Energy Fuels Resources (USA) Inc.
225 Union Blvd. Suite 600
Lakewood, CO, US, 80228
303 974 2140
www.energyfuels.com

June 24, 2016

Sent VIA E-MAIL AND OVERNIGHT DELIVERY

Mr. Scott Anderson
Director 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-18 and MW-24, White Mesa Mill Groundwater Discharge Permit UGW370004

Dear Mr. Anderson:

Enclosed are two copies of Energy Fuels Resource (USA) Inc.'s ("EFRI's") Source Assessment Report ("SAR") for sulfate in MW-18 and fluoride, field pH, cadmium and thallium in MW-24, at the White Mesa Mill. Sulfate in MW-18 and field pH and fluoride and field pH in MW-24 exceeded their Groundwater Compliance Limits ("GWCLs") in the third and fourth quarter of 2015. On February 11, 2016, EFRI submitted a notice ("4th Quarter 2015 Exceedance Notice") to the Director under Part I.G.1 (a) of the Groundwater Discharge Permit ("GWDP") providing notice that the concentrations of specific constituents in the monitoring wells at the Mill exceeded their respective GWCLs. As required by Part I.G.4(d) of the GWDP, EFRI submitted a Plan and Time Schedule ("Q4 2015 Plan and Time Schedule") for the assessment of MW-18 and MW-24 for the fourth quarter of 2015, which covers the constituents that were identified as exceeding the GWCLs. EFRI is voluntarily adding cadmium and thallium in MW-24, which were not included in the Q4 2015 Plan and Time Schedule. The Q4 2015 Plan and Time Schedule was submitted on March 3, 2016, and was approved by the DWMRC in correspondence dated March 30, 2016. 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
Harold R. Roberts
David E. Turk
Logan Shumway

SOURCE ASSESSMENT REPORT FOR MW-18 AND MW-24 WHITE MESA URANIUM MILL

Blanding, Utah

Prepared for:

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

Prepared by:

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

June 24, 2016

EXECUTIVE SUMMARY

This Source Assessment Report ("SAR") is an assessment of the sources, extent, and potential dispersion of sulfate in MW-18 and fluoride, cadmium, pH, and thallium in MW-24 at the White Mesa Mill as required under State of Utah Groundwater Discharge Permit ("GWDP") UGW370004, Part I.G.4 relating to violations of Part I.G.2 of the GWDP. Each of these constituents have exhibited exceedances of the applicable Groundwater Compliance Limits ("GWCLs").

MW-18 has been included in multiple recent investigations and reports, including the *Evaluation of Available Pre-Operational and Regional Background Data, Background Groundwater Quality Report: Existing Wells for Denison Mines* ("Existing Wells Background Report") (INTERA, 2007), an isotopic investigation (Hurst and Solomon, 2008), and a 2012 *Source Assessment Report* ("2012 SAR") (INTERA, 2012a,). Sulfate concentrations in MW-18 were identified as significantly increasing at the time of the Existing Wells Background Report and at the time of the 2012 SAR. Thallium and total dissolved solids exceedances in MW-18 were assessed and included in the 2012 SAR. The 2012 SAR noted that thallium and total dissolved solids trends were previously identified in the Existing Wells Background Report and concluded that increasing concentrations of thallium were most likely due to the site-wide decrease in pH, and that increases in total dissolved solids were most likely due to the proximity of MW-18 to the upper wildlife ponds and their contribution to elevated groundwater levels.

In a letter dated April 25, 2013, the State of Utah Division of Waste Management and Radiation Control ("DWMRC")[1] approved the removal of GWCLs in upgradient wells MW-01, MW-18, and MW-19 (DWMRC, 2013); however until the renewal of the GWDP, these wells are required to adhere to the GWCLs in the existing GWDP (DWMRC, 2012). Behavior of groundwater in MW-18 has not changed significantly since the time of the Existing Wells Background Report.

