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September 23, 2019

Sent VIA E-MAIL AND OVERNIGHT DELIVERY

Mr. Ty L. Howard
Director
Division of Waste Management and Radiation Control
Utah Department of Environmental Quality
195 North 1950 West
P.O. Box 144880
Salt Lake City, UT 84114-4880

Re: Transmittal of Source Assessment Report for MW-25 White Mesa Mill Groundwater Discharge Permit UGW370004

Dear Mr. Howard:

Enclosed are two copies of Energy Fuels Resource (USA) Inc.'s ("EFRI's") Source Assessment Report ("SAR") for MW-25 at the White Mesa Mill. This SAR addresses the constituent that was identified as exceeding the GWCL in the 1st Quarter 2019 as described in the Division of Waste Management and Radiation Control ("DWMRC")-approved Q1 2019 Plan and Time Schedule. EFRI submitted the Plan and Time Schedule for MW-25 on May 13, 2019. DWMRC approval of the Plan and Time Schedule was received by EFRI on June 26, 2019. Pursuant to the Plan and Time Schedule EFRI has prepared this SAR.

This transmittal also includes two CDs each containing a word searchable electronic copy of the report.

If you should have any questions regarding this report please contact me.

Yours very truly,

Kathy Weinel

ENERGY FUELS RESOURCES (USA) INC.
Kathy Weinel
Quality Assurance Manager

CC: David C. Frydenlund
Paul Goranson
Terry Slade
Logan Shumway
Scott Bakken

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SOURCE ASSESSMENT REPORT FOR CADMIUM IN MW-25 WHITE MESA URANIUM MILL

Blanding, Utah

Prepared for:

Energy Fuels Resources (USA) Inc.
225 Union Boulevard, Suite 600
Lakewood, Colorado 80228

Prepared by:

INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

6000 Uptown Boulevard NE, Suite 220
Albuquerque, New Mexico 87110

September 23, 2019

SOURCE ASSESSMENT REPORT FOR CADMIUM IN MW-25 WHITE MESA URANIUM MILL

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Prepared for:

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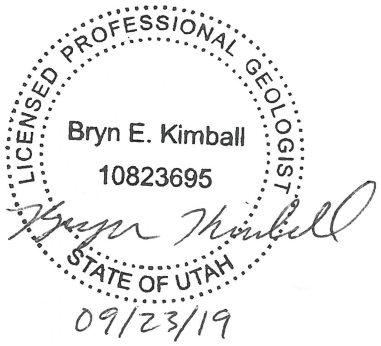

Bryn E. Kimball, PG
Utah Registration Number 10823695-2250
Expires 03/31/2021

September 23, 2019

EXECUTIVE SUMMARY

This Source Assessment Report ("SAR") is an assessment of the sources, extent, and potential dispersion of cadmium in monitoring well MW-25 at the White Mesa Mill ("the Mill") as required under State of Utah Groundwater Discharge Permit UGW370004 (the "GWDP"), Part I.G.4 relating to violations of Part I.G.2 of the GWDP. Cadmium in MW-25 has exhibited exceedances of the applicable Groundwater Compliance Limits ("GWCLs").

Groundwater at the Mill site has been evaluated in multiple recent investigations and reports, including the Revised Background Groundwater Quality Report (INTERA, 2007a), the New Wells Background Report (INTERA, 2008), the pH Report (INTERA, 2012b), an isotopic investigation (Hurst and Solomon, 2008), a Pyrite Report (HGC, 2012), and multiple SARs.

Since the time of the New Wells Background Report (INTERA, 2008), the behavior of constituents in MW-25 have not changed significantly. Cadmium concentrations continue to increase gradually. Uranium concentrations are significantly increasing; however, an increasing trend was observed at the time of the New Wells Background Report. There is no trend in chloride concentrations, and fluoride and sulfate are significantly decreasing , indicating that potential tailings seepage is not the source of exceedances of the cadmium GWCL. The exceedances of cadmium in MW-25 are likely due to both geochemical processes and analytical effects. Increased site-wide pyrite oxidation and an associated decrease in pH may be increasing the mobility of naturally occurring cadmium within the Burro Canyon Formation. In addition, the current GWCL for cadmium in MW-25 was based on the 10 data points available when it was originally calculated. This original GWCL now seems unrepresentative when considering the natural variability in cadmium concentrations apparent in the larger dataset that now exceeds 100 observations.

As the results of this analysis demonstrate, the behavior of cadmium concentrations in MW-25 have not changed significantly since the time of the New Wells Background Report. Cadmium concentrations exhibit a gradual, but statistically significant increasing trend. An increasing trend was also observed at the time of the New Wells Background Report, however the trend was not significant. The slope of the increasing cadmium trend for MW-25 is not as steep as that observed for MW-24 (INTERA, 2019), but in both cases, increasing cadmium concentrations most likely result from natural and site-wide influences. In accordance with the State of Utah Division of Waste Management and Radiation Control ("DWMRC")-approved Flowsheet (from INTERA, 2007a, included in this report as **Appendix E**), increasing trends may necessitate a modified approach for calculation of GWCLs. A modified approach for calculating a revised GWCL has been proposed and included in this analysis. The modified approach includes using the fraction of the groundwater quality standards under the Utah Administrative Code R317-6-4-4.6(B)(2) to

determine representative and appropriate GWCLs for trending constituents. Regular revisions to GWCLs for constituents in wells with significantly increasing trends over time due to background is consistent with the United States Environmental Protection Agency Unified Guidance (USEPA, 2009). Such revisions account for variability in larger datasets and minimize unwarranted out-of-compliance status.

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ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
CFCs	chlorofluorocarbons
CIR	Contaminant Investigation Report
Director	Director of the Division of Waste Management and Radiation Control
DWMRC	State of Utah Division of Waste Management and Radiation Control
EFRI	Energy Fuels Resources (USA) Incorporated
GWCL	Groundwater Compliance Limit
GWDP	State of Utah Ground Water Discharge Permit UGW370004
GWQS	Groundwater Quality Standard
INTERA	INTERA Incorporated
the Mill	White Mesa Uranium Mill, Blanding, Utah
OOC	out-of-compliance
SAR	Source Assessment Report
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Energy Fuels Resources (USA) Inc. ("EFRI") operates the White Mesa Uranium Mill (the "Mill"), located near Blanding, Utah (**Figure 1**). Groundwater at the Mill is regulated under the State of Utah Groundwater Discharge Permit UGW370004 (the "GWDP"). This is the Source Assessment Report ("SAR") required under Part I.G.4 of the GWDP relating to Part I.G.2 of the GWDP with respect to the cadmium in MW-25.

Part I.G.2 of the GWDP provides that an out-of-compliance ("OOC") status exists when the concentration of a constituent exceeds a groundwater compliance limit ("GWCL") in Table 2 of the GWDP in two consecutive samples from a compliance monitoring point. The GWDP was originally issued in March 2005, at which time GWCLs were set on an interim basis, based on fractions of State of Utah Ground Water Quality Standards ("GWQSs") or the equivalent, without reference to natural background at the Mill. The GWDP also required that EFRI prepare a background groundwater quality report to evaluate all historical data for the purposes of establishing background groundwater quality at the Mill and developing GWCLs under the GWDP. As required by then Part I.H.3 of the GWDP, EFRI submitted the following documents to the Director (the "Director")[1] of the State of Utah Division of Waste Management and Radiation Control ("DWMRC")[2] :

- A revised background groundwater quality report: the Existing Wells Background Report (INTERA, 2007a)
- A revised addendum: the Regional Background Report (INTERA, 2007b)
- A revised addendum: the New Wells Background Report (INTERA, 2008)

Based on a review of the Background Reports (the Existing Wells Background Report, the Regional Background Report, and the New Wells Background Reports [INTERA 2007a; 2007b; and 2008 respectively]) and other information and analyses, the Director re-opened the GWDP and modified the GWCLs to be equal to the mean concentration + 2 standard deviations or the equivalent. The modified GWCLs became effective on January 20, 2010. On January 19, 2018, and March 19, 2019, revised GWDPs were issued, which set the revised GWCLs as approved by the Director through SARs. The SARs for White Mesa Uranium Mill are summarized in **Table 1**.

[1] the Director was formerly the Executive Secretary of the Utah Radiation Control Board and the Co-Executive Secretary of the Utah Water Quality Board.

[2] Formerly referred to as the State of Utah Division of Radiation Control.

Table 1. White Mesa Uranium Mill SARs.

Plan and Time Schedule Date	Monitoring Periods Covered	DWMRC Plan and Time Schedule Approval Date	SAR Date	SAR Approval Date	Constituents
6/13/2011	Q1, Q2, Q3, Q4 of 2010, Q1 of 2011	7/12/2012	10/10/2012	4/25/2013	Multiple
9/7/2011	Q2 2011	7/12/2012	10/10/2012	4/25/2013	Multiple
4/13/2012	Multiple	7/12/2012	pH Report – 11/9/12; Pyrite Report – 12/7/12	4/25/2013	pH – multiple wells
12/13/2012	Q3 2012	2/4/2013	5/8/2013	7/23/2013	TDS – MW-29
3/15/2013	Q4 2012	5/30/2013	8/30/2013	9/17/2013	Selenium – MW-31
8/28/2013	Q1 2013	9/17/2013	12/17/2013	1/7/2014	Tetrahydrofuran – MW-01
9/20/2013	Q2 2013	10/16/2013	1/13/2014	3/10/2014	Gross Alpha – MW-32
12/5/2013	Q3 2013	12/18/2013	3/19/2014	6/5/2014	Sulfate – MW-01; TDS – MW-03A
12/4/2014	Q3 2014	1/8/2015	No SAR – OOC due to well damage	No SAR – OOC due to well damage	Uranium – MW-28
5/19/2015	Q1 2015	8/11/2015	12/9/15	2/19/2016	Selenium, Sulfate, TDS, pH – MW-31
9/10/2015	Q2 2015	11/10/2015	No SAR – install packer	No SAR – install packer	Cadmium, Zinc, Beryllium, Nickel – MW-03
12/3/2015	Q4 2015	4/4/2016	6/28/2016	12/20/2016	Sulfate – MW18, Fluoride, pH, Cadmium and Thallium – MW-24
3/10/2017	Q4 2016	5/23/2017	8/21/2017	3/20/2018	Selenium, Sulfate, TDS, and Uranium in MW-31
3/2/2018	Q4 2017	3/30/2018	6/28/2018	7/25/2018	Fluoride – MW-14
8/28/2018	Q2 2018	10/18/2018	1/19/2019	7/9/2019	Uranium, Selenium, pH – MW-30
12/5/2018	Q3 2018	3/5/2019	7/3/2019	--	Cadmium, Thallium, pH, Nickel, Beryllium – MW-24*
2/21/2019	Q4 2018	3/5/2019	7/3/2019	9/5/2019	Manganese – MW-11
5/19/2019	Q1 2019	6/26/2019	9/24/2019		Cadmium – MW-25

Notes:

* = Additional assessments required as stated in letter dated 9/5/19
TDS = total dissolved solids

On April 17, 2019, EFRI submitted an exceedance notice for the first quarter of 2019 to the Director under Part I.G.1(a) of the GWDP providing notice that the concentrations of specific constituents in the monitoring wells at the Mill exceeded their respective GWCLs for first quarter of 2019 and indicating which of those constituents had two consecutive exceedances. A plan and time schedule for cadmium in MW-25 was submitted on May 19, 2019. The plan and time schedule was approved by the DWMRC on June 26, 2019.

1.1 Source Assessment Report Organization

On behalf of EFRI, INTERA Incorporated ("INTERA") performed analyses of cadmium and indicator parameters in MW-25. A description of the approach used for analysis is provided in Section 2.0, and the results of the analysis are presented in Section 3.0. The calculation of a GWCL is discussed in Section 4.0, and conclusions and recommendations are reviewed in Section 5.0. Section 6.0 provides a list of references cited in this SAR.

The appendices comprise the analyses performed for this SAR and are organized in the following manner: **Appendix A** contains a table showing exceedances. **Appendix B** contains the statistical analysis performed on cadmium in MW-25. **Appendix C** contains the pH and indicator parameter analysis performed on MW-25. **Appendix D** contains a data plot for cadmium and indicator parameters in MW-25 using all available data to date compared to the data plot from the Background Reports (INTERA, 2007a, 2007b, 2008). **Appendix E** contains the Flowsheet that was developed based on the United States Environmental Protection Agency's ("USEPA") *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA, 2009), which was approved by DWMRC prior to completion of the Background Reports (INTERA, 2007a, 2007b, 2008). **Appendix F** is included on the compact disc that accompanies this SAR and contains the electronic input and output files used for statistical analysis.

Statistical analysis was performed using the R software package (v. 3.5.0). Input and output files included in **Appendix F** can be imported into either R or Statistica to recreate the results presented in this SAR.

1.2 Limitations Statement

This SAR presents the findings and interpretations of INTERA based on, and limited to, the conditions existing at the time of this SAR and the scope of services agreed upon between INTERA and EFRI. The calculations presented herein were completed using industry standard practices and were performed on data received from others. INTERA relies in good faith on information provided for this SAR, including analytical data, measurements, and previous investigations performed at the Mill site, but does not make any warranty, expressed or implied, that the information is accurate and complete.

2.0 CATEGORIES AND APPROACH FOR ANALYSIS

Generally, OOC constituents and wells can be grouped into five categories:

1. Constituents Potentially Impacted by Decreasing pH Trends Across the Site
2. Newly Installed Wells with Interim GWCLs
3. Constituents in Wells with Previously Identified Rising Trends
4. Pumping Wells
5. Other Constituents

This SAR addresses cadmium in MW-25, which falls into category one. Due to the limited number of data points available when the initial GWCL was calculated, cadmium also falls within the fifth category: Other Constituents.

2.1 Approach for Analysis

The first step in the analysis is to perform an assessment of the potential sources for the exceedances to determine whether they are due to background influences or Mill activities. If the exceedances are determined to be within natural variability or site-wide influences, then it is not necessary to perform any further evaluations on the extent and potential dispersion of the contamination or to perform an evaluation of potential remedial actions. Monitoring will continue and where appropriate revised GWCLs will be proposed to reflect changes in background conditions at the Mill site.

The analysis performed in this SAR considers all available data to evaluate the behavior of the constituent in the well. Analysis will help to determine if there have been any changes in the behavior of potential tailings system seepage indicator parameters (e.g., chloride, sulfate, fluoride, and uranium) since the date of the Background Reports (INTERA, 2007a, 2007b, 2008) that may suggest a change in the behavior of the groundwater in that well.

As discussed in the Background Reports (INTERA, 2007a, 2007b, 2008), indicator parameters of potential tailings system seepage include chloride, sulfate, fluoride, and uranium. Chloride is the best indicator of potential tailings system seepage; however, chloride is problematic as an indicator parameter for certain groundwater monitoring wells at the Mill site given the presence of the chloride plume (HGC, 2018). Sulfate and fluoride are useful indicator parameters when the geochemical conditions allow these constituents to behave conservatively (i.e., are non-reactive). Uranium can be a mobile metal; behavior ranges from conservative to non-conservative, depending on the geochemical conditions. Any potential seepage from the tailings system would be expected to exhibit increasing concentrations of chloride, sulfate, fluoride, and uranium, among other constituents. While uranium can be the most mobile of trace metals under certain conditions,

it is typically retarded behind chloride, fluoride, and sulfate due to possible sorption (see Section 3.3) and precipitation and would likely not show increasing concentrations in groundwater until sometime after chloride, fluoride, and sulfate concentrations had begun to increase (INTERA, 2007a). It is important to note, however, that while the absence of a rising trend in chloride concentration would indicate that there has been no impact from the tailings system, a rising trend in chloride concentration as well as in other indicator parameters could also be due to natural influences (see Section 12.0 of INTERA, 2007a).

The evaluation of SAR parameters and indicator parameters in MW-25 was supported by a statistical analysis that followed the process outlined in the Flowsheet (included in INTERA, 2007a), a copy of which is attached as **Appendix E**. The Flowsheet was designed based on USEPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA, 2009), and was approved by DWMRC prior to completion of the Background Reports (INTERA, 2007a, 2007b, 2008).

2.2 Approach for Setting Revised GWCLs

If the preceding approach results in the conclusion that the analysis in the Background Reports (INTERA, 2007a, 2007b, 2008) has not changed, or that the increasing concentrations of SAR parameters are due to natural variability in groundwater, or site-wide influences such as the oxidation of pyrite resulting in the site-wide decrease of pH, then a new GWCL may be proposed. In proposing revised GWCLs, INTERA has adopted the approach in the DWMRC-approved Flowsheet (**Appendix E**), including the last decision of the process that directs the analyst to consider a modified approach to determining a GWCL if an increasing trend is present.

2.3 University of Utah Study

At the request of the DWMRC, T. Grant Hurst and D. Kip Solomon of the Department of Geology and Geophysics of the University of Utah performed a groundwater study (the "University of Utah Study") at the Mill site in July 2007 (Hurst and Solomon, 2008). The purpose of this study was to characterize groundwater flow, chemical composition, noble gas composition, and water age to evaluate whether the increasing and elevated trace metal concentrations in monitoring wells at the Mill, all of which were identified in the Background Reports (INTERA, 2007a, 2007b, 2008), may indicate that potential seepage from the tailings system is occurring.

To evaluate sources of solute concentrations at the Mill, low-flow groundwater sampling was used as a method for collecting groundwater quality samples from 15 monitoring wells. In addition, surface water samples were collected from tailings cells 1, 3, and 4A, and two wildlife ponds. Passive diffusion samplers were also deployed and collected to characterize the dissolved gas composition of groundwater at different depths within the wells. Samples were collected and analyzed for the following constituents: tritium, nitrate, sulfate, deuterium and oxygen-18 of water,

sulfur-34 and oxygen-18 of sulfate, trace metals (uranium, manganese, and selenium), and chlorofluorocarbons ("CFCs").

Hurst and Solomon (2008, page iii) concluded generally that,

> *[t]he data show that groundwater at the Mill is largely older than 50 years, based on apparent recharge dates from chlorofluorocarbons and tritium concentrations. Wells exhibiting groundwater that has recharged within the last 50 years appears to be a result of recharge from wildlife ponds near the site. Stable isotope fingerprints do not suggest contamination of groundwater by tailings cell leakage, evidence that is corroborated by trace metal concentrations similar to historically-observed observations.*

Hurst and Solomon (2008) also concluded that,

> *[i]n general, the data collected in this study do not provide evidence that tailings cell leakage is leading to contamination of groundwater in the area around the White Mesa Mill. Evidence of old water in the majority of wells, and significantly different isotopic fingerprints between wells with the highest concentrations of trace metals and surface water sites, supports this conclusion.*

It should be further noted that subsequent to the University of Utah Study EFRI submitted the *Contaminant Investigation Report ["CIR"], White Mesa Uranium Mill Site, Blanding Utah*, dated December 30, 2009 (INTERA, 2009), in connection with the nitrate/chloride plume at the Mill site.

3.0 RESULTS OF ANALYSIS

This section describes the potential geochemical influences on groundwater in MW-25 and results of the analyses, summaries of which are provided in **Appendix B-1, Appendix C-1**, and **Appendix D**. Analyses of cadmium in MW-25 were performed as part of the flowsheet (see **Appendix B**). The analyses included a box plot to identify and omit extreme outliers, Shapiro-Wilk test for distribution, and Mann-Kendall trend tests (see **Appendices B-1**, and **B-7** through **B-10**).

3.1 Data Variability

The current GWCL for cadmium in MW-25 was calculated using only 10 data points that were available at the time of the New Wells Background Report. Since that time, over 100 data points for cadmium in MW-25 have become available. Although the mean of the initial data set and the complete data set are very similar (1.39 and 1.38 micrograms per liter [µg/L], respectively) a laboratory change in the fourth quarter of 2012 coincides with the appearance of greater variability in cadmium concentrations (**Appendix B-10**). This observed variation likely results from increased sampling frequency and more precise analytical methods and instrumentation.

As noted by DWMRC in a letter dated June 26, 2019, data collected after the laboratory change in fourth quarter of 2012 should be analyzed in accordance with EPA Unified Guidance to represent current conditions. Two datasets were analyzed in this SAR: the complete data set and a data subset starting in the fourth quarter of 2012. Although variation is observed beginning in 2012 (**Appendix B-10**), the two data sets are very similar. A summary of this analysis is presented in **Appendix B-1** and **Appendix B-4**.

3.2 Decreasing pH

Decreasing pH is one of the most important contributors to increasing concentrations of metals at the Mill site. A decreasing trend in pH is observed in MW-25, although the trend is not significant (**Appendix C-1**). A decreasing trend in pH has been observed in many groundwater monitoring wells across the Mill site, including upgradient and far downgradient monitoring wells (INTERA, 2012b). The Pyrite Report (HGC, 2012) attributes the decline in pH across the Mill site to the site-wide existence and oxidation of pyrite in the perched zone of the Burro Canyon aquifer. This report showed that pyrite is present in the Burro Canyon Formation based on boring logs, X-ray diffraction results, and concentrations of iron and total sulfur in bedrock samples from the Mill site (HGC, 2012).

Pyrite may oxidize according to the following reaction (Williamson and Rimstidt, 1994):

$$FeS_{2(s)} + 7/2O_{2(g)} + H_2O \rightarrow Fe^{2+}_{(aq)} + 2SO_4^{2-}{}_{(aq)} + 2H^+ \qquad \text{(reaction 1)}$$

Reaction 1 will increase hydrogen ion concentrations, which results in decreasing pH.

The likely causes for site-wide oxidation of pyrite include the following: (1) infiltration of oxidized water from the wildlife ponds upgradient of the Mill site; (2) rising water levels and incorporation of oxygen in air-filled pore spaces; (3) the introduction of oxygen during pumping related to treatment of the chloride and nitrate plumes; and (4) the introduction of oxygen during increased sampling of monitoring wells (INTERA, 2012b). Oxidation of pyrite and the resulting decrease in pH tends to cause subsequent pH-dependent reactions, some of which are described in more detail below.

3.3 Sorption

Another process that is likely to impact dissolved cadmium and other metals is sorption. Dissolved metals may be naturally attenuated by sorption, which refers to the processes by which solutes attach to solid surfaces (adsorption) and become incorporated into the bulk of a solid (absorption). The solid host is the sorbent, and the solute that sorbs is the sorbate. In most groundwater systems, minerals make up most of the sorbents. The sorption process can be reversed by a process known as desorption. Desorption remobilizes sorbates. In general, at lower pH (when dissolved hydrogen ion concentrations are high) mineral surfaces tend to have a slightly positive charge. With decreasing pH, positively charged dissolved metals are less attracted to mineral surfaces, and therefore are less attenuated by sorption. Different dissolved metals have variable affinities for sorption to different minerals.

