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January 31, 2020

Ms. Hillary Young, P.E.  
Chief Engineer  
Land Protection Division  
Oklahoma Department of Environmental Quality  
707 North Robinson  
P.O. Box 1677  
Oklahoma City, Oklahoma 73101-1677

**RE: Annual Groundwater Monitoring and  
Corrective Action Report for Calendar Year 2019  
Grand River Dam Authority  
Grand River Energy Center  
Chouteau, Oklahoma**

Dear Ms. Young:

As required by the State of Oklahoma regulations governing the disposal of coal combustion residuals (CCRs) from electric utilities (OAC 252:517), please find attached the Annual Groundwater Monitoring and Corrective Action Report for calendar year 2019. This report has been prepared for the CCR Landfill located at the Grand River Energy Center (GREC) in Chouteau, Oklahoma. As required by OAC 252:517, a copy of this document will also be posted on the GRDA CCR Webpage and a copy maintained in the facility operating records.

If you have any questions on this matter, or if you require any additional information, please do not hesitate to call.

Sincerely,

Michael L. Bednar  
Manager of Environmental Compliance

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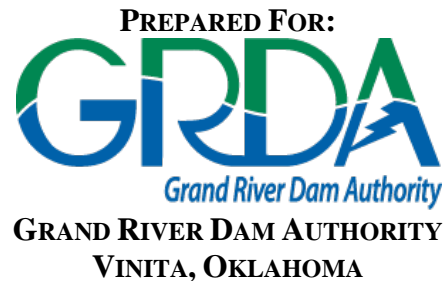
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are our greatest asset in  
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Oklahoma Agency  
of Excellence.



**ANNUAL GROUNDWATER MONITORING  
AND  
CORRECTIVE ACTION REPORT  
(CALENDAR YEAR 2019)**

**GRAND RIVER DAM AUTHORITY LANDFILL  
GRAND RIVER ENERGY CENTER  
MAYES COUNTY, OKLAHOMA  
SOLID WASTE PERMIT NO. 3549012**



**JANUARY 31, 2020**

**A&M PROJECT NO. 1986-043**

**PREPARED BY:**

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**ANNUAL GROUNDWATER MONITORING  
AND  
CORRECTIVE ACTION REPORT  
GRAND RIVER DAM AUTHORITY LANDFILL  
GRAND RIVER ENERGY CENTER  
MAYES COUNTY, OKLAHOMA**

## **1.0 INTRODUCTION**

The Grand River Dam Authority (GRDA) owns and operates the Grand River Energy Center (GREC), an electric power generating facility, located approximately three (3) miles east of the City of Chouteau in Mayes County, Oklahoma. Two (2) coal fired boilers are in place at GREC but only one (Unit #2) is currently operational. The coal fired boiler in use produces Coal Combustion Residuals (CCRs) consisting of fly ash and bottom ash. Fly ash comprises greater than 80% of CCRs generated at the facility and is largely sold for beneficial use purposes. Excess fly ash and bottom ash is disposed within an on-site permitted coal ash landfill, herein referred to as the GRDA Landfill. The GRDA Landfill is located entirely within the GREC complex.

On June 9, 2016, the Governor of the State of Oklahoma approved by Declaration a final rule for the Disposal of CCRs from Electric Utilities. The new rule regulates the disposal of CCRs under OAC 252:517 Sections 1 through 19. The rule applies both to new and existing CCR landfills and surface impoundments at coal burning electric utility sites.

OAC 252:517-9-1(e) requires existing CCR landfill facilities to:

*“No Later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report.”*

For the preceding calendar year, the annual report must:



- (i) Document the status of the groundwater monitoring and corrective action program for the CCR unit;
- (ii) Summarize key actions completed;
- (iii) Describe any problems encountered;
- (iv) Discuss actions to resolve problems; and
- (v) Project key activities for the upcoming year.

Additional information to be included in the annual report includes a map, image or diagram showing the CCR landfill and monitoring wells; identification of wells installed or decommissioned during the previous year with a discussion of why those activities occurred; the results of analysis of groundwater collected during the previous year; and summary information on the number of groundwater samples collected, dates of sampling, and whether the sampling was required by detection or assessment monitoring programs.

This Annual Groundwater Monitoring and Corrective Action Report has been prepared to satisfy the requirements of OAC 252:517-9-1(e).

## **2.0 LANDFILL INFORMATION**

The GRDA Landfill is permitted by the Oklahoma Department of Environmental Quality (DEQ) as a Non-Hazardous Industrial Waste Landfill that is allowed to accept fly ash, bottom ash and spent powdered activated carbon used to control flue gas emissions, generated at the GREC (DEQ, 2015). The GRDA Landfill is situated south of the coal-fired boiler units within the GREC complex, as shown in **Figure 1**, and has been in operation since 1981. The total landfill permit area consists of approximately 116 acres, of which only 47 acres have been utilized for CCR disposal. The GRDA Landfill remains active to date.

In October 2017, a request to modify the existing landfill permit was submitted to DEQ. The modification requested a *reduction* in landfill permit area from 116 acres to 67 acres with plans to only utilize a total of approximately 47 acres for CCR landfilling purposes. The request for



permit modification and design drawings (submitted with accompanying revised Closure Plan, Quality Assurance and Quality Control Plan, Run-on and Run-off Control Plan, and Post-Closure Plan) have been approved by DEQ.

The landfill is bordered by surface impoundments to the west and south. The surface impoundments to the south were created during construction of US Highway 412 by using the area for borrow material. These impoundments hold water continuously throughout the year and are connected in series. The impoundments are used for storm water and process wastewater treatment permitted separately by DEQ under industrial wastewater permit OK0035149. Discharge from the ponds is to the Neosho River. A discharge station which is continually monitored is located at the southeastern corner of the property, near the intersection of Highways 412 and 412B. The water level in these impoundments fluctuates from about 592 to 596 feet above mean sea level (MSL). **Figure 1** depicts the GRDA Landfill and its relative location to the surface impoundments.

### **3.0 SITE HYDROGEOLOGY**

The landfill is underlain by an unconsolidated clay, silt, sand and gravel layers ranging in total thickness from 9 feet to about 25 feet. The unconsolidated section is underlain by Pennsylvanian sandstone/limestone bedrock.

The uppermost aquifer at the site is in the unconsolidated section and is monitored for changes in groundwater quality. Five monitoring wells are used: one (1) upgradient well and four (4) downgradient wells. The locations of the monitoring wells are shown on **Figure 1**. MW-93-1 is the upgradient well, and MW-93-2, MW-93-3, MW-03-1 and MW-03-2 are the downgradient wells. The wells, installed in 1993 and 2003, are monitored routinely in accordance with the non-Hazardous Industrial Waste Landfill Permit issued by DEQ, as modified by the new CCR rules (OAC 252:517).



Historical groundwater flow maps covering the time period from July, 2012 through May, 2019 have been prepared and previously submitted to DEQ. Data provided shows the fluctuations of the groundwater levels at each monitoring well and provides an indication of the direction of groundwater flow. The maps were compiled semi-annually and include the elevation of the groundwater at each well, interpolated contours of the top of groundwater elevation across the site, and the direction of groundwater flow. The groundwater in the uppermost aquifer flows from the west-northwest to the east-southeast, generally following the surface terrain. The groundwater velocity in the uppermost aquifer is calculated to be about  $3.39 \times 10^{-6}$  cm/sec or 3.5 feet/year.

### **3.1 STATUS OF GROUNDWATER MONITORING AND CORRECTIVE ACTION**

A groundwater monitoring system currently composed of one upgradient and four downgradient monitoring wells has been in place at the facility since 2003. Groundwater monitoring for the GRDA Landfill is conducted on a semi-annual basis (generally in May/June and November/December of each calendar year) and a separate Semi-annual Groundwater Sampling and Statistical Analysis Report is prepared and submitted to DEQ.

Groundwater samples collected and analyzed during calendar year 2019 included, at a minimum, those constituents for Detection Monitoring as listed in Appendix A of OAC 252:517, those listed in Appendix B of OAC 252:517, and other general water quality parameters and metal constituents required by DEQ as a result of historically observed statistical exceedances.

Statistical evaluation of the laboratory analytical results is performed on the groundwater data in accordance with the GRDA Groundwater Sampling and Analysis Program. The evaluation of the analytical data includes utilizing a tolerance or prediction interval procedure. Under this procedure, an interval for each constituent determined from laboratory analysis is established from the background data (gathered from the upgradient monitoring well) and the level of each constituent in the downgradient (compliance) wells is compared to the upper tolerance or prediction limit.



The Shapiro-Francia Test of Normality, Levene's Equal Variance Test, and ANOVA (Analysis of Variance) for inter-well analysis is utilized in the statistical evaluation of the parameters. In the event an inter-well statistical evaluation indicates the presence of an elevated parameter in the downgradient wells compared to historical data of the upgradient or background wells, an Intra-well Prediction Limit Interval test is conducted on the specific well or wells of interest. These intra-well comparisons are then utilized to determine whether a significant increase had occurred within a specific well in question. This method of statistical evaluation is consistent with OAC 252:517-9-4(g)(3) and is the method historically used by the GREC Complex in statistical analysis of groundwater data.

Sampling activities for the first Semi-annual Groundwater Sampling and Statistical Analysis Report were conducted on May 7, 2019 and the report submitted to DEQ in August 2019. Statistical evaluation of the analytical data resulted in two of the monitoring wells (MW-93-3 and MW-03-2) exhibiting statistical significance for specific constituents in both the inter-well and intra-well evaluations. Statistical evaluation revealed that MW-93-3 had intra-well exceedances for alkalinity, specific conductance and total dissolved solids. MW-03-2 exhibited intra-well exceedances for sodium and chloride.

Except for alkalinity in MW-93-3, intra-well statistically significant constituents were the same constituents for which quarterly assessment monitoring was already on-going. And with the exception of chloride in MW-93-3, none of the constituents for which exceedances were observed have either a National Primary Drinking Water Standard or a Secondary Drinking Water Standard. Chloride has a non-enforceable, secondary maximum contaminant level of 250 milligrams per liter (mg/L) and is not considered to present a risk to human health at that level.

Because the percent of increase in the concentration of alkalinity in MW-93-3 was similar to the percent of increase observed in the upgradient well (MW-93-1) and the concentrations observed were similar (550 mg/L in MW-93-1 vs. 585 mg/L in MW-93-3), it was proposed to add alkalinity to the quarterly assessment monitoring event for MW-93-3. This would allow for further





evaluation to determine if the concentration in MW-93-3 was truly significant or if the concentration observed was simply the result of natural variation in the groundwater quality. In a sample collected from MW-93-3 during the second semi-annual November 21 sampling event, alkalinity has shown a decrease in concentration to 525 mg/L. Alkalinity has been added to the list of Appendix A compounds for the GRDA Landfill and is now a constituent that is monitored for on a routine (semi-annual) basis.

Sampling activities for the second semi-annual groundwater sampling and statistical analysis event were conducted on November 21, 2019. Analysis of the groundwater samples included those historical constituents for which assessment monitoring had previously been established, as well as CCR Appendix A and CCR Appendix B constituents. The groundwater samples from the monitoring wells were collected in accordance with the GRDA Groundwater Sampling and Analysis Program on file with DEQ and were analyzed by a third-party State of Oklahoma Certified Laboratory. Statistical evaluation of the data was then conducted on the results of analysis obtained from the laboratory.

The statistical analysis results for the second semi-annual sampling event are summarized in the table below. Included are the results of both the inter-well and intra-well evaluations. If a constituent for which laboratory analysis was conducted is not included in the table (e.g. alkalinity), there were no inter-well exceedances observed in any of the monitoring wells for that particular constituent. Only those constituents for which inter-well exceedances were observed are included.



Parameter	Inter-well Exceedance	Intra-Well Exceedance
arsenic	MW-93-2	
barium	MW-93-2, MW-93-3, MW-03-1, MW-03-2	MW-93-2
boron	MW-93-2	
chloride	MW-93-3, MW-03-1, MW-03-2	MW-93-3, MW-03-1, MW-03-2
fluoride	MW-93-2	
lithium	MW-03-2, MW-93-3	
mercury	MW-03-2, MW-93-3	MW-03-2, MW-93-3
molybdenum	MW-93-2	
pH	MW-93-2	
selenium	MW-93-2	MW-93-2
sodium	MW-93-2, MW-93-3, MW-03-2	MW-03-2
specific conductance	MW-93-2, MW-93-3, MW-03-2	MW-03-2
sulfate	MW-93-3	MW-93-3
total dissolved solids	MW-93-2, MW-93-3, MW-03-2	MW-93-3, MW-03-2

During the second semi-annual monitoring event MW-93-2, MW-93-3, MW-03-1, and MW-03-2 exhibited inter-well exceedances for some of the constituents relative to the upgradient monitoring well data. Further analysis reveals that these same wells had intra-well exceedances for a variety of constituents.

Except for mercury (an Appendix B constituent) detected in the sample from MW-03-02 (at a concentration of 0.00694 mg/L or 0.00694 parts per million), none of the constituents for which intra-well exceedances were observed are above their applicable groundwater protection standard. Considering the distance between MW-03-02 and the CCR Landfill (approximately 1,800 feet ) and the observed fluctuation in mercury concentration during background sampling of this well, it is believed that the observed statistically significant increase in MW-03-02 is the result of natural variation in groundwater quality at that location and not the result of impact from the CCR landfill. It is anticipated that based on this recent finding, a confirmation sample from MW-03-02 will immediately be collected and analyzed for mercury in order to determine if the mercury concentration of the groundwater has in fact increased in the local area of MW-03-02 or if the



result recently obtained is simply a statistical outlier. Data gathered will be shared with DEQ and a Letter Report of Findings included as an Addendum to this Report.

In the event the mercury concentration in MW-03-02 is confirmed, GRDA will comply with OAC 252:517-9-6(g) by providing separate notification to DEQ those constituents in Appendix B that have exceeded the groundwater protection standards and provide a proposed plan and schedule for analyzing the observed condition and for developing necessary and appropriate corrective action.

In the event the observed mercury concentration is determined through confirmation sampling and analysis to be a statistical outlier, GRDA will propose to continue assessment monitoring in accordance with OAC 252:517.

Combined radium concentrations (radium 226 and radium 228) observed during the second semi-annual sampling event were all below maximum background concentrations observed in the individual monitoring wells and are well below the National Primary Drinking Water Standard of 5 pCi/L for Combined Radium.

### **3.2 SUMMARY OF KEY ACTIONS COMPLETED**

In addition to conducting the required monitoring for constituents in groundwater from the monitoring wells, key actions completed during the preceding year included the preparation and submittal of an Assessment Monitoring Plan. The plan, required by DEQ as a result of confirmation sampling conducted during calendar year 2018 for a non-CCR required constituent (specific conductivity), was prepared and submitted to DEQ on March 29, 2019. In correspondence dated June 20, 2019, DEQ requested changes to the Assessment Plan requiring reference to the current CCR regulations (OAC 252:517) rather than the historical regulations which required the non-CCR constituent (OAC 252:515). The revised Plan was submitted to DEQ in August 2019. Further discussion and correspondence with DEQ concerning the Assessment Monitoring Plan resulted in the addition of additional constituents to the GRDA required Appendix A list of constituents. A revised Assessment Monitoring Plan which



incorporates the historical non-CCR regulated constituents into GRDA’s Appendix A list of constituents has been prepared and submitted to DEQ on January 10, 2020.

For the GRDA Landfill facility, the Appendix A constituent list for all monitoring activities now includes:

- alkalinity
- boron
- calcium
- chloride
- fluoride
- pH
- sodium
- specific conductance
- sulfate
- total dissolved solids (TDS)

The Appendix B constituent list for all GRDA Landfill groundwater monitoring activities includes:

- antimony
- arsenic
- barium
- beryllium
- cadmium
- cobalt
- fluoride
- lead
- lithium
- mercury
- molybdenum
- selenium
- thallium
- radium 226 and 228 combined

The following Table presents a summary of the assessment monitoring schedule proposed for the monitoring wells at the Grand River Dam Authority Landfill.

### ASSESSMENT MONITORING SCHEDULE

Monitoring Well	Proposed Constituent	Proposed Frequency
MW-93-1, MW-93-2, MW-93-3, MW-03-1, MW-03-2	Appendix A constituents (as identified above) plus any detected Appendix B constituents	Semi-Annually
MW-93-1, MW-93-2, MW-93-3, MW-03-1, MW-03-2	Appendix A constituents (as identified above) plus <b>all</b> Appendix B constituents	Annually



In accordance with OAC 252:517-9-6(e) assessment monitoring will continue at all wells for Appendix A and detected Appendix B constituents at least semi-annually and Appendix A and all Appendix B constituents annually until all constituents are below background levels for two consecutive sampling events.

In the event statistical evaluation indicates the constituents being monitored are below background levels for two consecutive assessment monitoring events, GRDA will notify DEQ of its intention to resume detection monitoring for the CCR landfill and obtain DEQ's approval to do so. GRDA's notification to DEQ will be placed in the facility's operating record as required by OAC 252:517-19-1(h)(7).

Key actions completed during 2019 also included additional monitoring and reporting for background concentrations of Appendix B constituents. Due to insufficient water in one of the monitoring wells (MW-03-1) during the 2018 calendar year, one additional sampling event was conducted during 2019 to gather the required number of background samples. The sampling event occurred on March 26, 2019 and a letter report, dated April 19, 2019, transmitted the background concentration information to DEQ.

On June 19, 2019, DEQ required the collection of additional groundwater samples from the monitoring wells to obtain lower laboratory quantitation limits analysis for certain OAC 252:517 Appendix B constituents (antimony, beryllium, cobalt, and thallium). The additional sampling and analyses were necessary to ensure the background concentrations were below Primary Drinking Water Standards and newly established groundwater protection standards established for some of these constituents<sup>1</sup>. To date, six monthly sampling events have been conducted. Two monthly sampling events remain to be conducted during calendar year 2020. **Table 1** presents the results obtained to date. The results of analysis show all concentrations to be below

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<sup>1</sup> Groundwater Protection Standard established by USEPA, effective 8/29/18 (83 FR 36435, July 30, 2018)



detection limits for the samples. None of the constituents tested exceed the established groundwater protection standards.

### **3.3 PROBLEMS ENCOUNTERED AND RESOLUTION OF PROBLEMS**

During the preceding year, no major problems were encountered in conducting the semi-annual groundwater monitoring activities at the GRDA Landfill facility and no corrective actions were required to be implemented.

### **3.4 KEY ACTIVITIES FOR THE UPCOMING YEAR**

Key activities for the upcoming year (calendar year 2020) include continued implementation of the semi-annual groundwater monitoring activities in accordance with OAC 252:517 and the above assessment monitoring schedule. It is possible that changes to the assessment monitoring activities may be required by DEQ during the upcoming year. If so, any additional assessment monitoring required will be conducted in accordance with DEQ directives.

### **3.5 ADDITIONAL REQUIRED INFORMATION**

A figure showing the location of the GRDA Coal Combustion Residuals landfill is included as **Figure 1**. The figure clearly shows the locations and identification numbers of the monitoring wells used for the GRDA Landfill. As previously stated, MW-93-1 is the upgradient well and MW-93-2, MW-93-3, MW-03-1 and MW-03-2 are the downgradient wells for the CCR landfill.

There were no new monitoring wells installed or decommissioned at the GRDA facility during the preceding calendar year (2019). The wells initially installed in 1993 and 2003 have been continuously utilized for groundwater monitoring at the facility.

During the preceding year, groundwater samples were collected and analyzed from all five monitoring wells. Analysis of samples collected during these events included the required constituents for detection monitoring (as required by OAC 252:517 and the DEQ required addition of constituents to the GRDA Appendix A List, Appendix B constituents, and the required background sampling for certain Appendix B metals as discussed in Section 3.2 above.



**Appendix A** presents the monitoring data collected during calendar year 2019 for the upgradient and each downgradient monitoring well in use for the GRDA Landfill. **Appendix B** presents the statistical analysis results for the second semi-annual monitoring event.

**Tables 2** and **2a** present summaries of the groundwater data collected during the first and second semi-annual sampling events for calendar year 2019, respectively. **Tables 3** and **3a** present historical summaries of select groundwater data (collected during the first and second semi-annual sampling events, respectively). **Tables 4** present historical data related to additional monitoring of monitoring wells MW-93-3 and MW-03-2. The additional quarterly analysis conducted for MW-93-3 (sodium and conductivity) and MW-03-2 (chloride) are required as a result of prior implementation of monitoring for these constituents in order to allow for assessment of whether an increasing trend in these constituents is occurring. Monitoring for these parameters has been ongoing since 2015. A summary table for calendar year 2019 which includes the number of groundwater samples that were collected for analysis, the dates the samples were collected and whether the individual sample collected was required by detection monitoring or assessment monitoring is included in **Table 5**.

During calendar year 2019, there was a transition between detection and assessment monitoring programs. Sampling and analysis of groundwater was conducted in accordance with the established detection monitoring requirements for the GRDA Landfill along with the additional monitoring required by DEQ. It is anticipated that assessment monitoring with the additional monitoring required by DEQ will continue into calendar year 2020.

## **4.0 REFERENCES**

Resources and references used in the preparation of this Annual Groundwater Monitoring and Corrective Action Report include:



Oklahoma State Department of Health (OSDH), Permit for a *Coal Ash Disposal Site*. January 13, 1981.

Oklahoma Department of Environmental Quality (DEQ), *Permit Modification to add an additional Solid Waste Stream, Grand River Dam Authority, Mayes County, Permit 3549012*. February 20, 2015.

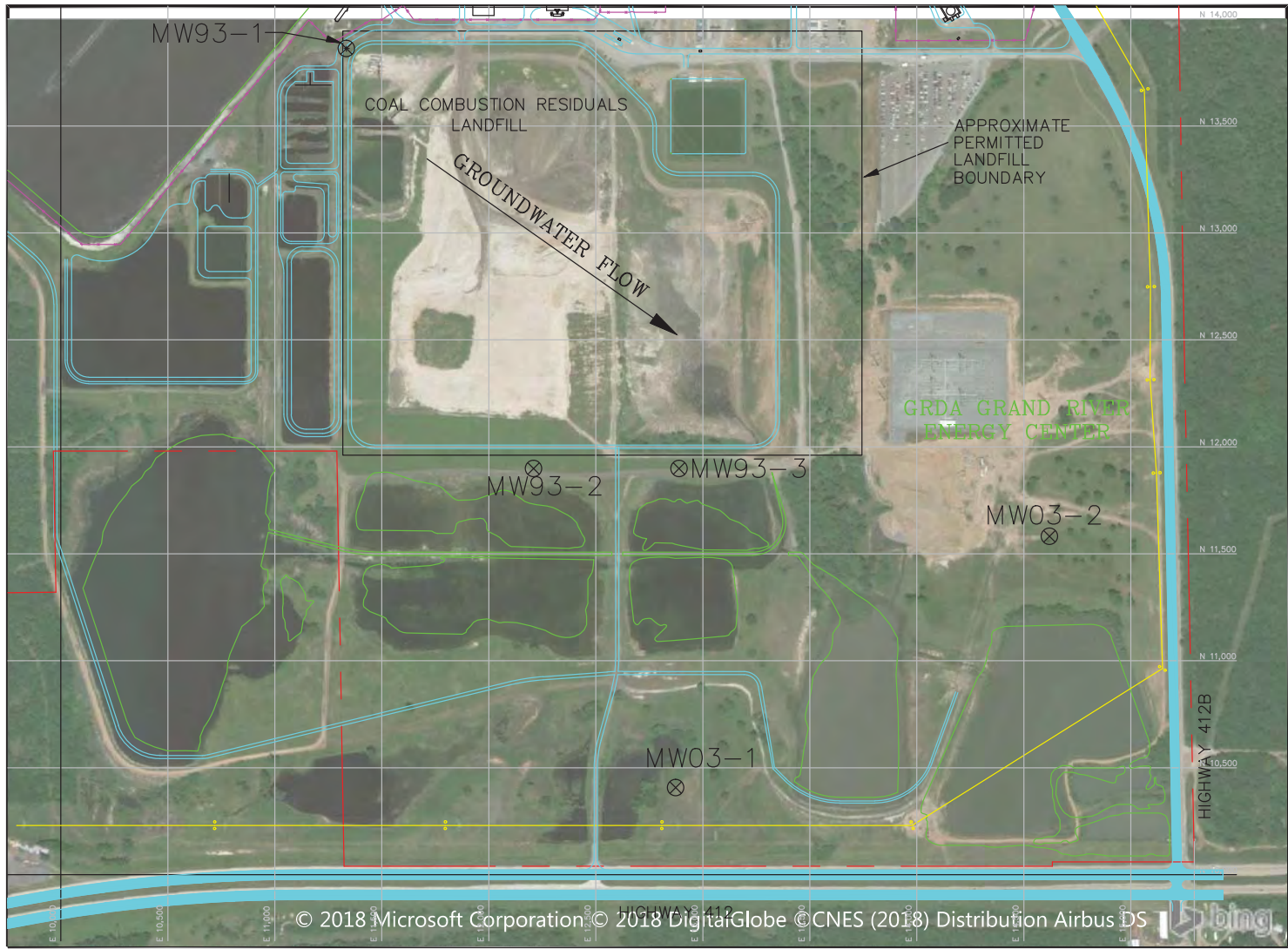
Oklahoma Department of Environmental Quality (DEQ), *OAC 252:517*. September 15, 2016.

Grand River Dam Authority, *2019 First Semi-Annual Groundwater Sampling and Statistical Analysis Report*. May 2018.





## FIGURES



N

SCALE

LEGEND

⊗ MW93-1      GROUNDWATER MONITORING WELL

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DJR      4/13/06

**GENERAL NOTES**

1) AERIAL BACKGROUND FROM BING MAPS.

REVISIONS					
NO.	DESCRIPTION	BY	CHECKED	DATE	DATE

**A & M ENGINEERING AND ENVIRONMENTAL SERVICES, INC.**

ENGINEERING - ENVIRONMENTAL - CONSTRUCTION

DRAWN: OPC	CHECKED BY: TAT	MATERIALS BY:	ENGINEER:
DATE: 01/30/2018	DATE: 01/30/2018	DATE:	DATE:

**CCR LANDFILL AND WELL LOCATION MAP**

**GRAND RIVER DAM AUTHORITY LANDFILL**

**CHOUTEAU, OK**

APPROVED BY: TAT	SCALE: AS SHOWN	PROJECT NUMBER: 1986-002	DRAWING NUMBER: FIGURE 1	REV:
DATE: 01/30/2018				

## **TABLES**

**TABLE 1**  
**RESULTS OF ANALYSIS**  
**SPECIFIC APPENDIX B CONSTITUENTS**

		MW93-01					
Constituent:	MCL <sup>a</sup>	8/16/2019	9/24/2019	10/28/2019	11/21/2019	12/19/2019	1/15/2020
Antimony (mg/L)	0.006	<0.00600	<0.000500	<0.000500	<0.00200	<0.00200	<0.00200
Beryllium (mg/L)	0.004	<0.00400	<0.000200	<0.000200	<0.00100	<0.00200	<0.00100
Cobalt (mg/L)	0.006 <sup>b</sup>	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
Thallium (mg/L)	0.002	<0.00200	<0.000100	<0.000100	<0.00100	<0.00200	<0.00100

		MW93-02					
Constituent:	MCL <sup>a</sup>	8/16/2019	9/24/2019	10/28/2019	11/21/2019	12/19/2019	1/15/2020
Antimony (mg/L)	0.006	<0.00600	<0.000500	<0.000500	<0.00200	<0.00200	<0.00200
Beryllium (mg/L)	0.004	<0.00400	<0.000200	<0.000200	<0.00100	<0.00200	<0.00100
Cobalt (mg/L)	0.006 <sup>b</sup>	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
Thallium (mg/L)	0.002	<0.00200	<0.000100	<0.000100	<0.00100	<0.00200	<0.00100

		MW93-03					
Constituent:	MCL <sup>a</sup>	8/16/2019	9/24/2019	10/28/2019	11/21/2019	12/19/2019	1/15/2020
Antimony (mg/L)	0.006	<0.00600	<0.000500	<0.000500	<0.00200	<0.00200	<0.00200
Beryllium (mg/L)	0.004	<0.00400	<0.000200	<0.000200	<0.00100	<0.00200	<0.00100
Cobalt (mg/L)	0.006 <sup>b</sup>	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
Thallium (mg/L)	0.002	<0.00200	<0.000100	<0.000100	<0.00100	<0.00200	<0.00100

		MW03-01					
Constituent:	MCL <sup>a</sup>	8/16/2019	9/24/2019	10/28/2019	11/21/2019	12/19/2019	1/15/2020
Antimony (mg/L)	0.006	<0.00600	<0.000500	<0.000500	<0.00200	<0.00200	<0.00200
Beryllium (mg/L)	0.004	<0.00400	<0.000200	<0.000200	<0.00100	<0.00200	<0.00100
Cobalt (mg/L)	0.006 <sup>b</sup>	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
Thallium (mg/L)	0.002	<0.00200	<0.000100	<0.000100	<0.00100	<0.00200	<0.00100

		MW03-02					
Constituent:	MCL <sup>a</sup>	8/16/2019	9/24/2019	10/28/2019	11/21/2019	12/19/2019	1/15/2020
Antimony (mg/L)	0.006	<0.00600	<0.000500	<0.000500	<0.00200	<0.00200	<0.00200
Beryllium (mg/L)	0.004	<0.00400	<0.000200	<0.000200	<0.00100	<0.00200	<0.00100
Cobalt (mg/L)	0.006 <sup>b</sup>	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
Thallium (mg/L)	0.002	<0.00200	<0.000100	<0.000100	<0.00100	<0.00200	<0.00100

<sup>a</sup> EPA Maximum Contaminant Level (MCL), November 2019

<sup>b</sup> Groundwater Protection Standard established by the USEPA, effective 8/29/18 (83 FR 36435, July 30, 2018)

**Table 2**  
**First Semi-Annual 2019 Analytical Results**  
**May 7, 2019**  
**Grand River Dam Authority (GRDA) Landfill**  
**Chouteau, Oklahoma**

PARAMETER	Monitoring Well I.D.				
	MW 93-1 (upgradient)	MW 93-2 (downgradient)	MW 93-3 (downgradient)	MW 03-1 (downgradient)	MW 03-2 (downgradient)
Pre-purge Water Elevation (msl)	610.96	602.27	595.71	598.00	594.75
Temperature °C	21.7	21.5	25.5	19.1	23.3
pH (S.U.)	7.00	9.05	6.69	6.33	6.81
Specific Conductivity (umhos/cm)	1,210	9,510	1,930	107	1,590
ORP mv	169	-198	147	253	202
Chloride (mg/L)	18.8	1,360	421	5.9	313
Nitrate-Nitrogen (mg/L)	<0.400	<0.400	0.498	<0.400	0.575
Sulfate (mg/L)	275	3,890	105.0	12.2	29.6
Boron (µg/L)	178	1,610	<100	<100	<100
Fluoride (mg/L)	<0.200	0.367	<0.200	<0.200	<0.200
Arsenic (mg/L)	<0.005	0.0259	<0.005	<0.005	<0.005
Barium (mg/L)	0.0243	0.0749	0.166	0.0415	0.0488
Calcium (mg/L)	212	86.3	110	15.0	267
Copper (mg/L)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Iron (mg/L)	0.0674	0.0681	0.0501	0.6710	<0.0500
Potassium (mg/L)	0.162	237	3.17	0.430	0.645
Selenium (mg/L)	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Sodium (mg/L)	124	2,470	412	13.1	138
Alkalinity (mg/L)	550	360	585	55	220
COD (mg/L)	11.9	75.4	17.6	7.41	17.3
Hardness (mg/L)	590	240	400	50	750
Total Phosphorus (mg/L)	<0.0500	0.285	0.0700	0.110	<0.005
TDS (mg/L)	952	8,480	1,510	102.0	1240
TOC (mg/L)	51.6	33.2	43.6	13.1	16.3
Total Residue (mg/L)	985	8,720	1,520	110	1490

NT = Not Tested

NS = Insufficient Sample for analysis

**Table 2a**  
**Second Semi-Annual 2019 Analytical Results**  
**November 21, 2019**  
**Grand River Dam Authority (GRDA) Landfill**  
**Chouteau, Oklahoma**

PARAMETER	Monitoring Well I.D.				
	MW 93-1 (upgradient)	MW 93-2 (downgradient)	MW 93-3 (downgradient)	MW 03-1 (downgradient)	MW 03-2 (downgradient)
Pre-purge Water Elevation (msl)	610.17	602.34	594.88	597.34	594.43
Temperature °C	16.89	16.91	16.89	14.34	12.96
pH (S.U.)	6.46	8.44	6.54	6.23	6.56
Specific Conductivity (umhos/cm)	1,510	15,400	2,200	140	3,600
ORP mv	393	-164	74	171	91
Chloride (mg/L)	22	<5.00	1,070	410.0	543
Sulfate (mg/L)	299	12	4010.0	184.0	394
Mercury (mg/L)	<0.00005	<0.00005	0.000861	<0.00005	0.00694
Boron (µg/L)	303	1,760	<200	<200	<200
Antimony (mg/L)	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic (mg/L)	<0.001	0.0197	<0.001	<0.001	<0.001
Beryllium (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001
Lead (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/L)	0.0321	0.100	0.1160	0.0449	0.0440
Cadmium (mg/L)	0.0011	<0.001	<0.001	<0.001	<0.001
Calcium (mg/L)	228	117	107	16.9	386
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt (mg/L)	<0.006	<0.006	<0.006	<0.006	<0.006
Molybdenum (mg/L)	<0.01	0.2520	<0.01	<0.01	<0.01
Selenium (mg/L)	<0.00500	0.00621	<0.00500	<0.00500	<0.00500
Sodium (mg/L)	99.1	2,500	403	10.5	166
Lithium (mg/L)	<0.015	<0.015	0.182	<0.015	0.0154
Total Radium (pCi/L)	0.872+/-0.759	1.25+/-0.678	1.03+/-0.998	0.729+/-0.536	0.394+/-0.564
Radium-226	-0.0852+/-0.373	0.545+/-0.305	0.999+/-0.596	0.120+/-0.148	0.0523+/-0.117
Radium-228	0.872+/-0.386	0.701+/-0.373	0.0275+/-0.402	0.609+/-0.388	0.342+/-0.447
Alkalinity, Total (mg/L)	480	360	525	55.0	220
TDS (mg/L)	966	8,400	1,550	80	1,760

NT = Not Tested

NS = Insufficient Sample for analysis

**Table 3  
Historical Monitoring Well Analytical Results  
November 21, 2019  
Grand River Dam Authority (GRDA) Landfill  
Chouteau, Oklahoma**

PARAMETER	WELL ID																																			
	MW 93-1 Upgradient																																			
	6/24/04	9/15/04	12/15/04	3/16/05	6/15/05	9/21/05	12/21/05	3/15/06	6/21/06	12/20/06	6/12/07	12/17/07	6/11/08	12/3/08	6/17/09	12/9/09	6/17/10	12/22/10	6/29/11	12/7/11	6/6/12	12/12/12	6/19/13	12/11/13	6/11/14	12/3/14	6/17/15	12/1/15	6/22/16	12/20/16	6/6/17	11/7/17	2/27/18	9/27/18	5/7/19	11/21/2019
pH (S.U.)	6.53	6.43	6.61	6.57	6.53	6.65	6.61	6.64	6.85	6.67	6.58	6.33	6.7	6.5	6.8	6.6	6.5	6.55	6.5	6.41	6.23	6.61	6.58	6.57	6.10	6.69	6.38	6.45	6.59	6.28	6.69	6.21	6.47	6.62	7.00	6.46
Specific Conductivity (umhos/cm)	1620	1618	1586	1521	1531	1441	1030	1318	1547	1370	1466	1327	1334	1352	1301	1218	1179	1270	1275	1236	1185	1227	1366	1329	1200	1230	1210	1230	1185	1186	1289	1458	1235	1,520	1,210	1,510
Alkalinity (mg/L)	348	332	327	340	330	347	340	320	314	300	310	330	370	344	350	370	380	370	366	370	384	330	360	358	342	368	380	383	390	395.4	398	394	384	360	550	480
Chloride (mg/L)	61	44	48	42	42	42	58	50	31	35	24	27	29	28	20	24	17	20	20.8	17.6	23.8	22.2	21.5	17.6	19.3	16.9	13	15.2	13	15.2	16.1	16.2	15.6	16.8	18.8	22
Sodium (mg/L)	94.7	71	92.3	86.3	77.4	92.8	81.9	99.7	82	85.1	74.9	81.8	56.5	75.2	67.4	76.9	55	70.5	55.4	69.1	55.6	58.9	70	72.9	56.5	69.4	69.7	57.5	66.9	54.8	58.4	45.2	59.6	68.2	124	99.1
Sulfate (mg/L)	500	475	558	880	22	467	475	375	420	330	260	300	375	340	650	160	290	304	306	255	275	301	409	306	316	292	286	299	250	275	265	281	299	305	275	299
Arsenic (mg/L)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0109	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0068	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	0.006	<0.005	<0.005	<0.001	

PARAMETER	WELL ID																																					
	MW 93-2 Downgradient																																					
	6/24/04	9/15/04	12/15/04	3/16/05	6/15/05	9/21/05	12/21/05	3/15/06	6/21/06	12/20/06	2/21/07	6/12/07	12/17/07	6/11/08	12/3/08	12/15/08	6/17/09	12/9/09	6/17/10	12/22/10	6/29/11	12/7/11	6/6/12	12/12/12	6/19/13	12/11/13	6/11/14	12/3/14	6/17/15	12/1/15	6/22/16	12/20/16	6/6/17	11/7/17	2/27/18	9/27/18	5/7/19	11/21/2019
pH (S.U.)	9.24	9.32	9.26	9.23	9.10	9.25	9.31	9.47	9.4	9.18	9.20	9.10	9.30	9.4	9.7	9.6*	9.8	9.8	9.6	9.5	9.4	9.5	9.68	10.02/9.51*	9.4	9.46	8.55	8.95	9.13	9.37	9.28	9.72	9.29	8.86	9.04	9.09	9.05	8.44
Specific Conductivity (umhos/cm)	10494	10340	9940	9690	10010	9660	10000	8650	9830	8310	7660	9590	9100	9600	10520	9070*	10690	10050	10020	11230	11110	10770	10490	11460	10500	10650	9940	10900	1270	10560	6710	11400	12590	10520	10900	15,700	9,510	15,400
Alkalinity (mg/L)	329	272	288	240	246	228	232	250	290	356	340	312	210	240	280	280	250	236	252	240	266	288	256	248	364	328	342	296	384	226	176	162	246	430	282	270	2470	360
Chloride (mg/L)	1892	1435	1600	1325	1400	1412	1550	1375	1500	1250	1250	1350	1399	1210	1584	1584	750	875	1500	1600	1670	1510	1610	1750	1390	1410	1360	1520	47.7	1760	1300	1690	1580	1160	1270	1,250	1,360	<5.00
Sodium (mg/L)	2180	1800	2480	2490	2030	2520	2300	2720	2450	2170	1900	1980	2244	2649	2120	2120	2220	240	2100	2460	2190	2500	2060	2730	2230	2290	1940	2730	270	3140 / 2780 / 1890**	2700	2400	2310	2750	2220	2,660	2,470	2,500
Sulfate (mg/L)	2650	2700	2950	3200	2650	3200	3200	3000	2700	2500	2900	2400	3100	2350	3300	2400*	2300	2200	2900	3460	2630	2520	2360	3240	2510	2460	2790	2940	114	3600	2620	3800	3630	4340	3870	3,680	3,890	12
Arsenic (mg/L)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0343	0.0603	0.0510	0.0330	NT	0.0525	0.0635	0.0179	0.0215	0.0610	<0.005	0.0098	0.0562	0.0530	0.0353	0.0197	0.0274	<0.005	0.03	0.047	0.06	0.038	0.028	0.024	0.039	0.0259	0.0197	

\*MW-93-2 was resampled for pH on 1/9/2013.

\*\*MW-93-2 was resampled for Sodium on 3/4/2016 and 5/25/2016

PARAMETER	WELL ID																																				
	MW 93-3 Downgradient																																				
	6/24/04	9/15/04	12/15/04	3/16/05	6/15/05	9/21/05	12/21/05	3/15/06	6/21/06	12/20/06	6/12/07	12/17/07	6/11/08	12/3/08	6/17/09	12/9/09	6/17/10	12/22/10	6/29/11	12/7/11	6/6/12	12/12/12	6/19/13	12/11/13	12/11/13	6/11/14	12/3/14	6/7/15	12/1/15	6/22/16	12/20/16	6/6/17	11/7/17	2/27/18	9/27/18	5/7/19	11/21/2019
pH (S.U.)	6.80	6.70	6.88	6.69	6.81	6.85	6.70	7.07	6.84	6.93	6.89	6.8	6.8	6.8	7.2	6.9	6.7	6.82	6.7	6.77	6.42	6.85	6.49	7.07	7.07	6.08	6.80	6.4	6.6	6.43	6.27	6.65	6.46	6.49	6.55	6.69	6.54
Specific Conductivity (umhos/cm)	1129	1068	972	1134	1080	1155	1140	1035	1226	1087	1031	910	1023	1073	1073	1038	1108	1090	1178	930	1203	1010	1438	1252	1252	1500	1200	1480	1807	2494	2200	1743	2121	2372	2,110	1,930	2,200
Alkalinity (mg/L)	309	264	254	290	268	264	246	227	253	250	280	290	300	226	240	214	296	230	256	244	288	226	316	262	262	338	262	388	480 / 462 / 440*	330	330.4	304	409	368	375	585	525
Chloride (mg/L)	160	139	122	180	150	215	180	221	210	210	110	131	144	152	120	175	150	170	170	98.9	194	168	194	173	173	254	194	168	280	518	475	113	402	435	426	421	1,070
Sodium (mg/L)	150	200	186	196	170	239	180	180	227	211	159	194	195	190	173	202	202	216	158	218	201	168	235	234	234	258	220	280	339 / 440 / 464*	449 / 368*	337	301	368	272	372	412	403
Sulfate (mg/L)	24	17	26	29	26	19	23	19	21	42	3	28	27	11	16	12	45	25.8	34.2	37.4	38.3	25.8	61.6	26.5	26.5	56.2	36.0	109	81	58.5	66.6	18.2	80.3	64.2	75.8	105.0	4010.0
Arsenic (mg/L)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001

\*MW-93-3 was resampled for Sodium and Alkalinity on 3/4/2016 and 5/25/2016, and Sodium on 10/11/2016.

**Table 3 (continued)  
 Historical Monitoring Well Analytical Results  
 November 21, 2019  
 Grand River Dam Authority (GRDA) Landfill  
 Chouteau, Oklahoma**

PARAMETER	WELL ID																																			
	MW 03-1 Downgradient																																			
	6/24/04	9/15/04	12/15/04	3/16/05	6/15/05	9/21/05	12/21/05	3/15/06	6/21/06	12/20/06	6/12/07	12/17/07	6/11/08	12/3/08	6/7/09	12/9/09	6/17/10	12/22/10	6/29/11	12/7/11	6/6/12	12/12/12	6/19/13	12/11/13	6/11/14	12/3/14	6/7/15	12/1/15	6/22/16	12/20/16	6/6/17	11/7/17	2/27/18	9/27/18	5/7/19	11/21/2019
pH (S.U.)	7.27	6.78	7.32	7.30	7.28	7.88	**	**	**	7	7	7	7.4	7.4	7.6	7.5	7.1	6.89	7.3	7.05	7.33	DRY	7.15	7.19	6.62	6.73	6.66	6.34	7.2	6.75	6.64	6.44	6.81	7.19	6.33	6.23
Specific Conductivity (umhos/cm)	497	687	514	422	465	517	**	**	**	447	630	540	467	649	519	469	500	504	463	501	457	DRY	373	476	828	409	267	385	320	NS	198	444	186	573	107	140
Alkalinity (mg/L)	209	220	184	160	252	180	**	**	**	204	200	190	200	206	204	216	232	216	210	222	216	DRY	144	212	222	194	134	150	130	211.6	56	217	72	NS	55	55.0
Chloride (mg/L)	10	22	6	4	6	5	**	**	**	5	4	3	11	11	4	32	5	8.7	4.86	5.88	9.36	DRY	<5.0	<5.0	44	<5.0	<5.00	0.777	0.628	0.786	0.887	1.13	1.07	NS	5.9	410.0
Sodium (mg/L)	10.2	42	8.04	5.99	7.3	14.1	**	**	**	8	8	10	5.71	7.01	7.34	6.77	9.31	7.11	7.04	8.87	7.94	DRY	10.3	9.78	55.9	9.80	9.7	12	8.59	7.94	6.56	17.6	16.8	NS	13.1	10.5
Sulfate (mg/L)	42	76	62	22	23	17	**	**	**	55	88	120	23	90	21	15	16	22.9	21.6	18.1	14.3	DRY	16.2	29.1	127	19.7	7.86	12.1	10.3	30.9	332	14.4	12.6	NS	12.2	184.0
Arsenic (mg/L)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	DRY	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.05	<0.005	<0.005	NS	<0.005	<0.001	

NS = Insufficient sample for analysis

PARAMETER	WELL ID																																			
	MW 03-2 Downgradient																																			
	6/24/04	9/15/04	12/15/04	3/16/05	6/15/05	9/21/05	12/21/05	3/15/06	6/21/06	12/20/06	6/12/07	12/17/07	6/11/08	12/3/08	6/7/09	12/9/09	6/17/10	12/22/10	6/29/11	12/7/11	6/6/12	12/12/12	6/19/13	12/11/13	6/11/14	12/3/14	6/7/15	12/1/15	6/22/16	12/20/16	6/6/17	11/7/17	2/27/18	9/27/18	5/7/19	11/21/2019
pH (S.U.)	6.84	7.17	6.86	6.80	6.87	6.87	6.83	6.88	6.78	6.88	6.87	6.7	6.9	6.8	7.3	6.8	6.8	7.2	6.7	6.69	6.73	6.82	6.88	6.72	7.00	7.14	6.45	6.39	6.75	6.36	6.73	6.22	6.47	6.63	6.81	6.56
Specific Conductivity (umhos/cm)	692	522	655	661	674	625	572	594	636	580	680	617	674	752	720	690	685	728	748	755	716	807	807	805	219	1540	965	967	1074	1454	1498	2042	2080	2,880	1,590	3,600
Alkalinity (mg/L)	235	200	222	220	252	224	230	220	228	220	228	200	200	210	200	208	216	230	224	236	230	242	232	230	92	76	220	214	204	199.4	192.0	192.0	196	185	220	220
Chloride (mg/L)	36	4	28	30	30	27	26	27	23	35	30	20	41	46	60	45	33	29	28.4	23.5	29.3	28.3	32.1	32.8	<5.00	51.2	54.7	67.8 / 69.6 / 80.1*	79.7 / 88.4*	126	117	288	247	283	313	543
Sodium (mg/L)	47.4	8.7	51.3	47	42.8	52.6	46.5	50.4	44.9	50.5	47	50.2	33.8	54.4	48.2	47.3	52.9	51.7	51	60.1	52	61.3	57.3	54	9.78	68	66.3	63.8	76.8	80.2	96.8	17.6	104	128	138	166
Sulfate (mg/L)	72	32	54	78	23	80	72	30	***	34	68	130	67	210	84	80	106	98.9	101	98.8	107	111	113	106	10.3	158	179	197	254	451	332	516	468	426	29.6	394
Arsenic (mg/L)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	0.008	<0.005	<0.005	<0.001	

\*MW-03-2 was resampled for Chloride on 3/4/2016, 5/25/2016, and 10/11/2016.



**Table 4**  
**FIRST Semi-Annual 2019 Additional Sampling Summary**  
**Grand River Dam Authority (GRDA) Landfill**  
**Chouteau, Oklahoma**

Sample Date	MW93-3		MW03-2
	Sodium (mg/L)	Conductivity (uS/cm)	Chloride (mg/L)
12/1/2015	339*	1807	67.8*
3/4/2016	440*	N/A	69.6*
5/25/2016	464*	N/A	80.1*
6/22/2016	449*	2494*	79.7*
10/11/2016	368*	2005*	88.4*
12/20/2016	337	2200*	126*
3/8/2017	334*	2404*	146*
6/6/2017	301*	1743	117*
11/7/2017	368	2121	288*
2/27/2018	272	2372*	247
9/27/2018	372	2110	283
5/7/2019	412	1930	313*

\* Indicates a verified intra-well statistical exceedance for the specified sampling event.

**Table 4a**  
**Second Semi-Annual 2019 Additional Sampling Summary**  
**Grand River Dam Authority (GRDA) Landfill**  
**Chouteau, Oklahoma**

Sample Date	MW93-3		MW03-2
	Sodium (mg/L)	Conductivity (uS/cm)	Chloride (mg/L)
12/1/2015	339*	1807	67.8*
3/4/2016	440*	N/A	69.6*
5/25/2016	464*	N/A	80.1*
6/22/2016	449*	2494*	79.7*
10/11/2016	368*	2005*	88.4*
12/20/2016	337	2200*	126*
3/8/2017	334*	2404*	146*
6/6/2017	301*	1743	117*
11/7/2017	368	2121	288*
2/27/2018	272	2372*	247
9/27/2018	372	2110	283
5/7/2019	412	1930	313*
11/21/2019	403	2,200	543*

\* Indicates a verified intra-well statistical exceedance for the specified sampling event.

**Table 5: Sampling Summary Table (2019)**  
**Grand River Dam Authority (GRDA) Landfill**  
**Chouteau, Oklahoma**

Well ID	# of Samples Collected	2019 Sampling Dates	Collected For:		Comments:
			Detection Monitoring	Assessment Monitoring	
MW93-1 (upgradient)	6	May 7 August 16 September 24 October 28 November 21 December 19	X	X	Includes samples for Appendix A, Appendix B, and Historical Assessment Constituents.
MW93-2 (downgradient)	7	March 26 May 7 August 16 September 24 October 28 November 21 December 19	X	X	Includes samples for Appendix A, Appendix B, and Historical Assessment Constituents.
MW93-3 (downgradient)	7	March 26 May 7 August 16 September 24 October 28 November 21 December 19	X	X	Includes samples for Appendix A, Appendix B, and Historical Assessment Constituents.
MW03-1 (downgradient)	7	March 26 May 7 August 16 September 24 October 28 November 21 December 19	X	X	Includes samples for Appendix A, Appendix B, and Historical Assessment Constituents.
MW03-2 (downgradient)	7	March 26 May 7 August 16 September 24 October 28 November 21 December 19	X	X	Includes samples for Appendix A, Appendix B, and Historical Assessment Constituents.

**APPENDIX A**  
**Laboratory Report Forms**

Green Country Testing, Inc.  
6825 E 38th Street  
Tulsa, OK 74145  
TEL: 918-828-9977 FAX: 918-828-7756  
Website: www.greencountrytesting.com



May 16, 2019

Ed Van Schaik  
A & M Engineering  
10010 E. 16th St.  
Tulsa, OK 74128-4813  
TEL: (918) 665-6575  
FAX: (918) 665-6576

RE: 1st Semi-Annual

Order No.: 1905151

Dear Ed Van Schaik:

Green Country Testing, Inc. received 7 sample(s) on 5/7/2019 for the analyses presented in the following report.

In accordance with your instructions, Green Country Testing conducted the analysis shown on the following pages on samples submitted by your company. The results relate only to the items tested. Unless otherwise noted, all analysis were conducted using EPA approved methodologies. Test reports meet all the NELAC requirements. All relevant sampling information is on the attached chain-of-custody form. The initials SUB as the analyst designate any testing sub-contracted by Green Country Testing.

Certifications/Accreditation: OK - 7604 - AR - ADEQ - KS - E-10232 - LA - 4002

A scope of Certified/Accredited parameters is available upon request. If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian Duzan".

Brian Duzan  
Laboratory Director

**CC:**  
Accounts Payable  
Jeff Elbert

Original

Green Country Testing, Inc.  
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## Case Narrative

WO#: 1905151  
Date: 5/16/2019

---

**CLIENT:** A & M Engineering  
**Project:** 1st Semi-Annual

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1905151  
MET\_Boron has been Sub Contracted.  
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MET\_Boron has been Sub Contracted.