Previous investigations into groundwater conditions in MW-24 include *Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site* (INTERA, 2008), the 2012 SAR (INTERA, 2012a), *PH Report White Mesa Uranium Mill* (INTERA, 2012b), and *Investigation of Pyrite in the Perched Zone, White Mesa Uranium Mill Site* ("Pyrite Investigation") (HGC, 2012).

Cadmium and thallium concentrations were identified as significantly increasing at the time of the 2012 SAR. The 2012 SAR examined the increasing concentrations of cadmium and thallium in MW-24 and concluded that the increase in these metals was most likely due to natural background influences, specifically the site-wide decrease in pH, and that GWCLs should be revised using all

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

available data to date in order to accurately reflect variations in background. The Pyrite Investigation (HGC, 2012) was performed to test the hypothesis that the site-wide decrease in pH may be due to oxidation of pyrite in the Dakota Sandstone and Burro Canyon Formations. Results of the Pyrite Investigation show that MW-24 contains pyrite detected analytically by X-ray Diffraction, supporting the conclusion that pH is decreasing due to oxidation of pyrite. In a letter dated April 25, 2013, DWMRC approved the revised GWCLs for cadmium and thallium in MW-24.

As the results of this analysis will demonstrate, concentrations of sulfate in MW-18 and cadmium, fluoride, pH, and thallium in MW-24 are consistent with conclusions presented in the 2012 SAR and other recent analyses. Groundwater in MW-18 has not changed significantly since the time of the Existing Wells Background Report. Groundwater in MW-24 continues to become more acidic, consistent with the site wide decline in pH likely due to the oxidation of pyrite (HGC, 2012). Exceedances in parameters analyzed in this report can be attributed to natural background and site-wide influences (decreasing pH).

In accordance with the DWMRC-approved Flowsheet (INTERA, 2007), increasing trends necessitate a modified approach for calculation of GWCLs. The modification in this approach uses the higher of the highest historical value (or lowest historical value for pH) or the mean plus two standard deviations (or mean minus two standard deviations for pH) as the proposed GWCL. 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's Unified Guidance (USEPA, 2009). Such revisions account for the trends and minimize unwarranted out-of-compliance status in such wells.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDICES (CONTINUED)

ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
AWAL	American West Analytical Laboratory
Background Reports	Refers to Existing Wells Background Report (INTERA, 2007) and New Wells Background Report (INTERA, 2008)
CFCs	chlorofluorocarbons
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) Inc.
Existing Wells Background Report	*Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site*
GWCL	Groundwater Compliance Limit
GWDP	State of Utah Ground Water Discharge Permit UGW370004
GWQS	Groundwater Quality Standard
INTERA	INTERA Incorporated
mg/L	milligrams per liter
Mill	White Mesa Uranium Mill
New Wells Background Report	*Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site*
NTU	Nephelometric Turbidity Unit
OOC	out-of-compliance
pH Report	*PH Report White Mesa Uranium Mill, Blanding, Utah*
Pyrite Investigation	*Investigation of Pyrite in the Perched Zone, White Mesa Uranium Mill Site*
RL	Laboratory reporting limit
SAR	Source Assessment Report
s.u.	standard units for pH
TDS	Total Dissolved Solids

ABBREVIATIONS AND ACRONYMS (CONTINUED)

University of Utah Study	*Summary of Work Completed, Data Results, Interpretations and Recommendations for the July 2007 Sampling Event at the Denison Mines, USA, White Mesa Uranium Mill Near Blanding Utah*
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 this site is regulated under the State of Utah Groundwater Discharge Permit ("GWDP") UGW370004. 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 sulfate in groundwater compliance monitoring well MW-18 and cadmium, fluoride, pH, and thallium in groundwater compliance monitoring well MW-24.