As described in more detail in the SAR for MW-24 (INTERA, 2019), sorption of cadmium and other metals becomes more limited with decreasing pH. In addition, decreasing pH may lead to desorption of metals, which could cause increasing metal concentrations. Decreasing pH and associated desorption of metals could account for some of the observed increase in cadmium concentrations in MW-25.

3.4 Indicator Parameter Evaluation

A summary of statistical analysis of indicator parameters is included in **Appendix C-1**. **Appendix C-2** presents a descriptive statistics comparison for pH and indicator parameters from the New Wells Background Report (INTERA, 2008a), the 2012 SAR (INTERA, 2012a), and this SAR. Data used in the analysis and data removed prior to analysis are presented in **Appendices C-3** and **C-4**, respectively. The distribution and identification of outliers and extreme outliers in indicator parameter concentration datasets are demonstrated in the box plots included in **Appendix C-5**. Histograms and timeseries plots are included in **Appendix C-6** and **C-7**, respectively. Groundwater elevation is plotted against time in **Figure 2**.

Indicator parameters in MW-25 exhibit no trend (chloride), significant decreasing trends (fluoride and sulfate), and a significant increasing trend (uranium) (**Appendix C-1**). Uranium concentrations were increasing at the time of the New Wells Background Report, though not significantly (INTERA, 2008a). The slopes of the significantly trending indicator parameters are not steep and summary statics show that concentrations have not changed notably over time (**Appendices C-7** and **C-2**, respectively). The indicator parameter results suggest that MW-25 is unlikely to be impacted by potential tailings seepage.

3.5 Groundwater Elevation

Groundwater elevations in MW-25 are presented in **Figure 2**. Groundwater elevations have been decreasing since a peak in 2012. This change is likely a result of the removal of the wildlife ponds, which removed the source of natural recharge to the groundwater, and increased groundwater pumping related to the ongoing corrective action activities at the Mill site. The variations in groundwater elevation do not appear to be related to the observed behavior of cadmium, pH, or the indicator parameters in MW-25.

3.6 Cadmium

The cadmium dataset for MW-25 contains 108 data points at the time of this SAR. The current GWCL was calculated using only 10 data points. As mentioned above, variability in cadmium concentrations is visible after the laboratory change in fourth quarter of 2012. Descriptive statistics from three datasets are compared in **Appendix B-4**: (1) the New Wells Background Report dataset, (2) the complete dataset, and (3) post-fourth quarter of 2012 dataset. All datasets are normally or lognormally distributed and have very similar mean concentrations and standard deviations. The complete dataset exhibits a statistically significant increasing trend (**Appendix B-10**). This increasing trend was observed at the time of the New Wells Background Report (**Appendix D**), although it was not significant. As noted in Section 3.4, the overall stability of indicator parameter concentrations in MW-25 suggests that the source of increased cadmium is not due to potential tailings seepage.

A discussion of sources of naturally occurring cadmium and its behavior with decreasing pH is included in Section 3.4.2 of the SAR for MW-11 and MW-24 (INTERA, 2019). Like at MW-24, increased pyrite oxidation and an associated decrease in pH may cause increased dissolution of cadmium-bearing minerals in the Burro Canyon Formation and decreased attenuation of cadmium by sorption. These combined processes may contribute to the gradual, but significantly increasing trend of cadmium in MW-25. In addition to geochemical processes, cadmium exceedances likely result from additional data that capture the natural variability of cadmium concentrations in this well relative to the original GWCL based on 10 data points. Because cadmium concentrations are most likely due to natural variation and site-wide influences, a revised GWCL for cadmium is

proposed. The current GWCL is 1.5 µg/L. The proposed revised GWCL is 2.5 µg/L, which is the fractional approach under Utah Administrative Code R317-6-4-4.6(B)(2). The proposed revised GWCL was calculated by a modified approach in accordance with the DWMRC-approved Flowsheet due to the significantly increasing trend in the complete data set (**Appendix E**). A discussion of the modified approach for cadmium is included in Section 4.0.

4.0 CALCULATION OF GROUNDWATER COMPLIANCE LIMITS

The findings of analyses discussed above support the following conclusions: (1) exceedances of the cadmium GWCL for MW-25 are likely the result of natural variability and site-wide oxidation of pyrite resulting in decreases in pH; (2) concentrations of indicator parameters in MW-25 have not changed significantly since the time of the Background Report (INTERA, 2008), the University of Utah Study, or recent SARs; and (3) MW-25 is not being impacted by potential tailings system seepage. Therefore, a revised GWCL for cadmium in MW-25 is proposed.

According to the DWMRC-approved Flowsheet (**Appendix E**), if an increasing trend is present, a modified approach should be considered for determining GWCLs. Flowsheet analysis was performed on two data sets during this SAR. **Appendix B-1** presents the summary of those analyses for the complete data set and the post-2012 data set. Although there is more variability observed in the post-2012 data set, the flowsheet GWCL for that data set is only 0.01 µg/L greater than the current GWCL, and therefore not an ideal data set from which to calculate a revised GWCL. The complete data set, which is normally distributed and exhibits a significant increasing trend (**Appendix B-1**), is recommended for calculation of a revised GWCL for cadmium in MW-25. The Flowsheet (**Appendix E**) calculations along with the proposed GWCLs using a modified approach in accordance with the DWMRC-approved Flowsheet are presented in **Appendix B-1** and **Table 2**.

Table 2. Proposed Revised GWCL.

Well	Parameter	Current GWCL	Flowsheet Revised GWCL	Rationale	Proposed Modified Approach GWCL	Modified Approach Rationale
MW-25	Cadmium (µg/L)	1.5	1.6	Mean + 2 Standard Deviations	2.5	Fraction of GWQS

Notes:
µg/L= micrograms per liter

5.0 CONCLUSIONS AND RECOMMENDATIONS

The Mill site was recently thoroughly studied in the Background Reports (INTERA, 2007a, 2007b, 2008), in various SARs, and in the University of Utah Study (Hurst and Solomon, 2008). The Background Reports and the University of Utah Study concluded that groundwater at the Mill site has not been impacted by Mill operations. All of these studies also acknowledged that there are natural influences on the Mill site that have given rise to increasing trends and general variability of background groundwater at the Mill site.

The focus of this SAR was, therefore, to identify any changes in the circumstances identified in those studies. Evaluation of cadmium and indicator parameters in MW-25 was performed in accordance with the DWMRC-approved Flowsheet (**Appendix E**). The current GWCL was established using 10 data points. The current data set has over 100 data points and contains enough data to demonstrate natural variability of cadmium concentrations in MW-25. Cadmium in MW-25 exhibits a significantly increasing trend when considering the complete dataset. An increasing trend was also observed at the time of the New Wells Background Report (INTERA, 2008). pH in MW-25 is decreasing and the mobility of cadmium tends to increase as pH decreases. The indicator parameter chloride is exhibiting no trend and fluoride and sulfate are decreasing significantly. Uranium is significantly increasing and was identified as increasing at the time of the New Wells Background Report (INTERA, 2008). The slopes of significantly trending indicator parameters are not steep and summary statics show that concentrations have not changed notably over time (**Appendices C-7** and **C-2**, respectively). Due to relatively stable concentrations of indicator parameters in MW-25 since the New Well Background Report, the increasing trend in cadmium is most likely not related to potential tailings seepage. The exceedances of cadmium in MW-25 are likely due to both geochemical processes associated with pyrite oxidation and site-wide decreasing pH and analytical effects, which include more precise analytical methods and instrumentation, resulting in a larger dataset with greater variability. The slope of the increasing cadmium trend for MW-25 is not as steep as that observed for MW-24 (INTERA, 2019); however, in both cases, increasing cadmium concentrations could result from mobilization of natural sources of cadmium within the Burro Canyon Formation.

INTERA recommends adopting the proposed revised GWCL for MW-25 using a modified approach for trending constituents in accordance with the Flowsheet (**Appendix E**). Regular revisions to GWCLs is consistent with the USEPA Unified Guidance (USEPA, 2009). Such revisions account for variability in larger datasets and minimize unwarranted OOC status.

6.0 REFERENCES

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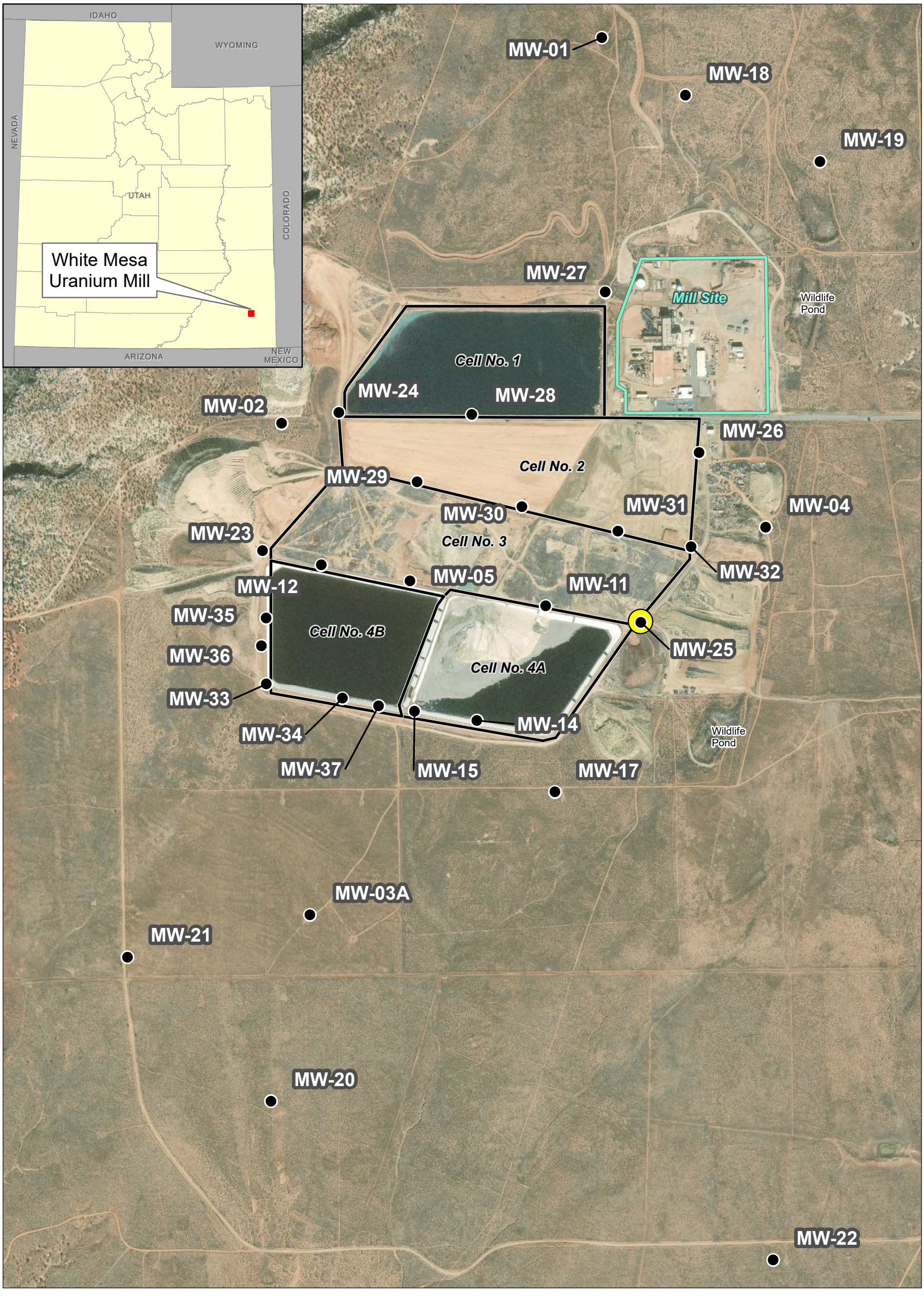
FIGURES



Source(s): Aerial – ESRI ArcGIS online;
Wells – HGC, Inc., May 2008 report.

Figure 1
Location of White Mesa Mill Site
and Groundwater Monitoring Wells
White Mesa Uranium Mill

S:\ABQ\IUC-001-01-001 Denison Mines\GIS\mapdocs\2018_SARs\01_LocationMap_rev3.mxd Date: 5/16/2019

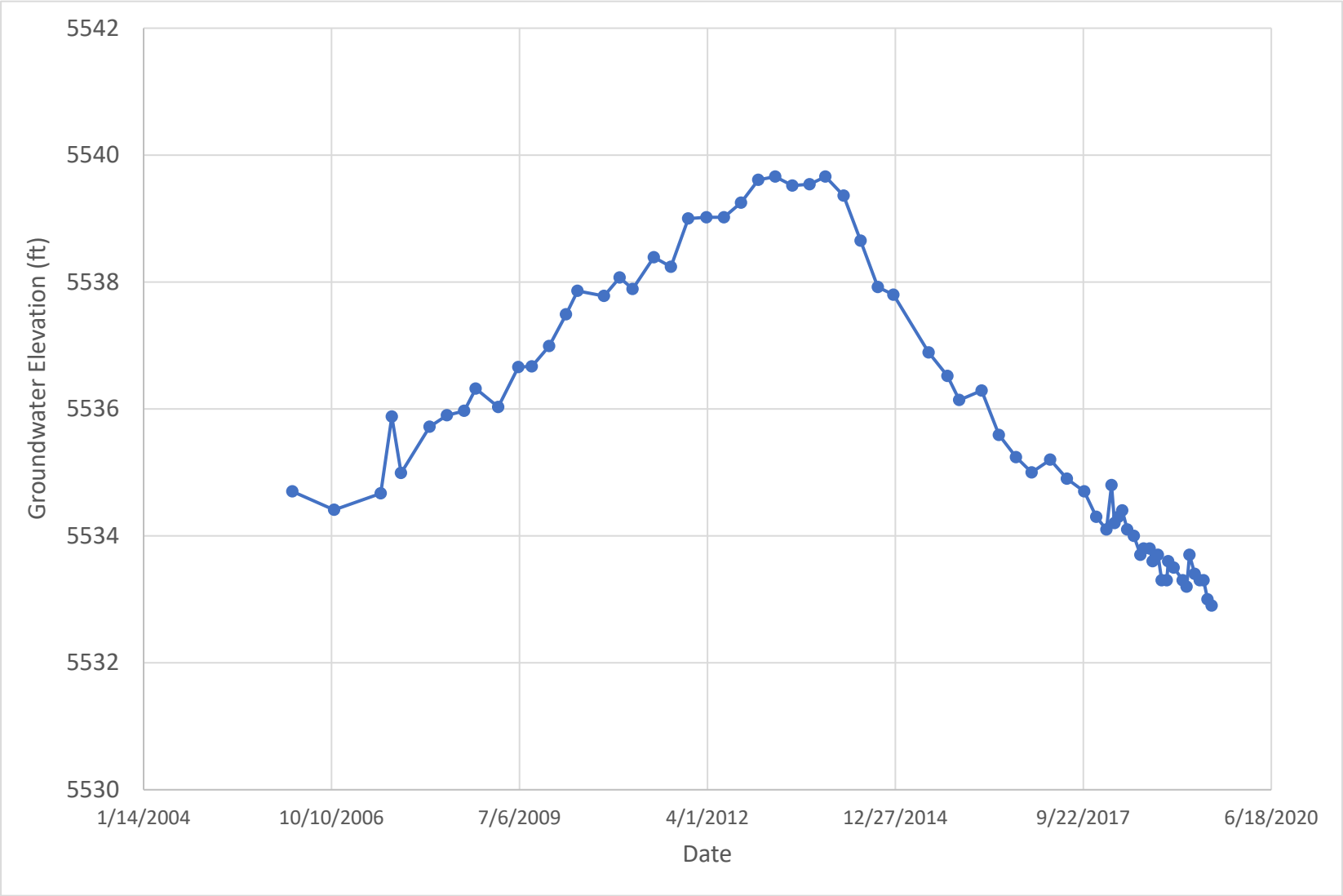


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Figure 2. Groundwater Elevation in MW-25
Source Assessment Report for MW-25
White Mesa Uranium Mill Blanding, Utah

APPENDIX A

GWCL Exceedances through Second Quarter 2019
Under the March 19, 2019 GWDP

APPENDIX A
GWCL Exceedances Through Second Quarter 2019 Under the March 19, 2019 GWDP

			Q1 2019 Results						Q2 2019 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in January 19, 2018 GWDP	Q1 2019 Sample Date	Q1 2019 Result	February 2019 Monthly Sample Date	February 2019 Monthly Result	March 2019 Monthly Sample Date	March 2019 Monthly Result	Q2 2019 Sample Date	Q2 2019 Result	May 2019 Monthly Sample Date	May 2019 Monthly Result	June 2019 Monthly Sample Date	June 2019 Monthly Result
Required Quarterly Sampling Wells														
MW-11 (Class II)	Manganese (ug/L)	164.67	1/15/2019	***181***	2/13/2019	***211***	3/6/2019	***170***	4/24/2019	***181***	5/7/2019	***210***	6/3/2019	***210***
MW-25 (Class III)	Cadmium (ug/L)	1.5	1/16/2019	1.32	2/12/2019	***1.52***	3/5/2019	***1.54***	4/10/2019	1.30	5/8/2019	1.41	6/4/2019	1.47
MW-26 (Class III)	Nitrate + Nitrite (as N) (mg/L)	0.62	1/17/2019	***2.21***	2/13/2019	***0.967***	3/6/2019	***3.22***	4/24/2019	***3.00***	5/7/2019	***0.986***	6/4/2019	***3.16***
	Chloroform (ug/L)	70		***1200***		***1300***		***1290***		***4140***		***1140***		***778***
	Chloride (mg/L)	58.31		***70.7***		57.2		***60.4***		***82.0***		***73.0***		***72.6***
	Methylene Chloride (ug/L)	5		3.24		1.91		1.45		4.16		1.69		<1.00
	Nitrogen, Ammonia as N	0.92		***0.938***		NA		NA		0.104		0.479		0.0919
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	1/16/2019	***17.9***	2/13/2019	***18.2***	3/6/2019	***16.2***	4/9/2019	***18.5***	5/7/2019	***17.9***	6/3/2019	***15.8***
	Chloride (mg/L)	128		***157***		***167***		***160***		***138***		***175***		***165***
	Selenium (ug/L)	47.2		***48.6***		NA		NA		***53.6***		47.1		***49.9***
	Uranium (ug/L)	8.32		***9.07***		***9.09***		***8.39***		***8.62***		8.15		***8.88***
	Field pH (S.U.)	6.47 - 8.5		6.60		***6.46***		6.97		7.06		7.00		7.12
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	1/15/2019	***19.0***	2/12/2019	***18.6***	3/5/2019	***18.5***	4/10/2019	***19.7***	5/7/2019	***18.9***	6/3/2019	***19.7***
	Chloride (mg/L)	143		***283***		***296***		***322***		***294***		***346***		***325***
MW - 36 (Class III)	Field pH (S.U.)	6.49 - 8.5	1/23/2019	***6.35***	NS	NA	NS	NA	4/18/2019	7.05	5/21/2019	6.73	6/3/2019	7.01
Required Semi-Annual Sampling Wells														
MW-05 (Class II)	Uranium (ug/L)	7.5	1/17/2019	0.557	NS	NA	NS	NA	4/24/2019	0.959	NS	NA	NS	NA
MW-12 (Class III)	Uranium (ug/L)	23.5	1/21/2019	***23.6***	NS	NA	NS	NA	4/25/2019	23.2	NS	NA	NS	NA
MW-24 (Class III)	Beryllium (ug/L)	2	1/23/2019	***3.37***	NS	NA	NS	NA	5/2/2019	***2.83***	NS	NA	NS	NA
	Cadmium (ug/L)	6.43		***8.34***		NA		NA		***8.24***		NA		NA
	Fluoride (mg/L)	0.47		NA		NA		NA		***0.839***		NA		NA
	Nickel (mg/L)	50		NA		NA		NA		***63.9***		NA		NA
	Thallium (ug/L)	2.01		***2.72***		NA		NA		***2.73***		NA		NA
	Field pH (S.U.)	5.03 - 8.5		***4.63***		NA		NA		***4.53***		NA		NA
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	1/21/2019	***6.40***	NS	NA	NS	NA	4/23/2019	***6.33***	NS	NA	NS	NA
	Chloride (mg/L)	38		31.0		NA		NA		32.0		NA		NA
MW-28 (Class III)	Chloride (mg/L)	105	1/22/2019	***127***	NS	NA	NS	NA	4/24/2019	***165***	NS	NA	NS	NA
	Cadmium (ug/L)	5.2		4.76		NA		NA		5.11		NA		NA
	Selenium (ug/L)	11.1		NA		NA		NA		***12.4***		NA		NA
	Gross Alpha (pCi/L)	2.42		NA		NA		NA		1.94		NA		NA
	Uranium (ug/L)	4.9		***7.12***		NA		NA		***9.60***		NA		NA
MW-32 (Class III)	Chloride (mg/L)	35.39	1/22/2019	***35.6***	NS	NA	NS	NA	4/9/2019	34.5	NS	NA	NS	NA
MW-35 (Class II)	Nitrogen, Ammonia as N	0.14	1/16/2019	0.100	NS	NA	NS	NA	4/18/2019	0.0634	NS	NA	NS	NA

Notes:

NS= Not Required and Not Sampled

NA= Not Applicable

Exceedances are shown in yellow

Pursuant to the DWMRC letter of May 22, 2019, this constituent will no longer be monitored on an accelerated schedule. This constituent will be dropped from this report after this quarter.