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-001

**Collection Date:** 5/7/2019 1:05:00 PM

**Client Sample ID:** MW 93-1

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	18.8	5.00		mg/L	1	5/10/2019 1:35:00 PM
<b>NITRATE / NITRITE AS N IN WATER</b>				<b>A4500-NO3-F</b>		Analyst: <b>KP</b>
Nitrate/Nitrite as N	< 0.400	0.400		mg/L	1	5/9/2019 5:34:00 PM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	275	5.00		mg/L	1	5/11/2019 2:29:00 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>8727</b>
Boron	178	100		ug/L	1	5/15/2019 4:44:00 PM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Arsenic	< 0.00500	0.00500		mg/L	1	5/10/2019 8:07:43 PM
Barium	0.0243	0.0100		mg/L	1	5/10/2019 8:07:43 PM
Calcium	212	0.500		mg/L	1	5/10/2019 8:07:43 PM
Copper	< 0.0100	0.0100		mg/L	1	5/10/2019 8:07:43 PM
Iron	0.0674	0.0500		mg/L	1	5/14/2019 11:00:32 PM
Potassium	0.162	0.0500		mg/L	1	5/10/2019 8:07:43 PM
Selenium	< 0.00500	0.00500		mg/L	1	5/10/2019 8:07:43 PM
Sodium	124	0.500		mg/L	1	5/10/2019 8:07:43 PM
<b>ALKALINITY IN WATER</b>				<b>A2320B, 2011</b>		Analyst: <b>CW</b>
Alkalinity, Total (As CaCO3)	550	12.5		mg CaCO3/L	1	5/14/2019 9:32:00 AM
<b>CHEMICAL OXYGEN DEMAND</b>				<b>A5220D, 2011</b>		Analyst: <b>CW</b>
Chemical Oxygen Demand	11.9	5.00		mg/L	1	5/8/2019 1:09:00 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response  
 ND Not Detected at the Reporting Limit PL Permit Limit  
 R RPD outside accepted recovery limits RL Reporting Detection Limit  
 W Sample container temperature is out of limit as specified at testcode

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering  
**Project:** 1st Semi-Annual

**Lab Order:** 1905151

<b>HARDNESS</b>					<b>A2340C, 2011</b>	Analyst: <b>CW</b>
Hardness, Calcium (As CaCO3)	590	10.0	mg CaCO3/L	5	5/14/2019 1:12:00 PM	
<b>TOTAL PHOSPHORUS</b>					<b>4500P-E,2011</b>	Analyst: <b>CW</b>
Total Phosphorus	< 0.0500	0.0500	mg/L	1	5/10/2019 11:24:00 AM	
<b>TOTAL DISSOLVED SOLIDS</b>					<b>A2540C, 2011</b>	Analyst: <b>MH</b>
Total Dissolved Solids (Residue, Filterable)	952	10	mg/L	1	5/10/2019 7:49:00 AM	
<b>TOTAL ORGANIC CARBON IN WATER</b>					<b>A5310B, 2011</b>	Analyst: <b>KR</b>
Total Organic Carbon	51.6	3.0	mg/L	1	5/14/2019 4:24:00 PM	
<b>TOTAL SOLIDS IN WATER</b>					<b>A2540B, 2011</b>	Analyst: <b>MH</b>
Total Solids	985	6	mg/L	1	5/14/2019 4:23:00 PM	

<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	W	Sample container temperature is out of limit as specified at testcode		



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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-002

**Collection Date:** 5/7/2019 1:55:00 PM

**Client Sample ID:** MW 93-2

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	1,360	50.0		mg/L	10	5/10/2019 1:35:00 PM
<b>NITRATE / NITRITE AS N IN WATER</b>				<b>A4500-NO3-F</b>		Analyst: <b>KP</b>
Nitrate/Nitrite as N	< 0.400	0.400		mg/L	1	5/9/2019 5:34:00 PM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	3,890	500		mg/L	100	5/11/2019 2:29:00 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>8727</b>
Boron	1,610	100		ug/L	1	5/15/2019 4:49:00 PM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Arsenic	0.0259	0.00500		mg/L	1	5/10/2019 9:07:21 PM
Barium	0.0749	0.0100		mg/L	1	5/10/2019 9:07:21 PM
Calcium	86.3	0.500		mg/L	1	5/10/2019 9:07:21 PM
Copper	< 0.0100	0.0100		mg/L	1	5/10/2019 9:07:21 PM
Iron	0.0681	0.0500		mg/L	1	5/14/2019 11:22:13 PM
Potassium	237	0.500		mg/L	1	5/10/2019 9:07:21 PM
Selenium	< 0.00500	0.00500		mg/L	1	5/10/2019 9:07:21 PM
Sodium	2,470	5.00		mg/L	1	5/10/2019 9:07:21 PM
<b>ALKALINITY IN WATER</b>				<b>A2320B, 2011</b>		Analyst: <b>CW</b>
Alkalinity, Total (As CaCO3)	360	12.5		mg CaCO3/L	1	5/14/2019 9:32:00 AM
<b>CHEMICAL OXYGEN DEMAND</b>				<b>A5220D, 2011</b>		Analyst: <b>CW</b>
Chemical Oxygen Demand	75.4	5.00		mg/L	1	5/8/2019 1:09:00 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

M Manual Integration used to determine area response  
 PL Permit Limit  
 RL Reporting Detection Limit

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**HARDNESS** **A2340C, 2011** Analyst: **CW**

Hardness, Calcium (As CaCO3)	240	10.0	mg CaCO3/L	5	5/14/2019 1:12:00 PM
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**TOTAL PHOSPHORUS** **4500P-E,2011** Analyst: **CW**

Total Phosphorus	0.285	0.0500	mg/L	1	5/10/2019 11:24:00 AM
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**TOTAL DISSOLVED SOLIDS** **A2540C, 2011** Analyst: **MH**

Total Dissolved Solids (Residue, Filterable)	8,480	10	mg/L	1	5/10/2019 7:49:00 AM
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**TOTAL ORGANIC CARBON IN WATER** **A5310B, 2011** Analyst: **KR**

Total Organic Carbon	33.2	3.0	mg/L	1	5/14/2019 4:24:00 PM
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**TOTAL SOLIDS IN WATER** **A2540B, 2011** Analyst: **MH**

Total Solids	8,720	6	mg/L	1	5/14/2019 4:23:00 PM
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<b>Qualifiers:</b>	H Holding times for preparation or analysis exceeded	M Manual Integration used to determine area response
	ND Not Detected at the Reporting Limit	PL Permit Limit
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	W Sample container temperature is out of limit as specified at testcode	

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-003

**Collection Date:** 5/7/2019 2:55:00 PM

**Client Sample ID:** MW 93-3

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**CHLORIDE IN WATER**

**4500CL-E, 2011**

Analyst: **BG**

Chloride	421	50.0		mg/L	10	5/10/2019 1:35:00 PM
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**NITRATE / NITRITE AS N IN WATER**

**A4500-NO3-F**

Analyst: **KP**

Nitrate/Nitrite as N	0.498	0.400		mg/L	1	5/9/2019 5:34:00 PM
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**SULFATE IN WATER**

**4500SO4-E,2011**

Analyst: **BG**

SO4	105	5.00		mg/L	1	5/11/2019 2:29:00 PM
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**METALS IN WATER BY ICP, TOTAL - N**

**E200.7, 1994 SW3010A**

Analyst: **8727**

Boron	< 100	100		ug/L	1	5/15/2019 4:54:00 PM
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**METALS IN WATER BY ICP, TOTAL**

**E200.7, 1994 SW3010A**

Analyst: **KR**

Arsenic	< 0.00500	0.00500		mg/L	1	5/10/2019 8:34:37 PM
Barium	0.166	0.0100		mg/L	1	5/10/2019 8:34:37 PM
Calcium	110	0.500		mg/L	1	5/10/2019 8:34:37 PM
Copper	< 0.0100	0.0100		mg/L	1	5/10/2019 8:34:37 PM
Iron	0.0501	0.0500		mg/L	1	5/14/2019 11:05:57 PM
Potassium	3.17	0.0500		mg/L	1	5/10/2019 8:34:37 PM
Selenium	< 0.00500	0.00500		mg/L	1	5/10/2019 8:34:37 PM
Sodium	412	0.500		mg/L	1	5/10/2019 8:34:37 PM

**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3)	585	12.5		mg CaCO3/L	1	5/14/2019 9:32:00 AM
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**CHEMICAL OXYGEN DEMAND**

**A5220D, 2011**

Analyst: **CW**

Chemical Oxygen Demand	17.6	5.00		mg/L	1	5/8/2019 1:09:00 PM
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**Qualifiers:** H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

M Manual Integration used to determine area response  
 PL Permit Limit  
 RL Reporting Detection Limit

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# Analytical Report

(continuous)

WO#: **1905151**

Date Reported: **5/16/2019**

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**HARDNESS** **A2340C, 2011** Analyst: **CW**

Hardness, Calcium (As CaCO3)	400	10.0	mg CaCO3/L	5	5/14/2019 1:12:00 PM
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**TOTAL PHOSPHORUS** **4500P-E,2011** Analyst: **CW**

Total Phosphorus	0.0700	0.0500	mg/L	1	5/10/2019 11:24:00 AM
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**TOTAL DISSOLVED SOLIDS** **A2540C, 2011** Analyst: **MH**

Total Dissolved Solids (Residue, Filterable)	1,510	10	mg/L	1	5/10/2019 7:49:00 AM
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**TOTAL ORGANIC CARBON IN WATER** **A5310B, 2011** Analyst: **KR**

Total Organic Carbon	43.6	6.0	mg/L	2	5/15/2019 12:05:00 PM
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**TOTAL SOLIDS IN WATER** **A2540B, 2011** Analyst: **MH**

Total Solids	1,520	6	mg/L	1	5/14/2019 4:23:00 PM
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<b>Qualifiers:</b>	H Holding times for preparation or analysis exceeded	M Manual Integration used to determine area response
	ND Not Detected at the Reporting Limit	PL Permit Limit
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	W Sample container temperature is out of limit as specified at testcode	

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-004

**Collection Date:** 5/7/2019 11:15:00 AM

**Client Sample ID:** MW 03-1

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	5.90	5.00		mg/L	1	5/10/2019 1:35:00 PM
<b>NITRATE / NITRITE AS N IN WATER</b>				<b>A4500-NO3-F</b>		Analyst: <b>KP</b>
Nitrate/Nitrite as N	< 0.400	0.400		mg/L	1	5/9/2019 5:34:00 PM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	12.2	5.00		mg/L	1	5/11/2019 2:29:00 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>8727</b>
Boron	< 100	100		ug/L	1	5/15/2019 4:59:00 PM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Arsenic	< 0.00500	0.00500		mg/L	1	5/10/2019 8:40:13 PM
Barium	0.0415	0.0100		mg/L	1	5/10/2019 8:40:13 PM
Calcium	15.0	0.0500		mg/L	1	5/10/2019 8:40:13 PM
Copper	< 0.0100	0.0100		mg/L	1	5/10/2019 8:40:13 PM
Iron	0.671	0.0500		mg/L	1	5/14/2019 11:11:32 PM
Potassium	0.430	0.0500		mg/L	1	5/10/2019 8:40:13 PM
Selenium	< 0.00500	0.00500		mg/L	1	5/10/2019 8:40:13 PM
Sodium	13.1	0.0500		mg/L	1	5/10/2019 8:40:13 PM
<b>ALKALINITY IN WATER</b>				<b>A2320B, 2011</b>		Analyst: <b>CW</b>
Alkalinity, Total (As CaCO3)	55.0	12.5		mg CaCO3/L	1	5/14/2019 9:32:00 AM
<b>CHEMICAL OXYGEN DEMAND</b>				<b>A5220D, 2011</b>		Analyst: <b>CW</b>
Chemical Oxygen Demand	7.41	5.00		mg/L	1	5/8/2019 1:09:00 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

M Manual Integration used to determine area response  
 PL Permit Limit  
 RL Reporting Detection Limit

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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: **1905151**

Date Reported: **5/16/2019**

**CLIENT:** A & M Engineering  
**Project:** 1st Semi-Annual

**Lab Order:** 1905151

<b>HARDNESS</b>					<b>A2340C, 2011</b>	Analyst: <b>CW</b>
Hardness, Calcium (As CaCO3)	50.0	10.0	mg CaCO3/L	5	5/14/2019 1:12:00 PM	
<b>TOTAL PHOSPHORUS</b>					<b>4500P-E,2011</b>	Analyst: <b>CW</b>
Total Phosphorus	0.110	0.0500	mg/L	1	5/10/2019 11:24:00 AM	
<b>TOTAL DISSOLVED SOLIDS</b>					<b>A2540C, 2011</b>	Analyst: <b>MH</b>
Total Dissolved Solids (Residue, Filterable)	102	10	mg/L	1	5/10/2019 7:49:00 AM	
<b>TOTAL ORGANIC CARBON IN WATER</b>					<b>A5310B, 2011</b>	Analyst: <b>KR</b>
Total Organic Carbon	13.1	3.0	mg/L	1	5/15/2019 12:05:00 PM	
<b>TOTAL SOLIDS IN WATER</b>					<b>A2540B, 2011</b>	Analyst: <b>MH</b>
Total Solids	110	6	mg/L	1	5/14/2019 4:23:00 PM	

<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	W	Sample container temperature is out of limit as specified at testcode		

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-005

**Collection Date:** 5/7/2019 12:15:00 PM

**Client Sample ID:** MW 03-2

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**CHLORIDE IN WATER**

**4500CL-E, 2011**

Analyst: **BG**

Chloride	313	50.0		mg/L	10	5/10/2019 1:35:00 PM
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**NITRATE / NITRITE AS N IN WATER**

**A4500-NO3-F**

Analyst: **KP**

Nitrate/Nitrite as N	0.575	0.400		mg/L	1	5/9/2019 5:34:00 PM
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**SULFATE IN WATER**

**4500SO4-E,2011**

Analyst: **BG**

SO4	29.6	5.00		mg/L	1	5/11/2019 2:29:00 PM
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**METALS IN WATER BY ICP, TOTAL - N**

**E200.7, 1994 SW3010A**

Analyst: **8727**

Boron	< 100	100		ug/L	1	5/15/2019 5:05:00 PM
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**METALS IN WATER BY ICP, TOTAL**

**E200.7, 1994 SW3010A**

Analyst: **KR**

Arsenic	< 0.00500	0.00500		mg/L	1	5/10/2019 8:50:56 PM
Barium	0.0488	0.0100		mg/L	1	5/10/2019 8:50:56 PM
Calcium	267	0.500		mg/L	1	5/10/2019 8:50:56 PM
Copper	< 0.0100	0.0100		mg/L	1	5/10/2019 8:50:56 PM
Iron	< 0.0500	0.0500		mg/L	1	5/14/2019 11:16:52 PM
Potassium	0.645	0.0500		mg/L	1	5/10/2019 8:50:56 PM
Selenium	< 0.00500	0.00500		mg/L	1	5/10/2019 8:50:56 PM
Sodium	138	0.500		mg/L	1	5/10/2019 8:50:56 PM

**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3)	220	12.5		mg CaCO3/L	1	5/14/2019 9:32:00 AM
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**CHEMICAL OXYGEN DEMAND**

**A5220D, 2011**

Analyst: **CW**

Chemical Oxygen Demand	17.3	5.00		mg/L	1	5/8/2019 1:09:00 PM
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**Qualifiers:** H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

M Manual Integration used to determine area response  
 PL Permit Limit  
 RL Reporting Detection Limit

Green Country Testing, Inc.  
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 TEL: 918-828-9977 FAX: 918-828-7756  
 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering  
**Project:** 1st Semi-Annual

**Lab Order:** 1905151

<b>HARDNESS</b>				<b>A2340C, 2011</b>	Analyst: <b>CW</b>
Hardness, Calcium (As CaCO3)	750	10.0	mg CaCO3/L	5	5/14/2019 1:12:00 PM
<b>TOTAL PHOSPHORUS</b>				<b>4500P-E,2011</b>	Analyst: <b>CW</b>
Total Phosphorus	< 0.0500	0.0500	mg/L	1	5/10/2019 11:24:00 AM
<b>TOTAL DISSOLVED SOLIDS</b>				<b>A2540C, 2011</b>	Analyst: <b>MH</b>
Total Dissolved Solids (Residue, Filterable)	1,240	10	mg/L	1	5/10/2019 7:49:00 AM
<b>TOTAL ORGANIC CARBON IN WATER</b>				<b>A5310B, 2011</b>	Analyst: <b>KR</b>
Total Organic Carbon	16.3	3.0	mg/L	1	5/15/2019 12:05:00 PM
<b>TOTAL SOLIDS IN WATER</b>				<b>A2540B, 2011</b>	Analyst: <b>MH</b>
Total Solids	1,490	6	mg/L	1	5/14/2019 4:23:00 PM

<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	W	Sample container temperature is out of limit as specified at testcode		



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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-006

**Collection Date:** 5/7/2019 12:15:00 PM

**Client Sample ID:** Dup

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**CHLORIDE IN WATER**

**4500CL-E, 2011**

Analyst: **BG**

Chloride	1,360	50.0		mg/L	10	5/10/2019 1:35:00 PM
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**NITRATE / NITRITE AS N IN WATER**

**A4500-NO3-F**

Analyst: **KP**

Nitrate/Nitrite as N	< 0.400	0.400		mg/L	1	5/9/2019 5:34:00 PM
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**SULFATE IN WATER**

**4500SO4-E,2011**

Analyst: **BG**

SO4	365	50.0		mg/L	10	5/11/2019 2:29:00 PM
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**METALS IN WATER BY ICP, TOTAL - N**

**E200.7, 1994 SW3010A**

Analyst: **8727**

Boron	1,620	100		ug/L	1	5/15/2019 5:10:00 PM
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**METALS IN WATER BY ICP, TOTAL**

**E200.7, 1994 SW3010A**

Analyst: **KR**

Arsenic	0.0253	0.00500		mg/L	1	5/10/2019 9:44:59 PM
Barium	0.0755	0.0100		mg/L	1	5/10/2019 9:44:59 PM
Calcium	85.1	0.500		mg/L	1	5/10/2019 9:44:59 PM
Copper	< 0.0100	0.0100		mg/L	1	5/10/2019 9:44:59 PM
Iron	0.109	0.0500		mg/L	1	5/14/2019 11:38:24 PM
Potassium	235	0.500		mg/L	1	5/10/2019 9:44:59 PM
Selenium	< 0.00500	0.00500		mg/L	1	5/10/2019 9:44:59 PM
Sodium	2,390	5.00		mg/L	1	5/10/2019 9:44:59 PM

**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3)	370	12.5		mg CaCO3/L	1	5/14/2019 9:32:00 AM
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**CHEMICAL OXYGEN DEMAND**

**A5220D, 2011**

Analyst: **CW**

Chemical Oxygen Demand	86.8	5.00		mg/L	1	5/8/2019 1:09:00 PM
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<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	W	Sample container temperature is out of limit as specified at testcode		

Original

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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**HARDNESS** **A2340C, 2011** Analyst: **CW**

Hardness, Calcium (As CaCO3)	240	10.0	mg CaCO3/L	5	5/14/2019 1:12:00 PM
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**TOTAL PHOSPHORUS** **4500P-E,2011** Analyst: **CW**

Total Phosphorus	0.301	0.0500	mg/L	1	5/10/2019 11:24:00 AM
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**TOTAL DISSOLVED SOLIDS** **A2540C, 2011** Analyst: **MH**

Total Dissolved Solids (Residue, Filterable)	8,520	10	mg/L	1	5/10/2019 7:49:00 AM
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**TOTAL ORGANIC CARBON IN WATER** **A5310B, 2011** Analyst: **KR**

Total Organic Carbon	36.7	3.0	mg/L	1	5/15/2019 12:05:00 PM
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**TOTAL SOLIDS IN WATER** **A2540B, 2011** Analyst: **MH**

Total Solids	8,740	6	mg/L	1	5/14/2019 4:23:00 PM
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<b>Qualifiers:</b>	H Holding times for preparation or analysis exceeded	M Manual Integration used to determine area response
	ND Not Detected at the Reporting Limit	PL Permit Limit
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	W Sample container temperature is out of limit as specified at testcode	

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# Analytical Report

(continuous)

WO#: 1905151

Date Reported: 5/16/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1905151

**Project:** 1st Semi-Annual

**Lab ID:** 1905151-007

**Collection Date:** 5/6/2019 3:00:00 PM

**Client Sample ID:** Trip Blank

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**CHLORIDE IN WATER**

**4500CL-E, 2011**

Analyst: **BG**

Chloride	< 5.00	5.00		mg/L	1	5/10/2019 1:35:00 PM
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**SULFATE IN WATER**

**4500SO4-E,2011**

Analyst: **BG**

SO4	14.5	5.00		mg/L	1	5/11/2019 2:29:00 PM
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**METALS IN WATER BY ICP, TOTAL - N**

**E200.7, 1994 SW3010A**

Analyst: **8727**

Boron	< 100	100		ug/L	1	5/15/2019 5:15:00 PM
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**METALS IN WATER BY ICP, TOTAL**

**E200.7, 1994 SW3010A**

Analyst: **KR**

Calcium	0.0621	0.0500		mg/L	1	5/10/2019 7:56:59 PM
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**FLUORIDE**

**4500 F-C, 2011**

Analyst: **CW**

Fluoride	< 0.200	0.200		mg/L	1	5/13/2019 1:48:00 PM
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**PH**

**4500H+B,2011**

Analyst: **MH**

pH	6.00	0.100	H	pH Units	1	5/13/2019 1:30:00 PM
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**TOTAL DISSOLVED SOLIDS**

**A2540C, 2011**

Analyst: **MH**

Total Dissolved Solids (Residue, Filterable)	91	10		mg/L	1	5/10/2019 7:49:00 AM
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**Qualifiers:**

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode

M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500 F-C, 2011

Sample ID: <b>MB-R36930</b>	SampType: <b>MBLK</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36930</b>
Client ID: <b>PBW</b>	Batch ID: <b>R36930</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397675</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride < 0.200 0.200

Sample ID: <b>LCS-R36930</b>	SampType: <b>LCS</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36930</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R36930</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397676</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 1.77 0.200 2.000 0 88.5 80 120

Sample ID: <b>1905218-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36930</b>
Client ID: <b>BatchQC</b>	Batch ID: <b>R36930</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397680</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 5.73 0.200 5.000 0.2810 109 72.7 139

Sample ID: <b>1905218-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36930</b>
Client ID: <b>BatchQC</b>	Batch ID: <b>R36930</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397681</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 5.69 0.200 5.000 0.2810 108 72.7 139 5.730 0.701 7.08

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500CI-E, 2011

Sample ID: <b>MB-R36917</b>	SampType: <b>MBLK</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397407</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	< 5.00	5.00									

Sample ID: <b>LCS-R36917</b>	SampType: <b>LCS</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397408</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	93.1	5.00	100.0	0	93.1	80	120				

Sample ID: <b>1904437-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397412</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	120	5.00	120.0	8.525	93.2	58.5	126				

Sample ID: <b>1904437-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397413</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	121	5.00	120.0	8.525	94.1	58.5	126	120.4	0.876	4.16	

**Qualifiers:** H Holding times for preparation or analysis exceeded  
 PL Permit Limit  
 S Spike Recovery outside accepted recovery limits  
 M Manual Integration used to determine area response  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

ND Not Detected at the Reporting Limit  
 RL Reporting Detection Limit



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500CI-E, 2011

Sample ID: <b>1905217-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397432</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	209	5.00	120.0	108.2	84.0	58.5	126				

Sample ID: <b>1905217-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397433</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	222	5.00	120.0	108.2	94.6	58.5	126	209.0	5.88	4.16	R

Sample ID: <b>MB-R36917</b>	SampType: <b>MBLK</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36917</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36917</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397439</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	< 5.00	5.00									

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500H+B,2011

Sample ID: <b>LCS-R36935</b>	SampType: <b>LCS</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>36935</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36935</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397693</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	9.01	0.100	9.000	0	100	80	120				

Sample ID: <b>1905115-004ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>36935</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36935</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397695</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	6.37	0.100						6.360	0.157	1.4	H

Sample ID: <b>1905169-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>36935</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36935</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397706</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.63	0.100						7.640	0.131	1.4	H

Sample ID: <b>1905214-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>36935</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36935</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>5/13/2019</b>	SeqNo: <b>397717</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	6.82	0.100						6.810	0.147	1.4	H

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500P-E,2011

Sample ID: <b>MB-R36900</b>	SampType: <b>MBLK</b>	TestCode: <b>PHOS_T</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36900</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36900</b>	TestNo: <b>4500P-E,2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397185</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Phosphorus	< 0.0500	0.0500									

Sample ID: <b>LCS-R36900</b>	SampType: <b>LCS</b>	TestCode: <b>PHOS_T</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36900</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36900</b>	TestNo: <b>4500P-E,2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397186</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Phosphorus	0.583	0.0500	0.6040	0	96.5	50.9	138				

Sample ID: <b>1905151-001BMS</b>	SampType: <b>MS</b>	TestCode: <b>PHOS_T</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36900</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R36900</b>	TestNo: <b>4500P-E,2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397190</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Phosphorus	0.501	0.0500	0.5000	0	100	74	119				

Sample ID: <b>1905151-001BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>PHOS_T</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36900</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R36900</b>	TestNo: <b>4500P-E,2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397191</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Phosphorus	0.506	0.0500	0.5000	0	101	74	119	0.5010	0.993	6.76	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode





# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500SO4-E,2011

Sample ID: <b>MB-R36927</b>	SampType: <b>MBLK</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397562</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	< 5.00	5.00									

Sample ID: <b>LCS-R36927</b>	SampType: <b>LCS</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397563</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	94.9	5.00	100.0	0	94.9	80	120				

Sample ID: <b>1904437-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397565</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	119	5.00	120.0	8.333	92.5	66	117				

Sample ID: <b>1904437-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397566</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	121	5.00	120.0	8.333	94.1	66	117	119.4	1.59	7.6	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500SO4-E,2011

Sample ID: <b>1905217-002AMS</b>	SampType: <b>MS</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397594</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	743	50.0	120.0	656.2	72.0	66	117				

Sample ID: <b>1905217-002AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397595</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	735	50.0	120.0	656.2	65.7	66	117	742.6	1.02	7.6	S

Sample ID: <b>MB-R36927</b>	SampType: <b>MBLK</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36927</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36927</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>5/11/2019</b>	SeqNo: <b>397600</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	< 5.00	5.00									

<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit
	PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A2320B, 2011

Sample ID: <b>MB-R36952</b>	SampType: <b>MBLK</b>	TestCode: <b>ALK</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>36952</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36952</b>	TestNo: <b>A2320B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>397856</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	< 2.50	2.50									

Sample ID: <b>LCS-R36952</b>	SampType: <b>LCS</b>	TestCode: <b>ALK</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>36952</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36952</b>	TestNo: <b>A2320B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>397857</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	102	2.50	100.0	0	102	80	120				

Sample ID: <b>1905151-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>ALK</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>36952</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R36952</b>	TestNo: <b>A2320B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>397859</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	550	12.5						550.0	0	6.17	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A2340C, 2011

Sample ID: <b>MB-R36958</b>	SampType: <b>MBLK</b>	TestCode: <b>HARD</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>36958</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36958</b>	TestNo: <b>A2340C, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>397933</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hardness, Calcium (As CaCO3)	< 2.00	2.00									

Sample ID: <b>LCS-R36958</b>	SampType: <b>LCS</b>	TestCode: <b>HARD</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>36958</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36958</b>	TestNo: <b>A2340C, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>397934</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hardness, Calcium (As CaCO3)	102	2.00	100.0	0	102	80	120				

**Qualifiers:**  
 H Holding times for preparation or analysis exceeded  
 PL Permit Limit  
 S Spike Recovery outside accepted recovery limits

M Manual Integration used to determine area response  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

ND Not Detected at the Reporting Limit  
 RL Reporting Detection Limit



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A2540B, 2011

Sample ID: <b>MB-R36939</b>	SampType: <b>MBLK</b>	TestCode: <b>TS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36939</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36939</b>	TestNo: <b>A2540B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398010</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Solids	< 6	6									

Sample ID: <b>LCS-R36939</b>	SampType: <b>LCS</b>	TestCode: <b>TS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36939</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36939</b>	TestNo: <b>A2540B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398011</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Solids	1,070	6	1,100	0	98	80	120				

Sample ID: <b>1905151-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>TS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36939</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R36939</b>	TestNo: <b>A2540B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398013</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Solids	1,010	6						985	2	4.06	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A2540C, 2011

Sample ID: <b>MB-R36896</b>	SampType: <b>MBLK</b>	TestCode: <b>TDS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36896</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36896</b>	TestNo: <b>A2540C, 2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397467</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filterable) < 10 10

Sample ID: <b>LCS-R36896</b>	SampType: <b>LCS</b>	TestCode: <b>TDS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36896</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36896</b>	TestNo: <b>A2540C, 2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397468</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filterable) 1,000 10 1,000 0 100 80 120

Sample ID: <b>1905151-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>TDS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36896</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R36896</b>	TestNo: <b>A2540C, 2011</b>		Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397470</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filterable) 989 10 952 4 4.82

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A5220D, 2011

Sample ID: <b>MB-R36844</b>	SampType: <b>MBLK</b>	TestCode: <b>COD</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36846</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36846</b>	TestNo: <b>A5220D, 2011</b>		Analysis Date: <b>5/8/2019</b>	SeqNo: <b>396746</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chemical Oxygen Demand

< 5.00 5.00

Sample ID: <b>LCS-R36844</b>	SampType: <b>LCS</b>	TestCode: <b>COD</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36846</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36846</b>	TestNo: <b>A5220D, 2011</b>		Analysis Date: <b>5/8/2019</b>	SeqNo: <b>396747</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chemical Oxygen Demand

77.3 5.00 75.00 0 103 90 110

Sample ID: <b>1905132-003AMS</b>	SampType: <b>MS</b>	TestCode: <b>COD</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36846</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36846</b>	TestNo: <b>A5220D, 2011</b>		Analysis Date: <b>5/8/2019</b>	SeqNo: <b>396751</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chemical Oxygen Demand

112 5.00 75.00 41.86 93.7 75.4 117

Sample ID: <b>1905132-003AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>COD</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36846</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36846</b>	TestNo: <b>A5220D, 2011</b>		Analysis Date: <b>5/8/2019</b>	SeqNo: <b>396752</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chemical Oxygen Demand

117 5.00 75.00 41.86 100 75.4 117 112.1 4.45 7.07

**Qualifiers:** H Holding times for preparation or analysis exceeded  
 PL Permit Limit  
 S Spike Recovery outside accepted recovery limits  
 M Manual Integration used to determine area response  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

ND Not Detected at the Reporting Limit  
 RL Reporting Detection Limit



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A5310B, 2011

Sample ID: <b>MB-R36992</b>	SampType: <b>MBLK</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36992</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36992</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398304</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon < 3.0 3.0

Sample ID: <b>LCS-R36992</b>	SampType: <b>LCS</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36992</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36992</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398305</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 25.4 3.0 25.0 0 102 85 115

Sample ID: <b>1905054-001BMS</b>	SampType: <b>MS</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36992</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36992</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398307</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 33.5 3.0 20.0 14.0 97.6 29.2 182

Sample ID: <b>1905054-001BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36992</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36992</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398308</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 32.4 3.0 20.0 14.0 92.0 29.2 182 33.5 3.4 7.49

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode





# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A5310B, 2011

Sample ID: <b>1905104-005BMS</b>	SampType: <b>MS</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36992</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36992</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398318</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	36.8	3.0	20.0	16.0	104	29.2	182				

Sample ID: <b>1905104-005BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36992</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36992</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398318</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	37.0	3.0	20.0	16.0	105	29.2	182	36.8	0.6	7.49	

Sample ID: <b>MB-R36993</b>	SampType: <b>MBLK</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36993</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R36993</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/15/2019</b>	SeqNo: <b>398330</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	< 3.0	3.0									

Sample ID: <b>LCS-R36993</b>	SampType: <b>LCS</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36993</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R36993</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/15/2019</b>	SeqNo: <b>398331</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	26.5	3.0	25.0	0	106	85	115				

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** A5310B, 2011

Sample ID: <b>1905151-003CMS</b>	SampType: <b>MS</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36993</b>						
Client ID: <b>MW 93-3</b>	Batch ID: <b>R36993</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/15/2019</b>	SeqNo: <b>398333</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	64.5	6.0	20.0	43.6	104	29.2	182				

Sample ID: <b>1905151-003CMSD</b>	SampType: <b>MSD</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36993</b>						
Client ID: <b>MW 93-3</b>	Batch ID: <b>R36993</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/15/2019</b>	SeqNo: <b>398334</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	63.0	6.0	20.0	43.6	97.0	29.2	182	64.5	2.3	7.49	

Sample ID: <b>1905169-007BMS</b>	SampType: <b>MS</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36993</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36993</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/15/2019</b>	SeqNo: <b>398345</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	31.4	3.0	20.0	14.6	84.4	29.2	182				

Sample ID: <b>1905169-007BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>TOC</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>36993</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R36993</b>	TestNo: <b>A5310B, 2011</b>		Analysis Date: <b>5/15/2019</b>	SeqNo: <b>398346</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	31.6	3.0	20.0	14.6	85.1	29.2	182	31.4	0.4	7.49	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** E200.7, 1994

Sample ID: <b>MB-10321</b>	SampType: <b>MBLK</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>5/9/2019</b>	RunNo: <b>36925</b>						
Client ID: <b>PBW</b>	Batch ID: <b>10321</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397538</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	< 0.00500	0.00500									
Barium	< 0.0100	0.0100									
Calcium	< 0.0500	0.0500									
Copper	< 0.0100	0.0100									
Potassium	< 0.0500	0.0500									
Selenium	< 0.00500	0.00500									
Sodium	< 0.0500	0.0500									

Sample ID: <b>LCS-10321</b>	SampType: <b>LCS</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>5/9/2019</b>	RunNo: <b>36925</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>10321</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>5/10/2019</b>	SeqNo: <b>397539</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.98	0.00500	2.000	0	98.9	85	115				
Barium	1.96	0.0100	2.000	0	98.2	85	115				
Calcium	2.10	0.0500	2.000	0	105	85	115				
Copper	2.00	0.0100	2.000	0	100	85	115				
Potassium	19.9	0.0500	20.00	0	99.7	85	115				
Selenium	1.91	0.00500	2.000	0	95.4	85	115				
Sodium	2.06	0.0500	2.000	0	103	85	115				

<b>Qualifiers:</b>	H Holding times for preparation or analysis exceeded	M Manual Integration used to determine area response	ND Not Detected at the Reporting Limit
	PL Permit Limit	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S Spike Recovery outside accepted recovery limits	W Sample container temperature is out of limit as specified at testcode	



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** E200.7, 1994

Sample ID:	1905181-001AMS	SampType:	MS	TestCode:	MET_WW_T	Units:	mg/L	Prep Date:	5/9/2019	RunNo:	36925
Client ID:	BatchQC	Batch ID:	10321	TestNo:	E200.7, 1994	SW3010A		Analysis Date:	5/10/2019	SeqNo:	397541
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.01	0.00500	2.000	0	101	80.3	117				
Barium	2.06	0.0100	2.000	0.06525	99.9	88.4	109				
Calcium	56.3	0.0500	2.000	54.28	102	21.9	163				
Copper	2.07	0.0100	2.000	0.1007	98.6	81.3	116				
Potassium	23.6	0.0500	20.00	3.189	102	87.1	111				
Selenium	1.92	0.00500	2.000	0	96.2	78.5	115				
Sodium	15.5	0.0500	2.000	13.61	96.0	48.4	144				

Sample ID:	1905181-001AMSD	SampType:	MSD	TestCode:	MET_WW_T	Units:	mg/L	Prep Date:	5/9/2019	RunNo:	36925
Client ID:	BatchQC	Batch ID:	10321	TestNo:	E200.7, 1994	SW3010A		Analysis Date:	5/10/2019	SeqNo:	397542
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.02	0.00500	2.000	0	101	80.3	117	2.013	0.149	3.26	
Barium	2.06	0.0100	2.000	0.06525	99.7	88.4	109	2.064	0.194	3.25	
Calcium	56.2	0.0500	2.000	54.28	94.0	21.9	163	56.31	0.267	2.28	
Copper	2.08	0.0100	2.000	0.1007	98.9	81.3	116	2.073	0.289	3.36	
Potassium	23.6	0.0500	20.00	3.189	102	87.1	111	23.61	0	3	
Selenium	1.93	0.00500	2.000	0	96.4	78.5	115	1.925	0.208	3.4	
Sodium	15.5	0.0500	2.000	13.61	96.5	48.4	144	15.53	0.0644	2.93	

**Qualifiers:** H Holding times for preparation or analysis exceeded  
 PL Permit Limit  
 S Spike Recovery outside accepted recovery limits  
 M Manual Integration used to determine area response  
 R RPD outside accepted recovery limits  
 W Sample container temperature is out of limit as specified at testcode

ND Not Detected at the Reporting Limit  
 RL Reporting Detection Limit



# QC SUMMARY REPORT

WO#: 1905151

16-May-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** E200.7, 1994

Sample ID: <b>MB-10321</b>	SampType: <b>MBLK</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>5/9/2019</b>	RunNo: <b>36925</b>						
Client ID: <b>PBW</b>	Batch ID: <b>10321</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398121</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	< 0.0500	0.0500									

Sample ID: <b>LCS-10321</b>	SampType: <b>LCS</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>5/9/2019</b>	RunNo: <b>36925</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>10321</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398122</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	2.04	0.0500	2.000	0	102	85	115				

Sample ID: <b>1905181-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>5/9/2019</b>	RunNo: <b>36925</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>10321</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398124</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	2.37	0.0500	2.000	0.3033	103	72.1	125				

Sample ID: <b>1905181-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>5/9/2019</b>	RunNo: <b>36925</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>10321</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>5/14/2019</b>	SeqNo: <b>398125</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	2.68	0.0500	2.000	0.3033	119	72.1	125	2.370	12.2	5.07	R

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit R RPD outside accepted recovery limits RL Reporting Detection Limit  
 S Spike Recovery outside accepted recovery limits W Sample container temperature is out of limit as specified at testcode



# Chain of Custody Record

Laboratory Number: **1905151**

Company Name: <b>ATM Engineering</b>	Billing Information:	PO Number: <b>1986-002-001</b>	Project Name/Number: <b>1st Semi-Annual</b>	Page <b>1</b> of <b>2</b>
Contact Name: <b>Ed Van Schaik</b>		Quote Number:	Turn Time	
Address:		Required QC Level: <b>Std</b>	Sampler's Signature	<input type="checkbox"/> 1 Day
City, State Zip:		Bill Monthly: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Shipping Method: <b>Handy</b> GCT / Mail	<input type="checkbox"/> 2 Day
Phone Number: Ext:	Ext:			<input checked="" type="checkbox"/> Standard
Fax Number:				<input type="checkbox"/> Other
E-mail Address:				(Rush turn times will incur a surcharge.)

Which Regulations Apply:		Matrix Code:		Container		Pres.	Requested Tests								Comments	
<input type="checkbox"/> RCRA <input type="checkbox"/> Drinking Water <input type="checkbox"/> POTW <input type="checkbox"/> Distribution <input type="checkbox"/> NPDES <input type="checkbox"/> Special <input type="checkbox"/> USDA/FDA <input type="checkbox"/> State <input type="checkbox"/> RECAP/RISC <input type="checkbox"/> Other		SO = Soil O = Oil AQ = Aqueous SL = Sludge DW = Drinking F = Food WW = Waste SW = Swab MW = Monit. Well LQ = Liquid SOL = Solid		Number	Type P=Plastic, G=Glass, V=Vial	HCl, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub>	Alkalinity	Sulfate	Hardness	Nitrate-Nitrogen	Total Residue	TDS	COD	TOC		Arsenic
Sample ID/Description	Date	Time	Grab/Composite	Matrix												
MW 93-1	5-7-19	1305	G	AQ	5	P, G		X	X	X	X	X	X	X	X	X
MW 93-2	5-7-19	1355	G	AQ	5	P, G		X	X	X	X	X	X	X	X	X
MW 93-3	5-7-19	1455	G	AQ	5	P, G		X	X	X	X	X	X	X	X	X
MW 03-1	5-7-19	1115	G	AQ	5	P, G		X	X	X	X	X	X	X	X	X
MW 03-2	5-7-19	1215	G	AQ	5	P, G		X	X	X	X	X	X	X	X	X
<del>Trip Blank Dup.</del>	5-7-19	-	G	AA		P, G		X	X	X	X	X	X	X	X	X

GREEN COUNTRY TESTING  
CHAIN OF CUSTODY  
ATTACHMENT  
1 OF 2 PAGES

	Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
1	<b>Ed Van Schaik</b>	<b>5-7-19 1612</b>	<b>[Signature]</b>	<b>5/7/19 1612</b>	
2					
3					Received on ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4					Temp: <b>14'</b>

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.

6825 E. 38th Street  
Tulsa, OK 74145  
918-828-9977  
Fax: 918-828-7756



# Chain of Custody Record

Laboratory Number: **1905187**

Company Name:	<b>Alt M Engineering</b>	Billing Information:	PO Number:	Project Name/Number:	Page <b>2</b> of <b>2</b>
Contact Name:	<b>Ed Van Schaik</b>		<b>1986-002-001</b>	<b>1st Semi-Annual</b>	
Address:			Quote Number:	Sampler's Signature:	Turn Time
City, State Zip:					<input type="checkbox"/> 1 Day
Phone Number:	Ext:	Ext:	Required QC Level:		<input type="checkbox"/> 2 Day
Fax Number:			<b>Std</b>		<input checked="" type="checkbox"/> Standard
E-mail Address:			Bill Monthly:	Shipping Method:	<input type="checkbox"/> Other
			<input type="checkbox"/> Yes	UPS / FedEx / Air	(Rush turn times will incur a surcharge.)
			<input type="checkbox"/> No	<b>Hand</b> / GCT / Mail	

Which Regulations Apply:		Matrix Code:		Container		Pres.	Requested Tests								Comments		
Sample ID/Description	Date	Time	Grab/Composite	Matrix	Number	Type P=Plastic, G=Glass, V=Vinl	HCl, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Barium	Calcium	Chloride	Copper	Iron	Phosphorous	Potassium		Selenium	Sodium
MW 93-1	5-7-19	1305	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 93-2	5-7-19	1355	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 93-3	5-7-19	1455	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 03-1	5-7-19	1115	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 03-2	5-7-19	1215	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
<del>TRP Blank</del> Dup	5-7-19	-	G	AQ	4	P,G		X	X	X	X	X	X	X	X	X	

REENCOUNTRYTESTING  
CHAIN OF CUSTODY  
ATTACHMENT  
**2 OF 2 PAGES**

	Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
1	<b>Ed Van Schaik</b>	<b>5-7-19 1612</b>	<i>[Signature]</i>	<b>5/7/19 16:12</b>	
2					
3					Received on ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4					Temp: <b>14</b>

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.

6825 E. 38th Street  
Tulsa, OK 74145  
918-828-9977  
Fax: 918-828-7756





Green Country Testing, Inc.  
6825 E 38th Street  
Tulsa, OK 74145  
TEL: 918-828-9977 FAX: 918-828-7756  
Website: www.greencountrytesting.com



July 11, 2019

Tom Trebonik  
A & M Engineering  
10010 E. 16th St.  
Tulsa, OK 74128-4813  
TEL: (918) 665-6575  
FAX: (918) 665-6576

RE: 1st Semi-Annual

Order No.: 1907171

Dear Tom Trebonik:

Green Country Testing, Inc. received 6 sample(s) on 7/10/2019 for the analyses presented in the following report.

In accordance with your instructions, Green Country Testing conducted the analysis shown on the following pages on samples submitted by your company. The results relate only to the items tested. Unless otherwise noted, all analysis were conducted using EPA approved methodologies. Test reports meet all the NELAC requirements. All relevant sampling information is on the attached chain-of-custody form. The initials SUB as the analyst designate any testing sub-contracted by Green Country Testing.

Certifications/Accreditation: OK - 7604 - AR - ADEQ - KS - E-10232 - LA - 4002

A scope of Certified/Accredited parameters is available upon request. If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian Duzan", with a stylized flourish at the end.

Brian Duzan  
Laboratory Director

**CC:**  
Accounts Payable  
Jeff Elbert

Original

Green Country Testing, Inc.  
 6825 E 38th Street  
 Tulsa, OK 74145  
 TEL: 918-828-9977 FAX: 918-828-7756  
 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1907171

Date Reported: 7/11/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1907171

**Project:** 1st Semi-Annual

**Lab ID:** 1907171-001

**Collection Date:** 5/7/2019 1:05:00 PM

**Client Sample ID:** MW 93-1

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**FLUORIDE** 4500 F-C, 2011 Analyst: CW

Fluoride	< 0.200	0.200	H	mg/L	1	7/11/2019 7:57:00 AM
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**Lab ID:** 1907171-002

**Collection Date:** 5/7/2019 1:55:00 PM

**Client Sample ID:** MW 93-2

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**FLUORIDE** 4500 F-C, 2011 Analyst: CW

Fluoride	0.367	0.200	H	mg/L	1	7/11/2019 7:57:00 AM
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**Lab ID:** 1907171-003

**Collection Date:** 5/7/2019 2:55:00 PM

**Client Sample ID:** MW 93-3

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**FLUORIDE** 4500 F-C, 2011 Analyst: CW

Fluoride	< 0.200	0.200	H	mg/L	1	7/11/2019 7:57:00 AM
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**Qualifiers:**

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode

M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Green Country Testing, Inc.  
 6825 E 38th Street  
 Tulsa, OK 74145  
 TEL: 918-828-9977 FAX: 918-828-7756  
 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1907171

Date Reported: 7/11/2019

**CLIENT:** A & M Engineering

**Lab Order:** 1907171

**Project:** 1st Semi-Annual

**Lab ID:** 1907171-004

**Collection Date:** 5/7/2019 11:15:00 AM

**Client Sample ID:** MW 03-1

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**FLUORIDE** 4500 F-C, 2011 Analyst: CW

Fluoride	< 0.200	0.200	H	mg/L	1	7/11/2019 7:57:00 AM
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**Lab ID:** 1907171-005

**Collection Date:** 5/7/2019 12:15:00 PM

**Client Sample ID:** MW 03-2

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**FLUORIDE** 4500 F-C, 2011 Analyst: CW

Fluoride	< 0.200	0.200	H	mg/L	1	7/11/2019 7:57:00 AM
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**Lab ID:** 1907171-006

**Collection Date:** 5/7/2019

**Client Sample ID:** DUP

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
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**FLUORIDE** 4500 F-C, 2011 Analyst: CW

Fluoride	0.379	0.200	H	mg/L	1	7/11/2019 7:57:00 AM
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<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	W	Sample container temperature is out of limit as specified at testcode		

Original



# QC SUMMARY REPORT

WO#: 1907171  
 11-Jul-19

**Client:** A & M Engineering  
**Project:** 1st Semi-Annual

**TestNo:** 4500 F-C, 2011

Sample ID: <b>MB-R37915</b>	SampType: <b>MBLK</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>37915</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R37915</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>7/11/2019</b>	SeqNo: <b>408354</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	< 0.200	0.200									

Sample ID: <b>LCS-R37915</b>	SampType: <b>LCS</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>37915</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R37915</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>7/11/2019</b>	SeqNo: <b>408355</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.99	0.200	2.000	0	99.5	80	120				

Sample ID: <b>1907171-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>37915</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R37915</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>7/11/2019</b>	SeqNo: <b>408357</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	4.41	0.200	5.000	0	88.2	72.7	139				H

Sample ID: <b>1907171-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>37915</b>						
Client ID: <b>MW 93-1</b>	Batch ID: <b>R37915</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>7/11/2019</b>	SeqNo: <b>408358</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	4.08	0.200	5.000	0	81.6	72.7	139	4.410	7.77	7.08	RH

**Qualifiers:** H Holding times for preparation or analysis exceeded  
 PL Permit Limit  
 W Sample container temperature is out of limit as specified at testcode

M Manual Integration used to determine area response  
 R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit  
 RL Reporting Detection Limit



# Chain of Custody Record

*Rush*

relog: 1902171

Laboratory Number: 1905157

Company Name: <i>ATM Engineering</i>	Billing Information:	PO Number: <i>1986-002-001</i>	Project Name/Number: <i>1st Semi-Annual</i>	Page 1 of 2
Contact Name: <i>Ed Van Schaik</i>		Quote Number:	Turn Time	
Address:		Required QC Level: <i>Std</i>	Sampler's Signature:	<input type="checkbox"/> 1 Day
City, State Zip:		Bill Monthly: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Shipping Method: <i>Hand</i> UPS / FedEx / Air GCT / Mail	<input type="checkbox"/> 2 Day
Phone Number: Ext:	Ext:			<input checked="" type="checkbox"/> Standard
Fax Number:				<input type="checkbox"/> Other
E-mail Address:				(Rush turn times will incur a surcharge.)

Which Regulations Apply:	Matrix Code:	SO = Soil O = Oil	Container		Pres.	Requested Tests										Comments		
			Number	Type P=Plastic, G=Glass, V=Vial		HCL, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Alkalinity	Sulfate	Hardness	Nitrate-Nitrogen	Total Residue	TPS	COD	TOC	Arsenic		Barium	
<input type="checkbox"/> RCRA <input type="checkbox"/> Drinking Water	AQ = Aqueous																	Per: Tom Trebonik add Fluoride 7/10/19
<input type="checkbox"/> POTW <input type="checkbox"/> Distribution	DW = Drinking	SL = Sludge																
<input type="checkbox"/> NPDES <input type="checkbox"/> Special	WW = Waste	F = Food																
<input type="checkbox"/> USDA/FDA <input type="checkbox"/> State	MW = Monit. Well	SW = Swab																
<input type="checkbox"/> RECAP/RISC <input type="checkbox"/> Other	LQ = Liquid	SOL = Solid																
Sample ID/Description	Date	Time	Grab/Composite	Matrix	Number	Type	Pres.	Alkalinity	Sulfate	Hardness	Nitrate-Nitrogen	Total Residue	TPS	COD	TOC	Arsenic	Barium	
MW 93-1	5-7-19	1305	G	AQ	5	PG		X	X	X	X	X	X	X	X	X	X	
MW 93-2	5-7-19	1355	G	AQ	5	PG		X	X	X	X	X	X	X	X	X	X	
MW 93-3	5-7-19	1455	G	AQ	5	PG		X	X	X	X	X	X	X	X	X	X	
MW 03-1	5-7-19	1115	G	AQ	5	PG		X	X	X	X	X	X	X	X	X	X	
MW 03-2	5-7-19	1215	G	AQ	5	PG		X	X	X	X	X	X	X	X	X	X	
<del>Imp Stack Dup.</del>	5-7-19	-	G	AA		PG		X	X	X	X	X	X	X	X	X	X	

Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
<i>Ed Van Schaik</i>	<i>5-7-19 1612</i>	<i>[Signature]</i>	<i>5/17/19 1612</i>	
				Received on ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
				Temp: <i>4</i>

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.

6825 E. 38th Street  
Tulsa, OK 74145  
918-828-9977  
Fax: 918-828-7756



Chain of Custody Record

RUSH

relog: 1907171

Laboratory Number: 1905157

Company Name: <b>Alt M Engineering</b>	Billing Information:	PO Number: <b>1986-002-001</b>	Project Name/Number: <b>1<sup>st</sup> Semi-Annual</b>	Page 2 of 2
Contact Name: <b>Ed Van Schaik</b>		Quote Number:	Sampler's Signature	
Address:		Required QC Level: <b>Std</b>	Shipping Method: <input checked="" type="checkbox"/> UPS / FedEx / Air <input checked="" type="checkbox"/> Hand / GCT / Mail	Turn Time <input type="checkbox"/> 1 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other (Rush turn times will incur a surcharge.)
City, State Zip:	Ext:	Ext:		
Phone Number:				
Fax Number:				
E-mail Address:				

Which Regulations Apply:		Matrix Code:		Container		Pres.	Requested Tests								Comments		
Sample ID/Description	Date	Time	Grab/Composite	Matrix	Number	Type	HCl, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Barium	Calcium	Chloride	Copper	Iron	Phosphorous	Potassium		Selenium	Sodium
MW 93-1	5-7-19	1305	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 93-2	5-7-19	1355	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 93-3	5-7-19	1455	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 03-1	5-7-19	1115	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
MW 03-2	5-7-19	1215	G	AQ	5	P,G		X	X	X	X	X	X	X	X	X	
<del>Trunk Dig</del>	5-7-19	-	G	AQ	4	P,G		X	X	X	X	X	X	X	X	X	

Per: Tom Trebonik add fluoride 7/10/19

GREENCOUNTRYTESTING  
CHAIN OF CUSTODY  
ATTACHMENT  
2 OF 2 PAGES

	Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
1	Ed Van Schaik	5-7-19 1612	[Signature]	5/7/19 10:12	
2					
3					Received or ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4					Temp: 14

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples.

Green Country Testing reserves the right to return unused sample portions.

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December 30, 2019

Ed Van Schaik  
A & M Engineering  
10010 E. 16th St.  
Tulsa, OK 74128-4813  
TEL: (918) 665-6575  
FAX: (918) 665-6576

RE: GRDA 2nd Semi-Annual

Order No.: 1911404

Dear Ed Van Schaik:

Green Country Testing, Inc. received 5 sample(s) on 11/22/2019 for the analyses presented in the following report.

In accordance with your instructions, Green Country Testing conducted the analysis shown on the following pages on samples submitted by your company. The results relate only to the items tested. Unless otherwise noted, all analysis were conducted using EPA approved methodologies. Test reports meet all the NELAC requirements. All relevant sampling information is on the attached chain-of-custody form. The initials SUB as the analyst designate any testing sub-contracted by Green Country Testing.

Certifications/Accreditation: OK - 7604 - AR - ADEQ - KS - E-10232

A scope of Certified/Accredited parameters is available upon request. If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian Duzan", with a stylized flourish at the end.

Brian Duzan  
Laboratory Director

**CC:**  
Accounts Payable  
Jeff Elbert

Original



Green Country Testing, Inc.  
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Tulsa, OK 74145  
TEL: 918-828-9977 FAX: 918-828-7756  
Website: www.greencountrytesting.com



## Case Narrative

WO#: 1911404  
Date: 12/30/2019

---

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

---

1911404  
MET\_Boron has been Sub Contracted.  
1911404  
MET\_ODD has been Sub Contracted.  
1911404  
MET\_WW\_ICPMS has been Sub Contracted.  
1911404  
Radium Calculation has been Sub Contracted.  
1911404  
Radium-226 has been Sub Contracted.  
1911404  
Radium-228 has been Sub Contracted.  
1911404  
MET\_Boron has been Sub Contracted.  
1911404  
MET\_ODD has been Sub Contracted.  
1911404  
MET\_WW\_ICPMS has been Sub Contracted.  
1911404  
Radium Calculation has been Sub Contracted.  
1911404  
MET\_Boron has been Sub Contracted.  
1911404  
MET\_ODD has been Sub Contracted.  
1911404  
MET\_WW\_ICPMS has been Sub Contracted.  
1911404  
Radium Calculation has been Sub Contracted.  
1911404  
MET\_Boron has been Sub Contracted.  
1911404  
MET\_ODD has been Sub Contracted.  
1911404

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## Case Narrative

WO#: 1911404  
Date: 12/30/2019

---

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

---

MET\_WW\_ICPMS has been Sub Contracted.  
1911404  
Radium Calculation has been Sub Contracted.  
1911404  
MET\_Boron has been Sub Contracted.  
1911404  
MET\_ODD has been Sub Contracted.  
1911404  
MET\_WW\_ICPMS has been Sub Contracted.  
1911404  
Radium Calculation has been Sub Contracted.

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# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**Lab ID:** 1911404-001

**Collection Date:** 11/21/2019 12:10:00 PM

**Client Sample ID:** MW 93-01

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	22.0	5.00		mg/L	1	11/25/2019 8:53:00 AM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	299	50.0		mg/L	10	11/25/2019 10:05:00 AM
<b>MERCURY IN WATER, TOTAL</b>				<b>E245.1, 1994</b>		Analyst: <b>KR</b>
Mercury	< 0.0000500	0.0000500		mg/L	1	11/26/2019 6:40:59 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994</b>		Analyst: <b>9915</b>
Boron	0.303	0.200		mg/L	1	11/26/2019 3:34:00 AM
<b>METALS IN WATER BY ICP/MS</b>				<b>E200.8</b>		Analyst: <b>9915</b>
Antimony	< 0.00200	0.00200		mg/L	1	11/27/2019 9:34:00 AM
Arsenic	< 0.00100	0.00100		mg/L	1	11/27/2019 9:34:00 AM
Beryllium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:34:00 AM
Lead	< 0.00100	0.00100		mg/L	1	11/27/2019 9:34:00 AM
Thallium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:34:00 AM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Barium	0.0321	0.0100		mg/L	1	11/27/2019 2:39:42 PM
Cadmium	0.00112	0.00100		mg/L	1	11/27/2019 2:39:42 PM
Calcium	228	0.500		mg/L	1	11/27/2019 2:39:42 PM
Chromium	< 0.0100	0.0100		mg/L	1	11/27/2019 2:39:42 PM
Cobalt	< 0.00600	0.00600		mg/L	1	11/27/2019 2:39:42 PM
Molybdenum	< 0.0100	0.0100		mg/L	1	11/27/2019 2:39:42 PM
Selenium	< 0.00500	0.00500		mg/L	1	11/27/2019 2:39:42 PM
Sodium	99.1	0.500		mg/L	1	11/27/2019 2:39:42 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response  
 ND Not Detected at the Reporting Limit PL Permit Limit  
 RL Reporting Detection Limit W Sample container temperature is out of limit as specified at testcode

Green Country Testing, Inc.  
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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**METALS BY ICP**

**SW6010B**

Analyst: **9915**

Lithium < 0.0150 0.0150 mg/L 1 11/29/2019 10:13:00 PM

**RADIUM - N**

**PER CLIENT**

Analyst: **8727**

Total Radium by Calculation 0.872+/-0.759 1.52 pCi/L 1 12/19/2019

**RADIUM - N**

**E903.1**

Analyst: **8727**

Radium-226 -0.0852+/-0.373 0.787 pCi/L 1 12/19/2019

**RADIUM - N**

**E904.0**

Analyst: **8727**

Radium-228 0.872+/-0.386 0.731 pCi/L 1 12/10/2019

**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3) 480 12.5 mg CaCO3/L 1 11/26/2019 11:44:00 AM

**SPECIFIC CONDUCTANCE**

**E120.1, 1982**

Analyst: **DW**

Specific Conductivity 1,510 3.00 µmhos/cm 3 11/27/2019 2:30:00 PM

**FLUORIDE**

**4500 F-C, 2011**

Analyst: **CW**

Fluoride < 0.200 0.200 mg/L 1 11/26/2019 8:53:00 AM

**PH**

**4500H+B,2011**

Analyst: **DW**

pH 6.46 0.100 H pH Units 1 11/27/2019 10:15:00 AM

**TOTAL DISSOLVED SOLIDS**

**A2540C, 2011**

Analyst: **DW**

Total Dissolved Solids (Residue, Filterable) 966 20 mg/L 2 11/25/2019 9:00:00 AM

<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	W	Sample container temperature is out of limit as specified at testcode

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# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**Lab ID:** 1911404-002

**Collection Date:** 11/21/2019 1:20:00 PM

**Client Sample ID:** MW 93-02

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	< 5.00	5.00		mg/L	1	11/25/2019 8:53:00 AM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	12.4	5.00		mg/L	1	11/25/2019 10:05:00 AM
<b>MERCURY IN WATER, TOTAL</b>				<b>E245.1, 1994</b>		Analyst: <b>KR</b>
Mercury	< 0.0000500	0.0000500		mg/L	1	11/26/2019 6:40:59 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994</b>		Analyst: <b>9915</b>
Boron	1.76	0.200		mg/L	1	11/26/2019 3:37:00 AM
<b>METALS IN WATER BY ICP/MS</b>				<b>E200.8</b>		Analyst: <b>9915</b>
Antimony	< 0.00200	0.00200		mg/L	1	11/27/2019 9:37:00 AM
Arsenic	0.0197	0.00100		mg/L	1	11/27/2019 9:37:00 AM
Beryllium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:37:00 AM
Lead	< 0.00100	0.00100		mg/L	1	11/27/2019 9:37:00 AM
Thallium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:37:00 AM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994</b>	<b>SW3010A</b>	Analyst: <b>KR</b>
Barium	0.100	0.0100		mg/L	1	11/27/2019 3:11:53 PM
Cadmium	< 0.00100	0.00100		mg/L	1	11/27/2019 3:11:53 PM
Calcium	117	0.500		mg/L	1	11/27/2019 3:11:53 PM
Chromium	< 0.0100	0.0100		mg/L	1	11/27/2019 3:11:53 PM
Cobalt	< 0.00600	0.00600		mg/L	1	11/27/2019 3:11:53 PM
Molybdenum	0.252	0.0100		mg/L	1	11/27/2019 3:11:53 PM
Selenium	0.00621	0.00500		mg/L	1	11/27/2019 3:11:53 PM
Sodium	2,500	5.00		mg/L	1	11/27/2019 3:11:53 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response  
 ND Not Detected at the Reporting Limit PL Permit Limit  
 RL Reporting Detection Limit W Sample container temperature is out of limit as specified at testcode

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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**METALS BY ICP**

**SW6010B**

Analyst: **9915**

Lithium < 0.0150 0.0150 mg/L 1 11/29/2019 10:15:00 PM

**RADIUM - N**

**PER CLIENT**

Analyst: **8727**

Total Radium by Calculation 1.25+/-0.678 0.850 pCi/L 1 12/19/2019

**RADIUM - N**

**E903.1**

Analyst: **8727**

Radium-226 0.545+/-0.305 0.271 pCi/L 1 12/19/2019

**RADIUM - N**

**E904.0**

Analyst: **8727**

Radium-228 0.701+/-0.373 0.579 pCi/L 1 12/10/2019

**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3) 360 12.5 mg CaCO3/L 1 11/26/2019 11:44:00 AM

**SPECIFIC CONDUCTANCE**

**E120.1, 1982**

Analyst: **DW**

Specific Conductivity 15,400 20.0 µmhos/cm 20 11/27/2019 2:30:00 PM

**FLUORIDE**

**4500 F-C, 2011**

Analyst: **CW**

Fluoride 0.554 0.200 mg/L 1 11/26/2019 8:53:00 AM

**PH**

**4500H+B,2011**

Analyst: **DW**

pH 8.44 0.100 H pH Units 1 11/27/2019 10:15:00 AM

**TOTAL DISSOLVED SOLIDS**

**A2540C, 2011**

Analyst: **DW**

Total Dissolved Solids (Residue, Filterable) 8,400 20 mg/L 2 11/25/2019 9:00:00 AM

<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	W	Sample container temperature is out of limit as specified at testcode

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# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**Lab ID:** 1911404-003

**Collection Date:** 11/21/2019 2:30:00 PM

**Client Sample ID:** MW 93-03

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	1,070	50.0		mg/L	10	11/25/2019 8:53:00 AM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	4,010	500		mg/L	100	11/25/2019 10:05:00 AM
<b>MERCURY IN WATER, TOTAL</b>				<b>E245.1, 1994</b>		Analyst: <b>KR</b>
Mercury	0.000861	0.0000500		mg/L	1	11/26/2019 6:40:59 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994</b>		Analyst: <b>9915</b>
Boron	< 0.200	0.200		mg/L	1	11/26/2019 3:40:00 AM
<b>METALS IN WATER BY ICP/MS</b>				<b>E200.8</b>		Analyst: <b>9915</b>
Antimony	< 0.00200	0.00200		mg/L	1	11/27/2019 9:40:00 AM
Arsenic	< 0.00100	0.00100		mg/L	1	11/27/2019 9:40:00 AM
Beryllium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:40:00 AM
Lead	< 0.00100	0.00100		mg/L	1	11/27/2019 9:40:00 AM
Thallium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:40:00 AM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Barium	0.116	0.0100		mg/L	1	11/27/2019 3:27:58 PM
Cadmium	< 0.00100	0.00100		mg/L	1	11/27/2019 3:27:58 PM
Calcium	107	0.500		mg/L	1	11/27/2019 3:27:58 PM
Chromium	< 0.0100	0.0100		mg/L	1	11/27/2019 3:27:58 PM
Cobalt	< 0.00600	0.00600		mg/L	1	11/27/2019 3:27:58 PM
Molybdenum	< 0.0100	0.0100		mg/L	1	11/27/2019 3:27:58 PM
Selenium	< 0.00500	0.00500		mg/L	1	11/27/2019 3:27:58 PM
Sodium	403	0.500		mg/L	1	11/27/2019 3:27:58 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response  
 ND Not Detected at the Reporting Limit PL Permit Limit  
 RL Reporting Detection Limit W Sample container temperature is out of limit as specified at testcode

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# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**METALS BY ICP**

**SW6010B**

Analyst: **9915**

Lithium	0.182	0.0150	mg/L	1	11/29/2019 10:18:00 PM
---------	-------	--------	------	---	------------------------

**RADIUM - N**

**PER CLIENT**

Analyst: **8727**

Total Radium by Calculation	1.03+/-0.998	1.18	pCi/L	1	12/19/2019
-----------------------------	--------------	------	-------	---	------------

**RADIUM - N**

**E903.1**

Analyst: **8727**

Radium-226	0.999+/-0.596	0.509	pCi/L	1	12/19/2019
------------	---------------	-------	-------	---	------------

**RADIUM - N**

**E904.0**

Analyst: **8727**

Radium-228	0.0275+/-0.402	0.668	pCi/L	1	12/10/2019
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**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3)	525	12.5	mg CaCO3/L	1	11/26/2019 11:44:00 AM
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**SPECIFIC CONDUCTANCE**

**E120.1, 1982**

Analyst: **DW**

Specific Conductivity	2,200	5.00	µmhos/cm	5	11/27/2019 2:30:00 PM
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**FLUORIDE**

**4500 F-C, 2011**

Analyst: **CW**

Fluoride	< 0.200	0.200	mg/L	1	11/26/2019 8:53:00 AM
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**PH**

**4500H+B,2011**

Analyst: **DW**

pH	6.54	0.100	H pH Units	1	11/27/2019 10:15:00 AM
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**TOTAL DISSOLVED SOLIDS**

**A2540C, 2011**

Analyst: **DW**

Total Dissolved Solids (Residue, Filterable)	1,550	20	mg/L	2	11/25/2019 9:00:00 AM
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<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	W	Sample container temperature is out of limit as specified at testcode



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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**Lab ID:** 1911404-004

**Collection Date:** 11/21/2019 3:40:00 PM

**Client Sample ID:** MW 03-01

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	410	50.0		mg/L	10	11/25/2019 8:53:00 AM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	184	5.00		mg/L	1	11/25/2019 10:05:00 AM
<b>MERCURY IN WATER, TOTAL</b>				<b>E245.1, 1994</b>		Analyst: <b>KR</b>
Mercury	< 0.0000500	0.0000500		mg/L	1	11/26/2019 6:40:59 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994</b>		Analyst: <b>9915</b>
Boron	< 0.200	0.200		mg/L	1	11/26/2019 3:43:00 AM
<b>METALS IN WATER BY ICP/MS</b>				<b>E200.8</b>		Analyst: <b>9915</b>
Antimony	< 0.00200	0.00200		mg/L	1	11/27/2019 9:43:00 AM
Arsenic	< 0.00100	0.00100		mg/L	1	11/27/2019 9:43:00 AM
Beryllium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:43:00 AM
Lead	< 0.00100	0.00100		mg/L	1	11/27/2019 9:43:00 AM
Thallium	< 0.00100	0.00100		mg/L	1	11/27/2019 9:43:00 AM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Barium	0.0449	0.0100		mg/L	1	11/27/2019 3:33:18 PM
Cadmium	< 0.00100	0.00100		mg/L	1	11/27/2019 3:33:18 PM
Calcium	16.9	0.0500		mg/L	1	11/27/2019 3:33:18 PM
Chromium	< 0.0100	0.0100		mg/L	1	11/27/2019 3:33:18 PM
Cobalt	< 0.00600	0.00600		mg/L	1	11/27/2019 3:33:18 PM
Molybdenum	< 0.0100	0.0100		mg/L	1	11/27/2019 3:33:18 PM
Selenium	< 0.00500	0.00500		mg/L	1	11/27/2019 3:33:18 PM
Sodium	10.5	0.0500		mg/L	1	11/27/2019 3:33:18 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response  
 ND Not Detected at the Reporting Limit PL Permit Limit  
 RL Reporting Detection Limit W Sample container temperature is out of limit as specified at testcode