Part I.G.2 of the GWDP provides that an out-of-compliance ("OOC") status exists when the concentration of a constituent in two consecutive samples from a compliance monitoring point exceeds a groundwater compliance limit ("GWCL"), as specified in Table 2 of the GWDP. 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; however, 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 site and developing more specific GWCLs under the GWDP. As required by then Part I.H.3 of the GWDP, EFRI submitted the following to the Director (the "Director") of the State of Utah Division of Waste Management and Radiation Control ("DWMRC")[2] (the Director was formerly the Executive Secretary of the Utah Radiation Control Board and the Co-Executive Secretary of the Utah Water Quality Board):

- 2007. *Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site*. November 16. Prepared by INTERA. ("Existing Wells Background Report")
- 2008. *Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s Mill Site.* April 30. Prepared by INTERA ("New Wells Background Report")

These reports will be referred to individually by their respective names and collectively as the "Background Reports."

Based on a review of the Background Reports and other information and analyses, the Director re-opened the GWDP and modified the GWCLs to be equal to the mean concentration plus two standard deviations or the equivalent. The modified GWCLs became effective on January 20, 2010.

The SARs for White Mesa Uranium Mill are summarized in **Table 1:**

[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 Investigation, 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	N/A	Cadmium, Zinc, Beryllium, Nickel - MW-03
12/3/2015	Q4 2015	4/4/2016	6/28/2016		SO4 – MW-18 F, pH, Cd, Tl – MW-24

Notes:
Q = Quarter
OOC = out of compliance

On February 11, 2016, EFRI submitted a notice ("4th Quarter 2015 Exceedance Notice") 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 the fourth quarter of 2015 and indicating which of those constituents had two consecutive exceedances as of that quarter. A plan and time schedule for MW-18 and MW-24 for the fourth quarter of 2015 ("Q4 2015 Plan and Time Schedule") covers the constituents that were identified as exceeding the revised GWCLs that had been previously approved by the DWMRC. EFRI is voluntarily adding cadmium and thallium in MW-24, which were not included in the Q4 2015 Plan and Time

Schedule. The Q4 2015 Plan and Time Schedule was submitted on March 3, 2016, and was approved by the DWMRC in correspondence dated March 30, 2016.

This SAR addresses the constituents that were identified as exceeding the previously revised GWCLs in the fourth quarter of 2015 as described in the DWMRC-approved Q4 2015 Plan and Time Schedule. As noted above, this SAR also addresses cadmium and thallium in MW-24, which EFRI has added voluntarily.

1.1 Source Assessment Report Organization

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 GWCLs 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 the SAR.

The appendices comprise the analyses performed for this Report and are organized in the following manner: **Appendix A** contains a table showing exceedances. **Appendix B** contains the geochemical analysis performed on sulfate in MW-18 and fluoride, cadmium, pH, and thallium in MW-24. **Appendix C** contains the indicator parameter analysis performed on MW-18 and MW-24. **Appendix D** contains the pH analysis performed on MW-24. **Appendix E** contains data plots for SAR constituents and indicator parameters in MW-18 and MW-24 compared to the data plots from the Background Reports using all available data to date. **Appendix F** contains the *Groundwater Data Preparation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site, San Juan County, Utah* ("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. **Appendix G** 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 software package "R" during this assessment. R is a free statistical package that allows the analyst to perform statistical analysis and format and output graphs more effectively than the Statistica software package. The Flowsheet process was performed in the same manner. Input and output files included in **Appendix G** can be imported into either R or Statistica to recreate the results presented in this Report.

2.0 CATEGORIES AND APPROACH FOR ANALYSIS

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

1. Constituents in wells with previously identified rising trends.
2. Constituents in pumping wells.
3. Constituents potentially impacted by decreasing trends in pH across the Mill site.
4. Newly installed wells with interim GWCLs.
5. Other constituents and wells.

This SAR addresses sulfate in MW-18 and pH in MW-24, which fall into category 1, constituents in wells with previously identified trends, as sulfate concentrations in MW-18 were identified as significantly increasing at the time of the Existing Wells Background Report (INTERA, 2007). pH in MW-24 was also identified as decreasing at the time of the New Wells Background Report (INTERA, 2008); however it was determined that laboratory pH was used for the background report analysis. Subsequent investigations using pH obtained in the field were completed in 2012 (INTERA, 2012a, 2012b), with identification of significantly decreasing trends in pH in MW-24. Cadmium and thallium in MW-24 fall into category 3, constituents potentially impacted by decreasing trends in pH across the Mill site. The mobility of cadmium and thallium in groundwater is sensitive to decreases in pH, and pH is decreasing site-wide, due to oxidation of pyrite (HGC, 2012). Fluoride and pH in MW-24 fall into category 5, other constituents and wells.