APPENDIX B

Geochemical Analysis for Cadmium in MW-25

APPENDIX B-1
Summary of Geochemical Analysis for Cadmium in MW-25

Well	Data Set	Constituent	Units	N	% Non-Detected Values	Mean	Standard Deviation (SD)	Shapiro-Wilk Test for Normality		Normally or Lognormally Distributed?	Mann Kendall Trend Analysis		Linear P	Significant Trend	Highest Historical Value (HHV)	Current GWCL	Flowsheet GWCL	Flowsheet GWCL Rationale	Proposed Modified Approach GWCL	Modified Approach GWCL Rationale[a]
								W	p		S	p								
MW-25	All	Cadmium	µg/L	108	0%	1.38	0.09	0.99	0.63	Normal	1029	3.2E-03	5.89E-03	Significant	1.6	1.5	1.6	Mean + 2 SD	2.50	Fractional Approach
MW-25	Oct 2012 to Present	Cadmium	µg/L	79	0%	1.39	0.09	0.98	0.29	Normal	165	0.24	0.63	Not Significant	1.6	1.5	1.6	Mean + 2 SD		

Notes:

%ND = percent of non-detected values
mg/L = milligrams per liter
µg/L = micrograms per liter
s.u. = standard units
N = number of valid data points
p = probability
W = Shapiro Wilk test value
S = Mann-Kendall statistic

Distribution = Distribution as determined by the Shapiro-Wilk distribution test for constituents with % Detect > 50% and N>8
Mean = The arithmatic mean as determined for normally or log-normally distributed constituents with % Detect > 50%
Standard Deviation = The standard deviation as determined for normally or log-normally distributed constituents with % Detect > 85%
Highest Historical Value = The highest observed value for constituents with % Detect < 50%

APPENDIX B-2
Comparison of Calculated and Measured TDS in MW-25

Well Number	Sample Date	Alkalinity (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Measured TDS (mg/L)	Calculated TDS (mg/L)	Ratio
MW-25	6/23/2005	392	358	34	128	9.1	282.0	1600	2860	2803	98%
MW-25	9/22/2005	403	376	34	135	9.6	285.0	1670	2890	2913	101%
MW-25	12/13/2005	396	386	33	139	10.0	290.0	1860	2850	3114	109%
MW-25	3/22/2006	406	370	32	132	9.7	291.0	1710	2850	2951	104%
MW-25	6/20/2006	409	378	32	138	10.2	284.0	1680	2850	2931	103%
MW-25	9/12/2006	398	385	30	135	10.8	287.0	1570	2800	2816	101%
MW-25	10/24/2006	405	400	33	138	10.0	295.0	1880	2740	3161	115%
MW-25	3/16/2007	390	386	32	135	10.1	289.0	1750	2970	2992	101%
MW-25	6/20/2007	403	395	31	140	9.9	269.0	1740	2900	2988	103%
MW-25	8/27/2007	412	390	33	136	9.5	274.0	1850	2810	3105	110%
MW-25	10/25/2007	410	392	32	115	10.1	272.0	1710	2750	2941	107%
MW-25	3/18/2008	415	353	32	120	9.8	306.0	1750	2710	2986	110%
MW-25	3/18/2008	413	345	31	117	9.5	298.0	1760	2630	2974	113%
MW-25	6/12/2008	381	383	25	130	9.5	306.0	1610	2770	2844	103%
MW-25	8/4/2008	400	391	28	134	10.0	310.0	1710	2700	2983	110%
MW-25	2/3/2009	392	331	31	116	8.4	255.0	1630	2750	2763	100%
MW-25	5/13/2009	399	333	30	116	8.5	279.0	1690	2710	2856	105%
MW-25	8/24/2009	418	361	30	121	9.9	310.0	1580	2740	2830	103%
MW-25	10/13/2009	412	352	34	116	9.8	296.0	1650	2690	2870	107%
MW-25	2/3/2010	432	351	31	116	9.5	300.0	1630	2670	2870	107%
MW-25	4/28/2010	424	368	31	122	9.7	317.0	1660	2780	2932	105%
MW-25	9/8/2010	435	367	31	125	9.6	306.0	1760	2790	3034	109%
MW-25	11/10/2010	413	354	31	116	9.3	277.0	1650	2800	2850	102%
MW-25	2/2/2011	405	358	30	119	9.3	298.0	1690	2720	2909	107%
MW-25	4/4/2011	408	354	31	117	9.7	310.0	1620	2900	2850	98%
MW-25	8/3/2011	382	367	32	123	9.8	310.0	1660	2830	2884	102%
MW-25	10/4/2011	387	354	32	120	9.2	276.0	1680	2700	2858	106%
MW-25	2/14/2012	404	371	30	123	9.6	314.0	1630	2770	2882	104%
MW-25	5/2/2012	410	351	30	118	11.9	269.0	1670	2850	2860	100%
MW-25	7/10/2012	396	321	33	117	9.3	290.0	1620	2780	2786	100%
MW-25	11/12/2012	400	358	29	122	9.4	296.0	1680	2750	2894	105%
MW-25	2/20/2013	398	364	36	120	10.5	301.0	1730	2770	2960	107%
MW-25	5/14/2013	425	367	28	124	9.2	323.0	1350	2880	2626	91%
MW-25	7/10/2013	427	346	28	113	10.0	278.0	1320	2840	2522	89%
MW-25	11/19/2013	437	324	29	110	9.6	276.0	1450	2900	2636	91%
MW-25	3/10/2014	394	349	32	124	9.6	298.0	1560	2810	2766	98%
MW-25	6/2/2014	393	336	31	125	8.9	298.0	1560	2820	2752	98%
MW-25	9/3/2014	438	319	30	120	9.4	283.0	1530	2640	2729	103%
MW-25	11/4/2014	447	331	30	112	9.4	272.0	1750	2670	2951	111%
MW-25	2/4/2015	394	339	31	120	10.0	291.0	1620	2760	2805	102%
MW-25	4/7/2015	415	343	31	116	9.6	310.0	1580	2760	2805	102%
MW-25	8/10/2015	422	365	37	120	10.3	300.0	1560	2660	2814	106%
MW-25	11/11/2015	397	361	30	118	9.0	283.0	1750	2570	2948	115%
MW-25	2/8/2016	398	359	32	122	9.5	302.0	1680	2760	2902	105%
MW-25	5/3/2016	399	350	31	122	10.0	307.0	1730	2580	2949	114%
MW-25	8/17/2016	398	342	32	119	10.2	291.0	1670	2590	2862	111%
MW-25	11/2/2016	406	342	33	116	10.5	293.0	1330	2650	2530	95%
MW-25	2/7/2017	376	325	31	114	11.1	308.0	1320	2480	2485	100%
MW-25	5/1/2017	388	333	31	113	9.7	292.0	1490	2660	2657	100%
MW-25	8/14/2017	395	334	33	109	9.4	304.0	1800	2470	2984	121%
MW-25	11/1/2017	399	342	31	121	9.4	292.0	1490	2600	2685	103%
MW-25	2/19/2018	404	350	31	122	10.3	292.0	1490	2610	2699	103%
MW-25	4/17/2018	395	354	34	120	10.2	294.0	1580	2860	2787	97%
MW-25	9/10/2018	410	359	34	122	9.4	305.0	1640	2640	2880	109%
MW-25	10/24/2018	376	392	30	132	10.2	323.0	1530	2480	2793	113%
MW-25	1/16/2019	403	365	31	126	10.2	317.0	1530	2510	2782	111%
MW-25	4/10/2019	390	364	30	115	9.6	283.0	1450	2520	2642	105%
MW-25	7/15/2019	400	398	34	136	10.6	313.0	1660	2630	2952	112%

Notes:
mg/L = milligrams per liter
TDS = total dissolved solids

APPENDIX B-3
Charge Balance Calculations for Major Cations and Anions in MW-25

Well	Sample Date	Calcium (meq/L)	Sodium (meq/L)	Magnesium (meq/L)	Potassium (meq/L)	Total Cation Charge (meq/L)	HCO_3 (meq/L)	Chloride (meq/L)	SO_4 (meq/L)	Total Anion Charge (meq/L)	Charge Balance Error
MW-25	6/23/2005	17.9	12.27	10.53	0.23	**40.89**	-6.42	-0.96	-33.31	**40.70**	0.24%
MW-25	9/22/2005	18.8	12.40	11.11	0.25	**42.51**	-6.60	-0.96	-34.77	**42.33**	0.21%
MW-25	12/13/2005	19.3	12.61	11.44	0.26	**43.57**	-6.49	-0.93	-38.73	**46.15**	-2.88%
MW-25	3/22/2006	18.5	12.35	10.86	0.25	**41.92**	-6.65	-0.90	-35.60	**43.16**	-1.45%
MW-25	6/20/2006	18.9	12.35	11.35	0.26	**42.83**	-6.70	-0.90	-34.98	**42.58**	0.29%
MW-25	9/12/2006	19.2	12.48	11.11	0.28	**43.08**	-6.52	-0.85	-32.69	**40.06**	3.63%
MW-25	10/24/2006	20.0	12.83	11.35	0.26	**44.40**	-6.64	-0.93	-39.14	**46.71**	-2.53%
MW-25	3/16/2007	19.3	12.57	11.11	0.26	**43.20**	-6.39	-0.90	-36.44	**43.73**	-0.61%
MW-25	6/20/2007	19.7	11.70	11.52	0.25	**43.18**	-6.60	-0.87	-36.23	**43.71**	-0.60%
MW-25	8/27/2007	19.5	11.92	11.19	0.24	**42.81**	-6.75	-0.93	-38.52	**46.20**	-3.81%
MW-25	10/25/2007	19.6	11.83	9.46	0.26	**41.11**	-6.72	-0.90	-35.60	**43.22**	-2.51%
MW-25	3/18/2008	17.6	13.31	9.87	0.25	**41.05**	-6.80	-0.90	-36.44	**44.14**	-3.63%
MW-25	3/18/2008	17.2	12.96	9.63	0.24	**40.05**	-6.77	-0.87	-36.64	**44.29**	-5.03%
MW-25	6/12/2008	19.1	13.31	10.70	0.24	**43.36**	-6.24	-0.71	-33.52	**40.47**	3.45%
MW-25	8/4/2008	19.5	13.48	11.02	0.26	**44.28**	-6.56	-0.79	-35.60	**42.95**	1.52%
MW-25	11/10/2008	19.1	13.96	10.61	0.25	**43.94**	-6.42	-0.85	-37.48	**44.75**	-0.91%
MW-25	2/3/2009	16.5	11.09	9.54	0.21	**37.37**	-6.42	-0.87	-33.94	**41.24**	-4.92%
MW-25	5/13/2009	16.6	12.14	9.54	0.22	**38.51**	-6.54	-0.85	-35.19	**42.57**	-5.00%
MW-25	8/24/2009	18.0	13.48	9.95	0.25	**41.71**	-6.85	-0.85	-32.90	**40.59**	1.35%
MW-25	10/13/2009	17.6	12.88	9.54	0.25	**40.23**	-6.75	-0.96	-34.35	**42.06**	-2.22%
MW-25	2/3/2010	17.5	13.05	9.54	0.24	**40.35**	-7.08	-0.87	-33.94	**41.89**	-1.87%
MW-25	4/28/2010	18.4	13.79	10.04	0.25	**42.44**	-6.95	-0.87	-34.56	**42.38**	0.06%
MW-25	9/8/2010	18.3	13.31	10.28	0.25	**42.15**	-7.13	-0.87	-36.64	**44.65**	-2.87%
MW-25	11/10/2010	17.7	12.05	9.54	0.24	**39.49**	-6.77	-0.87	-34.35	**42.00**	-3.07%
MW-25	2/2/2011	17.9	12.96	9.79	0.24	**40.85**	-6.64	-0.85	-35.19	**42.67**	-2.17%
MW-25	4/4/2011	17.7	13.48	9.63	0.25	**41.02**	-6.69	-0.87	-33.73	**41.29**	-0.32%
MW-25	8/30/2011	18.3	13.48	10.12	0.25	**42.17**	-6.26	-0.90	-34.56	**41.72**	0.53%
MW-25	10/4/2011	17.7	12.01	9.87	0.24	**39.78**	-6.34	-0.90	-34.98	**42.22**	-2.98%
MW-25	2/14/2012	18.5	13.66	10.12	0.25	**42.54**	-6.62	-0.85	-33.94	**41.40**	1.35%
MW-25	5/2/2012	17.5	11.70	9.71	0.30	**39.23**	-6.72	-0.85	-34.77	**42.34**	-3.81%
MW-25	7/10/2012	16.0	12.61	9.63	0.24	**38.50**	-6.49	-0.93	-33.73	**41.15**	-3.33%
MW-25	11/12/2012	17.9	12.88	10.04	0.24	**41.02**	-6.56	-0.81	-34.98	**42.35**	-1.59%
MW-25	2/20/2013	18.2	13.09	9.87	0.27	**41.40**	-6.52	-1.02	-36.02	**43.56**	-2.55%
MW-25	5/14/2013	18.3	14.05	10.20	0.24	**42.80**	-6.96	-0.79	-28.11	**35.87**	8.82%
MW-25	7/10/2013	17.3	12.09	9.30	0.26	**38.91**	-7.00	-0.79	-27.48	**35.27**	4.91%
MW-25	11/19/2013	16.2	12.01	9.05	0.25	**37.47**	-7.16	-0.82	-30.19	**38.17**	-0.93%
MW-25	3/10/2014	17.4	12.96	10.20	0.25	**40.82**	-6.46	-0.89	-30.19	**37.53**	4.20%
MW-25	6/2/2014	16.8	12.96	10.28	0.23	**40.24**	-6.44	-0.87	-32.48	**39.79**	0.56%
MW-25	9/3/2014	15.9	12.31	9.87	0.24	**38.34**	-7.18	-0.85	-32.48	**40.50**	-2.74%
MW-25	11/4/2014	16.5	11.83	9.21	0.24	**37.80**	-7.33	-0.83	-31.86	**40.02**	-2.84%
MW-25	2/4/2015	16.9	12.66	9.87	0.26	**39.70**	-6.46	-0.86	-36.44	**43.75**	-4.85%
MW-25	4/7/2015	17.1	13.48	9.54	0.25	**40.39**	-6.80	-0.88	-33.73	**41.41**	-1.24%

APPENDIX B-3
Charge Balance Calculations for Major Cations and Anions in MW-25

Well	Sample Date	Calcium (meq/L)	Sodium (meq/L)	Magnesium (meq/L)	Potassium (meq/L)	Total Cation Charge (meq/L)	HCO_3 (meq/L)	Chloride (meq/L)	SO_4 (meq/L)	Total Anion Charge (meq/L)	Charge Balance Error
MW-25	8/10/2015	18.2	13.05	9.87	0.26	**41.40**	-6.92	-1.04	-32.90	**40.85**	0.67%
MW-25	11/11/2015	18.0	12.31	9.71	0.23	**40.26**	-6.51	-0.84	-32.48	**39.83**	0.54%
MW-25	2/8/2016	17.9	13.14	10.04	0.24	**41.33**	-6.52	-0.89	-36.44	**43.85**	-2.96%
MW-25	5/3/2016	17.5	13.35	10.04	0.26	**41.11**	-6.54	-0.87	-34.98	**42.39**	-1.53%
MW-25	8/17/2016	17.1	12.66	9.79	0.26	**39.77**	-6.52	-0.91	-36.02	**43.45**	-4.42%
MW-25	11/2/2016	17.1	12.74	9.54	0.27	**39.62**	-6.65	-0.92	-34.77	**42.35**	-3.32%
MW-25	2/7/2017	16.2	13.40	9.38	0.28	**39.28**	-6.16	-0.86	-27.48	**34.51**	6.46%
MW-25	5/1/2017	16.6	12.70	9.30	0.25	**38.86**	-6.36	-0.87	-31.02	**38.26**	0.79%
MW-25	8/14/2017	16.7	13.22	8.97	0.24	**39.10**	-6.47	-0.92	-37.48	**44.87**	-6.88%
MW-25	11/1/2017	17.1	12.70	9.95	0.24	**39.96**	-6.54	-0.88	-31.02	**38.44**	1.94%
MW-25	2/19/2018	17.5	12.70	10.04	0.26	**40.47**	-6.62	-0.87	-31.02	**38.51**	2.48%
MW-25	4/17/2018	17.7	12.79	9.87	0.26	**40.59**	-6.47	-0.95	-32.90	**40.32**	0.33%
MW-25	9/10/2018	17.9	13.27	10.04	0.24	**41.46**	-6.72	-0.96	-34.15	**41.83**	-0.44%
MW-25	10/24/2018	19.6	14.05	10.86	0.26	**44.73**	-6.16	-0.85	-31.86	**38.87**	7.02%
MW-25	1/16/2019	18.2	13.79	10.37	0.26	**42.63**	-6.60	-0.87	-31.86	**39.33**	4.03%
MW-25	4/10/2019	18.2	12.31	9.46	0.25	**40.18**	-6.39	-0.85	-30.19	**37.43**	3.54%
MW-25	7/15/2019	19.9	13.61	11.19	0.27	**44.93**	-6.56	-0.97	-34.56	**42.08**	3.28%

Notes:

meq/L = milliequivalents per litre

APPENDIX B-4
Descriptive Statistics for Cadmium in MW-25

Well Number	Data Set	Analyte	Units	% Non-Detects	N	Distribution	Mean	Min. Conc.	Max. Conc.	Std. Dev.	Range	Geometric Mean	Skewness	Q25	Median	Q75
MW-25	**2008 Background Report**	Cadmium	µg/L	0	10	Normal or Lognormal	1.39	1.30	1.50	0.10	0.20	1.40	-0.40	1.40	1.40	1.40
MW-25	**2019 SAR- All**	Cadmium	µg/L	0	108	Normal	1.38	1.19	1.60	0.09	0.41	1.37	0.26	1.31	1.37	1.43
MW-25	**2019 SAR - 2012 to present**	Cadmium	µg/L	0	79	Normal	1.39	1.23	1.60	0.09	0.37	1.39	0.36	1.33	1.39	1.45

Notes

µg/L = micrograms per liter

APPENDIX B-5
MW-25 Data Used for Statistical Analysis

Well	Date Sampled	Parameter Name	Report Result	Report Units	Qualifer
MW-25	6/23/2005	Cadmium	1.30	µg/L	
MW-25	9/22/2005	Cadmium	1.36	µg/L	
MW-25	12/13/2005	Cadmium	1.34	µg/L	
MW-25	6/20/2006	Cadmium	1.45	µg/L	
MW-25	9/12/2006	Cadmium	1.46	µg/L	
MW-25	10/24/2006	Cadmium	1.36	µg/L	
MW-25	3/16/2007	Cadmium	1.44	µg/L	
MW-25	6/20/2007	Cadmium	1.39	µg/L	
MW-25	8/27/2007	Cadmium	1.44	µg/L	
MW-25	10/25/2007	Cadmium	1.37	µg/L	
MW-25	3/18/2008	Cadmium	1.23	µg/L	
MW-25	6/12/2008	Cadmium	1.19	µg/L	
MW-25	8/4/2008	Cadmium	1.27	µg/L	
MW-25	11/10/2008	Cadmium	1.20	µg/L	
MW-25	2/3/2009	Cadmium	1.37	µg/L	
MW-25	5/13/2009	Cadmium	1.24	µg/L	
MW-25	8/24/2009	Cadmium	1.34	µg/L	
MW-25	10/13/2009	Cadmium	1.32	µg/L	
MW-25	2/3/2010	Cadmium	1.26	µg/L	
MW-25	4/28/2010	Cadmium	1.44	µg/L	
MW-25	9/8/2010	Cadmium	1.40	µg/L	
MW-25	11/10/2010	Cadmium	1.26	µg/L	
MW-25	2/2/2011	Cadmium	1.34	µg/L	
MW-25	4/4/2011	Cadmium	1.27	µg/L	
MW-25	8/30/2011	Cadmium	1.19	µg/L	
MW-25	10/4/2011	Cadmium	1.27	µg/L	
MW-25	2/14/2012	Cadmium	1.31	µg/L	
MW-25	5/2/2012	Cadmium	1.33	µg/L	
MW-25	7/10/2012	Cadmium	1.24	µg/L	
MW-25	11/12/2012	Cadmium	1.56	µg/L	
MW-25	2/20/2013	Cadmium	1.35	µg/L	
MW-25	3/19/2013	Cadmium	1.40	µg/L	
MW-25	4/17/2013	Cadmium	1.36	µg/L	
MW-25	5/14/2013	Cadmium	1.52	µg/L	
MW-25	6/24/2013	Cadmium	1.31	µg/L	
MW-25	7/10/2013	Cadmium	1.41	µg/L	
MW-25	8/19/2013	Cadmium	1.57	µg/L	
MW-25	9/17/2013	Cadmium	1.31	µg/L	
MW-25	10/22/2013	Cadmium	1.50	µg/L	
MW-25	11/19/2013	Cadmium	1.35	µg/L	
MW-25	12/17/2013	Cadmium	1.23	µg/L	
MW-25	1/7/2014	Cadmium	1.39	µg/L	
MW-25	2/13/2014	Cadmium	1.29	µg/L	

APPENDIX B-5
MW-25 Data Used for Statistical Analysis

Well	Date Sampled	Parameter Name	Report Result	Report Units	Qualifer
MW-25	3/10/2014	Cadmium	1.29	µg/L	
MW-25	4/28/2014	Cadmium	1.51	µg/L	
MW-25	5/13/2014	Cadmium	1.34	µg/L	
MW-25	6/2/2014	Cadmium	1.24	µg/L	
MW-25	7/28/2014	Cadmium	1.30	µg/L	
MW-25	8/18/2014	Cadmium	1.30	µg/L	
MW-25	9/3/2014	Cadmium	1.30	µg/L	
MW-25	10/6/2014	Cadmium	1.41	µg/L	
MW-25	11/4/2014	Cadmium	1.57	µg/L	
MW-25	12/9/2014	Cadmium	1.27	µg/L	
MW-25	1/20/2015	Cadmium	1.44	µg/L	
MW-25	2/4/2015	Cadmium	1.33	µg/L	
MW-25	3/4/2015	Cadmium	1.37	µg/L	
MW-25	4/7/2015	Cadmium	1.27	µg/L	
MW-25	5/11/2015	Cadmium	1.38	µg/L	
MW-25	6/23/2015	Cadmium	1.42	µg/L	
MW-25	7/6/2015	Cadmium	1.43	µg/L	
MW-25	8/10/2015	Cadmium	1.41	µg/L	
MW-25	9/15/2015	Cadmium	1.31	µg/L	
MW-25	10/6/2015	Cadmium	1.50	µg/L	
MW-25	11/11/2015	Cadmium	1.38	µg/L	
MW-25	12/8/2015	Cadmium	1.45	µg/L	
MW-25	1/19/2016	Cadmium	1.37	µg/L	
MW-25	2/8/2016	Cadmium	1.51	µg/L	
MW-25	3/2/2016	Cadmium	1.42	µg/L	
MW-25	4/12/2016	Cadmium	1.39	µg/L	
MW-25	5/3/2016	Cadmium	1.43	µg/L	
MW-25	6/14/2016	Cadmium	1.43	µg/L	
MW-25	7/12/2016	Cadmium	1.44	µg/L	
MW-25	8/17/2016	Cadmium	1.37	µg/L	
MW-25	9/13/2016	Cadmium	1.41	µg/L	
MW-25	11/2/2016	Cadmium	1.33	µg/L	
MW-25	12/5/2016	Cadmium	1.41	µg/L	
MW-25	1/17/2017	Cadmium	1.42	µg/L	
MW-25	2/7/2017	Cadmium	1.45	µg/L	
MW-25	3/7/2017	Cadmium	1.46	µg/L	
MW-25	4/4/2017	Cadmium	1.58	µg/L	
MW-25	5/1/2017	Cadmium	1.35	µg/L	
MW-25	6/6/2017	Cadmium	1.32	µg/L	
MW-25	7/12/2017	Cadmium	1.42	µg/L	
MW-25	8/14/2017	Cadmium	1.33	µg/L	
MW-25	9/11/2017	Cadmium	1.51	µg/L	
MW-25	10/2/2017	Cadmium	1.40	µg/L	
MW-25	11/1/2017	Cadmium	1.40	µg/L	
MW-25	12/4/2017	Cadmium	1.60	µg/L	