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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**METALS BY ICP**

**SW6010B**

Analyst: **9915**

Lithium	< 0.0150	0.0150	mg/L	1	11/29/2019 10:21:00 PM
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**RADIUM - N**

**PER CLIENT**

Analyst: **8727**

Total Radium by Calculation	0.729+/-0.536	0.839	pCi/L	1	12/19/2019
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**RADIUM - N**

**E903.1**

Analyst: **8727**

Radium-226	0.120+/-0.148	0.204	pCi/L	1	12/19/2019
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**RADIUM - N**

**E904.0**

Analyst: **8727**

Radium-228	0.609+/-0.388	0.638	pCi/L	1	12/10/2019
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**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3)	55.0	12.5	mg CaCO3/L	1	11/26/2019 11:44:00 AM
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**SPECIFIC CONDUCTANCE**

**E120.1, 1982**

Analyst: **DW**

Specific Conductivity	140	1.00	µmhos/cm	1	11/27/2019 2:30:00 PM
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**FLUORIDE**

**4500 F-C, 2011**

Analyst: **CW**

Fluoride	< 0.200	0.200	mg/L	1	11/26/2019 8:53:00 AM
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**PH**

**4500H+B,2011**

Analyst: **DW**

pH	6.23	0.100	H pH Units	1	11/27/2019 10:15:00 AM
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**TOTAL DISSOLVED SOLIDS**

**A2540C, 2011**

Analyst: **DW**

Total Dissolved Solids (Residue, Filterable)	80	20	mg/L	2	11/25/2019 9:00:00 AM
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<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	W	Sample container temperature is out of limit as specified at testcode

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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**Lab ID:** 1911404-005

**Collection Date:** 11/22/2019 10:10:00 AM

**Client Sample ID:** MW 03-02

**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>CHLORIDE IN WATER</b>				<b>4500CL-E, 2011</b>		Analyst: <b>BG</b>
Chloride	543	50.0		mg/L	10	11/25/2019 8:53:00 AM
<b>SULFATE IN WATER</b>				<b>4500SO4-E,2011</b>		Analyst: <b>BG</b>
SO4	394	50.0		mg/L	10	11/25/2019 10:05:00 AM
<b>MERCURY IN WATER, TOTAL</b>				<b>E245.1, 1994</b>		Analyst: <b>KR</b>
Mercury	0.00694	0.000100		mg/L	2	11/26/2019 6:40:59 PM
<b>METALS IN WATER BY ICP, TOTAL - N</b>				<b>E200.7, 1994</b>		Analyst: <b>9915</b>
Boron	< 0.200	0.200		mg/L	1	11/26/2019 3:45:00 AM
<b>METALS IN WATER BY ICP/MS</b>				<b>E200.8</b>		Analyst: <b>9915</b>
Antimony	< 0.00200	0.00200		mg/L	1	11/26/2019 3:34:00 AM
Arsenic	< 0.00100	0.00100		mg/L	1	11/26/2019 3:34:00 AM
Beryllium	< 0.00100	0.00100		mg/L	1	11/26/2019 3:34:00 AM
Lead	< 0.00100	0.00100		mg/L	1	11/26/2019 3:34:00 AM
Thallium	< 0.00100	0.00100		mg/L	1	11/26/2019 3:34:00 AM
<b>METALS IN WATER BY ICP, TOTAL</b>				<b>E200.7, 1994 SW3010A</b>		Analyst: <b>KR</b>
Barium	0.0440	0.0100		mg/L	1	11/27/2019 3:44:04 PM
Cadmium	< 0.00100	0.00100		mg/L	1	11/27/2019 3:44:04 PM
Calcium	386	0.500		mg/L	1	11/27/2019 3:44:04 PM
Chromium	< 0.0100	0.0100		mg/L	1	11/27/2019 3:44:04 PM
Cobalt	< 0.00600	0.00600		mg/L	1	11/27/2019 3:44:04 PM
Molybdenum	< 0.0100	0.0100		mg/L	1	11/27/2019 3:44:04 PM
Selenium	< 0.00500	0.00500		mg/L	1	11/27/2019 3:44:04 PM
Sodium	166	0.500		mg/L	1	11/27/2019 3:44:04 PM

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response  
 ND Not Detected at the Reporting Limit PL Permit Limit  
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 Website: www.greencountrytesting.com



# Analytical Report

(continuous)

WO#: 1911404

Date Reported: 12/30/2019

**CLIENT:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**Lab Order:** 1911404

**METALS BY ICP**

**SW6010B**

Analyst: **9915**

Lithium	0.0154	0.0150	mg/L	1	11/29/2019 10:24:00 PM
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**RADIUM - N**

**PER CLIENT**

Analyst: **8727**

Total Radium by Calculation	0.394+/-0.564	1.09	pCi/L	1	12/19/2019
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**RADIUM - N**

**E903.1**

Analyst: **8727**

Radium-226	0.0523+/-0.117	0.202	pCi/L	1	12/19/2019
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**RADIUM - N**

**E904.0**

Analyst: **8727**

Radium-228	0.342+/-0.447	0.886	pCi/L	1	12/10/2019
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**ALKALINITY IN WATER**

**A2320B, 2011**

Analyst: **CW**

Alkalinity, Total (As CaCO3)	220	12.5	mg CaCO3/L	1	11/26/2019 11:44:00 AM
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**SPECIFIC CONDUCTANCE**

**E120.1, 1982**

Analyst: **DW**

Specific Conductivity	3,600	5.00	µmhos/cm	5	11/27/2019 2:30:00 PM
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**FLUORIDE**

**4500 F-C, 2011**

Analyst: **CW**

Fluoride	< 0.200	0.200	mg/L	1	11/26/2019 8:53:00 AM
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**PH**

**4500H+B,2011**

Analyst: **DW**

pH	6.56	0.100	H pH Units	1	11/27/2019 10:15:00 AM
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**TOTAL DISSOLVED SOLIDS**

**A2540C, 2011**

Analyst: **DW**

Total Dissolved Solids (Residue, Filterable)	1,760	20	mg/L	2	11/25/2019 9:00:00 AM
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<b>Qualifiers:</b>	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	W	Sample container temperature is out of limit as specified at testcode



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** 4500 F-C, 2011

Sample ID: <b>MB-R40317</b>	SampType: <b>MBLK</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40317</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R40317</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435194</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	< 0.200	0.200									

Sample ID: <b>LCS-R40317</b>	SampType: <b>LCS</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40317</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40317</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435195</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.02	0.200	2.000	0	101	80	120				

Sample ID: <b>1911404-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40317</b>						
Client ID: <b>MW 93-01</b>	Batch ID: <b>R40317</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435197</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	4.74	0.200	5.000	0	94.8	81.1	126				

Sample ID: <b>1911404-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>FLUOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40317</b>						
Client ID: <b>MW 93-01</b>	Batch ID: <b>R40317</b>	TestNo: <b>4500 F-C, 201</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435198</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	4.86	0.200	5.000	0	97.2	81.1	126	4.740	2.50	13	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** 4500CI-E, 2011

Sample ID: <b>MB-R40296</b>	SampType: <b>MBLK</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40296</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R40296</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434798</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	< 5.00	5.00									

Sample ID: <b>LCS-R40296</b>	SampType: <b>LCS</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40296</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40296</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434799</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	97.2	5.00	100.0	0	97.2	80	120				

Sample ID: <b>1911382-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40296</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40296</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434802</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	169	5.00	120.0	57.10	93.5	51.7	131				

Sample ID: <b>1911382-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>CHLOR</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40296</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40296</b>	TestNo: <b>4500CI-E, 201</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434803</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	168	5.00	120.0	57.10	92.2	51.7	131	169.4	0.984	8.09	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** 4500H+B,2011

Sample ID: <b>LCS-R40358</b>	SampType: <b>LCS</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>40358</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40358</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435564</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	8.99	0.100	9.000	0	99.9	80	120				

Sample ID: <b>1911403-005ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>40358</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40358</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435573</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	6.84	0.100						6.850	0.146	1.4	H

Sample ID: <b>1911407-003ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>PH</b>	Units: <b>pH Units</b>	Prep Date:	RunNo: <b>40358</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40358</b>	TestNo: <b>4500H+B,201</b>		Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435580</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	11.6	0.100						11.61	0.259	1.4	H

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** 4500SO4-E,2011

Sample ID: <b>MB-R40298</b>	SampType: <b>MBLK</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40298</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R40298</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434835</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	< 5.00	5.00									

Sample ID: <b>LCS-R40298</b>	SampType: <b>LCS</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40298</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40298</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434836</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	99.4	5.00	100.0	0	99.4	80	120				

Sample ID: <b>1911382-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40298</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40298</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434840</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	274	5.00	120.0	174.5	82.8	73.8	121				

Sample ID: <b>1911382-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>SO4</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40298</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40298</b>	TestNo: <b>4500SO4-E,2</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>434841</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
SO4	273	5.00	120.0	174.5	81.9	73.8	121	273.9	0.418	4.33	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp





# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** A2320B, 2011

Sample ID: <b>MB-R40328</b>	SampType: <b>MBLK</b>	TestCode: <b>ALK</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>40328</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R40328</b>	TestNo: <b>A2320B, 2011</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435289</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	< 2.50	2.50									

Sample ID: <b>LCS-R40328</b>	SampType: <b>LCS</b>	TestCode: <b>ALK</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>40328</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40328</b>	TestNo: <b>A2320B, 2011</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435290</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	109	2.50	100.0	0	109	80	120				

Sample ID: <b>1911404-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>ALK</b>	Units: <b>mg CaCO3/L</b>	Prep Date:	RunNo: <b>40328</b>						
Client ID: <b>MW 93-01</b>	Batch ID: <b>R40328</b>	TestNo: <b>A2320B, 2011</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435292</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	485	12.5						480.0	1.04	3.57	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** A2540C, 2011

Sample ID: <b>MB-R40295</b>	SampType: <b>MBLK</b>	TestCode: <b>TDS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40295</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R40295</b>	TestNo: <b>A2540C, 2011</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>435104</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filterable) < 10 10

Sample ID: <b>LCS-R40295</b>	SampType: <b>LCS</b>	TestCode: <b>TDS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40295</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40295</b>	TestNo: <b>A2540C, 2011</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>435105</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filterable) 1,000 10 1,000 0 100 80 120

Sample ID: <b>1911325-002ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>TDS</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40295</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40295</b>	TestNo: <b>A2540C, 2011</b>		Analysis Date: <b>11/25/2019</b>	SeqNo: <b>435107</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filterable) 1,300 20 1,350 4 5

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** E120.1, 1982

Sample ID: <b>LCS-R40360</b>	SampType: <b>LCS</b>	TestCode: <b>COND</b>	Units: <b>µmhos/cm</b>	Prep Date:	RunNo: <b>40360</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40360</b>	TestNo: <b>E120.1, 1982</b>		Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435592</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductivity	102	1.00	100.0	0	102	80	120				

Sample ID: <b>1911407-003ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>COND</b>	Units: <b>µmhos/cm</b>	Prep Date:	RunNo: <b>40360</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40360</b>	TestNo: <b>E120.1, 1982</b>		Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435601</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductivity	5,100	10.0						5,090	0.196	6.12	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** E200.7, 1994

Sample ID: <b>MB-11233</b>	SampType: <b>MBLK</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>11/25/2019</b>	RunNo: <b>40377</b>						
Client ID: <b>PBW</b>	Batch ID: <b>11233</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435802</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	< 0.0100	0.0100									
Cadmium	< 0.00100	0.00100									
Calcium	< 0.0500	0.0500									
Chromium	< 0.0100	0.0100									
Cobalt	< 0.0100	0.0100									
Molybdenum	< 0.0100	0.0100									
Selenium	< 0.00500	0.00500									
Sodium	< 0.0500	0.0500									

Sample ID: <b>LCS-11233</b>	SampType: <b>LCS</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>11/25/2019</b>	RunNo: <b>40377</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>11233</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435803</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	1.98	0.0100	2.000	0	99.1	85	115				
Cadmium	2.01	0.00100	2.000	0	101	85	115				
Calcium	2.03	0.0500	2.000	0	101	85	115				
Chromium	1.99	0.0100	2.000	0	99.4	85	115				
Cobalt	2.04	0.0100	2.000	0	102	85	115				
Molybdenum	2.02	0.0100	2.000	0	101	85	115				
Selenium	1.95	0.00500	2.000	0	97.3	85	115				
Sodium	2.02	0.0500	2.000	0	101	85	115				

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** E200.7, 1994

Sample ID: <b>1911359-002AMS</b>	SampType: <b>MS</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>11/25/2019</b>	RunNo: <b>40377</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>11233</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435805</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Barium	2.10	0.0100	2.000	0.05923	102	93.6	109				
Cadmium	2.03	0.00100	2.000	0	101	94.5	105				
Calcium	42.6	0.0500	2.000	40.55	100	0.05	197				
Chromium	2.02	0.0100	2.000	0	101	93.1	107				
Cobalt	2.02	0.0100	2.000	0	101	93.1	104				
Molybdenum	2.04	0.0100	2.000	0	102	95.7	105				
Selenium	1.97	0.00500	2.000	0	98.6	86.5	109				
Sodium	8.33	0.0500	2.000	6.374	97.6	8.51	194				

Sample ID: <b>1911359-002AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>MET_WW_T</b>	Units: <b>mg/L</b>	Prep Date: <b>11/25/2019</b>	RunNo: <b>40377</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>11233</b>	TestNo: <b>E200.7, 1994</b>	<b>SW3010A</b>	Analysis Date: <b>11/27/2019</b>	SeqNo: <b>435806</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Barium	2.10	0.0100	2.000	0.05923	102	93.6	109	2.105	0.190	2.9	
Cadmium	2.02	0.00100	2.000	0	101	94.5	105	2.029	0.247	1.89	
Calcium	42.4	0.0500	2.000	40.55	94.0	0.05	197	42.55	0.282	2.09	
Chromium	2.01	0.0100	2.000	0	101	93.1	107	2.015	0.0496	3.89	
Cobalt	2.02	0.0100	2.000	0	101	93.1	104	2.018	0.0992	1.91	
Molybdenum	2.04	0.0100	2.000	0	102	95.7	105	2.042	0.0490	3.32	
Selenium	1.97	0.00500	2.000	0	98.7	86.5	109	1.973	0.0507	2.19	
Sodium	8.32	0.0500	2.000	6.374	97.4	8.51	194	8.326	0.0481	3.41	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** E245.1, 1994

Sample ID: <b>MB-R40341</b>	SampType: <b>MBLK</b>	TestCode: <b>HG_WW</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40341</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R40341</b>	TestNo: <b>E245.1, 1994</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435403</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	< 0.0000500	0.0000500									

Sample ID: <b>LCS-R40341</b>	SampType: <b>LCS</b>	TestCode: <b>HG_WW</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40341</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R40341</b>	TestNo: <b>E245.1, 1994</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435404</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.000997	0.0000500	0.001000	0	99.7	85	115				

Sample ID: <b>1911397-003AMS</b>	SampType: <b>MS</b>	TestCode: <b>HG_WW</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40341</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40341</b>	TestNo: <b>E245.1, 1994</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435406</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.000818	0.0000500	0.001000	0	81.8	77.8	119				

Sample ID: <b>1911397-003AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>HG_WW</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40341</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40341</b>	TestNo: <b>E245.1, 1994</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435407</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.000822	0.0000500	0.001000	0	82.2	77.8	119	0.0008178	0.537	1.89	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# QC SUMMARY REPORT

WO#: 1911404  
 30-Dec-19

**Client:** A & M Engineering  
**Project:** GRDA 2nd Semi-Annual

**TestNo:** E245.1, 1994

Sample ID: <b>1911433-001BMS</b>	SampType: <b>MS</b>	TestCode: <b>HG_WW</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40341</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40341</b>	TestNo: <b>E245.1, 1994</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435420</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00110	0.0000500	0.001000	0.00009160	101	77.8	119				

Sample ID: <b>1911433-001BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>HG_WW</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>40341</b>						
Client ID: <b>BatchQC</b>	Batch ID: <b>R40341</b>	TestNo: <b>E245.1, 1994</b>		Analysis Date: <b>11/26/2019</b>	SeqNo: <b>435421</b>						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00110	0.0000500	0.001000	0.00009160	101	77.8	119	0.001100	0	1.89	

**Qualifiers:** H Holding times for preparation or analysis exceeded M Manual Integration used to determine area response ND Not Detected at the Reporting Limit  
 PL Permit Limit RL Reporting Detection Limit W Sample container temperature is out of limit as sp



# Chain of Custody Record

Laboratory Number: 191401  
 Lab Use Only

<b>Client Information:</b>		<b>Billing Information:</b>		PO Number: <u>1986-039-002</u>	Project Name/Number: <u>GRDA 2nd Semi-Annual</u>
Company Name: <u>A+M Engineering</u>				Quote Number:	Sampler's Signature
Contact Name: <u>Ed Van Schaik</u>				Required QC Level: <u>Std</u>	
Address:				Bill Monthly: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Shipping Method: UPS / FedEx / Airborne DHL / GCT / <u>Hand</u> / Mail
City, State Zip:					
Phone Number: <u>918-665-6525</u> Ext: <u>227</u>		Ext:			
Fax Number:					
E-mail Address:					

Page 1 of 3

Turn Time  
 1 Day  
 2 Day  
 Standard  
 Other  
 (Rush turn times will incur a surcharge.)

Which Regulations Apply:		Matrix Code:		Container		Pres.	Requested Tests										Comments	
<input type="checkbox"/> RCRA	<input type="checkbox"/> Drinking Water	AQ = Aqueous	SO = Soil	Number	Type P = Plastic, G = Glass, V = Vial	HCL, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	228 Combined	
<input type="checkbox"/> POTW	<input type="checkbox"/> Distribution	DW = Drinking	O = Oil	Date	Time													
<input type="checkbox"/> NPDES	<input type="checkbox"/> Special	SL = Sludge	F = Food	Grab / Composite	Matrix													
<input type="checkbox"/> USDA/FDA	<input type="checkbox"/> State	WW = Waste	SW = Swab															
<input type="checkbox"/> RECAP/RISC	<input type="checkbox"/> Other	MW = Monit. Well	SOL = Solid															
		LQ = Liquid																
MW 93-01	11-21-19	1210	G	AQ	5	P	X	X	X	X	X	X	X	X	X	X	X	#629 6, 15, 20
MW 93-02	11-21-19	1320	G	AQ	5	P	X	X	X	X	X	X	X	X	X	X	X	1, 21, 12, 4,
MW 93-03	11-21-19	1430	G	AQ	5	P	X	X	X	X	X	X	X	X	X	X	X	9, 25, 17, 24,
MW 03-01	11-21-19	1540	G	AQ	5	P	X	X	X	X	X	X	X	X	X	X	X	5, 11, 10, 16
MW 03-02	11-21-19	1010	G	AQ	5	P	X	X	X	X	X	X	X	X	X	X	X	13, 8, 3, 15, 23
																		14, 22, 7, 19

GREENCOUNTRY TESTING  
 CHAIN OF CUSTODY  
 ATTACHMENT  
 OF 3 PAGES

Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
<u>Ed Van Schaik</u>	<u>11-22-19 1148</u>	<u>[Signature]</u>	<u>11-22-19 1148</u>	

Received on ice?  Yes  No  
 Temp: 0.5 C

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.

6825 E. 38th Street  
 Tulsa, OK 74145  
 918-828-9977  
 Fax: 918-828-7756





# Chain of Custody Record

Laboratory Number: **Lab use only**

Company Name: <b>A+M Engineering</b>	Billing Information:	PO Number: <b>1986-039-002</b>	Project Name/Number: <b>GRDA 2<sup>nd</sup> Semi-Annual</b>	Page 2 of 3
Contact Name: <b>Ed Van Schaik</b>		Quote Number:	Sampler's Signature: <b>Ed Van Schaik</b>	
Address:		Required QC Level: <b>Std</b>	Shipping Method: <b>Hand / Mail</b>	<input type="checkbox"/> 1 Day
City, State Zip:		Bill Monthly: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	UPS / FedEx / Airborne	<input type="checkbox"/> 2 Day
Phone Number: <b>918-665-6575</b> Ext: <b>227</b>	Ext:		DHL / GCT / <b>Hand</b> / Mail	<input checked="" type="checkbox"/> Standard
Fax Number:				<input type="checkbox"/> Other
E-mail Address:				(Rush turn times will incur a surcharge.)

Which Regulations Apply:					Matrix Code:		Container		Pres.	Requested Tests								Comments
Sample ID/Description	Date	Time	Grab/Composite	Matrix	Number	Type P=Plastic, G=Glass, V=Vial	HCL, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Alkalinity	Boron	Calcium	Chloride	pH	Sulfate	Antimony	Arsenic	Barium	Beryllium	
MW 93-01	11-21-19	1210	G	AQ	5	P		X	X	X	X	X	X	X	X	X	X	
MW 93-02	11-29-19	1320	G	AQ	5	P		X	X	X	X	X	X	X	X	X	X	
MW 93-03	11-21-19	1430	G	AQ	5	P		X	X	X	X	X	X	X	X	X	X	
MW 03-01	11-21-19	1540	G	AQ	5	P		X	X	X	X	X	X	X	X	X	X	
MW 03-02	11-22-19	1010	G	AQ	5	P		X	X	X	X	X	X	X	X	X	X	

GREENCOUNTRYTESTING  
CHAIN OF CUSTODY  
ATTACHMENT  
2 OF 3 PAGES

Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
<b>Ed Van Schaik</b>	<b>11-22-19 1148</b>	<b>[Signature]</b>	<b>11-22-19 1148</b>	Received on ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Temp: <b>0.5°C</b>

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.

6825 E. 38th Street  
Tulsa, OK 74145  
918-828-9977  
Fax: 918-828-7756



# Chain of Custody Record

Laboratory Number: 1911404

<b>Client Information:</b>		<b>Billing Information:</b>		PO Number:	Project Name/Number:	Page 3 of 3
Company Name:	<u>ATM Engineering</u>			<u>1986-039-002</u>	<u>GRDA 2<sup>nd</sup> Semi-Annual</u>	
Contact Name:	<u>Ed Van Schaik</u>			Quote Number:	Sampler's Signature	<input type="checkbox"/> 1 Day
Address:					<u>Ed Van Schaik</u>	<input type="checkbox"/> 2 Day
City, State Zip:				Required QC Level		<input checked="" type="checkbox"/> Standard
Phone Number:	<u>918-665-6575</u> Ext: <u>227</u>		Ext:	Bill Monthly	Shipping Method:	<input type="checkbox"/> Other
Fax Number:				<input type="checkbox"/> Yes	UPS / FedEx / Airborne	(Rush turn times will incur a surcharge.)
E-mail Address:				<input type="checkbox"/> No	DHL / GCT / <u>Hand</u> Mail	

Which Regulations Apply:		Matrix Code:		Container		Pres.	Requested Tests				Comments
<input type="checkbox"/> RCRA	<input type="checkbox"/> Drinking Water	AQ = Aqueous	SO = Soil	Number	Type P=Plastic G=Glass, V=Vial	HCL, HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH, Na <sub>2</sub> S <sub>2</sub> O <sub>7</sub>	Specific Cond	TDS	Fluoride	Sodium	
<input type="checkbox"/> POTW	<input type="checkbox"/> Distribution	DW = Drinking	O = Oil								
<input type="checkbox"/> NPDES	<input type="checkbox"/> Special	WW = Waste	SL = Sludge								
<input type="checkbox"/> USDA/FDA	<input type="checkbox"/> State	MW = Monit. Well	F = Food								
<input type="checkbox"/> RECAP/RISC	<input type="checkbox"/> Other	LQ = Liquid	SW = Swab								
			SOL = Solid								
Sample ID/Description	Date	Time	Grab/Composite	Matrix							
<u>MW 93-01</u>	<u>11-21-19</u>	<u>1210</u>	<u>G</u>	<u>AQ</u>	<u>5</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	
<u>MW 93-02</u>	<u>11-21-19</u>	<u>1320</u>	<u>G</u>	<u>AQ</u>	<u>5</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	
<u>MW 93-03</u>	<u>11-21-19</u>	<u>1430</u>	<u>G</u>	<u>AQ</u>	<u>5</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	
<u>MW 03-01</u>	<u>11-21-19</u>	<u>1540</u>	<u>G</u>	<u>AQ</u>	<u>5</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	
<u>MW 03-02</u>	<u>11-21-19</u>	<u>1010</u>	<u>G</u>	<u>AQ</u>	<u>5</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	

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Relinquished by	Date/Time	Received by	Date/Time	Field Notes:
<u>Ed Van Schaik</u>	<u>11-22-19 1148</u>	<u>[Signature]</u>	<u>11-22-19 1148</u>	
				Received on ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
				Temp: <u>0.5°C</u>

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.

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**APPENDIX B**  
**Statistical Analysis Results**  
**November 2019**

## Concentrations (mg/L)

### Parameter: Alkalinity

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 278

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Samples: 70

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	70	0 (0%)	12/15/1994	367	367
			12/14/1995	334	334
			3/6/1996	384	384
			4/25/1996	363	363
			10/2/1996	365	365
			12/10/1996	346	346
			3/11/1997	350	350
			4/15/1997	330	330
			8/14/1997	400	400
			12/4/1997	380	380
			3/31/1998	360	360
			6/23/1998	390	390
			8/11/1998	389	389
			12/8/1998	376	376
			3/9/1999	340	340
			6/8/1999	395	395
			8/19/1999	400	400
			12/14/1999	360	360
			3/7/2000	384	384
			6/23/2000	364	364
			12/12/2000	450	450
			3/27/2001	362	362
			6/28/2001	340	340
			9/10/2001	326	326
			12/18/2001	326	326
			3/19/2002	330	330
			6/26/2002	350	350
			9/18/2002	353	353
			12/11/2002	344	344
			3/13/2003	320	320
			6/25/2003	336	336
			9/26/2003	320	320
			12/10/2003	324	324
			3/9/2004	329	329
			6/24/2004	348	348
			9/15/2004	332	332
			12/15/2004	327	327
			3/16/2005	340	340
			6/15/2005	330	330
			9/21/2005	347	347
			12/21/2005	340	340
			3/15/2006	320	320
			6/21/2006	314	314
			12/20/2006	300	300

6/12/2007	310	310
12/17/2007	330	330
6/11/2008	370	370
12/3/2008	344	344
6/17/2009	350	350
12/9/2009	370	370
6/17/2010	380	380
12/22/2010	370	370
6/29/2011	366	366
12/7/2011	370	370
6/6/2012	384	384
12/12/2012	330	330
6/19/2013	360	360
12/11/2013	358	358
6/11/2014	342	342
12/3/2014	368	368
6/17/2015	380	380
12/1/2015	383	383
6/22/2016	390	390
12/20/2016	395.4	395.4
6/6/2017	398	398
11/7/2017	394	394
2/27/2018	384	384
9/27/2018	360	360
5/7/2019	550	550
11/21/2019	480	480

---

There are 4 compliance wells

<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
MW#93-2	71	0 (0%)	12/15/1994	170	170
			12/14/1995	191	191
			3/6/1996	308	308
			4/25/1996	340	340
			10/2/1996	340	340
			12/10/1996	270	270
			3/11/1997	210	210
			4/15/1997	220	220
			8/14/1997	240	240
			12/4/1997	200	200
			3/31/1998	184	184
			6/23/1998	250	250
			8/11/1998	208	208
			12/8/1998	200	200
			3/9/1999	224	224
			6/8/1999	220	220
			8/19/1999	226	226
			12/14/1999	240	240
			3/7/2000	244	244
			6/23/2000	264	264
			12/12/2000	220	220
			3/27/2001	215	215
			6/28/2001	240	240
			9/10/2001	208	208
			12/18/2001	235	235
			3/19/2002	263	263

6/26/2002	290	290
9/18/2002	256	256
12/11/2002	249	249
3/13/2003	240	240
6/25/2003	246	246
9/26/2003	250	250
12/10/2003	200	200
3/9/2004	280	280
6/24/2004	329	329
9/15/2004	272	272
12/15/2004	288	288
3/16/2005	240	240
6/15/2005	246	246
9/21/2005	228	228
12/21/2005	232	232
3/15/2006	250	250
6/21/2006	290	290
12/20/2006	356	356
2/21/2007	340	340
6/12/2007	312	312
12/17/2007	210	210
6/11/2008	240	240
12/3/2008	280	280
6/17/2009	250	250
12/9/2009	236	236
6/17/2010	252	252
12/22/2010	240	240
6/29/2011	266	266
12/7/2011	288	288
6/6/2012	256	256
12/12/2012	248	248
6/19/2013	364	364
12/11/2013	328	328
6/11/2014	342	342
12/3/2014	296	296
6/17/2015	384	384
12/1/2015	226	226
6/22/2016	176	176
12/20/2016	162.2	162.2
6/6/2017	246	246
11/7/2017	430	430
2/27/2018	282	282
9/27/2018	270	270
5/7/2019	360	360
11/21/2019	360	360

---

MW#93-3      70      0 (0%)

12/15/1994	240	240
12/14/1995	206	206
3/6/1996	226	226
4/25/1996	228	228
10/2/1996	240	240
12/10/1996	225	225
3/11/1997	210	210
4/15/1997	200	200
8/14/1997	255	255
12/4/1997	140	140
3/31/1998	240	240

6/23/1998	225	225
8/11/1998	224	224
12/8/1998	214	214
3/9/1999	234	234
6/8/1999	236	236
8/19/1999	260	260
12/14/1999	300	300
3/7/2000	264	264
6/23/2000	244	244
12/12/2000	320	320
3/27/2001	254	254
6/28/2001	255	255
9/10/2001	332	332
12/18/2001	230	230
3/19/2002	255	255
6/26/2002	250	250
9/18/2002	268	268
12/11/2002	268	268
3/13/2003	247	247
6/25/2003	252	252
9/26/2003	244	244
12/10/2003	271	271
3/9/2004	284	284
6/24/2004	309	309
9/15/2004	264	264
12/15/2004	254	254
3/16/2005	290	290
6/15/2005	268	268
9/21/2005	264	264
12/21/2005	246	246
3/15/2006	227	227
6/21/2006	253	253
12/20/2006	250	250
6/12/2007	280	280
12/17/2007	290	290
6/11/2008	300	300
12/3/2008	226	226
6/17/2009	240	240
12/9/2009	214	214
6/17/2010	296	296
12/22/2010	230	230
6/29/2011	256	256
12/7/2011	244	244
6/6/2012	288	288
12/12/2012	226	226
6/19/2013	316	316
12/11/2013	262	262
6/11/2014	338	338
12/3/2014	262	262
6/17/2015	388	388
5/25/2016	440	440
6/22/2016	330	330
12/20/2016	330.4	330.4
6/6/2017	304	304
11/7/2017	409	409
2/27/2018	368	368
9/27/2018	375	375

			5/7/2019	585	585
			11/21/2019	525	525
MW#03-1	31	0 (0%)	6/24/2004	209	209
			9/15/2004	220	220
			12/15/2004	184	184
			3/16/2005	160	160
			6/15/2005	252	252
			9/21/2005	180	180
			12/20/2006	204	204
			6/12/2007	200	200
			12/17/2007	190	190
			6/11/2008	200	200
			12/3/2008	206	206
			6/17/2009	204	204
			12/9/2009	216	216
			6/17/2010	232	232
			12/22/2010	216	216
			6/29/2011	210	210
			12/7/2011	222	222
			6/6/2012	216	216
			6/19/2013	144	144
			12/11/2013	212	212
			6/11/2014	222	222
			12/3/2014	194	194
			6/17/2015	134	134
			12/1/2015	150	150
			6/22/2016	130	130
			12/20/2016	211.6	211.6
			6/6/2017	56	56
			11/7/2017	217	217
			2/27/2018	72	72
			5/7/2019	55	55
			11/21/2019	55	55
MW#03-2	36	0 (0%)	6/24/2004	235	235
			9/15/2004	200	200
			12/15/2004	222	222
			3/16/2005	220	220
			6/15/2005	252	252
			9/21/2005	224	224
			12/21/2005	230	230
			3/15/2006	220	220
			6/21/2006	228	228
			12/20/2006	220	220
			6/12/2007	228	228
			12/17/2007	200	200
			6/11/2008	200	200
			12/3/2008	210	210
			6/17/2009	200	200
			12/9/2009	208	208
			6/17/2010	216	216
			12/22/2010	230	230
			6/29/2011	224	224
			12/7/2011	236	236
			6/6/2012	230	230
			12/12/2012	242	242



6/19/2013	232	232
12/11/2013	230	230
6/11/2014	92	92
12/3/2014	76	76
6/17/2015	220	220
12/1/2015	214	214
6/22/2016	204	204
12/20/2016	199.4	199.4
6/6/2017	192	192
11/7/2017	192	192
2/27/2018	196	196
9/27/2018	185	185
5/7/2019	220	220
11/21/2019	220	220

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Alkalinity

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 36.8911

Overall Std Dev = 38.0346

Overall Total = 10255.7

SS Wells = 26791.8

SS Total = 400717

---

### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	26791.8	4	6697.96	4.89013
Error (within wells)	373925	273	1369.69	
Totals	400717	277		

4.89013 exceeds 2.37; assumption of equal variance should be rejected

---

### Well: MW#93-1

Sample	Residual
12/15/1994	5.55143
12/14/1995	27.4486
3/6/1996	22.5514
4/25/1996	1.55143
10/2/1996	3.55143
12/10/1996	15.4486
3/11/1997	11.4486
4/15/1997	31.4486
8/14/1997	38.5514
12/4/1997	18.5514
3/31/1998	1.44857
6/23/1998	28.5514
8/11/1998	27.5514
12/8/1998	14.5514
3/9/1999	21.4486
6/8/1999	33.5514
8/19/1999	38.5514
12/14/1999	1.44857
3/7/2000	22.5514
6/23/2000	2.55143
12/12/2000	88.5514
3/27/2001	0.551429
6/28/2001	21.4486
9/10/2001	35.4486
12/18/2001	35.4486
3/19/2002	31.4486
6/26/2002	11.4486
9/18/2002	8.44857
12/11/2002	17.4486
3/13/2003	41.4486
6/25/2003	25.4486
9/26/2003	41.4486

12/10/2003	37.4486
3/9/2004	32.4486
6/24/2004	13.4486
9/15/2004	29.4486
12/15/2004	34.4486
3/16/2005	21.4486
6/15/2005	31.4486
9/21/2005	14.4486
12/21/2005	21.4486
3/15/2006	41.4486
6/21/2006	47.4486
12/20/2006	61.4486
6/12/2007	51.4486
12/17/2007	31.4486
6/11/2008	8.55143
12/3/2008	17.4486
6/17/2009	11.4486
12/9/2009	8.55143
6/17/2010	18.5514
12/22/2010	8.55143
6/29/2011	4.55143
12/7/2011	8.55143
6/6/2012	22.5514
12/12/2012	31.4486
6/19/2013	1.44857
12/11/2013	3.44857
6/11/2014	19.4486
12/3/2014	6.55143
6/17/2015	18.5514
12/1/2015	21.5514
6/22/2016	28.5514
12/20/2016	33.9514
6/6/2017	36.5514
11/7/2017	32.5514
2/27/2018	22.5514
9/27/2018	1.44857
5/7/2019	188.551
11/21/2019	118.551

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
12/15/1994	90.7915
12/14/1995	69.7915
3/6/1996	47.2085
4/25/1996	79.2085
10/2/1996	79.2085
12/10/1996	9.20845
3/11/1997	50.7915
4/15/1997	40.7915
8/14/1997	20.7915
12/4/1997	60.7915
3/31/1998	76.7915
6/23/1998	10.7915
8/11/1998	52.7915
12/8/1998	60.7915
3/9/1999	36.7915
6/8/1999	40.7915
8/19/1999	34.7915

12/14/1999	20.7915
3/7/2000	16.7915
6/23/2000	3.20845
12/12/2000	40.7915
3/27/2001	45.7915
6/28/2001	20.7915
9/10/2001	52.7915
12/18/2001	25.7915
3/19/2002	2.20845
6/26/2002	29.2085
9/18/2002	4.79155
12/11/2002	11.7915
3/13/2003	20.7915
6/25/2003	14.7915
9/26/2003	10.7915
12/10/2003	60.7915
3/9/2004	19.2085
6/24/2004	68.2085
9/15/2004	11.2085
12/15/2004	27.2085
3/16/2005	20.7915
6/15/2005	14.7915
9/21/2005	32.7915
12/21/2005	28.7915
3/15/2006	10.7915
6/21/2006	29.2085
12/20/2006	95.2085
2/21/2007	79.2085
6/12/2007	51.2085
12/17/2007	50.7915
6/11/2008	20.7915
12/3/2008	19.2085
6/17/2009	10.7915
12/9/2009	24.7915
6/17/2010	8.79155
12/22/2010	20.7915
6/29/2011	5.20845
12/7/2011	27.2085
6/6/2012	4.79155
12/12/2012	12.7915
6/19/2013	103.208
12/11/2013	67.2085
6/11/2014	81.2085
12/3/2014	35.2085
6/17/2015	123.208
12/1/2015	34.7915
6/22/2016	84.7915
12/20/2016	98.5915
6/6/2017	14.7915
11/7/2017	169.208
2/27/2018	21.2085
9/27/2018	9.20845
5/7/2019	99.2085
11/21/2019	99.2085

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
12/15/1994	35.5486

12/14/1995	69.5486
3/6/1996	49.5486
4/25/1996	47.5486
10/2/1996	35.5486
12/10/1996	50.5486
3/11/1997	65.5486
4/15/1997	75.5486
8/14/1997	20.5486
12/4/1997	135.549
3/31/1998	35.5486
6/23/1998	50.5486
8/11/1998	51.5486
12/8/1998	61.5486
3/9/1999	41.5486
6/8/1999	39.5486
8/19/1999	15.5486
12/14/1999	24.4514
3/7/2000	11.5486
6/23/2000	31.5486
12/12/2000	44.4514
3/27/2001	21.5486
6/28/2001	20.5486
9/10/2001	56.4514
12/18/2001	45.5486
3/19/2002	20.5486
6/26/2002	25.5486
9/18/2002	7.54857
12/11/2002	7.54857
3/13/2003	28.5486
6/25/2003	23.5486
9/26/2003	31.5486
12/10/2003	4.54857
3/9/2004	8.45143
6/24/2004	33.4514
9/15/2004	11.5486
12/15/2004	21.5486
3/16/2005	14.4514
6/15/2005	7.54857
9/21/2005	11.5486
12/21/2005	29.5486
3/15/2006	48.5486
6/21/2006	22.5486
12/20/2006	25.5486
6/12/2007	4.45143
12/17/2007	14.4514
6/11/2008	24.4514
12/3/2008	49.5486
6/17/2009	35.5486
12/9/2009	61.5486
6/17/2010	20.4514
12/22/2010	45.5486
6/29/2011	19.5486
12/7/2011	31.5486
6/6/2012	12.4514
12/12/2012	49.5486
6/19/2013	40.4514
12/11/2013	13.5486

6/11/2014	62.4514
12/3/2014	13.5486
6/17/2015	112.451
5/25/2016	164.451
6/22/2016	54.4514
12/20/2016	54.8514
6/6/2017	28.4514
11/7/2017	133.451
2/27/2018	92.4514
9/27/2018	99.4514
5/7/2019	309.451
11/21/2019	249.451

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
6/24/2004	29.2065
9/15/2004	40.2065
12/15/2004	4.20645
3/16/2005	19.7935
6/15/2005	72.2065
9/21/2005	0.206452
12/20/2006	24.2065
6/12/2007	20.2065
12/17/2007	10.2065
6/11/2008	20.2065
12/3/2008	26.2065
6/17/2009	24.2065
12/9/2009	36.2065
6/17/2010	52.2065
12/22/2010	36.2065
6/29/2011	30.2065
12/7/2011	42.2065
6/6/2012	36.2065
6/19/2013	35.7935
12/11/2013	32.2065
6/11/2014	42.2065
12/3/2014	14.2065
6/17/2015	45.7935
12/1/2015	29.7935
6/22/2016	49.7935
12/20/2016	31.8065
6/6/2017	123.794
11/7/2017	37.2065
2/27/2018	107.794
5/7/2019	124.794
11/21/2019	124.794

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
6/24/2004	25.35
9/15/2004	9.65
12/15/2004	12.35
3/16/2005	10.35
6/15/2005	42.35
9/21/2005	14.35
12/21/2005	20.35
3/15/2006	10.35
6/21/2006	18.35

12/20/2006	10.35
6/12/2007	18.35
12/17/2007	9.65
6/11/2008	9.65
12/3/2008	0.35
6/17/2009	9.65
12/9/2009	1.65
6/17/2010	6.35
12/22/2010	20.35
6/29/2011	14.35
12/7/2011	26.35
6/6/2012	20.35
12/12/2012	32.35
6/19/2013	22.35
12/11/2013	20.35
6/11/2014	117.65
12/3/2014	133.65
6/17/2015	10.35
12/1/2015	4.35
6/22/2016	5.65
12/20/2016	10.25
6/6/2017	17.65
11/7/2017	17.65
2/27/2018	13.65
9/27/2018	24.65
5/7/2019	10.35
11/21/2019	10.35

# Shapiro-Francia Test of Normality

Parameter: Alkalinity

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 278

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	55	-2.74777	7.55021	-151.127
2	55	-2.45727	13.5884	-286.277
3	56	-2.32634	19.0003	-416.552
4	72	-2.19728	23.8283	-574.757
5	76	-2.12007	28.323	-735.882
6	92	-2.03352	32.4582	-922.966
7	130	-1.95996	36.2997	-1177.76
8	134	-1.91103	39.9517	-1433.84
9	140	-1.85218	43.3823	-1693.14
10	144	-1.81191	46.6653	-1954.06
11	150	-1.76241	49.7714	-2218.42
12	160	-1.71688	52.7191	-2493.12
13	162.2	-1.68494	55.5581	-2766.42
14	170	-1.64485	58.2636	-3046.04
15	176	-1.61644	60.8765	-3330.54
16	180	-1.58047	63.3744	-3615.02
17	184	-1.55477	65.7917	-3901.1
18	184	-1.52203	68.1083	-4181.15
19	185	-1.49085	70.3309	-4456.96
20	190	-1.46838	72.4871	-4735.95
21	191	-1.43953	74.5593	-5010.9
22	192	-1.41865	76.5719	-5283.29
23	192	-1.39175	78.5089	-5550.5
24	194	-1.36581	80.3743	-5815.47
25	196	-1.34694	82.1885	-6079.47
26	199.4	-1.32251	83.9375	-6343.17
27	200	-1.30469	85.6398	-6604.11
28	200	-1.28155	87.2821	-6860.42
29	200	-1.26464	88.8814	-7113.35
30	200	-1.24264	90.4256	-7361.88
31	200	-1.22123	91.917	-7606.12
32	200	-1.20553	93.3703	-7847.23
33	200	-1.18504	94.7746	-8084.24
34	200	-1.17	96.1435	-8318.24
35	200	-1.15035	97.4668	-8548.31
36	200	-1.13113	98.7463	-8774.53
37	204	-1.11699	99.994	-9002.4
38	204	-1.09847	101.201	-9226.49
39	204	-1.08482	102.377	-9447.79
40	206	-1.06694	103.516	-9667.58
41	206	-1.05375	104.626	-9884.65
42	208	-1.03643	105.7	-10100.2
43	208	-1.01943	106.74	-10312.3
44	208	-1.00687	107.753	-10521.7
45	209	-0.990356	108.734	-10728.7
46	210	-0.97815	109.691	-10934.1



47	210	-0.9621	110.617	-11136.1
48	210	-0.946291	111.512	-11334.9
49	210	-0.93459	112.386	-11531.1
50	210	-0.919183	113.23	-11724.1
51	211.6	-0.907769	114.054	-11916.2
52	212	-0.892733	114.851	-12105.5
53	214	-0.881587	115.629	-12294.2
54	214	-0.866894	116.38	-12479.7
55	214	-0.852385	117.107	-12662.1
56	215	-0.841621	117.815	-12843
57	216	-0.827417	118.5	-13021.7
58	216	-0.816874	119.167	-13198.2
59	216	-0.802956	119.812	-13371.6
60	216	-0.789191	120.434	-13542.1
61	217	-0.778966	121.041	-13711.1
62	220	-0.765456	121.627	-13879.5
63	220	-0.755415	122.198	-14045.7
64	220	-0.742143	122.749	-14209
65	220	-0.732275	123.285	-14370.1
66	220	-0.719228	123.802	-14528.3
67	220	-0.706302	124.301	-14683.7
68	220	-0.696684	124.786	-14837
69	220	-0.68396	125.254	-14987.5
70	220	-0.67449	125.709	-15135.8
71	220	-0.661955	126.147	-15281.5
72	222	-0.649522	126.569	-15425.7
73	222	-0.640266	126.979	-15567.8
74	222	-0.628006	127.373	-15707.2
75	224	-0.618872	127.756	-15845.9
76	224	-0.606775	128.125	-15981.8
77	224	-0.597761	128.482	-16115.7
78	224	-0.585815	128.825	-16246.9
79	225	-0.573953	129.155	-16376
80	225	-0.565108	129.474	-16503.2
81	226	-0.553384	129.78	-16628.2
82	226	-0.544642	130.077	-16751.3
83	226	-0.533048	130.361	-16871.8
84	226	-0.521527	130.633	-16989.7
85	226	-0.51293	130.896	-17105.6
86	227	-0.501527	131.148	-17219.4
87	228	-0.493018	131.391	-17331.8
88	228	-0.481728	131.623	-17441.7
89	228	-0.473299	131.847	-17549.6
90	228	-0.462114	132.06	-17655
91	230	-0.450985	132.264	-17758.7
92	230	-0.442676	132.46	-17860.5
93	230	-0.431644	132.646	-17959.8
94	230	-0.423405	132.825	-18057.2
95	230	-0.412463	132.995	-18152
96	230	-0.401571	133.157	-18244.4
97	232	-0.393433	133.311	-18335.7
98	232	-0.382622	133.458	-18424.4
99	232	-0.374544	133.598	-18511.3
100	234	-0.363809	133.73	-18596.5
101	235	-0.353118	133.855	-18679.4
102	235	-0.345126	133.974	-18760.5
103	236	-0.334503	134.086	-18839.5

104	236	-0.326561	134.193	-18916.6
105	236	-0.316004	134.293	-18991.1
106	240	-0.308108	134.388	-19065.1
107	240	-0.297612	134.476	-19136.5
108	240	-0.287147	134.559	-19205.4
109	240	-0.279319	134.637	-19272.5
110	240	-0.268908	134.709	-19337
111	240	-0.26112	134.777	-19399.7
112	240	-0.250759	134.84	-19459.8
113	240	-0.240426	134.898	-19517.5
114	240	-0.232693	134.952	-19573.4
115	240	-0.222403	135.001	-19626.8
116	240	-0.214702	135.047	-19678.3
117	242	-0.204452	135.089	-19727.8
118	244	-0.196779	135.128	-19775.8
119	244	-0.186567	135.163	-19821.3
120	244	-0.176374	135.194	-19864.3
121	244	-0.168741	135.222	-19905.5
122	246	-0.158579	135.248	-19944.5
123	246	-0.150969	135.27	-19981.7
124	246	-0.140835	135.29	-20016.3
125	246	-0.130716	135.307	-20048.5
126	247	-0.123135	135.322	-20078.9
127	248	-0.113039	135.335	-20106.9
128	249	-0.105474	135.346	-20133.2
129	250	-0.0953969	135.355	-20157
130	250	-0.0878447	135.363	-20179
131	250	-0.0777834	135.369	-20198.4
132	250	-0.0677301	135.374	-20215.4
133	250	-0.0601949	135.377	-20230.4
134	250	-0.0501541	135.38	-20243
135	252	-0.0426257	135.382	-20253.7
136	252	-0.0325917	135.383	-20261.9
137	252	-0.0225612	135.383	-20267.6
138	252	-0.0150408	135.384	-20271.4
139	253	-0.00501359	135.384	-20272.7
140	254	0.00501359	135.384	-20271.4
141	254	0.0150408	135.384	-20267.6
142	255	0.0225612	135.384	-20261.8
143	255	0.0325917	135.385	-20253.5
144	255	0.0426257	135.387	-20242.6
145	256	0.0501541	135.39	-20229.8
146	256	0.0601949	135.393	-20214.4
147	256	0.0677301	135.398	-20197
148	260	0.0777834	135.404	-20176.8
149	262	0.0878447	135.412	-20153.8
150	262	0.0953969	135.421	-20128.8
151	263	0.105474	135.432	-20101.1
152	264	0.113039	135.445	-20071.2
153	264	0.123135	135.46	-20038.7
154	264	0.130716	135.477	-20004.2
155	264	0.140835	135.497	-19967
156	266	0.150969	135.52	-19926.9
157	268	0.158579	135.545	-19884.4
158	268	0.168741	135.573	-19839.1
159	268	0.176374	135.604	-19791.9
160	270	0.186567	135.639	-19741.5

161	270	0.196779	135.678	-19688.4
162	271	0.204452	135.72	-19633
163	272	0.214702	135.766	-19574.6
164	280	0.222403	135.815	-19512.3
165	280	0.232693	135.869	-19447.1
166	280	0.240426	135.927	-19379.8
167	282	0.250759	135.99	-19309.1
168	284	0.26112	136.058	-19235
169	288	0.268908	136.13	-19157.5
170	288	0.279319	136.209	-19077.1
171	288	0.287147	136.291	-18994.4
172	290	0.297612	136.38	-18908.1
173	290	0.308108	136.474	-18818.7
174	290	0.316004	136.574	-18727.1
175	290	0.326561	136.681	-18632.4
176	296	0.334503	136.793	-18533.3
177	296	0.345126	136.912	-18431.2
178	300	0.353118	137.037	-18325.3
179	300	0.363809	137.169	-18216.1
180	300	0.374544	137.309	-18103.7
181	304	0.382622	137.456	-17987.4
182	308	0.393433	137.61	-17866.3
183	309	0.401571	137.772	-17742.2
184	310	0.412463	137.942	-17614.3
185	312	0.423405	138.121	-17482.2
186	314	0.431644	138.307	-17346.7
187	316	0.442676	138.503	-17206.8
188	320	0.450985	138.707	-17062.5
189	320	0.462114	138.92	-16914.6
190	320	0.473299	139.144	-16763.1
191	320	0.481728	139.376	-16609
192	324	0.493018	139.62	-16449.2
193	326	0.501527	139.871	-16285.7
194	326	0.51293	140.134	-16118.5
195	327	0.521527	140.406	-15948
196	328	0.533048	140.69	-15773.2
197	329	0.544642	140.987	-15594
198	329	0.553384	141.293	-15411.9
199	330	0.565108	141.612	-15225.4
200	330	0.573953	141.942	-15036
201	330	0.585815	142.285	-14842.7
202	330	0.597761	142.642	-14645.4
203	330	0.606775	143.011	-14445.2
204	330	0.618872	143.394	-14241
205	330.4	0.628006	143.788	-14033.5
206	332	0.640266	144.198	-13820.9
207	332	0.649522	144.62	-13605.3
208	334	0.661955	145.058	-13384.2
209	336	0.67449	145.513	-13157.5
210	338	0.68396	145.981	-12926.4
211	340	0.696684	146.466	-12689.5
212	340	0.706302	146.965	-12449.3
213	340	0.719228	147.482	-12204.8
214	340	0.732275	148.018	-11955.8
215	340	0.742143	148.569	-11703.5
216	340	0.755415	149.14	-11446.7
217	340	0.765456	149.726	-11186.4

218	342	0.778966	150.333	-10920
219	342	0.789191	150.955	-10650.1
220	344	0.802956	151.6	-10373.9
221	344	0.816874	152.267	-10092.9
222	346	0.827417	152.952	-9806.59
223	347	0.841621	153.66	-9514.55
224	348	0.852385	154.387	-9217.92
225	350	0.866894	155.138	-8914.51
226	350	0.881587	155.916	-8605.95
227	350	0.892733	156.713	-8293.5
228	353	0.907769	157.537	-7973.05
229	356	0.919183	158.382	-7645.83
230	358	0.93459	159.255	-7311.24
231	360	0.946291	160.15	-6970.58
232	360	0.9621	161.076	-6624.22
233	360	0.97815	162.033	-6272.09
234	360	0.990356	163.014	-5915.56
235	360	1.00687	164.027	-5553.09
236	360	1.01943	165.067	-5186.09
237	362	1.03643	166.141	-4810.91
238	363	1.05375	167.251	-4428.4
239	364	1.06694	168.39	-4040.03
240	364	1.08482	169.566	-3645.16
241	365	1.09847	170.773	-3244.21
242	366	1.11699	172.021	-2835.4
243	367	1.13113	173.3	-2420.27
244	368	1.15035	174.624	-1996.94
245	368	1.17	175.992	-1566.38
246	370	1.18504	177.397	-1127.92
247	370	1.20553	178.85	-681.871
248	370	1.22123	180.341	-230.017
249	370	1.24264	181.886	229.761
250	375	1.26464	183.485	704.001
251	376	1.28155	185.127	1185.86
252	380	1.30469	186.83	1681.65
253	380	1.32251	188.579	2184.2
254	380	1.34694	190.393	2696.03
255	383	1.36581	192.258	3219.14
256	384	1.39175	194.195	3753.57
257	384	1.41865	196.208	4298.33
258	384	1.43953	198.28	4851.11
259	384	1.46838	200.436	5414.97
260	384	1.49085	202.659	5987.46
261	388	1.52203	204.975	6578.01
262	389	1.55477	207.393	7182.81
263	390	1.58047	209.891	7799.19
264	390	1.61644	212.503	8429.6
265	394	1.64485	215.209	9077.68
266	395	1.68494	218.048	9743.23
267	395.4	1.71688	220.996	10422.1
268	398	1.76241	224.102	11123.5
269	400	1.81191	227.385	11848.3
270	400	1.85218	230.815	12589.2
271	409	1.91103	234.467	13370.8
272	430	1.95996	238.309	14213.6
273	440	2.03352	242.444	15108.3
274	450	2.12007	246.939	16062.3

275	480	2.19728	251.767	17117
276	525	2.32634	257.179	18338.4
277	550	2.45727	263.217	19689.9

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Sample Standard Deviation = 79.509

Numerator = 3.87691e+008

Denominator = 4.60921e+008 = 277 263.217

W Statistic = 0.841122

5% Critical value of 0.976 exceeds 0.841122

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.841122

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Alkalinity

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 70

Maximum Background Concentration = 550

Confidence Level = 94.6%

False Positive Rate = 5.4%

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<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#93-2	11/21/2019	1	360	FALSE
MW#93-3	11/21/2019	1	525	FALSE
MW#03-1	11/21/2019	1	55	FALSE
MW#03-2	11/21/2019	1	220	FALSE

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## Concentrations (mg/L)

### Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 45

Percent Non-Detects: 100%

Total Background Samples: 9

There is 1 background well

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Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

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There are 4 compliance wells

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Well	Samples	ND	Date	Result	Original
MW#03-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			3/26/2019	ND<0.01	ND<0.01
			11/21/2019	ND<0.002	ND<0.002
MW#03-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.002	ND<0.002
MW#93-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.002	ND<0.002

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MW#93-3	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.002	ND<0.002

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.0012642

Overall Std Dev = 0.00188074

Overall Total = 0.0568889

SS Wells = 1.79797e-005

SS Total = 0.000155637

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.79797e-005	4	4.49492e-006	1.30612
Error (within wells)	0.000137657	40	3.44143e-006	
Totals	0.000155637	44		

1.30612 does not exceed 2.60597 indicating equal variance

### Well: MW#93-1

Sample	Residual
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

### Well: MW#03-1

Sample	Residual
5/24/2018	0.000888889
6/19/2018	0.000888889
7/19/2018	0.000888889
8/22/2018	0.000888889
10/18/2018	0.000888889
11/20/2018	0.000888889
12/20/2018	0.000888889
3/26/2019	0.000888889
11/21/2019	0.007111111

### Well: MW#03-2

Sample	Residual
5/24/2018	0.000888889
6/19/2018	0.000888889
7/19/2018	0.000888889
8/22/2018	0.000888889
9/19/2018	0.000888889
10/18/2018	0.000888889
11/20/2018	0.000888889
12/20/2018	0.000888889
11/21/2019	0.007111111

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000888889
6/19/2018	0.000888889
7/19/2018	0.000888889
8/22/2018	0.000888889
9/19/2018	0.000888889
10/18/2018	0.000888889
11/20/2018	0.000888889
12/20/2018	0.000888889
11/21/2019	0.00711111

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000888889
6/19/2018	0.000888889
7/19/2018	0.000888889
8/22/2018	0.000888889
9/19/2018	0.000888889
10/18/2018	0.000888889
11/20/2018	0.000888889
12/20/2018	0.000888889
11/21/2019	0.00711111

## Shapiro-Wilks Test of Normality

Parameter: Antimony

All Wells

### Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.002	0.01	0.008	0.385	0.00308
2	0.002	0.01	0.008	0.2651	0.0021208
3	0.002	0.01	0.008	0.2313	0.0018504
4	0.002	0.01	0.008	0.2065	0.001652
5	0.01	0.01	0	0.1865	0
6	0.01	0.01	0	0.1695	0
7	0.01	0.01	0	0.1545	0
8	0.01	0.01	0	0.141	0
9	0.01	0.01	0	0.1286	0
10	0.01	0.01	0	0.1173	0
11	0.01	0.01	0	0.1062	0
12	0.01	0.01	0	0.0959	0
13	0.01	0.01	0	0.086	0
14	0.01	0.01	0	0.0775	0
15	0.01	0.01	0	0.0673	0
16	0.01	0.01	0	0.0584	0
17	0.01	0.01	0	0.0497	0
18	0.01	0.01	0	0.0412	0
19	0.01	0.01	0	0.0328	0
20	0.01	0.01	0	0.0245	0
21	0.01	0.01	0	0.0163	0
22	0.01	0.01	0	0.0081	0
23	0.01	0.01	0		
24	0.01	0.01	0		
25	0.01	0.01	0		
26	0.01	0.01	0		
27	0.01	0.01	0		
28	0.01	0.01	0		
29	0.01	0.01	0		
30	0.01	0.01	0		
31	0.01	0.01	0		
32	0.01	0.01	0		
33	0.01	0.01	0		
34	0.01	0.01	0		
35	0.01	0.01	0		
36	0.01	0.01	0		
37	0.01	0.01	0		
38	0.01	0.01	0		
39	0.01	0.01	0		
40	0.01	0.01	0		
41	0.01	0.01	0		
42	0.01	0.002	-0.008		
43	0.01	0.002	-0.008		
44	0.01	0.002	-0.008		
45	0.01	0.002	-0.008		

---

Sum of b values = 0.0087032

Sample Standard Deviation = 0.00230239

W Statistic = 0.324748

5% Critical value of 0.945 exceeds 0.324748

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.324748

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 100%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.01

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.002	FALSE
MW#03-2	11/21/2019	1	0.002	FALSE
MW#93-2	11/21/2019	1	0.002	FALSE
MW#93-3	11/21/2019	1	0.002	FALSE