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 caused by background 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, a revised GWCL is proposed to reflect changes in background conditions at the Mill site.

Assessments for potential sources of cadmium and thallium in MW-24 have been performed in the 2012 SAR (INTERA, 2012a). Fluoride, an indicator parameter in MW-24, was included in the 2012 analysis.

Assessment of the site-wide pH trend has been performed in *PH Report White Mesa Uranium Mill* ("pH Report") (INTERA, 2012b), and *Investigation of Pyrite in the Perched Zone, White Mesa Uranium Mill Site* ("Pyrite Investigation") (HGC, 2012).

Analysis of sulfate as an indicator parameter in MW-18 was performed during the 2012 SAR (INTERA, 2012a). The analysis performed in this SAR considers all available data to date to evaluate the behavior of the constituents in these wells. 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 and/or the 2012 SAR that may suggest a change in the behavior of the groundwater in that well.

As discussed in detail in Section 9.0 of the Existing Wells Background Report (INTERA, 2007), chloride is the best indicator of potential tailings system seepage, followed by fluoride and then sulfate due to their high mobility and concentration in tailings system porewater relative to common metals. Uranium is probably the most mobile of trace (metal) elements and is the best indicator parameter for metals and radionuclides. Any potential seepage from the tailings system would be expected to exhibit increasing concentrations of chloride, followed by fluoride, sulfate, and uranium. While uranium may be the most mobile of trace (metal) elements, it is typically retarded behind chloride, fluoride, and sulfate and would likely not be expressed in groundwater until sometime after chloride, fluoride, and sulfate concentrations had begun to rise (INTERA, 2007). This is because uranium is prone to oxidation and transport at low pH, as well as precipitation or sorption near neutral pH.

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 the Existing Wells Background Report). Therefore, in situations where there is a significant rising trend in concentrations of chloride or in other indicator parameters, other evaluations would need to be performed. The additional evaluations would assess the behavior of the other indicator parameters and whether or not the concentrations, mass balance, and other factors indicate a potential tailings system leak.

The geochemical analysis of sulfate in MW-18 and fluoride, cadmium, thallium, and pH in MW-24, along with indicator parameters from each well, was supported by a statistical analysis that followed the process outlined in the Flowsheet (INTERA, 2007), a copy of which is attached as **Appendix F.** 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.

2.1.1 Constituents in Wells with Previously Identified Trends

Sulfate concentrations in MW-18 were identified as significantly increasing at the time of the Existing Wells Background Report (INTERA, 2007) and at the time of the 2012 SAR (INTERA, 2012a). pH has been decreasing site wide since the time of the Background Reports

and was the subject of a pH Report and a Pyrite Report (INTERA, 2012a; HGC, 2012). pH in MW-24 was identified as decreasing at the time of the New Wells Background Report (INTERA, 2008); however it was determined that laboratory pH was used for the background report analysis. Subsequent investigations using pH obtained in the field were completed in 2012 (INTERA, 2012a, 2012b). pH in MW-24 was identified as significantly decreasing at the time of the pH Report.

Although other constituents included in this SAR also fall into categories as described below, most have been identified as having significantly increasing trends in investigations subsequent to the Background Reports. Cadmium and Thallium concentrations in MW-24 were identified as significantly increasing at the time of the 2012 SAR (INTERA, 2012a).

2.1.2 Constituents Potentially Impacted by Decreasing pH Trends Across the Mill Site

The mobility of cadmium and thallium is sensitive to low pH. A decreasing trend in pH has been observed in almost every groundwater monitoring well across the Mill site, including upgradient (MW-01, MW-18, and MW-19) and far downgradient (MW-03A) monitoring wells. Significantly decreasing pH is observed in MW-24, where decreasing pH may be resulting from oxidation of pyrite (HGC, 2012). Section 3.3 presents the pH analysis for MW-24.

2.1.3 Other Constituents and Wells

Fluoride in MW-24 falls into category 5, "other constituents and wells" as defined in the 2012 SAR (INTERA, 2012a). To assess constituents that fall into this category, all available data were used to determine whether or not there is any new information that would suggest that the conclusions from previous analyses conducted in the Background Reports and approved SARs may have changed since the time of those reports.

2.2 Approach for Setting Revised GWCLs

If the preceding approach resulted in the conclusion that the prior analysis in the Background Reports or most recently approved SARs has not changed, or that the OOC status of sulfate in MW-18 and cadmium, fluoride, thallium, and pH in MW-24 is due to natural site-wide influences, then new GWCLs may be proposed for the constituents. In proposing revised GWCLs, INTERA has adopted the approach in the DWMRC-approved Flowsheet, 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.

Appendix B-1 summarizes the geochemical analysis for SAR parameters in MW-18 and MW-24 and presents the revised GWCLs for those parameters based on the Flowsheet.

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 age, in order to evaluate whether or not the increasing and elevated trace metal concentrations in monitoring wells at the Mill (all of which were identified in the Background Reports) 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, including MW-18. Although MW-24 was not included, MW-2, located just downgradient from MW-24, was included. In addition, surface water samples were collected from 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:

> *[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.*

3.0 RESULTS OF ANALYSIS

This section describes the results of the analysis, summaries of which are provided in **Appendix B-1, Appendix C-1**, and **Appendix D-1.** Supporting analyses are presented in **Appendix E.**

3.1 Changes in Groundwater

The following sections describe changes, events, and other factors that may be influencing the behavior of constituents in MW-18 and MW-24.

3.1.1 Well Redevelopment

Well redevelopment, including surging and over-pumping of certain existing wells that exceeded 5 Nephelometric Turbidity Units (NTU), was performed in several site wells in 2010 and 2011. Redevelopment was required by DWMRC to provide evidence that traditional well development techniques for these wells had been exhausted prior to obtaining a variance in turbidity monitoring requirements. The aggressive well redevelopment activities appeared to have irreversibly disturbed the formation and did not result in improvement of groundwater turbidity across the site (HGC, 2011).

Surging and bailing was performed on MW-24 on April 14, 2011. MW-24 was over-pumped on May 5, 2011. Field forms reveal that MW-24 was surged and bailed dry, and that there was not enough water for over-pumping. Variations in concentrations of cadmium, fluoride, and thallium are visible in time series plots (**Appendix B-9**) around the time of redevelopment.

No redevelopment was conducted at monitoring well MW-18.

3.1.2 Geochemical Influences

The Pyrite Investigation (HGC, 2012) attributes the decline in pH across the Mill site to the site-wide, apparently ubiquitous existence and oxidation of pyrite in the perched zone at the site. Drill core from MW-24 contains pyrite detected by X-ray Diffraction, providing evidence that pH is decreasing due to oxidation of that pyrite. The solubility of cadmium and thallium are influenced by low pH, as discussed in further detail in Section 3.3.

3.1.3 Hydrologic Influences

Water in MW-18 has been influenced by its proximity to the northern historic pond and /or the wildlife pond. Groundwater elevation in MW-18 increased 22 feet in 18 years. Since the wildlife ponds were removed from use, water levels in MW-18 appear to have reached a maximum elevation and appear to be decreasing (**Figure 2**). Specifically, in MW-18, the water level elevations are higher than water elevations in the Burro Canyon Aquifer beneath all of the Mill tailings cells.

Additionally, this monitoring well is located north and northeast of the tailings cells, local groundwater flow is to the south southwest. MW-24 is not affected by the former wildlife ponds, and has indicated a much smaller increase in water levels of approximately two feet over the last 12 years (**Figure 2**).

3.1.4 Analytical Influences

In the fourth quarter of 2012, EFRI switched analytical laboratories from Energy Laboratory to American West Analytical Laboratory ("AWAL"). Most constituents included in this SAR exhibit apparent increased variability after the laboratory change (**Figure 3**). Although variability of concentrations in the levels of constituents is evident around the time a switch was made to a new laboratory, this change may not be solely attributed to the use of a new laboratory.

3.2 Indicator Parameter Analysis

A summary of geochemical analysis of indicator parameters is included in **Appendix C-1**. **Appendix C-2** presents a descriptive statistics comparison for indicator parameters from the Background Report and the 2012 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 data sets are demonstrated in the box plots included in **Appendix C-5.** A Piper diagram, which can be used to distinguish between different waters, is presented in **Appendix C-6.** The most recent data records for MW-18, MW-24, MW-1, MW-3, MW-3A, MW-18, and Cell 1 are plotted on the Piper diagram. The diagram illustrates that the relationship of the cations and anions differs between water from MW-18 and MW-24 and water from Cell 1. The most significant difference between water from Cell 1 and regional groundwater from the monitoring well network is that the major cations in Cell 1 water are sodium (Na), potassium (K), and magnesium (Mg); calcium (Ca) content is negligible. In contrast, calcium comprises about 30-70 percent of the major cations in the groundwater monitoring wells. The major anion in all waters is sulfate, making the anionic constituents a poor indicator of water types in this case.

3.2.1 MW-18

Chloride, sulfate, and uranium concentrations in MW-18 are exhibiting statistically significant increasing trends (see **Appendix C-8** for indicator parameter plots). At the time of the Existing Wells Background Report, chloride was increasing; however, the increase was not statistically significant. Also at the time of the Existing Wells Background Report, sulfate and uranium concentrations were significantly increasing. At the time of the 2012 SAR, chloride, sulfate, and uranium concentrations in MW-18 were increasing significantly. Fluoride concentrations continue to exhibit a significantly decreasing trend in MW-18.

3.2.2 MW-24

Chloride, sulfate, and uranium concentrations in MW-24 are not exhibiting any trends (**Appendix C-1 and C-8**). Fluoride concentrations are exhibiting a significantly increasing trend. At the time of the New Wells Background Report, the number of records per data set was between eight and ten. Chloride and uranium concentrations were decreasing; fluoride and sulfate were not exhibiting any trend.

3.3 pH Analysis

Due to the increase in cadmium and thallium concentrations in MW-24 and their presumptive relationship to decreasing pH, a pH analysis was performed in addition to the geochemical analysis for MW-24 (see **Appendix D**). The pH analysis included using box plots to identify and omit extreme outliers, performing the Shapiro-Wilk test of normality (Shapiro and Wilk, 1965), and then testing for trends using either the least squares regression or the Mann-Kendall method (see **Appendices D-3** through **D-6**). The results of the pH analysis in MW-24 show a significantly decreasing trend in pH. Oxidation of pyrite can result in decreasing pH. Decreasing pH can also increase the solubility of minerals that potentially contain naturally occurring cadmium and thallium, which could be the cause of, or could contribute to, the increasing trends in cadmium and thallium in MW-24 over time.

3.4 Constituents in Wells with Previously Identified Increasing Trends

As described in Section 2.1.1, most of the constituents included in this SAR have increasing trends that were identified in SARs subsequent to the Background Reports; however these constituents also fall into categories as described below.

3.4.1 Sulfate in MW-18

Sulfate concentrations in upgradient well MW-18 have been significantly increasing since the time of the Existing Wells Background Report. Indicator parameters chloride, sulfate, and uranium have been increasing since the Existing Wells Background Report.