APPENDIX B-5
MW-25 Data Used for Statistical Analysis

Well	Date Sampled	Parameter Name	Report Result	Report Units	Qualifer
MW-25	1/23/2018	Cadmium	1.38	µg/L	
MW-25	2/19/2018	Cadmium	1.28	µg/L	
MW-25	3/7/2018	Cadmium	1.45	µg/L	
MW-25	4/17/2018	Cadmium	1.38	µg/L	
MW-25	5/14/2018	Cadmium	1.34	µg/L	
MW-25	6/18/2018	Cadmium	1.38	µg/L	
MW-25	7/23/2018	Cadmium	1.30	µg/L	
MW-25	8/9/2018	Cadmium	1.36	µg/L	
MW-25	9/10/2018	Cadmium	1.35	µg/L	
MW-25	10/24/2018	Cadmium	1.30	µg/L	
MW-25	11/13/2018	Cadmium	1.51	µg/L	
MW-25	12/10/2018	Cadmium	1.49	µg/L	
MW-25	1/16/2019	Cadmium	1.32	µg/L	
MW-25	2/12/2019	Cadmium	1.52	µg/L	
MW-25	3/5/2019	Cadmium	1.54	µg/L	
MW-25	4/10/2019	Cadmium	1.30	µg/L	
MW-25	5/8/2019	Cadmium	1.41	µg/L	
MW-25	6/4/2019	Cadmium	1.47	µg/L	
MW-25	7/15/2019	Cadmium	1.23	µg/L	
MW-25	8/6/2019	Cadmium	1.37	µg/L	

Notes:

D= Diluted

U = Not detected above method detection limit

µg/L = micrograms per liter

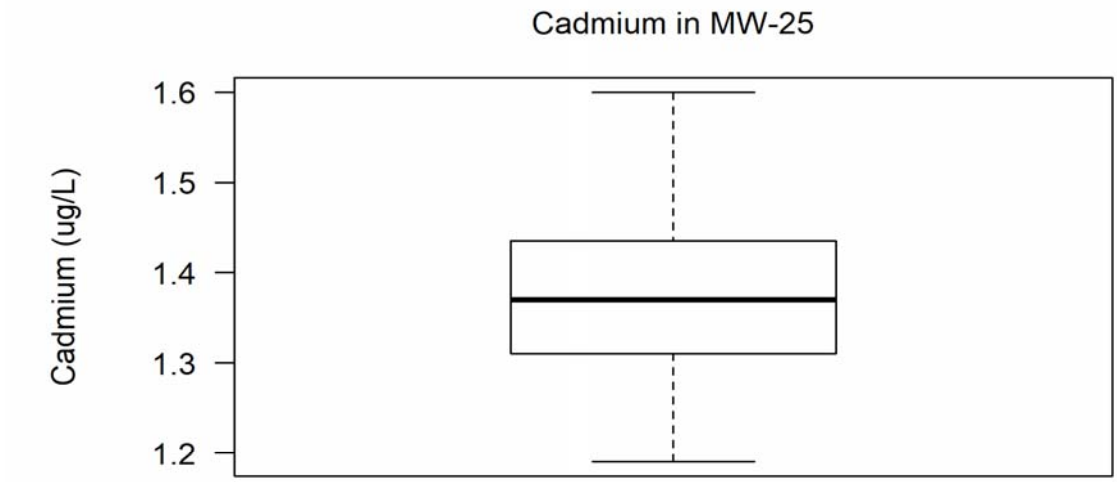
APPENDIX B-6
Data Removed from Analysis

Reason	Location ID	Date Sampled	Parameter Name	Report Result	Report Units
Extreme Upper Outlier, not part of trend	MW-25	3/22/2006	Cadmium	2.78	µg/L

Note:
µg/L = micrograms per liter

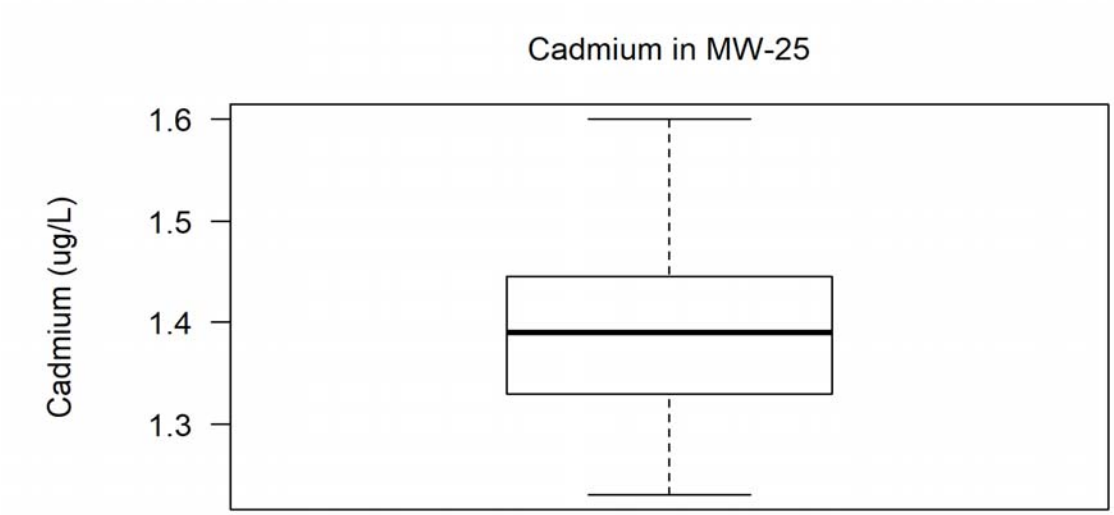
APPENDIX B-7
Box Plot of Cadmium in MW-25

Cadmium in MW-25 for All data



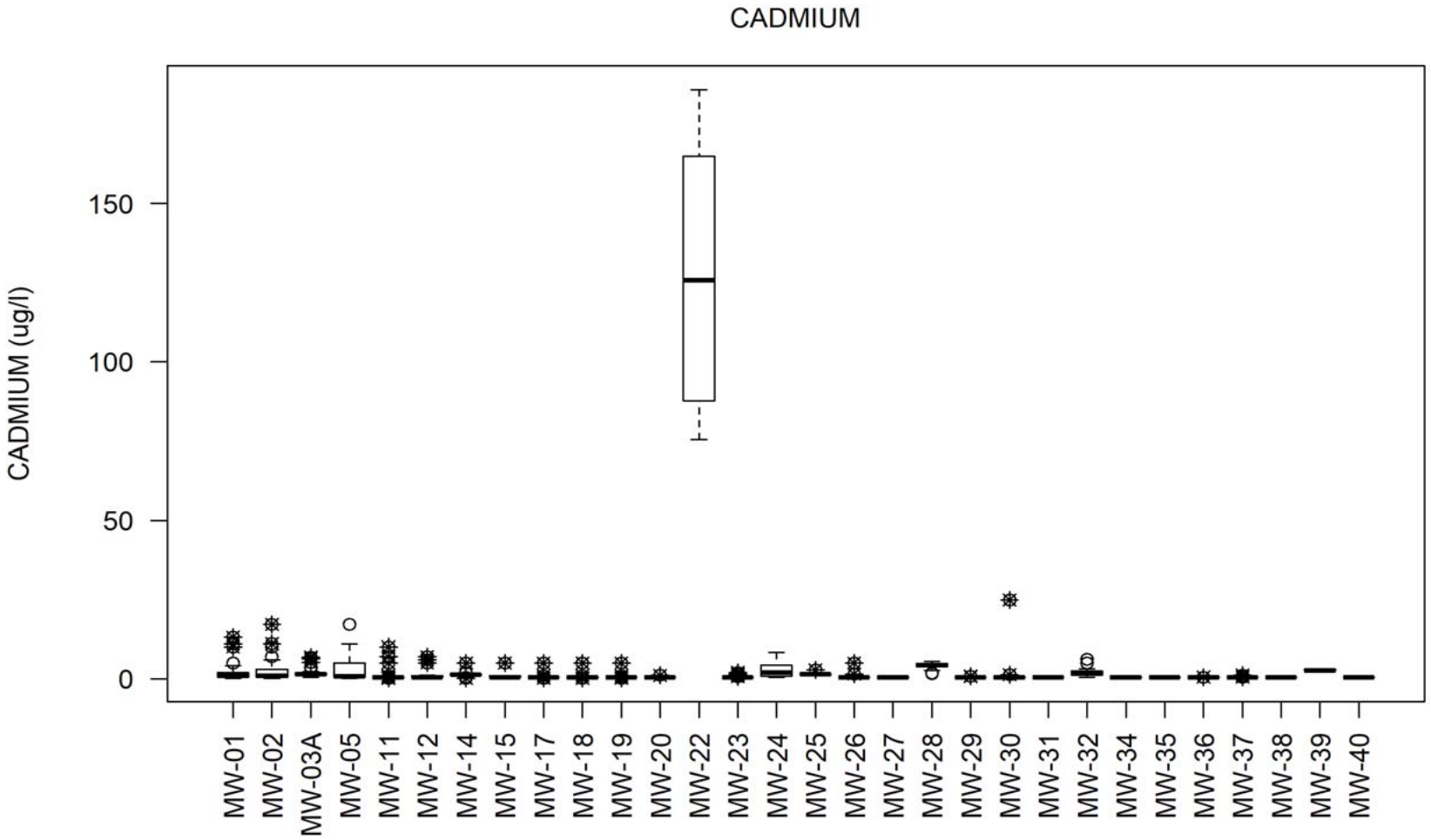
Percent nondetect: 0%
Min: 1.19, Mean: 1.38, Max: 1.6, Std Dev: 0.09
Upper extreme threshold (Q75 + 3xH): 1.8
Lower extreme threshold (Q25 - 3xH): 0.9425

Cadmium in MW-25 for post-Oct 2012 Data Set



Percent nondetect: 0%
Min: 1.23, Mean: 1.39, Max: 1.6, Std Dev: 0.09
Upper extreme threshold (Q75 + 3xH): 1.79
Lower extreme threshold (Q25 - 3xH): 0.985000000000001

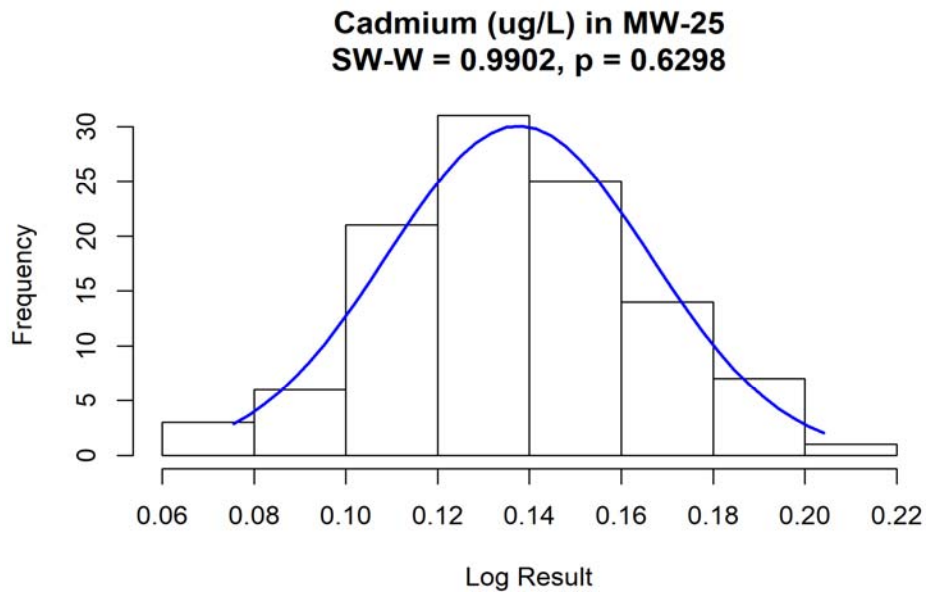
APPENDIX B-8
Box Plot of Cadmium All Groundwater Monitoring Wells



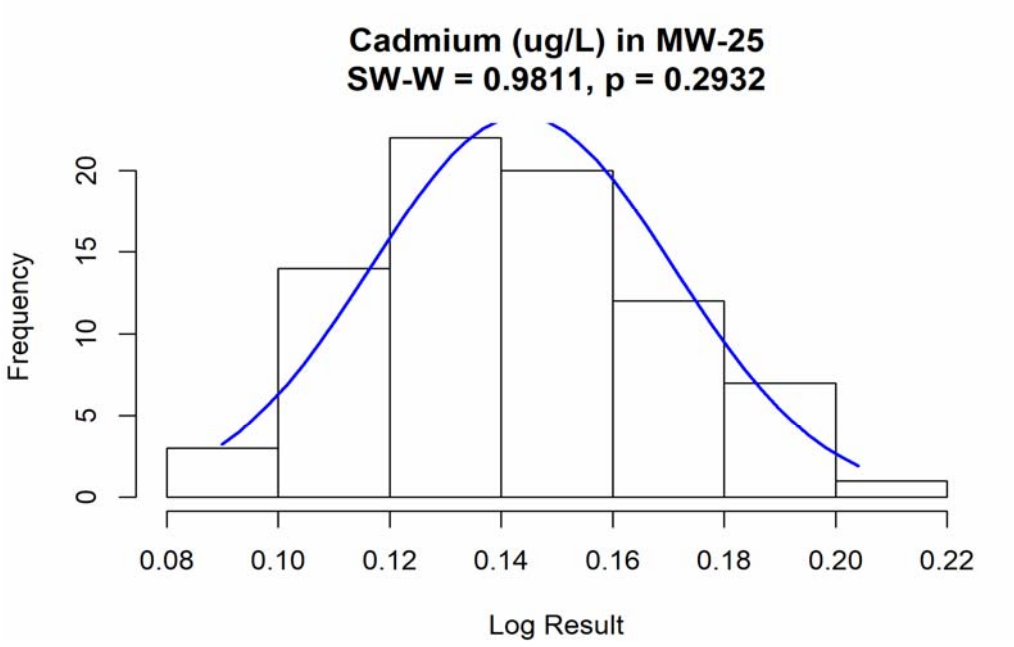
Note:
Cadmium data for all wells, extreme outliers removed if not part of trend

APPENDIX B-9
Histograms of Cadmium in MW-25

Cadmium in MW-25 for All data

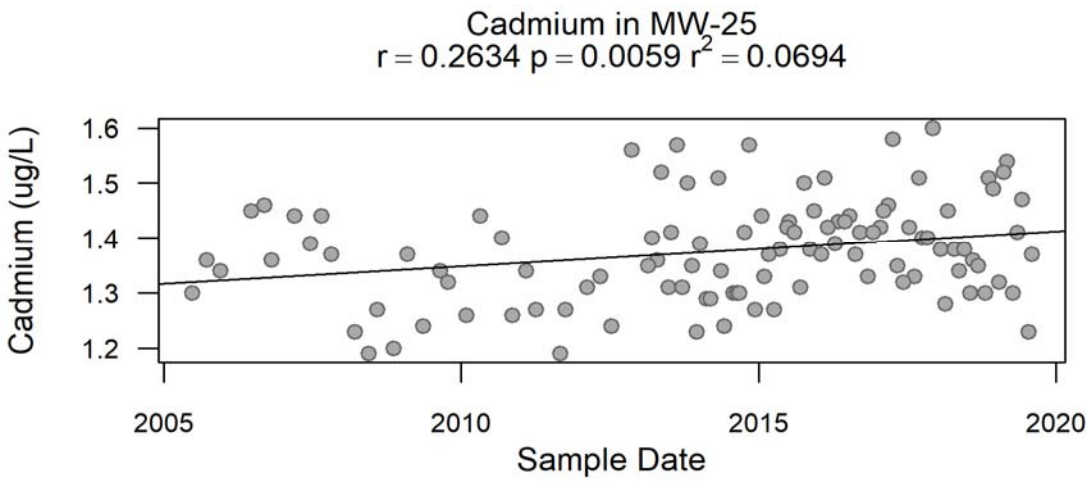


Cadmium in MW-25 for post-Oct 2012 Data Set

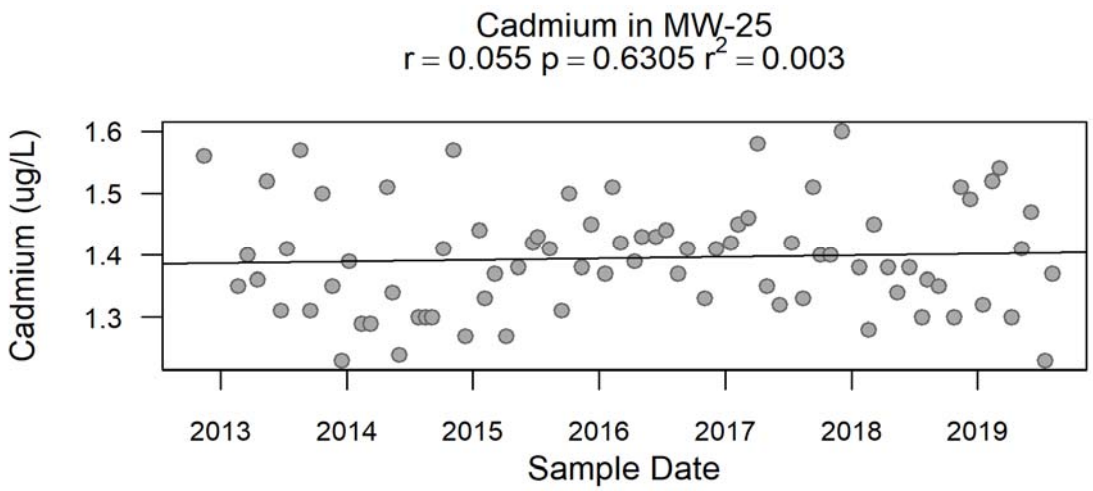


APPENDIX B-10
Time Concentration Plots of Cadmium in MW-25

Cadmium in MW-25 for All Data



Cadmium in MW-25 for post-Oct 2012 Data Set



● Indicates a detected result
○ Indicates a non-detect result

APPENDIX C

Geochemical Analysis for pH and Indicator Parameters in MW-25

APPENDIX C-1
Summary of Geochemical Analysis for pH and Indicator Parameters in MW-25

Well	Constituent	N	% Non-Detected Values	Mean	Standard Deviation	Shapiro-Wilk Test for Normality		Normally or Lognormally distributed?	Least Squares Regression Trend Analysis[a]		Mann-Kendall Trend Analysis[b]		Background Report Significant Trend?	2019 Significant Trend?
						W	p		r^2	p	S	p		
MW-25	Chloride (mg/L)	74	0%	31.1	1.91	0.95	8.20E-03	Not normal	NA	NA	-62	3.88E-01	No Trend	Not significant
MW-25	Fluoride (mg/L)	66	0%	0.32	0.03	0.95	1.27E-02	Not normal	NA	NA	-625	2.72E-04	Decreasing	Significant
MW-25	Sulfate (mg/L)	59	0%	1627	128	0.94	8.68E-03	Not normal	NA	NA	-566	1.08E-04	Decreasing	Significant
MW-25	Uranium (µg/L)	111	0%	6.21	0.48	0.98	5.05E-02	Normal	NA	NA	1258	6.78E-04	Increasing	Significant
MW-25	pH (pH Units)	126	0%	6.59	0.25	0.99	1.96E-01	Normal	NA	NA	-761	5.45E-02	Decreasing	Not significant

Notes:

σ = sigma

%ND = percent of non-detected values

µg/L = micrograms per liter

mg/L = milligrams per liter

S = Mann-Kendall statistic

N = number of valid data points

p = probability

W = Shapiro-Wilk test value

r2 = The measure of how well the trendline fits the data where r2=1 represents a perfect fit.

a = A regression test was performed on data that was determined to have normal or log-normal distribution

b = The Mann-Kendall test was performed on data that are not normally or lognormally distributed

APPENDIX C-2
Descriptive Statistics for pH and Indicator Parameters in MW-25

Well Number	Data Set	Analyte	Units	% Non-Detects	N	Distribution	Mean	Min. Conc.	Max. Conc.	Std. Dev.	Range	Geometric Mean	Skewness	Q25	Median	Q75
MW-25	**2008 Background Report**	Chloride	mg/L	0%	11	Normal or Lognormal	32.40	30	34	1.20	4	32.30	-0.40	32.0	32.0	33.0
MW-25	**2012 SAR**	Chloride	mg/L	0%	28	Not Normal	31.21	25	34	1.89	9	31.15	-1.17	30.0	31.0	32.0
MW-25	**2019 SAR**	Chloride	mg/L	0%	74	Not Normal	31.09	25	36.8	1.91	11.8	31.03	0.07	30.0	31.0	32.0
MW-25	**2008 Background Report**	Fluoride	mg/L	0%	11	Normal or Lognormal	0.30	0.30	0.4	0.0	0.2	0.30	1.10	0.30	0.3	0.4
MW-25	**2012 SAR**	Fluoride	mg/L	0%	29	Normal or Lognormal	0.32	0.28	0.37	0.0	0.095	0.33	-0.11	0.31	0.321	0.34
MW-25	**2019 SAR**	Fluoride	mg/L	0%	66	Not Normal	0.32	0.32	0.2	0.41	0.2	0.32	0.05	0.30	0.32	0.33
MW-25	**2008 Background Report**	Sulfate	mg/L	0%	11	Normal or Lognormal	1729.1	1570	1880	101.8	310	1726.40	0.10	1670	1710	1850
MW-25	**2012 SAR**	Sulfate	mg/L	0%	29	Normal or Lognormal	1692.7	1570	1880	80.39	310	1690.90	0.82	1630	1680	1740
MW-25	**2019 SAR**	Sulfate	mg/L	0%	58	Not Normal	1626.9	1320	1880	127.7	560	1621.83	-0.57	1560	1650	1710
MW-25	**2008 Background Report**	Uranium	µg/L	0%	11	Normal or Lognormal	5.90	5.4	6.4	0.30	0.9	5.90	-0.50	5.9	6.0	6.0
MW-25	**2012 SAR**	Uranium	µg/L	0%	40	Normal or Lognormal	6.10	4.8	7.06	0.50	2.29	6.09	-0.18	5.8	6.0	6.5
MW-25	**2019 SAR**	Uranium	µg/L	0%	110	Not Normal	6.21	4.77	7.6	0.48	2.8	6.19	-0.11	5.9	6.2	6.5
MW-25	**2012 pH Report**	pH	pH Units	0%	41	Normal or Lognormal	6.13	5.8	7.25	0.26	1.5	6.64	-0.63	6.5	6.6	6.8
MW-25	**2019 SAR**	pH	pH Units	0%	126	Normal or Lognormal	6.59	5.77	7.25	0.25	1.5	6.58	-0.07	6.5	6.6	6.7

APPENDIX C-3
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Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	06/23/2005	Chloride	34.0	mg/L	
MW-25	09/22/2005	Chloride	34.0	mg/L	
MW-25	12/13/2005	Chloride	33.0	mg/L	
MW-25	03/22/2006	Chloride	32.0	mg/L	
MW-25	06/20/2006	Chloride	32.0	mg/L	
MW-25	09/12/2006	Chloride	30.0	mg/L	
MW-25	10/24/2006	Chloride	33.0	mg/L	
MW-25	03/16/2007	Chloride	32.0	mg/L	
MW-25	06/20/2007	Chloride	31.0	mg/L	
MW-25	08/27/2007	Chloride	33.0	mg/L	
MW-25	10/25/2007	Chloride	32.0	mg/L	
MW-25	03/18/2008	Chloride	32.0	mg/L	
MW-25	06/12/2008	Chloride	25.0	mg/L	
MW-25	08/04/2008	Chloride	28.0	mg/L	
MW-25	11/10/2008	Chloride	30.0	mg/L	
MW-25	02/03/2009	Chloride	31.0	mg/L	
MW-25	05/13/2009	Chloride	30.0	mg/L	
MW-25	08/24/2009	Chloride	30.0	mg/L	
MW-25	10/13/2009	Chloride	34.0	mg/L	
MW-25	02/03/2010	Chloride	31.0	mg/L	
MW-25	04/28/2010	Chloride	31.0	mg/L	
MW-25	09/08/2010	Chloride	31.0	mg/L	
MW-25	11/10/2010	Chloride	31.0	mg/L	
MW-25	02/02/2011	Chloride	30.0	mg/L	
MW-25	04/04/2011	Chloride	31.0	mg/L	
MW-25	08/03/2011	Chloride	32.0	mg/L	
MW-25	10/04/2011	Chloride	32.0	mg/L	
MW-25	02/14/2012	Chloride	30.0	mg/L	
MW-25	05/02/2012	Chloride	30.0	mg/L	
MW-25	07/10/2012	Chloride	33.0	mg/L	
MW-25	11/12/2012	Chloride	28.8	mg/L	
MW-25	02/20/2013	Chloride	36.1	mg/L	
MW-25	05/14/2013	Chloride	28.1	mg/L	
MW-25	06/24/2013	Chloride	30.4	mg/L	
MW-25	07/10/2013	Chloride	28.0	mg/L	
MW-25	08/19/2013	Chloride	31.1	mg/L	
MW-25	09/17/2013	Chloride	29.6	mg/L	
MW-25	10/22/2013	Chloride	28.6	mg/L	
MW-25	11/19/2013	Chloride	29.0	mg/L	
MW-25	12/17/2013	Chloride	31.2	mg/L	
MW-25	01/07/2014	Chloride	31.0	mg/L	
MW-25	02/13/2014	Chloride	30.4	mg/L	
MW-25	03/10/2014	Chloride	31.5	mg/L	
MW-25	04/28/2014	Chloride	31.0	mg/L	
MW-25	05/13/2014	Chloride	26.4	mg/L	
MW-25	06/02/2014	Chloride	30.9	mg/L	

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Data Used for Statistical Analysis

Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	09/03/2014	Chloride	30.0	mg/L	
MW-25	11/04/2014	Chloride	29.6	mg/L	
MW-25	02/04/2015	Chloride	30.5	mg/L	
MW-25	04/07/2015	Chloride	31.1	mg/L	
MW-25	08/10/2015	Chloride	36.8	mg/L	
MW-25	11/11/2015	Chloride	29.8	mg/L	
MW-25	12/08/2015	Chloride	31.1	mg/L	
MW-25	01/19/2016	Chloride	29.6	mg/L	
MW-25	02/08/2016	Chloride	31.6	mg/L	
MW-25	03/02/2016	Chloride	30.9	mg/L	
MW-25	04/12/2016	Chloride	31.5	mg/L	
MW-25	05/03/2016	Chloride	30.8	mg/L	
MW-25	06/14/2016	Chloride	31.2	mg/L	
MW-25	07/12/2016	Chloride	29.6	mg/L	
MW-25	08/17/2016	Chloride	32.2	mg/L	
MW-25	09/13/2016	Chloride	32.0	mg/L	
MW-25	11/02/2016	Chloride	32.7	mg/L	
MW-25	02/07/2017	Chloride	30.6	mg/L	
MW-25	05/01/2017	Chloride	31.0	mg/L	
MW-25	08/14/2017	Chloride	32.7	mg/L	
MW-25	11/01/2017	Chloride	31.2	mg/L	
MW-25	02/19/2018	Chloride	30.8	mg/L	
MW-25	04/17/2018	Chloride	33.8	mg/L	
MW-25	09/10/2018	Chloride	34.2	mg/L	
MW-25	10/24/2018	Chloride	30.1	mg/L	
MW-25	01/16/2019	Chloride	30.7	mg/L	
MW-25	04/10/2019	Chloride	30.1	mg/L	
MW-25	07/15/2019	Chloride	34.3	mg/L	
MW-25	6/23/2005	Fluoride	0.31	mg/L	
MW-25	9/22/2005	Fluoride	0.35	mg/L	
MW-25	12/13/2005	Fluoride	0.34	mg/L	
MW-25	3/22/2006	Fluoride	0.33	mg/L	
MW-25	6/20/2006	Fluoride	0.33	mg/L	
MW-25	9/12/2006	Fluoride	0.32	mg/L	
MW-25	10/24/2006	Fluoride	0.32	mg/L	
MW-25	3/16/2007	Fluoride	0.38	mg/L	
MW-25	8/27/2007	Fluoride	0.36	mg/L	
MW-25	10/25/2007	Fluoride	0.28	mg/L	
MW-25	3/18/2008	Fluoride	0.34	mg/L	
MW-25	6/12/2008	Fluoride	0.32	mg/L	
MW-25	8/4/2008	Fluoride	0.32	mg/L	
MW-25	11/10/2008	Fluoride	0.34	mg/L	
MW-25	2/3/2009	Fluoride	0.35	mg/L	
MW-25	5/13/2009	Fluoride	0.35	mg/L	
MW-25	8/24/2009	Fluoride	0.32	mg/L	
MW-25	10/13/2009	Fluoride	0.33	mg/L	

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Data Used for Statistical Analysis

Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	2/3/2010	Fluoride	0.31	mg/L	
MW-25	4/28/2010	Fluoride	0.33	mg/L	
MW-25	9/8/2010	Fluoride	0.34	mg/L	
MW-25	11/10/2010	Fluoride	0.31	mg/L	
MW-25	2/2/2011	Fluoride	0.31	mg/L	
MW-25	4/4/2011	Fluoride	0.28	mg/L	
MW-25	8/3/2011	Fluoride	0.31	mg/L	
MW-25	10/4/2011	Fluoride	0.32	mg/L	
MW-25	2/14/2012	Fluoride	0.34	mg/L	
MW-25	5/2/2012	Fluoride	0.32	mg/L	
MW-25	7/10/2012	Fluoride	0.30	mg/L	
MW-25	11/12/2012	Fluoride	0.30	mg/L	
MW-25	2/20/2013	Fluoride	0.32	mg/L	
MW-25	5/14/2013	Fluoride	0.39	mg/L	
MW-25	11/19/2013	Fluoride	0.33	mg/L	
MW-25	12/17/2013	Fluoride	0.30	mg/L	
MW-25	1/7/2014	Fluoride	0.30	mg/L	
MW-25	2/13/2014	Fluoride	0.31	mg/L	
MW-25	3/10/2014	Fluoride	0.36	mg/L	
MW-25	4/28/2014	Fluoride	0.41	mg/L	
MW-25	5/13/2014	Fluoride	0.32	mg/L	
MW-25	6/2/2014	Fluoride	0.33	mg/L	
MW-25	7/28/2014	Fluoride	0.30	mg/L	
MW-25	8/18/2014	Fluoride	0.30	mg/L	
MW-25	9/3/2014	Fluoride	0.30	mg/L	
MW-25	11/4/2014	Fluoride	0.24	mg/L	
MW-25	2/4/2015	Fluoride	0.28	mg/L	
MW-25	4/7/2015	Fluoride	0.29	mg/L	
MW-25	11/11/2015	Fluoride	0.30	mg/L	
MW-25	2/8/2016	Fluoride	0.32	mg/L	
MW-25	5/3/2016	Fluoride	0.30	mg/L	
MW-25	8/17/2016	Fluoride	0.32	mg/L	
MW-25	11/2/2016	Fluoride	0.33	mg/L	
MW-25	2/7/2017	Fluoride	0.26	mg/L	
MW-25	5/1/2017	Fluoride	0.32	mg/L	
MW-25	8/14/2017	Fluoride	0.31	mg/L	
MW-25	2/19/2018	Fluoride	0.28	mg/L	
MW-25	3/7/2018	Fluoride	0.32	mg/L	
MW-25	4/17/2018	Fluoride	0.36	mg/L	
MW-25	5/14/2018	Fluoride	0.35	mg/L	
MW-25	8/9/2018	Fluoride	0.24	mg/L	
MW-25	9/10/2018	Fluoride	0.24	mg/L	
MW-25	10/24/2018	Fluoride	0.31	mg/L	
MW-25	11/13/2018	Fluoride	0.31	mg/L	
MW-25	12/10/2018	Fluoride	0.30	mg/L	
MW-25	1/16/2019	Fluoride	0.30	mg/L	

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Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	4/10/2019	Fluoride	0.32	mg/L	
MW-25	7/15/2019	Fluoride	0.30	mg/L	
MW-25	06/23/2005	Sulfate	1600	mg/L	
MW-25	09/22/2005	Sulfate	1670	mg/L	D
MW-25	12/13/2005	Sulfate	1860	mg/L	D
MW-25	03/22/2006	Sulfate	1710	mg/L	D
MW-25	06/20/2006	Sulfate	1680	mg/L	D
MW-25	09/12/2006	Sulfate	1570	mg/L	D
MW-25	10/24/2006	Sulfate	1880	mg/L	D
MW-25	03/16/2007	Sulfate	1750	mg/L	D
MW-25	06/20/2007	Sulfate	1740	mg/L	D
MW-25	08/27/2007	Sulfate	1850	mg/L	D
MW-25	10/25/2007	Sulfate	1710	mg/L	D
MW-25	03/18/2008	Sulfate	1750	mg/L	D
MW-25	06/12/2008	Sulfate	1610	mg/L	D
MW-25	08/04/2008	Sulfate	1710	mg/L	D
MW-25	11/10/2008	Sulfate	1800	mg/L	D
MW-25	02/03/2009	Sulfate	1630	mg/L	D
MW-25	05/13/2009	Sulfate	1690	mg/L	D
MW-25	08/24/2009	Sulfate	1580	mg/L	D
MW-25	10/13/2009	Sulfate	1650	mg/L	D
MW-25	02/03/2010	Sulfate	1630	mg/L	D
MW-25	04/28/2010	Sulfate	1660	mg/L	D
MW-25	09/08/2010	Sulfate	1760	mg/L	D
MW-25	11/10/2010	Sulfate	1650	mg/L	D
MW-25	02/02/2011	Sulfate	1690	mg/L	D
MW-25	04/04/2011	Sulfate	1620	mg/L	D
MW-25	08/03/2011	Sulfate	1660	mg/L	D
MW-25	10/04/2011	Sulfate	1680	mg/L	D
MW-25	02/14/2012	Sulfate	1630	mg/L	D
MW-25	05/02/2012	Sulfate	1670	mg/L	D
MW-25	07/10/2012	Sulfate	1620	mg/L	D
MW-25	11/12/2012	Sulfate	1680	mg/L	
MW-25	02/20/2013	Sulfate	1730	mg/L	
MW-25	05/14/2013	Sulfate	1350	mg/L	
MW-25	07/10/2013	Sulfate	1320	mg/L	
MW-25	11/19/2013	Sulfate	1450	mg/L	
MW-25	02/13/2014	Sulfate	1450	mg/L	
MW-25	03/10/2014	Sulfate	1560	mg/L	
MW-25	06/02/2014	Sulfate	1560	mg/L	
MW-25	09/03/2014	Sulfate	1530	mg/L	
MW-25	11/04/2014	Sulfate	1750	mg/L	
MW-25	02/04/2015	Sulfate	1620	mg/L	
MW-25	04/07/2015	Sulfate	1580	mg/L	
MW-25	08/10/2015	Sulfate	1560	mg/L	
MW-25	11/11/2015	Sulfate	1750	mg/L	

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Data Used for Statistical Analysis

Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	02/08/2016	Sulfate	1680	mg/L	
MW-25	05/03/2016	Sulfate	1730	mg/L	
MW-25	08/17/2016	Sulfate	1670	mg/L	
MW-25	11/02/2016	Sulfate	1330	mg/L	
MW-25	02/07/2017	Sulfate	1320	mg/L	
MW-25	05/01/2017	Sulfate	1490	mg/L	
MW-25	08/14/2017	Sulfate	1800	mg/L	
MW-25	11/01/2017	Sulfate	1490	mg/L	
MW-25	02/19/2018	Sulfate	1490.00	mg/L	
MW-25	04/17/2018	Sulfate	1580.00	mg/L	
MW-25	09/10/2018	Sulfate	1640.00	mg/L	
MW-25	10/24/2018	Sulfate	1530.00	mg/L	
MW-25	01/16/2019	Sulfate	1530.00	mg/L	
MW-25	04/10/2019	Sulfate	1450.00	mg/L	
MW-25	07/15/2019	Sulfate	1660.00	mg/L	
MW-25	06/23/2005	Uranium	5.87	µg/L	
MW-25	09/22/2005	Uranium	6.04	µg/L	
MW-25	12/13/2005	Uranium	5.99	µg/L	
MW-25	03/22/2006	Uranium	5.42	µg/L	
MW-25	06/20/2006	Uranium	6.36	µg/L	
MW-25	09/12/2006	Uranium	5.90	µg/L	
MW-25	10/24/2006	Uranium	5.57	µg/L	
MW-25	03/16/2007	Uranium	6.01	µg/L	
MW-25	06/20/2007	Uranium	5.86	µg/L	
MW-25	08/27/2007	Uranium	6.27	µg/L	
MW-25	10/25/2007	Uranium	6.02	µg/L	
MW-25	03/18/2008	Uranium	5.94	µg/L	
MW-25	06/12/2008	Uranium	6.08	µg/L	
MW-25	08/04/2008	Uranium	5.56	µg/L	
MW-25	11/10/2008	Uranium	5.35	µg/L	
MW-25	02/03/2009	Uranium	5.87	µg/L	
MW-25	05/13/2009	Uranium	5.70	µg/L	
MW-25	08/24/2009	Uranium	6.02	µg/L	
MW-25	10/13/2009	Uranium	6.28	µg/L	
MW-25	02/03/2010	Uranium	5.93	µg/L	
MW-25	04/28/2010	Uranium	6.43	µg/L	
MW-25	09/08/2010	Uranium	6.57	µg/L	
MW-25	11/10/2010	Uranium	5.89	µg/L	
MW-25	01/11/2011	Uranium	7.02	µg/L	
MW-25	02/02/2011	Uranium	4.77	µg/L	
MW-25	03/15/2011	Uranium	6.80	µg/L	
MW-25	04/04/2011	Uranium	5.56	µg/L	
MW-25	05/11/2011	Uranium	6.72	µg/L	
MW-25	06/20/2011	Uranium	7.06	µg/L	
MW-25	07/06/2011	Uranium	6.74	µg/L	
MW-25	08/30/2011	Uranium	6.37	µg/L	

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Data Used for Statistical Analysis

Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	09/07/2011	Uranium	5.96	µg/L	
MW-25	10/04/2011	Uranium	5.27	µg/L	
MW-25	11/09/2011	Uranium	6.56	µg/L	
MW-25	12/12/2011	Uranium	6.10	µg/L	
MW-25	01/25/2012	Uranium	6.60	µg/L	
MW-25	02/14/2012	Uranium	6.50	µg/L	
MW-25	03/14/2012	Uranium	6.93	µg/L	
MW-25	04/09/2012	Uranium	6.52	µg/L	
MW-25	05/02/2012	Uranium	5.90	µg/L	
MW-25	06/18/2012	Uranium	7.60	µg/L	
MW-25	07/10/2012	Uranium	6.45	µg/L	
MW-25	08/06/2012	Uranium	6.72	µg/L	
MW-25	09/18/2012	Uranium	6.01	µg/L	
MW-25	10/22/2012	Uranium	6.37	µg/L	
MW-25	11/12/2012	Uranium	6.61	µg/L	
MW-25	12/24/2012	Uranium	4.83	µg/L	
MW-25	01/22/2013	Uranium	5.97	µg/L	
MW-25	02/20/2013	Uranium	5.39	µg/L	
MW-25	03/19/2013	Uranium	5.68	µg/L	
MW-25	04/17/2013	Uranium	5.56	µg/L	
MW-25	05/14/2013	Uranium	5.88	µg/L	
MW-25	06/24/2013	Uranium	5.35	µg/L	
MW-25	07/10/2013	Uranium	6.22	µg/L	
MW-25	08/19/2013	Uranium	6.42	µg/L	
MW-25	09/17/2013	Uranium	5.99	µg/L	
MW-25	10/22/2013	Uranium	5.94	µg/L	
MW-25	11/19/2013	Uranium	7.13	µg/L	
MW-25	02/13/2014	Uranium	5.83	µg/L	
MW-25	03/10/2014	Uranium	6.26	µg/L	
MW-25	05/13/2014	Uranium	7.43	µg/L	
MW-25	06/02/2014	Uranium	6.07	µg/L	
MW-25	07/28/2014	Uranium	5.90	µg/L	
MW-25	08/18/2014	Uranium	6.10	µg/L	
MW-25	09/03/2014	Uranium	6.00	µg/L	
MW-25	10/06/2014	Uranium	6.67	µg/L	
MW-25	11/04/2014	Uranium	6.04	µg/L	
MW-25	12/09/2014	Uranium	5.75	µg/L	
MW-25	01/20/2015	Uranium	6.54	µg/L	
MW-25	02/04/2015	Uranium	6.81	µg/L	
MW-25	03/04/2015	Uranium	6.43	µg/L	
MW-25	04/07/2015	Uranium	5.86	µg/L	
MW-25	05/11/2015	Uranium	6.38	µg/L	
MW-25	06/23/2015	Uranium	5.88	µg/L	
MW-25	07/06/2015	Uranium	6.25	µg/L	
MW-25	08/10/2015	Uranium	6.39	µg/L	
MW-25	09/15/2015	Uranium	6.20	µg/L	

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Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	10/06/2015	Uranium	6.40	µg/L	
MW-25	11/11/2015	Uranium	6.19	µg/L	
MW-25	12/08/2015	Uranium	6.00	µg/L	
MW-25	01/19/2016	Uranium	6.54	µg/L	
MW-25	02/08/2016	Uranium	6.16	µg/L	
MW-25	03/02/2016	Uranium	6.22	µg/L	
MW-25	04/12/2016	Uranium	6.03	µg/L	
MW-25	05/03/2016	Uranium	6.30	µg/L	
MW-25	06/14/2016	Uranium	5.99	µg/L	
MW-25	07/12/2016	Uranium	6.64	µg/L	
MW-25	08/17/2016	Uranium	6.33	µg/L	
MW-25	09/13/2016	Uranium	6.48	µg/L	
MW-25	11/02/2016	Uranium	6.48	µg/L	
MW-25	12/05/2016	Uranium	6.70	µg/L	
MW-25	01/17/2017	Uranium	6.54	µg/L	
MW-25	02/07/2017	Uranium	6.60	µg/L	
MW-25	03/07/2017	Uranium	6.39	µg/L	
MW-25	04/04/2017	Uranium	6.65	µg/L	
MW-25	05/01/2017	Uranium	6.27	µg/L	
MW-25	06/06/2017	Uranium	6.12	µg/L	
MW-25	07/12/2017	Uranium	6.66	µg/L	
MW-25	08/14/2017	Uranium	6.31	µg/L	
MW-25	09/11/2017	Uranium	6.12	µg/L	
MW-25	10/02/2017	Uranium	6.72	µg/L	
MW-25	11/01/2017	Uranium	5.98	µg/L	
MW-25	12/04/2017	Uranium	6	µg/L	
MW-25	01/23/2018	Uranium	7	µg/L	
MW-25	02/19/2018	Uranium	6	µg/L	
MW-25	04/17/2018	Uranium	7	µg/L	
MW-25	09/10/2018	Uranium	6	µg/L	
MW-25	10/24/2018	Uranium	6	µg/L	
MW-25	01/16/2019	Uranium	6	µg/L	
MW-25	04/10/2019	Uranium	7	µg/L	
MW-25	07/15/2019	Uranium	7	µg/L	
MW-25	06/23/2005	pH	7	pH Units	
MW-25	09/22/2005	pH	7	pH Units	
MW-25	12/13/2005	pH	7	pH Units	
MW-25	03/22/2006	pH	7	pH Units	
MW-25	06/20/2006	pH	7	pH Units	
MW-25	09/12/2006	pH	7	pH Units	
MW-25	10/24/2006	pH	7	pH Units	
MW-25	03/16/2007	pH	7	pH Units	
MW-25	06/20/2007	pH	7	pH Units	
MW-25	08/27/2007	pH	7	pH Units	
MW-25	10/25/2007	pH	6	pH Units	
MW-25	03/18/2008	pH	7	pH Units	

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Data Used for Statistical Analysis

Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	06/12/2008	pH	7	pH Units	
MW-25	08/04/2008	pH	7	pH Units	
MW-25	11/10/2008	pH	7	pH Units	
MW-25	11/19/2008	pH	7	pH Units	
MW-25	02/03/2009	pH	7	pH Units	
MW-25	05/13/2009	pH	6.6	pH Units	
MW-25	08/12/2009	pH	6.6	pH Units	
MW-25	08/24/2009	pH	6.5	pH Units	
MW-25	10/13/2009	pH	6.5	pH Units	
MW-25	02/03/2010	pH	6.5	pH Units	
MW-25	04/28/2010	pH	7.2	pH Units	
MW-25	09/08/2010	pH	6.6	pH Units	
MW-25	11/10/2010	pH	6.4	pH Units	
MW-25	01/11/2011	pH	6.4	pH Units	
MW-25	03/15/2011	pH	6.8	pH Units	
MW-25	04/04/2011	pH	6.7	pH Units	
MW-25	05/11/2011	pH	6.1	pH Units	
MW-25	06/20/2011	pH	5.8	pH Units	
MW-25	07/06/2011	pH	6.3	pH Units	
MW-25	08/03/2011	pH	6.4	pH Units	
MW-25	08/30/2011	pH	6.5	pH Units	
MW-25	09/07/2011	pH	6.5	pH Units	
MW-25	10/04/2011	pH	6.6	pH Units	
MW-25	11/09/2011	pH	6.5	pH Units	
MW-25	12/12/2011	pH	6.9	pH Units	
MW-25	01/25/2012	pH	6.6	pH Units	
MW-25	02/14/2012	pH	6.8	pH Units	
MW-25	04/09/2012	pH	6.6	pH Units	
MW-25	05/02/2012	pH	6.7	pH Units	
MW-25	07/10/2012	pH	6.9	pH Units	
MW-25	08/06/2012	pH	6.6	pH Units	
MW-25	09/18/2012	pH	6.5	pH Units	
MW-25	10/22/2012	pH	6.5	pH Units	
MW-25	11/12/2012	pH	6.5	pH Units	
MW-25	01/22/2013	pH	6.7	pH Units	
MW-25	02/20/2013	pH	6.6	pH Units	
MW-25	03/19/2013	pH	6.4	pH Units	
MW-25	04/17/2013	pH	7.0	pH Units	
MW-25	06/24/2013	pH	6.7	pH Units	
MW-25	07/10/2013	pH	6.3	pH Units	
MW-25	08/19/2013	pH	6.7	pH Units	
MW-25	09/17/2013	pH	6.5	pH Units	
MW-25	10/22/2013	pH	6.8	pH Units	
MW-25	11/19/2013	pH	6.6	pH Units	
MW-25	12/17/2013	pH	6.7	pH Units	
MW-25	01/07/2014	pH	6.4	pH Units	

APPENDIX C-3
Data Used for Statistical Analysis

Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	02/13/2014	pH	6.1	pH Units	
MW-25	03/10/2014	pH	6.3	pH Units	
MW-25	04/28/2014	pH	7.2	pH Units	
MW-25	05/13/2014	pH	6.8	pH Units	
MW-25	06/02/2014	pH	6.7	pH Units	
MW-25	07/28/2014	pH	6.4	pH Units	
MW-25	08/18/2014	pH	7.2	pH Units	
MW-25	09/03/2014	pH	6.5	pH Units	
MW-25	10/06/2014	pH	6.5	pH Units	
MW-25	11/04/2014	pH	6.3	pH Units	
MW-25	12/09/2014	pH	6.4	pH Units	
MW-25	01/20/2015	pH	6.2	pH Units	
MW-25	02/04/2015	pH	6.5	pH Units	
MW-25	03/04/2015	pH	6.3	pH Units	
MW-25	04/07/2015	pH	6.5	pH Units	
MW-25	05/11/2015	pH	6.5	pH Units	
MW-25	06/01/2015	pH	6.6	pH Units	
MW-25	06/23/2015	pH	6.5	pH Units	
MW-25	07/06/2015	pH	6.7	pH Units	
MW-25	08/10/2015	pH	6.5	pH Units	
MW-25	09/15/2015	pH	6.6	pH Units	
MW-25	10/06/2015	pH	6.5	pH Units	
MW-25	11/11/2015	pH	6.8	pH Units	
MW-25	12/08/2015	pH	6.4	pH Units	
MW-25	01/19/2016	pH	6.2	pH Units	
MW-25	02/08/2016	pH	6.5	pH Units	
MW-25	03/02/2016	pH	6.6	pH Units	
MW-25	04/12/2016	pH	6.5	pH Units	
MW-25	05/03/2016	pH	6.2	pH Units	
MW-25	06/14/2016	pH	6.3	pH Units	
MW-25	07/12/2016	pH	6.2	pH Units	
MW-25	08/17/2016	pH	6.6	pH Units	
MW-25	09/13/2016	pH	6.2	pH Units	
MW-25	10/04/2016	pH	6.7	pH Units	
MW-25	11/02/2016	pH	6.7	pH Units	
MW-25	12/05/2016	pH	6.7	pH Units	
MW-25	01/17/2017	pH	6.4	pH Units	
MW-25	02/07/2017	pH	6.3	pH Units	
MW-25	03/07/2017	pH	6.6	pH Units	
MW-25	04/04/2017	pH	6.0	pH Units	
MW-25	05/01/2017	pH	6.5	pH Units	
MW-25	06/06/2017	pH	6.6	pH Units	
MW-25	07/12/2017	pH	6.8	pH Units	
MW-25	08/14/2017	pH	6.2	pH Units	
MW-25	09/11/2017	pH	6.2	pH Units	
MW-25	10/02/2017	pH	6.6	pH Units	

APPENDIX C-3
Data Used for Statistical Analysis

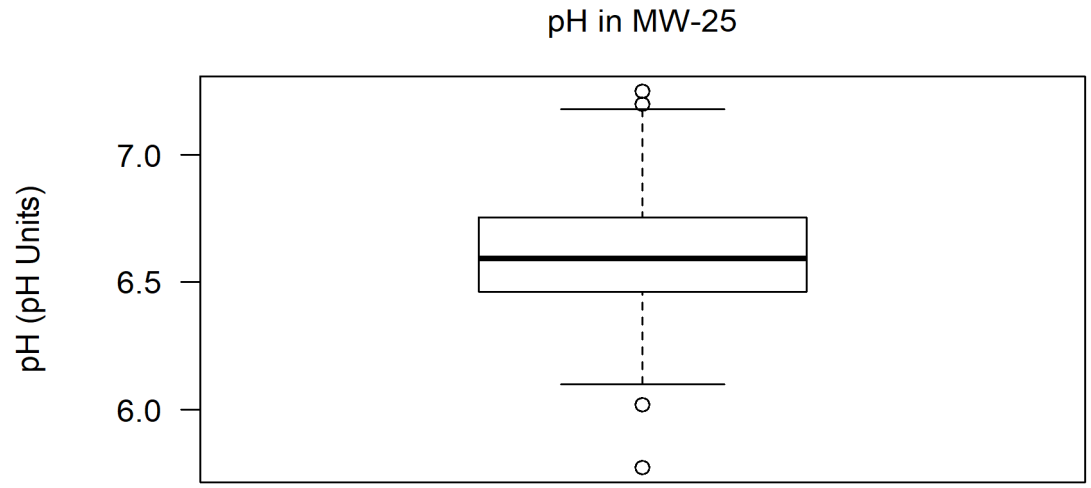
Well ID	Date Sampled	Parameter	Result	Units	Qualifer
MW-25	11/01/2017	pH	6.8	pH Units	
MW-25	12/04/2017	pH	6.9	pH Units	
MW-25	01/23/2018	pH	6.1	pH Units	
MW-25	02/19/2018	pH	6.9	pH Units	
MW-25	03/07/2018	pH	6.5	pH Units	
MW-25	04/17/2018	pH	6.5	pH Units	
MW-25	05/14/2018	pH	6.7	pH Units	
MW-25	06/18/2018	pH	6.8	pH Units	
MW-25	07/23/2018	pH	6.9	pH Units	
MW-25	08/09/2018	pH	6.6	pH Units	
MW-25	09/10/2018	pH	6.7	pH Units	
MW-25	10/24/2018	pH	6.4	pH Units	
MW-25	11/13/2018	pH	6.8	pH Units	
MW-25	12/10/2018	pH	6.8	pH Units	
MW-25	01/16/2019	pH	6.5	pH Units	
MW-25	02/12/2019	pH	6.4	pH Units	
MW-25	03/05/2019	pH	6.8	pH Units	
MW-25	04/10/2019	pH	6.8	pH Units	
MW-25	05/08/2019	pH	6.6	pH Units	
MW-25	06/04/2019	pH	6.7	pH Units	
MW-25	07/15/2019	pH	6.6	pH Units	
MW-25	08/06/2019	pH	7.1	pH Units	

Note:
D = Diluted

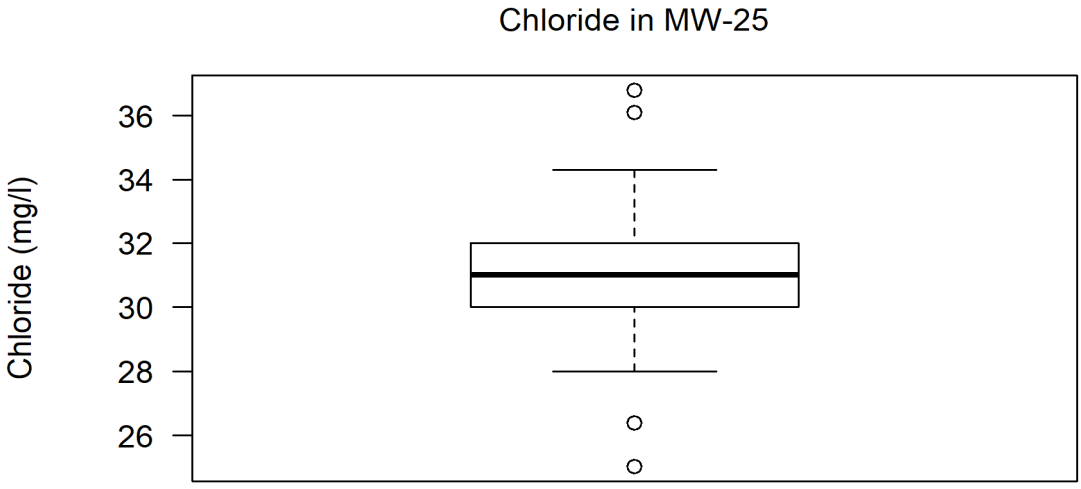
APPENDIX C-4
Indicator Parameter Data Removed from Analysis

Reason	Location ID	Date Sampled	Parameter Name	Report Result	Report Units
Extreme Upper Outlier, not part of trend	MW-25	7/10/2013	Fluoride	0.53	mg/L
Extreme Lower Outlier, not part of trend	MW-25	8/10/2015	Fluoride	0.19	mg/L
Extreme Upper Outlier, not part of trend	MW-25	11/1/2017	Fluoride	0.57	mg/L
Extreme Lower Outlier, not part of trend	MW-25	6/18/2018	Fluoride	0.13	mg/L
Extreme Lower Outlier, not part of trend	MW-25	7/23/2018	Fluoride	0.13	mg/L
Extreme Upper Outlier, not part of trend	MW-25	06/20/2007	Fluoride	0.43	mg/L
Extreme Upper Outlier, not part of trend	MW-25	5/14/2013	pH	7.8	pH Units
Extreme Upper Outlier, not part of trend	MW-25	4/28/2014	Uranium	10.6	µg/L

APPENDIX C-5
Box Plots for pH and Indicator Parameters in MW-25

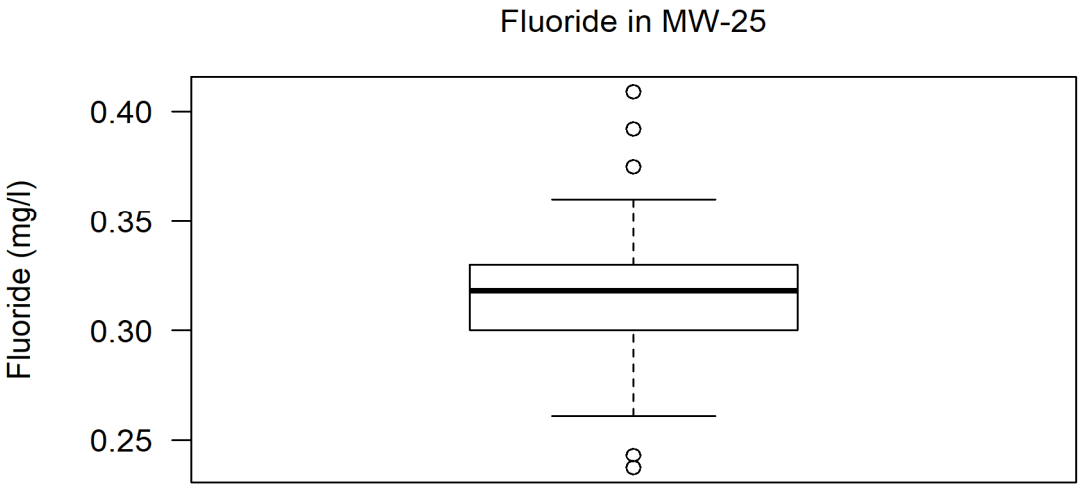


Percent nondetect: 0%
Min: 5.77, Mean: 6.59, Max: 7.25, Std Dev: 0.25
Upper extreme threshold (Q75 + 3xH): 7.61
Lower extreme threshold (Q25 - 3xH): 5.5975

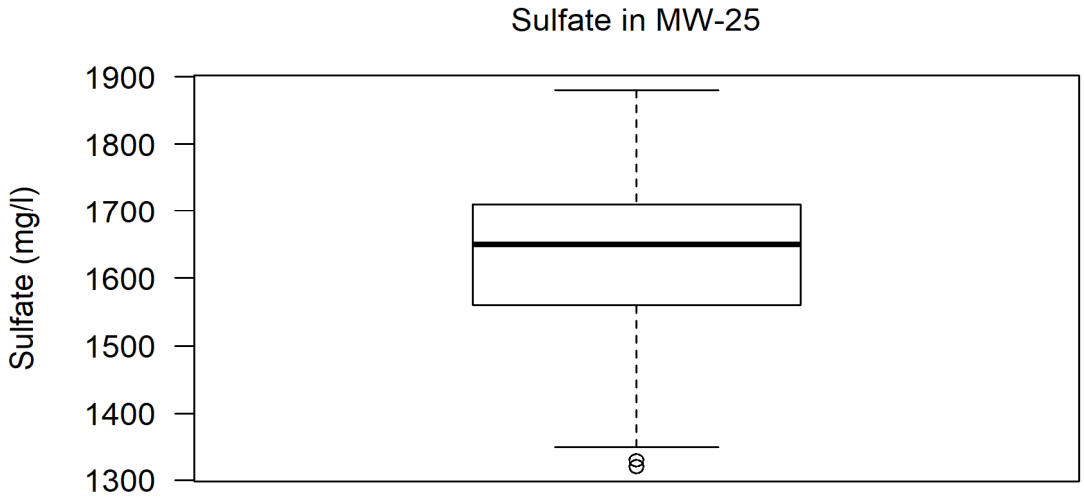


Percent nondetect: 0%
Min: 25, Mean: 31.09, Max: 36.8, Std Dev: 1.91
Upper extreme threshold (Q75 + 3xH): 38
Lower extreme threshold (Q25 - 3xH): 24

APPENDIX C-5
Box Plots for pH and Indicator Parameters in MW-25

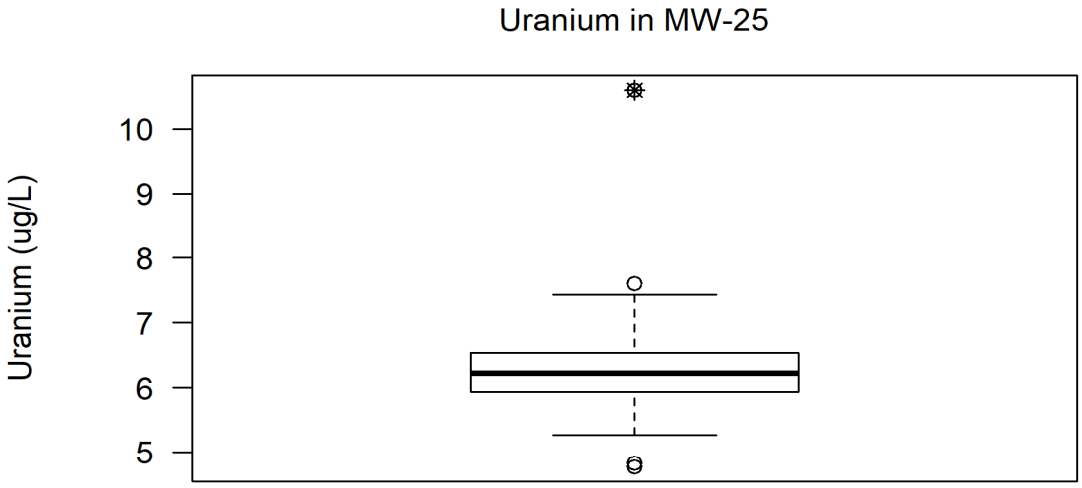


Percent nondetect: 0%
Min: 0.237, Mean: 0.32, Max: 0.409, Std Dev: 0.03
Upper extreme threshold (Q75 + 3xH): 0.42
Lower extreme threshold (Q25 - 3xH): 0.21



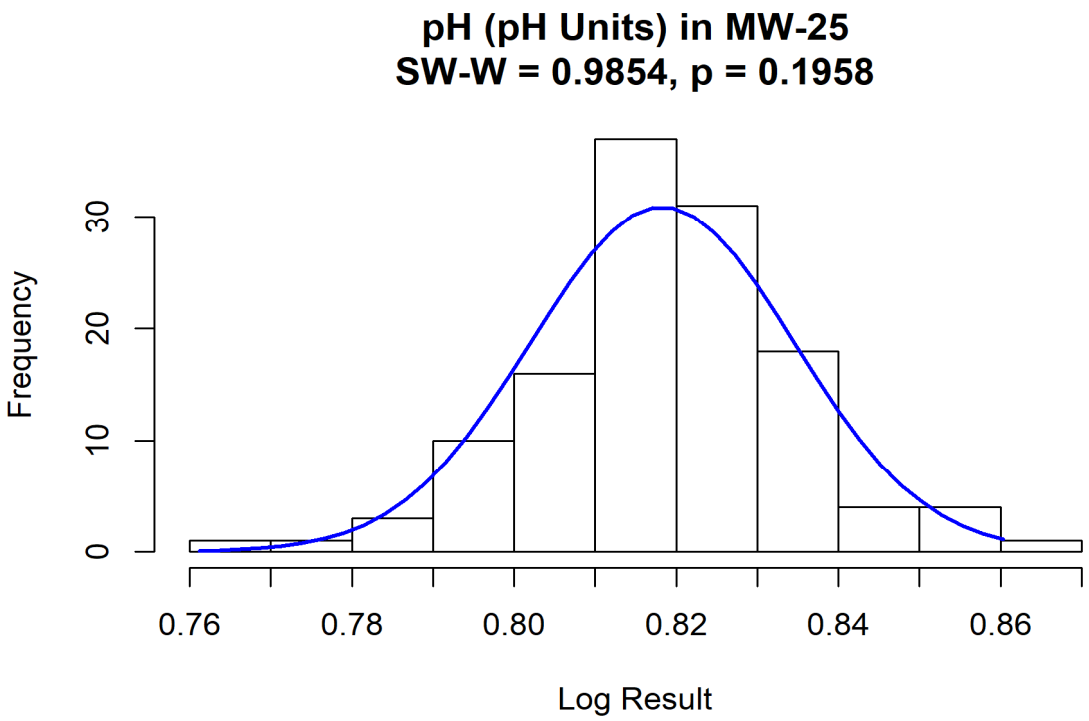
Percent nondetect: 0%
Min: 1320, Mean: 1626.95, Max: 1880, Std Dev: 127.74
Upper extreme threshold (Q75 + 3xH): 2160
Lower extreme threshold (Q25 - 3xH): 1110

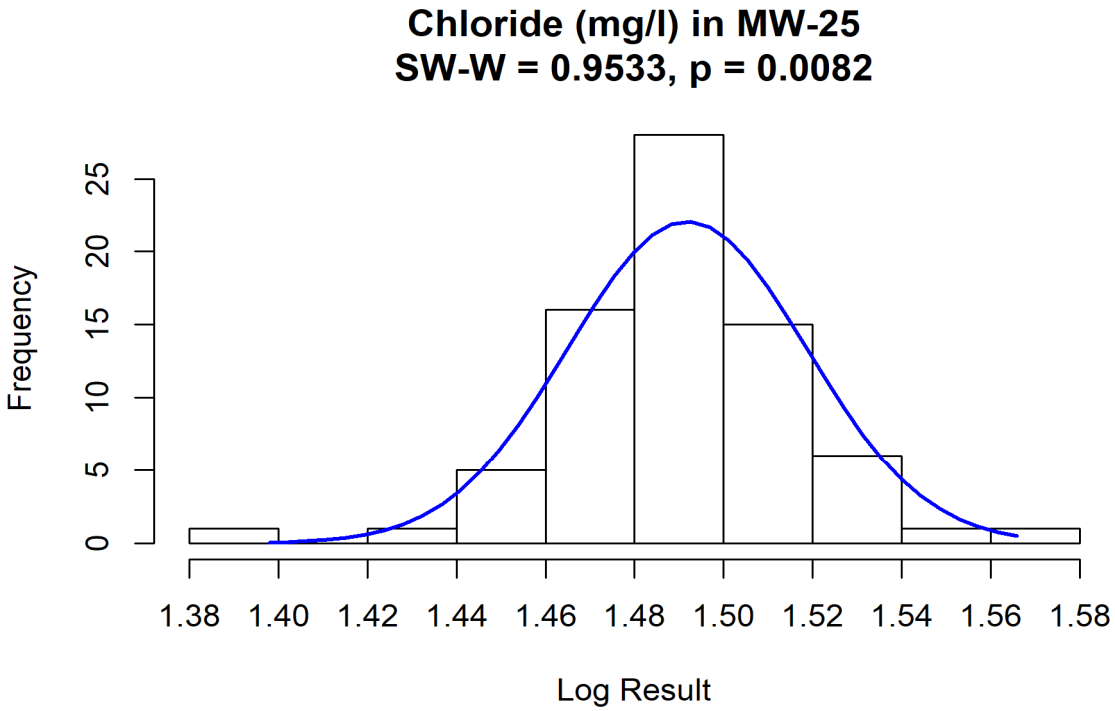
APPENDIX C-5
Box Plots for pH and Indicator Parameters in MW-25



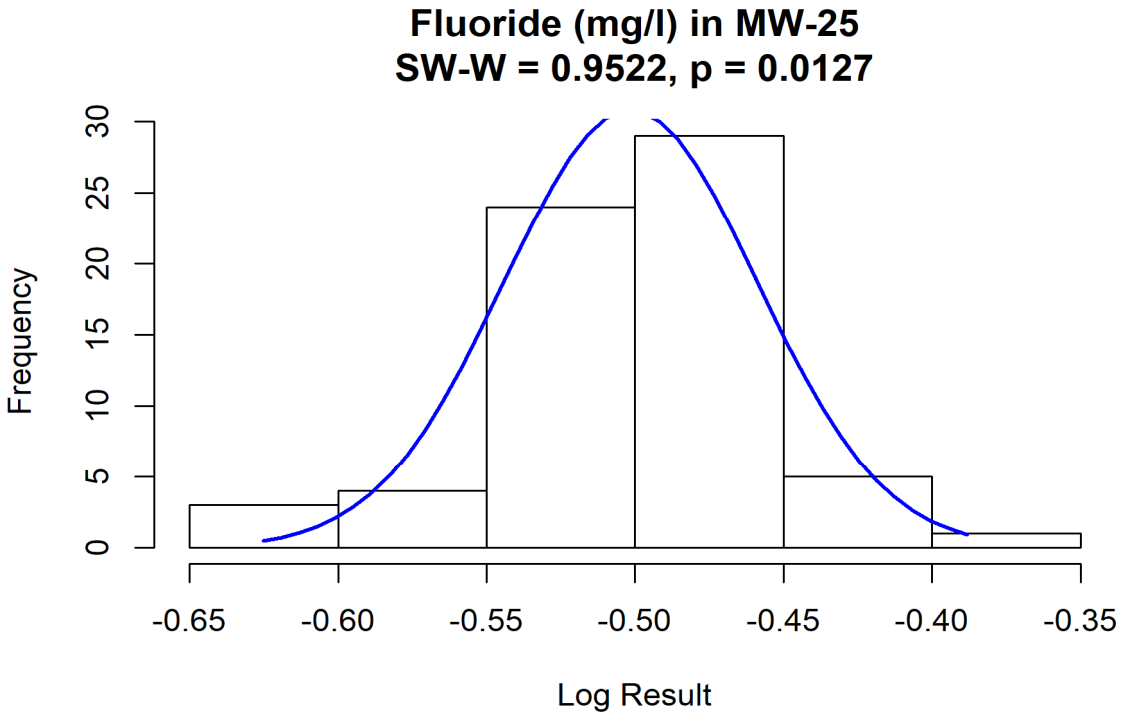
Percent nondetect: 0%
Min: 4.77, Mean: 6.25, Max: 10.6, Std Dev: 0.63
Upper extreme threshold (Q75 + 3xH): 8.3475
Lower extreme threshold (Q25 - 3xH): 4.13

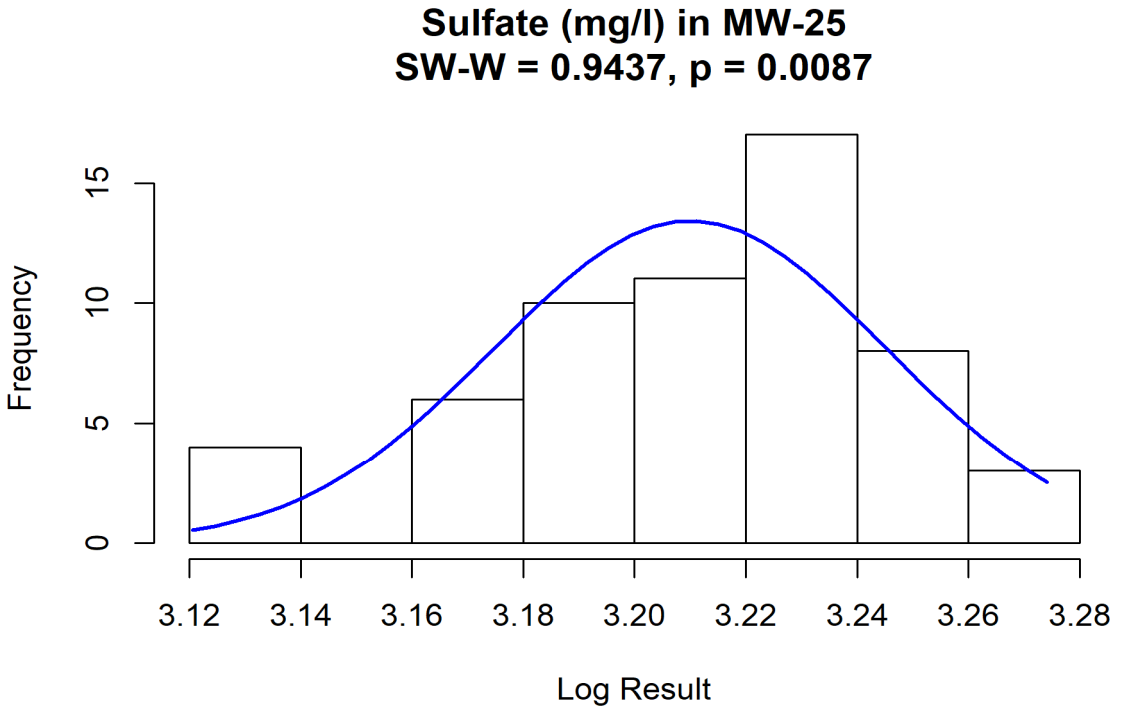
APPENDIX C-6
Histograms for pH and Indicator Parameters in MW-25



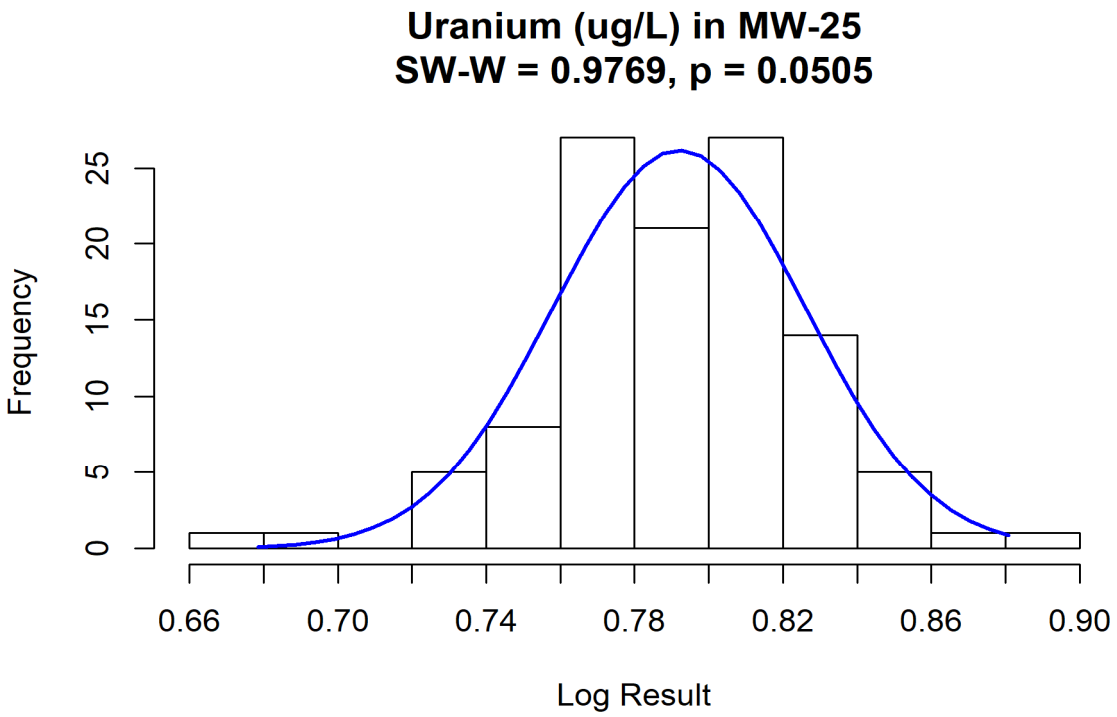


APPENDIX C-6
Histograms for pH and Indicator Parameters in MW-25



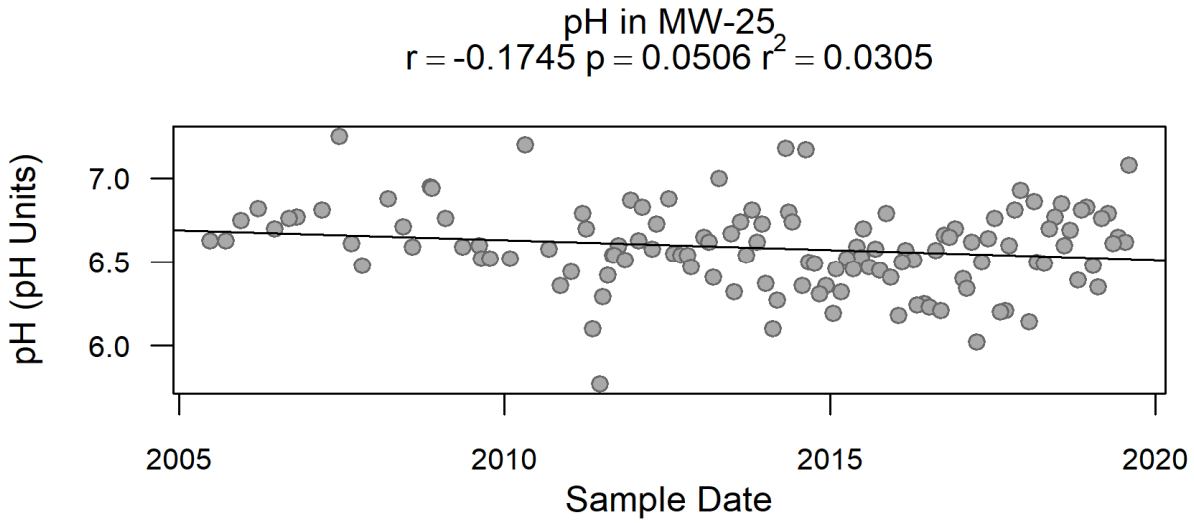


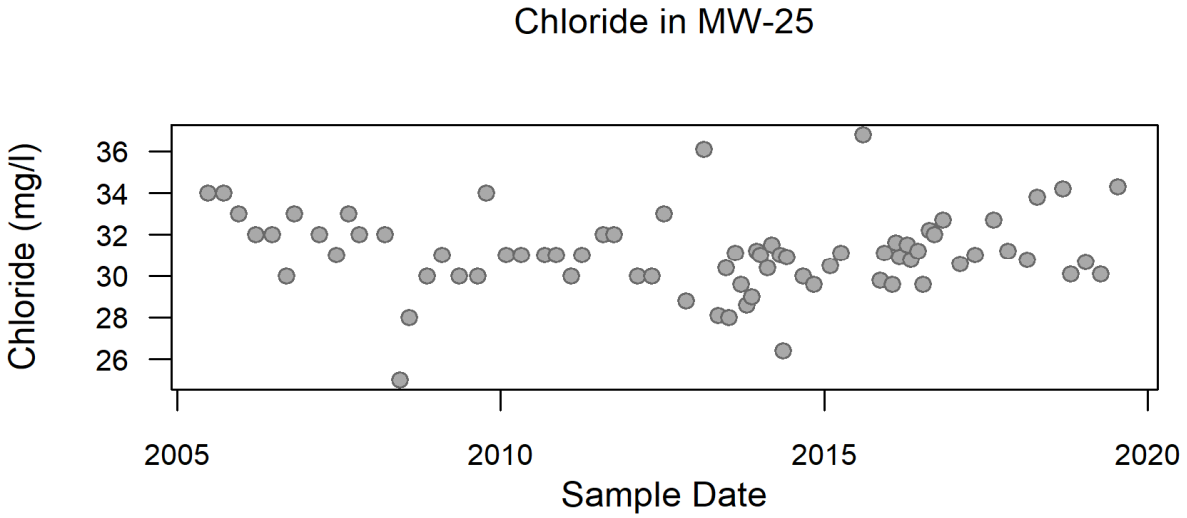
APPENDIX C-6
Histograms for pH and Indicator Parameters in MW-25

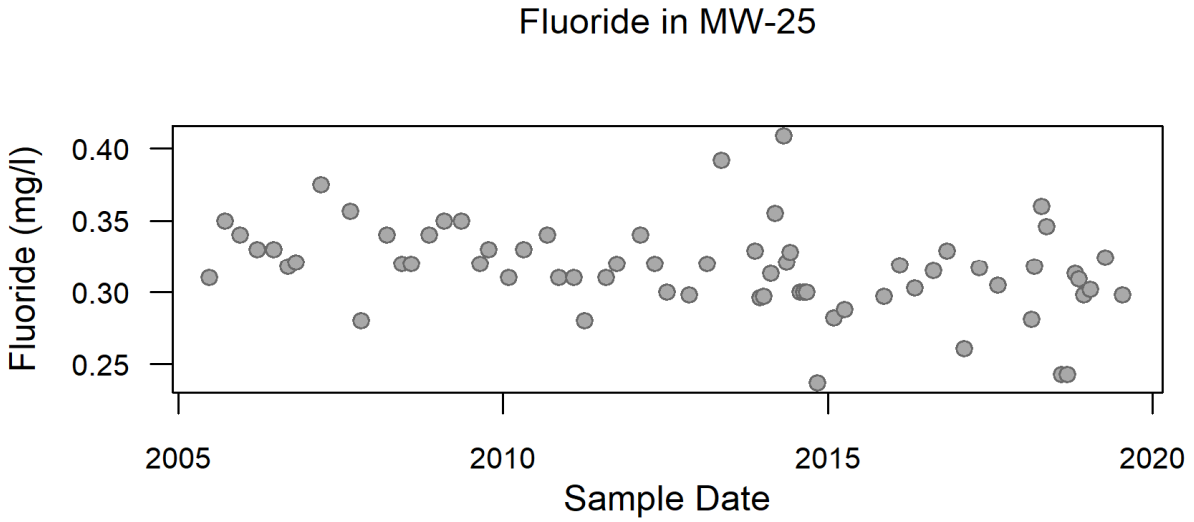


APPENDIX C-7

Time Series Plots and Linear Regressions for pH and Indicator Parameters in MW-25

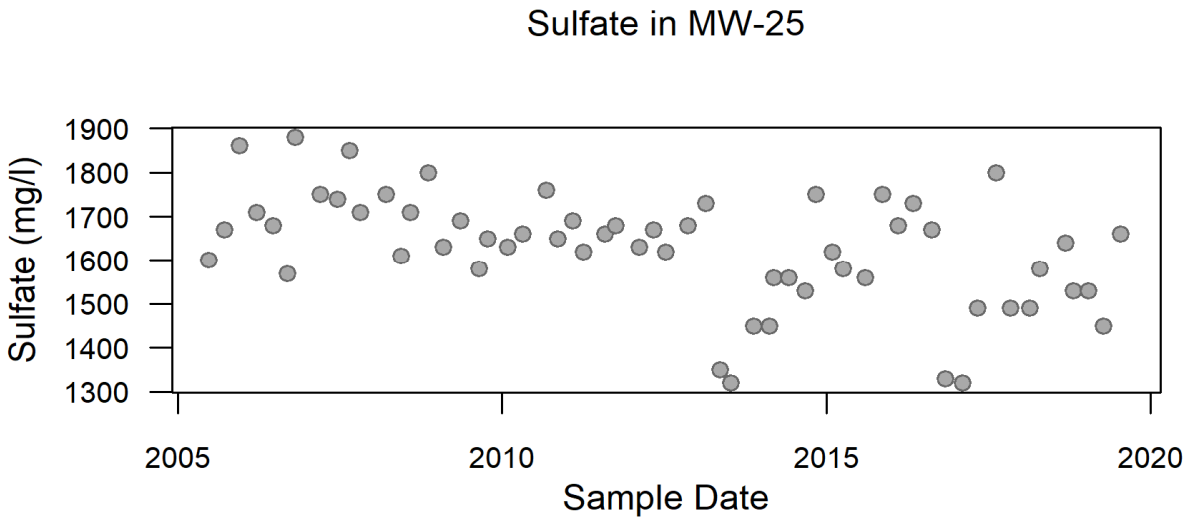


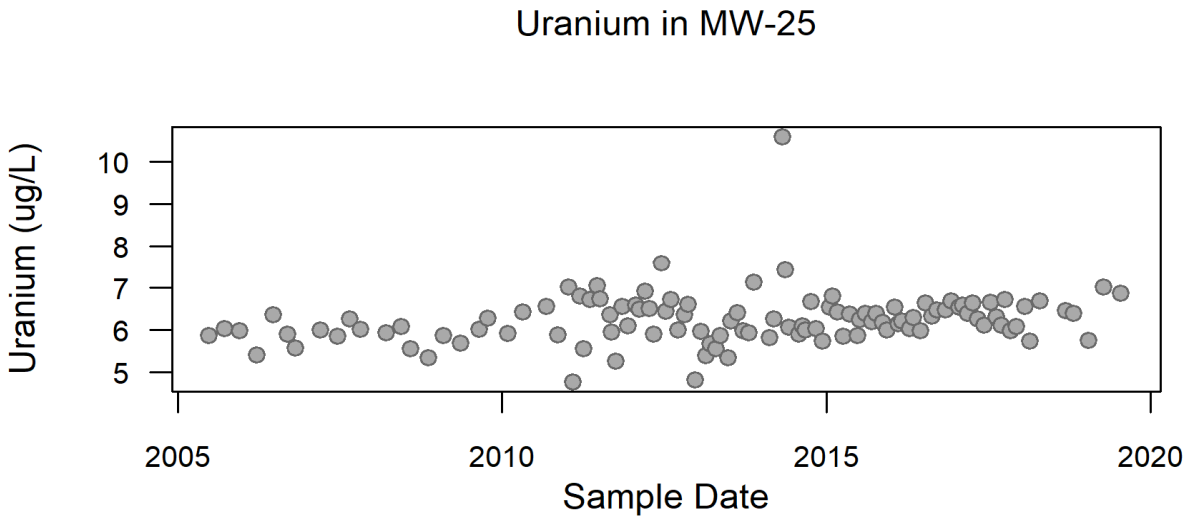




APPENDIX C-7

Time Series Plots and Linear Regressions for pH and Indicator Parameters in MW-25





Notes:

Indicates a detected result

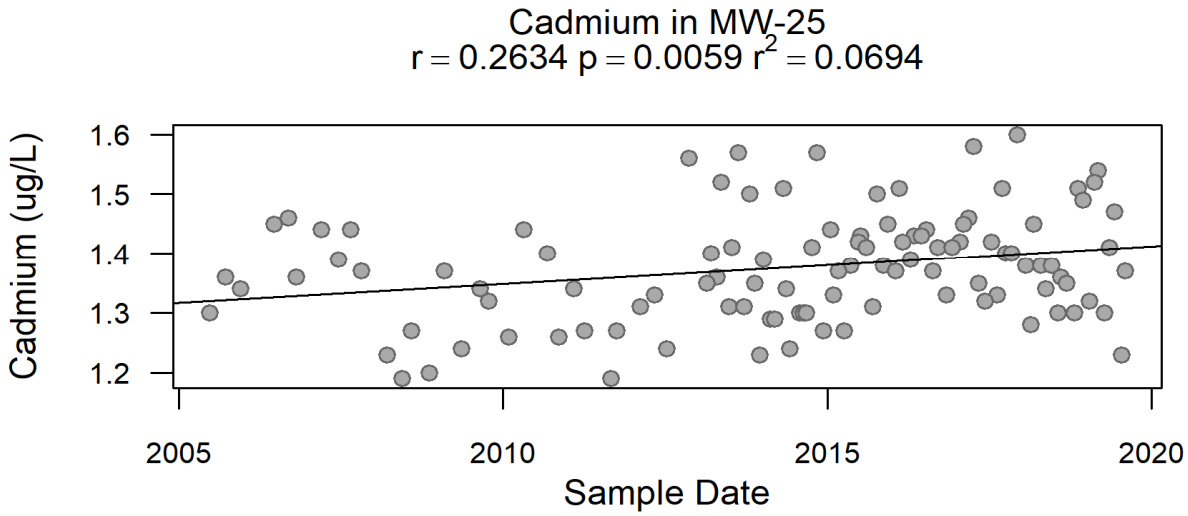
Indicates a non-detect result

APPENDIX D

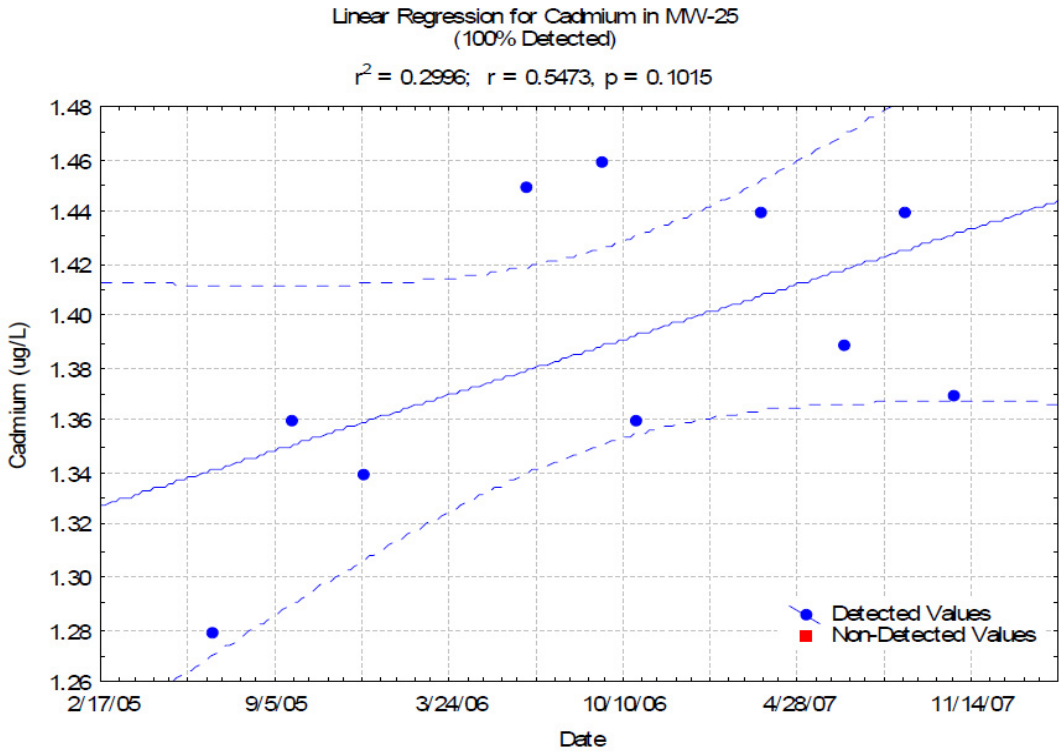
Time Concentration Plots Compared to Background Report Plots

APPENDIX D
Time Concentration Plots Compared to Background Report Plots

Cadmium in MW-25 from 2019 SAR

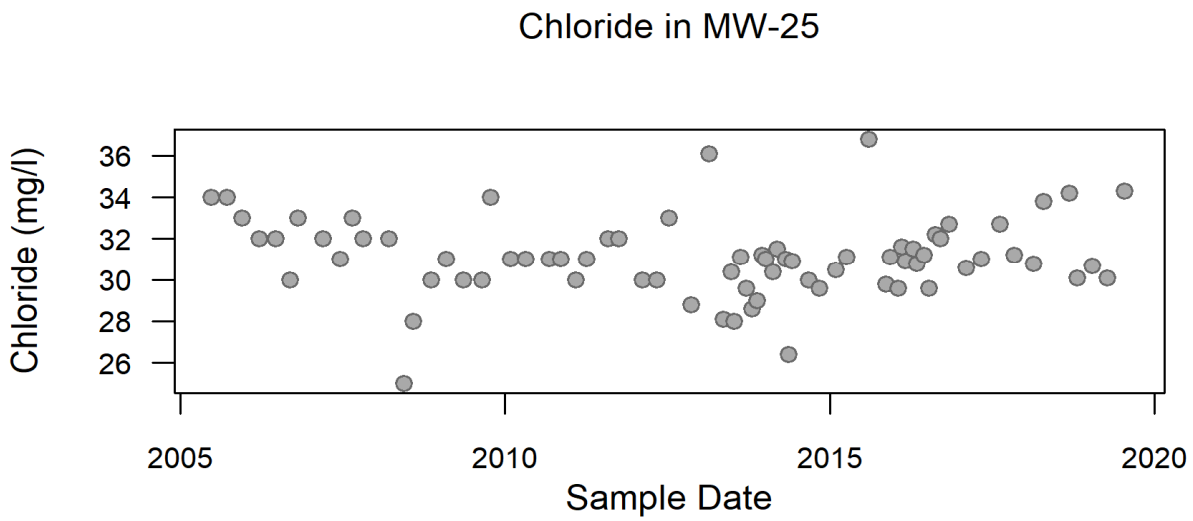


Cadmium in MW-25 from Existing Wells Background Report

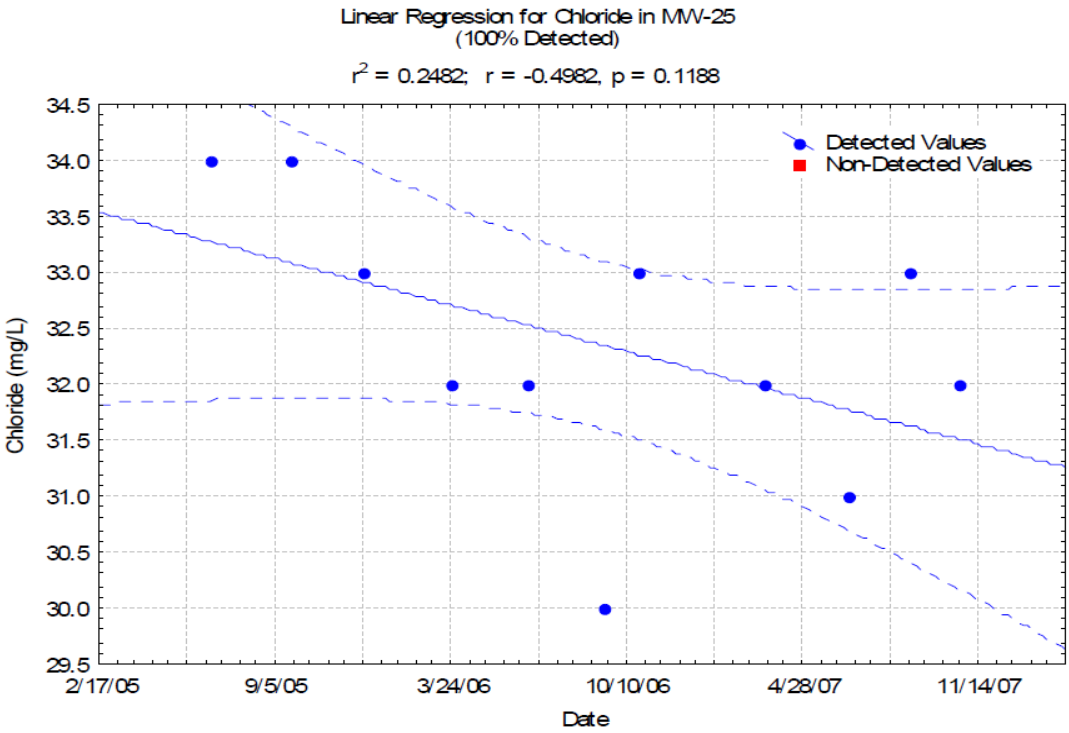


APPENDIX D
Time Concentration Plots Compared to Background Report Plots

Chloride in MW-25 from 2019 SAR

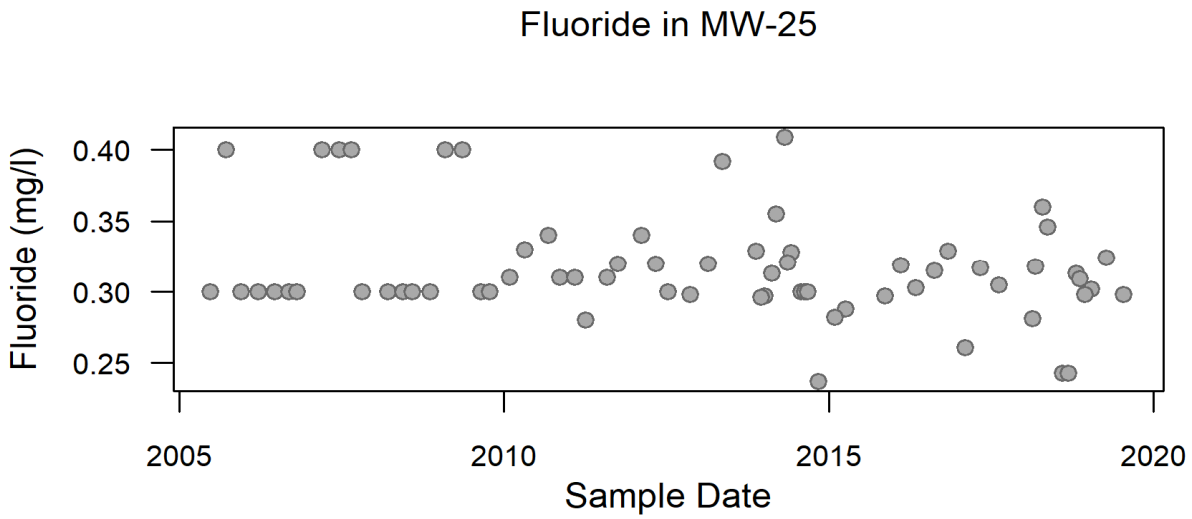


Chloride in MW-25 from New Wells Background Report

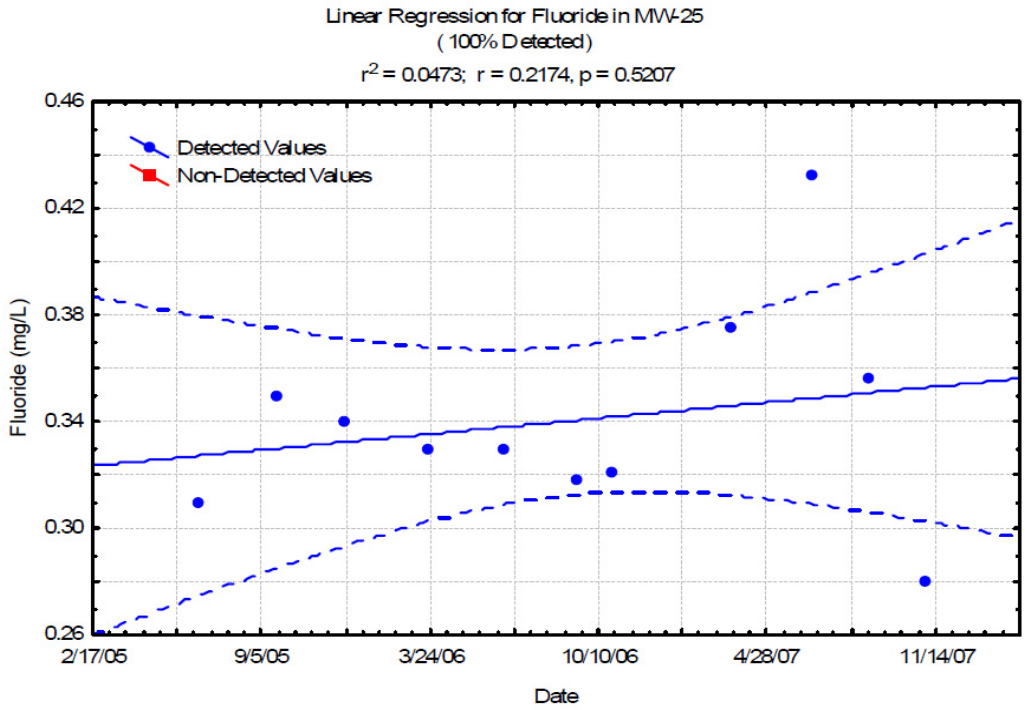


APPENDIX D
Time Concentration Plots Compared to Background Report Plots

Fluoride in MW-25 from 2019 SAR

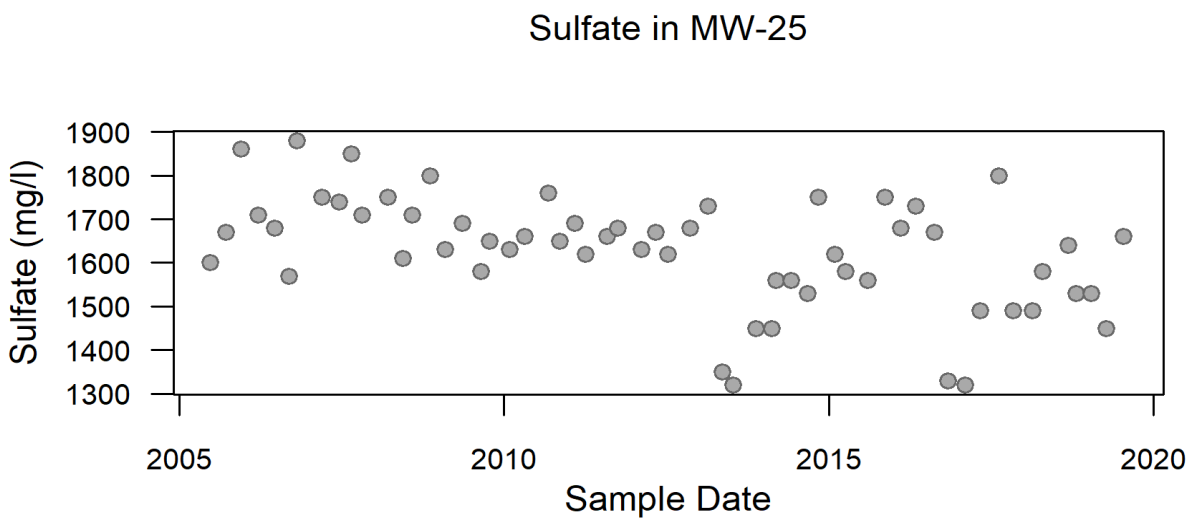


Fluoride in MW-25 from New Wells Background Report

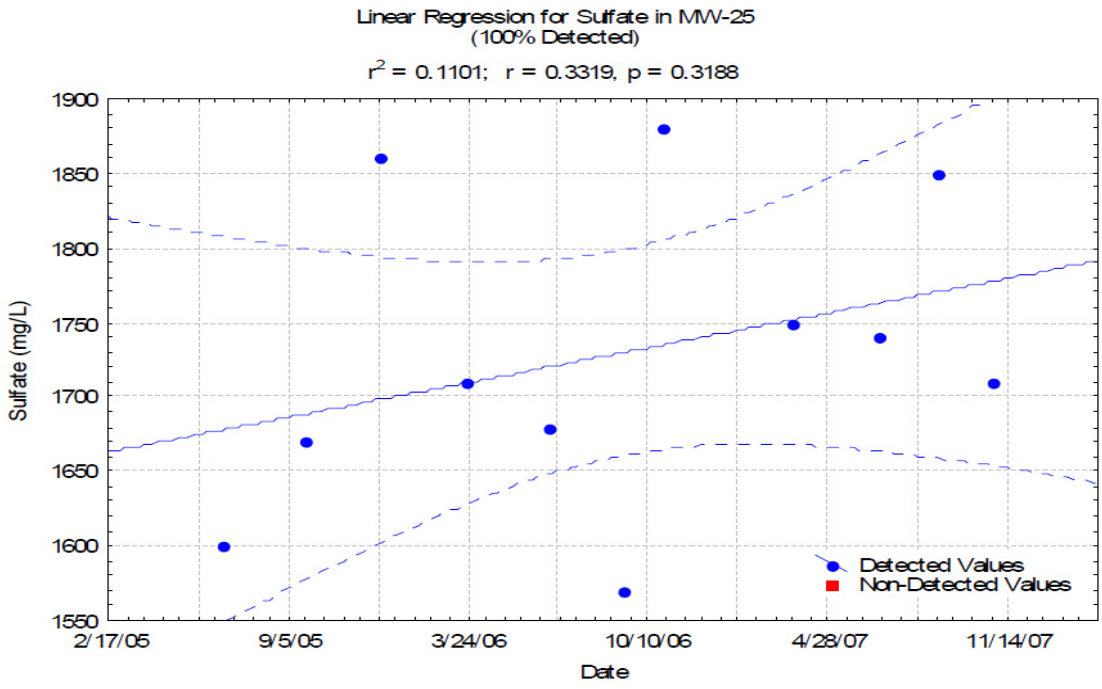


APPENDIX D
Time Concentration Plots Compared to Background Report Plots

Sulfate in MW-25 from 2019 SAR

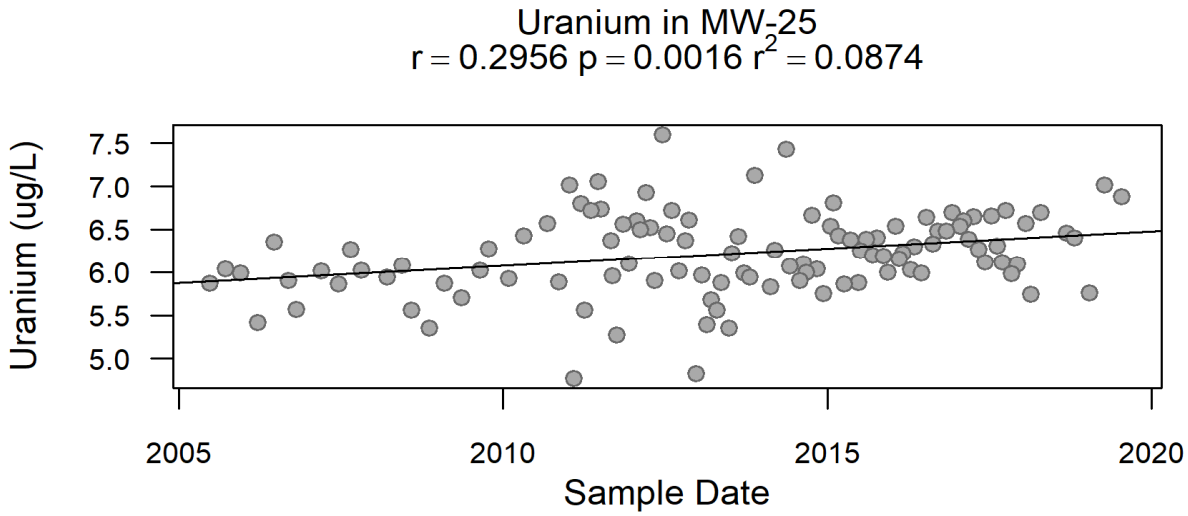


Sulfate in MW-25 from New Wells Background Report

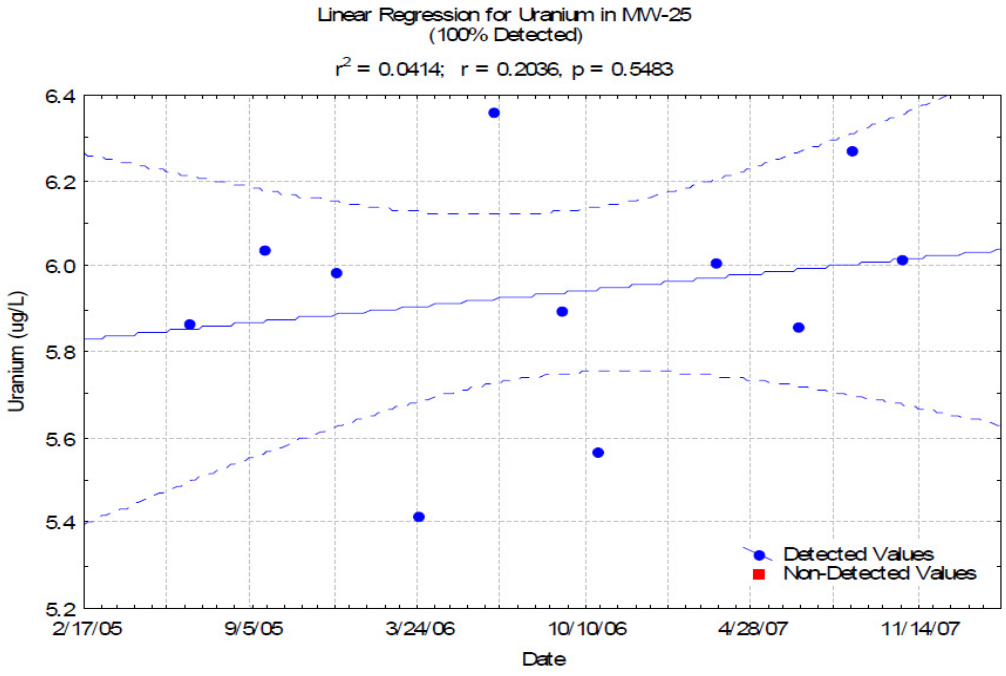


APPENDIX D
Time Concentration Plots Compared to Background Report Plots

Uranium in MW-25 from 2019 SAR



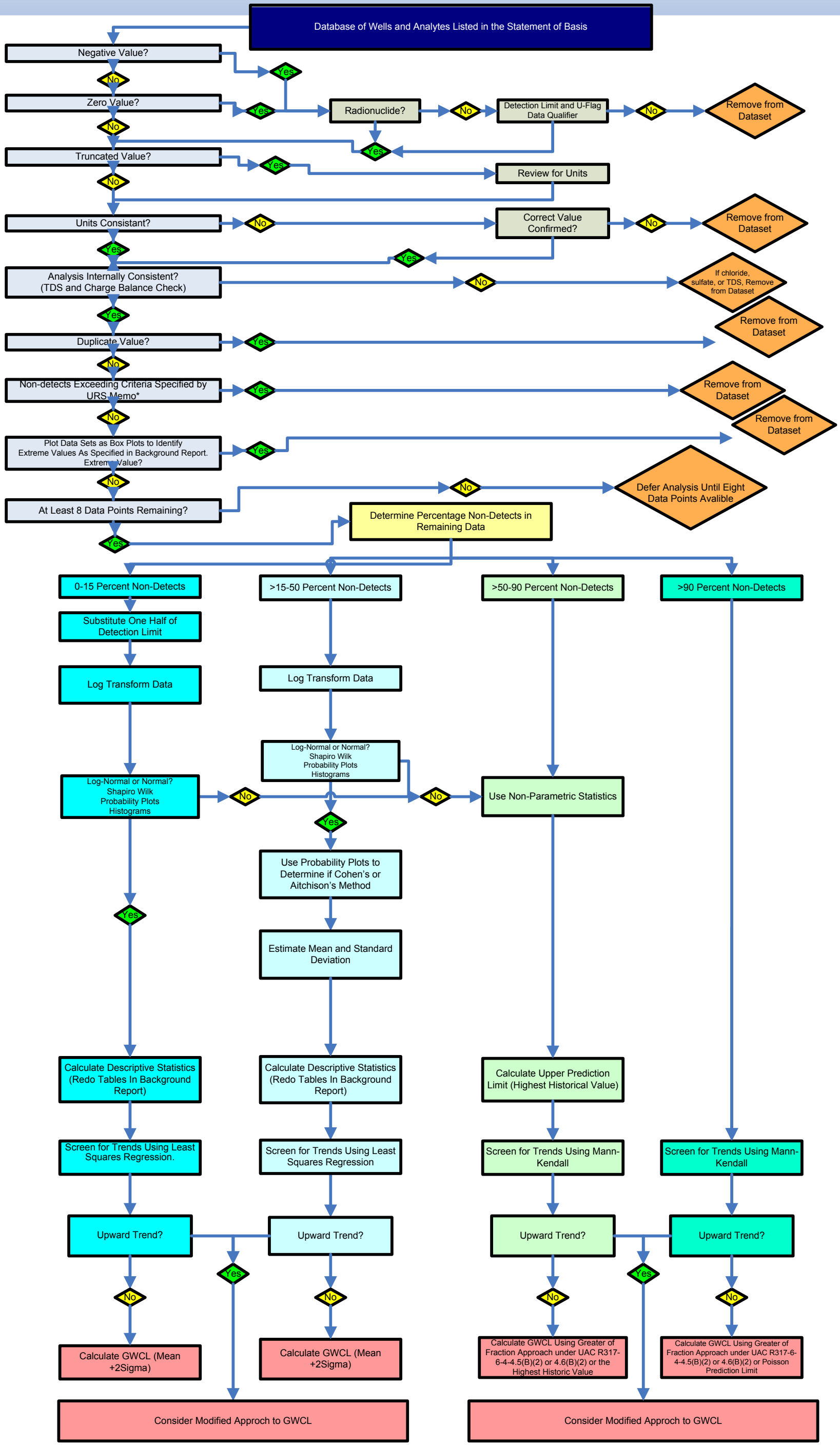
Uranium in MW-25 from New Wells Background Report



APPENDIX E

Flowsheet
(Groundwater Data Preparation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site (INTERA, 2007a)

Appendix E. Flowsheet
Groundwater Data Preparation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site, San Juan County, Utah



*A non-detect considered "insensitive" will be the maximum reporting limit in a dataset and will exceed other non-detects by, for example, an order of magnitude (e.g., <10 versus <1.0 µg/L). In some cases, insensitive non-detects may also exceed detectable values in a dataset (e.g., <10 versus 3.5 µg/L).

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APPENDIX F

Input and Output Files (Electronic Only)