---

## Concentrations (mg/L)

### Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 168

Total Non-Detect: 130

Percent Non-Detects: 77.381%

Total Background Samples: 34

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	34	31 (91.1765%)	6/12/2007	0.0109	0.0109
			12/17/2007	ND<0.005	ND<0.005
			6/11/2008	ND<0.005	ND<0.005
			12/3/2008	ND<0.005	ND<0.005
			6/17/2009	ND<0.005	ND<0.005
			12/9/2009	ND<0.005	ND<0.005
			6/17/2010	ND<0.005	ND<0.005
			12/22/2010	ND<0.005	ND<0.005
			6/29/2011	ND<0.005	ND<0.005
			12/7/2011	ND<0.005	ND<0.005
			6/6/2012	ND<0.005	ND<0.005
			12/12/2012	0.0068	0.0068
			6/19/2013	ND<0.005	ND<0.005
			12/11/2013	ND<0.005	ND<0.005
			6/11/2014	ND<0.005	ND<0.005
			12/3/2014	ND<0.005	ND<0.005
			6/17/2015	ND<0.005	ND<0.005
			12/1/2015	ND<0.005	ND<0.005
			6/22/2016	ND<0	ND<0
			12/20/2016	ND<0.0005	ND<0.0005
			6/6/2017	ND<0.005	ND<0.005
			11/7/2017	ND<0.005	ND<0.005
			2/27/2018	0.006	0.006
			5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			9/27/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			5/7/2019	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	32	29 (90.625%)	6/12/2007	ND<0.005	ND<0.005
			12/17/2007	ND<0.005	ND<0.005
			6/11/2008	ND<0.005	ND<0.005
			12/3/2008	ND<0.005	ND<0.005
			6/17/2009	ND<0.005	ND<0.005

12/9/2009	ND<0.005	ND<0.005
6/17/2010	ND<0.005	ND<0.005
12/22/2010	ND<0.005	ND<0.005
6/29/2011	ND<0.005	ND<0.005
12/7/2011	ND<0.005	ND<0.005
6/6/2012	ND<0.005	ND<0.005
6/19/2013	0.008	0.008
12/11/2013	ND<0.005	ND<0.005
6/11/2014	ND<0.005	ND<0.005
12/3/2014	ND<0.005	ND<0.005
6/17/2015	ND<0.005	ND<0.005
12/1/2015	ND<0.005	ND<0.005
6/22/2016	ND<0	ND<0
12/20/2016	ND<0.0005	ND<0.0005
6/6/2017	ND<0.005	ND<0.005
11/7/2017	ND<0.005	ND<0.005
2/27/2018	ND<0.005	ND<0.005
5/24/2018	ND<0.005	ND<0.005
6/19/2018	ND<0.005	ND<0.005
7/19/2018	0.0445	0.0445
8/22/2018	0.123	0.123
10/18/2018	ND<0.005	ND<0.005
11/20/2018	ND<0.005	ND<0.005
12/20/2018	ND<0.005	ND<0.005
3/26/2019	ND<0.005	ND<0.005
5/7/2019	ND<0.005	ND<0.005
11/21/2019	ND<0.001	ND<0.001

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MW#03-2	34	33 (97.0588%)	6/12/2007	ND<0.005	ND<0.005
			12/17/2007	ND<0.005	ND<0.005
			6/11/2008	ND<0.005	ND<0.005
			12/3/2008	ND<0.005	ND<0.005
			6/17/2009	ND<0.005	ND<0.005
			12/9/2009	ND<0.005	ND<0.005
			6/17/2010	ND<0.005	ND<0.005
			12/22/2010	ND<0.005	ND<0.005
			6/29/2011	ND<0.005	ND<0.005
			12/7/2011	ND<0.005	ND<0.005
			6/6/2012	ND<0.005	ND<0.005
			12/12/2012	ND<0.005	ND<0.005
			6/19/2013	ND<0.005	ND<0.005
			12/11/2013	ND<0.005	ND<0.005
			6/11/2014	ND<0.005	ND<0.005
			12/3/2014	ND<0.005	ND<0.005
			6/17/2015	ND<0.005	ND<0.005
			12/1/2015	ND<0.005	ND<0.005
			6/22/2016	ND<0.005	ND<0.005
			12/20/2016	ND<0.0005	ND<0.0005
			6/6/2017	ND<0.005	ND<0.005
			11/7/2017	ND<0.005	ND<0.005
			2/27/2018	0.008	0.008
			5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			9/27/2018	ND<0.005	ND<0.005

			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			5/7/2019	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001
MW#93-2	34	3 (8.82353%)	6/12/2007	0.0343	0.0343
			12/17/2007	0.0603	0.0603
			6/11/2008	0.051	0.051
			12/3/2008	0.033	0.033
			6/17/2009	0.0525	0.0525
			12/9/2009	0.0635	0.0635
			6/17/2010	0.0179	0.0179
			12/22/2010	0.0215	0.0215
			6/29/2011	0.061	0.061
			12/7/2011	ND<0.005	ND<0.005
			6/6/2012	0.0098	0.0098
			12/12/2012	0.0562	0.0562
			6/19/2013	ND<0.005	ND<0.005
			12/11/2013	0.0353	0.0353
			6/11/2014	0.0197	0.0197
			12/3/2014	0.0274	0.0274
			6/17/2015	ND<0.005	ND<0.005
			12/1/2015	0.03	0.03
			6/22/2016	0.047	0.047
			12/20/2016	0.06	0.06
			6/6/2017	0.038	0.038
			11/7/2017	0.028	0.028
			2/27/2018	0.024	0.024
			5/24/2018	0.0292	0.0292
			6/19/2018	0.0274	0.0274
			7/19/2018	0.0367	0.0367
			8/22/2018	0.0333	0.0333
			9/19/2018	0.0344	0.0344
			9/27/2018	0.0389	0.0389
			10/18/2018	0.0378	0.0378
			11/20/2018	0.0313	0.0313
			12/20/2018	0.0285	0.0285
			5/7/2019	0.0259	0.0259
			11/21/2019	0.0197	0.0197
MW#93-3	34	34 (100%)	6/12/2007	ND<0.005	ND<0.005
			12/17/2007	ND<0.005	ND<0.005
			6/11/2008	ND<0.005	ND<0.005
			12/3/2008	ND<0.005	ND<0.005
			6/17/2009	ND<0.005	ND<0.005
			12/9/2009	ND<0.005	ND<0.005
			6/17/2010	ND<0.005	ND<0.005
			12/22/2010	ND<0.005	ND<0.005
			6/29/2011	ND<0.005	ND<0.005
			12/7/2011	ND<0.005	ND<0.005
			6/6/2012	ND<0.005	ND<0.005
			12/12/2012	ND<0.005	ND<0.005
			6/19/2013	ND<0.005	ND<0.005
			12/11/2013	ND<0.005	ND<0.005
			6/11/2014	ND<0.005	ND<0.005
			12/3/2014	ND<0.005	ND<0.005



6/17/2015	ND<0.005	ND<0.005
12/1/2015	ND<0.005	ND<0.005
6/22/2016	ND<0.005	ND<0.005
12/20/2016	ND<0.0005	ND<0.0005
6/6/2017	ND<0.005	ND<0.005
11/7/2017	ND<0.005	ND<0.005
2/27/2018	ND<0.005	ND<0.005
5/24/2018	ND<0.005	ND<0.005
6/19/2018	ND<0.005	ND<0.005
7/19/2018	ND<0.005	ND<0.005
8/22/2018	ND<0.005	ND<0.005
9/19/2018	ND<0.005	ND<0.005
9/27/2018	ND<0.005	ND<0.005
10/18/2018	ND<0.005	ND<0.005
11/20/2018	ND<0.005	ND<0.005
12/20/2018	ND<0.005	ND<0.005
5/7/2019	ND<0.005	ND<0.005
11/21/2019	ND<0.001	ND<0.001

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00460365

Overall Std Dev = 0.0109703

Overall Total = 0.773413

SS Wells = 0.00437045

SS Total = 0.0200981

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## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.00437045	4	0.00109261	11.3237
Error (within wells)	0.0157277	163	9.6489e-005	
Totals	0.0200981	167		

11.3237 exceeds 2.37; assumption of equal variance should be rejected

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## Well: MW#93-1

### Sample Residual

6/12/2007	0.00604118
12/17/2007	0.000141176
6/11/2008	0.000141176
12/3/2008	0.000141176
6/17/2009	0.000141176
12/9/2009	0.000141176
6/17/2010	0.000141176
12/22/2010	0.000141176
6/29/2011	0.000141176
12/7/2011	0.000141176
6/6/2012	0.000141176
12/12/2012	0.00194118
6/19/2013	0.000141176
12/11/2013	0.000141176
6/11/2014	0.000141176
12/3/2014	0.000141176
6/17/2015	0.000141176
12/1/2015	0.000141176
6/22/2016	0.00485882
12/20/2016	0.00435882
6/6/2017	0.000141176
11/7/2017	0.000141176
2/27/2018	0.00114118
5/24/2018	0.000141176
6/19/2018	0.000141176
7/19/2018	0.000141176
8/22/2018	0.000141176
9/19/2018	0.000141176
9/27/2018	0.000141176
10/18/2018	0.000141176
11/20/2018	0.000141176
12/20/2018	0.000141176

5/7/2019	0.000141176
11/21/2019	0.00385882

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
6/12/2007	0.00459375
12/17/2007	0.00459375
6/11/2008	0.00459375
12/3/2008	0.00459375
6/17/2009	0.00459375
12/9/2009	0.00459375
6/17/2010	0.00459375
12/22/2010	0.00459375
6/29/2011	0.00459375
12/7/2011	0.00459375
6/6/2012	0.00459375
6/19/2013	0.00159375
12/11/2013	0.00459375
6/11/2014	0.00459375
12/3/2014	0.00459375
6/17/2015	0.00459375
12/1/2015	0.00459375
6/22/2016	0.00959375
12/20/2016	0.00909375
6/6/2017	0.00459375
11/7/2017	0.00459375
2/27/2018	0.00459375
5/24/2018	0.00459375
6/19/2018	0.00459375
7/19/2018	0.0349063
8/22/2018	0.113406
10/18/2018	0.00459375
11/20/2018	0.00459375
12/20/2018	0.00459375
3/26/2019	0.00459375
5/7/2019	0.00459375
11/21/2019	0.00859375

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
6/12/2007	0.000161765
12/17/2007	0.000161765
6/11/2008	0.000161765
12/3/2008	0.000161765
6/17/2009	0.000161765
12/9/2009	0.000161765
6/17/2010	0.000161765
12/22/2010	0.000161765
6/29/2011	0.000161765
12/7/2011	0.000161765
6/6/2012	0.000161765
12/12/2012	0.000161765
6/19/2013	0.000161765
12/11/2013	0.000161765
6/11/2014	0.000161765
12/3/2014	0.000161765
6/17/2015	0.000161765
12/1/2015	0.000161765

6/22/2016	0.000161765
12/20/2016	0.00433824
6/6/2017	0.000161765
11/7/2017	0.000161765
2/27/2018	0.00316176
5/24/2018	0.000161765
6/19/2018	0.000161765
7/19/2018	0.000161765
8/22/2018	0.000161765
9/19/2018	0.000161765
9/27/2018	0.000161765
10/18/2018	0.000161765
11/20/2018	0.000161765
12/20/2018	0.000161765
5/7/2019	0.000161765
11/21/2019	0.00383824

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
6/12/2007	0.00110882
12/17/2007	0.0271088
6/11/2008	0.0178088
12/3/2008	0.000191176
6/17/2009	0.0193088
12/9/2009	0.0303088
6/17/2010	0.0152912
12/22/2010	0.0116912
6/29/2011	0.0278088
12/7/2011	0.0281912
6/6/2012	0.0233912
12/12/2012	0.0230088
6/19/2013	0.0281912
12/11/2013	0.00210882
6/11/2014	0.0134912
12/3/2014	0.00579118
6/17/2015	0.0281912
12/1/2015	0.00319118
6/22/2016	0.0138088
12/20/2016	0.0268088
6/6/2017	0.00480882
11/7/2017	0.00519118
2/27/2018	0.00919118
5/24/2018	0.00399118
6/19/2018	0.00579118
7/19/2018	0.00350882
8/22/2018	0.000108824
9/19/2018	0.00120882
9/27/2018	0.00570882
10/18/2018	0.00460882
11/20/2018	0.00189118
12/20/2018	0.00469118
5/7/2019	0.00729118
11/21/2019	0.0134912

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
6/12/2007	0.00025
12/17/2007	0.00025

6/11/2008	0.00025
12/3/2008	0.00025
6/17/2009	0.00025
12/9/2009	0.00025
6/17/2010	0.00025
12/22/2010	0.00025
6/29/2011	0.00025
12/7/2011	0.00025
6/6/2012	0.00025
12/12/2012	0.00025
6/19/2013	0.00025
12/11/2013	0.00025
6/11/2014	0.00025
12/3/2014	0.00025
6/17/2015	0.00025
12/1/2015	0.00025
6/22/2016	0.00025
12/20/2016	0.00425
6/6/2017	0.00025
11/7/2017	0.00025
2/27/2018	0.00025
5/24/2018	0.00025
6/19/2018	0.00025
7/19/2018	0.00025
8/22/2018	0.00025
9/19/2018	0.00025
9/27/2018	0.00025
10/18/2018	0.00025
11/20/2018	0.00025
12/20/2018	0.00025
5/7/2019	0.00025
11/21/2019	0.00375

# Shapiro-Francia Test of Normality

Parameter: Arsenic

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 168

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	0	-2.57583	6.63492	0
2	0	-2.29036	11.8807	0
3	0.0005	-2.12007	16.3754	-0.00106003
4	0.0005	-1.99539	20.357	-0.00205773
5	0.0005	-1.8957	23.9506	-0.00300558
6	0.0005	-1.81191	27.2337	-0.00391154
7	0.001	-1.7392	30.2585	-0.00565074
8	0.001	-1.67466	33.063	-0.0073254
9	0.001	-1.61644	35.6758	-0.00894183
10	0.001	-1.56322	38.1195	-0.0105051
11	0.005	-1.5141	40.412	-0.0180756
12	0.005	-1.46838	42.5682	-0.0254175
13	0.005	-1.4325	44.6202	-0.03258
14	0.005	-1.39175	46.5572	-0.0395387
15	0.005	-1.35317	48.3883	-0.0463046
16	0.005	-1.31652	50.1215	-0.0528872
17	0.005	-1.28155	51.7639	-0.059295
18	0.005	-1.24809	53.3216	-0.0655354
19	0.005	-1.21596	54.8001	-0.0716152
20	0.005	-1.18504	56.2045	-0.0775404
21	0.005	-1.15522	57.539	-0.0833165
22	0.005	-1.12639	58.8078	-0.0889485
23	0.005	-1.09847	60.0144	-0.0944408
24	0.005	-1.07138	61.1623	-0.0997977
25	0.005	-1.04939	62.2635	-0.105045
26	0.005	-1.02365	63.3113	-0.110163
27	0.005	-0.998575	64.3085	-0.115156
28	0.005	-0.974114	65.2574	-0.120026
29	0.005	-0.950222	66.1603	-0.124777
30	0.005	-0.926859	67.0194	-0.129412
31	0.005	-0.903992	67.8366	-0.133932
32	0.005	-0.881587	68.6138	-0.13834
33	0.005	-0.859618	69.3527	-0.142638
34	0.005	-0.838054	70.055	-0.146828
35	0.005	-0.816874	70.7223	-0.150912
36	0.005	-0.796056	71.356	-0.154893
37	0.005	-0.778966	71.9628	-0.158788
38	0.005	-0.758753	72.5385	-0.162581
39	0.005	-0.738846	73.0844	-0.166275
40	0.005	-0.719228	73.6017	-0.169872
41	0.005	-0.699883	74.0915	-0.173371
42	0.005	-0.680797	74.555	-0.176775
43	0.005	-0.661955	74.9932	-0.180085
44	0.005	-0.643345	75.4071	-0.183302
45	0.005	-0.624956	75.7977	-0.186426
46	0.005	-0.606775	76.1659	-0.18946

47	0.005	-0.588793	76.5125	-0.192404
48	0.005	-0.570999	76.8386	-0.195259
49	0.005	-0.556308	77.148	-0.198041
50	0.005	-0.538836	77.4384	-0.200735
51	0.005	-0.521527	77.7104	-0.203343
52	0.005	-0.504372	77.9648	-0.205864
53	0.005	-0.487364	78.2023	-0.208301
54	0.005	-0.470498	78.4237	-0.210654
55	0.005	-0.453763	78.6296	-0.212922
56	0.005	-0.437153	78.8207	-0.215108
57	0.005	-0.420664	78.9976	-0.217212
58	0.005	-0.40429	79.1611	-0.219233
59	0.005	-0.388022	79.3116	-0.221173
60	0.005	-0.371856	79.4499	-0.223032
61	0.005	-0.358459	79.5784	-0.224825
62	0.005	-0.342466	79.6957	-0.226537
63	0.005	-0.326561	79.8023	-0.22817
64	0.005	-0.310738	79.8989	-0.229724
65	0.005	-0.294992	79.9859	-0.231198
66	0.005	-0.279319	80.0639	-0.232595
67	0.005	-0.263715	80.1335	-0.233914
68	0.005	-0.248174	80.1951	-0.235155
69	0.005	-0.232693	80.2492	-0.236318
70	0.005	-0.217267	80.2964	-0.237404
71	0.005	-0.201894	80.3372	-0.238414
72	0.005	-0.186567	80.372	-0.239347
73	0.005	-0.173829	80.4022	-0.240216
74	0.005	-0.158579	80.4274	-0.241009
75	0.005	-0.143367	80.4479	-0.241726
76	0.005	-0.128189	80.4643	-0.242366
77	0.005	-0.113039	80.4771	-0.242932
78	0.005	-0.0979139	80.4867	-0.243421
79	0.005	-0.0828129	80.4936	-0.243835
80	0.005	-0.0677301	80.4981	-0.244174
81	0.005	-0.0526632	80.5009	-0.244437
82	0.005	-0.0376076	80.5023	-0.244625
83	0.005	-0.0225612	80.5028	-0.244738
84	0.005	-0.00751925	80.5029	-0.244776
85	0.005	0.00751925	80.503	-0.244738
86	0.005	0.0225612	80.5035	-0.244625
87	0.005	0.0376076	80.5049	-0.244437
88	0.005	0.0526632	80.5077	-0.244174
89	0.005	0.0677301	80.5122	-0.243835
90	0.005	0.0828129	80.5191	-0.243421
91	0.005	0.0979139	80.5287	-0.242932
92	0.005	0.113039	80.5415	-0.242366
93	0.005	0.128189	80.5579	-0.241726
94	0.005	0.143367	80.5785	-0.241009
95	0.005	0.158579	80.6036	-0.240216
96	0.005	0.173829	80.6338	-0.239347
97	0.005	0.186567	80.6686	-0.238414
98	0.005	0.201894	80.7094	-0.237404
99	0.005	0.217267	80.7566	-0.236318
100	0.005	0.232693	80.8107	-0.235155
101	0.005	0.248174	80.8723	-0.233914
102	0.005	0.263715	80.9419	-0.232595
103	0.005	0.279319	81.0199	-0.231198

104	0.005	0.294992	81.1069	-0.229724
105	0.005	0.310738	81.2035	-0.22817
106	0.005	0.326561	81.3101	-0.226537
107	0.005	0.342466	81.4274	-0.224825
108	0.005	0.358459	81.5559	-0.223032
109	0.005	0.371856	81.6942	-0.221173
110	0.005	0.388022	81.8447	-0.219233
111	0.005	0.40429	82.0082	-0.217212
112	0.005	0.420664	82.1851	-0.215108
113	0.005	0.437153	82.3762	-0.212922
114	0.005	0.453763	82.5821	-0.210654
115	0.005	0.470498	82.8035	-0.208301
116	0.005	0.487364	83.041	-0.205864
117	0.005	0.504372	83.2954	-0.203343
118	0.005	0.521527	83.5674	-0.200735
119	0.005	0.538836	83.8578	-0.198041
120	0.005	0.556308	84.1672	-0.195259
121	0.005	0.570999	84.4933	-0.192404
122	0.005	0.588793	84.8399	-0.18946
123	0.005	0.606775	85.2081	-0.186426
124	0.005	0.624956	85.5987	-0.183302
125	0.005	0.643345	86.0126	-0.180085
126	0.005	0.661955	86.4508	-0.176775
127	0.005	0.680797	86.9143	-0.173371
128	0.005	0.699883	87.4041	-0.169872
129	0.005	0.719228	87.9214	-0.166275
130	0.005	0.738846	88.4673	-0.162581
131	0.006	0.758753	89.043	-0.158029
132	0.0068	0.778966	89.6498	-0.152732
133	0.008	0.796056	90.2835	-0.146363
134	0.008	0.816874	90.9508	-0.139828
135	0.0098	0.838054	91.6531	-0.131615
136	0.0109	0.859618	92.392	-0.122246
137	0.0179	0.881587	93.1692	-0.106465
138	0.0197	0.903992	93.9864	-0.0886565
139	0.0197	0.926859	94.8455	-0.0703974
140	0.0215	0.950222	95.7484	-0.0499676
141	0.024	0.974114	96.6973	-0.0265889
142	0.0259	0.998575	97.6945	-0.000725787
143	0.0274	1.02365	98.7423	0.0273223
144	0.0274	1.04939	99.8436	0.0560755
145	0.028	1.07138	100.991	0.0860741
146	0.0285	1.09847	102.198	0.11738
147	0.0292	1.12639	103.467	0.150271
148	0.03	1.15522	104.801	0.184928
149	0.0313	1.18504	106.206	0.22202
150	0.033	1.21596	107.684	0.262146
151	0.0333	1.24809	109.242	0.303708
152	0.0343	1.28155	110.884	0.347665
153	0.0344	1.31652	112.618	0.392953
154	0.0353	1.35317	114.449	0.44072
155	0.0367	1.39175	116.386	0.491797
156	0.0378	1.4325	118.438	0.545946
157	0.038	1.46838	120.594	0.601744
158	0.0389	1.5141	122.886	0.660643
159	0.0445	1.56322	125.33	0.730206
160	0.047	1.61644	127.943	0.806179



161	0.051	1.67466	130.747	0.891587
162	0.0525	1.7392	133.772	0.982895
163	0.0562	1.81191	137.055	1.08472
164	0.06	1.8957	140.649	1.19847
165	0.0603	1.99539	144.63	1.31879
166	0.061	2.12007	149.125	1.44811
167	0.0635	2.29036	154.371	1.59355

---

Sample Standard Deviation = 0.0162925

Numerator = 2.5394

Denominator = 6.8432 = 167 154.371

W Statistic = 0.371084

5% Critical value of 0.976 exceeds 0.371084

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.371084

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 77.381%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 34

Maximum Background Concentration = 0.0109

Confidence Level = 89.5%

False Positive Rate = 10.5%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.001	FALSE
MW#03-2	11/21/2019	1	0.001	FALSE
MW#93-2	11/21/2019	1	0.0197	TRUE
MW#93-3	11/21/2019	1	0.001	FALSE

---

# Non-Parametric Prediction Interval

## Intra-Well Comparison for MW#93-2

### Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 9.09091%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 33

Maximum Baseline Concentration = 0.0635

Confidence Level = 97.1%

False Positive Rate = 2.9%

---

Baseline Samples	Date	Result
	6/12/2007	0.0343
	12/17/2007	0.0603
	6/11/2008	0.051
	12/3/2008	0.033
	6/17/2009	0.0525
	12/9/2009	0.0635
	6/17/2010	0.0179
	12/22/2010	0.0215
	6/29/2011	0.061
	12/7/2011	ND<0.005
	6/6/2012	0.0098
	12/12/2012	0.0562
	6/19/2013	ND<0.005
	12/11/2013	0.0353
	6/11/2014	0.0197
	12/3/2014	0.0274
	6/17/2015	ND<0.005
	12/1/2015	0.03
	6/22/2016	0.047
	12/20/2016	0.06
	6/6/2017	0.038
	11/7/2017	0.028
	2/27/2018	0.024
	5/24/2018	0.0292
	6/19/2018	0.0274
	7/19/2018	0.0367
	8/22/2018	0.0333
	9/19/2018	0.0344
	9/27/2018	0.0389
	10/18/2018	0.0378
	11/20/2018	0.0313
	12/20/2018	0.0285
	5/7/2019	0.0259

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.0197	FALSE

## Concentrations (mg/L)

### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 2

Percent Non-Detects: 4.44444%

Total Background Samples: 9

There is 1 background well

---

Well	Samples	ND	Date	Result	Original
MW#93-1	9	0 (0%)	5/24/2018	0.0246	0.0246
			6/19/2018	0.0239	0.0239
			7/19/2018	0.0202	0.0202
			8/22/2018	0.0152	0.0152
			9/19/2018	0.0267	0.0267
			10/18/2018	0.0213	0.0213
			11/20/2018	0.0267	0.0267
			12/20/2018	0.0175	0.0175
			11/21/2019	0.0321	0.0321

---

There are 4 compliance wells

---

Well	Samples	ND	Date	Result	Original
MW#03-1	9	0 (0%)	5/24/2018	0.0519	0.0519
			6/19/2018	0.0752	0.0752
			7/19/2018	0.671	0.671
			8/22/2018	2	2
			10/18/2018	0.184	0.184
			11/20/2018	0.0663	0.0663
			12/20/2018	0.0375	0.0375
			3/26/2019	0.0384	0.0384
			11/21/2019	0.0449	0.0449
MW#03-2	9	1 (11.1111%)	5/24/2018	0.0519	0.0519
			6/19/2018	0.0391	0.0391
			7/19/2018	0.044	0.044
			8/22/2018	0.0409	0.0409
			9/19/2018	0.0447	0.0447
			10/18/2018	0.0463	0.0463
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	0.0443	0.0443
			11/21/2019	0.044	0.044
MW#93-2	9	0 (0%)	5/24/2018	0.0604	0.0604
			6/19/2018	0.0538	0.0538
			7/19/2018	0.0583	0.0583
			8/22/2018	0.0612	0.0612
			9/19/2018	0.0641	0.0641
			10/18/2018	0.0669	0.0669
			11/20/2018	0.069	0.069
			12/20/2018	0.0651	0.0651
			11/21/2019	0.1	0.1

---

MW#93-3	9	1 (11.1111%)	5/24/2018	0.214	0.214
			6/19/2018	0.201	0.201
			7/19/2018	0.259	0.259
			8/22/2018	0.184	0.184
			9/19/2018	0.228	0.228
			10/18/2018	0.241	0.241
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	0.259	0.259
			11/21/2019	0.116	0.116

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.102848

Overall Std Dev = 0.259577

Overall Total = 4.62818

SS Wells = 1.27452

SS Total = 2.96473

---

### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.27452	4	0.31863	7.54059
Error (within wells)	1.69021	40	0.0422553	
Totals	2.96473	44		

7.54059 exceeds 2.60597; assumption of equal variance should be rejected

---

#### Well: MW#93-1

Sample	Residual
5/24/2018	0.00146667
6/19/2018	0.000766667
7/19/2018	0.00293333
8/22/2018	0.00793333
9/19/2018	0.00356667
10/18/2018	0.00183333
11/20/2018	0.00356667
12/20/2018	0.00563333
11/21/2019	0.00896667

#### Well: MW#03-1

Sample	Residual
5/24/2018	0.300233
6/19/2018	0.276933
7/19/2018	0.318867
8/22/2018	1.64787
10/18/2018	0.168133
11/20/2018	0.285833
12/20/2018	0.314633
3/26/2019	0.313733
11/21/2019	0.307233

#### Well: MW#03-2

Sample	Residual
5/24/2018	0.0113222
6/19/2018	0.00147778
7/19/2018	0.00342222
8/22/2018	0.000322222
9/19/2018	0.00412222
10/18/2018	0.00572222
11/20/2018	0.0305778
12/20/2018	0.00372222
11/21/2019	0.00342222

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.00613333
6/19/2018	0.0127333
7/19/2018	0.00823333
8/22/2018	0.00533333
9/19/2018	0.00243333
10/18/2018	0.000366667
11/20/2018	0.00246667
12/20/2018	0.00143333
11/21/2019	0.0334667

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.0237778
6/19/2018	0.0107778
7/19/2018	0.0687778
8/22/2018	0.00622222
9/19/2018	0.0377778
10/18/2018	0.0507778
11/20/2018	0.180222
12/20/2018	0.0687778
11/21/2019	0.0742222

# Shapiro-Wilks Test of Normality

Parameter: Barium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.01	2	1.99	0.385	0.76615
2	0.01	0.671	0.661	0.2651	0.175231
3	0.0152	0.259	0.2438	0.2313	0.0563909
4	0.0175	0.259	0.2415	0.2065	0.0498697
5	0.0202	0.241	0.2208	0.1865	0.0411792
6	0.0213	0.228	0.2067	0.1695	0.0350357
7	0.0239	0.214	0.1901	0.1545	0.0293704
8	0.0246	0.201	0.1764	0.141	0.0248724
9	0.0267	0.184	0.1573	0.1286	0.0202288
10	0.0267	0.184	0.1573	0.1173	0.0184513
11	0.0321	0.116	0.0839	0.1062	0.00891018
12	0.0375	0.1	0.0625	0.0959	0.00599375
13	0.0384	0.0752	0.0368	0.086	0.0031648
14	0.0391	0.069	0.0299	0.0775	0.00231725
15	0.0409	0.0669	0.026	0.0673	0.0017498
16	0.044	0.0663	0.0223	0.0584	0.00130232
17	0.044	0.0651	0.0211	0.0497	0.00104867
18	0.0443	0.0641	0.0198	0.0412	0.00081576
19	0.0447	0.0612	0.0165	0.0328	0.0005412
20	0.0449	0.0604	0.0155	0.0245	0.00037975
21	0.0463	0.0583	0.012	0.0163	0.0001956
22	0.0519	0.0538	0.0019	0.0081	1.539e-005
23	0.0519	0.0519	0		
24	0.0538	0.0519	-0.0019		
25	0.0583	0.0463	-0.012		
26	0.0604	0.0449	-0.0155		
27	0.0612	0.0447	-0.0165		
28	0.0641	0.0443	-0.0198		
29	0.0651	0.044	-0.0211		
30	0.0663	0.044	-0.0223		
31	0.0669	0.0409	-0.026		
32	0.069	0.0391	-0.0299		
33	0.0752	0.0384	-0.0368		
34	0.1	0.0375	-0.0625		
35	0.116	0.0321	-0.0839		
36	0.184	0.0267	-0.1573		
37	0.184	0.0267	-0.1573		
38	0.201	0.0246	-0.1764		
39	0.214	0.0239	-0.1901		
40	0.228	0.0213	-0.2067		
41	0.241	0.0202	-0.2208		
42	0.259	0.0175	-0.2415		
43	0.259	0.0152	-0.2438		
44	0.671	0.01	-0.661		
45	2	0.01	-1.99		

---



Sum of b values = 1.24321

Sample Standard Deviation = 0.306281

W Statistic = 0.374455

5% Critical value of 0.945 exceeds 0.374455

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.374455

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 4.44444%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.0321

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.0449	TRUE
MW#03-2	11/21/2019	1	0.044	TRUE
MW#93-2	11/21/2019	1	0.1	TRUE
MW#93-3	11/21/2019	1	0.116	TRUE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.069

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.0604
	6/19/2018	0.0538
	7/19/2018	0.0583
	8/22/2018	0.0612
	9/19/2018	0.0641
	10/18/2018	0.0669
	11/20/2018	0.069
	12/20/2018	0.0651

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.1	TRUE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 12.5%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.259

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.214
	6/19/2018	0.201
	7/19/2018	0.259
	8/22/2018	0.184
	9/19/2018	0.228
	10/18/2018	0.241
	11/20/2018	ND<0.01
	12/20/2018	0.259

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.116	FALSE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#03-1

#### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 2

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.0519
	6/19/2018	0.0752
	7/19/2018	0.671
	8/22/2018	2
	10/18/2018	0.184
	11/20/2018	0.0663
	12/20/2018	0.0375
	3/26/2019	0.0384

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.0449	FALSE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#03-2

#### Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 12.5%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.0519

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.0519
	6/19/2018	0.0391
	7/19/2018	0.044
	8/22/2018	0.0409
	9/19/2018	0.0447
	10/18/2018	0.0463
	11/20/2018	ND<0.01
	12/20/2018	0.0443

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.044	FALSE

## Concentrations (mg/L)

### Parameter: Beryllium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 43

Percent Non-Detects: 95.5556%

Total Background Samples: 9

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	9	7 (77.7778%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	0.0201	0.0201
			8/22/2018	0.0108	0.0108
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			3/26/2019	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001
MW#03-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001
MW#93-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

MW#93-3	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

---

There are 0 unused wells

---

<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Beryllium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00153235

Overall Std Dev = 0.0025831

Overall Total = 0.0689556

SS Wells = 2.84624e-005

SS Total = 0.000293585

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	2.84624e-005	4	7.1156e-006	1.07356
Error (within wells)	0.000265123	40	6.62807e-006	
Totals	0.000293585	44		

1.07356 does not exceed 2.60597 indicating equal variance

---

Well: MW#93-1	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0

Well: MW#03-1	Sample	Residual
	5/24/2018	0.000211111
	6/19/2018	0.000211111
	7/19/2018	0.00988889
	8/22/2018	0.000588889
	10/18/2018	0.000211111
	11/20/2018	0.000211111
	12/20/2018	0.000211111
	3/26/2019	0.000211111
	11/21/2019	0.00921111

Well: MW#03-2	Sample	Residual
	5/24/2018	0.001
	6/19/2018	0.001
	7/19/2018	0.001
	8/22/2018	0.001
	9/19/2018	0.001
	10/18/2018	0.001
	11/20/2018	0.001
	12/20/2018	0.001
	11/21/2019	0.008

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
9/19/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
11/21/2019	0.008

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
9/19/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
11/21/2019	0.008

# Shapiro-Wilks Test of Normality

Parameter: Beryllium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.001	0.0201	0.0191	0.385	0.0073535
2	0.001	0.0108	0.0098	0.2651	0.00259798
3	0.001	0.01	0.009	0.2313	0.0020817
4	0.001	0.01	0.009	0.2065	0.0018585
5	0.01	0.01	0	0.1865	0
6	0.01	0.01	0	0.1695	0
7	0.01	0.01	0	0.1545	0
8	0.01	0.01	0	0.141	0
9	0.01	0.01	0	0.1286	0
10	0.01	0.01	0	0.1173	0
11	0.01	0.01	0	0.1062	0
12	0.01	0.01	0	0.0959	0
13	0.01	0.01	0	0.086	0
14	0.01	0.01	0	0.0775	0
15	0.01	0.01	0	0.0673	0
16	0.01	0.01	0	0.0584	0
17	0.01	0.01	0	0.0497	0
18	0.01	0.01	0	0.0412	0
19	0.01	0.01	0	0.0328	0
20	0.01	0.01	0	0.0245	0
21	0.01	0.01	0	0.0163	0
22	0.01	0.01	0	0.0081	0
23	0.01	0.01	0		
24	0.01	0.01	0		
25	0.01	0.01	0		
26	0.01	0.01	0		
27	0.01	0.01	0		
28	0.01	0.01	0		
29	0.01	0.01	0		
30	0.01	0.01	0		
31	0.01	0.01	0		
32	0.01	0.01	0		
33	0.01	0.01	0		
34	0.01	0.01	0		
35	0.01	0.01	0		
36	0.01	0.01	0		
37	0.01	0.01	0		
38	0.01	0.01	0		
39	0.01	0.01	0		
40	0.01	0.01	0		
41	0.01	0.01	0		
42	0.01	0.001	-0.009		
43	0.01	0.001	-0.009		
44	0.0108	0.001	-0.0098		
45	0.0201	0.001	-0.0191		

---

Sum of b values = 0.0138917

Sample Standard Deviation = 0.00306242

W Statistic = 0.467658

5% Critical value of 0.945 exceeds 0.467658

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.467658

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Beryllium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 95.5556%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.01

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

Well	Date	Samples	Mean	Impacted
MW#03-1	11/21/2019	1	0.001	FALSE
MW#03-2	11/21/2019	1	0.001	FALSE
MW#93-2	11/21/2019	1	0.001	FALSE
MW#93-3	11/21/2019	1	0.001	FALSE

---

## Concentrations (mg/L)

### Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 63

Total Non-Detect: 25

Percent Non-Detects: 39.6825%

Total Background Samples: 13

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	13	0 (0%)	10/11/2016	0.429	0.429
			12/20/2016	0.386	0.386
			2/16/2017	0.341	0.341
			3/8/2017	0.348	0.348
			5/9/2017	0.366	0.366
			6/6/2017	0.371	0.371
			8/22/2017	0.458	0.458
			9/22/2017	0.499	0.499
			11/7/2017	0.46	0.46
			2/27/2018	0.33	0.33
			9/27/2018	0.386	0.386
			5/7/2019	0.178	0.178
			11/21/2019	0.303	0.303

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	12	9 (75%)	10/11/2016	ND<0.025	ND<0.025
			12/20/2016	ND<0.025	ND<0.025
			2/16/2017	ND<0.025	ND<0.025
			3/8/2017	ND<0.025	ND<0.025
			5/9/2017	0.041	0.041
			6/6/2017	ND<0.025	ND<0.025
			8/22/2017	ND<0.025	ND<0.025
			9/22/2017	0.025	0.025
			11/7/2017	ND<0.1	ND<0.1
			2/27/2018	0.05	0.05
			5/7/2019	ND<0.1	ND<0.1
			11/21/2019	ND<0.2	ND<0.2
MW#03-2	12	11 (91.6667%)	10/11/2016	ND<0.025	ND<0.025
			12/20/2016	ND<0.025	ND<0.025
			2/16/2017	ND<0.025	ND<0.025
			3/8/2017	ND<0.025	ND<0.025
			5/9/2017	0.032	0.032
			6/6/2017	ND<0.025	ND<0.025
			8/22/2017	ND<0.025	ND<0.025
			9/22/2017	ND<0.025	ND<0.025
			11/7/2017	ND<0.1	ND<0.1
			2/27/2018	ND<0.05	ND<0.05
			5/7/2019	ND<0.1	ND<0.1
			11/21/2019	ND<0.2	ND<0.2

MW#93-2	13	0 (0%)	10/11/2016	2.86	2.86
			12/20/2016	2.31	2.31
			2/16/2017	2.09	2.09
			3/8/2017	2.07	2.07
			5/9/2017	1.97	1.97
			6/6/2017	1.83	1.83
			8/22/2017	2.38	2.38
			9/22/2017	2.48	2.48
			11/7/2017	0.46	0.46
			2/27/2018	0.064	0.064
			9/27/2018	2.01	2.01
			5/7/2019	1.61	1.61
			11/21/2019	1.76	1.76
MW#93-3	13	5 (38.4615%)	10/11/2016	0.079	0.079
			12/20/2016	0.08	0.08
			2/16/2017	0.126	0.126
			3/8/2017	0.09	0.09
			5/9/2017	0.139	0.139
			6/6/2017	ND<0.025	ND<0.025
			8/22/2017	0.119	0.119
			9/22/2017	0.118	0.118
			11/7/2017	ND<0.1	ND<0.1
			2/27/2018	0.089	0.089
			9/27/2018	ND<0.1	ND<0.1
			5/7/2019	ND<0.1	ND<0.1
			11/21/2019	ND<0.2	ND<0.2

There are 0 unused wells

Well	Samples	ND	Date	Result	Original
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## Levene's Test for Equal of Variance

### Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.142523

Overall Std Dev = 0.314317

Overall Total = 8.97896

SS Wells = 2.50677

SS Total = 6.1253

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	2.50677	4	0.626693	10.045
Error (within wells)	3.61853	58	0.0623884	
Totals	6.1253	62		

10.045 exceeds 2.52521; assumption of equal variance should be rejected

---

### Well: MW#93-1

#### Sample Residual

10/11/2016	0.0555385
12/20/2016	0.0125385
2/16/2017	0.0324615
3/8/2017	0.0254615
5/9/2017	0.00746154
6/6/2017	0.00246154
8/22/2017	0.0845385
9/22/2017	0.125538
11/7/2017	0.0865385
2/27/2018	0.0434615
9/27/2018	0.0125385
5/7/2019	0.195462
11/21/2019	0.0704615

### Well: MW#03-1

#### Sample Residual

10/11/2016	0.0305
12/20/2016	0.0305
2/16/2017	0.0305
3/8/2017	0.0305
5/9/2017	0.0145
6/6/2017	0.0305
8/22/2017	0.0305
9/22/2017	0.0305
11/7/2017	0.0445
2/27/2018	0.0055
5/7/2019	0.0445
11/21/2019	0.1445

### Well: MW#03-2

#### Sample Residual

10/11/2016	0.02975
12/20/2016	0.02975



2/16/2017	0.02975
3/8/2017	0.02975
5/9/2017	0.02275
6/6/2017	0.02975
8/22/2017	0.02975
9/22/2017	0.02975
11/7/2017	0.04525
2/27/2018	0.00475
5/7/2019	0.04525
11/21/2019	0.14525

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
10/11/2016	1.022
12/20/2016	0.472
2/16/2017	0.252
3/8/2017	0.232
5/9/2017	0.132
6/6/2017	0.008
8/22/2017	0.542
9/22/2017	0.642
11/7/2017	1.378
2/27/2018	1.774
9/27/2018	0.172
5/7/2019	0.228
11/21/2019	0.078

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
10/11/2016	0.026
12/20/2016	0.025
2/16/2017	0.021
3/8/2017	0.015
5/9/2017	0.034
6/6/2017	0.08
8/22/2017	0.014
9/22/2017	0.013
11/7/2017	0.005
2/27/2018	0.016
9/27/2018	0.005
5/7/2019	0.005
11/21/2019	0.095

# Shapiro-Francia Test of Normality

Parameter: Boron

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 63

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	0.025	-2.17009	4.70929	-0.0542523
2	0.025	-1.86629	8.19234	-0.10091
3	0.025	-1.68494	11.0314	-0.143033
4	0.025	-1.5382	13.3974	-0.181488
5	0.025	-1.41865	15.41	-0.216954
6	0.025	-1.32251	17.159	-0.250017
7	0.025	-1.23187	18.6765	-0.280814
8	0.025	-1.15035	19.9998	-0.309572
9	0.025	-1.08032	21.1669	-0.33658
10	0.025	-1.01104	22.1891	-0.361856
11	0.025	-0.950222	23.092	-0.385612
12	0.025	-0.889006	23.8824	-0.407837
13	0.025	-0.830953	24.5728	-0.428611
14	0.025	-0.778966	25.1796	-0.448085
15	0.025	-0.725736	25.7063	-0.466228
16	0.032	-0.67449	26.1613	-0.487812
17	0.041	-0.628006	26.5556	-0.51356
18	0.05	-0.579873	26.8919	-0.542554
19	0.05	-0.53594	27.1791	-0.569351
20	0.064	-0.490189	27.4194	-0.600723
21	0.079	-0.445443	27.6178	-0.635913
22	0.08	-0.40429	27.7813	-0.668256
23	0.089	-0.361133	27.9117	-0.700397
24	0.09	-0.318639	28.0132	-0.729075
25	0.1	-0.279319	28.0913	-0.757007
26	0.1	-0.237847	28.1478	-0.780791
27	0.1	-0.199336	28.1876	-0.800725
28	0.1	-0.158579	28.2127	-0.816583
29	0.1	-0.118085	28.2266	-0.828391
30	0.1	-0.0802981	28.2331	-0.836421
31	0.1	-0.0401167	28.2347	-0.840433
32	0.118	0	28.2347	-0.840433
33	0.119	0.0401167	28.2363	-0.835659
34	0.126	0.0802981	28.2428	-0.825541
35	0.139	0.118085	28.2567	-0.809128
36	0.178	0.158579	28.2819	-0.7809
37	0.2	0.199336	28.3216	-0.741033
38	0.2	0.237847	28.3782	-0.693464
39	0.2	0.279319	28.4562	-0.6376
40	0.303	0.318639	28.5577	-0.541052
41	0.33	0.361133	28.6881	-0.421878
42	0.341	0.40429	28.8516	-0.284016
43	0.348	0.445443	29.05	-0.129001
44	0.366	0.490189	29.2903	0.0504079
45	0.371	0.53594	29.5775	0.249242
46	0.386	0.579873	29.9138	0.473073

47	0.386	0.628006	30.3082	0.715483
48	0.429	0.67449	30.7631	1.00484
49	0.458	0.725736	31.2898	1.33723
50	0.46	0.778966	31.8966	1.69555
51	0.46	0.830953	32.5871	2.07779
52	0.499	0.889006	33.3774	2.5214
53	1.61	0.950222	34.2803	4.05126
54	1.76	1.01104	35.3025	5.83068
55	1.83	1.08032	36.4696	7.80767
56	1.97	1.15035	37.7929	10.0739
57	2.01	1.23187	39.3104	12.5499
58	2.07	1.32251	41.0594	15.2875
59	2.09	1.41865	43.072	18.2525
60	2.31	1.5382	45.4381	21.8057
61	2.38	1.68494	48.2771	25.8159
62	2.48	1.86629	51.7601	30.4443

Sample Standard Deviation = 0.779418

Numerator = 926.854

Denominator = 1949.52 = 62 51.7601

W Statistic = 0.475427

5% Critical value of 0.964 exceeds 0.475427

Evidence of non-normality at 95% level of significance

1% Critical value of 0.947 exceeds 0.475427

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 39.6825%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 13

Maximum Background Concentration = 0.499

Confidence Level = 76.5%

False Positive Rate = 23.5%

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Well	Date	Samples	Mean	Impacted
MW#03-1	11/21/2019	1	0.2	FALSE
MW#03-2	11/21/2019	1	0.2	FALSE
MW#93-2	11/21/2019	1	1.76	TRUE
MW#93-3	11/21/2019	1	0.2	FALSE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 12

Maximum Baseline Concentration = 2.86

Confidence Level = 92.3%

False Positive Rate = 7.7%

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Baseline Samples	Date	Result
	10/11/2016	2.86
	12/20/2016	2.31
	2/16/2017	2.09
	3/8/2017	2.07
	5/9/2017	1.97
	6/6/2017	1.83
	8/22/2017	2.38
	9/22/2017	2.48
	11/7/2017	0.46
	2/27/2018	0.064
	9/27/2018	2.01
	5/7/2019	1.61

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Date	Samples	Mean	Impacted
11/21/2019	1	1.76	FALSE

## Concentrations (mg/L)

### Parameter: Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 41

Percent Non-Detects: 91.1111%

Total Background Samples: 9

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	9	7 (77.7778%)	5/24/2018	ND<0.001	ND<0.001
			6/19/2018	ND<0.001	ND<0.001
			7/19/2018	ND<0.001	ND<0.001
			8/22/2018	ND<0.001	ND<0.001
			9/19/2018	ND<0.00117	ND<0.00117
			10/18/2018	ND<0.001	ND<0.001
			11/20/2018	0.00125	0.00125
			12/20/2018	ND<0.001	ND<0.001
			11/21/2019	0.00112	0.00112

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	9	7 (77.7778%)	5/24/2018	ND<0.001	ND<0.001
			6/19/2018	ND<0.001	ND<0.001
			7/19/2018	0.00486	0.00486
			8/22/2018	0.0204	0.0204
			10/18/2018	ND<0.001	ND<0.001
			11/20/2018	ND<0.001	ND<0.001
			12/20/2018	ND<0.001	ND<0.001
			3/26/2019	ND<0.001	ND<0.001
			11/21/2019	ND<0.001	ND<0.001
			MW#03-2	9	9 (100%)
6/19/2018	ND<0.001	ND<0.001			
7/19/2018	ND<0.001	ND<0.001			
8/22/2018	ND<0.001	ND<0.001			
9/19/2018	ND<0.001	ND<0.001			
10/18/2018	ND<0.001	ND<0.001			
11/20/2018	ND<0.001	ND<0.001			
12/20/2018	ND<0.001	ND<0.001			
11/21/2019	ND<0.001	ND<0.001			
MW#93-2	9	9 (100%)			
			6/19/2018	ND<0.001	ND<0.001
			7/19/2018	ND<0.001	ND<0.001
			8/22/2018	ND<0.001	ND<0.001
			9/19/2018	ND<0.001	ND<0.001
			10/18/2018	ND<0.001	ND<0.001
			11/20/2018	ND<0.001	ND<0.001
			12/20/2018	ND<0.001	ND<0.001
			11/21/2019	ND<0.001	ND<0.001

MW#93-3	9	9 (100%)	5/24/2018	ND<0.001	ND<0.001
			6/19/2018	ND<0.001	ND<0.001
			7/19/2018	ND<0.001	ND<0.001
			8/22/2018	ND<0.001	ND<0.001
			9/19/2018	ND<0.001	ND<0.001
			10/18/2018	ND<0.001	ND<0.001
			11/20/2018	ND<0.001	ND<0.001
			12/20/2018	ND<0.001	ND<0.001
			11/21/2019	ND<0.001	ND<0.001

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.000820049

Overall Std Dev = 0.00261533

Overall Total = 0.0369022

SS Wells = 0.000115257

SS Total = 0.000300957

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.000115257	4	2.88144e-005	6.20665
Error (within wells)	0.0001857	40	4.64249e-006	
Totals	0.000300957	44		

6.20665 exceeds 2.60597; assumption of equal variance should be rejected

### Well: MW#93-1

Sample	Residual
5/24/2018	6e-005
6/19/2018	6e-005
7/19/2018	6e-005
8/22/2018	6e-005
9/19/2018	0.00011
10/18/2018	6e-005
11/20/2018	0.00019
12/20/2018	6e-005
11/21/2019	6e-005

### Well: MW#03-1

Sample	Residual
5/24/2018	0.00258444
6/19/2018	0.00258444
7/19/2018	0.00127556
8/22/2018	0.0168156
10/18/2018	0.00258444
11/20/2018	0.00258444
12/20/2018	0.00258444
3/26/2019	0.00258444
11/21/2019	0.00258444

### Well: MW#03-2

Sample	Residual
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0



**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

# Shapiro-Wilks Test of Normality

Parameter: Cadmium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.001	0.0204	0.0194	0.385	0.007469
2	0.001	0.00486	0.00386	0.2651	0.00102329
3	0.001	0.00125	0.00025	0.2313	5.7825e-005
4	0.001	0.00117	0.00017	0.2065	3.5105e-005
5	0.001	0.00112	0.00012	0.1865	2.238e-005
6	0.001	0.001	0	0.1695	0
7	0.001	0.001	0	0.1545	0
8	0.001	0.001	0	0.141	0
9	0.001	0.001	0	0.1286	0
10	0.001	0.001	0	0.1173	0
11	0.001	0.001	0	0.1062	0
12	0.001	0.001	0	0.0959	0
13	0.001	0.001	0	0.086	0
14	0.001	0.001	0	0.0775	0
15	0.001	0.001	0	0.0673	0
16	0.001	0.001	0	0.0584	0
17	0.001	0.001	0	0.0497	0
18	0.001	0.001	0	0.0412	0
19	0.001	0.001	0	0.0328	0
20	0.001	0.001	0	0.0245	0
21	0.001	0.001	0	0.0163	0
22	0.001	0.001	0	0.0081	0
23	0.001	0.001	0		
24	0.001	0.001	0		
25	0.001	0.001	0		
26	0.001	0.001	0		
27	0.001	0.001	0		
28	0.001	0.001	0		
29	0.001	0.001	0		
30	0.001	0.001	0		
31	0.001	0.001	0		
32	0.001	0.001	0		
33	0.001	0.001	0		
34	0.001	0.001	0		
35	0.001	0.001	0		
36	0.001	0.001	0		
37	0.001	0.001	0		
38	0.001	0.001	0		
39	0.001	0.001	0		
40	0.001	0.001	0		
41	0.00112	0.001	-0.00012		
42	0.00117	0.001	-0.00017		
43	0.00125	0.001	-0.00025		
44	0.00486	0.001	-0.00386		
45	0.0204	0.001	-0.0194		

---

Sum of b values = 0.0086076

Sample Standard Deviation = 0.00293404

W Statistic = 0.195605

5% Critical value of 0.945 exceeds 0.195605

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.195605

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 91.1111%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.00125

Confidence Level = 69.2%

False Positive Rate = 30.8%

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<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.001	FALSE
MW#03-2	11/21/2019	1	0.001	FALSE
MW#93-2	11/21/2019	1	0.001	FALSE
MW#93-3	11/21/2019	1	0.001	FALSE

---

## Concentrations (mg/L)

### Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 72

Total Non-Detect: 5

Percent Non-Detects: 6.94444%

Total Background Samples: 17

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	17	1 (5.88235%)	6/6/2012	484	484
			12/12/2012	560	560
			6/19/2013	670	670
			12/11/2013	549	549
			6/11/2014	192	192
			12/3/2014	213	213
			6/17/2015	184	184
			12/1/2015	199	199
			6/22/2016	205	205
			12/20/2016	202	202
			6/6/2017	206	206
			11/7/2017	212	212
			2/27/2018	211	211
			9/27/2018	240	240
			11/20/2018	ND<0.5	ND<0.5
			5/7/2019	212	212
			11/21/2019	228	228

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	17	1 (5.88235%)	6/6/2012	78.9	78.9
			12/12/2012	101	101
			6/19/2013	100	100
			12/11/2013	88	88
			6/11/2014	41.8	41.8
			12/3/2014	53.8	53.8
			6/17/2015	2.29	2.29
			12/1/2015	42.8	42.8
			6/22/2016	40	40
			12/20/2016	41.8	41.8
			6/6/2017	45.2	45.2
			11/7/2017	68.5	68.5
			2/27/2018	74.7	74.7
			9/27/2018	68.9	68.9
			11/20/2018	ND<0.5	ND<0.5
			5/7/2019	86.3	86.3
			11/21/2019	117	117
MW#93-3	17	1 (5.88235%)	6/6/2012	86.4	86.4
			12/12/2012	97	97
			6/19/2013	163	163
			12/11/2013	102	102

			6/11/2014	49.5	49.5
			12/3/2014	31.7	31.7
			6/17/2015	43.4	43.4
			12/1/2015	58	58
			6/22/2016	95.6	95.6
			12/20/2016	82.1	82.1
			6/6/2017	56	56
			11/7/2017	80.2	80.2
			2/27/2018	91.8	91.8
			9/27/2018	94.8	94.8
			11/20/2018	ND<0.5	ND<0.5
			5/7/2019	110	110
			11/21/2019	107	107
MW#03-1	10	1 (10%)	5/24/2018	22.2	22.2
			6/19/2018	43.6	43.6
			7/19/2018	154	154
			8/22/2018	613	613
			11/20/2018	ND<0.5	ND<0.5
			11/20/2018	35.6	35.6
			12/20/2018	13.3	13.3
			3/26/2019	16.6	16.6
			5/7/2019	15	15
			11/21/2019	16.9	16.9
MW#03-2	11	1 (9.09091%)	5/24/2018	197	197
			6/19/2018	291	291
			7/19/2018	338	338
			8/22/2018	325	325
			9/19/2018	303	303
			9/27/2018	352	352
			11/20/2018	ND<0.5	ND<0.5
			11/20/2018	331	331
			12/20/2018	350	350
			5/7/2019	267	267
			11/21/2019	386	386

There are 0 unused wells

Well	Samples	ND	Date	Result	Original
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## Levene's Test for Equal of Variance

### Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 71.6039

Overall Std Dev = 91.0283

Overall Total = 5155.48

SS Wells = 153439

SS Total = 588316

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### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	153439	4	38359.6	5.90993
Error (within wells)	434878	67	6490.71	
Totals	588316	71		

5.90993 exceeds 2.44724; assumption of equal variance should be rejected

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#### Well: MW#93-1

Sample	Residual
6/6/2012	203.559
12/12/2012	279.559
6/19/2013	389.559
12/11/2013	268.559
6/11/2014	88.4412
12/3/2014	67.4412
6/17/2015	96.4412
12/1/2015	81.4412
6/22/2016	75.4412
12/20/2016	78.4412
6/6/2017	74.4412
11/7/2017	68.4412
2/27/2018	69.4412
9/27/2018	40.4412
11/20/2018	279.941
5/7/2019	68.4412
11/21/2019	52.4412

#### Well: MW#93-2

Sample	Residual
6/6/2012	17.0476
12/12/2012	39.1476
6/19/2013	38.1476
12/11/2013	26.1476
6/11/2014	20.0524
12/3/2014	8.05235
6/17/2015	59.5624
12/1/2015	19.0524
6/22/2016	21.8524
12/20/2016	20.0524
6/6/2017	16.6524
11/7/2017	6.64765
2/27/2018	12.8476

9/27/2018	7.04765
11/20/2018	61.3524
5/7/2019	24.4476
11/21/2019	55.1476

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
6/6/2012	7.04706
12/12/2012	17.6471
6/19/2013	83.6471
12/11/2013	22.6471
6/11/2014	29.8529
12/3/2014	47.6529
6/17/2015	35.9529
12/1/2015	21.3529
6/22/2016	16.2471
12/20/2016	2.74706
6/6/2017	23.3529
11/7/2017	0.847059
2/27/2018	12.4471
9/27/2018	15.4471
11/20/2018	78.8529
5/7/2019	30.6471
11/21/2019	27.6471

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
5/24/2018	70.87
6/19/2018	49.47
7/19/2018	60.93
8/22/2018	519.93
11/20/2018	92.57
11/20/2018	57.47
12/20/2018	79.77
3/26/2019	76.47
5/7/2019	78.07
11/21/2019	76.17

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	88.5
6/19/2018	5.5
7/19/2018	52.5
8/22/2018	39.5
9/19/2018	17.5
9/27/2018	66.5
11/20/2018	285
11/20/2018	45.5
12/20/2018	64.5
5/7/2019	18.5
11/21/2019	100.5



# Shapiro-Francia Test of Normality

Parameter: Calcium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 72

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	0.5	-2.22621	4.956	-1.1131
2	0.5	-1.92684	8.6687	-2.07652
3	0.5	-1.7392	11.6935	-2.94612
4	0.5	-1.60725	14.2768	-3.74975
5	0.5	-1.49085	16.4994	-4.49517
6	2.29	-1.39175	18.4364	-7.68227
7	13.3	-1.31058	20.154	-25.113
8	15	-1.23187	21.6715	-43.591
9	16.6	-1.16012	23.0173	-62.8489
10	16.9	-1.09847	24.224	-81.4131
11	22.2	-1.03643	25.2982	-104.422
12	31.7	-0.97815	26.255	-135.429
13	35.6	-0.923014	27.1069	-168.289
14	40	-0.874218	27.8712	-203.257
15	41.8	-0.823893	28.55	-237.696
16	41.8	-0.775574	29.1515	-270.115
17	42.8	-0.732275	29.6877	-301.456
18	43.4	-0.687131	30.1599	-331.278
19	43.6	-0.643345	30.5738	-359.328
20	45.2	-0.603765	30.9383	-386.618
21	49.5	-0.56217	31.2543	-414.445
22	53.8	-0.521527	31.5263	-442.503
23	56	-0.481728	31.7584	-469.48
24	58	-0.445443	31.9568	-495.316
25	68.5	-0.40701	32.1224	-523.196
26	68.9	-0.369171	32.2587	-548.632
27	74.7	-0.334503	32.3706	-573.619
28	78.9	-0.297612	32.4592	-597.101
29	80.2	-0.26112	32.5274	-618.043
30	82.1	-0.227545	32.5792	-636.724
31	86.3	-0.191671	32.6159	-653.265
32	86.4	-0.156042	32.6402	-666.747
33	88	-0.12061	32.6548	-677.361
34	91.8	-0.0878447	32.6625	-685.425
35	94.8	-0.0526632	32.6653	-690.418
36	95.6	-0.0175476	32.6656	-692.095
37	97	0.0175476	32.6659	-690.393
38	100	0.0526632	32.6687	-685.127
39	101	0.0878447	32.6764	-676.255
40	102	0.12061	32.6909	-663.952
41	107	0.156042	32.7153	-647.256
42	110	0.191671	32.752	-626.172
43	117	0.227545	32.8038	-599.549
44	154	0.26112	32.872	-559.337
45	163	0.297612	32.9606	-510.826
46	184	0.334503	33.0724	-449.277

47	192	0.369171	33.2087	-378.397
48	197	0.40701	33.3744	-298.216
49	199	0.445443	33.5728	-209.572
50	202	0.481728	33.8049	-112.263
51	205	0.521527	34.0769	-5.35037
52	206	0.56217	34.3929	110.457
53	211	0.603765	34.7574	237.851
54	212	0.643345	35.1713	374.24
55	212	0.687131	35.6435	519.912
56	213	0.732275	36.1797	675.886
57	228	0.775574	36.7812	852.717
58	240	0.823893	37.46	1050.45
59	267	0.874218	38.2243	1283.87
60	291	0.923014	39.0762	1552.46
61	303	0.97815	40.033	1848.84
62	325	1.03643	41.1072	2185.69
63	331	1.09847	42.3138	2549.28
64	338	1.16012	43.6597	2941.4
65	350	1.23187	45.1772	3372.55
66	352	1.31058	46.8948	3833.88
67	386	1.39175	48.8318	4371.09
68	484	1.49085	51.0544	5092.66
69	549	1.60725	53.6377	5975.04
70	560	1.7392	56.6625	6948.99
71	613	1.92684	60.3752	8130.15

Sample Standard Deviation = 154.526

Numerator = 6.60993e+007

Denominator = 1.02357e+008 = 71 60.3752

W Statistic = 0.64577

5% Critical value of 0.968 exceeds 0.64577

Evidence of non-normality at 95% level of significance

1% Critical value of 0.956 exceeds 0.64577

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 6.94444%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 17

Maximum Background Concentration = 670

Confidence Level = 81%

False Positive Rate = 19%

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Well	Date	Samples	Mean	Impacted
MW#93-2	11/21/2019	1	117	FALSE
MW#93-3	11/21/2019	1	107	FALSE
MW#03-1	11/21/2019	1	16.9	FALSE
MW#03-2	11/21/2019	1	386	FALSE

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# Concentrations (mg/L)

## Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 285

Total Non-Detect: 6

Percent Non-Detects: 2.10526%

Total Background Samples: 72

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	72	0 (0%)	12/15/1994	30	30
			3/14/1995	38	38
			6/21/1995	37	37
			12/14/1995	24	24
			3/6/1996	20	20
			4/25/1996	32	32
			10/2/1996	40	40
			12/10/1996	30	30
			3/11/1997	4	4
			4/15/1997	28	28
			8/14/1997	33	33
			12/4/1997	29	29
			3/31/1998	30	30
			6/23/1998	37	37
			8/11/1998	24	24
			12/8/1998	31	31
			3/9/1999	30	30
			6/8/1999	35	35
			8/19/1999	40	40
			12/14/1999	40	40
			3/7/2000	50	50
			6/23/2000	52	52
			12/12/2000	54	54
			3/27/2001	60	60
			6/28/2001	58	58
			9/10/2001	46	46
			12/18/2001	46	46
			3/19/2002	42	42
			6/26/2002	51	51
			9/18/2002	57	57
			12/11/2002	56	56
			3/13/2003	56	56
			6/25/2003	63	63
			9/26/2003	59	59
			12/10/2003	40	40
			3/9/2004	58	58
			6/24/2004	61	61
			9/15/2004	44	44
			12/15/2004	48	48
			3/16/2005	42	42
			6/15/2005	42	42
			9/21/2005	42	42
			12/21/2005	58	58
			3/15/2006	50	50

6/21/2006	31	31
12/20/2006	35	35
6/12/2007	24	24
12/17/2007	27	27
6/11/2008	29	29
12/3/2008	28	28
6/17/2009	20	20
12/9/2009	24	24
6/17/2010	17	17
12/22/2010	20	20
6/29/2011	20.8	20.8
12/7/2011	17.6	17.6
6/6/2012	23.8	23.8
12/12/2012	22.2	22.2
6/19/2013	21.5	21.5
12/11/2013	17.6	17.6
6/11/2014	19.3	19.3
12/3/2014	16.9	16.9
6/17/2015	13	13
12/1/2015	15.2	15.2
6/22/2016	13	13
12/20/2016	15.2	15.2
6/6/2017	16.1	16.1
11/7/2017	16.2	16.2
2/27/2018	15.6	15.6
9/27/2018	16.8	16.8
5/7/2019	18.8	18.8
11/21/2019	22	22

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There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	73	1 (1.36986%)	12/15/1994	400	400
			3/14/1995	1500	1500
			6/21/1995	75	75
			12/14/1995	1749	1749
			3/6/1996	1674	1674
			4/25/1996	1999	1999
			10/2/1996	1553	1553
			12/10/1996	1560	1560
			3/11/1997	1634	1634
			4/15/1997	1700	1700
			8/14/1997	2149	2149
			12/4/1997	1769	1769
			3/31/1998	2000	2000
			6/23/1998	2099	2099
			8/11/1998	1874	1874
			12/8/1998	1922	1922
			3/9/1999	1700	1700
			6/8/1999	1739	1739
			8/19/1999	1800	1800
			12/14/1999	1800	1800
			3/7/2000	1328	1328
			6/23/2000	950	950
			12/12/2000	1789	1789
3/27/2001	1749	1749			

6/28/2001	1799	1799
9/10/2001	2050	2050
12/18/2001	1600	1600
3/19/2002	1730	1730
6/26/2002	1699	1699
9/18/2002	1674	1674
12/11/2002	1613	1613
3/13/2003	1510	1510
6/25/2003	1800	1800
9/26/2003	1616	1616
12/10/2003	1509	1509
3/9/2004	1800	1800
6/24/2004	1892	1892
9/15/2004	1435	1435
12/15/2004	1600	1600
3/16/2005	1325	1325
6/15/2005	1400	1400
9/21/2005	1412	1412
12/21/2005	1550	1550
3/15/2006	1375	1375
6/21/2006	1500	1500
12/20/2006	1250	1250
2/21/2007	1250	1250
6/12/2007	1350	1350
12/17/2007	1399	1399
6/11/2008	1210	1210
12/3/2008	1584	1584
6/17/2009	750	750
12/9/2009	875	875
6/17/2010	1500	1500
12/22/2010	1600	1600
6/29/2011	1670	1670
12/7/2011	1510	1510
6/6/2012	1610	1610
12/12/2012	1750	1750
6/19/2013	1390	1390
12/11/2013	1410	1410
6/11/2014	1360	1360
12/3/2014	1520	1520
6/17/2015	47.7	47.7
12/1/2015	1760	1760
6/22/2016	1300	1300
12/20/2016	1690	1690
6/6/2017	1580	1580
11/7/2017	1160	1160
2/27/2018	1270	1270
9/27/2018	1250	1250
5/7/2019	1360	1360
11/21/2019	ND<5	ND<5

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MW#93-3	72	0 (0%)	12/15/1994	440	440
			3/14/1995	420	420
			6/21/1995	420	420
			12/14/1995	406	406
			3/6/1996	368	368
			4/25/1996	384	384
			10/2/1996	430	430

12/10/1996	377	377
3/11/1997	375	375
4/15/1997	400	400
8/14/1997	916	916
12/4/1997	249	249
3/31/1998	275	275
6/23/1998	246	246
8/11/1998	500	500
12/8/1998	260	260
3/9/1999	280	280
6/8/1999	214	214
8/19/1999	260	260
12/14/1999	200	200
3/7/2000	232	232
6/23/2000	270	270
12/12/2000	196	196
3/27/2001	190	190
6/28/2001	180	180
9/10/2001	202	202
12/18/2001	149	149
3/19/2002	203	203
6/26/2002	180	180
9/18/2002	185	185
12/11/2002	178	178
3/13/2003	207	207
6/25/2003	190	190
9/26/2003	158	158
12/10/2003	140	140
3/9/2004	13	13
6/24/2004	160	160
9/15/2004	139	139
12/15/2004	122	122
3/16/2005	180	180
6/15/2005	150	150
9/21/2005	215	215
12/21/2005	180	180
3/15/2006	221	221
6/21/2006	210	210
12/20/2006	210	210
6/12/2007	110	110
12/17/2007	131	131
6/11/2008	144	144
12/3/2008	152	152
6/17/2009	120	120
12/9/2009	175	175
6/17/2010	150	150
12/22/2010	170	170
6/29/2011	170	170
12/7/2011	98.9	98.9
6/6/2012	194	194
12/12/2012	168	168
6/19/2013	194	194
12/11/2013	173	173
6/11/2014	254	254
12/3/2014	194	194
6/17/2015	168	168
12/1/2015	280	280

			6/22/2016	518	518
			12/20/2016	475	475
			6/6/2017	113	113
			11/7/2017	402	402
			2/27/2018	435	435
			9/27/2018	426	426
			5/7/2019	421	421
			11/21/2019	1070	1070
MW#03-1	31	4 (12.9032%)	6/24/2004	10	10
			9/15/2004	22	22
			12/15/2004	6	6
			3/16/2005	4	4
			6/15/2005	6	6
			9/21/2005	5	5
			12/20/2006	5	5
			6/12/2007	4	4
			12/17/2007	3	3
			6/11/2008	11	11
			12/3/2008	11	11
			6/17/2009	4	4
			12/9/2009	32	32
			6/17/2010	5	5
			12/22/2010	8.7	8.7
			6/29/2011	4.86	4.86
			12/7/2011	5.88	5.88
			6/6/2012	9.36	9.36
			6/19/2013	ND<5	ND<5
			12/11/2013	ND<5	ND<5
			6/11/2014	44	44
			12/3/2014	ND<5	ND<5
			6/17/2015	ND<5	ND<5
			12/1/2015	0.777	0.777
			6/22/2016	0.628	0.628
			12/20/2016	0.786	0.786
			6/6/2017	0.887	0.887
			11/7/2017	1.13	1.13
			2/27/2018	1.07	1.07
			5/7/2019	5.9	5.9
			11/21/2019	410	410
MW#03-2	37	1 (2.7027%)	6/24/2004	36	36
			9/15/2004	4	4
			12/15/2004	28	28
			3/16/2005	30	30
			6/15/2005	30	30
			9/21/2005	27	27
			12/21/2005	26	26
			3/15/2006	27	27
			6/21/2006	23	23
			12/20/2006	35	35
			6/12/2007	30	30
			12/17/2007	20	20
			6/11/2008	41	41
			12/3/2008	46	46
			6/17/2009	60	60
			12/9/2009	45	45



6/17/2010	33	33
12/22/2010	29	29
6/29/2011	28.4	28.4
12/7/2011	23.5	23.5
6/6/2012	29.3	29.3
12/12/2012	28.3	28.3
6/19/2013	32.1	32.1
12/11/2013	32.8	32.8
6/11/2014	ND<5	ND<5
12/3/2014	51.2	51.2
6/17/2015	54.7	54.7
12/1/2015	67.8	67.8
6/22/2016	79.7	79.7
10/11/2016	88.4	88.4
12/20/2016	126	126
6/6/2017	117	117
11/7/2017	288	288
2/27/2018	247	247
9/27/2018	283	283
5/7/2019	313	313
11/21/2019	543	543

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 118.465

Overall Std Dev = 201.333

Overall Total = 33762.4

SS Wells = 3.17198e+006

SS Total = 1.15119e+007

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## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	3.17198e+006	4	792995	26.6235
Error (within wells)	8.33994e+006	280	29785.5	
Totals	1.15119e+007	284		

26.6235 exceeds 2.37; assumption of equal variance should be rejected

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Well: MW#93-1	Sample	Residual
	12/15/1994	3.66111
	3/14/1995	4.33889
	6/21/1995	3.33889
	12/14/1995	9.66111
	3/6/1996	13.6611
	4/25/1996	1.66111
	10/2/1996	6.33889
	12/10/1996	3.66111
	3/11/1997	29.6611
	4/15/1997	5.66111
	8/14/1997	0.661111
	12/4/1997	4.66111
	3/31/1998	3.66111
	6/23/1998	3.33889
	8/11/1998	9.66111
	12/8/1998	2.66111
	3/9/1999	3.66111
	6/8/1999	1.33889
	8/19/1999	6.33889
	12/14/1999	6.33889
	3/7/2000	16.3389
	6/23/2000	18.3389
	12/12/2000	20.3389
	3/27/2001	26.3389
	6/28/2001	24.3389
	9/10/2001	12.3389
	12/18/2001	12.3389
	3/19/2002	8.33889
	6/26/2002	17.3389
	9/18/2002	23.3389
	12/11/2002	22.3389
	3/13/2003	22.3389

6/25/2003	29.3389
9/26/2003	25.3389
12/10/2003	6.33889
3/9/2004	24.3389
6/24/2004	27.3389
9/15/2004	10.3389
12/15/2004	14.3389
3/16/2005	8.33889
6/15/2005	8.33889
9/21/2005	8.33889
12/21/2005	24.3389
3/15/2006	16.3389
6/21/2006	2.66111
12/20/2006	1.33889
6/12/2007	9.66111
12/17/2007	6.66111
6/11/2008	4.66111
12/3/2008	5.66111
6/17/2009	13.6611
12/9/2009	9.66111
6/17/2010	16.6611
12/22/2010	13.6611
6/29/2011	12.8611
12/7/2011	16.0611
6/6/2012	9.86111
12/12/2012	11.4611
6/19/2013	12.1611
12/11/2013	16.0611
6/11/2014	14.3611
12/3/2014	16.7611
6/17/2015	20.6611
12/1/2015	18.4611
6/22/2016	20.6611
12/20/2016	18.4611
6/6/2017	17.5611
11/7/2017	17.4611
2/27/2018	18.0611
9/27/2018	16.8611
5/7/2019	14.8611
11/21/2019	11.6611

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
12/15/1994	1090.57
3/14/1995	9.42877
6/21/1995	1415.57
12/14/1995	258.429
3/6/1996	183.429
4/25/1996	508.429
10/2/1996	62.4288
12/10/1996	69.4288
3/11/1997	143.429
4/15/1997	209.429
8/14/1997	658.429
12/4/1997	278.429
3/31/1998	509.429
6/23/1998	608.429
8/11/1998	383.429

12/8/1998	431.429
3/9/1999	209.429
6/8/1999	248.429
8/19/1999	309.429
12/14/1999	309.429
3/7/2000	162.571
6/23/2000	540.571
12/12/2000	298.429
3/27/2001	258.429
6/28/2001	308.429
9/10/2001	559.429
12/18/2001	109.429
3/19/2002	239.429
6/26/2002	208.429
9/18/2002	183.429
12/11/2002	122.429
3/13/2003	19.4288
6/25/2003	309.429
9/26/2003	125.429
12/10/2003	18.4288
3/9/2004	309.429
6/24/2004	401.429
9/15/2004	55.5712
12/15/2004	109.429
3/16/2005	165.571
6/15/2005	90.5712
9/21/2005	78.5712
12/21/2005	59.4288
3/15/2006	115.571
6/21/2006	9.42877
12/20/2006	240.571
2/21/2007	240.571
6/12/2007	140.571
12/17/2007	91.5712
6/11/2008	280.571
12/3/2008	93.4288
6/17/2009	740.571
12/9/2009	615.571
6/17/2010	9.42877
12/22/2010	109.429
6/29/2011	179.429
12/7/2011	19.4288
6/6/2012	119.429
12/12/2012	259.429
6/19/2013	100.571
12/11/2013	80.5712
6/11/2014	130.571
12/3/2014	29.4288
6/17/2015	1442.87
12/1/2015	269.429
6/22/2016	190.571
12/20/2016	199.429
6/6/2017	89.4288
11/7/2017	330.571
2/27/2018	220.571
9/27/2018	240.571
5/7/2019	130.571

11/21/2019 1485.57

**Well: MW#93-3**

**Sample Residual**

12/15/1994	176.307
3/14/1995	156.307
6/21/1995	156.307
12/14/1995	142.307
3/6/1996	104.307
4/25/1996	120.307
10/2/1996	166.307
12/10/1996	113.307
3/11/1997	111.307
4/15/1997	136.307
8/14/1997	652.307
12/4/1997	14.6931
3/31/1998	11.3069
6/23/1998	17.6931
8/11/1998	236.307
12/8/1998	3.69306
3/9/1999	16.3069
6/8/1999	49.6931
8/19/1999	3.69306
12/14/1999	63.6931
3/7/2000	31.6931
6/23/2000	6.30694
12/12/2000	67.6931
3/27/2001	73.6931
6/28/2001	83.6931
9/10/2001	61.6931
12/18/2001	114.693
3/19/2002	60.6931
6/26/2002	83.6931
9/18/2002	78.6931
12/11/2002	85.6931
3/13/2003	56.6931
6/25/2003	73.6931
9/26/2003	105.693
12/10/2003	123.693
3/9/2004	250.693
6/24/2004	103.693
9/15/2004	124.693
12/15/2004	141.693
3/16/2005	83.6931
6/15/2005	113.693
9/21/2005	48.6931
12/21/2005	83.6931
3/15/2006	42.6931
6/21/2006	53.6931
12/20/2006	53.6931
6/12/2007	153.693
12/17/2007	132.693
6/11/2008	119.693
12/3/2008	111.693
6/17/2009	143.693
12/9/2009	88.6931
6/17/2010	113.693
12/22/2010	93.6931

6/29/2011	93.6931
12/7/2011	164.793
6/6/2012	69.6931
12/12/2012	95.6931
6/19/2013	69.6931
12/11/2013	90.6931
6/11/2014	9.69306
12/3/2014	69.6931
6/17/2015	95.6931
12/1/2015	16.3069
6/22/2016	254.307
12/20/2016	211.307
6/6/2017	150.693
11/7/2017	138.307
2/27/2018	171.307
9/27/2018	162.307
5/7/2019	157.307
11/21/2019	806.307

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
6/24/2004	10.709
9/15/2004	1.29103
12/15/2004	14.709
3/16/2005	16.709
6/15/2005	14.709
9/21/2005	15.709
12/20/2006	15.709
6/12/2007	16.709
12/17/2007	17.709
6/11/2008	9.70897
12/3/2008	9.70897
6/17/2009	16.709
12/9/2009	11.291
6/17/2010	15.709
12/22/2010	12.009
6/29/2011	15.849
12/7/2011	14.829
6/6/2012	11.349
6/19/2013	15.709
12/11/2013	15.709
6/11/2014	23.291
12/3/2014	15.709
6/17/2015	15.709
12/1/2015	19.932
6/22/2016	20.081
12/20/2016	19.923
6/6/2017	19.822
11/7/2017	19.579
2/27/2018	19.639
5/7/2019	14.809
11/21/2019	389.291

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
6/24/2004	45.3027
9/15/2004	77.3027
12/15/2004	53.3027

3/16/2005	51.3027
6/15/2005	51.3027
9/21/2005	54.3027
12/21/2005	55.3027
3/15/2006	54.3027
6/21/2006	58.3027
12/20/2006	46.3027
6/12/2007	51.3027
12/17/2007	61.3027
6/11/2008	40.3027
12/3/2008	35.3027
6/17/2009	21.3027
12/9/2009	36.3027
6/17/2010	48.3027
12/22/2010	52.3027
6/29/2011	52.9027
12/7/2011	57.8027
6/6/2012	52.0027
12/12/2012	53.0027
6/19/2013	49.2027
12/11/2013	48.5027
6/11/2014	76.3027
12/3/2014	30.1027
6/17/2015	26.6027
12/1/2015	13.5027
6/22/2016	1.6027
10/11/2016	7.0973
12/20/2016	44.6973
6/6/2017	35.6973
11/7/2017	206.697
2/27/2018	165.697
9/27/2018	201.697
5/7/2019	231.697
11/21/2019	461.697

# Shapiro-Francia Test of Normality

Parameter: Chloride

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 285

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	0.628	-2.74777	7.55021	-1.7256
2	0.777	-2.51213	13.861	-3.67752
3	0.786	-2.32634	19.2729	-5.50603
4	0.887	-2.22621	24.2289	-7.48067
5	1.07	-2.12007	28.7236	-9.74915
6	1.13	-2.05375	32.9415	-12.0699
7	3	-1.97737	36.8515	-18.002
8	4	-1.92684	40.5642	-25.7093
9	4	-1.86629	44.0472	-33.1745
10	4	-1.82501	47.3778	-40.4745
11	4	-1.77438	50.5263	-47.572
12	4	-1.7392	53.5511	-54.5288
13	4.86	-1.6954	56.4255	-62.7685
14	5	-1.66456	59.1962	-71.0913
15	5	-1.62576	61.8393	-79.2201
16	5	-1.59819	64.3935	-87.2111
17	5	-1.56322	66.8372	-95.0272
18	5	-1.5382	69.2033	-102.718
19	5	-1.50626	71.4721	-110.249
20	5	-1.48328	73.6722	-117.666
21	5	-1.4538	75.7858	-124.935
22	5	-1.4325	77.8378	-132.097
23	5.88	-1.40507	79.8121	-140.359
24	5.9	-1.38517	81.7308	-148.532
25	6	-1.35946	83.5789	-156.689
26	6	-1.34075	85.3765	-164.733
27	8.7	-1.31652	87.1097	-176.187
28	9.36	-1.29884	88.7967	-188.344
29	10	-1.27588	90.4246	-201.103
30	11	-1.25908	92.0099	-214.953
31	11	-1.23724	93.5406	-228.562
32	13	-1.22123	95.032	-244.438
33	13	-1.20036	96.4729	-260.043
34	13	-1.18504	97.8772	-275.448
35	15.2	-1.16505	99.2345	-293.157
36	15.2	-1.15035	100.558	-310.642
37	15.6	-1.13113	101.837	-328.288
38	16.1	-1.11699	103.085	-346.272
39	16.2	-1.09847	104.292	-364.067
40	16.8	-1.08482	105.468	-382.292
41	16.9	-1.06694	106.607	-400.323
42	17	-1.05375	107.717	-418.237
43	17.6	-1.03643	108.791	-436.478
44	17.6	-1.02365	109.839	-454.494
45	18.8	-1.00687	110.853	-473.423
46	19.3	-0.994457	111.842	-492.616



47	20	-0.97815	112.799	-512.179
48	20	-0.966088	113.732	-531.501
49	20	-0.950222	114.635	-550.505
50	20	-0.938476	115.516	-569.275
51	20.8	-0.923014	116.368	-588.474
52	21.5	-0.911562	117.199	-608.072
53	22	-0.896473	118.002	-627.795
54	22	-0.885291	118.786	-647.271
55	22.2	-0.87055	119.544	-666.597
56	23	-0.859618	120.283	-686.369
57	23.5	-0.845198	120.997	-706.231
58	23.8	-0.834498	121.694	-726.092
59	24	-0.820379	122.367	-745.781
60	24	-0.809896	123.023	-765.218
61	24	-0.796056	123.656	-784.324
62	24	-0.785774	124.274	-803.182
63	26	-0.772193	124.87	-823.259
64	27	-0.7621	125.451	-843.836
65	27	-0.748762	126.011	-864.052
66	27	-0.738846	126.557	-884.001
67	28	-0.725736	127.084	-904.322
68	28	-0.715986	127.597	-924.37
69	28	-0.703089	128.091	-944.056
70	28.3	-0.693493	128.572	-963.682
71	28.4	-0.680797	129.035	-983.017
72	29	-0.671346	129.486	-1002.49
73	29	-0.658838	129.92	-1021.59
74	29	-0.649522	130.342	-1040.43
75	29.3	-0.637192	130.748	-1059.1
76	30	-0.628006	131.142	-1077.94
77	30	-0.615839	131.522	-1096.41
78	30	-0.606775	131.89	-1114.62
79	30	-0.594766	132.244	-1132.46
80	30	-0.585815	132.587	-1150.03
81	30	-0.573953	132.916	-1167.25
82	30	-0.565108	133.236	-1184.21
83	31	-0.553384	133.542	-1201.36
84	31	-0.544642	133.838	-1218.24
85	32	-0.533048	134.123	-1235.3
86	32	-0.524401	134.398	-1252.08
87	32.1	-0.51293	134.661	-1268.55
88	32.8	-0.504372	134.915	-1285.09
89	33	-0.493018	135.158	-1301.36
90	33	-0.484544	135.393	-1317.35
91	35	-0.473299	135.617	-1333.92
92	35	-0.464904	135.833	-1350.19
93	35	-0.453763	136.039	-1366.07
94	36	-0.445443	136.237	-1382.11
95	37	-0.434397	136.426	-1398.18
96	37	-0.426148	136.608	-1413.95
97	38	-0.415193	136.78	-1429.72
98	40	-0.40701	136.946	-1446
99	40	-0.396142	137.103	-1461.85
100	40	-0.388022	137.253	-1477.37
101	40	-0.377233	137.396	-1492.46
102	41	-0.369171	137.532	-1507.6
103	42	-0.358459	137.66	-1522.65

104	42	-0.350451	137.783	-1537.37
105	42	-0.33981	137.899	-1551.64
106	42	-0.331854	138.009	-1565.58
107	44	-0.321278	138.112	-1579.72
108	44	-0.31337	138.21	-1593.5
109	45	-0.302855	138.302	-1607.13
110	46	-0.294992	138.389	-1620.7
111	46	-0.284535	138.47	-1633.79
112	46	-0.276714	138.546	-1646.52
113	47.7	-0.266311	138.617	-1659.22
114	48	-0.258527	138.684	-1671.63
115	50	-0.248174	138.746	-1684.04
116	50	-0.240426	138.804	-1696.06
117	51	-0.230118	138.856	-1707.8
118	51.2	-0.222403	138.906	-1719.18
119	52	-0.212137	138.951	-1730.22
120	54	-0.204452	138.993	-1741.26
121	54.7	-0.194225	139.03	-1751.88
122	56	-0.186567	139.065	-1762.33
123	56	-0.176374	139.096	-1772.21
124	57	-0.168741	139.125	-1781.82
125	58	-0.158579	139.15	-1791.02
126	58	-0.150969	139.173	-1799.78
127	58	-0.140835	139.193	-1807.95
128	59	-0.133244	139.21	-1815.81
129	60	-0.123135	139.226	-1823.2
130	60	-0.115562	139.239	-1830.13
131	61	-0.105474	139.25	-1836.56
132	63	-0.0979139	139.26	-1842.73
133	67.8	-0.0878447	139.267	-1848.69
134	75	-0.0802981	139.274	-1854.71
135	79.7	-0.0702426	139.279	-1860.31
136	88.4	-0.0627062	139.283	-1865.85
137	98.9	-0.0526632	139.285	-1871.06
138	110	-0.0451348	139.287	-1876.02
139	113	-0.0350997	139.289	-1879.99
140	117	-0.0275759	139.289	-1883.22
141	120	-0.0175476	139.29	-1885.32
142	122	-0.0100272	139.29	-1886.55
143	126	0	139.29	-1886.55
144	131	0.0100272	139.29	-1885.23
145	139	0.0175476	139.29	-1882.79
146	140	0.0275759	139.291	-1878.93
147	144	0.0350997	139.292	-1873.88
148	149	0.0451348	139.294	-1867.15
149	150	0.0526632	139.297	-1859.25
150	150	0.0627062	139.301	-1849.85
151	152	0.0702426	139.306	-1839.17
152	158	0.0802981	139.312	-1826.48
153	160	0.0878447	139.32	-1812.43
154	168	0.0979139	139.33	-1795.98
155	168	0.105474	139.341	-1778.26
156	170	0.115562	139.354	-1758.61
157	170	0.123135	139.369	-1737.68
158	173	0.133244	139.387	-1714.63
159	175	0.140835	139.407	-1689.98
160	178	0.150969	139.43	-1663.11

161	180	0.158579	139.455	-1634.57
162	180	0.168741	139.483	-1604.19
163	180	0.176374	139.514	-1572.45
164	180	0.186567	139.549	-1538.86
165	185	0.194225	139.587	-1502.93
166	190	0.204452	139.629	-1464.09
167	190	0.212137	139.674	-1423.78
168	194	0.222403	139.723	-1380.63
169	194	0.230118	139.776	-1335.99
170	194	0.240426	139.834	-1289.35
171	196	0.248174	139.896	-1240.71
172	200	0.258527	139.962	-1189
173	202	0.266311	140.033	-1135.21
174	203	0.276714	140.11	-1079.03
175	207	0.284535	140.191	-1020.13
176	210	0.294992	140.278	-958.186
177	210	0.302855	140.37	-894.587
178	214	0.31337	140.468	-827.526
179	215	0.321278	140.571	-758.451
180	221	0.331854	140.681	-685.111
181	232	0.33981	140.797	-606.275
182	246	0.350451	140.919	-520.064
183	247	0.358459	141.048	-431.525
184	249	0.369171	141.184	-339.601
185	254	0.377233	141.327	-243.784
186	260	0.388022	141.477	-142.898
187	260	0.396142	141.634	-39.9015
188	270	0.40701	141.8	69.9913
189	275	0.415193	141.972	184.169
190	280	0.426148	142.154	303.491
191	280	0.434397	142.342	425.122
192	283	0.445443	142.541	551.183
193	288	0.453763	142.747	681.866
194	313	0.464904	142.963	827.381
195	368	0.473299	143.187	1001.56
196	375	0.484544	143.422	1183.26
197	377	0.493018	143.665	1369.13
198	384	0.504372	143.919	1562.81
199	400	0.51293	144.182	1767.98
200	400	0.524401	144.457	1977.74
201	402	0.533048	144.741	2192.02
202	406	0.544642	145.038	2413.15
203	410	0.553384	145.344	2640.04
204	420	0.565108	145.664	2877.38
205	420	0.573953	145.993	3118.44
206	421	0.585815	146.336	3365.07
207	426	0.594766	146.69	3618.44
208	430	0.606775	147.058	3879.35
209	435	0.615839	147.437	4147.24
210	440	0.628006	147.832	4423.57
211	475	0.637192	148.238	4726.23
212	500	0.649522	148.66	5050.99
213	518	0.658838	149.094	5392.27
214	543	0.671346	149.544	5756.81
215	750	0.680797	150.008	6267.41
216	875	0.693493	150.489	6874.22
217	916	0.703089	150.983	7518.25

218	950	0.715986	151.496	8198.43
219	1070	0.725736	152.022	8974.97
220	1160	0.738846	152.568	9832.03
221	1210	0.748762	153.129	10738
222	1250	0.7621	153.71	11690.7
223	1250	0.772193	154.306	12655.9
224	1250	0.785774	154.924	13638.1
225	1270	0.796056	155.557	14649.1
226	1300	0.809896	156.213	15702
227	1325	0.820379	156.886	16789
228	1328	0.834498	157.583	17897.2
229	1350	0.845198	158.297	19038.2
230	1360	0.859618	159.036	20207.3
231	1360	0.87055	159.794	21391.2
232	1375	0.885291	160.577	22608.5
233	1390	0.896473	161.381	23854.6
234	1399	0.911562	162.212	25129.9
235	1400	0.923014	163.064	26422.1
236	1410	0.938476	163.945	27745.4
237	1412	0.950222	164.848	29087.1
238	1435	0.966088	165.781	30473.4
239	1500	0.97815	166.738	31940.6
240	1500	0.994457	167.727	33432.3
241	1500	1.00687	168.741	34942.6
242	1509	1.02365	169.788	36487.3
243	1510	1.03643	170.863	38052.3
244	1510	1.05375	171.973	39643.5
245	1520	1.06694	173.111	41265.2
246	1550	1.08482	174.288	42946.7
247	1553	1.09847	175.495	44652.6
248	1560	1.11699	176.742	46395.1
249	1580	1.13113	178.022	48182.3
250	1584	1.15035	179.345	50004.5
251	1600	1.16505	180.703	51868.5
252	1600	1.18504	182.107	53764.6
253	1600	1.20036	183.548	55685.2
254	1610	1.22123	185.039	57651.4
255	1613	1.23724	186.57	59647
256	1616	1.25908	188.155	61681.7
257	1634	1.27588	189.783	63766.5
258	1670	1.29884	191.47	65935.5
259	1674	1.31652	193.203	68139.4
260	1674	1.34075	195.001	70383.8
261	1690	1.35946	196.849	72681.3
262	1699	1.38517	198.768	75034.7
263	1700	1.40507	200.742	77423.3
264	1700	1.4325	202.794	79858.6
265	1730	1.4538	204.908	82373.7
266	1739	1.48328	207.108	84953.1
267	1749	1.50626	209.376	87587.5
268	1749	1.5382	211.743	90277.9
269	1750	1.56322	214.186	93013.5
270	1760	1.59819	216.74	95826.3
271	1769	1.62576	219.384	98702.3
272	1789	1.66456	222.154	101680
273	1799	1.6954	225.029	104730
274	1800	1.7392	228.053	107861

275	1800	1.77438	231.202	111055
276	1800	1.82501	234.533	114340
277	1800	1.86629	238.016	117699
278	1874	1.92684	241.728	121310
279	1892	1.97737	245.638	125051
280	1922	2.05375	249.856	128998
281	1999	2.12007	254.351	133236
282	2000	2.22621	259.307	137689
283	2050	2.32634	264.719	142458
284	2099	2.51213	271.03	147731

---

Sample Standard Deviation = 650.478

Numerator = 2.18244e+010

Denominator = 3.25687e+010 = 284 271.03

W Statistic = 0.670104

5% Critical value of 0.976 exceeds 0.670104

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.670104

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 2.10526%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 72

Maximum Background Concentration = 63

Confidence Level = 94.7%

False Positive Rate = 5.3%

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Well	Date	Samples	Mean	Impacted
MW#93-2	11/21/2019	1	5	FALSE
MW#93-3	11/21/2019	1	1070	TRUE
MW#03-1	11/21/2019	1	410	TRUE
MW#03-2	11/21/2019	1	543	TRUE

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## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 71

Maximum Baseline Concentration = 916

Confidence Level = 98.6%

False Positive Rate = 1.4%

---

Baseline Samples	Date	Result
	12/15/1994	440
	3/14/1995	420
	6/21/1995	420
	12/14/1995	406
	3/6/1996	368
	4/25/1996	384
	10/2/1996	430
	12/10/1996	377
	3/11/1997	375
	4/15/1997	400
	8/14/1997	916
	12/4/1997	249
	3/31/1998	275
	6/23/1998	246
	8/11/1998	500
	12/8/1998	260
	3/9/1999	280
	6/8/1999	214
	8/19/1999	260
	12/14/1999	200
	3/7/2000	232
	6/23/2000	270
	12/12/2000	196
	3/27/2001	190
	6/28/2001	180
	9/10/2001	202
	12/18/2001	149
	3/19/2002	203
	6/26/2002	180
	9/18/2002	185
	12/11/2002	178
	3/13/2003	207
	6/25/2003	190
	9/26/2003	158
	12/10/2003	140
	3/9/2004	13
	6/24/2004	160
	9/15/2004	139
	12/15/2004	122
	3/16/2005	180
	6/15/2005	150

9/21/2005	215
12/21/2005	180
3/15/2006	221
6/21/2006	210
12/20/2006	210
6/12/2007	110
12/17/2007	131
6/11/2008	144
12/3/2008	152
6/17/2009	120
12/9/2009	175
6/17/2010	150
12/22/2010	170
6/29/2011	170
12/7/2011	98.9
6/6/2012	194
12/12/2012	168
6/19/2013	194
12/11/2013	173
6/11/2014	254
12/3/2014	194
6/17/2015	168
12/1/2015	280
6/22/2016	518
12/20/2016	475
6/6/2017	113
11/7/2017	402
2/27/2018	435
9/27/2018	426
5/7/2019	421

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<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	1070	TRUE



## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#03-1

#### Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 13.3333%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 30

Maximum Baseline Concentration = 44

Confidence Level = 96.8%

False Positive Rate = 3.2%

---

Baseline Samples	Date	Result
	6/24/2004	10
	9/15/2004	22
	12/15/2004	6
	3/16/2005	4
	6/15/2005	6
	9/21/2005	5
	12/20/2006	5
	6/12/2007	4
	12/17/2007	3
	6/11/2008	11
	12/3/2008	11
	6/17/2009	4
	12/9/2009	32
	6/17/2010	5
	12/22/2010	8.7
	6/29/2011	4.86
	12/7/2011	5.88
	6/6/2012	9.36
	6/19/2013	ND<5
	12/11/2013	ND<5
	6/11/2014	44
	12/3/2014	ND<5
	6/17/2015	ND<5
	12/1/2015	0.777
	6/22/2016	0.628
	12/20/2016	0.786
	6/6/2017	0.887
	11/7/2017	1.13
	2/27/2018	1.07
	5/7/2019	5.9

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Date	Samples	Mean	Impacted
11/21/2019	1	410	TRUE

# Non-Parametric Prediction Interval

## Intra-Well Comparison for MW#03-2

### Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 2.77778%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 36

Maximum Baseline Concentration = 313

Confidence Level = 97.3%

False Positive Rate = 2.7%

---

Baseline Samples	Date	Result
	6/24/2004	36
	9/15/2004	4
	12/15/2004	28
	3/16/2005	30
	6/15/2005	30
	9/21/2005	27
	12/21/2005	26
	3/15/2006	27
	6/21/2006	23
	12/20/2006	35
	6/12/2007	30
	12/17/2007	20
	6/11/2008	41
	12/3/2008	46
	6/17/2009	60
	12/9/2009	45
	6/17/2010	33
	12/22/2010	29
	6/29/2011	28.4
	12/7/2011	23.5
	6/6/2012	29.3
	12/12/2012	28.3
	6/19/2013	32.1
	12/11/2013	32.8
	6/11/2014	ND<5
	12/3/2014	51.2
	6/17/2015	54.7
	12/1/2015	67.8
	6/22/2016	79.7
	10/11/2016	88.4
	12/20/2016	126
	6/6/2017	117
	11/7/2017	288
	2/27/2018	247
	9/27/2018	283
	5/7/2019	313

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Date	Samples	Mean	Impacted
11/21/2019	1	543	TRUE



## Concentrations (mg/L)

### Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 43

Percent Non-Detects: 95.5556%

Total Background Samples: 9

There is 1 background well

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Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

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There are 4 compliance wells

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Well	Samples	ND	Date	Result	Original
MW#03-1	9	7 (77.7778%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	0.0808	0.0808
			8/22/2018	0.38	0.38
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			3/26/2019	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01
MW#03-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01
MW#93-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

---

MW#93-3	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.0152375

Overall Std Dev = 0.0499716

Overall Total = 0.685689

SS Wells = 0.0417928

SS Total = 0.109875

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.0417928	4	0.0104482	6.13858
Error (within wells)	0.0680822	40	0.00170206	
Totals	0.109875	44		

6.13858 exceeds 2.60597; assumption of equal variance should be rejected

---

Well: MW#93-1	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0

Well: MW#03-1	Sample	Residual
	5/24/2018	0.0489778
	6/19/2018	0.0489778
	7/19/2018	0.0218222
	8/22/2018	0.321022
	10/18/2018	0.0489778
	11/20/2018	0.0489778
	12/20/2018	0.0489778
	3/26/2019	0.0489778
	11/21/2019	0.0489778

Well: MW#03-2	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

# Shapiro-Wilks Test of Normality

Parameter: Chromium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.01	0.38	0.37	0.385	0.14245
2	0.01	0.0808	0.0708	0.2651	0.0187691
3	0.01	0.01	0	0.2313	0
4	0.01	0.01	0	0.2065	0
5	0.01	0.01	0	0.1865	0
6	0.01	0.01	0	0.1695	0
7	0.01	0.01	0	0.1545	0
8	0.01	0.01	0	0.141	0
9	0.01	0.01	0	0.1286	0
10	0.01	0.01	0	0.1173	0
11	0.01	0.01	0	0.1062	0
12	0.01	0.01	0	0.0959	0
13	0.01	0.01	0	0.086	0
14	0.01	0.01	0	0.0775	0
15	0.01	0.01	0	0.0673	0
16	0.01	0.01	0	0.0584	0
17	0.01	0.01	0	0.0497	0
18	0.01	0.01	0	0.0412	0
19	0.01	0.01	0	0.0328	0
20	0.01	0.01	0	0.0245	0
21	0.01	0.01	0	0.0163	0
22	0.01	0.01	0	0.0081	0
23	0.01	0.01	0		
24	0.01	0.01	0		
25	0.01	0.01	0		
26	0.01	0.01	0		
27	0.01	0.01	0		
28	0.01	0.01	0		
29	0.01	0.01	0		
30	0.01	0.01	0		
31	0.01	0.01	0		
32	0.01	0.01	0		
33	0.01	0.01	0		
34	0.01	0.01	0		
35	0.01	0.01	0		
36	0.01	0.01	0		
37	0.01	0.01	0		
38	0.01	0.01	0		
39	0.01	0.01	0		
40	0.01	0.01	0		
41	0.01	0.01	0		
42	0.01	0.01	0		
43	0.01	0.01	0		
44	0.0808	0.01	-0.0708		
45	0.38	0.01	-0.37		

---



Sum of b values = 0.161219

Sample Standard Deviation = 0.055921

W Statistic = 0.1889

5% Critical value of 0.945 exceeds 0.1889

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.1889

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 95.5556%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.01

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.01	FALSE
MW#03-2	11/21/2019	1	0.01	FALSE
MW#93-2	11/21/2019	1	0.01	FALSE
MW#93-3	11/21/2019	1	0.01	FALSE

---

## Concentrations (mg/L)

### Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 43

Percent Non-Detects: 95.5556%

Total Background Samples: 9

There is 1 background well

---

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.006	ND<0.006

---

There are 4 compliance wells

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Well	Samples	ND	Date	Result	Original
MW#03-1	9	7 (77.7778%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	0.0321	0.0321
			8/22/2018	0.115	0.115
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			3/26/2019	ND<0.01	ND<0.01
			11/21/2019	ND<0.006	ND<0.006
MW#03-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.006	ND<0.006
MW#93-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.006	ND<0.006

---

MW#93-3	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.006	ND<0.006

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00506519

Overall Std Dev = 0.0141003

Overall Total = 0.227933

SS Wells = 0.00328971

SS Total = 0.00874804

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.00328971	4	0.000822427	6.02695
Error (within wells)	0.00545833	40	0.000136458	
Totals	0.00874804	44		

6.02695 exceeds 2.60597; assumption of equal variance should be rejected

### Well: MW#93-1

Sample	Residual
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.003555556

### Well: MW#03-1

Sample	Residual
5/24/2018	0.0136778
6/19/2018	0.0136778
7/19/2018	0.00842222
8/22/2018	0.0913222
10/18/2018	0.0136778
11/20/2018	0.0136778
12/20/2018	0.0136778
3/26/2019	0.0136778
11/21/2019	0.0176778

### Well: MW#03-2

Sample	Residual
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.003555556

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.00355556

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.00355556

# Shapiro-Wilks Test of Normality

Parameter: Cobalt

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.006	0.115	0.109	0.385	0.041965
2	0.006	0.0321	0.0261	0.2651	0.00691911
3	0.006	0.01	0.004	0.2313	0.0009252
4	0.006	0.01	0.004	0.2065	0.000826
5	0.006	0.01	0.004	0.1865	0.000746
6	0.01	0.01	0	0.1695	0
7	0.01	0.01	0	0.1545	0
8	0.01	0.01	0	0.141	0
9	0.01	0.01	0	0.1286	0
10	0.01	0.01	0	0.1173	0
11	0.01	0.01	0	0.1062	0
12	0.01	0.01	0	0.0959	0
13	0.01	0.01	0	0.086	0
14	0.01	0.01	0	0.0775	0
15	0.01	0.01	0	0.0673	0
16	0.01	0.01	0	0.0584	0
17	0.01	0.01	0	0.0497	0
18	0.01	0.01	0	0.0412	0
19	0.01	0.01	0	0.0328	0
20	0.01	0.01	0	0.0245	0
21	0.01	0.01	0	0.0163	0
22	0.01	0.01	0	0.0081	0
23	0.01	0.01	0		
24	0.01	0.01	0		
25	0.01	0.01	0		
26	0.01	0.01	0		
27	0.01	0.01	0		
28	0.01	0.01	0		
29	0.01	0.01	0		
30	0.01	0.01	0		
31	0.01	0.01	0		
32	0.01	0.01	0		
33	0.01	0.01	0		
34	0.01	0.01	0		
35	0.01	0.01	0		
36	0.01	0.01	0		
37	0.01	0.01	0		
38	0.01	0.01	0		
39	0.01	0.01	0		
40	0.01	0.01	0		
41	0.01	0.006	-0.004		
42	0.01	0.006	-0.004		
43	0.01	0.006	-0.004		
44	0.0321	0.006	-0.0261		
45	0.115	0.006	-0.109		

---

Sum of b values = 0.0513813

Sample Standard Deviation = 0.0160528

W Statistic = 0.232838

5% Critical value of 0.945 exceeds 0.232838

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.232838

Evidence of non-normality at 99% level of significance



# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 95.5556%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.01

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.006	FALSE
MW#03-2	11/21/2019	1	0.006	FALSE
MW#93-2	11/21/2019	1	0.006	FALSE
MW#93-3	11/21/2019	1	0.006	FALSE

---

## Concentrations (mg/L)

### Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 102

Total Non-Detect: 42

Percent Non-Detects: 41.1765%

Total Background Samples: 21

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	21	10 (47.619%)	10/11/2016	0.1	0.1
			12/20/2016	0.2	0.2
			2/16/2017	0.16	0.16
			3/8/2017	0.19	0.19
			5/9/2017	0.13	0.13
			6/6/2017	0.14	0.14
			8/22/2017	0.1	0.1
			9/22/2017	0.11	0.11
			11/7/2017	0.12	0.12
			2/27/2018	0.16	0.16
			5/24/2018	ND<0.2	ND<0.2
			6/19/2018	ND<0.2	ND<0.2
			7/19/2018	ND<0.2	ND<0.2
			8/22/2018	ND<0.2	ND<0.2
			9/19/2018	0.243	0.243
			9/27/2018	ND<0.1	ND<0.1
			10/18/2018	ND<0.2	ND<0.2
			11/20/2018	ND<0.2	ND<0.2
			12/20/2018	ND<0.2	ND<0.2
			5/7/2019	ND<0.2	ND<0.2
11/21/2019	ND<0.2	ND<0.2			

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	21	12 (57.1429%)	10/11/2016	ND<0.1	ND<0.1
			12/20/2016	0.18	0.18
			2/16/2017	0.13	0.13
			3/8/2017	0.19	0.19
			5/9/2017	0.1	0.1
			6/6/2017	ND<0.1	ND<0.1
			8/22/2017	0.1	0.1
			9/22/2017	0.1	0.1
			11/7/2017	0.12	0.12
			2/27/2018	0.1	0.1
			5/24/2018	ND<0.2	ND<0.2
			6/19/2018	ND<0.2	ND<0.2
			7/19/2018	ND<0.2	ND<0.2
			8/22/2018	ND<0.1	ND<0.1
			9/19/2018	0.21	0.21
			10/18/2018	ND<0.2	ND<0.2
			11/20/2018	ND<0.2	ND<0.2
12/20/2018	ND<0.2	ND<0.2			

			3/26/2019	ND<0.2	ND<0.2
			5/7/2019	ND<0.2	ND<0.2
			11/21/2019	ND<0.2	ND<0.2
MW#03-2	20	13 (65%)	10/11/2016	ND<0.1	ND<0.1
			12/20/2016	0.14	0.14
			2/16/2017	0.12	0.12
			3/8/2017	0.14	0.14
			5/9/2017	ND<0.1	ND<0.1
			6/6/2017	0.1	0.1
			8/22/2017	ND<0.1	ND<0.1
			9/22/2017	ND<0.1	ND<0.1
			11/7/2017	0.1	0.1
			2/27/2018	0.12	0.12
			5/24/2018	ND<0.2	ND<0.2
			6/19/2018	ND<0.2	ND<0.2
			7/19/2018	ND<0.2	ND<0.2
			8/22/2018	ND<0.2	ND<0.2
			9/19/2018	0.21	0.21
			10/18/2018	ND<0.2	ND<0.2
			11/20/2018	ND<0.2	ND<0.2
			12/20/2018	ND<0.2	ND<0.2
			5/7/2019	ND<0.2	ND<0.2
			11/21/2019	ND<0.2	ND<0.2
MW#93-2	20	1 (5%)	10/11/2016	0.81	0.81
			12/20/2016	1.06	1.06
			2/16/2017	0.68	0.68
			3/8/2017	0.79	0.79
			5/9/2017	0.7	0.7
			6/6/2017	0.68	0.68
			8/22/2017	0.35	0.35
			9/22/2017	0.51	0.51
			11/7/2017	0.12	0.12
			2/27/2018	ND<0.1	ND<0.1
			5/24/2018	0.937	0.937
			6/19/2018	0.991	0.991
			7/19/2018	0.906	0.906
			8/22/2018	0.865	0.865
			9/19/2018	1	1
			10/18/2018	0.698	0.698
			11/20/2018	1.02	1.02
			12/20/2018	0.685	0.685
			5/7/2019	0.367	0.367
			11/21/2019	0.554	0.554
MW#93-3	20	6 (30%)	10/11/2016	0.15	0.15
			12/20/2016	0.23	0.23
			2/16/2017	0.2	0.2
			3/8/2017	0.22	0.22
			5/9/2017	0.18	0.18
			6/6/2017	0.24	0.24
			8/22/2017	0.23	0.23
			9/22/2017	0.2	0.2
			11/7/2017	0.2	0.2
			2/27/2018	0.21	0.21
			5/24/2018	0.23	0.23

6/19/2018	0.223	0.223
7/19/2018	ND<0.21	ND<0.21
8/22/2018	ND<0.2	ND<0.2
9/19/2018	0.389	0.389
10/18/2018	ND<0.2	ND<0.2
11/20/2018	0.283	0.283
12/20/2018	ND<0.2	ND<0.2
5/7/2019	ND<0.2	ND<0.2
11/21/2019	ND<0.2	ND<0.2

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.0742394

Overall Std Dev = 0.106551

Overall Total = 7.57241

SS Wells = 0.513723

SS Total = 1.14667

---

### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.513723	4	0.128431	19.6821
Error (within wells)	0.632949	97	0.00652525	
Totals	1.14667	101		

19.6821 exceeds 2.44724; assumption of equal variance should be rejected

---

#### Well: MW#93-1

#### Sample Residual

10/11/2016	0.0691905
12/20/2016	0.0308095
2/16/2017	0.00919048
3/8/2017	0.0208095
5/9/2017	0.0391905
6/6/2017	0.0291905
8/22/2017	0.0691905
9/22/2017	0.0591905
11/7/2017	0.0491905
2/27/2018	0.00919048
5/24/2018	0.0308095
6/19/2018	0.0308095
7/19/2018	0.0308095
8/22/2018	0.0308095
9/19/2018	0.0738095
9/27/2018	0.0691905
10/18/2018	0.0308095
11/20/2018	0.0308095
12/20/2018	0.0308095
5/7/2019	0.0308095
11/21/2019	0.0308095

#### Well: MW#03-1

#### Sample Residual

10/11/2016	0.0585714
12/20/2016	0.0214286
2/16/2017	0.0285714
3/8/2017	0.0314286
5/9/2017	0.0585714
6/6/2017	0.0585714
8/22/2017	0.0585714
9/22/2017	0.0585714
11/7/2017	0.0385714

2/27/2018	0.0585714
5/24/2018	0.0414286
6/19/2018	0.0414286
7/19/2018	0.0414286
8/22/2018	0.0585714
9/19/2018	0.0514286
10/18/2018	0.0414286
11/20/2018	0.0414286
12/20/2018	0.0414286
3/26/2019	0.0414286
5/7/2019	0.0414286
11/21/2019	0.0414286

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
10/11/2016	0.0565
12/20/2016	0.0165
2/16/2017	0.0365
3/8/2017	0.0165
5/9/2017	0.0565
6/6/2017	0.0565
8/22/2017	0.0565
9/22/2017	0.0565
11/7/2017	0.0565
2/27/2018	0.0365
5/24/2018	0.0435
6/19/2018	0.0435
7/19/2018	0.0435
8/22/2018	0.0435
9/19/2018	0.0535
10/18/2018	0.0435
11/20/2018	0.0435
12/20/2018	0.0435
5/7/2019	0.0435
11/21/2019	0.0435

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
10/11/2016	0.11885
12/20/2016	0.36885
2/16/2017	0.01115
3/8/2017	0.09885
5/9/2017	0.00885
6/6/2017	0.01115
8/22/2017	0.34115
9/22/2017	0.18115
11/7/2017	0.57115
2/27/2018	0.59115
5/24/2018	0.24585
6/19/2018	0.29985
7/19/2018	0.21485
8/22/2018	0.17385
9/19/2018	0.30885
10/18/2018	0.00685
11/20/2018	0.32885
12/20/2018	0.00615
5/7/2019	0.32415
11/21/2019	0.13715

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
10/11/2016	0.06975
12/20/2016	0.01025
2/16/2017	0.01975
3/8/2017	0.00025
5/9/2017	0.03975
6/6/2017	0.02025
8/22/2017	0.01025
9/22/2017	0.01975
11/7/2017	0.01975
2/27/2018	0.00975
5/24/2018	0.01025
6/19/2018	0.00325
7/19/2018	0.00975
8/22/2018	0.01975
9/19/2018	0.16925
10/18/2018	0.01975
11/20/2018	0.06325
12/20/2018	0.01975
5/7/2019	0.01975
11/21/2019	0.01975

# Shapiro-Francia Test of Normality

Parameter: Fluoride

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 102

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	0.1	-2.36561	5.59613	-0.236561
2	0.1	-2.07485	9.90113	-0.444046
3	0.1	-1.8957	13.4948	-0.633616
4	0.1	-1.77438	16.6432	-0.811054
5	0.1	-1.66456	19.414	-0.97751
6	0.1	-1.57179	21.8845	-1.13469
7	0.1	-1.49852	24.13	-1.28454
8	0.1	-1.42554	26.1622	-1.42709
9	0.1	-1.35946	28.0104	-1.56304
10	0.1	-1.29884	29.6973	-1.69292
11	0.1	-1.24809	31.2551	-1.81773
12	0.1	-1.19522	32.6836	-1.93726
13	0.1	-1.1455	33.9958	-2.05181
14	0.1	-1.10306	35.2125	-2.16211
15	0.1	-1.05812	36.3322	-2.26792
16	0.1	-1.01522	37.3628	-2.36945
17	0.1	-0.974114	38.3117	-2.46686
18	0.11	-0.938476	39.1925	-2.57009
19	0.12	-0.900227	40.0029	-2.67812
20	0.12	-0.863249	40.7481	-2.78171
21	0.12	-0.830953	41.4386	-2.88142
22	0.12	-0.796056	42.0723	-2.97695
23	0.12	-0.7621	42.6531	-3.0684
24	0.13	-0.729003	43.1845	-3.16317
25	0.13	-0.699883	43.6743	-3.25416
26	0.14	-0.668209	44.1208	-3.3477
27	0.14	-0.637192	44.5269	-3.43691
28	0.14	-0.609791	44.8987	-3.52228
29	0.15	-0.579873	45.235	-3.60926
30	0.16	-0.550465	45.538	-3.69734
31	0.16	-0.524401	45.813	-3.78124
32	0.18	-0.49585	46.0588	-3.87049
33	0.18	-0.467699	46.2776	-3.95468
34	0.19	-0.439913	46.4711	-4.03826
35	0.19	-0.415193	46.6435	-4.11715
36	0.2	-0.388022	46.794	-4.19476
37	0.2	-0.361133	46.9245	-4.26698
38	0.2	-0.337155	47.0381	-4.33441
39	0.2	-0.310738	47.1347	-4.39656
40	0.2	-0.284535	47.2156	-4.45347
41	0.2	-0.258527	47.2825	-4.50517
42	0.2	-0.235269	47.3378	-4.55223
43	0.2	-0.209575	47.3818	-4.59414
44	0.2	-0.184017	47.4156	-4.63095
45	0.2	-0.161119	47.4416	-4.66317
46	0.2	-0.135774	47.46	-4.69032



47	0.2	-0.110516	47.4722	-4.71243
48	0.2	-0.0853288	47.4795	-4.72949
49	0.2	-0.0627062	47.4834	-4.74203
50	0.2	-0.0376076	47.4849	-4.74956
51	0.2	-0.0125328	47.485	-4.75206
52	0.2	0.0125328	47.4852	-4.74956
53	0.2	0.0376076	47.4866	-4.74203
54	0.2	0.0627062	47.4905	-4.72949
55	0.2	0.0853288	47.4978	-4.71243
56	0.2	0.110516	47.51	-4.69032
57	0.2	0.135774	47.5284	-4.66317
58	0.2	0.161119	47.5544	-4.63095
59	0.2	0.184017	47.5883	-4.59414
60	0.2	0.209575	47.6322	-4.55223
61	0.2	0.235269	47.6875	-4.50517
62	0.2	0.258527	47.7544	-4.45347
63	0.2	0.284535	47.8353	-4.39656
64	0.2	0.310738	47.9319	-4.33441
65	0.2	0.337155	48.0456	-4.26698
66	0.2	0.361133	48.176	-4.19476
67	0.2	0.388022	48.3265	-4.11715
68	0.2	0.415193	48.4989	-4.03411
69	0.2	0.439913	48.6925	-3.94613
70	0.2	0.467699	48.9112	-3.85259
71	0.2	0.49585	49.1571	-3.75342
72	0.21	0.524401	49.4321	-3.6433
73	0.21	0.550465	49.7351	-3.5277
74	0.21	0.579873	50.0713	-3.40592
75	0.21	0.609791	50.4432	-3.27787
76	0.22	0.637192	50.8492	-3.13769
77	0.223	0.668209	51.2957	-2.98868
78	0.23	0.699883	51.7855	-2.8277
79	0.23	0.729003	52.317	-2.66003
80	0.23	0.7621	52.8978	-2.48475
81	0.24	0.796056	53.5315	-2.2937
82	0.243	0.830953	54.222	-2.09177
83	0.283	0.863249	54.9672	-1.84747
84	0.35	0.900227	55.7776	-1.53239
85	0.367	0.938476	56.6583	-1.18797
86	0.389	0.974114	57.6072	-0.809044
87	0.51	1.01522	58.6379	-0.291281
88	0.554	1.05812	59.7575	0.294919
89	0.68	1.10306	60.9742	1.045
90	0.68	1.1455	62.2864	1.82394
91	0.685	1.19522	63.715	2.64267
92	0.698	1.24809	65.2727	3.51383
93	0.7	1.29884	66.9597	4.42302
94	0.79	1.35946	68.8078	5.497
95	0.81	1.42554	70.84	6.65169
96	0.865	1.49852	73.0855	7.9479
97	0.906	1.57179	75.5561	9.37194
98	0.937	1.66456	78.3268	10.9316
99	0.991	1.77438	81.4752	12.69
100	1	1.8957	85.0689	14.5857
101	1.02	2.07485	89.3739	16.7021

---

Sample Standard Deviation = 0.244419

Numerator = 278.96

Denominator = 539.265 = 101 89.3739

W Statistic = 0.517296

5% Critical value of 0.976 exceeds 0.517296

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.517296

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 41.1765%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 21

Maximum Background Concentration = 0.243

Confidence Level = 84%

False Positive Rate = 16%

---

Well	Date	Samples	Mean	Impacted
MW#03-1	11/21/2019	1	0.2	FALSE
MW#03-2	11/21/2019	1	0.2	FALSE
MW#93-2	11/21/2019	1	0.554	TRUE
MW#93-3	11/21/2019	1	0.2	FALSE

---

# Non-Parametric Prediction Interval

## Intra-Well Comparison for MW#93-2

### Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 5.26316%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 19

Maximum Baseline Concentration = 1.06

Confidence Level = 95%

False Positive Rate = 5%

---

Baseline Samples	Date	Result
	10/11/2016	0.81
	12/20/2016	1.06
	2/16/2017	0.68
	3/8/2017	0.79
	5/9/2017	0.7
	6/6/2017	0.68
	8/22/2017	0.35
	9/22/2017	0.51
	11/7/2017	0.12
	2/27/2018	ND<0.1
	5/24/2018	0.937
	6/19/2018	0.991
	7/19/2018	0.906
	8/22/2018	0.865
	9/19/2018	1
	10/18/2018	0.698
	11/20/2018	1.02
	12/20/2018	0.685
	5/7/2019	0.367

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.554	FALSE

## Concentrations (mg/L)

### Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 42

Percent Non-Detects: 93.3333%

Total Background Samples: 9

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	9	6 (66.6667%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	0.124	0.124
			8/22/2018	0.143	0.143
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	0.00791	0.00791
			3/26/2019	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001
MW#03-2	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001
MW#93-2	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001

MW#93-3	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.001	ND<0.001

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00952681

Overall Std Dev = 0.0223228

Overall Total = 0.428707

SS Wells = 0.0137394

SS Total = 0.0219255

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.0137394	4	0.00343484	16.7837
Error (within wells)	0.00818613	40	0.000204653	
Totals	0.0219255	44		

16.7837 exceeds 2.60597; assumption of equal variance should be rejected

### Well: MW#93-1

Sample	Residual
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.003555556

### Well: MW#03-1

Sample	Residual
5/24/2018	0.0284344
6/19/2018	0.0284344
7/19/2018	0.0905656
8/22/2018	0.109566
10/18/2018	0.0284344
11/20/2018	0.0284344
12/20/2018	0.0255244
3/26/2019	0.0284344
11/21/2019	0.0324344