A possible explanation for the trends in MW-18 was discussed in detail in Section 12 of the Existing Wells Background Report, where it was posited that the increasing trends could be attributed to the rise in water levels seen in the wells since 1993, which have resulted from the periodic recharge of the upper wildlife pond at the Mill site, introducing oxygen-rich water to the vadose zone. In MW-18, the water level elevations are higher than water elevations in the Burro Canyon Aquifer beneath all of the Mill tailings cells. Additionally, this monitoring well is located north and northeast of the tailings cells, local groundwater flow is to the south southwest. Therefore, trends in sulfate and other indicator parameters in MW-18 are not unexpected and are consistent with the previous observations in the Existing Wells Background Report. Given the

location of MW-18, the increasing trends in the constituents in MW-18, including the increasing trends in the indicator parameters, are unlikely due to Mill influences.

In addition, as discussed in more detail in Section 2.3 above, MW-18 was included in the University of Utah Study in which Hurst and Solomon concluded that "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 concentrations." Hurst and Solomon made this conclusion in light of the documented trends in sulfate and uranium in MW-18 at that time.

Therefore, it can be concluded that the behavior of constituents in MW-18 has not changed significantly since the time of the Background Reports. The trend in sulfate concentrations in MW-18 is the result of oxidation of pyrite by fresh water seepage from the wildlife ponds.

The current GWCL for sulfate in MW-18 is 1938.9 milligrams per liter (mg/L). **Appendix B-1** presents a revised GWCL for sulfate in MW-18 of 2220.3 mg/L, based on the higher of either the highest historic value or the mean plus two standard deviations, in accordance with the modified approach to GWCLs in the Flowsheet. That would be the appropriate GWCL, were a revised GWCL to be adopted. However, in accordance with a letter dated April 25, 2013, DWMRC has approved the removal of GWCLs from upgradient wells during the next GWDP amendment.

3.4.1 pH in MW-24

pH has been decreasing site-wide, and significantly decreasing in MW-24 since the time of the pH Report (INTERA, 2012b). Indicator parameters chloride, sulfate, and uranium in MW-24 are not exhibiting any increasing trends, further indicating that decreasing pH is not related to potential tailings seepage. The Pyrite Investigation (HGC, 2012) attributes the decline in pH across the Mill site to the site-wide, apparently ubiquitous existence of pyrite in the perched zone at the site. Drill core from MW-24 contains pyrite detected by X-ray Diffraction, providing evidence that supports the hypothesis that pH may be decreasing due to the oxidation of that pyrite. The Pyrite Investigation (HGC, 2012) also performed a pH-sulfate mass balance to determine (1) whether enough pyrite was available to drop the pH in MW-24 waters, (2) how much pyrite would need to be oxidized to drop the pH by 1.2 pH units, and (3) how much sulfate would be created during the oxidation of the pyrite. The Pyrite Investigation concluded that the modelled amount of sulfate produced is in agreement with the sulfate concentration increase observed in MW-24 during the course of its operation. The decrease in pH in MW-24 is due to natural site-wide influences and the GWCL should be updated to reflect these conditions.

The current GWCL for pH in MW-24 is 5.55-8.5 standard units (s.u.). **Appendix B-1** presents a revised GWCL for pH in MW-24 of 4.83-8.5 s.u., based on the lower of either the lowest historic

value or the mean minus two standard deviations, in accordance with the modified approach to GWCLs in the Flowsheet.

3.5 Constituents Potentially Impacted by Decreasing pH

Cadmium and thallium are sensitive to low pH. Site-wide pH, including MW-24, has been decreasing. Pyrite was detected analytically in core samples during the Pyrite Investigation. Oxygen transport to groundwater can be enhanced by fluctuations in the water table; caused by routine purging and sampling of wells, the increased number and frequency of sampling of the monitoring wells, and the redevelopment effort of 2010 and 2011, among other factors. MW-24 is screened above the water table, and enhanced oxygen transport in to the vadose zone from wells with screens extending above the water table is also an important mechanism (HGC, 2012).

In the absence of increasing trends in the indicator parameters (chloride, sulfate, and uranium, and most particularly chloride) in MW-24, potential seepage from the tailings cells can be ruled out as being the cause of the decreasing trend in pH in MW-24. This is because chloride moves in groundwater at the speed of water, whereas pH is affected both by transport and by chemical reactions that occur along the flowpath. