15:00	18 of 25



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Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1132586-01,02,03,05,06,07

L1132586-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132586-06 08/26/1	9 21:41 • (MS) R	3444477-7 08	/26/19 21:55 •	(MSD) R34444	77-8 08/26/19	22:10						
	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	249000	283000	284000	68.8	69.7	1	80.0-120	EV	EV	0.154	15
Sulfate	50000	8790	51600	51800	85.6	86.1	1	80.0-120			0.464	15

ACCOUNT: SCS Engineers - KS

PROJECT: 27217233.19

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Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY L1132586-04,08,09,10,11

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Method Blank (MB)

Method Blat	ik (ivib)				1
(MB) R3444820-	1 08/27/19 10:26				
	MB Result	MB Qualifier	MB MDL	MB RDL	2
Analyte	ug/l		ug/l	ug/l	T
Boron	U		12.6	200	
Calcium	U		46.3	1000	³ S
					Ĭ

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

(LCS) R3444820-2 08/27/	'19 10:28 • (LCS	D) R3444820-	3 08/27/19 10:3	31						
	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	1000	980	100	98.0	80.0-120			2.04	20
Calcium	10000	10100	9800	101	98.0	80.0-120			2.82	20

L1132586-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132586-08 08/27/1	9 10:33 • (MS) F	3444820-5 0	8/27/19 10:39 •	(MSD) R34448	320-6 08/27/19	9 10:41							8
	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	%	%		%			%	%	g
Boron	1000	1630	2630	2650	100	102	1	75.0-125			0.830	20	
Calcium	10000	60300	73100	73700	128	134	1	75.0-125	$\underline{\vee}$	$\underline{\vee}$	0.767	20	

L1132586-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132586-11 08/27/19	10:44 • (MS) R3	3444820-7 08/	/27/19 10:46 • (MSD) R344482	20-8 08/27/19	10:49						
	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	510	1530	1520	102	101	1	75.0-125			0.0864	20
Calcium	10000	366000	371000	368000	50.2	20.9	1	75.0-125	$\underline{\vee}$	V	0.792	20

ACCOUNT:	
SCS Engineers - KS	

PROJECT: 27217233.19

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Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3445287-1 0	08/28/19 23:42			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	ug/l		ug/l	ug/l
Calcium	U		46.3	1000

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

(LCS) R3445287-2 08/28/1	.CS) R3445287-2 08/28/19 23:45 • (LCSD) R3445287-3 08/28/19 23:48									
	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	%	%	%			%	%
Calcium	10000	9530	9600	95.3	96.0	80.0-120			0.785	20

L1132586-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1132586-12 08/28/19	(OS) L1132586-12 08/28/19 23:51 • (MS) R3445287-5 08/28/19 23:56 • (MSD) R3445287-6 08/28/19 23:59											
	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	%	%		%			%	%
		-	0	0								

ACCOUNT:				
SCS Engineers - KS				

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GLOSSARY OF TERMS

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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.
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).
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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SDG: L1132586 DATE/TIME: 09/03/19 15:00

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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	Nebras
Alaska	17-026	Nevad
Arizona	AZ0612	New H
Arkansas	88-0469	New Je
California	2932	New M
Colorado	TN00003	New Y
Connecticut	PH-0197	North (
Florida	E87487	North (
Georgia	NELAP	North (
Georgia ¹	923	North I
ldaho	TN00003	Ohio-V
Illinois	200008	Oklaho
Indiana	C-TN-01	Oregor
lowa	364	Pennsy
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South I
Louisiana	AI30792	Tennes
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virginia
Minnesota	047-999-395	Washir
Mississippi	TN00003	West V
Missouri	340	Wiscor
Montana	CERT0086	Wyomi

lebraska	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 ¹⁴	2006
Texas	T104704245-18-15
Texas⁵	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	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

SCS Engineers - KS

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.

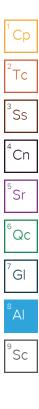


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	Billing Information:						A	nalvsis /	Contair	er / Preser	vative	-	-	Chain of Custod	ly Page of			
SCS Engineers - KS			Account 8575 W Suite 10	est 110t		•	Pres Chk										National	Center for Testing & Inno
uite 100 Overland Park KS 66210			Overlan	d Park,	1994 - X	et and the												
eport to: a son Franks		al and a second second	Email To: j jay.martir	n@kcpl.co	and and some first had all and			5	62								12065 Lebanon Ri Mount Juliet, TN 3 Phone: 615-758-5 Phone: 800-767-5	858 1
roject escription: KCPL - LaCygne Gen			LAL	1 1	MONG PL Please Circle: PT MT CT ET		03 6	- NUMBER 7								Fax: 615-758-585	• • • • • • • • • • • • • • • • • • • •	
hone: 913-681-0030 ax: 913-681-0012	Client Project 27217233.1			/ /	ab Project # AQUAOPKS-LACYGNE			E-HN	DPE-H	oPres	res		1905	1			SDG # 13 2986 D120	
ASON FRANK	Site/Facility ID)#		P.O.#			250mlHDPE-HNO3	250mIHDPE-HNO3	125mlHDPE-NoPres	25mlHDPE-NoPres						Acctnum: AC		
ollected by (signature):		ab MUST Be ay Five I		Quote #			0	6010 25	SmiHE	mIHDF					110	Template: T1 Prelogin: P7	25643	
mmediately packed on Ice N Y	Next Da Two Day Three D	10 Da	r (Rad Only) ay (Rad Only)	1	Date Results Needed No. of			1-601	1.1	oride 125				-			PM: 206 - Jeff Carr PB:	
Sample ID	Comp/Grab	Matrix *	Depth	D)ate	Time	Cntrs	Boror	Calcium	Chloride	Sulfate		a na				Shipped Via: Remarks	Sample # (lab o
MW-14R	GRA	B GW	1	181	23/1	1225	1	-	-	X								- 1
DUPLICATE 1		GW				1225	1	1		X				1. 2154 - 11				- 2
WW-14R MS/MSD	est a	GW				1225	1	-	-	X	A.C.					1.1		
WW-601		GW				1305	1		12:12		X							- 3
WW-701		GW			and a second	1150	1		X		in the						-	-4
MW-704		GW				1120	1			X	1.1			-				- 5
WW-706		GW				1040	1				X						-	-6
DUPLICATE 3		GW		17		1040	1				X		1					-7
MW-706 MS/MSD		GW			1 .	1040	1				X							de 2
MW-804	K	GW	1	81	22/1	8 1405	† 1	X					1					-8
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	Remarks:			.,	75						pH Flov	1	Temp Other _		COC Bott Corre	Seal Pr Signed/ les arr ect bot	Accurate: tive intact: tles used:	t: VNP Y
DW - Drinking Water OT - Other	Samples return UPSFe	rned via: edEx Cou	urier	Tracking # 4510				lE	261	4	369	U		~	VOA	Zero He	volume sent <u>If Applica</u> adspace: on Correct/C	able Y
Belinquished by : (Signature)		Date:	3/13 1436 Received by: (Signature)			8-	23-1 14				ТВ	L/MeoH R			<0.5 mR/hr:			
Relineuisped by : (Signature)	1	Date:	19	Time:	TO Re	ceived by: (Signat	ture)				Temp: 4,3	430F	C Bottles	Received:	If pre	servatio	n required by l	.ogin: Date/Time
Relinquished by : (Signature)		Øate:		Time:	Re	eceived for lab by:	(Signa	ature)	1		Date:	224	Time:	5	Hold:	1		Condition

			10.000	Billing Inf	8575 West 110th Street Suite 100 Overland Park, KS 66210				Analvsis / Container / Preservative						Chain of Custody Page										
SCS Engineers - KS 575 West 110th Street uite 100 Overland Park KS 66210				8575 W Suite 1				Pres Chk											Rational Cu	nter for Testing & Innovation					
eport to: ason Franks		Sector	a de la		jfranks@ in@kcpl.co					ks@scsengineers.com; pl.com:											2 2	46		12065 Lebanon Rd Mount Juliet, TN 37	
roject			City/State	1	(<u> </u>	- 1.	10	Please Circle	207.1	4	2 22	-						11 3. G - 2	- F	Phone: 615-758-585 Phone: 800-767-585 Fax: 615-758-5859					
Description: KCPL - LaCygne Gene		ng Stat		LAI	Lab Pr	1		PT MT CT	EI	heor	N N				1		14			SDG # 113	"DCar				
hone: 913-681-0030 ax: 913-681-0012	1	17233.1			AQU	AOPK	S-LAC	YGNE	4.4 1	НДРЕ-НИО	DPE-H	oPres	Pres				Juli		H	Table #	2586				
Collected by (print):		Facility ID	#	Kale	P.O. # otified) Quote #					IHDF	6010 250mIHDPE-HNO3	SomIH	25mlHDPE-NoPres	5mlHDPE-NoPres						-	Acctnum: AQL	JAOPKS			
Collected by (signature):		Rush? (Li	ab MUST Be	Notified)						250ml		IHD	HDP							Template:T13					
Immediately Packed on Ice N Y		Same Da Next Day Two Day Three Da	10 D	Day y (Rad Only) ay (Rad Only)		Date R	esults N	Veeded	No. of	- 6010	1.1.	-	12						F	Prelogin: P72 PM: 206 - Jeff C PB:					
Sample ID	Con	np/Grab	Matrix *	Depth		Date		Time	Cntrs	Boron	Calcium	Chloride	Sulfate		-	2			5	Shipped Via: Remarks	Sample # (lab only)				
DUPLICATE 2	G	RAS	GW	11	3.	22/1	9	1605	1	X	Ŭ										-9				
MW-804 MS/MSD	10	1	GW			1		1605	1	Х	and a second										,				
MW-805		No.	GW			1		1535	1	х						12					-10				
MW-903			GW					1500	1		X										- 11				
DUPLICATE 4			GW			1		1500	1		X		1								-12				
MW-903 MS/MSD			GW	and the second				1500	1		X								_						
				1			100 C			1	1														
			a feature and the a		-						The second				1. A										
			and and the state of the state						1		11														
						-								1.5		45				۰.					
* Matrix: 55 - Soil AIR - Air F - Filter 5W - Groundwater B - Bioassay WW - WasteWater	Rem	arks:											pH Flow		_ Tem	a de la composición de la comp		COC Si Bottle	eal Pre igned/A es arri	e Receipt Ch esent/Intact Accurate: .ve intact: :les used:	necklist : <u>NP</u> Y_N _Y_N _Y_N _Y_N _N _N				
DW - Drinking Water OT - Other		ples return PS Fe	ned via: dEx Cou	urier	Tracking #		ng #								~		Suffic VOA Ze	cient v ero Hea	volume sent: <u>If Applicab</u> adspace:	<u>le</u> _Y_N					
Relinquished by Signature	7		Date:	3/19	Time: 14		Receip	ed by: (Signati	ure)	8-	23-14:		Trip Bla	nk Recei		es /No HCL / Me TBR				1 Correct/Ch :0.5 mR/hr:	ecked: Y _N Y _N				
Religious d by : (Signature)	-		Date:	119	Time:	50	Receiv	ed by: (Signatu	ure)				Temp:/			tles Recei	ved:	If prese	ervation	required by Lo	gin: Date/Time				
Reinquished by : (Signature)			Date:		Time:		Receiv	red for lab by: ((Signat	ure)	7		Date:	4	Tim	10 11e: 395		Hold:			Condition: NCF / OK				

Jared Morrison December 16, 2022

ATTACHMENT 1-6 November 2019 Sampling Event Laboratory Report



ANALYTICAL REPORT

November 18, 2019

SCS Engineers - KS

Sample Delivery Group: Samples Received: Project Number: Description: L1159196 11/09/2019 27217233.19 Evergy - LaCygne Generating Station

Report To:

Jason Franks 8575 West 110th Street Suite 100 Overland Park, KS 66210 ¹Cp ²Tc ³Ss ⁴Cn ⁵Sr ⁶Qc ⁷GI ⁸AI ⁹Sc

Entire Report Reviewed By:

Vubb law

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.

ACCOUNT: SCS Engineers - KS PROJECT: 27217233.19

SDG: L1159196

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² Tc	
³ Ss	
⁴ Cn	
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SDG: L1159196

SAMPLE SUMMARY

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	SAMPLES		ЛАКТ		ONL	LAD. MATION
MW-901 L1159196-01 GW			Collected by Jason R. Franks	Collected date/time 11/08/19 13:50	Received da 11/09/19 08:4	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378170	1	11/13/19 07:13	11/13/19 08:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	1	11/13/19 01:20	11/13/19 01:20	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380941	1	11/15/19 11:53	11/16/19 10:00	TRB	Mt. Juliet, TN
MW-902 L1159196-02 GW			Collected by Jason R. Franks	Collected date/time 11/08/19 11:00	Received da 11/09/19 08:4	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378170	1	11/13/19 07:13	11/13/19 08:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	1	11/13/19 01:51	11/13/19 01:51	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380941	1	11/15/19 11:53	11/16/19 10:03	TRB	Mt. Juliet, TN
MW-903 L1159196-03 GW			Collected by Jason R. Franks	Collected date/time 11/08/19 11:45	Received da 11/09/19 08:4	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378170	1	11/13/19 07:13	11/13/19 08:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	1	11/13/19 02:07	11/13/19 02:07	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	20	11/13/19 02:55	11/13/19 02:55	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380941	1	11/15/19 11:53	11/16/19 10:06	TRB	Mt. Juliet, Ti
MW-904 L1159196-04 GW			Collected by Jason R. Franks	Collected date/time 11/08/19 12:20	Received da 11/09/19 08:4	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378170	1	11/13/19 07:13	11/13/19 08:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	1	11/13/19 03:11	11/13/19 03:11	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380941	1	11/15/19 11:53	11/16/19 09:30	TRB	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	
MW-905 L1159196-05 GW			Jason R. Franks	11/08/19 13:15	11/09/19 08:4	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378170	1	11/13/19 07:13	11/13/19 08:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	1	11/13/19 03:59	11/13/19 03:59	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380941	1	11/15/19 11:53	11/16/19 10:09	TRB	Mt. Juliet, TN
DUPLICATE L1159196-06 GW			Collected by Jason R. Franks	Collected date/time 11/08/19 12:20	Received da 11/09/19 08:4	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378170	1	11/13/19 07:13	11/13/19 08:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1379280	1	11/13/19 04:15	11/13/19 04:15	ELN	Mt. Juliet, TN
		1	11/15/19 11:53	11/16/19 10:12	TRB	Mt. Juliet, TN

PROJECT: 27217233.19

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CASE NARRATIVE

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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.

Jubb land

Jeff Carr Project Manager

Τс Ss Cn Sr Qc GI AI Sc

SDG: L1159196 DATE/TIME: 11/18/19 16:17 PAGE: 4 of 17

SAMPLE RESULTS - 01 L1159196

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ср	
Analyte	ug/l		ug/l		date / time		2	i
Dissolved Solids	502000		10000	1	11/13/2019 08:12	WG1378170	Tc	

Wet Chemistry by Method 9056A

Collected date/time: 11/08/19 13:50

Wet Chemistry by Method 9056A											
	Result	Qualifier	RDL	Dilution	Analysis	Batch					
Analyte	ug/l		ug/l		date / time			⁴ Cn			
Chloride	23200		1000	1	11/13/2019 01:20	WG1379280		СП			
Fluoride	481		100	1	11/13/2019 01:20	WG1379280		5			
Sulfate	21200		5000	1	11/13/2019 01:20	WG1379280		⁵Sr			

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	1090		200	1	11/16/2019 10:00	WG1380941
Calcium	53400		1000	1	11/16/2019 10:00	WG1380941

SAMPLE RESULTS - 02 L1159196



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Gravimetric Analysis by Method 2540 C-2011

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	<u> </u>	
Analyte	ug/l		ug/l		date / time		 2	1
Dissolved Solids	471000		10000	1	11/13/2019 08:12	WG1378170	Tc	

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Allalysis	Balch	
Analyte	ug/l		ug/l		date / time		2
Dissolved Solids	471000		10000	1	11/13/2019 08:12	<u>WG1378170</u>	Tc
Wet Chemistry by	Method 9056A	L					³ Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		⁴ Cn
Chloride	32100		1000	1	11/13/2019 01:51	WG1379280	
Fluoride	455		100	1	11/13/2019 01:51	WG1379280	5
Sulfate	27900		5000	1	11/13/2019 01:51	WG1379280	⁵ Sr

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	ug/l		ug/l		date / time		
Boron	1170		200	1	11/16/2019 10:03	WG1380941	
Calcium	64300		1000	1	11/16/2019 10:03	WG1380941	



SAMPLE RESULTS - 03 L1159196

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ср
Analyte	ug/l		ug/l		date / time		2
Dissolved Solids	1870000		25000	1	11/13/2019 08:12	WG1378170	² Tc

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	L
Analyte	ug/l		ug/l		date / time		2
Chloride	24500		1000	1	11/13/2019 02:07	WG1379280	
Fluoride	140		100	1	11/13/2019 02:07	WG1379280	-
Sulfate	1050000		100000	20	11/13/2019 02:55	WG1379280	

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	508		200	1	11/16/2019 10:06	WG1380941
Calcium	348000		1000	1	11/16/2019 10:06	WG1380941

SAMPLE RESULTS - 04 L1159196

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier RDL	Dilution	Analysis	Batch	 Ct
Analyte	ug/l	ug/l		date / time		 2
Dissolved Solids	607000	1330	0 1	11/13/2019 08:12	WG1378170	Tc

Wet Chemistry by Method 9056A

Collected date/time: 11/08/19 12:20

	sis by Method 2					
	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	607000		13300	1	11/13/2019 08:12	WG1378170
Wat Chamistry by	Mothod ODEG	N				
Wet Chemistry by	Method anapp	x				
	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	32600		1000	1	11/13/2019 03:11	WG1379280
Fluoride	369		100	1	11/13/2019 03:11	WG1379280

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	957		200	1	11/16/2019 09:30	WG1380941
Calcium	65300		1000	1	11/16/2019 09:30	WG1380941

SAMPLE RESULTS - 05 L1159196

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ср	
Analyte	ug/l		ug/l		date / time		2	i
Dissolved Solids	537000		13300	1	11/13/2019 08:12	WG1378170	Tc	l

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
analyte	ug/l		ug/l		date / time		[
hloride	52800		1000	1	11/13/2019 03:59	WG1379280	
Fluoride	488		100	1	11/13/2019 03:59	WG1379280	4
Sulfate	27700		5000	1	11/13/2019 03:59	WG1379280	Ĭ

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	1770		200	1	11/16/2019 10:09	WG1380941
Calcium	46000		1000	1	11/16/2019 10:09	WG1380941

SAMPLE RESULTS - 06 L1159196

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	 Ct
Analyte	ug/l		ug/l		date / time		2
Dissolved Solids	620000		13300	1	11/13/2019 08:12	WG1378170	Tc

Wet Chemistry by Method 9056A

Clavinicatic Analy	sis by Method 2	010 0 20	/ 11			
	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Dissolved Solids	620000		13300	1	11/13/2019 08:12	WG1378170
Wet Chemistry by	^r Method 9056A					
	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Chloride	32500		1000	1	11/13/2019 04:15	WG1379280
Fluoride	366		100	1	11/13/2019 04:15	WG1379280
Sulfate	78200		5000	4	11/13/2019 04:15	WG1379280

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	ug/l		ug/l		date / time	
Boron	951		200	1	11/16/2019 10:12	WG1380941
Calcium	64700		1000	1	11/16/2019 10:12	WG1380941



SDG: L1159196

WG1378170

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY L1159196-01,02,03,04,05,06

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Method Blank (MB)

(MB) R3472026-1 11/13/	/19 08:12			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	ug/l		ug/l	ug/l
Dissolved Solids	U		2820	10000

L1159196-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1159196-03 11/13/19	08:12 • (DUP) R	3472026-3 11	1/13/19 08:1	2		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Dissolved Solids	1870000	1900000	1	1.33		5

L1159236-02 Original Sample (OS) • Duplicate (DUP)

L1159236-02 Original Sample (OS) • Duplicate (DUP)											
(OS) L1159236-02 11/13/	(19 08:12 • (DUP)	R3472026-4 1	11/13/19 08:	:12			L				
	Original Resul	t DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	8				
Analyte	ug/l	ug/l		%		%	L				
Dissolved Solids	2030000	2370000	1	15.2	<u>J3</u>	5	9				

Laboratory Control Sample (LCS)

(LCS) R3472026-2 11/13	.CS) R3472026-2 11/13/19 08:12											
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier							
Analyte	ug/l	ug/l	%	%								
Dissolved Solids	8800000	8580000	97.5	85.0-115								

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QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3471427-1 11/12/19 23:17

(IVID) R34/1427-1 1	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	

L1159196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159196-01 11/13/19 01:20 • (DUP) R3471427-3 11/13/19 01:36

	. ,					
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	ug/l	ug/l		%		%
Chloride	23200	23100	1	0.397		15
Fluoride	481	480	1	0.167		15
Sulfate	21200	21100	1	0.387		15

L1159236-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1159236-10 11/13/19 (OS) L1159236-10 11/13/19 08:29 • (DUP) R3471427-8 11/13/19 09:17												
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits							
Analyte	ug/l	ug/l		%		%							
Chloride	29000	29000	1	0.0934		15							
Fluoride	430	434	1	0.810		15							
Sulfate	21900	21900	1	0.227		15							

Laboratory Control Sample (LCS)

(LCS) R3471427-2 11/12/1	CS) R3471427-2 11/12/19 23:33										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier						
Analyte	ug/l	ug/l	%	%							
Chloride	40000	38700	96.9	80.0-120							
Fluoride	8000	8000	100	80.0-120							
Sulfate	40000	38900	97.2	80.0-120							

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SCS Engineers - KS

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SDG: L1159196 DATE/TIME: 11/18/19 16:17 PAGE: 12 of 17 Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

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L1159196-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1159196-04 11/13/19 03:11 • (MS) R3471427-4 11/13/19 03:27 • (MSD) R3471427-5 11/13/19 03:43													
	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	32600	81300	80400	97.4	95.6	1	80.0-120			1.10	15	
Fluoride	5000	369	5100	5170	94.7	96.1	1	80.0-120			1.33	15	
Sulfate	50000	78300	125000	125000	92.6	94.0	1	80.0-120	E	E	0.553	15	

L1159236-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1159236-07 11/13/19	OS) L1159236-07 11/13/19 07:10 • (MS) R3471427-6 11/13/19 07:26 • (MSD) R3471427-7 11/13/19 07:41													
	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	92000	136000	137000	89.0	89.9	1	80.0-120	E	E	0.344	15		
Fluoride	5000	951	5760	5850	96.2	98.0	1	80.0-120			1.52	15		
Sulfate	50000	ND	47800	47900	93.6	93.8	1	80.0-120			0.216	15		

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WG1380941

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

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Method Blank (MB)

Method Dian										
(MB) R3472629-1 11/16/19 09:22										
	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) R3472629-2 11/16/19	(LCS) R3472629-2 11/16/19 09:24 • (LCSD) R3472629-3 11/16/19 09:27													
	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	890	902	89.0	90.2	80.0-120			1.33	20				
Calcium	10000	9110	9080	91.1	90.8	80.0-120			0.303	20				

L1159196-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

LIISSISO-04 Oligii	iai Jampie	(00) • Mati	iv obive (ii		Shike Dut								
(OS) L1159196-04 11/16/19	09:30 • (MS) R	3472629-5 11/1	6/19 09:35 • (I	VISD) R347262	9-6 11/16/19 09	9:38							⁸ Al
	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	%	%		%			%	%	 9
Boron	1000	957	1860	1870	90.6	90.8	1	75.0-125			0.121	20	SC
Calcium	10000	65300	73600	73200	82.9	79.2	1	75.0-125			0.510	20	

ACCOUNT:
SCS Engineers - KS

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GLOSSARY OF TERMS

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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).

J3 The associated batch QC was outside the established quality control range for precision.

PROJECT: 27217233.19

SDG: L1159196

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	Nebra
Alaska	17-026	Nebras
Arizona	AZ0612	New H
Arkansas	88-0469	New Je
California	2932	New M
Colorado	TN00003	New Ye
Connecticut	PH-0197	North (
Florida	E87487	North (
Georgia	NELAP	North (
Georgia ¹	923	North I
Idaho	TN00003	Ohio-V
Illinois	200008	Oklaho
Indiana	C-TN-01	Oregor
lowa	364	Pennsy
Kansas	E-10277	Rhode
Kentucky ¹⁶	90010	South
Kentucky ²	16	South I
Louisiana	AI30792	Tennes
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas
Maryland	324	Utah
Massachusetts	M-TN003	Vermo
Michigan	9958	Virginia
Minnesota	047-999-395	Washir
Mississippi	TN00003	West V
Missouri	340	Wiscor
Montana	CERT0086	Wyomi

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	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

SCS Engineers - KS

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.



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PAGE: 16 of 17

11/18/19 16:17



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CS Engineers - KS			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ts Payable est 110th Stree	t	Pres Chk								an training an training and training			r for Testing & Innovation
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* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	Remarks:					電影				pH Flow	v	Temp Other		COC S Bottl	Seal P Signed Les ar	ple Receipt Che Present/Intact: d/Accurate: crive intact: ottles used:	
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A AND A DESCRIPTION OF

Jared Morrison December 16, 2022

ATTACHMENT 2 Statistical Analyses

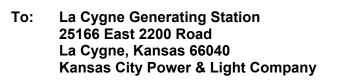
Jared Morrison December 16, 2022

ATTACHMENT 2-1

Fall 2018 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

April 11, 2019





From: SCS Engineers

RE: Determination of Statistically Significant Increases – Bottom Ash Impoundment Fall 2018 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the Bottom Ash Impoundment at the La Cygne 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 29, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on January 12, 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 14, 2019 and March 11, 2019.

The completed statistical evaluation identified Appendix III constituent, calcium, above its prediction limit in monitoring well MW-903. The prediction limit for calcium in monitoring well MW-903 is 358.2 mg/L. The detection monitoring sample was reported at 375 mg/L. The first verification re-sample was collected on January 14, 2019 with a result of 377 mg/L. The second verification re-sample was collected on March 11, 2019 with a result of 375 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for calcium from monitoring well MW-903 exceeds its prediction limit and is a confirmed SSI over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified one SSI above the background prediction limit for calcium in monitor well MW-903.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas[™] Output:

Statistical evaluation output from Sanitas[™] for the prediction limit analysis. This includes prediction limit plots, prediction limit background data, detection sample result, 1st verification re-sample result (when applicable), 2nd verification re-sample result (when applicable), extra sample results for pH because pH is collected as part of the sampling procedure, and a Prediction Limit summary table. Output documentation includes the analytical data used for the statistical analyses.

Attachment 2: Sanitas[™] Configuration Settings:

Screen shots of the applicable Sanitas[™] configuration settings for the statistical prediction limit analysis. This includes data configuration, output configuration, prediction limit configuration and other tests configuration.

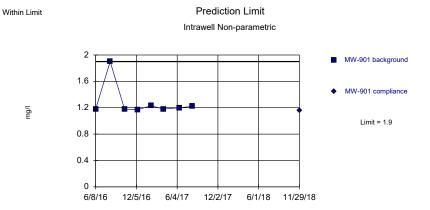
Revision Number	Revision Date	Attachment Revised	Summary of Revisions

La Cygne Generating Station Determination of Statistically Significant Increases Bottom Ash Impoundment April 11, 2019

ATTACHMENT 1

Sanitas[™] Output

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



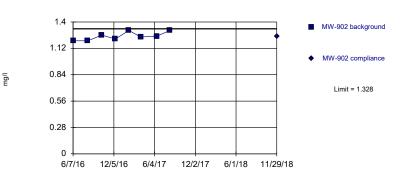
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient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

Constituent: BORON Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data





Prediction Limit



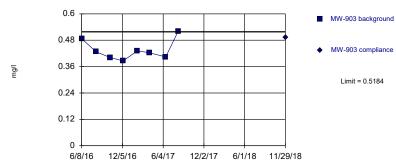
Background Data Summary: Mean=1.249, Std. Dev.=0.04357, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8927, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: BORON Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

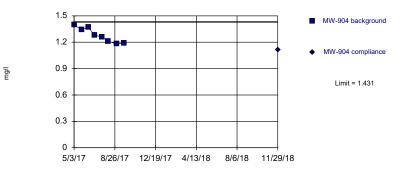
Prediction Limit



Background Data Summary: Mean=0.4351, Std. Dev.=0.04604, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8763, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188. Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG



Prediction Limit Intrawell Parametric



Background Data Summary: Mean=1.279, Std. Dev=0.08408, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9243, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: BORON (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	1.18	
8/11/2016	1.9	
10/14/2016	1.18	
12/12/2016	1.17	
2/9/2017	1.23	
4/4/2017	1.18	
6/16/2017	1.2	
8/11/2017	1.22	
11/29/2018		1.16

Constituent: BORON (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	1.2	
8/11/2016	1.2	
10/13/2016	1.26	
12/12/2016	1.22	
2/10/2017	1.31	
4/4/2017	1.24	
6/15/2017	1.25	
8/11/2017	1.31	
11/29/2018		1.25

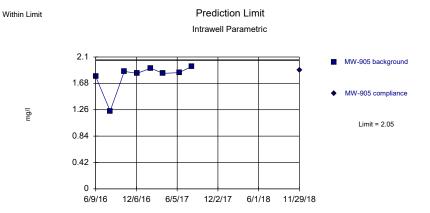
Constituent: BORON (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	0.487	
8/11/2016	0.427	
10/13/2016	0.401	
12/9/2016	0.386	
2/10/2017	0.432	
4/4/2017	0.423	
6/16/2017	0.404	
8/10/2017	0.521	
11/29/2018		0.493

Constituent: BORON (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	1.4	
5/24/2017	1.34	
6/12/2017	1.37	
6/30/2017	1.28	
7/21/2017	1.26	
8/7/2017	1.21	
9/1/2017	1.18	
9/22/2017	1.19	
11/29/2018		1.11

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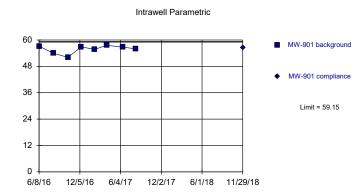
Background Data Summary (based on x⁴4 transformation): Mean=10.94, Std. Dev.=3.707, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wlik @alpha = 0.01, calculated = 0.7543, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05122). Report alpha = 0.00188.

Constituent: BORON Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data



Within Limit

l/gr



Prediction Limit

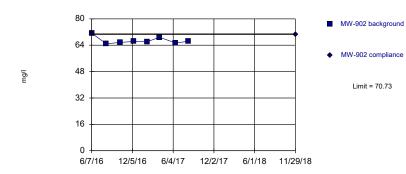
Background Data Summary: Mean=55.76, Std. Dev.=1.873, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8695, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

> Constituent: CALCIUM Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit Intrawell Parametric

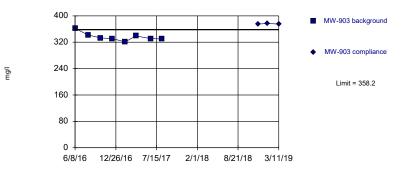


Background Data Summary: Mean=66.88, Std. Dev =2.13, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8116, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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Prediction Limit



Background Data Summary: Mean=336.1, Std. Dev.=12.19, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8714, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: BORON (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	1.79	
8/12/2016	1.24	
10/14/2016	1.87	
12/9/2016	1.84	
2/8/2017	1.92	
4/4/2017	1.84	
6/14/2017	1.85	
8/9/2017	1.95	
11/29/2018		1.89

Constituent: CALCIUM (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-901	M/M/ Q
	10100-901	MW-901
6/8/2016	57.2	
8/11/2016	53.9	
10/14/2016	52.1	
12/12/2016	56.9	
2/9/2017	55.7	
4/4/2017	57.6	
6/16/2017	56.7	
8/11/2017	56	
11/29/2018		56.4

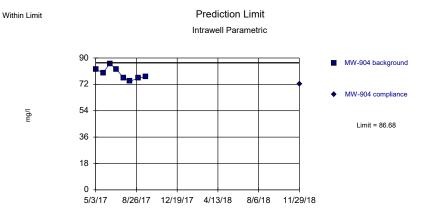
Constituent: CALCIUM (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	71.3	
8/11/2016	64.9	
10/13/2016	65.7	
12/12/2016	66.3	
2/10/2017	66.2	
4/4/2017	68.8	
6/15/2017	65.4	
8/11/2017	66.4	
11/29/2018		70.4

Constituent: CALCIUM (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-903	MW-903	
6/8/2016	362		
8/11/2016	342		
10/13/2016	333		
12/9/2016	331		
2/10/2017	321		
4/4/2017	339		
6/16/2017	331		
8/10/2017	330		
11/29/2018		375	
1/14/2019		377	1st verification re-sample
3/11/2019		375	2nd verification re-sample
0,11,2010		0/0	2nd vernication re-sample

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Background Data Summary: Mean=79.34, Std. Dev.=4.056, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9418, critical = 0.749. Kappa = 1.81 (c=7), w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

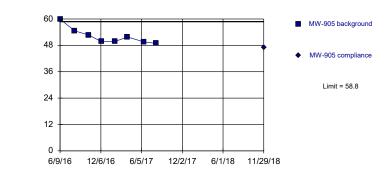
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Prediction Limit

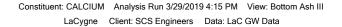




Intrawell Parametric

Background Data Summary: Mean=52.13, Std. Dev.=3.685, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8283, 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 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data



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Within Limit

Prediction Limit Intrawell Non-parametric

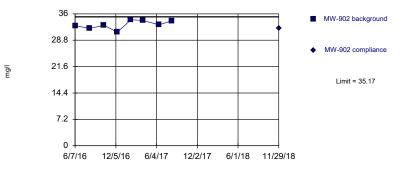


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient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





Prediction Limit Intrawell Parametric



Background Data Summary: Mean=33.05, Std. Dev.=1.174, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9249, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: CALCIUM (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	82.4	
5/24/2017	79.8	
6/12/2017	86.2	
6/30/2017	82.3	
7/21/2017	76.5	
8/7/2017	74.1	
9/1/2017	76.3	
9/22/2017	77.1	
11/29/2018		72.1

Constituent: CALCIUM (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	59.9	
8/12/201	6 54.6	
10/14/20	16 52.7	
12/9/201	6 49.7	
2/8/2017	49.8	
4/4/2017	51.8	
6/14/201		
8/9/2017		
11/29/20		46.9

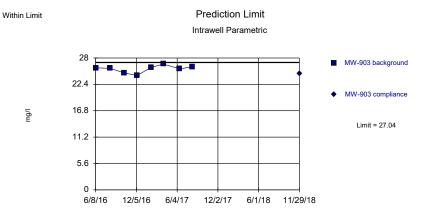
Constituent: CHLORIDE (mg/l) Analysis Run 3/29/2019 4:18 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	23.3	
8/11/2016	51.5	
10/14/2016	21.8	
12/12/2016	20.9	
2/9/2017	22.6	
4/4/2017	23.1	
6/16/2017	22.6	
8/11/2017	22.6	
11/29/2018		23

Constituent: CHLORIDE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	32.8	
8/11/2016	32	
10/13/2016	32.9	
12/12/2016	31	
2/10/2017	34.4	
4/4/2017	34.2	
6/15/2017	33	
8/11/2017	34.1	
11/29/2018		32.1

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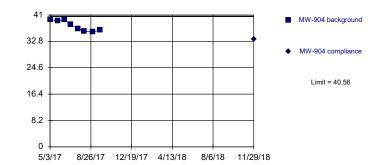


Background Data Summary: Mean=25.66, Std. Dev.=0.7615, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9099, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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l/gr

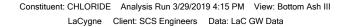


Prediction Limit

Intrawell Parametric

Background Data Summary: Mean=37.63, Std. Dev=1.623, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8728, 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 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data



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Within Limit

Prediction Limit Intrawell Non-parametric

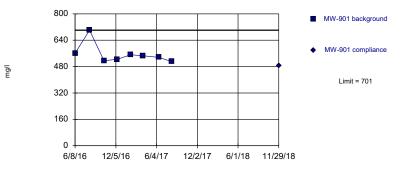


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient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

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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: CHLORIDE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	25.9	
8/11/2016	25.8	
10/13/2016	24.8	
12/9/2016	24.3	
2/10/2017	26	
4/4/2017	26.7	
6/16/2017	25.7	
8/10/2017	26.1	
11/29/2018		24.7

Constituent: CHLORIDE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	39.6	
5/24/2017	39.1	
6/12/2017	39.5	
6/30/2017	38	
7/21/2017	36.7	
8/7/2017	36	
9/1/2017	35.7	
9/22/2017	36.4	
11/29/2018		33.5

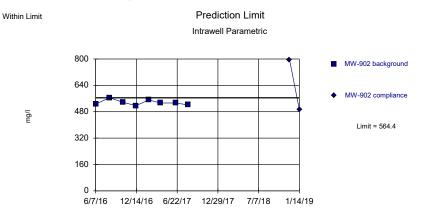
Constituent: CHLORIDE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	51.5	
8/12/2016	22.4	
10/14/2016	50.7	
12/9/2016	48.6	
2/8/2017	52.5	
4/4/2017	52.5	
6/14/2017	52.7	
8/9/2017	52.1	
11/29/2018		52.4

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	561	
8/11/2016	701	
10/14/2016	516	
12/12/2016	524	
2/9/2017	552	
4/4/2017	546	
6/16/2017	536	
8/11/2017	510	
11/29/2018		487

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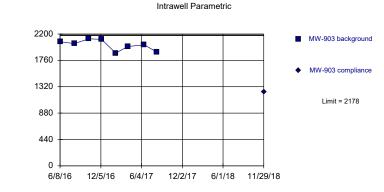


Background Data Summary: Mean=535.6, Std. Dev.=15.91, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9238, critical = 0.749. Kappa = 1.81 (c=7), w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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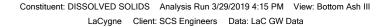
l/gr



Prediction Limit

Background Data Summary: Mean=2016, Std. Dev.=89.27, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9217, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

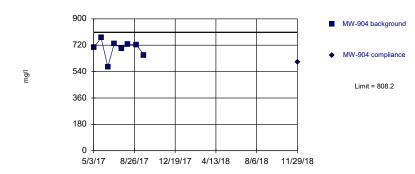
Constituent: DISSOLVED SOLIDS Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data



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Within Limit

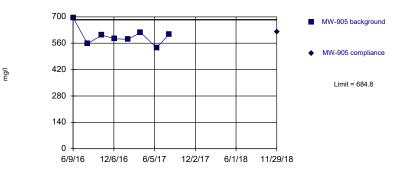
Prediction Limit Intrawell Parametric



Background Data Summary: Mean=697.3, Std. Dev.=61.28, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8884, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188. Sanitas[™] v.9.6.12 Sanitas software licensed to SCS Engineers. UG



Prediction Limit Intrawell Parametric



Background Data Summary: Mean=597.8, Std. Dev.=48.07, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9215, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-902	MW-902	
6/7/2016	526		
8/11/2016	565		
10/13/2016	537		
12/12/2016	517		
2/10/2017	552		
4/4/2017	533		
6/15/2017	533		
8/11/2017	522		
11/29/2018		796	
1/14/2019		492	1st verification re-sample

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	2070	
8/11/2016	2040	
10/13/2016	2120	
12/9/2016	2110	
2/10/2017	1880	
4/4/2017	1990	
6/16/2017	2020	
8/10/2017	1900	
11/29/2018		1230

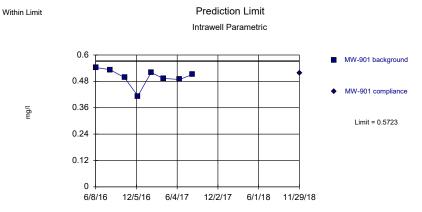
Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	704	
5/24/2017	771	
6/12/2017	571	
6/30/2017	732	
7/21/2017	697	
8/7/2017	728	
9/1/2017	723	
9/22/2017	652	
11/29/2018		604

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	696	
8/12/2016	557	
10/14/2016	603	
12/9/2016	584	
2/8/2017	580	
4/4/2017	618	
6/14/2017	536	
8/9/2017	608	
11/29/2018		619

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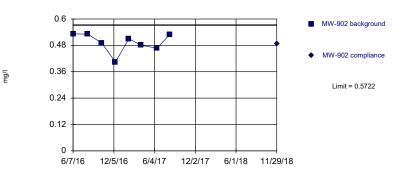


Background Data Summary: Mean=0.4999, Std. Dev.=0.04001, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8585, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0512). Report alpha = 0.05188.

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Within Limit

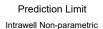
Prediction Limit

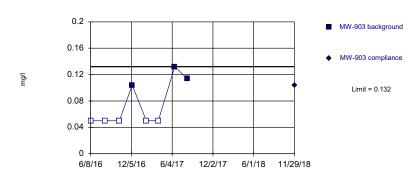


Background Data Summary: Mean=0.4931, Std. Dev.=0.04371, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8622, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Constituent: FLUORIDE Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas^w v.9.6.12 Sanitas software licensed to SCS Engineers. UG Hollow symbols indicate censored values. Within Limit

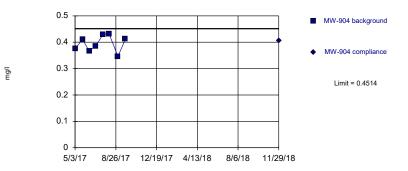




Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized. Sanitas[™] v.9.6.12 Sanitas software licensed to SCS Engineers. UG



Prediction Limit



Background Data Summary: Mean=0.3946, Std. Dev.=0.03135, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.935, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.0188.

Constituent: FLUORIDE (mg/I) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	0.543	
8/11/2016	0.533	
10/14/2016	0.497	
12/12/2016	0.413	
2/9/2017	0.52	
4/4/2017	0.493	
6/16/2017	0.489	
8/11/2017	0.511	
11/29/2018		
		0.517

Constituent: FLUORIDE (mg/I) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	0.532	
8/11/2016	0.531	
10/13/2016	0.49	
12/12/2016	0.404	
2/10/2017	0.51	
4/4/2017	0.481	
6/15/2017	0.467	
8/11/2017	0.53	
11/29/2018		0.488

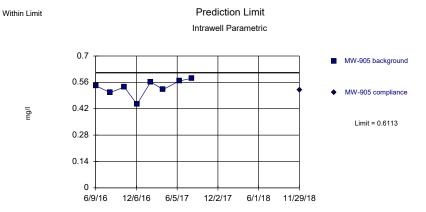
Constituent: FLUORIDE (mg/I) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	<0.1	
8/11/2016	<0.1	
10/13/2016	<0.1	
12/9/2016	0.104	
2/10/2017	<0.1	
4/4/2017	<0.1	
6/16/2017	0.132	
8/10/2017	0.114	
11/29/2018		0.104

Constituent: FLUORIDE (mg/I) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

MW-904	MW-904
5/3/2017 0.375	
5/24/2017 0.411	
6/12/2017 0.366	
6/30/2017 0.385	
7/21/2017 0.43	
8/7/2017 0.432	
9/1/2017 0.346	
9/22/2017 0.412	
11/29/2018	0.406
1120/2010	0.100

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Background Data Summary: Mean=0.5325, Std. Dev.=0.04351, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9161, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0512). Report alpha = 0.05188.

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S.U.

Prediction Limit Intrawell Parametric



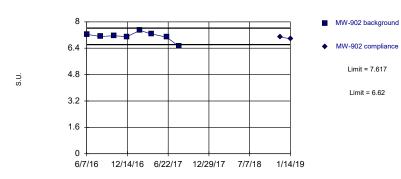
Background Data Summary: Mean=7.369, Std. Dev.=0.2321, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8719, critical = 0.749. Kappa = 1.81 (c=7), w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Constituent: pH Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limits

Prediction Limit

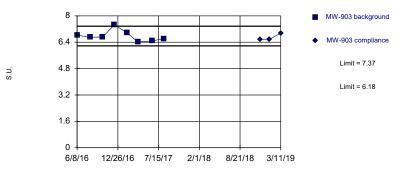


Background Data Summary: Mean=7.119, Std. Dev.=0.2754, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.849, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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Prediction Limit Intrawell Parametric



Background Data Summary: Mean=6.775, Std. Dev.=0.3286, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8941, 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 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Constituent: FLUORIDE (mg/I) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	0.542	
8/12/2016	0.506	
10/14/2016	0.535	
12/9/2016	0.444	
2/8/2017	0.562	
4/4/2017	0.522	
6/14/2017	0.567	
8/9/2017	0.582	
11/29/2018		0.52

Constituent: pH (S.U.) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	7.46	
8/11/2016	7.35	
10/14/2016	7.43	
12/12/2016	7.57	
2/9/2017	7.62	
4/4/2017	7.39	
6/16/2017	7.26	
8/11/2017	6.87	
11/29/2018		7.12

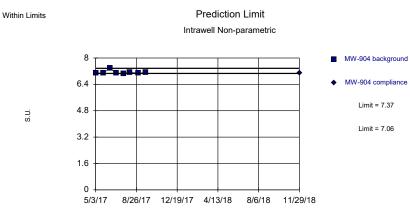
Constituent: pH (S.U.) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-902	MW-902	
6/7/2016	7.24		
8/11/2016	7.11		
10/13/2016	7.16		
12/12/2016	7.1		
2/10/2017	7.48		
4/4/2017	7.27		
6/15/2017	7.07		
8/11/2017	6.52		
11/29/2018		7.07	
1/14/2019		6.98	extra sample

Constituent: pH (S.U.) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-903	MW-903	
6/8/2016	6.83		
8/11/2016	6.7		
10/13/2016	6.72		
12/9/2016	7.46		
2/10/2017	6.97		
4/4/2017	6.42		
6/15/2017	6.48		
8/10/2017	6.62		
11/29/2018		6.58	
1/14/2019		6.58	extra sample
3/11/2019		6.95	extra sample

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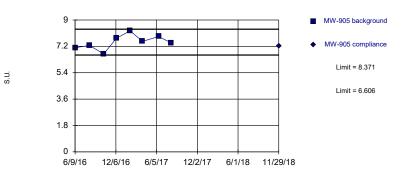


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.02358. Individual comparison alpha = 0.01182 (1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

Constituent: pH Analysis Run 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Sanitas™ v.9.6.12 Sanitas software licensed to SCS Engineers. UG



Prediction Limit



Background Data Summary: Mean=7.489, Std. Dev.=0.4875, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9969, 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 3/29/2019 4:15 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit Intrawell Non-parametric



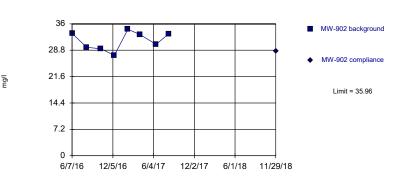
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient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

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Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=31.36, Std. Dev =2.54, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9129, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH (S.U.) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	7.09	
5/24/2017	7.08	
6/12/2017	7.37	
6/30/2017	7.07	
7/21/2017	7.06	
8/7/2017	7.13	
9/1/2017	7.08	
9/22/2017	7.11	
11/29/2018		7.07

Constituent: pH (S.U.) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	7.11	
8/12/2016	7.26	
10/14/2016	6.68	
12/9/2016	7.75	
2/8/2017	8.26	
4/4/2017	7.54	
6/14/2017	7.87	
8/9/2017	7.44	
11/29/2018		7.23

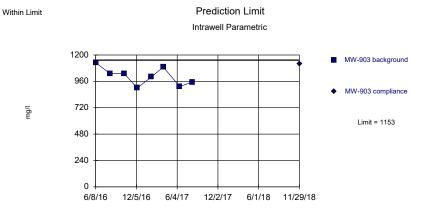
Constituent: SULFATE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	19.5	
8/11/2016	33.8	
10/14/2016	15.6	
12/12/2016	14.5	
2/9/2017	17.1	
4/4/2017	18.4	
6/16/2017	15.6	
8/11/2017	15.1	
11/29/2018		19.7

Constituent: SULFATE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

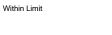
	MW-902	MW-902
		10100-902
6/7/2016	33.4	
8/11/2016	29.6	
10/13/2016	29.2	
12/12/2016	27.4	
2/10/2017	34.5	
4/4/2017	33.1	
6/15/2017	30.4	
8/11/2017	33.3	
11/29/2018		28.6

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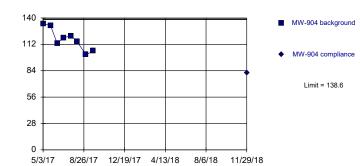


Background Data Summary: Mean=1006, Std. Dev.=81.43, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9566, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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l/gm



Prediction Limit

Intrawell Parametric

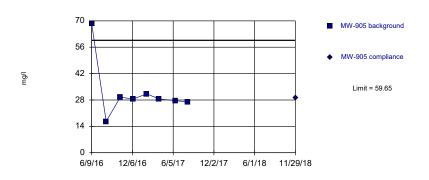
Background Data Summary: Mean=117.5, Std. Dev.=11.66, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9538, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 3/29/2019 4:16 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Constituent: SULFATE Analysis Run 3/29/2019 4:16 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit



Background Data Summary (based on cube root transformation): Mean=3.127, Std. Dev.=0.4312, 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: SULFATE Analysis Run 3/29/2019 4:16 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Constituent: SULFATE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-903	MM 002
	10100-903	MW-903
6/8/2016	1130	
8/11/2016	1030	
10/13/2016	1030	
12/9/2016	899	
2/10/2017	1000	
4/4/2017	1090	
6/16/2017	913	
8/10/2017	954	
11/29/2018		1120

Constituent: SULFATE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	134	
5/24/2017	132	
6/12/2017	113	
6/30/2017	119	
7/21/2017	121	
8/7/2017	115	
9/1/2017	101	
9/22/2017	105	
11/29/2018		81.5

Constituent: SULFATE (mg/l) Analysis Run 3/29/2019 4:19 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	68.5	
8/12/2016	16.6	
10/14/2016	29.5	
12/9/2016	28.5	
2/8/2017	31.2	
4/4/2017	28.6	
6/14/2017	27.6	
8/9/2017	27	
11/29/2018		29

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 3/29/2019, 4:19 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method
BORON (mg/l)	MW-901	<u>oppor Eini.</u> 1.9	n/a	<u>11/29/2018</u>	<u>0.055017.</u> 1.16	No	8	0	n/a	0.005912	NP Intra (normality)
BORON (mg/l)	MW-902	1.328	n/a	11/29/2018	1.10	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-903	0.5184	n/a	11/29/2018	0.493	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-904	1.431	n/a	11/29/2018	1.11	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-905	2.05	n/a	11/29/2018	1.89	No	8	0	x^4	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-901	59.15	n/a	11/29/2018	56.4	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-902	70.73	n/a	11/29/2018	70.4	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-903	358.2	n/a	3/11/2019	375	Yes	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-904	86.68	n/a	11/29/2018	72.1	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-905	58.8	n/a	11/29/2018	46.9	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-901	51.5	n/a	11/29/2018	23	No	8	0	n/a	0.005912	NP Intra (normality)
CHLORIDE (mg/l)	MW-902	35.17	n/a	11/29/2018	32.1	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-903	27.04	n/a	11/29/2018	24.7	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-904	40.56	n/a	11/29/2018	33.5	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-905	52.7	n/a	11/29/2018	52.4	No	8	0	n/a	0.005912	NP Intra (normality)
DISSOLVED SOLIDS (mg/l)	MW-901	701	n/a	11/29/2018	487	No	8	0	n/a	0.005912	NP Intra (normality)
DISSOLVED SOLIDS (mg/l)	MW-902	564.4	n/a	1/14/2019	492	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-903	2178	n/a	11/29/2018	1230	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-904	808.2	n/a	11/29/2018	604	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-905	684.8	n/a	11/29/2018	619	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-901	0.5723	n/a	11/29/2018	0.517	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-902	0.5722	n/a	11/29/2018	0.488	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-903	0.132	n/a	11/29/2018	0.104	No	8	62.5	n/a	0.005912	NP Intra (NDs) 1 of 3
FLUORIDE (mg/l)	MW-904	0.4514	n/a	11/29/2018	0.406	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-905	0.6113	n/a	11/29/2018	0.52	No	8	0	No	0.00188	Param Intra 1 of 3
pH (S.U.)	MW-901	7.789	6.949	11/29/2018	7.12	No	8	0	No	0.000	Param Intra 1 of 3
pH (S.U.)	MW-902	7.617	6.62	1/14/2019	6.98	No	8	0	No	0.000	Param Intra 1 of 3
pH (S.U.)	MW-903	7.37	6.18	3/11/2019	6.95	No	8	0	No	0.000	Param Intra 1 of 3
pH (S.U.)	MW-904	7.37	7.06	11/29/2018	7.07	No	8	0	n/a	0.01182	NP Intra (normality)
pH (S.U.)	MW-905	8.371	6.606	11/29/2018	7.23	No	8	0	No	0.000	Param Intra 1 of 3
SULFATE (mg/l)	MW-901	33.8	n/a	11/29/2018	19.7	No	8	0	n/a	0.005912	NP Intra (normality)
SULFATE (mg/l)	MW-902	35.96	n/a	11/29/2018	28.6	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-903	1153	n/a	11/29/2018	1120	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/I)	MW-904	138.6	n/a	11/29/2018	81.5	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/I)	MW-905	59.65	n/a	11/29/2018	29	No	8	0	x^(1/3)	0.00188	Param Intra 1 of 3

La Cygne Generating Station Determination of Statistically Significant Increases Bottom Ash Impoundment April 11, 2019

ATTACHMENT 2

Sanitas[™] Configuration Settings

Data	Output	Trend Test	Control Cht	Prediction Lim	Tolerance Lim	Conf/Tol Int	ANOVA	Welchs	Other Tests		
Exclud	le data flag	s:									
Data Reading Options											
Individual Observations											
O Mean of Each: O Month											
ON	ledian of Ea	ach:	Season	n							
Non-Detect / Trace Handling											
Setup	Seasons										
Automatically Process Resamples											

Data	Output	Trend Test	Control Cht	Prediction Lim	Tolerance Lim	Conf/Tol Int	ANOVA	Welchs	Other Tests
 Fou Fou	Include Tick Use Constit aw Border A arge/Reduc arge/Reduc de Margins e CAS# (No incate File N lude Limit Li ow Deselec	Page nbine Data Pa k Marks on D uent Name for round Text R ce Fonts (Gran ce Fonts (Data (on reports with t Const. Name Names to 20 ines when fou ted Data on 1 ted Data on a	ata Page r Graph Title eports and Da ohs): a/Text Report thout explicit s e)	ighter V	 □ Rou □ Use □ Indi □ Sho □ Thic Zoo Output ● Les ○ No ○ Mo 	Decimal Precisi ss Precision mal Precision are Precision	2 Sig. Digits and Data s	(when not	set in data file)
Printer:	Adobe PD	F		⊻ s	tore Print Jobs in	maluple Consu	tuent mode	Store /	V Printers
		•							

Data	Output	Trend Test	Control Cht	Prediction Lim	Tolerance Lim	Conf/Tol Int	ANOVA	Welchs	Other Tests
_	t for Norma		apiro-Wilk/Fra nen Non-Dete		at Alpha = 0.01	× 0	nsformation Use Ladder Natural Log Never Tran	or No Tran	Isformation
Use Ait	chison's Ad onal Furthe	ljustment ∨ r Refinement:	when Non-De Use	etects Percent >	15	50	Use Specifi Use Best W Plot Transfo	Natura V Statistic	l Log 🛛 🗸
● ⊮ ○ ⊮	Seasonality Seasonality	ntra-and Inter y Is Detected y Is Detected en Sufficient E	Or Insufficient	to Test Never	Plot Ba	her Background Tr ckground Data andard Deviati		ed at Alph	a = 0.05 ∨
Facility Statist Consti Down	γ α ical Evalua tuents Anal	Non-Parametr tions per Year lyzed: pmpliance) W	r.	2 7 4	2-Taileo	tically Remove d Test Mode Deselected Dat	-	nd Outliers	alue V
Comp	oaring Ind	iividual Obsen) 1 of 2 (ified Califomia	1 of 3	/ 0 1 of 4	 Highes Most R 	etric Limit when t/Second High ecent PQL if a ecent Backgro	est Backgro vailable, or	ound Value MDL	nod)

•	Tests
Rank Von Neumann, Wilcoxon Rank Sum / Mann-Whitney	
Use Modified Alpha 2-Tailed Test Mode	
Outlier Tests	
◯ EPA 1989 Outlier Screening (fixed alpha of 0.05)	
Dixon's at α= 0.05 ∨ or if n > 22 ∨ Rosner's at α= 0.01 ∨ ∨ Use EPA Screening to establish Suspected Or One of the stable of the	tliers
O 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 \checkmark at Alpha = 0.1 \checkmark	
Stop if Non-Normal	
◯ Continue with Parametric Test if Non-Normal	
○ Tukey's if Non-Normal, with IQR Multiplier = 3.0	
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 Zabel Axes	
Use Default Constituent Names Note Cation-Anion Balance (Piper only)	
O Use Constituent Definition File Edit	

Jared Morrison December 16, 2022

ATTACHMENT 2-2

Spring 2019 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

October 1, 2019

To: La Cygne Generating Station 25166 East 2200 Road La Cygne, Kansas 66040 Kansas City Power & Light Company



From: SCS Engineers

RE: Determination of Statistically Significant Increases – Bottom Ash Impoundment Spring 2019 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the Bottom Ash Impoundment at the La Cygne 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 23, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 5, 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 17, 2019 and August 22, 2019.

The completed statistical evaluation identified Appendix III constituent, calcium, above its prediction limit in monitoring well MW-903.

Constituent/Monitoring Well	*UPL	Observation May 23, 2019	1st Verification July 17, 2019	2nd Verification August 22, 2019
Calcium				
MW-903	358.2	367	373	366

*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 one SSI above the background prediction limit for calcium in monitoring well MW-903.

La Cygne Generating Station Determination of Statistically Significant Increases Bottom Ash Impoundment October 1, 2019 Page 2 of 2

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas[™] Output:

Statistical evaluation output from Sanitas[™] for the prediction limit analysis. This includes prediction limit plots, prediction limit background data, detection sample result, 1st verification re-sample result (when applicable), 2nd verification re-sample result (when applicable), extra sample results for pH because pH is collected as part of the sampling procedure, and a Prediction Limit summary table. Output documentation includes the analytical data used for the statistical analyses.

Attachment 2: Sanitas[™] Configuration Settings:

Screen shots of the applicable Sanitas[™] configuration settings for the statistical prediction limit analysis. This includes data configuration, output configuration, prediction limit configuration and other tests configuration.

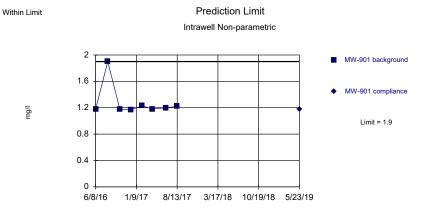
Revision Number	Revision Date	Attachment Revised	Summary of Revisions

La Cygne Generating Station Determination of Statistically Significant Increases Bottom Ash Impoundment October 1, 2019

ATTACHMENT 1

Sanitas[™] Output

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

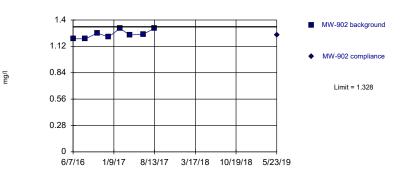


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005912 (1 of 3). Insufficient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

Constituent: BORON Analysis Run 9/25/2019 12:12 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Sanitas[™] v.9.6.23 Sanitas software licensed to SCS Engineers. UG



Prediction Limit



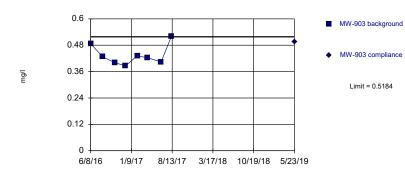
Background Data Summary: Mean=1.249, Std. Dev.=0.04357, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wik @alpha = 0.01, calculated = 0.8927, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.0188.

Constituent: BORON Analysis Run 9/25/2019 12:12 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit Intrawell Parametric

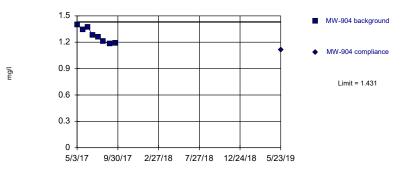


Background Data Summary: Mean=0.4351, Std. Dev.=0.04604, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8763, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05123). Report alpha = 0.05188.

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Prediction Limit Intrawell Parametric



Background Data Summary: Mean=1.279, Std. Dev=0.08408, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9243, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: BORON (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	1.18	
8/11/2016	1.9	
10/14/2016	1.18	
12/12/2016	1.17	
2/9/2017	1.23	
4/4/2017	1.18	
6/16/2017	1.2	
8/11/2017	1.22	
5/23/2019		1.18

Constituent: BORON (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	1.2	
8/11/2016	1.2	
10/13/2016	1.26	
12/12/2016	1.22	
2/10/2017	1.31	
4/4/2017	1.24	
6/15/2017	1.25	
8/11/2017	1.31	
5/23/2019		1.24

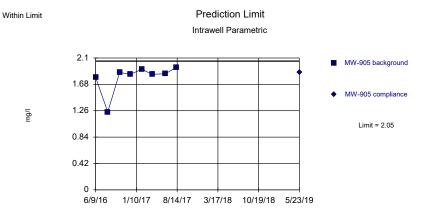
Constituent: BORON (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	0.487	
8/11/2016	0.427	
10/13/2016	0.401	
12/9/2016	0.386	
2/10/2017	0.432	
4/4/2017	0.423	
6/16/2017	0.404	
8/10/2017	0.521	
5/23/2019		0.494

Constituent: BORON (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	1.4	
5/24/2017	1.34	
6/12/2017	1.37	
6/30/2017	1.28	
7/21/2017	1.26	
8/7/2017	1.21	
9/1/2017	1.18	
9/22/2017	1.19	
5/23/2019		1.11

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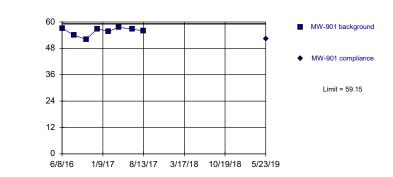
Background Data Summary (based on x⁴4 transformation): Mean=10.94, Std. Dev.=3.707, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wlik @alpha = 0.01, calculated = 0.7543, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05122). Report alpha = 0.00188.

Constituent: BORON Analysis Run 9/25/2019 12:12 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Sanitas[™] v.9.6.23 Sanitas software licensed to SCS Engineers. UG



l/gr

Prediction Limit



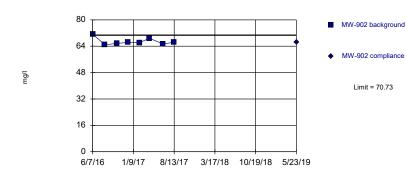
Background Data Summary: Mean=55.76, Std. Dev.=1.873, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8695, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

> Constituent: CALCIUM Analysis Run 9/25/2019 12:12 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit Intrawell Parametric

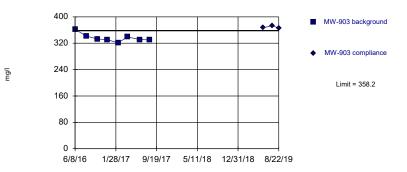


Background Data Summary: Mean=66.88, Std. Dev =2.13, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8116, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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Prediction Limit



Background Data Summary: Mean=336.1, Std. Dev.=12.19, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8714, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: BORON (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	1.79	
8/12/2016	1.24	
10/14/2016	1.87	
12/9/2016	1.84	
2/8/2017	1.92	
4/4/2017	1.84	
6/14/2017	1.85	
8/9/2017	1.95	
5/23/2019		1.87

Constituent: CALCIUM (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-901	MW-90
6/8/2016	57.2	
8/11/2016	53.9	
10/14/2016	52.1	
12/12/2016	56.9	
2/9/2017	55.7	
4/4/2017	57.6	
6/16/2017	56.7	
8/11/2017	56	
5/23/2019		52.3

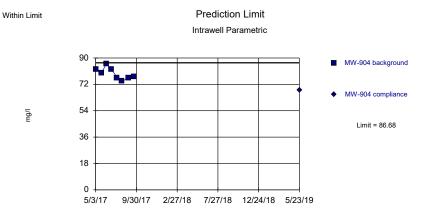
Constituent: CALCIUM (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-902
		10100-902
6/7/2016	71.3	
8/11/2016	64.9	
10/13/2016	65.7	
12/12/2016	66.3	
2/10/2017	66.2	
4/4/2017	68.8	
6/15/2017	65.4	
8/11/2017	66.4	
5/23/2019		66.5

Constituent: CALCIUM (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903	3
6/8/2016	362		
8/11/2016	342		
10/13/2016	333		
12/9/2016	331		
2/10/2017	321		
4/4/2017	339		
6/16/2017	331		
8/10/2017	330		
5/23/2019		367	
7/17/2019		373	1st verification sample
8/22/2019		366	2nd verification sample

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Background Data Summary: Mean=79.34, Std. Dev.=4.056, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9418, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

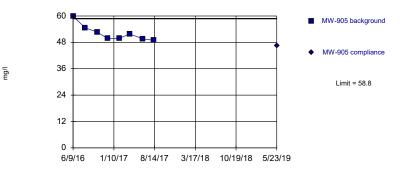
> Constituent: CALCIUM Analysis Run 9/25/2019 12:12 PM View: Bottom Ash III LaCvone Client: SCS Engineers Data: LaC GW Data



Within Limit

Prediction Limit





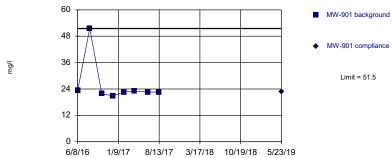
Background Data Summary: Mean=52.13, Std. Dev.=3.685, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8283, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

> Constituent: CALCIUM Analysis Run 9/25/2019 12:12 PM View: Bottom Ash III LaCvone Client: SCS Engineers Data: LaC GW Data

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

Within Limit

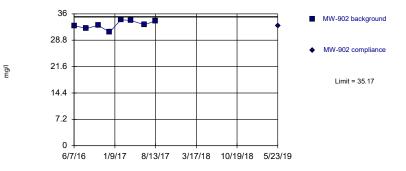
Prediction Limit Intrawell Non-parametric



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



Prediction Limit Intrawell Parametric



Background Data Summary: Mean=33.05, Std. Dev.=1.174, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9249, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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 (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

MW-904 5/3/2017 82.4 5/24/2017 79.8 6/12/2017 86.2 6/30/2017 82.3	
5/24/2017 79.8 6/12/2017 86.2	
6/12/2017 86.2	
6/30/2017 82.3	
7/21/2017 76.5	
8/7/2017 74.1	
9/1/2017 76.3	
9/22/2017 77.1	
5/23/2019	68.2
5/23/2019	08.2

Constituent: CALCIUM (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	59.9	
8/12/2016	54.6	
10/14/2016	52.7	
12/9/2016	49.7	
2/8/2017	49.8	
4/4/2017	51.8	
6/14/2017	49.6	
8/9/2017	48.9	
5/23/2019		46.4
5/25/2019		40.4

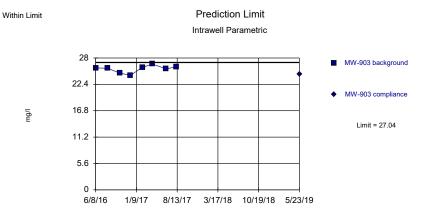
Constituent: CHLORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	23.3	
8/11/2016	51.5	
10/14/2016	21.8	
12/12/2016	20.9	
2/9/2017	22.6	
4/4/2017	23.1	
6/16/2017	22.6	
8/11/2017	22.6	
5/23/2019		22.8

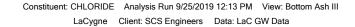
Constituent: CHLORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	32.8	
8/11/2016	32	
10/13/2016	32.9	
12/12/2016	31	
2/10/2017	34.4	
4/4/2017	34.2	
6/15/2017	33	
8/11/2017	34.1	
5/23/2019		32.8

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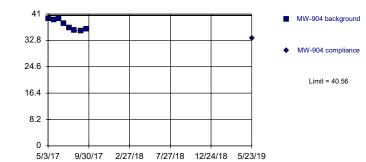
Background Data Summary: Mean=25.66, Std. Dev.=0.7615, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9099, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.







l/gr



Prediction Limit

Intrawell Parametric

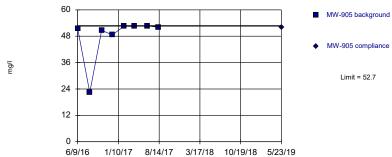
Background Data Summary: Mean=37.63, Std. Dev.=1.623, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8728, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

> Constituent: CHLORIDE Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCvone Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit Intrawell Non-parametric



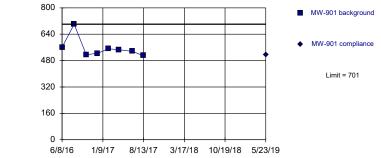
Limit = 52.7

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Within Limit

∥gr

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.

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: CHLORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	25.9	
8/11/2016	25.8	
10/13/2016	24.8	
12/9/2016	24.3	
2/10/2017	26	
4/4/2017	26.7	
6/16/2017	25.7	
8/10/2017	26.1	
5/23/2019		24.5

Constituent: CHLORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	39.6	
5/24/2017	39.1	
6/12/2017	39.5	
6/30/2017	38	
7/21/2017	36.7	
8/7/2017	36	
9/1/2017	35.7	
9/22/2017	36.4	
5/23/2019		33.4

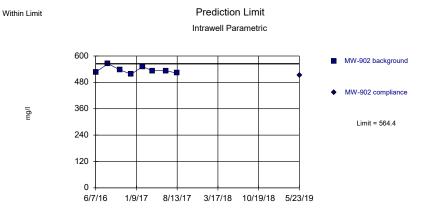
Constituent: CHLORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	51.5	
8/12/2016	22.4	
10/14/2016	50.7	
12/9/2016	48.6	
2/8/2017	52.5	
4/4/2017	52.5	
6/14/2017	52.7	
8/9/2017	52.1	
5/23/2019		52

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

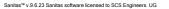
	MW-901	MW-901
6/8/2016	561	
8/11/2016	701	
10/14/2016	516	
12/12/2016	524	
2/9/2017	552	
4/4/2017	546	
6/16/2017	536	
8/11/2017	510	
5/23/2019		514

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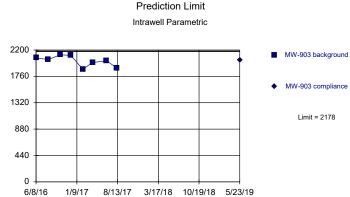
Background Data Summary: Mean=535.6, Std. Dev.=15.91, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9238, critical = 0.749. Kappa = 1.81 (c=7), w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data



Within Limit

l/gr



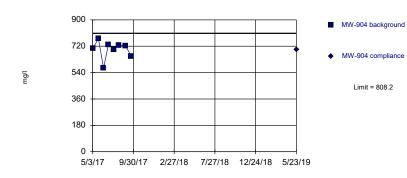
Background Data Summary: Mean=2016, Std. Dev.=89.27, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9217, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit



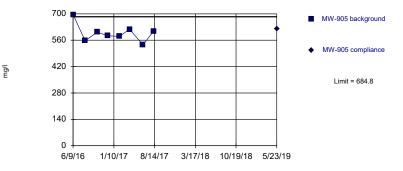
Background Data Summary: Mean=697.3, Std. Dev.=61.28, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8884, critical = 0.749. Kappa = 1.81 (c=7), w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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Prediction Limit





Background Data Summary: Mean=597.8, Std. Dev.=48.07, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9215, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-90
6/7/2016	526	
8/11/2016	565	
10/13/2016	537	
12/12/2016	517	
2/10/2017	552	
4/4/2017	533	
6/15/2017	533	
8/11/2017	522	
5/23/2019		511

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	2070	
8/11/2016	2040	
10/13/2016	2120	
12/9/2016	2110	
2/10/2017	1880	
4/4/2017	1990	
6/16/2017	2020	
8/10/2017	1900	
5/23/2019		2030

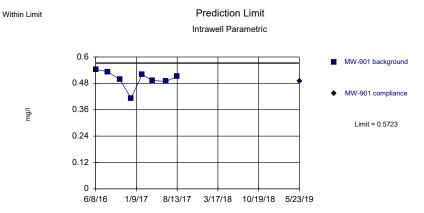
Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	704	
5/24/2017	771	
6/12/2017	571	
6/30/2017	732	
7/21/2017	697	
8/7/2017	728	
9/1/2017	723	
9/22/2017	652	
5/23/2019		696

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	696	
8/12/2016	557	
10/14/2016	603	
12/9/2016	584	
2/8/2017	580	
4/4/2017	618	
6/14/2017	536	
8/9/2017	608	
5/23/2019		621

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Background Data Summary: Mean=0.4999, Std. Dev.=0.04001, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8585, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

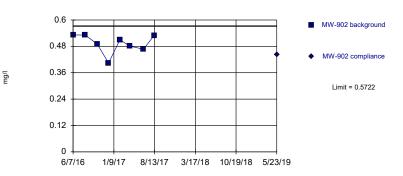
> Constituent: FLUORIDE Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCvone Client: SCS Engineers Data: LaC GW Data



Within Limit

Prediction Limit Intrawell Parametric





Background Data Summary: Mean=0.4931, Std. Dev.=0.04371, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8622, 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 9/25/2019 12:13 PM View: Bottom Ash III LaCvone Client: SCS Engineers Data: LaC GW Data

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Prediction Limit

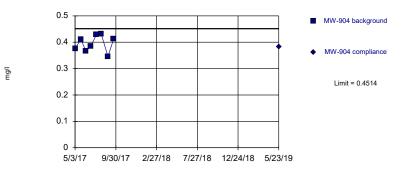
Intrawell Non-parametric



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Prediction Limit Intrawell Parametric



Background Data Summary: Mean=0.3946, Std. Dev.=0.03135, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.935, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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: FLUORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-901	MW-901
6/8/2016	0.543	
8/11/2016	0.533	
10/14/2016	0.497	
12/12/2016	0.413	
2/9/2017	0.52	
4/4/2017	0.493	
6/16/2017	0.489	
8/11/2017	0.511	
5/23/2019		0.489

Constituent: FLUORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-902
		11111-302
6/7/2016	0.532	
8/11/2016	0.531	
10/13/2016	0.49	
12/12/2016	0.404	
2/10/2017	0.51	
4/4/2017	0.481	
6/15/2017	0.467	
8/11/2017	0.53	
5/23/2019		0.441

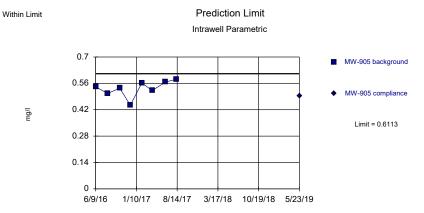
Constituent: FLUORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	<0.1	
8/11/2016	<0.1	
10/13/2016	<0.1	
12/9/2016	0.104	
2/10/2017	<0.1	
4/4/2017	<0.1	
6/16/2017	0.132	
8/10/2017	0.114	
5/23/2019		0.13

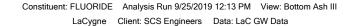
Constituent: FLUORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	0.375	
5/24/2017	0.411	
6/12/2017	0.366	
6/30/2017	0.385	
7/21/2017	0.43	
8/7/2017	0.432	
9/1/2017	0.346	
9/22/2017	0.412	
	0.412	
5/23/2019		0.382

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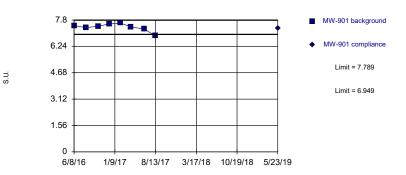
Background Data Summary: Mean=0.5325, Std. Dev.=0.04351, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9161, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.







Prediction Limit Intrawell Parametric



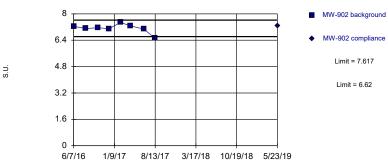
Background Data Summary: Mean=7.369, Std. Dev.=0.2321, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8719, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

> Constituent: pH Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCvone Client: SCS Engineers Data: LaC GW Data

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Within Limits

Prediction Limit Intrawell Parametric

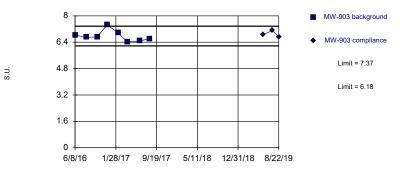


MW-902 compliance Limit = 7.617 Limit = 6.62

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Prediction Limit Intrawell Parametric



Background Data Summary: Mean=6.775, Std. Dev.=0.3286, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8941, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Background Data Summary: Mean=7.119, Std. Dev.=0.2754, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.849, 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 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Constituent: pH Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Constituent: FLUORIDE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

		MW-905	MW-905
6/9/2	2016	0.542	
0/10	2/2016	0.506	
0/12	2/2010	0.506	
10/1	14/2016	0.535	
12/9	9/2016	0.444	
2/8/2	2017	0.562	
4/4/2	2017	0.522	
6/14	1/2017	0.567	
8/9/2	2017	0.582	
5/23	3/2019		0.494

Constituent: pH (S.U.) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-901	MW-90
6/8/2016	7.46	
8/11/2016	7.35	
10/14/2016	7.43	
12/12/2016	7.57	
2/9/2017	7.62	
4/4/2017	7.39	
6/16/2017	7.26	
8/11/2017	6.87	
5/23/2019		7.31

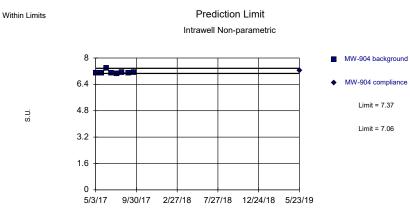
Constituent: pH (S.U.) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-902
0/7/0010		1111 002
6/7/2016	7.24	
8/11/2016	7.11	
10/13/2016	7.16	
12/12/2016	7.1	
2/10/2017	7.48	
4/4/2017	7.27	
6/15/2017	7.07	
8/11/2017	6.52	
5/23/2019		7.26

Constituent: pH (S.U.) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903	3
6/8/2016	6.83		
8/11/2016	6.7		
10/13/2016	6.72		
12/9/2016	7.46		
2/10/2017	6.97		
4/4/2017	6.42		
6/15/2017	6.48		
8/10/2017	6.62		
5/23/2019		6.86	
7/17/2019		7.11	extra sample
8/22/2019		6.73	extra sample
8/22/2019		o./3	extra sample

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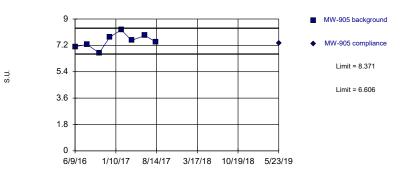
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.02358. Individual comparison alpha = 0.01182 (1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

Constituent: pH Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data





Prediction Limit



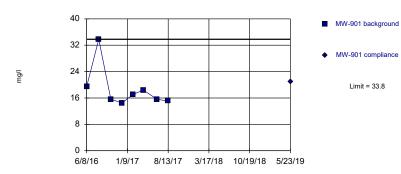
Background Data Summary: Mean=7.489, Std. Dev.=0.4875, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9969, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

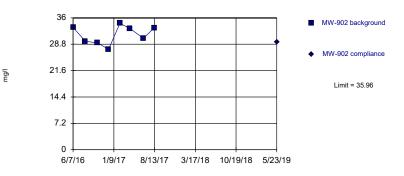
Prediction Limit Intrawell Non-parametric



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



Prediction Limit



Background Data Summary: Mean=31.36, Std. Dev.=2.54, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9129, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: pH (S.U.) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	7.09	
5/24/2017	7.08	
6/12/2017	7.37	
6/30/2017	7.07	
7/21/2017	7.06	
8/7/2017	7.13	
9/1/2017	7.08	
9/22/2017	7.11	
5/23/2019		7.23

Constituent: pH (S.U.) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	7.11	
8/12/2016	7.26	
10/14/2016	6.68	
12/9/2016	7.75	
2/8/2017	8.26	
4/4/2017	7.54	
6/14/2017	7.87	
8/9/2017	7.44	
5/23/2019		7.36

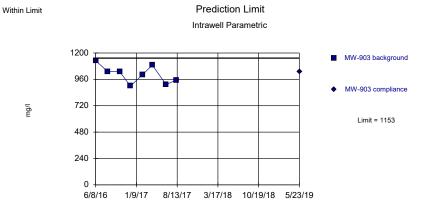
Constituent: SULFATE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-901	MW-9
6/8/2016	19.5	
8/11/2016	33.8	
10/14/2016	15.6	
12/12/2016	14.5	
2/9/2017	17.1	
4/4/2017	18.4	
6/16/2017	15.6	
8/11/2017	15.1	
5/23/2019		21
512312019		21

Constituent: SULFATE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-902	MW-902
6/7/2016	33.4	
8/11/2016	29.6	
10/13/2016	29.2	
12/12/2016	27.4	
2/10/2017	34.5	
4/4/2017	33.1	
6/15/2017	30.4	
8/11/2017	33.3	
5/23/2019		29.4

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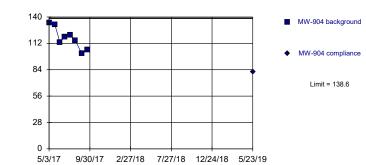


Background Data Summary: Mean=1006, Std. Dev.=81.43, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9566, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

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l/gm



Prediction Limit

Intrawell Parametric

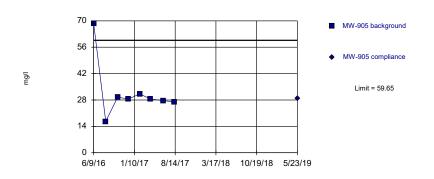
Background Data Summary: Mean=117.5, Std. Dev.=11.66, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9538, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.05132). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data Constituent: SULFATE Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

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Within Limit

Prediction Limit



Background Data Summary (based on cube root transformation): Mean=3.127, Std. Dev.=0.4312, 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: SULFATE Analysis Run 9/25/2019 12:13 PM View: Bottom Ash III LaCygne Client: SCS Engineers Data: LaC GW Data

Constituent: SULFATE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-903	MW-903
6/8/2016	1130	
8/11/2016	1030	
10/13/2016	1030	
12/9/2016	899	
2/10/2017	1000	
4/4/2017	1090	
6/16/2017	913	
8/10/2017	954	
5/23/2019		1030

Constituent: SULFATE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-904	MW-904
5/3/2017	134	
5/24/2017	132	
6/12/2017	113	
6/30/2017	119	
7/21/2017	121	
8/7/2017	115	
9/1/2017	101	
9/22/2017	105	
5/23/2019		81.7

Constituent: SULFATE (mg/l) Analysis Run 9/25/2019 12:14 PM View: Bottom Ash III

	MW-905	MW-905
6/9/2016	68.5	
8/12/2016	16.6	
10/14/2016	29.5	
12/9/2016	28.5	
2/8/2017	31.2	
4/4/2017	28.6	
6/14/2017	27.6	
8/9/2017	27	
5/23/2019		28.7

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 9/25/2019, 12:14 PM

				one ooo Enginooro - Duta			00 0/20	2010, 12.1			
<u>Constituent</u>	Well	<u>Upper Lim.</u>	Lower Lim.	<u>Date</u>	Observ.	<u>Sig.</u>	<u>Bg N</u>		Transform	<u>Alpha</u>	Method
BORON (mg/l)	MW-901	1.9	n/a	5/23/2019	1.18	No	8	0	n/a	0.005912	())
BORON (mg/l)	MW-902	1.328	n/a	5/23/2019	1.24	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-903	0.5184	n/a	5/23/2019	0.494	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-904	1.431	n/a	5/23/2019	1.11	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-905	2.05	n/a	5/23/2019	1.87	No	8	0	x^4	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-901	59.15	n/a	5/23/2019	52.3	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-902	70.73	n/a	5/23/2019	66.5	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-903	358.2	n/a	8/22/2019	366	Yes	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-904	86.68	n/a	5/23/2019	68.2	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-905	58.8	n/a	5/23/2019	46.4	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/I)	MW-901	51.5	n/a	5/23/2019	22.8	No	8	0	n/a	0.005912	NP Intra (normality)
CHLORIDE (mg/I)	MW-902	35.17	n/a	5/23/2019	32.8	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/I)	MW-903	27.04	n/a	5/23/2019	24.5	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/I)	MW-904	40.56	n/a	5/23/2019	33.4	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/I)	MW-905	52.7	n/a	5/23/2019	52	No	8	0	n/a	0.005912	NP Intra (normality)
DISSOLVED SOLIDS (mg/l)	MW-901	701	n/a	5/23/2019	514	No	8	0	n/a	0.005912	NP Intra (normality)
DISSOLVED SOLIDS (mg/l)	MW-902	564.4	n/a	5/23/2019	511	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-903	2178	n/a	5/23/2019	2030	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-904	808.2	n/a	5/23/2019	696	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-905	684.8	n/a	5/23/2019	621	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-901	0.5723	n/a	5/23/2019	0.489	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-902	0.5722	n/a	5/23/2019	0.441	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-903	0.132	n/a	5/23/2019	0.13	No	8	62.5	n/a	0.005912	NP Intra (NDs) 1 of 3
FLUORIDE (mg/l)	MW-904	0.4514	n/a	5/23/2019	0.382	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-905	0.6113	n/a	5/23/2019	0.494	No	8	0	No	0.00188	Param Intra 1 of 3
pH (S.U.)	MW-901	7.789	6.949	5/23/2019	7.31	No	8	0	No	0.000	Param Intra 1 of 3
pH (S.U.)	MW-902	7.617	6.62	5/23/2019	7.26	No	8	0	No	0.000	Param Intra 1 of 3
pH (S.U.)	MW-903	7.37	6.18	8/22/2019	6.73	No	8	0	No	0.000	Param Intra 1 of 3
pH (S.U.)	MW-904	7.37	7.06	5/23/2019	7.23	No	8	0	n/a	0.01182	NP Intra (normality)
pH (S.U.)	MW-905	8.371	6.606	5/23/2019	7.36	No	8	0	No	0.000	Param Intra 1 of 3
SULFATE (mg/l)	MW-901	33.8	n/a	5/23/2019	21	No	8	0	n/a	0.005912	NP Intra (normality)
SULFATE (mg/l)	MW-902	35.96	n/a	5/23/2019	29.4	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-903	1153	n/a	5/23/2019	1030	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-904	138.6	n/a	5/23/2019	81.7	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-905	59.65	n/a	5/23/2019	28.7	No	8	0	x^(1/3)	0.00188	Param Intra 1 of 3

La Cygne Generating Station Determination of Statistically Significant Increases Bottom Ash Impoundment October 1, 2019

ATTACHMENT 2

Sanitas[™] Configuration Settings

Data	Output	Trend Test	Control Cht	Prediction Lim	Tolerance Lim	Conf/Tol Int	ANOVA	Welchs	Other Tests	
Exclud	le data flag	s: i			Observations w characters will b	ith flags contair be deselected:	ning the follo	owing		
	Reading Op dividual Ob	ptions oservations								
OM	lean of Eac	:h:	O Month							
OM	ledian of Ea	ach:	Seasor	n						
Non-I	Detect / Tr	ace Handling								
Setup	Seasons									
🗌 Aut	omatically f	Process Resa	mples							

Data	Output	Trend Test	Control Cht	Prediction Lim	Tolerance Lim	Conf/Tol I	nt ANOVA	Welchs	Other Tests
 Bla Fou Fou Fou Fou Tou Constant Constant	ck and Whi Ir Plots Per Always Con Include Ticl Use Constit W Border A arge/Reduc arge/Reduc de Margins (e CAS# (No incate File N lude Limit Li ow Deselect	te Output Page Ibine Data Pa & Marks on D uent Name fo round Text R ce Fonts (Grap ce Fonts (Grap ce Fonts (Data (on reports with t Const. Name Names to 20 nes when fou ted Data on 1 ted Data on a	ages ata Page r Graph Title eports and Da phs): a/Text Report thout explicit s e)	ta Pages 100% s): 100% etting) se ighter V	 ✓ Pro Rou Use ✓ Indi Shot This Zou Output Les Noi 	mpt to Oven	write/Append S 2 Sig. Digits round Data ates s 200% ~ ecision	Summary Ta	ables
				⊠ S	tore Print Jobs in	Multiple Cor	nstituent Mode	Store A	NI Print Jobs
Printer:	Adobe PD	F							V Printers

Data O	Output	Trend Test	Control Cht	Prediction Lim	Tolerance Lim	Conf/Tol Int	ANOVA	Welchs	Other Tests		
Use No	son's Adju	etric Test wh	when Non-De	cts Percent > 5 etects Percent >	at Alpha = 0.01 50 15 then NDs % >	Transformation • Use Ladder of Powers • Natural Log or No Transformation • Never Transform • Use Specific Transformation: • Natural Log • Natural Log					
Use Po	oisson Pre	diction Limit	when Non-De	etects Percent >	0		Plot Transfo	ormed Value	es		
 If Sea If Sea Alway 	asonality asonality ays (When ays Use N	ra- and Inter Is Detected Is Detected Sufficient D on-Parametr	Or Insufficient Data)	t to Test Never	✓ Plot Ba Override St Override D	Background Tr ckground Data andard Deviati F: (ion: Ovenide Ka	ppa:	a = 0.05 ∨		
Constituer	ents Analy	ons per Year zed: npliance) We		2 7 4	Automatically Remove Background Outliers 2-Tailed Test Mode Show Deselected Data Lighter Nan Reconcerting Limit and Highert Rackground Value						
Sampling Comparie 1 of 2 of 4	ing Indiv	ridual Obsen 1 of 2 (ed California	1 of 3	✓ 1 of 4	Non-Parametric Limit = Highest Background Value Non-Parametric Limit when 100% Non-Detects: Highest/Second Highest Background Value Most Recent PQL if available, or MDL Most Recent Background Value (subst. method)						

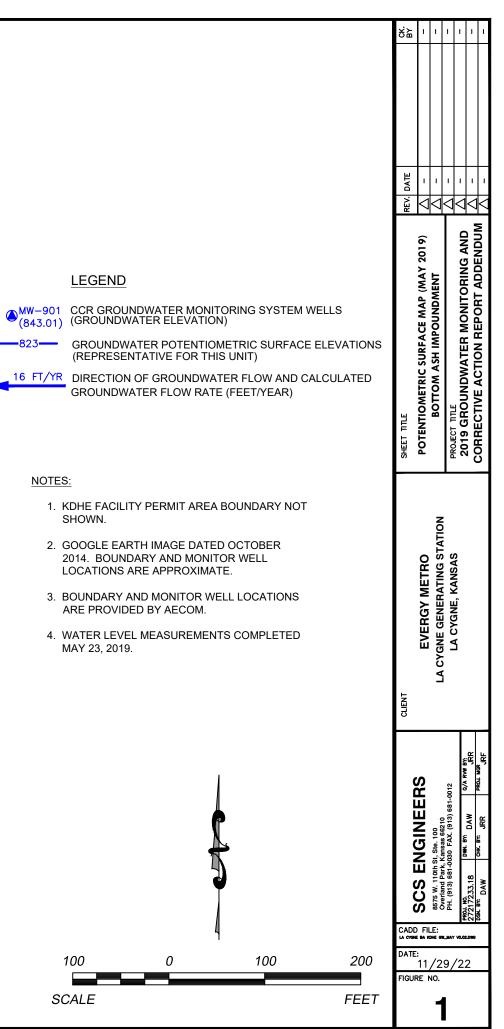
Data Output Trend Test Control Cht Prediction Lim Tolerance Lim Conf/Tol Int ANOVA Welchs	Other Tests							
Rank Von Neumann, Wilcoxon Rank Sum / Mann-Whitney								
Use Modified Alpha 2-Tailed Test Mode								
Outlier Tests								
EPA 1989 Outlier Screening (fixed alpha of 0.05)								
• Dixon's at $\alpha = 0.05 \lor$ or if n > 22 \lor Rosner's at $\alpha = 0.01 \lor$ Use EPA Screening to establish Suspected Outliers								
O 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 V at Alpha = 0.1 V								
Stop if Non-Normal								
◯ Continue with Parametric Test if Non-Normal								
○ Tukey's if Non-Normal, with IQR Multiplier = 3.0								
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 Label Axes								
Use Default Constituent Names Note Cation-Anion Balance (Piper on	ily)							
O Use Constituent Definition File Edit								

Jared Morrison December 16, 2022

ATTACHMENT 3 Groundwater Potentiometric Surface Maps



100 SCALE





100 SCALE