### Well: MW#03-2

Sample	Residual
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.003555556

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.00355556

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000444444
6/19/2018	0.000444444
7/19/2018	0.000444444
8/22/2018	0.000444444
9/19/2018	0.000444444
10/18/2018	0.000444444
11/20/2018	0.000444444
12/20/2018	0.000444444
11/21/2019	0.00355556



# Shapiro-Wilks Test of Normality

Parameter: Lead

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.001	0.143	0.142	0.385	0.05467
2	0.001	0.124	0.123	0.2651	0.0326073
3	0.001	0.00791	0.00691	0.2313	0.00159828
4	0.001	0.005	0.004	0.2065	0.000826
5	0.001	0.005	0.004	0.1865	0.000746
6	0.005	0.005	0	0.1695	0
7	0.005	0.005	0	0.1545	0
8	0.005	0.005	0	0.141	0
9	0.005	0.005	0	0.1286	0
10	0.005	0.005	0	0.1173	0
11	0.005	0.005	0	0.1062	0
12	0.005	0.005	0	0.0959	0
13	0.005	0.005	0	0.086	0
14	0.005	0.005	0	0.0775	0
15	0.005	0.005	0	0.0673	0
16	0.005	0.005	0	0.0584	0
17	0.005	0.005	0	0.0497	0
18	0.005	0.005	0	0.0412	0
19	0.005	0.005	0	0.0328	0
20	0.005	0.005	0	0.0245	0
21	0.005	0.005	0	0.0163	0
22	0.005	0.005	0	0.0081	0
23	0.005	0.005	0		
24	0.005	0.005	0		
25	0.005	0.005	0		
26	0.005	0.005	0		
27	0.005	0.005	0		
28	0.005	0.005	0		
29	0.005	0.005	0		
30	0.005	0.005	0		
31	0.005	0.005	0		
32	0.005	0.005	0		
33	0.005	0.005	0		
34	0.005	0.005	0		
35	0.005	0.005	0		
36	0.005	0.005	0		
37	0.005	0.005	0		
38	0.005	0.005	0		
39	0.005	0.005	0		
40	0.005	0.005	0		
41	0.005	0.001	-0.004		
42	0.005	0.001	-0.004		
43	0.00791	0.001	-0.00691		
44	0.124	0.001	-0.123		
45	0.143	0.001	-0.142		

---

Sum of b values = 0.0904476

Sample Standard Deviation = 0.0269741

W Statistic = 0.255534

5% Critical value of 0.945 exceeds 0.255534

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.255534

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 93.3333%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.005

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

Well	Date	Samples	Mean	Impacted
MW#03-1	11/21/2019	1	0.001	FALSE
MW#03-2	11/21/2019	1	0.001	FALSE
MW#93-2	11/21/2019	1	0.001	FALSE
MW#93-3	11/21/2019	1	0.001	FALSE

---

## Concentrations (mg/L)

### Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 32

Percent Non-Detects: 71.1111%

Total Background Samples: 9

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.015	ND<0.015
			7/19/2018	ND<0.015	ND<0.015
			8/22/2018	ND<0.015	ND<0.015
			9/19/2018	ND<0.015	ND<0.015
			10/18/2018	ND<0.015	ND<0.015
			11/20/2018	ND<0.015	ND<0.015
			12/20/2018	ND<0.015	ND<0.015
			11/21/2019	ND<0.015	ND<0.015

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	9	8 (88.8889%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.015	ND<0.015
			7/19/2018	ND<0.015	ND<0.015
			8/22/2018	0.0461	0.0461
			10/18/2018	ND<0.015	ND<0.015
			11/20/2018	ND<0.015	ND<0.015
			12/20/2018	ND<0.015	ND<0.015
			3/26/2019	ND<0.015	ND<0.015
			11/21/2019	ND<0.015	ND<0.015
			MW#03-2	9	7 (77.7778%)
6/19/2018	ND<0.015	ND<0.015			
7/19/2018	ND<0.015	ND<0.015			
8/22/2018	ND<0.015	ND<0.015			
9/19/2018	ND<0.015	ND<0.015			
10/18/2018	ND<0.015	ND<0.015			
11/20/2018	ND<0.015	ND<0.015			
12/20/2018	ND<0.015	ND<0.015			
11/21/2019	0.0154	0.0154			
MW#93-2	9	7 (77.7778%)			
			6/19/2018	ND<0.015	ND<0.015
			7/19/2018	ND<0.015	ND<0.015
			8/22/2018	ND<0.015	ND<0.015
			9/19/2018	ND<0.015	ND<0.015
			10/18/2018	ND<0.015	ND<0.015
			11/20/2018	0.0185	0.0185
			12/20/2018	ND<0.015	ND<0.015
			11/21/2019	ND<0.015	ND<0.015

MW#93-3	9	1 (11.1111%)	5/24/2018	0.178	0.178
			6/19/2018	0.162	0.162
			7/19/2018	ND<0.015	ND<0.015
			8/22/2018	0.159	0.159
			9/19/2018	0.16	0.16
			10/18/2018	0.164	0.164
			11/20/2018	0.187	0.187
			12/20/2018	0.168	0.168
			11/21/2019	0.182	0.182

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00831407

Overall Std Dev = 0.0214343

Overall Total = 0.374133

SS Wells = 0.00578439

SS Total = 0.0202148

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	0.00578439	4	0.0014461	4.00847
Error (within wells)	0.0144304	40	0.00036076	
Totals	0.0202148	44		

4.00847 exceeds 2.60597; assumption of equal variance should be rejected

---

### Well: MW#93-1

Sample	Residual
5/24/2018	0.00444444
6/19/2018	0.000555556
7/19/2018	0.000555556
8/22/2018	0.000555556
9/19/2018	0.000555556
10/18/2018	0.000555556
11/20/2018	0.000555556
12/20/2018	0.000555556
11/21/2019	0.000555556

### Well: MW#03-1

Sample	Residual
5/24/2018	0.0079
6/19/2018	0.0029
7/19/2018	0.0029
8/22/2018	0.0282
10/18/2018	0.0029
11/20/2018	0.0029
12/20/2018	0.0029
3/26/2019	0.0029
11/21/2019	0.0029

### Well: MW#03-2

Sample	Residual
5/24/2018	0.002
6/19/2018	0.0003
7/19/2018	0.0003
8/22/2018	0.0003
9/19/2018	0.0003
10/18/2018	0.0003
11/20/2018	0.0003
12/20/2018	0.0003
11/21/2019	0.0001

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.0131222
6/19/2018	0.00207778
7/19/2018	0.00207778
8/22/2018	0.00207778
9/19/2018	0.00207778
10/18/2018	0.00207778
11/20/2018	0.00142222
12/20/2018	0.00207778
11/21/2019	0.00207778

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.0252222
6/19/2018	0.00922222
7/19/2018	0.137778
8/22/2018	0.00622222
9/19/2018	0.00722222
10/18/2018	0.0112222
11/20/2018	0.0342222
12/20/2018	0.0152222
11/21/2019	0.0292222

# Shapiro-Wilks Test of Normality

Parameter: Lithium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.01	0.187	0.177	0.385	0.068145
2	0.01	0.182	0.172	0.2651	0.0455972
3	0.015	0.178	0.163	0.2313	0.0377019
4	0.015	0.168	0.153	0.2065	0.0315945
5	0.015	0.164	0.149	0.1865	0.0277885
6	0.015	0.162	0.147	0.1695	0.0249165
7	0.015	0.16	0.145	0.1545	0.0224025
8	0.015	0.159	0.144	0.141	0.020304
9	0.015	0.0461	0.0311	0.1286	0.00399946
10	0.015	0.0302	0.0152	0.1173	0.00178296
11	0.015	0.0185	0.0035	0.1062	0.0003717
12	0.015	0.0173	0.0023	0.0959	0.00022057
13	0.015	0.0154	0.0004	0.086	3.44e-005
14	0.015	0.015	0	0.0775	0
15	0.015	0.015	0	0.0673	0
16	0.015	0.015	0	0.0584	0
17	0.015	0.015	0	0.0497	0
18	0.015	0.015	0	0.0412	0
19	0.015	0.015	0	0.0328	0
20	0.015	0.015	0	0.0245	0
21	0.015	0.015	0	0.0163	0
22	0.015	0.015	0	0.0081	0
23	0.015	0.015	0		
24	0.015	0.015	0		
25	0.015	0.015	0		
26	0.015	0.015	0		
27	0.015	0.015	0		
28	0.015	0.015	0		
29	0.015	0.015	0		
30	0.015	0.015	0		
31	0.015	0.015	0		
32	0.015	0.015	0		
33	0.0154	0.015	-0.0004		
34	0.0173	0.015	-0.0023		
35	0.0185	0.015	-0.0035		
36	0.0302	0.015	-0.0152		
37	0.0461	0.015	-0.0311		
38	0.159	0.015	-0.144		
39	0.16	0.015	-0.145		
40	0.162	0.015	-0.147		
41	0.164	0.015	-0.149		
42	0.168	0.015	-0.153		
43	0.178	0.015	-0.163		
44	0.182	0.01	-0.172		
45	0.187	0.01	-0.177		

---



Sum of b values = 0.284859

Sample Standard Deviation = 0.0598742

W Statistic = 0.514432

5% Critical value of 0.945 exceeds 0.514432

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.514432

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 71.1111%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.015

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.015	FALSE
MW#03-2	11/21/2019	1	0.0154	TRUE
MW#93-2	11/21/2019	1	0.015	FALSE
MW#93-3	11/21/2019	1	0.182	TRUE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#03-2

#### Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 87.5%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.0173

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.0173
	6/19/2018	ND<0.015
	7/19/2018	ND<0.015
	8/22/2018	ND<0.015
	9/19/2018	ND<0.015
	10/18/2018	ND<0.015
	11/20/2018	ND<0.015
	12/20/2018	ND<0.015

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.0154	FALSE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 12.5%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.187

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.178
	6/19/2018	0.162
	7/19/2018	ND<0.015
	8/22/2018	0.159
	9/19/2018	0.16
	10/18/2018	0.164
	11/20/2018	0.187
	12/20/2018	0.168

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.182	FALSE

## Concentrations (mg/L)

### Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 26

Percent Non-Detects: 57.7778%

Total Background Samples: 9

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<5e-005	ND<5e-005
			6/19/2018	ND<5e-005	ND<5e-005
			7/19/2018	ND<5e-005	ND<5e-005
			8/22/2018	ND<5e-005	ND<5e-005
			9/19/2018	ND<5e-005	ND<5e-005
			10/18/2018	ND<5e-005	ND<5e-005
			11/20/2018	ND<5e-005	ND<5e-005
			12/20/2018	ND<5e-005	ND<5e-005
			11/21/2019	ND<5e-005	ND<5e-005

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	9	8 (88.8889%)	5/24/2018	ND<5e-005	ND<5e-005
			6/19/2018	ND<5e-005	ND<5e-005
			7/19/2018	ND<5e-005	ND<5e-005
			8/22/2018	0.000184	0.000184
			10/18/2018	ND<5e-005	ND<5e-005
			11/20/2018	ND<5e-005	ND<5e-005
			12/20/2018	ND<5e-005	ND<5e-005
			3/26/2019	ND<5e-005	ND<5e-005
			11/21/2019	ND<5e-005	ND<5e-005
MW#03-2	9	1 (11.1111%)	5/24/2018	ND<5e-005	ND<5e-005
			6/19/2018	0.000224	0.000224
			7/19/2018	0.000239	0.000239
			8/22/2018	0.000255	0.000255
			9/19/2018	0.000636	0.000636
			10/18/2018	0.00101	0.00101
			11/20/2018	0.000803	0.000803
			12/20/2018	0.00107	0.00107
			11/21/2019	0.00694	0.00694
MW#93-2	9	8 (88.8889%)	5/24/2018	ND<5e-005	ND<5e-005
			6/19/2018	ND<5e-005	ND<5e-005
			7/19/2018	ND<5e-005	ND<5e-005
			8/22/2018	ND<5e-005	ND<5e-005
			9/19/2018	ND<5e-005	ND<5e-005
			10/18/2018	0.000572	0.000572
			11/20/2018	ND<5e-005	ND<5e-005
			12/20/2018	ND<5e-005	ND<5e-005
			11/21/2019	ND<5e-005	ND<5e-005

MW#93-3	9	0 (0%)	5/24/2018	0.000787	0.000787
			6/19/2018	0.000367	0.000367
			7/19/2018	0.00033	0.00033
			8/22/2018	0.000514	0.000514
			9/19/2018	0.000428	0.000428
			10/18/2018	0.000579	0.000579
			11/20/2018	0.000577	0.000577
			12/20/2018	0.000245	0.000245
			11/21/2019	0.000861	0.000861

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.000310938

Overall Std Dev = 0.00087637

Overall Total = 0.0139922

SS Wells = 1.03843e-005

SS Total = 3.3793e-005

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.03843e-005	4	2.59607e-006	4.43606
Error (within wells)	2.34088e-005	40	5.8522e-007	
Totals	3.3793e-005	44		

4.43606 exceeds 2.60597; assumption of equal variance should be rejected

### Well: MW#93-1

Sample	Residual
5/24/2018	6.77626e-021
6/19/2018	6.77626e-021
7/19/2018	6.77626e-021
8/22/2018	6.77626e-021
9/19/2018	6.77626e-021
10/18/2018	6.77626e-021
11/20/2018	6.77626e-021
12/20/2018	6.77626e-021
11/21/2019	6.77626e-021

### Well: MW#03-1

Sample	Residual
5/24/2018	1.48889e-005
6/19/2018	1.48889e-005
7/19/2018	1.48889e-005
8/22/2018	0.000119111
10/18/2018	1.48889e-005
11/20/2018	1.48889e-005
12/20/2018	1.48889e-005
3/26/2019	1.48889e-005
11/21/2019	1.48889e-005

### Well: MW#03-2

Sample	Residual
5/24/2018	0.00119744
6/19/2018	0.00102344
7/19/2018	0.00100844
8/22/2018	0.000992444
9/19/2018	0.000611444
10/18/2018	0.000237444
11/20/2018	0.000444444
12/20/2018	0.000177444
11/21/2019	0.00569256

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	5.8e-005
6/19/2018	5.8e-005
7/19/2018	5.8e-005
8/22/2018	5.8e-005
9/19/2018	5.8e-005
10/18/2018	0.000464
11/20/2018	5.8e-005
12/20/2018	5.8e-005
11/21/2019	5.8e-005

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000266111
6/19/2018	0.000153889
7/19/2018	0.000190889
8/22/2018	6.88889e-006
9/19/2018	9.28889e-005
10/18/2018	5.81111e-005
11/20/2018	5.61111e-005
12/20/2018	0.000275889
11/21/2019	0.000340111



# Shapiro-Wilks Test of Normality

Parameter: Mercury

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	5e-005	0.00694	0.00689	0.385	0.00265265
2	5e-005	0.00107	0.00102	0.2651	0.000270402
3	5e-005	0.00101	0.00096	0.2313	0.000222048
4	5e-005	0.000861	0.000811	0.2065	0.000167471
5	5e-005	0.000803	0.000753	0.1865	0.000140435
6	5e-005	0.000787	0.000737	0.1695	0.000124922
7	5e-005	0.000636	0.000586	0.1545	9.0537e-005
8	5e-005	0.000579	0.000529	0.141	7.4589e-005
9	5e-005	0.000577	0.000527	0.1286	6.77722e-005
10	5e-005	0.000572	0.000522	0.1173	6.12306e-005
11	5e-005	0.000514	0.000464	0.1062	4.92768e-005
12	5e-005	0.000428	0.000378	0.0959	3.62502e-005
13	5e-005	0.000367	0.000317	0.086	2.7262e-005
14	5e-005	0.00033	0.00028	0.0775	2.17e-005
15	5e-005	0.000255	0.000205	0.0673	1.37965e-005
16	5e-005	0.000245	0.000195	0.0584	1.1388e-005
17	5e-005	0.000239	0.000189	0.0497	9.3933e-006
18	5e-005	0.000224	0.000174	0.0412	7.1688e-006
19	5e-005	0.000184	0.000134	0.0328	4.3952e-006
20	5e-005	5e-005	0	0.0245	0
21	5e-005	5e-005	0	0.0163	0
22	5e-005	5e-005	0	0.0081	0
23	5e-005	5e-005	0		
24	5e-005	5e-005	0		
25	5e-005	5e-005	0		
26	5e-005	5e-005	0		
27	0.000184	5e-005	-0.000134		
28	0.000224	5e-005	-0.000174		
29	0.000239	5e-005	-0.000189		
30	0.000245	5e-005	-0.000195		
31	0.000255	5e-005	-0.000205		
32	0.00033	5e-005	-0.00028		
33	0.000367	5e-005	-0.000317		
34	0.000428	5e-005	-0.000378		
35	0.000514	5e-005	-0.000464		
36	0.000572	5e-005	-0.000522		
37	0.000577	5e-005	-0.000527		
38	0.000579	5e-005	-0.000529		
39	0.000636	5e-005	-0.000586		
40	0.000787	5e-005	-0.000737		
41	0.000803	5e-005	-0.000753		
42	0.000861	5e-005	-0.000811		
43	0.00101	5e-005	-0.00096		
44	0.00107	5e-005	-0.00102		
45	0.00694	5e-005	-0.00689		

---

Sum of b values = 0.00405269

Sample Standard Deviation = 0.00104031

W Statistic = 0.344909

5% Critical value of 0.945 exceeds 0.344909

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.344909

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 57.7778%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 5e-005

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

Well	Date	Samples	Mean	Impacted
MW#03-1	11/21/2019	1	5e-005	FALSE
MW#03-2	11/21/2019	1	0.00694	TRUE
MW#93-2	11/21/2019	1	5e-005	FALSE
MW#93-3	11/21/2019	1	0.000861	TRUE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#03-2

#### Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 12.5%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.00107

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	ND<5e-005
	6/19/2018	0.000224
	7/19/2018	0.000239
	8/22/2018	0.000255
	9/19/2018	0.000636
	10/18/2018	0.00101
	11/20/2018	0.000803
	12/20/2018	0.00107

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.00694	TRUE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.000787

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	0.000787
	6/19/2018	0.000367
	7/19/2018	0.00033
	8/22/2018	0.000514
	9/19/2018	0.000428
	10/18/2018	0.000579
	11/20/2018	0.000577
	12/20/2018	0.000245

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.000861	TRUE

## Concentrations (mg/L)

### Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 36

Percent Non-Detects: 80%

Total Background Samples: 9

There is 1 background well

---

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

---

There are 4 compliance wells

---

Well	Samples	ND	Date	Result	Original
MW#03-1	9	8 (88.8889%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	0.0167	0.0167
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			3/26/2019	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01
MW#03-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01
MW#93-2	9	1 (11.1111%)	5/24/2018	1.4	1.4
			6/19/2018	1.18	1.18
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	0.949	0.949
			9/19/2018	1.34	1.34
			10/18/2018	1.08	1.08
			11/20/2018	1.29	1.29
			12/20/2018	1.34	1.34
			11/21/2019	0.252	0.252

---

MW#93-3	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.01	ND<0.01

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.0774202

Overall Std Dev = 0.201348

Overall Total = 3.48391

SS Wells = 1.06971

SS Total = 1.78381

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.06971	4	0.267428	14.9799
Error (within wells)	0.7141	40	0.0178525	
Totals	1.78381	44		

14.9799 exceeds 2.60597; assumption of equal variance should be rejected

---

Well: MW#93-1	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0

Well: MW#03-1	Sample	Residual
	5/24/2018	0.000744444
	6/19/2018	0.000744444
	7/19/2018	0.000744444
	8/22/2018	0.00595556
	10/18/2018	0.000744444
	11/20/2018	0.000744444
	12/20/2018	0.000744444
	3/26/2019	0.000744444
	11/21/2019	0.000744444

Well: MW#03-2	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0



**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.417667
6/19/2018	0.197667
7/19/2018	0.972333
8/22/2018	0.0333333
9/19/2018	0.357667
10/18/2018	0.0976667
11/20/2018	0.307667
12/20/2018	0.357667
11/21/2019	0.730333

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

# Shapiro-Wilks Test of Normality

Parameter: Molybdenum

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.01	1.4	1.39	0.385	0.53515
2	0.01	1.34	1.33	0.2651	0.352583
3	0.01	1.34	1.33	0.2313	0.307629
4	0.01	1.29	1.28	0.2065	0.26432
5	0.01	1.18	1.17	0.1865	0.218205
6	0.01	1.08	1.07	0.1695	0.181365
7	0.01	0.949	0.939	0.1545	0.145076
8	0.01	0.252	0.242	0.141	0.034122
9	0.01	0.0167	0.0067	0.1286	0.00086162
10	0.01	0.01	0	0.1173	0
11	0.01	0.01	0	0.1062	0
12	0.01	0.01	0	0.0959	0
13	0.01	0.01	0	0.086	0
14	0.01	0.01	0	0.0775	0
15	0.01	0.01	0	0.0673	0
16	0.01	0.01	0	0.0584	0
17	0.01	0.01	0	0.0497	0
18	0.01	0.01	0	0.0412	0
19	0.01	0.01	0	0.0328	0
20	0.01	0.01	0	0.0245	0
21	0.01	0.01	0	0.0163	0
22	0.01	0.01	0	0.0081	0
23	0.01	0.01	0		
24	0.01	0.01	0		
25	0.01	0.01	0		
26	0.01	0.01	0		
27	0.01	0.01	0		
28	0.01	0.01	0		
29	0.01	0.01	0		
30	0.01	0.01	0		
31	0.01	0.01	0		
32	0.01	0.01	0		
33	0.01	0.01	0		
34	0.01	0.01	0		
35	0.01	0.01	0		
36	0.01	0.01	0		
37	0.0167	0.01	-0.0067		
38	0.252	0.01	-0.242		
39	0.949	0.01	-0.939		
40	1.08	0.01	-1.07		
41	1.18	0.01	-1.17		
42	1.29	0.01	-1.28		
43	1.34	0.01	-1.33		
44	1.34	0.01	-1.33		
45	1.4	0.01	-1.39		

---

Sum of b values = 2.03931

Sample Standard Deviation = 0.448686

W Statistic = 0.469493

5% Critical value of 0.945 exceeds 0.469493

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.469493

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 80%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.01

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.01	FALSE
MW#03-2	11/21/2019	1	0.01	FALSE
MW#93-2	11/21/2019	1	0.252	TRUE
MW#93-3	11/21/2019	1	0.01	FALSE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 12.5%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 1.4

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	1.4
	6/19/2018	1.18
	7/19/2018	ND<0.01
	8/22/2018	0.949
	9/19/2018	1.34
	10/18/2018	1.08
	11/20/2018	1.29
	12/20/2018	1.34

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.252	FALSE

## Concentrations (std)

### Parameter: ph

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 287

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Samples: 72

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	72	0 (0%)	12/15/1994	6.67	6.67
			3/14/1995	6.72	6.72
			6/21/1995	6.58	6.58
			12/14/1995	6.72	6.72
			3/6/1996	6.72	6.72
			4/25/1996	6.79	6.79
			10/2/1996	6.61	6.61
			12/10/1996	6.51	6.51
			3/11/1997	6.77	6.77
			4/15/1997	6.66	6.66
			8/14/1997	6.66	6.66
			12/4/1997	6.78	6.78
			3/31/1998	6.87	6.87
			6/23/1998	6.5	6.5
			8/11/1998	7.05	7.05
			12/8/1998	6.62	6.62
			3/9/1999	6.6	6.6
			6/8/1999	6.93	6.93
			8/19/1999	6.54	6.54
			12/14/1999	6.55	6.55
			3/7/2000	6.59	6.59
			6/23/2000	6.52	6.52
			12/12/2000	6.56	6.56
			3/27/2001	6.6	6.6
			6/28/2001	6.59	6.59
			9/10/2001	6.76	6.76
			12/18/2001	6.76	6.76
			3/19/2002	6.93	6.93
			6/26/2002	6.85	6.85
			9/18/2002	6.62	6.62
			12/11/2002	6.58	6.58
			3/13/2003	6.66	6.66
			6/25/2003	6.94	6.94
			9/26/2003	6.42	6.42
			12/10/2003	6.64	6.64
			3/9/2004	6.68	6.68
			6/24/2004	6.53	6.53
			9/15/2004	6.43	6.43
			12/15/2004	6.61	6.61
			3/16/2005	6.57	6.57
			6/15/2005	6.53	6.53
			9/21/2005	6.65	6.65
			12/21/2005	6.61	6.61
			3/15/2006	6.64	6.64

6/21/2006	6.85	6.85
12/20/2006	6.67	6.67
6/12/2007	6.58	6.58
12/17/2007	6.33	6.33
6/11/2008	6.7	6.7
12/3/2008	6.5	6.5
6/17/2009	6.8	6.8
12/9/2009	6.6	6.6
6/17/2010	6.5	6.5
12/22/2010	6.55	6.55
6/29/2011	6.5	6.5
12/7/2011	6.41	6.41
6/6/2012	6.23	6.23
12/12/2012	6.61	6.61
6/19/2013	6.58	6.58
12/11/2013	6.57	6.57
6/11/2014	6.1	6.1
12/3/2014	6.69	6.69
6/17/2015	6.38	6.38
12/1/2015	6.45	6.45
6/22/2016	6.59	6.59
12/20/2016	6.28	6.28
6/6/2017	6.69	6.69
11/7/2017	6.21	6.21
2/27/2018	6.47	6.47
9/19/2018	6.62	6.62
5/7/2019	7	7
11/21/2019	6.46	6.46

---

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	75	0 (0%)	12/15/1994	8.54	8.54
			3/14/1995	8.82	8.82
			6/21/1995	8.68	8.68
			12/14/1995	8.16	8.16
			3/6/1996	9.37	9.37
			4/25/1996	9.14	9.14
			10/2/1996	8.94	8.94
			12/10/1996	9.27	9.27
			3/11/1997	8.95	8.95
			4/15/1997	9.25	9.25
			8/14/1997	8.67	8.67
			12/4/1997	8.77	8.77
			3/31/1998	9.32	9.32
			6/23/1998	8.87	8.87
			8/11/1998	9	9
			12/8/1998	8.9	8.9
			3/9/1999	9.39	9.39
			6/8/1999	9.25	9.25
			8/19/1999	9.15	9.15
			12/14/1999	8.98	8.98
			3/7/2000	9.2	9.2
			6/23/2000	9.18	9.18
			12/12/2000	9.18	9.18
			3/27/2001	9.29	9.29

6/28/2001	9.22	9.22
9/10/2001	9.1	9.1
12/18/2001	9.4	9.4
3/19/2002	9.54	9.54
6/26/2002	9.44	9.44
9/18/2002	9.24	9.24
12/11/2002	9.16	9.16
3/13/2003	9.28	9.28
6/25/2003	9.27	9.27
9/26/2003	9.32	9.32
12/10/2003	9.25	9.25
3/9/2004	9.37	9.37
6/24/2004	9.24	9.24
9/15/2004	9.32	9.32
12/15/2004	9.26	9.26
3/16/2005	9.23	9.23
6/15/2005	9.1	9.1
9/21/2005	9.25	9.25
12/21/2005	9.31	9.31
3/15/2006	9.47	9.47
6/21/2006	9.4	9.4
12/20/2006	9.18	9.18
2/21/2007	9.2	9.2
6/12/2007	9.1	9.1
12/17/2007	9.3	9.3
6/11/2008	9.4	9.4
12/3/2008	9.7	9.7
12/15/2008	9.6	9.6
6/17/2009	9.8	9.8
12/9/2009	9.8	9.8
6/17/2010	9.6	9.6
12/22/2010	9.5	9.5
6/29/2011	9.4	9.4
12/7/2011	9.5	9.5
6/6/2012	9.68	9.68
12/12/2012	10.02	10.02
1/9/2013	9.51	9.51
6/19/2013	9.4	9.4
12/11/2013	9.46	9.46
6/11/2014	8.55	8.55
12/3/2014	8.95	8.95
6/17/2015	9.13	9.13
12/1/2015	9.37	9.37
6/22/2016	9.28	9.28
12/20/2016	9.72	9.72
6/6/2017	9.29	9.29
11/7/2017	8.86	8.86
2/27/2018	9.04	9.04
9/19/2018	9.09	9.09
5/7/2019	9.05	9.05
11/21/2019	8.44	8.44

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MW#93-3	72	0 (0%)	12/15/1994	6.68	6.68
			3/14/1995	6.74	6.74
			6/21/1995	6.61	6.61
			12/14/1995	6.75	6.75
			3/6/1996	6.85	6.85



4/25/1996	6.78	6.78
10/2/1996	6.75	6.75
12/10/1996	6.7	6.7
3/11/1997	6.8	6.8
4/15/1997	6.74	6.74
8/14/1997	6.88	6.88
12/4/1997	6.88	6.88
3/31/1998	6.92	6.92
6/23/1998	6.76	6.76
8/11/1998	6.91	6.91
12/8/1998	6.93	6.93
3/9/1999	6.78	6.78
6/8/1999	6.85	6.85
8/19/1999	6.97	6.97
12/14/1999	6.8	6.8
3/7/2000	6.77	6.77
6/23/2000	6.82	6.82
12/12/2000	6.86	6.86
3/27/2001	6.79	6.79
6/28/2001	6.86	6.86
9/10/2001	7.04	7.04
12/18/2001	6.93	6.93
3/19/2002	7	7
6/26/2002	6.89	6.89
9/18/2002	7.96	7.96
12/11/2002	6.74	6.74
3/13/2003	6.87	6.87
6/25/2003	6.85	6.85
9/26/2003	6.77	6.77
12/10/2003	6.99	6.99
3/9/2004	7.45	7.45
6/24/2004	6.8	6.8
9/15/2004	6.7	6.7
12/15/2004	6.88	6.88
3/16/2005	6.69	6.69
6/15/2005	6.81	6.81
9/21/2005	6.85	6.85
12/21/2005	6.7	6.7
3/15/2006	7.07	7.07
6/21/2006	6.84	6.84
12/20/2006	6.93	6.93
6/12/2007	6.89	6.89
12/17/2007	6.8	6.8
6/11/2008	6.8	6.8
12/3/2008	6.8	6.8
6/17/2009	7.2	7.2
12/9/2009	6.9	6.9
6/17/2010	6.7	6.7
12/22/2010	6.82	6.82
6/29/2011	6.7	6.7
12/7/2011	6.77	6.77
6/6/2012	6.42	6.42
12/12/2012	6.85	6.85
6/19/2013	6.49	6.49
12/11/2013	7.07	7.07
6/11/2014	6.08	6.08
12/3/2014	6.8	6.8

			6/17/2015	6.4	6.4
			12/1/2015	6.6	6.6
			6/22/2016	6.43	6.43
			12/20/2016	6.27	6.27
			6/6/2017	6.65	6.65
			11/7/2017	6.46	6.46
			2/27/2018	6.49	6.49
			9/19/2018	6.55	6.55
			5/7/2019	6.69	6.69
			11/21/2019	6.54	6.54
<hr/>					
MW#03-1	32	0 (0%)	6/24/2004	7.27	7.27
			9/15/2004	6.78	6.78
			12/15/2004	7.32	7.32
			3/16/2005	7.3	7.3
			6/15/2005	7.28	7.28
			9/21/2005	7.88	7.88
			12/20/2006	7	7
			6/12/2007	7.29	7.29
			12/17/2007	6.8	6.8
			6/11/2008	7.4	7.4
			12/3/2008	7.4	7.4
			6/17/2009	7.6	7.6
			12/9/2009	7.5	7.5
			6/17/2010	7.1	7.1
			12/22/2010	6.89	6.89
			6/29/2011	7.3	7.3
			12/7/2011	7.05	7.05
			6/6/2012	7.33	7.33
			6/19/2013	7.15	7.15
			12/11/2013	7.19	7.19
			6/11/2014	6.62	6.62
			12/3/2014	6.73	6.73
			6/17/2015	6.66	6.66
			12/1/2015	6.34	6.34
			6/22/2016	7.2	7.2
			12/20/2016	6.75	6.75
			6/6/2017	6.64	6.64
			11/7/2017	6.44	6.44
			2/27/2018	6.81	6.81
			9/19/2018	7.19	7.19
			5/7/2019	6.33	6.33
			11/21/2019	6.23	6.23
<hr/>					
MW#03-2	36	0 (0%)	6/24/2004	6.84	6.84
			9/15/2004	7.17	7.17
			12/15/2004	6.86	6.86
			3/16/2005	6.8	6.8
			6/15/2005	6.87	6.87
			9/21/2005	6.87	6.87
			12/21/2005	6.83	6.83
			3/15/2006	6.88	6.88
			6/21/2006	6.78	6.78
			12/20/2006	6.88	6.88
			6/12/2007	6.87	6.87
			12/17/2007	6.7	6.7
			6/11/2008	6.9	6.9

12/3/2008	6.8	6.8
6/17/2009	7.3	7.3
12/9/2009	6.8	6.8
6/17/2010	6.8	6.8
12/22/2010	7.2	7.2
6/29/2011	6.7	6.7
12/7/2011	6.69	6.69
6/6/2012	6.73	6.73
12/12/2012	6.82	6.82
6/19/2013	6.88	6.88
12/11/2013	6.72	6.72
6/11/2014	7	7
12/3/2014	7.14	7.14
6/17/2015	6.45	6.45
12/1/2015	6.39	6.39
6/22/2016	6.75	6.75
12/20/2016	6.36	6.36
6/6/2017	6.73	6.73
11/7/2017	6.22	6.22
2/27/2018	6.47	6.47
9/19/2018	6.63	6.63
5/7/2019	6.81	6.81
11/21/2019	6.56	6.56

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: ph

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.187394

Overall Std Dev = 0.193043

Overall Total = 53.7822

SS Wells = 1.20568

SS Total = 10.658

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### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.20568	4	0.301419	8.99253
Error (within wells)	9.45232	282	0.0335189	
Totals	10.658	286		

8.99253 exceeds 2.37; assumption of equal variance should be rejected

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### Well: MW#93-1

Sample	Residual
12/15/1994	0.0583333
3/14/1995	0.1083333
6/21/1995	0.0316667
12/14/1995	0.1083333
3/6/1996	0.1083333
4/25/1996	0.1783333
10/2/1996	0.00166667
12/10/1996	0.101667
3/11/1997	0.1583333
4/15/1997	0.0483333
8/14/1997	0.0483333
12/4/1997	0.1683333
3/31/1998	0.2583333
6/23/1998	0.111667
8/11/1998	0.4383333
12/8/1998	0.00833333
3/9/1999	0.0116667
6/8/1999	0.3183333
8/19/1999	0.0716667
12/14/1999	0.0616667
3/7/2000	0.0216667
6/23/2000	0.0916667
12/12/2000	0.0516667
3/27/2001	0.0116667
6/28/2001	0.0216667
9/10/2001	0.1483333
12/18/2001	0.1483333
3/19/2002	0.3183333
6/26/2002	0.2383333
9/18/2002	0.00833333
12/11/2002	0.0316667
3/13/2003	0.0483333

6/25/2003	0.328333
9/26/2003	0.191667
12/10/2003	0.0283333
3/9/2004	0.0683333
6/24/2004	0.0816667
9/15/2004	0.181667
12/15/2004	0.00166667
3/16/2005	0.0416667
6/15/2005	0.0816667
9/21/2005	0.0383333
12/21/2005	0.00166667
3/15/2006	0.0283333
6/21/2006	0.238333
12/20/2006	0.0583333
6/12/2007	0.0316667
12/17/2007	0.281667
6/11/2008	0.0883333
12/3/2008	0.111667
6/17/2009	0.188333
12/9/2009	0.0116667
6/17/2010	0.111667
12/22/2010	0.0616667
6/29/2011	0.111667
12/7/2011	0.201667
6/6/2012	0.381667
12/12/2012	0.00166667
6/19/2013	0.0316667
12/11/2013	0.0416667
6/11/2014	0.511667
12/3/2014	0.0783333
6/17/2015	0.231667
12/1/2015	0.161667
6/22/2016	0.0216667
12/20/2016	0.331667
6/6/2017	0.0783333
11/7/2017	0.401667
2/27/2018	0.141667
9/19/2018	0.00833333
5/7/2019	0.388333
11/21/2019	0.151667

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
12/15/1994	0.678133
3/14/1995	0.398133
6/21/1995	0.538133
12/14/1995	1.05813
3/6/1996	0.151867
4/25/1996	0.0781333
10/2/1996	0.278133
12/10/1996	0.0518667
3/11/1997	0.268133
4/15/1997	0.0318667
8/14/1997	0.548133
12/4/1997	0.448133
3/31/1998	0.101867
6/23/1998	0.348133
8/11/1998	0.218133

12/8/1998	0.318133
3/9/1999	0.171867
6/8/1999	0.0318667
8/19/1999	0.0681333
12/14/1999	0.238133
3/7/2000	0.0181333
6/23/2000	0.0381333
12/12/2000	0.0381333
3/27/2001	0.0718667
6/28/2001	0.00186667
9/10/2001	0.118133
12/18/2001	0.181867
3/19/2002	0.321867
6/26/2002	0.221867
9/18/2002	0.0218667
12/11/2002	0.0581333
3/13/2003	0.0618667
6/25/2003	0.0518667
9/26/2003	0.101867
12/10/2003	0.0318667
3/9/2004	0.151867
6/24/2004	0.0218667
9/15/2004	0.101867
12/15/2004	0.0418667
3/16/2005	0.0118667
6/15/2005	0.118133
9/21/2005	0.0318667
12/21/2005	0.0918667
3/15/2006	0.251867
6/21/2006	0.181867
12/20/2006	0.0381333
2/21/2007	0.0181333
6/12/2007	0.118133
12/17/2007	0.0818667
6/11/2008	0.181867
12/3/2008	0.481867
12/15/2008	0.381867
6/17/2009	0.581867
12/9/2009	0.581867
6/17/2010	0.381867
12/22/2010	0.281867
6/29/2011	0.181867
12/7/2011	0.281867
6/6/2012	0.461867
12/12/2012	0.801867
1/9/2013	0.291867
6/19/2013	0.181867
12/11/2013	0.241867
6/11/2014	0.668133
12/3/2014	0.268133
6/17/2015	0.0881333
12/1/2015	0.151867
6/22/2016	0.0618667
12/20/2016	0.501867
6/6/2017	0.0718667
11/7/2017	0.358133
2/27/2018	0.178133

9/19/2018	0.128133
5/7/2019	0.168133
11/21/2019	0.778133

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
12/15/1994	0.113194
3/14/1995	0.0531944
6/21/1995	0.183194
12/14/1995	0.0431944
3/6/1996	0.0568056
4/25/1996	0.0131944
10/2/1996	0.0431944
12/10/1996	0.0931944
3/11/1997	0.00680556
4/15/1997	0.0531944
8/14/1997	0.0868056
12/4/1997	0.0868056
3/31/1998	0.126806
6/23/1998	0.0331944
8/11/1998	0.116806
12/8/1998	0.136806
3/9/1999	0.0131944
6/8/1999	0.0568056
8/19/1999	0.176806
12/14/1999	0.00680556
3/7/2000	0.0231944
6/23/2000	0.0268056
12/12/2000	0.0668056
3/27/2001	0.00319444
6/28/2001	0.0668056
9/10/2001	0.246806
12/18/2001	0.136806
3/19/2002	0.206806
6/26/2002	0.0968056
9/18/2002	1.16681
12/11/2002	0.0531944
3/13/2003	0.0768056
6/25/2003	0.0568056
9/26/2003	0.0231944
12/10/2003	0.196806
3/9/2004	0.656806
6/24/2004	0.00680556
9/15/2004	0.0931944
12/15/2004	0.0868056
3/16/2005	0.103194
6/15/2005	0.0168056
9/21/2005	0.0568056
12/21/2005	0.0931944
3/15/2006	0.276806
6/21/2006	0.0468056
12/20/2006	0.136806
6/12/2007	0.0968056
12/17/2007	0.00680556
6/11/2008	0.00680556
12/3/2008	0.00680556
6/17/2009	0.406806
12/9/2009	0.106806

6/17/2010	0.0931944
12/22/2010	0.0268056
6/29/2011	0.0931944
12/7/2011	0.0231944
6/6/2012	0.373194
12/12/2012	0.0568056
6/19/2013	0.303194
12/11/2013	0.276806
6/11/2014	0.713194
12/3/2014	0.00680556
6/17/2015	0.393194
12/1/2015	0.193194
6/22/2016	0.363194
12/20/2016	0.523194
6/6/2017	0.143194
11/7/2017	0.333194
2/27/2018	0.303194
9/19/2018	0.243194
5/7/2019	0.103194
11/21/2019	0.253194

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
6/24/2004	0.245938
9/15/2004	0.244062
12/15/2004	0.295938
3/16/2005	0.275938
6/15/2005	0.255938
9/21/2005	0.855938
12/20/2006	0.0240625
6/12/2007	0.265938
12/17/2007	0.224062
6/11/2008	0.375938
12/3/2008	0.375938
6/17/2009	0.575938
12/9/2009	0.475938
6/17/2010	0.0759375
12/22/2010	0.134062
6/29/2011	0.275938
12/7/2011	0.0259375
6/6/2012	0.305938
6/19/2013	0.125938
12/11/2013	0.165938
6/11/2014	0.404062
12/3/2014	0.294062
6/17/2015	0.364062
12/1/2015	0.684062
6/22/2016	0.175938
12/20/2016	0.274062
6/6/2017	0.384062
11/7/2017	0.584062
2/27/2018	0.214062
9/19/2018	0.165938
5/7/2019	0.694062
11/21/2019	0.794062

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
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6/24/2004	0.0566667
9/15/2004	0.386667
12/15/2004	0.0766667
3/16/2005	0.0166667
6/15/2005	0.0866667
9/21/2005	0.0866667
12/21/2005	0.0466667
3/15/2006	0.0966667
6/21/2006	0.00333333
12/20/2006	0.0966667
6/12/2007	0.0866667
12/17/2007	0.0833333
6/11/2008	0.116667
12/3/2008	0.0166667
6/17/2009	0.516667
12/9/2009	0.0166667
6/17/2010	0.0166667
12/22/2010	0.416667
6/29/2011	0.0833333
12/7/2011	0.0933333
6/6/2012	0.0533333
12/12/2012	0.0366667
6/19/2013	0.0966667
12/11/2013	0.0633333
6/11/2014	0.216667
12/3/2014	0.356667
6/17/2015	0.333333
12/1/2015	0.393333
6/22/2016	0.0333333
12/20/2016	0.423333
6/6/2017	0.0533333
11/7/2017	0.563333
2/27/2018	0.313333
9/19/2018	0.153333
5/7/2019	0.0266667
11/21/2019	0.223333

## Shapiro-Francia Test of Normality

Parameter: ph

All Wells

### Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 287

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	6.08	-2.74777	7.55021	-16.7064
2	6.1	-2.51213	13.861	-32.0304
3	6.21	-2.32634	19.2729	-46.477
4	6.22	-2.22621	24.2289	-60.324
5	6.23	-2.12007	28.7236	-73.532
6	6.23	-2.05375	32.9415	-86.3269
7	6.27	-1.97737	36.8515	-98.725
8	6.28	-1.92684	40.5642	-110.826
9	6.33	-1.86629	44.0472	-122.639
10	6.33	-1.82501	47.3778	-134.191
11	6.34	-1.77438	50.5263	-145.441
12	6.36	-1.7392	53.5511	-156.502
13	6.38	-1.6954	56.4255	-167.319
14	6.39	-1.66456	59.1962	-177.956
15	6.4	-1.62576	61.8393	-188.36
16	6.41	-1.59819	64.3935	-198.605
17	6.42	-1.56322	66.8372	-208.641
18	6.42	-1.5382	69.2033	-218.516
19	6.43	-1.5141	71.4958	-228.252
20	6.43	-1.48328	73.6959	-237.789
21	6.44	-1.46106	75.8306	-247.198
22	6.45	-1.4325	77.8827	-256.438
23	6.45	-1.41183	79.8759	-265.544
24	6.46	-1.38517	81.7946	-274.493
25	6.46	-1.36581	83.6601	-283.316
26	6.47	-1.34075	85.4577	-291.99
27	6.47	-1.32251	87.2067	-300.547
28	6.49	-1.29884	88.8937	-308.976
29	6.49	-1.28155	90.536	-317.294
30	6.5	-1.25908	92.1213	-325.478
31	6.5	-1.24264	93.6655	-333.555
32	6.5	-1.22123	95.1569	-341.493
33	6.5	-1.20553	96.6102	-349.329
34	6.51	-1.18504	98.0145	-357.043
35	6.52	-1.17	99.3834	-364.672
36	6.53	-1.15035	100.707	-372.184
37	6.53	-1.1359	101.997	-379.601
38	6.54	-1.12168	103.255	-386.937
39	6.54	-1.10306	104.472	-394.151
40	6.55	-1.08935	105.659	-401.286
41	6.55	-1.07138	106.806	-408.304
42	6.55	-1.05812	107.926	-415.234
43	6.56	-1.04073	109.009	-422.061
44	6.56	-1.02789	110.066	-428.804
45	6.57	-1.01104	111.088	-435.447
46	6.57	-0.998575	112.085	-442.008

47	6.58	-0.982202	113.05	-448.47
48	6.58	-0.970094	113.991	-454.854
49	6.58	-0.954165	114.901	-461.132
50	6.58	-0.942375	115.789	-467.333
51	6.59	-0.926859	116.648	-473.441
52	6.59	-0.915365	117.486	-479.473
53	6.59	-0.900227	118.297	-485.406
54	6.6	-0.889006	119.087	-491.273
55	6.6	-0.877897	119.858	-497.067
56	6.6	-0.863249	120.603	-502.765
57	6.6	-0.852385	121.33	-508.39
58	6.61	-0.838054	122.032	-513.93
59	6.61	-0.827417	122.717	-519.399
60	6.61	-0.813379	123.378	-524.776
61	6.61	-0.802956	124.023	-530.083
62	6.61	-0.789191	124.646	-535.3
63	6.62	-0.778966	125.252	-540.456
64	6.62	-0.765456	125.838	-545.524
65	6.62	-0.755415	126.409	-550.525
66	6.62	-0.742143	126.96	-555.438
67	6.63	-0.732275	127.496	-560.293
68	6.64	-0.719228	128.013	-565.068
69	6.64	-0.709522	128.517	-569.779
70	6.64	-0.696684	129.002	-574.405
71	6.65	-0.687131	129.474	-578.975
72	6.65	-0.67449	129.929	-583.46
73	6.66	-0.665079	130.372	-587.89
74	6.66	-0.655726	130.801	-592.257
75	6.66	-0.643345	131.215	-596.541
76	6.66	-0.634124	131.617	-600.765
77	6.67	-0.621911	132.004	-604.913
78	6.67	-0.612813	132.38	-609
79	6.68	-0.60076	132.741	-613.013
80	6.68	-0.591776	133.091	-616.967
81	6.69	-0.579873	133.427	-620.846
82	6.69	-0.570999	133.753	-624.666
83	6.69	-0.559237	134.066	-628.407
84	6.69	-0.550465	134.369	-632.09
85	6.69	-0.538836	134.659	-635.695
86	6.7	-0.530162	134.94	-639.247
87	6.7	-0.518658	135.209	-642.722
88	6.7	-0.510074	135.47	-646.139
89	6.7	-0.498687	135.718	-649.48
90	6.7	-0.490189	135.959	-652.765
91	6.7	-0.481728	136.191	-655.992
92	6.7	-0.470498	136.412	-659.145
93	6.7	-0.462114	136.626	-662.241
94	6.72	-0.450985	136.829	-665.271
95	6.72	-0.442676	137.025	-668.246
96	6.72	-0.431644	137.211	-671.147
97	6.72	-0.423405	137.39	-673.992
98	6.73	-0.412463	137.561	-676.768
99	6.73	-0.40429	137.724	-679.489
100	6.73	-0.393433	137.879	-682.137
101	6.74	-0.385321	138.027	-684.734
102	6.74	-0.374544	138.168	-687.258
103	6.74	-0.36649	138.302	-689.728

104	6.75	-0.355788	138.428	-692.13
105	6.75	-0.347787	138.549	-694.477
106	6.75	-0.337155	138.663	-696.753
107	6.75	-0.329206	138.771	-698.975
108	6.76	-0.318639	138.873	-701.129
109	6.76	-0.310738	138.97	-703.23
110	6.76	-0.302855	139.061	-705.277
111	6.77	-0.292375	139.147	-707.257
112	6.77	-0.284535	139.228	-709.183
113	6.77	-0.27411	139.303	-711.039
114	6.77	-0.266311	139.374	-712.842
115	6.78	-0.255936	139.439	-714.577
116	6.78	-0.248174	139.501	-716.259
117	6.78	-0.237847	139.557	-717.872
118	6.78	-0.230118	139.61	-719.432
119	6.78	-0.219834	139.659	-720.923
120	6.79	-0.212137	139.704	-722.363
121	6.79	-0.201894	139.745	-723.734
122	6.8	-0.194225	139.782	-725.055
123	6.8	-0.184017	139.816	-726.306
124	6.8	-0.176374	139.847	-727.505
125	6.8	-0.166199	139.875	-728.635
126	6.8	-0.158579	139.9	-729.714
127	6.8	-0.150969	139.923	-730.74
128	6.8	-0.140835	139.943	-731.698
129	6.8	-0.133244	139.96	-732.604
130	6.8	-0.123135	139.976	-733.441
131	6.8	-0.115562	139.989	-734.227
132	6.8	-0.105474	140	-734.944
133	6.8	-0.0979139	140.01	-735.61
134	6.8	-0.0878447	140.017	-736.208
135	6.81	-0.0802981	140.024	-736.754
136	6.81	-0.0702426	140.029	-737.233
137	6.81	-0.0627062	140.033	-737.66
138	6.82	-0.0526632	140.035	-738.019
139	6.82	-0.0451348	140.037	-738.327
140	6.82	-0.0350997	140.039	-738.566
141	6.83	-0.0275759	140.039	-738.755
142	6.84	-0.0175476	140.04	-738.875
143	6.84	-0.0100272	140.04	-738.943
144	6.85	0	140.04	-738.943
145	6.85	0.0100272	140.04	-738.874
146	6.85	0.0175476	140.04	-738.754
147	6.85	0.0275759	140.041	-738.565
148	6.85	0.0350997	140.042	-738.325
149	6.85	0.0451348	140.044	-738.016
150	6.85	0.0526632	140.047	-737.655
151	6.86	0.0627062	140.051	-737.225
152	6.86	0.0702426	140.056	-736.743
153	6.86	0.0802981	140.062	-736.192
154	6.87	0.0878447	140.07	-735.589
155	6.87	0.0979139	140.08	-734.916
156	6.87	0.105474	140.091	-734.191
157	6.87	0.115562	140.104	-733.397
158	6.87	0.123135	140.119	-732.552
159	6.88	0.133244	140.137	-731.635
160	6.88	0.140835	140.157	-730.666

161	6.88	0.150969	140.18	-729.627
162	6.88	0.158579	140.205	-728.536
163	6.88	0.166199	140.232	-727.393
164	6.88	0.176374	140.264	-726.179
165	6.89	0.184017	140.297	-724.911
166	6.89	0.194225	140.335	-723.573
167	6.89	0.201894	140.376	-722.182
168	6.9	0.212137	140.421	-720.718
169	6.9	0.219834	140.469	-719.202
170	6.91	0.230118	140.522	-717.611
171	6.92	0.237847	140.579	-715.966
172	6.93	0.248174	140.64	-714.246
173	6.93	0.255936	140.706	-712.472
174	6.93	0.266311	140.777	-710.627
175	6.93	0.27411	140.852	-708.727
176	6.93	0.284535	140.933	-706.755
177	6.94	0.292375	141.018	-704.726
178	6.97	0.302855	141.11	-702.615
179	6.99	0.310738	141.207	-700.443
180	7	0.318639	141.308	-698.213
181	7	0.329206	141.417	-695.908
182	7	0.337155	141.53	-693.548
183	7	0.347787	141.651	-691.114
184	7.04	0.355788	141.778	-688.609
185	7.05	0.36649	141.912	-686.025
186	7.05	0.374544	142.052	-683.385
187	7.07	0.385321	142.201	-680.66
188	7.07	0.393433	142.356	-677.879
189	7.1	0.40429	142.519	-675.008
190	7.14	0.412463	142.689	-672.063
191	7.15	0.423405	142.868	-669.036
192	7.17	0.431644	143.055	-665.941
193	7.19	0.442676	143.251	-662.758
194	7.19	0.450985	143.454	-659.516
195	7.2	0.462114	143.668	-656.188
196	7.2	0.470498	143.889	-652.801
197	7.2	0.481728	144.121	-649.332
198	7.27	0.490189	144.361	-645.769
199	7.28	0.498687	144.61	-642.138
200	7.29	0.510074	144.87	-638.42
201	7.3	0.518658	145.139	-634.634
202	7.3	0.530162	145.42	-630.763
203	7.3	0.538836	145.711	-626.83
204	7.32	0.550465	146.014	-622.801
205	7.33	0.559237	146.326	-618.701
206	7.4	0.570999	146.652	-614.476
207	7.4	0.579873	146.989	-610.185
208	7.45	0.591776	147.339	-605.776
209	7.5	0.60076	147.7	-601.27
210	7.6	0.612813	148.075	-596.613
211	7.88	0.621911	148.462	-591.712
212	7.96	0.634124	148.864	-586.665
213	8.16	0.643345	149.278	-581.415
214	8.44	0.655726	149.708	-575.881
215	8.54	0.665079	150.15	-570.201
216	8.55	0.67449	150.605	-564.434
217	8.67	0.687131	151.078	-558.477

218	8.68	0.696684	151.563	-552.429
219	8.77	0.709522	152.066	-546.207
220	8.82	0.719228	152.584	-539.863
221	8.86	0.732275	153.12	-533.375
222	8.87	0.742143	153.671	-526.793
223	8.9	0.755415	154.241	-520.069
224	8.94	0.765456	154.827	-513.226
225	8.95	0.778966	155.434	-506.254
226	8.95	0.789191	156.057	-499.191
227	8.98	0.802956	156.702	-491.981
228	9	0.813379	157.363	-484.66
229	9.04	0.827417	158.048	-477.18
230	9.05	0.838054	158.75	-469.596
231	9.09	0.852385	159.477	-461.848
232	9.1	0.863249	160.222	-453.992
233	9.1	0.877897	160.993	-446.003
234	9.1	0.889006	161.783	-437.913
235	9.13	0.900227	162.593	-429.694
236	9.14	0.915365	163.431	-421.328
237	9.15	0.926859	164.29	-412.847
238	9.16	0.942375	165.178	-404.215
239	9.18	0.954165	166.089	-395.456
240	9.18	0.970094	167.03	-386.55
241	9.18	0.982202	167.995	-377.534
242	9.2	0.998575	168.992	-368.347
243	9.2	1.01104	170.014	-359.045
244	9.22	1.02789	171.07	-349.568
245	9.23	1.04073	172.154	-339.962
246	9.24	1.05812	173.273	-330.185
247	9.24	1.07138	174.421	-320.286
248	9.25	1.08935	175.608	-310.209
249	9.25	1.10306	176.824	-300.006
250	9.25	1.12168	178.083	-289.63
251	9.25	1.1359	179.373	-279.123
252	9.26	1.15035	180.696	-268.471
253	9.27	1.17	182.065	-257.625
254	9.27	1.18504	183.469	-246.64
255	9.28	1.20553	184.923	-235.452
256	9.28	1.22123	186.414	-224.119
257	9.29	1.24264	187.958	-212.575
258	9.29	1.25908	189.544	-200.878
259	9.3	1.28155	191.186	-188.96
260	9.31	1.29884	192.873	-176.868
261	9.32	1.32251	194.622	-164.542
262	9.32	1.34075	196.42	-152.046
263	9.32	1.36581	198.285	-139.317
264	9.37	1.38517	200.204	-126.338
265	9.37	1.41183	202.197	-113.109
266	9.37	1.4325	204.249	-99.6864
267	9.39	1.46106	206.384	-85.9671
268	9.4	1.48328	208.584	-72.0242
269	9.4	1.5141	210.876	-57.7917
270	9.4	1.5382	213.242	-43.3326
271	9.4	1.56322	215.686	-28.6383
272	9.4	1.59819	218.24	-13.6153
273	9.44	1.62576	220.883	1.73192
274	9.46	1.66456	223.654	17.4787

275	9.47	1.6954	226.529	33.5341
276	9.5	1.7392	229.553	50.0565
277	9.5	1.77438	232.702	66.9131
278	9.51	1.82501	236.032	84.2689
279	9.54	1.86629	239.515	102.073
280	9.6	1.92684	243.228	120.571
281	9.6	1.97737	247.138	139.554
282	9.68	2.05375	251.356	159.434
283	9.7	2.12007	255.851	179.999
284	9.72	2.22621	260.807	201.637
285	9.8	2.32634	266.219	224.436
286	9.8	2.51213	272.529	249.054

---

Sample Standard Deviation = 1.119

Numerator = 62028.1

Denominator = 97597.4 = 286 272.529

W Statistic = 0.635551

5% Critical value of 0.976 exceeds 0.635551

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.635551

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: ph

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 72

Maximum Background Concentration = 7.05

Confidence Level = 94.7%

False Positive Rate = 5.3%

---

Well	Date	Samples	Mean	Impacted
MW#93-2	11/21/2019	1	8.44	TRUE
MW#93-3	11/21/2019	1	6.54	FALSE
MW#03-1	11/21/2019	1	6.23	FALSE
MW#03-2	11/21/2019	1	6.56	FALSE

---



# Non-Parametric Prediction Interval

## Intra-Well Comparison for MW#93-2

### Parameter: ph

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 74

Maximum Baseline Concentration = 10.02

Confidence Level = 98.7%

False Positive Rate = 1.3%

---

Baseline Samples	Date	Result
	12/15/1994	8.54
	3/14/1995	8.82
	6/21/1995	8.68
	12/14/1995	8.16
	3/6/1996	9.37
	4/25/1996	9.14
	10/2/1996	8.94
	12/10/1996	9.27
	3/11/1997	8.95
	4/15/1997	9.25
	8/14/1997	8.67
	12/4/1997	8.77
	3/31/1998	9.32
	6/23/1998	8.87
	8/11/1998	9
	12/8/1998	8.9
	3/9/1999	9.39
	6/8/1999	9.25
	8/19/1999	9.15
	12/14/1999	8.98
	3/7/2000	9.2
	6/23/2000	9.18
	12/12/2000	9.18
	3/27/2001	9.29
	6/28/2001	9.22
	9/10/2001	9.1
	12/18/2001	9.4
	3/19/2002	9.54
	6/26/2002	9.44
	9/18/2002	9.24
	12/11/2002	9.16
	3/13/2003	9.28
	6/25/2003	9.27
	9/26/2003	9.32
	12/10/2003	9.25
	3/9/2004	9.37
	6/24/2004	9.24
	9/15/2004	9.32
	12/15/2004	9.26
	3/16/2005	9.23
	6/15/2005	9.1

9/21/2005	9.25
12/21/2005	9.31
3/15/2006	9.47
6/21/2006	9.4
12/20/2006	9.18
2/21/2007	9.2
6/12/2007	9.1
12/17/2007	9.3
6/11/2008	9.4
12/3/2008	9.7
12/15/2008	9.6
6/17/2009	9.8
12/9/2009	9.8
6/17/2010	9.6
12/22/2010	9.5
6/29/2011	9.4
12/7/2011	9.5
6/6/2012	9.68
12/12/2012	10.02
1/9/2013	9.51
6/19/2013	9.4
12/11/2013	9.46
6/11/2014	8.55
12/3/2014	8.95
6/17/2015	9.13
12/1/2015	9.37
6/22/2016	9.28
12/20/2016	9.72
6/6/2017	9.29
11/7/2017	8.86
2/27/2018	9.04
9/19/2018	9.09
5/7/2019	9.05

---

<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	8.44	FALSE

## Concentrations (mg/L)

### Parameter: Selenium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 43

Percent Non-Detects: 95.5556%

Total Background Samples: 9

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.005	ND<0.005

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#03-1	9	8 (88.8889%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	0.0144	0.0144
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			3/26/2019	ND<0.005	ND<0.005
			11/21/2019	ND<0.005	ND<0.005
MW#03-2	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.005	ND<0.005
MW#93-2	9	8 (88.8889%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	0.00621	0.00621

MW#93-3	9	9 (100%)	5/24/2018	ND<0.005	ND<0.005
			6/19/2018	ND<0.005	ND<0.005
			7/19/2018	ND<0.005	ND<0.005
			8/22/2018	ND<0.005	ND<0.005
			9/19/2018	ND<0.005	ND<0.005
			10/18/2018	ND<0.005	ND<0.005
			11/20/2018	ND<0.005	ND<0.005
			12/20/2018	ND<0.005	ND<0.005
			11/21/2019	ND<0.005	ND<0.005

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Selenium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00041916

Overall Std Dev = 0.00127865

Overall Total = 0.0188622

SS Wells = 2.36369e-005

SS Total = 7.19373e-005

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	2.36369e-005	4	5.90922e-006	4.89371
Error (within wells)	4.83005e-005	40	1.20751e-006	
Totals	7.19373e-005	44		

4.89371 exceeds 2.60597; assumption of equal variance should be rejected

---

Well: MW#93-1	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0

Well: MW#03-1	Sample	Residual
	5/24/2018	0.00104444
	6/19/2018	0.00104444
	7/19/2018	0.00104444
	8/22/2018	0.00835556
	10/18/2018	0.00104444
	11/20/2018	0.00104444
	12/20/2018	0.00104444
	3/26/2019	0.00104444
	11/21/2019	0.00104444

Well: MW#03-2	Sample	Residual
	5/24/2018	0
	6/19/2018	0
	7/19/2018	0
	8/22/2018	0
	9/19/2018	0
	10/18/2018	0
	11/20/2018	0
	12/20/2018	0
	11/21/2019	0

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.000134444
6/19/2018	0.000134444
7/19/2018	0.000134444
8/22/2018	0.000134444
9/19/2018	0.000134444
10/18/2018	0.000134444
11/20/2018	0.000134444
12/20/2018	0.000134444
11/21/2019	0.00107556

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0
6/19/2018	0
7/19/2018	0
8/22/2018	0
9/19/2018	0
10/18/2018	0
11/20/2018	0
12/20/2018	0
11/21/2019	0

## Shapiro-Wilks Test of Normality

Parameter: Selenium

All Wells

### Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.005	0.0144	0.0094	0.385	0.003619
2	0.005	0.00621	0.00121	0.2651	0.000320771
3	0.005	0.005	0	0.2313	0
4	0.005	0.005	0	0.2065	0
5	0.005	0.005	0	0.1865	0
6	0.005	0.005	0	0.1695	0
7	0.005	0.005	0	0.1545	0
8	0.005	0.005	0	0.141	0
9	0.005	0.005	0	0.1286	0
10	0.005	0.005	0	0.1173	0
11	0.005	0.005	0	0.1062	0
12	0.005	0.005	0	0.0959	0
13	0.005	0.005	0	0.086	0
14	0.005	0.005	0	0.0775	0
15	0.005	0.005	0	0.0673	0
16	0.005	0.005	0	0.0584	0
17	0.005	0.005	0	0.0497	0
18	0.005	0.005	0	0.0412	0
19	0.005	0.005	0	0.0328	0
20	0.005	0.005	0	0.0245	0
21	0.005	0.005	0	0.0163	0
22	0.005	0.005	0	0.0081	0
23	0.005	0.005	0		
24	0.005	0.005	0		
25	0.005	0.005	0		
26	0.005	0.005	0		
27	0.005	0.005	0		
28	0.005	0.005	0		
29	0.005	0.005	0		
30	0.005	0.005	0		
31	0.005	0.005	0		
32	0.005	0.005	0		
33	0.005	0.005	0		
34	0.005	0.005	0		
35	0.005	0.005	0		
36	0.005	0.005	0		
37	0.005	0.005	0		
38	0.005	0.005	0		
39	0.005	0.005	0		
40	0.005	0.005	0		
41	0.005	0.005	0		
42	0.005	0.005	0		
43	0.005	0.005	0		
44	0.00621	0.005	-0.00121		
45	0.0144	0.005	-0.0094		

---

Sum of b values = 0.00393977

Sample Standard Deviation = 0.00140876

W Statistic = 0.177753

5% Critical value of 0.945 exceeds 0.177753

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.177753

Evidence of non-normality at 99% level of significance



## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Selenium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 95.5556%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.005

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

Well	Date	Samples	Mean	Impacted
MW#03-1	11/21/2019	1	0.005	FALSE
MW#03-2	11/21/2019	1	0.005	FALSE
MW#93-2	11/21/2019	1	0.00621	TRUE
MW#93-3	11/21/2019	1	0.005	FALSE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Selenium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 100%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 8

Maximum Baseline Concentration = 0.005

Confidence Level = 88.9%

False Positive Rate = 11.1%

---

Baseline Samples	Date	Result
	5/24/2018	ND<0.005
	6/19/2018	ND<0.005
	7/19/2018	ND<0.005
	8/22/2018	ND<0.005
	9/19/2018	ND<0.005
	10/18/2018	ND<0.005
	11/20/2018	ND<0.005
	12/20/2018	ND<0.005

---

Date	Samples	Mean	Impacted
11/21/2019	1	0.00621	TRUE

## Concentrations (mg/l)

### Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 226

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Samples: 52

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	52	0 (0%)	12/15/1994	54.7	54.7
			12/14/1995	51.9	51.9
			12/10/1996	51.6	51.6
			12/4/1997	51.2	51.2
			12/8/1998	47	47
			12/14/1999	64.4	64.4
			12/12/2000	100	100
			3/19/2002	112	112
			6/26/2002	95	95
			9/18/2002	78	78
			12/11/2002	83	83
			3/13/2003	94	94
			6/25/2003	113	113
			9/26/2003	84.6	84.6
			12/10/2003	98.1	98.1
			3/9/2004	95.4	95.4
			6/24/2004	94.7	94.7
			9/15/2004	71	71
			12/15/2004	92.3	92.3
			3/16/2005	86.3	86.3
			6/15/2005	77.4	77.4
			9/21/2005	92.8	92.8
			12/21/2005	81.9	81.9
			3/15/2006	99.7	99.7
			6/21/2006	82	82
			12/20/2006	85.1	85.1
			6/12/2007	74.9	74.9
			12/17/2007	81.8	81.8
			6/11/2008	56.5	56.5
			12/3/2008	75.2	75.2
			6/17/2009	67.4	67.4
			12/9/2009	76.9	76.9
			6/17/2010	55	55
			12/22/2010	70.5	70.5
			6/29/2011	55.4	55.4
			12/7/2011	69.1	69.1
			6/6/2012	55.6	55.6
			12/12/2012	58.9	58.9
			6/19/2013	70	70
			12/11/2013	72.9	72.9
			6/11/2014	56.5	56.5
			12/3/2014	69.4	69.4
			6/17/2015	69.7	69.7
			12/1/2015	57.5	57.5

6/22/2016	66.9	66.9
12/20/2016	54.8	54.8
6/6/2017	58.4	58.4
11/7/2017	45.2	45.2
2/27/2018	59.6	59.6
9/27/2018	68.2	68.2
5/7/2019	124	124
11/21/2019	99.1	99.1

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	53	0 (0%)	12/15/1994	2170	2170
			12/14/1995	2220	2220
			12/10/1996	2100	2100
			12/4/1997	2440	2440
			12/8/1998	2565	2565
			12/14/1999	2980	2980
			12/12/2000	2800	2800
			3/19/2002	2500	2500
			6/26/2002	2260	2260
			9/18/2002	2140	2140
			12/11/2002	2320	2320
			3/13/2003	2600	2600
			6/25/2003	1990	1990
			9/26/2003	1820	1820
			12/10/2003	1920	1920
			3/9/2004	2050	2050
			6/24/2004	2180	2180
			9/15/2004	1800	1800
			12/15/2004	2480	2480
			3/16/2005	2490	2490
			6/15/2005	2030	2030
			9/21/2005	2520	2520
			12/21/2005	2300	2300
			3/15/2006	2720	2720
			6/21/2006	2450	2450
			12/20/2006	2170	2170
			2/21/2007	2900	2900
			6/12/2007	1980	1980
			12/17/2007	2244	2244
			6/11/2008	2649	2649
			12/3/2008	2120	2120
			6/17/2009	2230	2230
			12/9/2009	2140	2140
6/17/2010	2100	2100			
12/22/2010	2460	2460			
6/29/2011	2190	2190			
12/7/2011	2500	2500			
6/6/2012	2060	2060			
12/12/2012	2730	2730			
6/19/2013	2230	2230			
12/11/2013	2290	2290			
6/11/2014	1940	1940			
12/3/2014	2730	2730			
6/17/2015	270	270			

			5/25/2016	1890	1890
			6/22/2016	2700	2700
			12/20/2016	2400	2400
			6/6/2017	2310	2310
			11/7/2017	2750	2750
			2/27/2018	2220	2220
			9/27/2018	2660	2660
			5/7/2019	2470	2470
			11/21/2019	2500	2500
<hr/>					
MW#93-3	54	0 (0%)	12/15/1994	330	330
			12/14/1995	219	219
			12/10/1996	248	248
			12/4/1997	201	201
			12/8/1998	199	199
			12/14/1999	208	208
			12/12/2000	230	230
			12/18/2001	172	172
			3/19/2002	222	222
			6/26/2002	189	189
			9/18/2002	163	163
			12/11/2002	216	216
			3/13/2003	230	230
			6/25/2003	190	190
			9/26/2003	229	229
			12/10/2003	231	231
			3/9/2004	30.8	30.8
			6/24/2004	150	150
			9/15/2004	200	200
			12/15/2004	186	186
			3/16/2005	196	196
			6/15/2005	170	170
			9/21/2005	239	239
			12/21/2005	180	180
			3/15/2006	180	180
			6/21/2006	227	227
			12/20/2006	211	211
			6/12/2007	159	159
			12/17/2007	194	194
			6/11/2008	195	195
			12/3/2008	190	190
			6/17/2009	173	173
			12/9/2009	202	202
			6/17/2010	202	202
			12/22/2010	216	216
			6/29/2011	158	158
			12/7/2011	218	218
			6/6/2012	201	201
			12/12/2012	168	168
			6/19/2013	235	235
			12/11/2013	234	234
			6/11/2014	258	258
			12/3/2014	220	220
			6/17/2015	280	280
			12/1/2015	339	339
			6/22/2016	449	449
			10/11/2016	368	368

			12/20/2016	337	337
			6/6/2017	301	301
			11/7/2017	368	368
			2/27/2018	272	272
			9/27/2018	372	372
			5/7/2019	412	412
			11/21/2019	403	403
MW#03-1	31	0 (0%)	6/24/2004	10.2	10.2
			9/15/2004	42	42
			12/15/2004	8.04	8.04
			3/16/2005	5.99	5.99
			6/15/2005	7.3	7.3
			9/21/2005	14.1	14.1
			12/20/2006	8	8
			6/12/2007	7.96	7.96
			12/17/2007	9.88	9.88
			6/11/2008	5.71	5.71
			12/3/2008	7.01	7.01
			6/17/2009	7.34	7.34
			12/9/2009	6.77	6.77
			6/17/2010	9.31	9.31
			12/22/2010	7.11	7.11
			6/29/2011	7.04	7.04
			12/7/2011	8.87	8.87
			6/6/2012	7.94	7.94
			6/19/2013	10.3	10.3
			12/11/2013	9.78	9.78
			6/11/2014	55.9	55.9
			12/3/2014	9.8	9.8
			6/17/2015	9.7	9.7
			12/1/2015	12	12
			6/22/2016	8.59	8.59
			12/20/2016	7.94	7.94
			6/6/2017	6.56	6.56
			11/7/2017	17.6	17.6
			2/27/2018	16.8	16.8
			5/7/2019	13.1	13.1
			11/21/2019	10.5	10.5
MW#03-2	36	0 (0%)	6/24/2004	47.4	47.4
			9/15/2004	8.7	8.7
			12/15/2004	51.3	51.3
			3/16/2005	47	47
			6/15/2005	42.8	42.8
			9/21/2005	52.6	52.6
			12/21/2005	46.5	46.5
			3/15/2006	50.4	50.4
			6/21/2006	44.9	44.9
			12/20/2006	50.5	50.5
			6/12/2007	47	47
			12/17/2007	50.2	50.2
			6/11/2008	33.8	33.8
			12/3/2008	54.4	54.4
			6/17/2009	48.2	48.2
			12/9/2009	47.3	47.3
			6/17/2010	52.9	52.9

12/22/2010	51.7	51.7
6/29/2011	51	51
12/7/2011	60.1	60.1
6/6/2012	52	52
12/12/2012	61.3	61.3
6/19/2013	57.3	57.3
12/11/2013	54	54
6/11/2014	9.78	9.78
12/3/2014	68	68
6/17/2015	66.3	66.3
12/1/2015	63.8	63.8
6/22/2016	76.8	76.8
12/20/2016	80.2	80.2
6/6/2017	96.8	96.8
11/7/2017	120	120
2/27/2018	104	104
9/27/2018	128	128
5/7/2019	138	138
11/21/2019	166	166

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 85.1222

Overall Std Dev = 178.297

Overall Total = 19237.6

SS Wells = 2.50668e+006

SS Total = 7.15273e+006

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### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	2.50668e+006	4	626671	29.8091
Error (within wells)	4.64604e+006	221	21022.8	
Totals	7.15273e+006	225		

29.8091 exceeds 2.37; assumption of equal variance should be rejected

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### Well: MW#93-1

Sample	Residual
12/15/1994	20.425
12/14/1995	23.225
12/10/1996	23.525
12/4/1997	23.925
12/8/1998	28.125
12/14/1999	10.725
12/12/2000	24.875
3/19/2002	36.875
6/26/2002	19.875
9/18/2002	2.875
12/11/2002	7.875
3/13/2003	18.875
6/25/2003	37.875
9/26/2003	9.475
12/10/2003	22.975
3/9/2004	20.275
6/24/2004	19.575
9/15/2004	4.125
12/15/2004	17.175
3/16/2005	11.175
6/15/2005	2.275
9/21/2005	17.675
12/21/2005	6.775
3/15/2006	24.575
6/21/2006	6.875
12/20/2006	9.975
6/12/2007	0.225
12/17/2007	6.675
6/11/2008	18.625
12/3/2008	0.075
6/17/2009	7.725
12/9/2009	1.775



6/17/2010	20.125
12/22/2010	4.625
6/29/2011	19.725
12/7/2011	6.025
6/6/2012	19.525
12/12/2012	16.225
6/19/2013	5.125
12/11/2013	2.225
6/11/2014	18.625
12/3/2014	5.725
6/17/2015	5.425
12/1/2015	17.625
6/22/2016	8.225
12/20/2016	20.325
6/6/2017	16.725
11/7/2017	29.925
2/27/2018	15.525
9/27/2018	6.925
5/7/2019	48.875
11/21/2019	23.975

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
12/15/1994	125.811
12/14/1995	75.8113
12/10/1996	195.811
12/4/1997	144.189
12/8/1998	269.189
12/14/1999	684.189
12/12/2000	504.189
3/19/2002	204.189
6/26/2002	35.8113
9/18/2002	155.811
12/11/2002	24.1887
3/13/2003	304.189
6/25/2003	305.811
9/26/2003	475.811
12/10/2003	375.811
3/9/2004	245.811
6/24/2004	115.811
9/15/2004	495.811
12/15/2004	184.189
3/16/2005	194.189
6/15/2005	265.811
9/21/2005	224.189
12/21/2005	4.18868
3/15/2006	424.189
6/21/2006	154.189
12/20/2006	125.811
2/21/2007	604.189
6/12/2007	315.811
12/17/2007	51.8113
6/11/2008	353.189
12/3/2008	175.811
6/17/2009	65.8113
12/9/2009	155.811
6/17/2010	195.811
12/22/2010	164.189

6/29/2011	105.811
12/7/2011	204.189
6/6/2012	235.811
12/12/2012	434.189
6/19/2013	65.8113
12/11/2013	5.81132
6/11/2014	355.811
12/3/2014	434.189
6/17/2015	2025.81
5/25/2016	405.811
6/22/2016	404.189
12/20/2016	104.189
6/6/2017	14.1887
11/7/2017	454.189
2/27/2018	75.8113
9/27/2018	364.189
5/7/2019	174.189
11/21/2019	204.189

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
12/15/1994	97.2074
12/14/1995	13.7926
12/10/1996	15.2074
12/4/1997	31.7926
12/8/1998	33.7926
12/14/1999	24.7926
12/12/2000	2.79259
12/18/2001	60.7926
3/19/2002	10.7926
6/26/2002	43.7926
9/18/2002	69.7926
12/11/2002	16.7926
3/13/2003	2.79259
6/25/2003	42.7926
9/26/2003	3.79259
12/10/2003	1.79259
3/9/2004	201.993
6/24/2004	82.7926
9/15/2004	32.7926
12/15/2004	46.7926
3/16/2005	36.7926
6/15/2005	62.7926
9/21/2005	6.20741
12/21/2005	52.7926
3/15/2006	52.7926
6/21/2006	5.79259
12/20/2006	21.7926
6/12/2007	73.7926
12/17/2007	38.7926
6/11/2008	37.7926
12/3/2008	42.7926
6/17/2009	59.7926
12/9/2009	30.7926
6/17/2010	30.7926
12/22/2010	16.7926
6/29/2011	74.7926
12/7/2011	14.7926

6/6/2012	31.7926
12/12/2012	64.7926
6/19/2013	2.20741
12/11/2013	1.20741
6/11/2014	25.2074
12/3/2014	12.7926
6/17/2015	47.2074
12/1/2015	106.207
6/22/2016	216.207
10/11/2016	135.207
12/20/2016	104.207
6/6/2017	68.2074
11/7/2017	135.207
2/27/2018	39.2074
9/27/2018	139.207
5/7/2019	179.207
11/21/2019	170.207

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
6/24/2004	1.70774
9/15/2004	30.0923
12/15/2004	3.86774
3/16/2005	5.91774
6/15/2005	4.60774
9/21/2005	2.19226
12/20/2006	3.90774
6/12/2007	3.94774
12/17/2007	2.02774
6/11/2008	6.19774
12/3/2008	4.89774
6/17/2009	4.56774
12/9/2009	5.13774
6/17/2010	2.59774
12/22/2010	4.79774
6/29/2011	4.86774
12/7/2011	3.03774
6/6/2012	3.96774
6/19/2013	1.60774
12/11/2013	2.12774
6/11/2014	43.9923
12/3/2014	2.10774
6/17/2015	2.20774
12/1/2015	0.0922581
6/22/2016	3.31774
12/20/2016	3.96774
6/6/2017	5.34774
11/7/2017	5.69226
2/27/2018	4.89226
5/7/2019	1.19226
11/21/2019	1.40774

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
6/24/2004	15.9606
9/15/2004	54.6606
12/15/2004	12.0606
3/16/2005	16.3606

6/15/2005	20.5606
9/21/2005	10.7606
12/21/2005	16.8606
3/15/2006	12.9606
6/21/2006	18.4606
12/20/2006	12.8606
6/12/2007	16.3606
12/17/2007	13.1606
6/11/2008	29.5606
12/3/2008	8.96056
6/17/2009	15.1606
12/9/2009	16.0606
6/17/2010	10.4606
12/22/2010	11.6606
6/29/2011	12.3606
12/7/2011	3.26056
6/6/2012	11.3606
12/12/2012	2.06056
6/19/2013	6.06056
12/11/2013	9.36056
6/11/2014	53.5806
12/3/2014	4.63944
6/17/2015	2.93944
12/1/2015	0.439444
6/22/2016	13.4394
12/20/2016	16.8394
6/6/2017	33.4394
11/7/2017	56.6394
2/27/2018	40.6394
9/27/2018	64.6394
5/7/2019	74.6394
11/21/2019	102.639

# Shapiro-Francia Test of Normality

Parameter: Sodium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 226

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	5.71	-2.65209	7.03356	-15.1434
2	5.99	-2.40892	12.8365	-29.5729
3	6.56	-2.22621	17.7925	-44.1768
4	6.77	-2.12007	22.2872	-58.5296
5	7.01	-2.01409	26.3437	-72.6484
6	7.04	-1.94314	30.1195	-86.3281
7	7.11	-1.88079	33.6569	-99.7005
8	7.3	-1.81191	36.9399	-112.928
9	7.34	-1.76241	40.046	-125.864
10	7.94	-1.70604	42.9566	-139.41
11	7.94	-1.66456	45.7274	-152.626
12	7.96	-1.62576	48.3705	-165.567
13	8	-1.58047	50.8683	-178.211
14	8.04	-1.54643	53.2598	-190.644
15	8.59	-1.50626	55.5286	-203.583
16	8.7	-1.47579	57.7066	-216.422
17	8.87	-1.44663	59.7993	-229.254
18	9.31	-1.41183	61.7926	-242.398
19	9.7	-1.38517	63.7113	-255.834
20	9.78	-1.35317	65.5424	-269.068
21	9.78	-1.32854	67.3074	-282.062
22	9.8	-1.30469	69.0096	-294.847
23	9.88	-1.27588	70.6374	-307.453
24	10.2	-1.25357	72.2089	-320.24
25	10.3	-1.22653	73.7132	-332.873
26	10.5	-1.20553	75.1665	-345.531
27	12	-1.18504	76.5709	-359.751
28	13.1	-1.16012	77.9167	-374.949
29	14.1	-1.14069	79.2179	-391.033
30	16.8	-1.11699	80.4656	-409.798
31	17.6	-1.09847	81.6722	-429.131
32	30.8	-1.08032	82.8393	-462.405
33	33.8	-1.05812	83.9589	-498.169
34	42	-1.04073	85.042	-541.88
35	42.8	-1.01943	86.0813	-585.512
36	44.9	-1.00271	87.0867	-630.533
37	45.2	-0.986272	88.0594	-675.113
38	46.5	-0.966088	88.9928	-720.036
39	47	-0.950222	89.8957	-764.696
40	47	-0.930718	90.7619	-808.44
41	47	-0.915365	91.5998	-851.462
42	47.3	-0.896473	92.4035	-893.866
43	47.4	-0.881587	93.1807	-935.653
44	48.2	-0.866894	93.9322	-977.437
45	50.2	-0.848786	94.6526	-1020.05
46	50.4	-0.834498	95.349	-1062.1

47	50.5	-0.816874	96.0163	-1103.36
48	51	-0.802956	96.661	-1144.31
49	51.2	-0.789191	97.2838	-1184.71
50	51.3	-0.772193	97.8801	-1224.33
51	51.6	-0.758753	98.4558	-1263.48
52	51.7	-0.742143	99.0066	-1301.85
53	51.9	-0.729003	99.5381	-1339.68
54	52	-0.715986	100.051	-1376.91
55	52.6	-0.699883	100.541	-1413.73
56	52.9	-0.687131	101.013	-1450.08
57	54	-0.671346	101.463	-1486.33
58	54.4	-0.658838	101.897	-1522.17
59	54.7	-0.646431	102.315	-1557.53
60	54.8	-0.631062	102.714	-1592.11
61	55	-0.618872	103.097	-1626.15
62	55.4	-0.603765	103.461	-1659.6
63	55.6	-0.591776	103.811	-1692.5
64	55.9	-0.579873	104.148	-1724.92
65	56.5	-0.565108	104.467	-1756.85
66	56.5	-0.553384	104.773	-1788.11
67	57.3	-0.538836	105.063	-1818.99
68	57.5	-0.52728	105.341	-1849.31
69	58.4	-0.515791	105.608	-1879.43
70	58.9	-0.501527	105.859	-1908.97
71	59.6	-0.490189	106.099	-1938.18
72	60.1	-0.476105	106.326	-1966.8
73	61.3	-0.464904	106.542	-1995.3
74	63.8	-0.453763	106.748	-2024.25
75	64.4	-0.439913	106.942	-2052.58
76	66.3	-0.428895	107.126	-2081.01
77	66.9	-0.415193	107.298	-2108.79
78	67.4	-0.40429	107.461	-2136.04
79	68	-0.390726	107.614	-2162.61
80	68.2	-0.379927	107.758	-2188.52
81	69.1	-0.369171	107.895	-2214.03
82	69.4	-0.355788	108.021	-2238.72
83	69.7	-0.345126	108.14	-2262.77
84	70	-0.331854	108.25	-2286
85	70.5	-0.321278	108.354	-2308.65
86	71	-0.310738	108.45	-2330.72
87	72.9	-0.297612	108.539	-2352.41
88	74.9	-0.287147	108.621	-2373.92
89	75.2	-0.27411	108.696	-2394.53
90	76.8	-0.263715	108.766	-2414.79
91	76.9	-0.253347	108.83	-2434.27
92	77.4	-0.240426	108.888	-2452.88
93	78	-0.230118	108.941	-2470.83
94	80.2	-0.217267	108.988	-2488.25
95	81.8	-0.207012	109.031	-2505.19
96	81.9	-0.196779	109.07	-2521.3
97	82	-0.184017	109.104	-2536.39
98	83	-0.173829	109.134	-2550.82
99	84.6	-0.161119	109.16	-2564.45
100	85.1	-0.150969	109.183	-2577.3
101	86.3	-0.140835	109.202	-2589.45
102	92.3	-0.128189	109.219	-2601.28
103	92.8	-0.118085	109.233	-2612.24

104	94	-0.105474	109.244	-2622.16
105	94.7	-0.0953969	109.253	-2631.19
106	95	-0.0853288	109.26	-2639.3
107	95.4	-0.0727562	109.266	-2646.24
108	96.8	-0.0627062	109.269	-2652.31
109	98.1	-0.0501541	109.272	-2657.23
110	99.1	-0.0401167	109.274	-2661.2
111	99.7	-0.0300838	109.275	-2664.2
112	100	-0.0175476	109.275	-2665.96
113	104	-0.00751925	109.275	-2666.74
114	112	0.00751925	109.275	-2665.9
115	113	0.0175476	109.275	-2663.91
116	120	0.0300838	109.276	-2660.3
117	124	0.0401167	109.278	-2655.33
118	128	0.0501541	109.28	-2648.91
119	138	0.0627062	109.284	-2640.26
120	150	0.0727562	109.289	-2629.34
121	158	0.0853288	109.297	-2615.86
122	159	0.0953969	109.306	-2600.69
123	163	0.105474	109.317	-2583.5
124	166	0.118085	109.331	-2563.9
125	168	0.128189	109.347	-2542.36
126	170	0.140835	109.367	-2518.42
127	172	0.150969	109.39	-2492.45
128	173	0.161119	109.416	-2464.58
129	180	0.173829	109.446	-2433.29
130	180	0.184017	109.48	-2400.17
131	186	0.196779	109.519	-2363.57
132	189	0.207012	109.562	-2324.44
133	190	0.217267	109.609	-2283.16
134	190	0.230118	109.662	-2239.44
135	194	0.240426	109.72	-2192.8
136	195	0.253347	109.784	-2143.39
137	196	0.263715	109.853	-2091.71
138	199	0.27411	109.928	-2037.16
139	200	0.287147	110.011	-1979.73
140	201	0.297612	110.099	-1919.91
141	201	0.310738	110.196	-1857.45
142	202	0.321278	110.299	-1792.55
143	202	0.331854	110.409	-1725.52
144	208	0.345126	110.528	-1653.73
145	211	0.355788	110.655	-1578.66
146	216	0.369171	110.791	-1498.92
147	216	0.379927	110.936	-1416.85
148	218	0.390726	111.088	-1331.68
149	219	0.40429	111.252	-1243.14
150	220	0.415193	111.424	-1151.79
151	222	0.428895	111.608	-1056.58
152	227	0.439913	111.802	-956.719
153	229	0.453763	112.008	-852.808
154	230	0.464904	112.224	-745.88
155	230	0.476105	112.45	-636.376
156	231	0.490189	112.691	-523.142
157	234	0.501527	112.942	-405.785
158	235	0.515791	113.208	-284.574
159	239	0.52728	113.486	-158.554
160	248	0.538836	113.777	-24.9226

161	258	0.553384	114.083	117.851
162	270	0.565108	114.402	270.43
163	272	0.579873	114.738	428.155
164	280	0.591776	115.089	593.853
165	301	0.603765	115.453	775.586
166	330	0.618872	115.836	979.814
167	337	0.631062	116.234	1192.48
168	339	0.646431	116.652	1411.62
169	368	0.658838	117.086	1654.07
170	368	0.671346	117.537	1901.13
171	372	0.687131	118.009	2156.74
172	403	0.699883	118.499	2438.8
173	412	0.715986	119.012	2733.78
174	449	0.729003	119.543	3061.1
175	1800	0.742143	120.094	4396.96
176	1820	0.758753	120.67	5777.89
177	1890	0.772193	121.266	7237.34
178	1920	0.789191	121.889	8752.58
179	1940	0.802956	122.533	10310.3
180	1980	0.816874	123.201	11927.7
181	1990	0.834498	123.897	13588.4
182	2030	0.848786	124.618	15311.4
183	2050	0.866894	125.369	17088.5
184	2060	0.881587	126.146	18904.6
185	2100	0.896473	126.95	20787.2
186	2100	0.915365	127.788	22709.5
187	2120	0.930718	128.654	24682.6
188	2140	0.950222	129.557	26716.1
189	2140	0.966088	130.49	28783.5
190	2170	0.986272	131.463	30923.7
191	2170	1.00271	132.468	33099.6
192	2180	1.01943	133.508	35321.9
193	2190	1.04073	134.591	37601.2
194	2220	1.05812	135.71	39950.2
195	2220	1.08032	136.878	42348.5
196	2230	1.09847	138.084	44798.1
197	2230	1.11699	139.332	47289
198	2244	1.14069	140.633	49848.7
199	2260	1.16012	141.979	52470.5
200	2290	1.18504	143.383	55184.3
201	2300	1.20553	144.837	57957
202	2310	1.22653	146.341	60790.3
203	2320	1.25357	147.912	63698.6
204	2400	1.27588	149.54	66760.7
205	2440	1.30469	151.242	69944.1
206	2450	1.32854	153.007	73199
207	2460	1.35317	154.838	76527.8
208	2470	1.38517	156.757	79949.2
209	2480	1.41183	158.75	83450.5
210	2490	1.44663	160.843	87052.6
211	2500	1.47579	163.021	90742.1
212	2500	1.50626	165.29	94507.8
213	2500	1.54643	167.681	98373.9
214	2520	1.58047	170.179	102357
215	2565	1.62576	172.822	106527
216	2600	1.66456	175.593	110855
217	2649	1.70604	178.504	115374



218	2660	1.76241	181.61	120062
219	2700	1.81191	184.893	124954
220	2720	1.88079	188.43	130070
221	2730	1.94314	192.206	135375
222	2730	2.01409	196.263	140873
223	2750	2.12007	200.757	146703
224	2800	2.22621	205.713	152937
225	2900	2.40892	211.516	159922

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Sample Standard Deviation = 951.682

Numerator = 2.55752e+010

Denominator = 4.31033e+010 = 225 211.516

W Statistic = 0.593347

5% Critical value of 0.976 exceeds 0.593347

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.593347

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 52

Maximum Background Concentration = 124

Confidence Level = 92.9%

False Positive Rate = 7.1%

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<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#93-2	11/21/2019	1	2500	TRUE
MW#93-3	11/21/2019	1	403	TRUE
MW#03-1	11/21/2019	1	10.5	FALSE
MW#03-2	11/21/2019	1	166	TRUE

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## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 52

Maximum Baseline Concentration = 2980

Confidence Level = 98.1%

False Positive Rate = 1.9%

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Baseline Samples	Date	Result
	12/15/1994	2170
	12/14/1995	2220
	12/10/1996	2100
	12/4/1997	2440
	12/8/1998	2565
	12/14/1999	2980
	12/12/2000	2800
	3/19/2002	2500
	6/26/2002	2260
	9/18/2002	2140
	12/11/2002	2320
	3/13/2003	2600
	6/25/2003	1990
	9/26/2003	1820
	12/10/2003	1920
	3/9/2004	2050
	6/24/2004	2180
	9/15/2004	1800
	12/15/2004	2480
	3/16/2005	2490
	6/15/2005	2030
	9/21/2005	2520
	12/21/2005	2300
	3/15/2006	2720
	6/21/2006	2450
	12/20/2006	2170
	2/21/2007	2900
	6/12/2007	1980
	12/17/2007	2244
	6/11/2008	2649
	12/3/2008	2120
	6/17/2009	2230
	12/9/2009	2140
	6/17/2010	2100
	12/22/2010	2460
	6/29/2011	2190
	12/7/2011	2500
	6/6/2012	2060
	12/12/2012	2730
	6/19/2013	2230
	12/11/2013	2290

6/11/2014	1940
12/3/2014	2730
6/17/2015	270
5/25/2016	1890
6/22/2016	2700
12/20/2016	2400
6/6/2017	2310
11/7/2017	2750
2/27/2018	2220
9/27/2018	2660
5/7/2019	2470

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<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	2500	FALSE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 53

Maximum Baseline Concentration = 449

Confidence Level = 98.1%

False Positive Rate = 1.9%

---

Baseline Samples	Date	Result
	12/15/1994	330
	12/14/1995	219
	12/10/1996	248
	12/4/1997	201
	12/8/1998	199
	12/14/1999	208
	12/12/2000	230
	12/18/2001	172
	3/19/2002	222
	6/26/2002	189
	9/18/2002	163
	12/11/2002	216
	3/13/2003	230
	6/25/2003	190
	9/26/2003	229
	12/10/2003	231
	3/9/2004	30.8
	6/24/2004	150
	9/15/2004	200
	12/15/2004	186
	3/16/2005	196
	6/15/2005	170
	9/21/2005	239
	12/21/2005	180
	3/15/2006	180
	6/21/2006	227
	12/20/2006	211
	6/12/2007	159
	12/17/2007	194
	6/11/2008	195
	12/3/2008	190
	6/17/2009	173
	12/9/2009	202
	6/17/2010	202
	12/22/2010	216
	6/29/2011	158
	12/7/2011	218
	6/6/2012	201
	12/12/2012	168
	6/19/2013	235
	12/11/2013	234

6/11/2014	258
12/3/2014	220
6/17/2015	280
12/1/2015	339
6/22/2016	449
10/11/2016	368
12/20/2016	337
6/6/2017	301
11/7/2017	368
2/27/2018	272
9/27/2018	372
5/7/2019	412

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<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	403	FALSE

# Non-Parametric Prediction Interval

## Intra-Well Comparison for MW#03-2

### Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 35

Maximum Baseline Concentration = 138

Confidence Level = 97.2%

False Positive Rate = 2.8%

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Baseline Samples	Date	Result
	6/24/2004	47.4
	9/15/2004	8.7
	12/15/2004	51.3
	3/16/2005	47
	6/15/2005	42.8
	9/21/2005	52.6
	12/21/2005	46.5
	3/15/2006	50.4
	6/21/2006	44.9
	12/20/2006	50.5
	6/12/2007	47
	12/17/2007	50.2
	6/11/2008	33.8
	12/3/2008	54.4
	6/17/2009	48.2
	12/9/2009	47.3
	6/17/2010	52.9
	12/22/2010	51.7
	6/29/2011	51
	12/7/2011	60.1
	6/6/2012	52
	12/12/2012	61.3
	6/19/2013	57.3
	12/11/2013	54
	6/11/2014	9.78
	12/3/2014	68
	6/17/2015	66.3
	12/1/2015	63.8
	6/22/2016	76.8
	12/20/2016	80.2
	6/6/2017	96.8
	11/7/2017	120
	2/27/2018	104
	9/27/2018	128
	5/7/2019	138

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Date	Samples	Mean	Impacted
11/21/2019	1	166	TRUE

## Concentrations (umhos/cm)

### Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 283

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Samples: 71

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	71	0 (0%)	12/15/1994	1080	1080
			3/14/1995	1103	1103
			6/21/1995	1154	1154
			12/14/1995	1109	1109
			3/6/1996	1010	1010
			4/25/1996	1063	1063
			10/2/1996	1169	1169
			12/10/1996	1187	1187
			3/11/1997	1077	1077
			4/15/1997	1070	1070
			8/14/1997	1217	1217
			12/4/1997	1170	1170
			3/31/1998	1092	1092
			6/23/1998	1210	1210
			8/11/1998	1273	1273
			12/8/1998	1888	1888
			3/9/1999	1080	1080
			6/8/1999	1301	1301
			8/19/1999	1301	1301
			12/14/1999	1270	1270
			3/7/2000	1290	1290
			6/23/2000	1393	1393
			12/12/2000	1309	1309
			3/27/2001	1469	1469
			6/28/2001	1560	1560
			9/10/2001	1374	1374
			12/18/2001	1374	1374
			3/19/2002	1326	1326
			6/26/2002	1516	1516
			9/18/2002	1423	1423
			12/11/2002	1515	1515
3/13/2003	1332	1332			
6/25/2003	1608	1608			
9/26/2003	1602	1602			
12/10/2003	1620	1620			
3/9/2004	1630	1630			
6/24/2004	1620	1620			
9/15/2004	1618	1618			
12/15/2004	1586	1586			
3/16/2005	1521	1521			
6/15/2005	1531	1531			
9/21/2005	1441	1441			
12/21/2005	1030	1030			
3/15/2006	1318	1318			



6/21/2006	1547	1547
12/20/2006	1370	1370
6/12/2007	1466	1466
12/17/2007	1327	1327
6/11/2008	1334	1334
12/3/2008	1352	1352
6/17/2009	1301	1301
12/9/2009	1218	1218
6/17/2010	1179	1179
12/22/2010	1270	1270
6/29/2011	1275	1275
12/7/2011	1236	1236
6/6/2012	1185	1185
12/12/2012	1227	1227
6/19/2013	1366	1366
12/11/2013	1329	1329
6/11/2014	1200	1200
12/3/2014	1230	1230
6/17/2015	1210	1210
12/1/2015	1230	1230
6/22/2016	1185	1185
12/20/2016	1186	1186
6/6/2017	1289	1289
11/7/2017	1458	1458
2/27/2018	1235	1235
9/19/2018	1520	1520
11/21/2019	1510	1510

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There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	74	0 (0%)	12/15/1994	7950	7950
			3/14/1995	8217	8217
			6/21/1995	9210	9210
			12/14/1995	9000	9000
			3/6/1996	8820	8820
			4/25/1996	9310	9310
			10/2/1996	9420	9420
			12/10/1996	9590	9590
			3/11/1997	9250	9250
			4/15/1997	9690	9690
			8/14/1997	10660	10660
			12/4/1997	10240	10240
			3/31/1998	9237	9237
			6/23/1998	10400	10400
			8/11/1998	11460	11460
			12/8/1998	10280	10280
			3/9/1999	9240	9240
			6/8/1999	10850	10850
			8/19/1999	10873	10873
			12/14/1999	9690	9690
			3/7/2000	9340	9340
			6/23/2000	1034	1034
			12/12/2000	9080	9080
3/27/2001	10260	10260			
6/28/2001	11600	11600			

9/10/2001	10700	10700
12/18/2001	10660	10660
3/19/2002	10197	10197
6/26/2002	10590	10590
9/18/2002	9690	9690
12/11/2002	10283	10283
3/13/2003	8920	8920
6/25/2003	10590	10590
9/26/2003	10693	10693
12/10/2003	10550	10550
3/9/2004	10620	10620
6/24/2004	10494	10494
9/15/2004	10340	10340
12/15/2004	9940	9940
3/16/2005	9690	9690
6/15/2005	10010	10010
9/21/2005	9660	9660
12/21/2005	10000	10000
3/15/2006	8650	8650
6/21/2006	9830	9830
12/20/2006	8310	8310
2/21/2007	7660	7660
6/12/2007	9590	9590
12/17/2007	9100	9100
6/11/2008	9600	9600
12/3/2008	10520	10520
12/15/2008	9070	9070
6/17/2009	10690	10690
12/9/2009	10050	10050
6/17/2010	10020	10020
12/22/2010	11230	11230
6/29/2011	11110	11110
12/7/2011	10770	10770
6/6/2012	10490	10490
12/12/2012	11460	11460
6/19/2013	10500	10500
12/11/2013	10650	10650
6/11/2014	9940	9940
12/3/2014	10900	10900
6/17/2015	1270	1270
12/1/2015	10560	10560
6/22/2016	6710	6710
12/20/2016	11400	11400
6/6/2017	12590	12590
11/7/2017	10.52	10.52
2/27/2018	10.9	10.9
9/19/2018	15700	15700
5/7/2019	15700	15700
11/21/2019	15400	15400

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MW#93-3	72	0 (0%)	12/15/1994	1762	1762
			3/14/1995	1490	1490
			6/21/1995	1421	1421
			12/14/1995	1534	1534
			3/6/1996	1327	1327
			4/25/1996	1570	1570
			10/2/1996	1657	1657

12/10/1996	1427	1427
3/11/1997	1370	1370
4/15/1997	1244	1244
8/14/1997	1351	1351
12/4/1997	1140	1140
3/31/1998	1172	1172
6/23/1998	1214	1214
8/11/1998	1296	1296
12/8/1998	1177	1177
3/9/1999	1137	1137
6/8/1999	1180	1180
8/19/1999	1253	1253
12/14/1999	1088	1088
3/7/2000	1250	1250
6/23/2000	1070	1070
12/12/2000	1051	1051
3/27/2001	1149	1149
6/28/2001	1155	1155
9/10/2001	1250	1250
12/18/2001	1064	1064
3/19/2002	1240	1240
6/26/2002	787	787
9/18/2002	1109	1109
12/11/2002	1125	1125
3/13/2003	1034	1034
6/25/2003	1111	1111
9/26/2003	1109	1109
12/10/2003	1173	1173
3/9/2004	881	881
6/24/2004	1129	1129
9/15/2004	1068	1068
12/15/2004	972	972
3/16/2005	1134	1134
6/15/2005	1080	1080
9/21/2005	1155	1155
12/21/2005	1140	1140
3/15/2006	1035	1035
6/21/2006	1226	1226
12/20/2006	1087	1087
6/12/2007	1031	1031
12/17/2007	910	910
6/11/2008	1023	1023
12/3/2008	1073	1073
6/17/2009	1073	1073
12/9/2009	1038	1038
6/17/2010	1108	1108
12/22/2010	1090	1090
6/29/2011	1178	1178
12/7/2011	930	930
6/6/2012	1203	1203
12/12/2012	1010	1010
6/19/2013	1438	1438
12/11/2013	1252	1252
6/11/2014	1500	1500
12/3/2014	1200	1200
6/17/2015	1480	1480
12/1/2015	1807	1807

			10/11/2016	2005	2005
			12/20/2016	2200	2200
			6/6/2017	1743	1743
			11/7/2017	2121	2121
			9/6/2018	2380	2380
			9/19/2018	2110	2110
			5/7/2019	2830	2830
			11/21/2019	2200	2200
MW#03-1	30	0 (0%)	6/24/2004	497	497
			9/15/2004	687	687
			12/15/2004	514	514
			3/16/2005	422	422
			6/15/2005	465	465
			9/21/2005	517	517
			12/20/2006	447	447
			6/12/2007	630	630
			12/17/2007	540	540
			6/11/2008	467	467
			12/3/2008	649	649
			6/17/2009	519	519
			12/9/2009	469	469
			6/17/2010	500	500
			12/22/2010	504	504
			6/29/2011	463	463
			12/7/2011	501	501
			6/6/2012	457	457
			6/19/2013	373	373
			12/11/2013	476	476
			6/11/2014	826	826
			12/3/2014	409	409
			6/17/2015	267	267
			12/1/2015	385	385
			6/22/2016	320	320
			6/6/2017	198	198
			11/7/2017	444	444
			2/27/2018	186.1	186.1
			9/19/2018	573	573
			11/21/2019	140	140
MW#03-2	36	0 (0%)	6/24/2004	692	692
			9/15/2004	522	522
			12/15/2004	655	655
			3/16/2005	661	661
			6/15/2005	674	674
			9/21/2005	625	625
			12/21/2005	572	572
			3/15/2006	594	594
			6/21/2006	636	636
			12/20/2006	580	580
			6/12/2007	680	680
			12/17/2007	617	617
			6/11/2008	674	674
			12/3/2008	752	752
			6/17/2009	720	720
			12/9/2009	690	690
			6/17/2010	685	685

12/22/2010	728	728
6/29/2011	748	748
12/7/2011	755	755
6/6/2012	716	716
12/12/2012	807	807
6/19/2013	807	807
12/11/2013	805	805
6/11/2014	219	219
12/3/2014	1540	1540
6/17/2015	965	965
12/1/2015	967	967
6/22/2016	1074	1074
12/20/2016	1454	1454
6/6/2017	1498	1498
11/7/2017	2042	2042
9/6/2018	2620	2620
9/19/2018	2880	2880
5/7/2019	2730	2730
11/21/2019	3600	3600

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 573.513

Overall Std Dev = 1264.37

Overall Total = 162304

SS Wells = 8.67919e+007

SS Total = 4.50814e+008

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### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	8.67919e+007	4	2.1698e+007	16.5705
Error (within wells)	3.64022e+008	278	1.30943e+006	
Totals	4.50814e+008	282		

16.5705 exceeds 2.37; assumption of equal variance should be rejected

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### Well: MW#93-1

#### Sample Residual

12/15/1994	244.859
3/14/1995	221.859
6/21/1995	170.859
12/14/1995	215.859
3/6/1996	314.859
4/25/1996	261.859
10/2/1996	155.859
12/10/1996	137.859
3/11/1997	247.859
4/15/1997	254.859
8/14/1997	107.859
12/4/1997	154.859
3/31/1998	232.859
6/23/1998	114.859
8/11/1998	51.8592
12/8/1998	563.141
3/9/1999	244.859
6/8/1999	23.8592
8/19/1999	23.8592
12/14/1999	54.8592
3/7/2000	34.8592
6/23/2000	68.1408
12/12/2000	15.8592
3/27/2001	144.141
6/28/2001	235.141
9/10/2001	49.1408
12/18/2001	49.1408
3/19/2002	1.14085
6/26/2002	191.141
9/18/2002	98.1408
12/11/2002	190.141
3/13/2003	7.14085

6/25/2003	283.141
9/26/2003	277.141
12/10/2003	295.141
3/9/2004	305.141
6/24/2004	295.141
9/15/2004	293.141
12/15/2004	261.141
3/16/2005	196.141
6/15/2005	206.141
9/21/2005	116.141
12/21/2005	294.859
3/15/2006	6.85915
6/21/2006	222.141
12/20/2006	45.1408
6/12/2007	141.141
12/17/2007	2.14085
6/11/2008	9.14085
12/3/2008	27.1408
6/17/2009	23.8592
12/9/2009	106.859
6/17/2010	145.859
12/22/2010	54.8592
6/29/2011	49.8592
12/7/2011	88.8592
6/6/2012	139.859
12/12/2012	97.8592
6/19/2013	41.1408
12/11/2013	4.14085
6/11/2014	124.859
12/3/2014	94.8592
6/17/2015	114.859
12/1/2015	94.8592
6/22/2016	139.859
12/20/2016	138.859
6/6/2017	35.8592
11/7/2017	133.141
2/27/2018	89.8592
9/19/2018	195.141
11/21/2019	185.141

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
12/15/1994	1750.26
3/14/1995	1483.26
6/21/1995	490.262
12/14/1995	700.262
3/6/1996	880.262
4/25/1996	390.262
10/2/1996	280.262
12/10/1996	110.262
3/11/1997	450.262
4/15/1997	10.2624
8/14/1997	959.738
12/4/1997	539.738
3/31/1998	463.262
6/23/1998	699.738
8/11/1998	1759.74
12/8/1998	579.738

3/9/1999	460.262
6/8/1999	1149.74
8/19/1999	1172.74
12/14/1999	10.2624
3/7/2000	360.262
6/23/2000	8666.26
12/12/2000	620.262
3/27/2001	559.738
6/28/2001	1899.74
9/10/2001	999.738
12/18/2001	959.738
3/19/2002	496.738
6/26/2002	889.738
9/18/2002	10.2624
12/11/2002	582.738
3/13/2003	780.262
6/25/2003	889.738
9/26/2003	992.738
12/10/2003	849.738
3/9/2004	919.738
6/24/2004	793.738
9/15/2004	639.738
12/15/2004	239.738
3/16/2005	10.2624
6/15/2005	309.738
9/21/2005	40.2624
12/21/2005	299.738
3/15/2006	1050.26
6/21/2006	129.738
12/20/2006	1390.26
2/21/2007	2040.26
6/12/2007	110.262
12/17/2007	600.262
6/11/2008	100.262
12/3/2008	819.738
12/15/2008	630.262
6/17/2009	989.738
12/9/2009	349.738
6/17/2010	319.738
12/22/2010	1529.74
6/29/2011	1409.74
12/7/2011	1069.74
6/6/2012	789.738
12/12/2012	1759.74
6/19/2013	799.738
12/11/2013	949.738
6/11/2014	239.738
12/3/2014	1199.74
6/17/2015	8430.26
12/1/2015	859.738
6/22/2016	2990.26
12/20/2016	1699.74
6/6/2017	2889.74
11/7/2017	9689.74
2/27/2018	9689.36
9/19/2018	5999.74
5/7/2019	5999.74



11/21/2019 5699.74

**Well: MW#93-3**

**Sample Residual**

12/15/1994	451.903
3/14/1995	179.903
6/21/1995	110.903
12/14/1995	223.903
3/6/1996	16.9028
4/25/1996	259.903
10/2/1996	346.903
12/10/1996	116.903
3/11/1997	59.9028
4/15/1997	66.0972
8/14/1997	40.9028
12/4/1997	170.097
3/31/1998	138.097
6/23/1998	96.0972
8/11/1998	14.0972
12/8/1998	133.097
3/9/1999	173.097
6/8/1999	130.097
8/19/1999	57.0972
12/14/1999	222.097
3/7/2000	60.0972
6/23/2000	240.097
12/12/2000	259.097
3/27/2001	161.097
6/28/2001	155.097
9/10/2001	60.0972
12/18/2001	246.097
3/19/2002	70.0972
6/26/2002	523.097
9/18/2002	201.097
12/11/2002	185.097
3/13/2003	276.097
6/25/2003	199.097
9/26/2003	201.097
12/10/2003	137.097
3/9/2004	429.097
6/24/2004	181.097
9/15/2004	242.097
12/15/2004	338.097
3/16/2005	176.097
6/15/2005	230.097
9/21/2005	155.097
12/21/2005	170.097
3/15/2006	275.097
6/21/2006	84.0972
12/20/2006	223.097
6/12/2007	279.097
12/17/2007	400.097
6/11/2008	287.097
12/3/2008	237.097
6/17/2009	237.097
12/9/2009	272.097
6/17/2010	202.097
12/22/2010	220.097

6/29/2011	132.097
12/7/2011	380.097
6/6/2012	107.097
12/12/2012	300.097
6/19/2013	127.903
12/11/2013	58.0972
6/11/2014	189.903
12/3/2014	110.097
6/17/2015	169.903
12/1/2015	496.903
10/11/2016	694.903
12/20/2016	889.903
6/6/2017	432.903
11/7/2017	810.903
9/6/2018	1069.9
9/19/2018	799.903
5/7/2019	1519.9
11/21/2019	889.903

**Well: MW#03-1**

**Sample Residual**

6/24/2004	35.4967
9/15/2004	225.497
12/15/2004	52.4967
3/16/2005	39.5033
6/15/2005	3.49667
9/21/2005	55.4967
12/20/2006	14.5033
6/12/2007	168.497
12/17/2007	78.4967
6/11/2008	5.49667
12/3/2008	187.497
6/17/2009	57.4967
12/9/2009	7.49667
6/17/2010	38.4967
12/22/2010	42.4967
6/29/2011	1.49667
12/7/2011	39.4967
6/6/2012	4.50333
6/19/2013	88.5033
12/11/2013	14.4967
6/11/2014	364.497
12/3/2014	52.5033
6/17/2015	194.503
12/1/2015	76.5033
6/22/2016	141.503
6/6/2017	263.503
11/7/2017	17.5033
2/27/2018	275.403
9/19/2018	111.497
11/21/2019	321.503

**Well: MW#03-2**

**Sample Residual**

6/24/2004	363.111
9/15/2004	533.111
12/15/2004	400.111
3/16/2005	394.111

6/15/2005	381.111
9/21/2005	430.111
12/21/2005	483.111
3/15/2006	461.111
6/21/2006	419.111
12/20/2006	475.111
6/12/2007	375.111
12/17/2007	438.111
6/11/2008	381.111
12/3/2008	303.111
6/17/2009	335.111
12/9/2009	365.111
6/17/2010	370.111
12/22/2010	327.111
6/29/2011	307.111
12/7/2011	300.111
6/6/2012	339.111
12/12/2012	248.111
6/19/2013	248.111
12/11/2013	250.111
6/11/2014	836.111
12/3/2014	484.889
6/17/2015	90.1111
12/1/2015	88.1111
6/22/2016	18.8889
12/20/2016	398.889
6/6/2017	442.889
11/7/2017	986.889
9/6/2018	1564.89
9/19/2018	1824.89
5/7/2019	1674.89
11/21/2019	2544.89

# Shapiro-Francia Test of Normality

Parameter: Specific Conductance

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 283

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	10.52	-2.74777	7.55021	-28.9065
2	10.9	-2.45727	13.5884	-55.6908
3	140	-2.32634	19.0003	-381.379
4	186.1	-2.19728	23.8283	-790.293
5	198	-2.12007	28.323	-1210.07
6	219	-2.03352	32.4582	-1655.41
7	267	-1.97737	36.3682	-2183.37
8	320	-1.91103	40.0203	-2794.9
9	373	-1.86629	43.5033	-3491.02
10	385	-1.81191	46.7863	-4188.61
11	409	-1.77438	49.9348	-4914.33
12	422	-1.72793	52.9205	-5643.52
13	444	-1.6954	55.7949	-6396.27
14	447	-1.65463	58.5327	-7135.89
15	457	-1.62576	61.1758	-7878.86
16	463	-1.58927	63.7015	-8614.7
17	465	-1.56322	66.1452	-9341.59
18	467	-1.53007	68.4863	-10056.1
19	469	-1.50626	70.7551	-10762.6
20	476	-1.47579	72.9331	-11465
21	497	-1.4538	75.0466	-12187.6
22	500	-1.42554	77.0788	-12900.4
23	501	-1.40507	79.053	-13604.3
24	504	-1.37866	80.9537	-14299.1
25	514	-1.35317	82.7848	-14994.7
26	517	-1.33462	84.566	-15684.7
27	519	-1.31058	86.2837	-16364.9
28	522	-1.29303	87.9556	-17039.8
29	540	-1.27024	89.5691	-17725.8
30	572	-1.25357	91.1405	-18442.8
31	573	-1.23187	92.658	-19148.7
32	580	-1.21596	94.1366	-19853.9
33	594	-1.19522	95.5651	-20563.9
34	617	-1.18	96.9575	-21291.9
35	625	-1.16012	98.3034	-22017
36	630	-1.1455	99.6156	-22738.7
37	636	-1.12639	100.884	-23455.1
38	649	-1.11232	102.122	-24177
39	655	-1.0939	103.318	-24893.5
40	661	-1.08032	104.485	-25607.6
41	674	-1.06252	105.614	-26323.7
42	674	-1.04939	106.715	-27031
43	680	-1.03215	107.781	-27732.8
44	685	-1.01943	108.82	-28431.2
45	687	-1.00271	109.825	-29120
46	690	-0.990356	110.806	-29803.4

47	692	-0.974114	111.755	-30477.4
48	716	-0.958125	112.673	-31163.5
49	720	-0.946291	113.569	-31844.8
50	728	-0.930718	114.435	-32522.4
51	748	-0.919183	115.28	-33209.9
52	752	-0.903992	116.097	-33889.7
53	755	-0.892733	116.894	-34563.7
54	787	-0.877897	117.665	-35254.6
55	805	-0.866894	118.416	-35952.5
56	807	-0.852385	119.143	-36640.3
57	807	-0.841621	119.851	-37319.5
58	826	-0.827417	120.536	-38003
59	881	-0.816874	121.203	-38722.7
60	910	-0.802956	121.848	-39453.3
61	930	-0.792618	122.476	-40190.5
62	965	-0.778966	123.083	-40942.2
63	967	-0.768821	123.674	-41685.6
64	972	-0.755415	124.244	-42419.9
65	1010	-0.745449	124.8	-43172.8
66	1010	-0.732275	125.336	-43912.4
67	1023	-0.722479	125.858	-44651.5
68	1030	-0.709522	126.362	-45382.3
69	1031	-0.699883	126.852	-46103.9
70	1034	-0.687131	127.324	-46814.4
71	1034	-0.67449	127.779	-47511.8
72	1035	-0.665079	128.221	-48200.2
73	1038	-0.652622	128.647	-48877.6
74	1051	-0.643345	129.061	-49553.7
75	1063	-0.631062	129.459	-50224.5
76	1064	-0.621911	129.846	-50886.3
77	1068	-0.609791	130.218	-51537.5
78	1070	-0.60076	130.579	-52180.3
79	1070	-0.588793	130.925	-52810.3
80	1073	-0.579873	131.262	-53432.5
81	1073	-0.568052	131.584	-54042.1
82	1074	-0.559237	131.897	-54642.7
83	1077	-0.547551	132.197	-55232.4
84	1080	-0.538836	132.487	-55814.3
85	1080	-0.52728	132.765	-56383.8
86	1080	-0.518658	133.034	-56943.9
87	1087	-0.507221	133.291	-57495.3
88	1088	-0.498687	133.54	-58037.9
89	1090	-0.487364	133.778	-58569.1
90	1092	-0.478914	134.007	-59092.1
91	1103	-0.467699	134.226	-59607.9
92	1108	-0.459327	134.437	-60116.9
93	1109	-0.448213	134.638	-60613.9
94	1109	-0.439913	134.831	-61101.8
95	1109	-0.428895	135.015	-61577.5
96	1111	-0.417928	135.19	-62041.8
97	1125	-0.409735	135.358	-62502.7
98	1129	-0.398855	135.517	-62953
99	1134	-0.390726	135.669	-63396.1
100	1137	-0.379927	135.814	-63828.1
101	1140	-0.371856	135.952	-64252
102	1140	-0.361133	136.082	-64663.7
103	1149	-0.353118	136.207	-65069.4

104	1154	-0.342466	136.324	-65464.6
105	1155	-0.334503	136.436	-65851
106	1155	-0.323919	136.541	-66225.1
107	1169	-0.316004	136.641	-66594.5
108	1170	-0.305481	136.734	-66951.9
109	1172	-0.297612	136.823	-67300.7
110	1173	-0.287147	136.905	-67637.6
111	1177	-0.279319	136.983	-67966.3
112	1178	-0.268908	137.056	-68283.1
113	1179	-0.26112	137.124	-68591
114	1180	-0.250759	137.187	-68886.8
115	1185	-0.243007	137.246	-69174.8
116	1185	-0.232693	137.3	-69450.6
117	1186	-0.224974	137.351	-69717.4
118	1187	-0.214702	137.397	-69972.2
119	1200	-0.204452	137.439	-70217.6
120	1200	-0.196779	137.477	-70453.7
121	1203	-0.186567	137.512	-70678.1
122	1210	-0.17892	137.544	-70894.6
123	1210	-0.168741	137.573	-71098.8
124	1214	-0.161119	137.598	-71294.4
125	1217	-0.150969	137.621	-71478.1
126	1218	-0.143367	137.642	-71652.8
127	1226	-0.133244	137.66	-71816.1
128	1227	-0.125661	137.675	-71970.3
129	1230	-0.115562	137.689	-72112.4
130	1230	-0.107995	137.7	-72245.3
131	1235	-0.0979139	137.71	-72366.2
132	1236	-0.0903606	137.718	-72477.9
133	1240	-0.0802981	137.725	-72577.5
134	1244	-0.0727562	137.73	-72668
135	1250	-0.0627062	137.734	-72746.3
136	1250	-0.0551734	137.737	-72815.3
137	1252	-0.0451348	137.739	-72871.8
138	1253	-0.0376076	137.74	-72918.9
139	1270	-0.0275759	137.741	-72954
140	1270	-0.0200544	137.741	-72979.4
141	1270	-0.0100272	137.742	-72992.2
142	1273	0	137.742	-72992.2
143	1275	0.0100272	137.742	-72979.4
144	1289	0.0200544	137.742	-72953.5
145	1290	0.0275759	137.743	-72918
146	1296	0.0376076	137.744	-72869.2
147	1301	0.0451348	137.746	-72810.5
148	1301	0.0551734	137.749	-72738.7
149	1301	0.0627062	137.753	-72657.1
150	1309	0.0727562	137.759	-72561.9
151	1318	0.0802981	137.765	-72456.1
152	1326	0.0903606	137.773	-72336.3
153	1327	0.0979139	137.783	-72206.3
154	1327	0.107995	137.794	-72063
155	1329	0.115562	137.808	-71909.4
156	1332	0.125661	137.824	-71742.1
157	1334	0.133244	137.841	-71564.3
158	1351	0.143367	137.862	-71370.6
159	1352	0.150969	137.885	-71166.5
160	1366	0.161119	137.911	-70946.4

161	1370	0.168741	137.939	-70715.2
162	1370	0.17892	137.971	-70470.1
163	1374	0.186567	138.006	-70213.8
164	1374	0.196779	138.045	-69943.4
165	1393	0.204452	138.086	-69658.6
166	1421	0.214702	138.133	-69353.5
167	1423	0.224974	138.183	-69033.4
168	1427	0.232693	138.237	-68701.3
169	1438	0.243007	138.296	-68351.9
170	1441	0.250759	138.359	-67990.5
171	1454	0.26112	138.427	-67610.9
172	1458	0.268908	138.5	-67218.8
173	1466	0.279319	138.578	-66809.3
174	1469	0.287147	138.66	-66387.5
175	1480	0.297612	138.749	-65947
176	1490	0.305481	138.842	-65491.9
177	1498	0.316004	138.942	-65018.5
178	1500	0.323919	139.047	-64532.6
179	1510	0.334503	139.159	-64027.5
180	1515	0.342466	139.276	-63508.7
181	1516	0.353118	139.401	-62973.3
182	1520	0.361133	139.531	-62424.4
183	1521	0.371856	139.669	-61858.8
184	1531	0.379927	139.814	-61277.2
185	1534	0.390726	139.966	-60677.8
186	1540	0.398855	140.126	-60063.6
187	1547	0.409735	140.293	-59429.7
188	1560	0.417928	140.468	-58777.7
189	1570	0.428895	140.652	-58104.4
190	1586	0.439913	140.846	-57406.7
191	1602	0.448213	141.046	-56688.6
192	1608	0.459327	141.257	-55950
193	1618	0.467699	141.476	-55193.3
194	1620	0.478914	141.706	-54417.4
195	1620	0.487364	141.943	-53627.9
196	1630	0.498687	142.192	-52815.1
197	1657	0.507221	142.449	-51974.6
198	1743	0.518658	142.718	-51070.6
199	1762	0.52728	142.996	-50141.5
200	1807	0.538836	143.286	-49167.8
201	1888	0.547551	143.586	-48134.1
202	2005	0.559237	143.899	-47012.8
203	2042	0.568052	144.222	-45852.8
204	2110	0.579873	144.558	-44629.3
205	2121	0.588793	144.905	-43380.5
206	2200	0.60076	145.265	-42058.8
207	2200	0.609791	145.637	-40717.2
208	2380	0.621911	146.024	-39237.1
209	2620	0.631062	146.422	-37583.7
210	2730	0.643345	146.836	-35827.4
211	2830	0.652622	147.262	-33980.5
212	2880	0.665079	147.704	-32065
213	3600	0.67449	148.159	-29636.9
214	6710	0.687131	148.632	-25026.2
215	7660	0.699883	149.121	-19665.1
216	7950	0.709522	149.625	-14024.4
217	8217	0.722479	150.147	-8087.8

218	8310	0.732275	150.683	-2002.6
219	8650	0.745449	151.239	4445.54
220	8820	0.755415	151.809	11108.3
221	8920	0.768821	152.4	17966.2
222	9000	0.778966	153.007	24976.9
223	9070	0.792618	153.635	32165.9
224	9080	0.802956	154.28	39456.8
225	9100	0.816874	154.948	46890.3
226	9210	0.827417	155.632	54510.8
227	9237	0.841621	156.34	62284.9
228	9240	0.852385	157.067	70160.9
229	9250	0.866894	157.819	78179.7
230	9310	0.877897	158.589	86352.9
231	9340	0.892733	159.386	94691
232	9420	0.903992	160.203	103207
233	9590	0.919183	161.048	112022
234	9590	0.930718	161.915	120947
235	9600	0.946291	162.81	130032
236	9660	0.958125	163.728	139287
237	9690	0.974114	164.677	148726
238	9690	0.990356	165.658	158323
239	9690	1.00271	166.663	168039
240	9690	1.01943	167.702	177917
241	9830	1.03215	168.768	188063
242	9940	1.04939	169.869	198494
243	9940	1.06252	170.998	209056
244	10000	1.08032	172.165	219859
245	10010	1.0939	173.362	230809
246	10020	1.11232	174.599	241954
247	10050	1.12639	175.868	253275
248	10197	1.1455	177.18	264955
249	10240	1.16012	178.526	276835
250	10260	1.18	179.918	288942
251	10280	1.19522	181.347	301229
252	10283	1.21596	182.825	313732
253	10340	1.23187	184.343	326470
254	10400	1.25357	185.914	339507
255	10490	1.27024	187.528	352832
256	10494	1.29303	189.2	366401
257	10500	1.31058	190.917	380162
258	10520	1.33462	192.698	394202
259	10550	1.35317	194.529	408478
260	10560	1.37866	196.43	423037
261	10590	1.40507	198.404	437916
262	10590	1.42554	200.437	453013
263	10620	1.4538	202.55	468452
264	10650	1.47579	204.728	484169
265	10660	1.50626	206.997	500226
266	10660	1.53007	209.338	516537
267	10690	1.56322	211.782	533248
268	10693	1.58927	214.307	550242
269	10700	1.62576	216.951	567637
270	10770	1.65463	219.688	585458
271	10850	1.6954	222.563	603853
272	10873	1.72793	225.548	622640
273	10900	1.77438	228.697	641981
274	11110	1.81191	231.98	662112



275	11230	1.86629	235.463	683070
276	11400	1.91103	239.115	704856
277	11460	1.97737	243.025	727516
278	11460	2.03352	247.16	750821
279	11600	2.12007	251.655	775413
280	12590	2.19728	256.483	803077
281	15400	2.32634	261.895	838903
282	15700	2.45727	267.933	877482

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Sample Standard Deviation = 4020.49

Numerator = 7.69975e+011

Denominator = 1.22133e+012 = 282 267.933

W Statistic = 0.630439

5% Critical value of 0.976 exceeds 0.630439

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.630439

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 71

Maximum Background Concentration = 1888

Confidence Level = 94.7%

False Positive Rate = 5.3%

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<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#93-2	11/21/2019	1	15400	TRUE
MW#93-3	11/21/2019	1	2200	TRUE
MW#03-1	11/21/2019	1	140	FALSE
MW#03-2	11/21/2019	1	3600	TRUE

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## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 73

Maximum Baseline Concentration = 15700

Confidence Level = 98.6%

False Positive Rate = 1.4%

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Baseline Samples	Date	Result
	12/15/1994	7950
	3/14/1995	8217
	6/21/1995	9210
	12/14/1995	9000
	3/6/1996	8820
	4/25/1996	9310
	10/2/1996	9420
	12/10/1996	9590
	3/11/1997	9250
	4/15/1997	9690
	8/14/1997	10660
	12/4/1997	10240
	3/31/1998	9237
	6/23/1998	10400
	8/11/1998	11460
	12/8/1998	10280
	3/9/1999	9240
	6/8/1999	10850
	8/19/1999	10873
	12/14/1999	9690
	3/7/2000	9340
	6/23/2000	1034
	12/12/2000	9080
	3/27/2001	10260
	6/28/2001	11600
	9/10/2001	10700
	12/18/2001	10660
	3/19/2002	10197
	6/26/2002	10590
	9/18/2002	9690
	12/11/2002	10283
	3/13/2003	8920
	6/25/2003	10590
	9/26/2003	10693
	12/10/2003	10550
	3/9/2004	10620
	6/24/2004	10494
	9/15/2004	10340
	12/15/2004	9940
	3/16/2005	9690
	6/15/2005	10010

9/21/2005	9660
12/21/2005	10000
3/15/2006	8650
6/21/2006	9830
12/20/2006	8310
2/21/2007	7660
6/12/2007	9590
12/17/2007	9100
6/11/2008	9600
12/3/2008	10520
12/15/2008	9070
6/17/2009	10690
12/9/2009	10050
6/17/2010	10020
12/22/2010	11230
6/29/2011	11110
12/7/2011	10770
6/6/2012	10490
12/12/2012	11460
6/19/2013	10500
12/11/2013	10650
6/11/2014	9940
12/3/2014	10900
6/17/2015	1270
12/1/2015	10560
6/22/2016	6710
12/20/2016	11400
6/6/2017	12590
11/7/2017	10.52
2/27/2018	10.9
9/19/2018	15700
5/7/2019	15700

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<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	15400	FALSE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 71

Maximum Baseline Concentration = 2830

Confidence Level = 98.6%

False Positive Rate = 1.4%

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Baseline Samples	Date	Result
	12/15/1994	1762
	3/14/1995	1490
	6/21/1995	1421
	12/14/1995	1534
	3/6/1996	1327
	4/25/1996	1570
	10/2/1996	1657
	12/10/1996	1427
	3/11/1997	1370
	4/15/1997	1244
	8/14/1997	1351
	12/4/1997	1140
	3/31/1998	1172
	6/23/1998	1214
	8/11/1998	1296
	12/8/1998	1177
	3/9/1999	1137
	6/8/1999	1180
	8/19/1999	1253
	12/14/1999	1088
	3/7/2000	1250
	6/23/2000	1070
	12/12/2000	1051
	3/27/2001	1149
	6/28/2001	1155
	9/10/2001	1250
	12/18/2001	1064
	3/19/2002	1240
	6/26/2002	787
	9/18/2002	1109
	12/11/2002	1125
	3/13/2003	1034
	6/25/2003	1111
	9/26/2003	1109
	12/10/2003	1173
	3/9/2004	881
	6/24/2004	1129
	9/15/2004	1068
	12/15/2004	972
	3/16/2005	1134
	6/15/2005	1080

9/21/2005	1155
12/21/2005	1140
3/15/2006	1035
6/21/2006	1226
12/20/2006	1087
6/12/2007	1031
12/17/2007	910
6/11/2008	1023
12/3/2008	1073
6/17/2009	1073
12/9/2009	1038
6/17/2010	1108
12/22/2010	1090
6/29/2011	1178
12/7/2011	930
6/6/2012	1203
12/12/2012	1010
6/19/2013	1438
12/11/2013	1252
6/11/2014	1500
12/3/2014	1200
6/17/2015	1480
12/1/2015	1807
10/11/2016	2005
12/20/2016	2200
6/6/2017	1743
11/7/2017	2121
9/6/2018	2380
9/19/2018	2110
5/7/2019	2830

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<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	2200	FALSE

# Non-Parametric Prediction Interval

## Intra-Well Comparison for MW#03-2

### Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 35

Maximum Baseline Concentration = 2880

Confidence Level = 97.2%

False Positive Rate = 2.8%

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Baseline Samples	Date	Result
	6/24/2004	692
	9/15/2004	522
	12/15/2004	655
	3/16/2005	661
	6/15/2005	674
	9/21/2005	625
	12/21/2005	572
	3/15/2006	594
	6/21/2006	636
	12/20/2006	580
	6/12/2007	680
	12/17/2007	617
	6/11/2008	674
	12/3/2008	752
	6/17/2009	720
	12/9/2009	690
	6/17/2010	685
	12/22/2010	728
	6/29/2011	748
	12/7/2011	755
	6/6/2012	716
	12/12/2012	807
	6/19/2013	807
	12/11/2013	805
	6/11/2014	219
	12/3/2014	1540
	6/17/2015	965
	12/1/2015	967
	6/22/2016	1074
	12/20/2016	1454
	6/6/2017	1498
	11/7/2017	2042
	9/6/2018	2620
	9/19/2018	2880
	5/7/2019	2730

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Date	Samples	Mean	Impacted
11/21/2019	1	3600	TRUE

# Concentrations (mg/L)

## Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 284

Total Non-Detect: 8

Percent Non-Detects: 2.8169%

Total Background Samples: 72

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	72	0 (0%)	12/15/1994	195	195
			3/14/1995	275	275
			6/21/1995	750	750
			12/14/1995	320	320
			3/6/1996	215	215
			4/25/1996	272	272
			10/2/1996	300	300
			12/10/1996	260	260
			3/11/1997	278	278
			4/15/1997	250	250
			8/14/1997	320	320
			12/4/1997	360	360
			3/31/1998	230	230
			6/23/1998	500	500
			8/11/1998	350	350
			12/8/1998	270	270
			3/9/1999	290	290
			6/8/1999	408	408
			8/19/1999	388	388
			12/14/1999	310	310
			3/7/2000	373	373
			6/23/2000	410	410
			12/12/2000	420	420
			3/27/2001	350	350
			6/28/2001	425	425
			9/10/2001	390	390
			12/18/2001	390	390
			3/19/2002	425	425
			6/26/2002	420	420
			9/18/2002	517	517
			12/11/2002	430	430
			3/13/2003	450	450
			6/25/2003	434	434
			9/26/2003	460	460
			12/10/2003	470	470
			3/9/2004	444	444
6/24/2004	500	500			
9/15/2004	475	475			
12/15/2004	558	558			
3/16/2005	880	880			
6/15/2005	22	22			
9/21/2005	467	467			
12/21/2005	475	475			
3/15/2006	375	375			



6/21/2006	420	420
12/20/2006	330	330
6/12/2007	260	260
12/17/2007	300	300
6/11/2008	375	375
12/3/2008	340	340
6/17/2009	240	240
12/9/2009	160	160
6/17/2010	290	290
12/22/2010	304	304
6/29/2011	306	306
12/7/2011	255	255
6/6/2012	275	275
12/12/2012	301	301
6/19/2013	409	409
12/11/2013	306	306
6/11/2014	316	316
12/3/2014	292	292
6/17/2015	286	286
12/1/2015	299	299
6/22/2016	250	250
12/20/2016	275	275
6/6/2017	265	265
11/7/2017	281	281
2/27/2018	299	299
9/27/2018	305	305
5/7/2019	275	275
11/21/2019	299	299

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There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	74	0 (0%)	12/15/1994	2000	2000
			3/14/1995	1550	1550
			6/21/1995	185	185
			12/14/1995	2367	2367
			3/6/1996	2150	2150
			4/25/1996	2000	2000
			10/2/1996	3267	3267
			12/10/1996	4000	4000
			3/11/1997	1700	1700
			4/15/1997	1500	1500
			8/14/1997	3650	3650
			12/4/1997	4300	4300
			3/31/1998	2500	2500
			6/23/1998	3250	3250
			8/11/1998	3050	3050
			12/8/1998	3050	3050
			3/9/1999	3600	3600
			6/8/1999	3150	3150
			8/19/1999	1897	1897
			12/14/1999	2500	2500
3/7/2000	3400	3400			
6/23/2000	3400	3400			
12/12/2000	3000	3000			
3/27/2001	2133	2133			

6/28/2001	2750	2750
9/10/2001	2650	2650
12/18/2001	2950	2950
3/19/2002	2967	2967
6/26/2002	3050	3050
9/18/2002	2900	2900
12/11/2002	2933	2933
3/13/2003	2900	2900
6/25/2003	2700	2700
9/26/2003	2767	2767
12/10/2003	2700	2700
3/9/2004	2550	2550
6/24/2004	2650	2650
9/15/2004	2700	2700
12/15/2004	2950	2950
3/16/2005	3200	3200
6/15/2005	2650	2650
9/21/2005	3200	3200
12/21/2005	3200	3200
3/15/2006	3000	3000
6/21/2006	2700	2700
12/20/2006	2500	2500
2/21/2007	1900	1900
6/12/2007	2400	2400
12/17/2007	3100	3100
6/11/2008	2350	2350
12/3/2008	3300	3300
12/15/2008	2400	2400
6/17/2009	2300	2300
12/9/2009	2200	2200
6/17/2010	2900	2900
12/22/2010	3460	3460
6/29/2011	2630	2630
12/7/2011	2520	2520
6/6/2012	2360	2360
12/12/2012	3240	3240
6/19/2013	2510	2510
12/11/2013	2460	2460
6/11/2014	2790	2790
12/3/2014	2940	2940
6/17/2015	114	114
12/1/2015	3600	3600
6/22/2016	2620	2620
12/20/2016	3800	3800
6/6/2017	3630	3630
11/7/2017	4340	4340
2/27/2018	3870	3870
9/27/2018	3680	3680
5/7/2019	3890	3890
11/21/2019	12.4	12.4

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MW#93-3	72	8 (11.1111%)	12/15/1994	ND<10	ND<10
			3/14/1995	ND<10	ND<10
			6/21/1995	10	10
			12/14/1995	ND<10	ND<10
			3/6/1996	10	10
			4/25/1996	ND<10	ND<10

10/2/1996	11	11
12/10/1996	10	10
3/11/1997	12	12
4/15/1997	15	15
8/14/1997	11	11
12/4/1997	8	8
3/31/1998	45	45
6/23/1998	4	4
8/11/1998	9	9
12/8/1998	2	2
3/9/1999	ND<10	ND<10
6/8/1999	3	3
8/19/1999	ND<10	ND<10
12/14/1999	ND<10	ND<10
3/7/2000	13	13
6/23/2000	14	14
12/12/2000	7	7
3/27/2001	3	3
6/28/2001	ND<10	ND<10
9/10/2001	20	20
12/18/2001	19	19
3/19/2002	8	8
6/26/2002	8	8
9/18/2002	8	8
12/11/2002	6	6
3/13/2003	18	18
6/25/2003	13	13
9/26/2003	16	16
12/10/2003	34	34
3/9/2004	130	130
6/24/2004	24	24
9/15/2004	17	17
12/15/2004	26	26
3/16/2005	29	29
6/15/2005	26	26
9/21/2005	19	19
12/21/2005	23	23
3/15/2006	19	19
6/21/2006	21	21
12/20/2006	42	42
6/12/2007	3	3
12/17/2007	28	28
6/11/2008	27	27
12/3/2008	11	11
6/17/2009	16	16
12/9/2009	12	12
6/17/2010	45	45
12/22/2010	25.8	25.8
6/29/2011	34.2	34.2
12/7/2011	37.4	37.4
6/6/2012	38.3	38.3
12/12/2012	25.8	25.8
6/19/2013	61.6	61.6
12/11/2013	26.5	26.5
6/11/2014	56.2	56.2
12/3/2014	36	36
6/17/2015	109	109

			12/1/2015	81	81
			6/22/2016	58.5	58.5
			12/20/2016	66.6	66.6
			6/6/2017	18.2	18.2
			11/7/2017	80.3	80.3
			2/27/2018	64.2	64.2
			9/27/2018	75.8	75.8
			5/7/2019	105	105
			11/21/2019	4010	4010
<hr/>					
MW#03-1	31	0 (0%)	6/24/2004	42	42
			9/15/2004	76	76
			12/15/2004	62	62
			3/16/2005	22	22
			6/15/2005	23	23
			9/21/2005	17	17
			12/20/2006	55	55
			6/12/2007	88	88
			12/17/2007	120	120
			6/11/2008	23	23
			12/3/2008	90	90
			6/17/2009	21	21
			12/9/2009	15	15
			6/17/2010	16	16
			12/22/2010	22.9	22.9
			6/29/2011	21.6	21.6
			12/7/2011	18.1	18.1
			6/6/2012	14.3	14.3
			6/19/2013	16.2	16.2
			12/11/2013	29.1	29.1
			6/11/2014	127	127
			12/3/2014	19.7	19.7
			6/17/2015	7.86	7.86
			12/1/2015	12.1	12.1
			6/22/2016	10.3	10.3
			12/20/2016	30.9	30.9
			6/6/2017	8.92	8.92
			11/7/2017	14.4	14.4
			2/27/2018	12.6	12.6
			5/7/2019	12.2	12.2
			11/21/2019	184	184
<hr/>					
MW#03-2	35	0 (0%)	6/24/2004	72	72
			9/15/2004	32	32
			12/15/2004	54	54
			3/16/2005	78	78
			6/15/2005	23	23
			9/21/2005	80	80
			12/21/2005	72	72
			3/15/2006	30	30
			12/20/2006	34	34
			6/12/2007	68	68
			12/17/2007	130	130
			6/11/2008	67	67
			12/3/2008	210	210
			6/17/2009	84	84
			12/9/2009	80	80

6/17/2010	106	106
12/22/2010	98.9	98.9
6/29/2011	101	101
12/7/2011	98.8	98.8
6/6/2012	107	107
12/12/2012	111	111
6/19/2013	113	113
12/11/2013	106	106
6/11/2014	10.3	10.3
12/3/2014	158	158
6/17/2015	179	179
12/1/2015	197	197
6/22/2016	254	254
12/20/2016	451	451
6/6/2017	332	332
11/7/2017	516	516
2/27/2018	468	468
9/27/2018	426	426
5/7/2019	29.6	29.6
11/21/2019	394	394

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There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 216.896

Overall Std Dev = 429.744

Overall Total = 61598.4

SS Wells = 1.28086e+007

SS Total = 5.22645e+007

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## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.28086e+007	4	3.20216e+006	22.6431
Error (within wells)	3.94559e+007	279	141419	
Totals	5.22645e+007	283		

22.6431 exceeds 2.37; assumption of equal variance should be rejected

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Well: MW#93-1	Sample	Residual
	12/15/1994	157.972
	3/14/1995	77.9722
	6/21/1995	397.028
	12/14/1995	32.9722
	3/6/1996	137.972
	4/25/1996	80.9722
	10/2/1996	52.9722
	12/10/1996	92.9722
	3/11/1997	74.9722
	4/15/1997	102.972
	8/14/1997	32.9722
	12/4/1997	7.02778
	3/31/1998	122.972
	6/23/1998	147.028
	8/11/1998	2.97222
	12/8/1998	82.9722
	3/9/1999	62.9722
	6/8/1999	55.0278
	8/19/1999	35.0278
	12/14/1999	42.9722
	3/7/2000	20.0278
	6/23/2000	57.0278
	12/12/2000	67.0278
	3/27/2001	2.97222
	6/28/2001	72.0278
	9/10/2001	37.0278
	12/18/2001	37.0278
	3/19/2002	72.0278
	6/26/2002	67.0278
	9/18/2002	164.028
	12/11/2002	77.0278
	3/13/2003	97.0278

6/25/2003	81.0278
9/26/2003	107.028
12/10/2003	117.028
3/9/2004	91.0278
6/24/2004	147.028
9/15/2004	122.028
12/15/2004	205.028
3/16/2005	527.028
6/15/2005	330.972
9/21/2005	114.028
12/21/2005	122.028
3/15/2006	22.0278
6/21/2006	67.0278
12/20/2006	22.9722
6/12/2007	92.9722
12/17/2007	52.9722
6/11/2008	22.0278
12/3/2008	12.9722
6/17/2009	112.972
12/9/2009	192.972
6/17/2010	62.9722
12/22/2010	48.9722
6/29/2011	46.9722
12/7/2011	97.9722
6/6/2012	77.9722
12/12/2012	51.9722
6/19/2013	56.0278
12/11/2013	46.9722
6/11/2014	36.9722
12/3/2014	60.9722
6/17/2015	66.9722
12/1/2015	53.9722
6/22/2016	102.972
12/20/2016	77.9722
6/6/2017	87.9722
11/7/2017	71.9722
2/27/2018	53.9722
9/27/2018	47.9722
5/7/2019	77.9722
11/21/2019	53.9722

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
12/15/1994	749.762
3/14/1995	1199.76
6/21/1995	2564.76
12/14/1995	382.762
3/6/1996	599.762
4/25/1996	749.762
10/2/1996	517.238
12/10/1996	1250.24
3/11/1997	1049.76
4/15/1997	1249.76
8/14/1997	900.238
12/4/1997	1550.24
3/31/1998	249.762
6/23/1998	500.238
8/11/1998	300.238

12/8/1998	300.238
3/9/1999	850.238
6/8/1999	400.238
8/19/1999	852.762
12/14/1999	249.762
3/7/2000	650.238
6/23/2000	650.238
12/12/2000	250.238
3/27/2001	616.762
6/28/2001	0.237838
9/10/2001	99.7622
12/18/2001	200.238
3/19/2002	217.238
6/26/2002	300.238
9/18/2002	150.238
12/11/2002	183.238
3/13/2003	150.238
6/25/2003	49.7622
9/26/2003	17.2378
12/10/2003	49.7622
3/9/2004	199.762
6/24/2004	99.7622
9/15/2004	49.7622
12/15/2004	200.238
3/16/2005	450.238
6/15/2005	99.7622
9/21/2005	450.238
12/21/2005	450.238
3/15/2006	250.238
6/21/2006	49.7622
12/20/2006	249.762
2/21/2007	849.762
6/12/2007	349.762
12/17/2007	350.238
6/11/2008	399.762
12/3/2008	550.238
12/15/2008	349.762
6/17/2009	449.762
12/9/2009	549.762
6/17/2010	150.238
12/22/2010	710.238
6/29/2011	119.762
12/7/2011	229.762
6/6/2012	389.762
12/12/2012	490.238
6/19/2013	239.762
12/11/2013	289.762
6/11/2014	40.2378
12/3/2014	190.238
6/17/2015	2635.76
12/1/2015	850.238
6/22/2016	129.762
12/20/2016	1050.24
6/6/2017	880.238
11/7/2017	1590.24
2/27/2018	1120.24
9/27/2018	930.238



5/7/2019	1140.24
11/21/2019	2737.36

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
12/15/1994	72.575
3/14/1995	72.575
6/21/1995	72.575
12/14/1995	72.575
3/6/1996	72.575
4/25/1996	72.575
10/2/1996	71.575
12/10/1996	72.575
3/11/1997	70.575
4/15/1997	67.575
8/14/1997	71.575
12/4/1997	74.575
3/31/1998	37.575
6/23/1998	78.575
8/11/1998	73.575
12/8/1998	80.575
3/9/1999	72.575
6/8/1999	79.575
8/19/1999	72.575
12/14/1999	72.575
3/7/2000	69.575
6/23/2000	68.575
12/12/2000	75.575
3/27/2001	79.575
6/28/2001	72.575
9/10/2001	62.575
12/18/2001	63.575
3/19/2002	74.575
6/26/2002	74.575
9/18/2002	74.575
12/11/2002	76.575
3/13/2003	64.575
6/25/2003	69.575
9/26/2003	66.575
12/10/2003	48.575
3/9/2004	47.425
6/24/2004	58.575
9/15/2004	65.575
12/15/2004	56.575
3/16/2005	53.575
6/15/2005	56.575
9/21/2005	63.575
12/21/2005	59.575
3/15/2006	63.575
6/21/2006	61.575
12/20/2006	40.575
6/12/2007	79.575
12/17/2007	54.575
6/11/2008	55.575
12/3/2008	71.575
6/17/2009	66.575
12/9/2009	70.575
6/17/2010	37.575

12/22/2010	56.775
6/29/2011	48.375
12/7/2011	45.175
6/6/2012	44.275
12/12/2012	56.775
6/19/2013	20.975
12/11/2013	56.075
6/11/2014	26.375
12/3/2014	46.575
6/17/2015	26.425
12/1/2015	1.575
6/22/2016	24.075
12/20/2016	15.975
6/6/2017	64.375
11/7/2017	2.275
2/27/2018	18.375
9/27/2018	6.775
5/7/2019	22.425
11/21/2019	3927.43

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
6/24/2004	2.25226
9/15/2004	36.2523
12/15/2004	22.2523
3/16/2005	17.7477
6/15/2005	16.7477
9/21/2005	22.7477
12/20/2006	15.2523
6/12/2007	48.2523
12/17/2007	80.2523
6/11/2008	16.7477
12/3/2008	50.2523
6/17/2009	18.7477
12/9/2009	24.7477
6/17/2010	23.7477
12/22/2010	16.8477
6/29/2011	18.1477
12/7/2011	21.6477
6/6/2012	25.4477
6/19/2013	23.5477
12/11/2013	10.6477
6/11/2014	87.2523
12/3/2014	20.0477
6/17/2015	31.8877
12/1/2015	27.6477
6/22/2016	29.4477
12/20/2016	8.84774
6/6/2017	30.8277
11/7/2017	25.3477
2/27/2018	27.1477
5/7/2019	27.5477
11/21/2019	144.252

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
6/24/2004	81.4457
9/15/2004	121.446

12/15/2004	99.4457
3/16/2005	75.4457
6/15/2005	130.446
9/21/2005	73.4457
12/21/2005	81.4457
3/15/2006	123.446
12/20/2006	119.446
6/12/2007	85.4457
12/17/2007	23.4457
6/11/2008	86.4457
12/3/2008	56.5543
6/17/2009	69.4457
12/9/2009	73.4457
6/17/2010	47.4457
12/22/2010	54.5457
6/29/2011	52.4457
12/7/2011	54.6457
6/6/2012	46.4457
12/12/2012	42.4457
6/19/2013	40.4457
12/11/2013	47.4457
6/11/2014	143.146
12/3/2014	4.55429
6/17/2015	25.5543
12/1/2015	43.5543
6/22/2016	100.554
12/20/2016	297.554
6/6/2017	178.554
11/7/2017	362.554
2/27/2018	314.554
9/27/2018	272.554
5/7/2019	123.846
11/21/2019	240.554

# Shapiro-Francia Test of Normality

Parameter: Sulfate

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 284

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	2	-2.74777	7.55021	-5.49553
2	3	-2.45727	13.5884	-12.8673
3	3	-2.32634	19.0003	-19.8464
4	3	-2.19728	23.8283	-26.4382
5	4	-2.12007	28.323	-34.9185
6	6	-2.03352	32.4582	-47.1196
7	7	-1.97737	36.3682	-60.9612
8	7.86	-1.91103	40.0203	-75.9819
9	8	-1.86629	43.5033	-90.9122
10	8	-1.81191	46.7863	-105.408
11	8	-1.77438	49.9348	-119.603
12	8	-1.72793	52.9205	-133.426
13	8.92	-1.6954	55.7949	-148.549
14	9	-1.65463	58.5327	-163.441
15	10	-1.62576	61.1758	-179.698
16	10	-1.58927	63.7015	-195.591
17	10	-1.56322	66.1452	-211.223
18	10	-1.53007	68.4863	-226.524
19	10	-1.50626	70.7551	-241.586
20	10	-1.47579	72.9331	-256.344
21	10	-1.4538	75.0466	-270.882
22	10	-1.42554	77.0788	-285.138
23	10	-1.40507	79.053	-299.189
24	10	-1.37866	80.9537	-312.975
25	10	-1.35946	82.8019	-326.57
26	10.3	-1.33462	84.5831	-340.316
27	10.3	-1.31652	86.3163	-353.877
28	11	-1.29303	87.9883	-368.1
29	11	-1.27588	89.6161	-382.135
30	11	-1.25357	91.1875	-395.924
31	12	-1.23724	92.7183	-410.771
32	12	-1.21596	94.1969	-425.362
33	12.1	-1.20036	95.6377	-439.886
34	12.2	-1.18	97.0301	-454.282
35	12.4	-1.16505	98.3875	-468.729
36	12.6	-1.1455	99.6996	-483.162
37	13	-1.13113	100.979	-497.867
38	13	-1.11232	102.216	-512.327
39	14	-1.09847	103.423	-527.706
40	14.3	-1.08032	104.59	-543.154
41	14.4	-1.06694	105.728	-558.518
42	15	-1.04939	106.83	-574.259
43	15	-1.03643	107.904	-589.806
44	16	-1.01943	108.943	-606.116
45	16	-1.00687	109.957	-622.226
46	16	-0.990356	110.938	-638.072

47	16.2	-0.97815	111.894	-653.918
48	17	-0.9621	112.82	-670.274
49	17	-0.950222	113.723	-686.428
50	18	-0.93459	114.596	-703.25
51	18.1	-0.923014	115.448	-719.957
52	18.2	-0.907769	116.272	-736.478
53	19	-0.896473	117.076	-753.511
54	19	-0.881587	117.853	-770.261
55	19	-0.87055	118.611	-786.802
56	19.7	-0.855996	119.344	-803.665
57	20	-0.841621	120.052	-820.497
58	21	-0.830953	120.743	-837.947
59	21	-0.816874	121.41	-855.102
60	21.6	-0.806422	122.06	-872.52
61	22	-0.792618	122.689	-889.958
62	22	-0.782366	123.301	-907.17
63	22.9	-0.768821	123.892	-924.776
64	23	-0.758753	124.467	-942.227
65	23	-0.745449	125.023	-959.373
66	23	-0.735557	125.564	-976.29
67	23	-0.722479	126.086	-992.907
68	24	-0.712751	126.594	-1010.01
69	25.8	-0.699883	127.084	-1028.07
70	25.8	-0.690309	127.561	-1045.88
71	26	-0.677639	128.02	-1063.5
72	26	-0.668209	128.466	-1080.87
73	26.5	-0.655726	128.896	-1098.25
74	27	-0.646431	129.314	-1115.7
75	28	-0.634124	129.716	-1133.46
76	29	-0.624956	130.107	-1151.58
77	29.1	-0.612813	130.482	-1169.41
78	29.6	-0.603765	130.847	-1187.29
79	30	-0.591776	131.197	-1205.04
80	30.9	-0.582841	131.537	-1223.05
81	32	-0.570999	131.863	-1241.32
82	34	-0.56217	132.179	-1260.44
83	34	-0.550465	132.482	-1279.15
84	34.2	-0.541736	132.775	-1297.68
85	36	-0.530162	133.056	-1316.76
86	37.4	-0.521527	133.328	-1336.27
87	38.3	-0.510074	133.589	-1355.81
88	42	-0.501527	133.84	-1376.87
89	42	-0.490189	134.08	-1397.46
90	45	-0.481728	134.312	-1419.13
91	45	-0.470498	134.534	-1440.31
92	54	-0.462114	134.747	-1465.26
93	55	-0.450985	134.951	-1490.07
94	56.2	-0.442676	135.147	-1514.94
95	58.5	-0.431644	135.333	-1540.2
96	61.6	-0.423405	135.512	-1566.28
97	62	-0.412463	135.682	-1591.85
98	64.2	-0.40429	135.846	-1617.81
99	66.6	-0.393433	136.001	-1644.01
100	67	-0.385321	136.149	-1669.82
101	68	-0.374544	136.289	-1695.29
102	72	-0.36649	136.424	-1721.68
103	72	-0.355788	136.55	-1747.3

104	75.8	-0.347787	136.671	-1773.66
105	76	-0.337155	136.785	-1799.28
106	78	-0.329206	136.893	-1824.96
107	80	-0.318639	136.995	-1850.45
108	80	-0.310738	137.091	-1875.31
109	80.3	-0.300232	137.182	-1899.42
110	81	-0.292375	137.267	-1923.1
111	84	-0.281926	137.346	-1946.78
112	88	-0.27411	137.422	-1970.91
113	90	-0.263715	137.491	-1994.64
114	98.8	-0.253347	137.555	-2019.67
115	98.9	-0.24559	137.616	-2043.96
116	101	-0.235269	137.671	-2067.72
117	105	-0.227545	137.723	-2091.61
118	106	-0.217267	137.77	-2114.64
119	106	-0.209575	137.814	-2136.86
120	107	-0.199336	137.854	-2158.19
121	109	-0.191671	137.89	-2179.08
122	111	-0.181468	137.923	-2199.22
123	113	-0.173829	137.954	-2218.87
124	114	-0.163659	137.98	-2237.52
125	120	-0.156042	138.005	-2256.25
126	127	-0.1459	138.026	-2274.78
127	130	-0.138305	138.045	-2292.76
128	130	-0.128189	138.062	-2309.42
129	158	-0.12061	138.076	-2328.48
130	160	-0.110516	138.088	-2346.16
131	179	-0.102953	138.099	-2364.59
132	184	-0.0928787	138.108	-2381.68
133	185	-0.0853288	138.115	-2397.46
134	195	-0.0752698	138.12	-2412.14
135	197	-0.0677301	138.125	-2425.49
136	210	-0.0576847	138.128	-2437.6
137	215	-0.0501541	138.131	-2448.38
138	230	-0.0401167	138.132	-2457.61
139	240	-0.0325917	138.134	-2465.43
140	250	-0.0225612	138.134	-2471.07
141	250	-0.0150408	138.134	-2474.83
142	254	-0.00501359	138.134	-2476.11
143	255	0.00501359	138.134	-2474.83
144	260	0.0150408	138.135	-2470.92
145	260	0.0225612	138.135	-2465.05
146	265	0.0325917	138.136	-2456.41
147	270	0.0401167	138.138	-2445.58
148	272	0.0501541	138.14	-2431.94
149	275	0.0576847	138.144	-2416.08
150	275	0.0677301	138.148	-2397.45
151	275	0.0752698	138.154	-2376.75
152	275	0.0853288	138.161	-2353.29
153	278	0.0928787	138.17	-2327.47
154	281	0.102953	138.18	-2298.54
155	286	0.110516	138.193	-2266.93
156	290	0.12061	138.207	-2231.95
157	290	0.128189	138.224	-2194.78
158	292	0.138305	138.243	-2154.39
159	299	0.1459	138.264	-2110.77
160	299	0.156042	138.288	-2064.11

161	299	0.163659	138.315	-2015.18
162	300	0.173829	138.345	-1963.03
163	300	0.181468	138.378	-1908.59
164	301	0.191671	138.415	-1850.89
165	304	0.199336	138.455	-1790.3
166	305	0.209575	138.499	-1726.38
167	306	0.217267	138.546	-1659.89
168	306	0.227545	138.598	-1590.26
169	310	0.235269	138.653	-1517.33
170	316	0.24559	138.713	-1439.72
171	320	0.253347	138.777	-1358.65
172	320	0.263715	138.847	-1274.26
173	330	0.27411	138.922	-1183.81
174	332	0.281926	139.002	-1090.21
175	340	0.292375	139.087	-990.801
176	350	0.300232	139.177	-885.72
177	350	0.310738	139.274	-776.961
178	360	0.318639	139.375	-662.251
179	373	0.329206	139.484	-539.457
180	375	0.337155	139.597	-413.024
181	375	0.347787	139.718	-282.604
182	388	0.355788	139.845	-144.558
183	390	0.36649	139.979	-1.62707
184	390	0.374544	140.12	144.445
185	394	0.385321	140.268	296.261
186	408	0.393433	140.423	456.782
187	409	0.40429	140.586	622.136
188	410	0.412463	140.756	791.246
189	420	0.423405	140.936	969.076
190	420	0.431644	141.122	1150.37
191	420	0.442676	141.318	1336.29
192	425	0.450985	141.521	1527.96
193	425	0.462114	141.735	1724.36
194	426	0.470498	141.956	1924.79
195	430	0.481728	142.188	2131.93
196	434	0.490189	142.429	2344.67
197	444	0.501527	142.68	2567.35
198	450	0.510074	142.94	2796.89
199	451	0.521527	143.212	3032.1
200	460	0.530162	143.493	3275.97
201	467	0.541736	143.787	3528.96
202	468	0.550465	144.09	3786.58
203	470	0.56217	144.406	4050.8
204	475	0.570999	144.732	4322.02
205	475	0.582841	145.072	4598.87
206	500	0.591776	145.422	4894.76
207	500	0.603765	145.786	5196.64
208	516	0.612813	146.162	5512.85
209	517	0.624956	146.552	5835.96
210	558	0.634124	146.955	6189.8
211	750	0.646431	147.372	6674.62
212	880	0.655726	147.802	7251.66
213	1500	0.668209	148.249	8253.97
214	1550	0.677639	148.708	9304.31
215	1700	0.690309	149.185	10477.8
216	1897	0.699883	149.674	11805.5
217	1900	0.712751	150.182	13159.7

218	2000	0.722479	150.704	14604.7
219	2000	0.735557	151.245	16075.8
220	2133	0.745449	151.801	17665.9
221	2150	0.758753	152.377	19297.2
222	2200	0.768821	152.968	20988.6
223	2300	0.782366	153.58	22788
224	2350	0.792618	154.208	24650.7
225	2360	0.806422	154.859	26553.8
226	2367	0.816874	155.526	28487.4
227	2400	0.830953	156.216	30481.7
228	2400	0.841621	156.925	32501.6
229	2460	0.855996	157.657	34607.3
230	2500	0.87055	158.415	36783.7
231	2500	0.881587	159.193	38987.6
232	2500	0.896473	159.996	41228.8
233	2510	0.907769	160.82	43507.3
234	2520	0.923014	161.672	45833.3
235	2550	0.93459	162.546	48216.5
236	2620	0.950222	163.449	50706.1
237	2630	0.9621	164.374	53236.4
238	2650	0.97815	165.331	55828.5
239	2650	0.990356	166.312	58453
240	2650	1.00687	167.326	61121.2
241	2700	1.01943	168.365	63873.6
242	2700	1.03643	169.439	66672
243	2700	1.04939	170.54	69505.3
244	2700	1.06694	171.679	72386.1
245	2750	1.08032	172.846	75356.9
246	2767	1.09847	174.052	78396.4
247	2790	1.11232	175.29	81499.8
248	2900	1.13113	176.569	84780.1
249	2900	1.1455	177.881	88102
250	2900	1.16505	179.239	91480.7
251	2933	1.18	180.631	94941.6
252	2940	1.20036	182.072	98470.7
253	2950	1.21596	183.55	102058
254	2950	1.23724	185.081	105708
255	2967	1.25357	186.653	109427
256	3000	1.27588	188.28	113255
257	3000	1.29303	189.952	117134
258	3050	1.31652	191.686	121149
259	3050	1.33462	193.467	125220
260	3050	1.35946	195.315	129366
261	3100	1.37866	197.216	133640
262	3150	1.40507	199.19	138066
263	3200	1.42554	201.222	142628
264	3200	1.4538	203.336	147280
265	3200	1.47579	205.514	152002
266	3240	1.50626	207.782	156883
267	3250	1.53007	210.123	161855
268	3267	1.56322	212.567	166962
269	3300	1.58927	215.093	172207
270	3400	1.62576	217.736	177734
271	3400	1.65463	220.474	183360
272	3460	1.6954	223.348	189226
273	3600	1.72793	226.334	195447
274	3600	1.77438	229.482	201835



275	3630	1.81191	232.765	208412
276	3650	1.86629	236.248	215224
277	3680	1.91103	239.9	222256
278	3800	1.97737	243.81	229770
279	3870	2.03352	247.946	237640
280	3890	2.12007	252.44	245887
281	4000	2.19728	257.268	254676
282	4010	2.32634	262.68	264005
283	4300	2.45727	268.718	274571

---

Sample Standard Deviation = 1232.97

Numerator = 7.53894e+010

Denominator = 1.15609e+011 = 283 268.718

W Statistic = 0.652109

5% Critical value of 0.976 exceeds 0.652109

Evidence of non-normality at 95% level of significance

1% Critical value of 0.967 exceeds 0.652109

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 2.8169%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 72

Maximum Background Concentration = 880

Confidence Level = 94.7%

False Positive Rate = 5.3%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#93-2	11/21/2019	1	12.4	FALSE
MW#93-3	11/21/2019	1	4010	TRUE
MW#03-1	11/21/2019	1	184	FALSE
MW#03-2	11/21/2019	1	394	FALSE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 11.2676%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 71

Maximum Baseline Concentration = 130

Confidence Level = 98.6%

False Positive Rate = 1.4%

---

Baseline Samples	Date	Result
	12/15/1994	ND<10
	3/14/1995	ND<10
	6/21/1995	10
	12/14/1995	ND<10
	3/6/1996	10
	4/25/1996	ND<10
	10/2/1996	11
	12/10/1996	10
	3/11/1997	12
	4/15/1997	15
	8/14/1997	11
	12/4/1997	8
	3/31/1998	45
	6/23/1998	4
	8/11/1998	9
	12/8/1998	2
	3/9/1999	ND<10
	6/8/1999	3
	8/19/1999	ND<10
	12/14/1999	ND<10
	3/7/2000	13
	6/23/2000	14
	12/12/2000	7
	3/27/2001	3
	6/28/2001	ND<10
	9/10/2001	20
	12/18/2001	19
	3/19/2002	8
	6/26/2002	8
	9/18/2002	8
	12/11/2002	6
	3/13/2003	18
	6/25/2003	13
	9/26/2003	16
	12/10/2003	34
	3/9/2004	130
	6/24/2004	24
	9/15/2004	17
	12/15/2004	26
	3/16/2005	29
	6/15/2005	26

9/21/2005	19
12/21/2005	23
3/15/2006	19
6/21/2006	21
12/20/2006	42
6/12/2007	3
12/17/2007	28
6/11/2008	27
12/3/2008	11
6/17/2009	16
12/9/2009	12
6/17/2010	45
12/22/2010	25.8
6/29/2011	34.2
12/7/2011	37.4
6/6/2012	38.3
12/12/2012	25.8
6/19/2013	61.6
12/11/2013	26.5
6/11/2014	56.2
12/3/2014	36
6/17/2015	109
12/1/2015	81
6/22/2016	58.5
12/20/2016	66.6
6/6/2017	18.2
11/7/2017	80.3
2/27/2018	64.2
9/27/2018	75.8
5/7/2019	105

---

<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
11/21/2019	1	4010	TRUE

## Concentrations (mg/L)

### Parameter: Thallium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 45

Total Non-Detect: 45

Percent Non-Detects: 100%

Total Background Samples: 9

There is 1 background well

---

Well	Samples	ND	Date	Result	Original
MW#93-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

---

There are 4 compliance wells

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Well	Samples	ND	Date	Result	Original
MW#03-1	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			3/26/2019	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

---

MW#03-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

---

MW#93-2	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

---

MW#93-3	9	9 (100%)	5/24/2018	ND<0.01	ND<0.01
			6/19/2018	ND<0.01	ND<0.01
			7/19/2018	ND<0.01	ND<0.01
			8/22/2018	ND<0.01	ND<0.01
			9/19/2018	ND<0.01	ND<0.01
			10/18/2018	ND<0.01	ND<0.01
			11/20/2018	ND<0.01	ND<0.01
			12/20/2018	ND<0.01	ND<0.01
			11/21/2019	ND<0.001	ND<0.001

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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## Levene's Test for Equal of Variance

### Parameter: Thallium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 0.00177778

Overall Std Dev = 0.00222475

Overall Total = 0.08

SS Wells = -1.89735e-019

SS Total = 0.000217778

---

## ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	-1.89735e-019	4	-4.74338e-020	-8.71234e-015
Error (within wells)	0.000217778	40	5.44444e-006	
Totals	0.000217778	44		

-8.71234e-015 does not exceed 2.60597 indicating equal variance

---

### Well: MW#93-1

Sample	Residual
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
9/19/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
11/21/2019	0.008

### Well: MW#03-1

Sample	Residual
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
3/26/2019	0.001
11/21/2019	0.008

### Well: MW#03-2

Sample	Residual
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
9/19/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
11/21/2019	0.008

**Well: MW#93-2**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
9/19/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
11/21/2019	0.008

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
5/24/2018	0.001
6/19/2018	0.001
7/19/2018	0.001
8/22/2018	0.001
9/19/2018	0.001
10/18/2018	0.001
11/20/2018	0.001
12/20/2018	0.001
11/21/2019	0.008



# Shapiro-Wilks Test of Normality

Parameter: Thallium

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 22; Samples = 45

<b>i</b>	<b>x(i)</b>	<b>x(n-i+1)</b>	<b>x(n-1+1)-x(i)a(n-i+1)</b>		<b>b(i)</b>
1	0.001	0.01	0.009	0.385	0.003465
2	0.001	0.01	0.009	0.2651	0.0023859
3	0.001	0.01	0.009	0.2313	0.0020817
4	0.001	0.01	0.009	0.2065	0.0018585
5	0.001	0.01	0.009	0.1865	0.0016785
6	0.01	0.01	0	0.1695	0
7	0.01	0.01	0	0.1545	0
8	0.01	0.01	0	0.141	0
9	0.01	0.01	0	0.1286	0
10	0.01	0.01	0	0.1173	0
11	0.01	0.01	0	0.1062	0
12	0.01	0.01	0	0.0959	0
13	0.01	0.01	0	0.086	0
14	0.01	0.01	0	0.0775	0
15	0.01	0.01	0	0.0673	0
16	0.01	0.01	0	0.0584	0
17	0.01	0.01	0	0.0497	0
18	0.01	0.01	0	0.0412	0
19	0.01	0.01	0	0.0328	0
20	0.01	0.01	0	0.0245	0
21	0.01	0.01	0	0.0163	0
22	0.01	0.01	0	0.0081	0
23	0.01	0.01	0		
24	0.01	0.01	0		
25	0.01	0.01	0		
26	0.01	0.01	0		
27	0.01	0.01	0		
28	0.01	0.01	0		
29	0.01	0.01	0		
30	0.01	0.01	0		
31	0.01	0.01	0		
32	0.01	0.01	0		
33	0.01	0.01	0		
34	0.01	0.01	0		
35	0.01	0.01	0		
36	0.01	0.01	0		
37	0.01	0.01	0		
38	0.01	0.01	0		
39	0.01	0.01	0		
40	0.01	0.01	0		
41	0.01	0.001	-0.009		
42	0.01	0.001	-0.009		
43	0.01	0.001	-0.009		
44	0.01	0.001	-0.009		
45	0.01	0.001	-0.009		

---

Sum of b values = 0.0114696

Sample Standard Deviation = 0.00286039

W Statistic = 0.365421

5% Critical value of 0.945 exceeds 0.365421

Evidence of non-normality at 95% level of significance

1% Critical value of 0.926 exceeds 0.365421

Evidence of non-normality at 99% level of significance

# Non-Parametric Prediction Interval

## Inter-Well Comparison

### Parameter: Thallium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 100%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 9

Maximum Background Concentration = 0.01

Confidence Level = 69.2%

False Positive Rate = 30.8%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#03-1	11/21/2019	1	0.001	FALSE
MW#03-2	11/21/2019	1	0.001	FALSE
MW#93-2	11/21/2019	1	0.001	FALSE
MW#93-3	11/21/2019	1	0.001	FALSE

---

## Concentrations (mg/L)

### Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Samples: 53

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Samples: 16

There is 1 background well

Well	Samples	ND	Date	Result	Original
MW#93-1	16	0 (0%)	6/6/2012	868	868
			12/12/2012	880	880
			6/19/2013	942	942
			12/11/2013	961	961
			6/11/2014	971	971
			12/3/2014	907	907
			6/17/2015	882	882
			12/1/2015	860	860
			6/22/2016	840	840
			12/20/2016	838	838
			6/6/2017	810	810
			11/7/2017	878	878
			2/27/2018	830	830
			9/27/2018	1050	1050
			5/7/2019	952	952
			11/21/2019	966	966

There are 4 compliance wells

Well	Samples	ND	Date	Result	Original
MW#93-2	16	0 (0%)	6/6/2012	7530	7530
			12/12/2012	7920	7920
			6/19/2013	7280	7280
			12/11/2013	7440	7440
			6/11/2014	7160	7160
			12/3/2014	7700	7700
			6/17/2015	730	730
			12/1/2015	7950	7950
			6/22/2016	3160	3160
			12/20/2016	8780	8780
			6/6/2017	7350	7350
			11/7/2017	7820	7820
			2/27/2018	7560	7560
			9/27/2018	8890	8890
			5/7/2019	8480	8480
			11/21/2019	8400	8400

MW#93-3	16	0 (0%)	6/6/2012	834	834
			12/12/2012	669	669
			6/19/2013	861	861
			12/11/2013	697	697
			6/11/2014	986	986
			12/3/2014	743	743

6/17/2015	911	911
12/1/2015	1050	1050
6/22/2016	1390	1390
12/20/2016	1189	1189
6/6/2017	780	780
11/7/2017	1250	1250
2/27/2018	1190	1190
9/27/2018	1420	1420
5/7/2019	1510	1510
11/21/2019	1550	1550

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MW#03-2	3	0 (0%)	9/27/2018	1630	1630
			5/7/2019	1240	1240
			11/21/2019	1760	1760

---

MW#03-1	2	0 (0%)	5/7/2019	102	102
			11/21/2019	80	80

---

There are 0 unused wells

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<b>Well</b>	<b>Samples</b>	<b>ND</b>	<b>Date</b>	<b>Result</b>	<b>Original</b>
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# Levene's Test for Equal of Variance

## Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Overall Mean = 497.175

Overall Std Dev = 1047.24

Overall Total = 26350.3

SS Wells = 1.50478e+007

SS Total = 5.70292e+007

---

### ANOVA Table

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	1.50478e+007	4	3.76195e+006	4.30128
Error (within wells)	4.19813e+007	48	874611	
Totals	5.70292e+007	52		

4.30128 exceeds 2.52521; assumption of equal variance should be rejected

---

#### Well: MW#93-1

Sample	Residual
6/6/2012	34.1875
12/12/2012	22.1875
6/19/2013	39.8125
12/11/2013	58.8125
6/11/2014	68.8125
12/3/2014	4.8125
6/17/2015	20.1875
12/1/2015	42.1875
6/22/2016	62.1875
12/20/2016	64.1875
6/6/2017	92.1875
11/7/2017	24.1875
2/27/2018	72.1875
9/27/2018	147.813
5/7/2019	49.8125
11/21/2019	63.8125

#### Well: MW#93-2

Sample	Residual
6/6/2012	395.625
12/12/2012	785.625
6/19/2013	145.625
12/11/2013	305.625
6/11/2014	25.625
12/3/2014	565.625
6/17/2015	6404.38
12/1/2015	815.625
6/22/2016	3974.38
12/20/2016	1645.63
6/6/2017	215.625
11/7/2017	685.625
2/27/2018	425.625
9/27/2018	1755.63

5/7/2019	1345.63
11/21/2019	1265.63

**Well: MW#93-3**

<b>Sample</b>	<b>Residual</b>
6/6/2012	230.375
12/12/2012	395.375
6/19/2013	203.375
12/11/2013	367.375
6/11/2014	78.375
12/3/2014	321.375
6/17/2015	153.375
12/1/2015	14.375
6/22/2016	325.625
12/20/2016	124.625
6/6/2017	284.375
11/7/2017	185.625
2/27/2018	125.625
9/27/2018	355.625
5/7/2019	445.625
11/21/2019	485.625

**Well: MW#03-2**

<b>Sample</b>	<b>Residual</b>
9/27/2018	86.6667
5/7/2019	303.333
11/21/2019	216.667

**Well: MW#03-1**

<b>Sample</b>	<b>Residual</b>
5/7/2019	11
11/21/2019	11

# Shapiro-Francia Test of Normality

Parameter: Total Dissolved Solids

All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Sample Size = 53

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
0	0	0	0	0
1	80	-2.09693	4.39712	-167.754
2	102	-1.78661	7.5891	-349.989
3	669	-1.59819	10.1433	-1419.18
4	697	-1.44663	12.2361	-2427.48
5	730	-1.32854	14.0011	-3397.32
6	743	-1.22123	15.4925	-4304.69
7	780	-1.13113	16.7719	-5186.97
8	810	-1.04505	17.8641	-6033.46
9	830	-0.970094	18.8052	-6838.64
10	834	-0.896473	19.6088	-7586.3
11	838	-0.830953	20.2993	-8282.64
12	840	-0.765456	20.8852	-8925.62
13	860	-0.706302	21.3841	-9533.04
14	861	-0.646431	21.802	-10089.6
15	868	-0.591776	22.1522	-10603.3
16	878	-0.53594	22.4394	-11073.8
17	880	-0.484544	22.6742	-11500.2
18	882	-0.431644	22.8605	-11880.9
19	907	-0.382622	23.0069	-12228
20	911	-0.331854	23.117	-12530.3
21	942	-0.284535	23.198	-12798.3
22	952	-0.235269	23.2533	-13022.3
23	961	-0.189118	23.2891	-13204.1
24	966	-0.140835	23.3089	-13340.1
25	971	-0.0953969	23.318	-13432.7
26	986	-0.0476439	23.3203	-13479.7
27	1050	0	23.3203	-13479.7
28	1050	0.0476439	23.3226	-13429.7
29	1189	0.0953969	23.3317	-13316.3
30	1190	0.140835	23.3515	-13148.7
31	1240	0.189118	23.3873	-12914.2
32	1250	0.235269	23.4426	-12620.1
33	1390	0.284535	23.5236	-12224.6
34	1420	0.331854	23.6337	-11753.3
35	1510	0.382622	23.7801	-11175.6
36	1550	0.431644	23.9664	-10506.5
37	1630	0.484544	24.2012	-9716.72
38	1760	0.53594	24.4884	-8773.46
39	3160	0.591776	24.8386	-6903.45
40	7160	0.646431	25.2565	-2275
41	7280	0.706302	25.7554	2866.88
42	7350	0.765456	26.3413	8492.98
43	7440	0.830953	27.0318	14675.3
44	7530	0.896473	27.8354	21425.7
45	7560	0.970094	28.7765	28759.6
46	7700	1.04505	29.8687	36806.5



47	7820	1.13113	31.1481	45652
48	7920	1.22123	32.6395	55324.1
49	7950	1.32854	34.4045	65886
50	8400	1.44663	36.4973	78037.7
51	8480	1.59819	39.0515	91590.4
52	8780	1.78661	42.2435	107277

---

Sample Standard Deviation = 3088.07

Numerator = 1.15083e+010

Denominator = 2.09478e+010 = 52 42.2435

W Statistic = 0.549382

5% Critical value of 0.957 exceeds 0.549382

Evidence of non-normality at 95% level of significance

1% Critical value of 0.938 exceeds 0.549382

Evidence of non-normality at 99% level of significance

## Non-Parametric Prediction Interval

### Inter-Well Comparison

#### Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Number of comparisons = 4

Future Samples (k) = 4

Recent Dates = 1

Background Samples (n) = 16

Maximum Background Concentration = 1050

Confidence Level = 80%

False Positive Rate = 20%

---

<b>Well</b>	<b>Date</b>	<b>Samples</b>	<b>Mean</b>	<b>Impacted</b>
MW#93-2	11/21/2019	1	8400	TRUE
MW#93-3	11/21/2019	1	1550	TRUE
MW#03-2	11/21/2019	1	1760	TRUE
MW#03-1	11/21/2019	1	80	FALSE

---

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-2

#### Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 15

Maximum Baseline Concentration = 8890

Confidence Level = 93.8%

False Positive Rate = 6.2%

---

Baseline Samples	Date	Result
	6/6/2012	7530
	12/12/2012	7920
	6/19/2013	7280
	12/11/2013	7440
	6/11/2014	7160
	12/3/2014	7700
	6/17/2015	730
	12/1/2015	7950
	6/22/2016	3160
	12/20/2016	8780
	6/6/2017	7350
	11/7/2017	7820
	2/27/2018	7560
	9/27/2018	8890
	5/7/2019	8480

---

Date	Samples	Mean	Impacted
11/21/2019	1	8400	FALSE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#93-3

#### Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 15

Maximum Baseline Concentration = 1510

Confidence Level = 93.8%

False Positive Rate = 6.2%

---

Baseline Samples	Date	Result
	6/6/2012	834
	12/12/2012	669
	6/19/2013	861
	12/11/2013	697
	6/11/2014	986
	12/3/2014	743
	6/17/2015	911
	12/1/2015	1050
	6/22/2016	1390
	12/20/2016	1189
	6/6/2017	780
	11/7/2017	1250
	2/27/2018	1190
	9/27/2018	1420
	5/7/2019	1510

---

Date	Samples	Mean	Impacted
11/21/2019	1	1550	TRUE

## Non-Parametric Prediction Interval

### Intra-Well Comparison for MW#03-2

#### Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Future Samples (k) = 1

Recent Dates = 1

Baseline Samples (n) = 2

Maximum Baseline Concentration = 1630

Confidence Level = 66.7%

False Positive Rate = 33.3%

---

Baseline Samples	Date	Result
	9/27/2018	1630
	5/7/2019	1240

---

Date	Samples	Mean	Impacted
11/21/2019	1	1760	TRUE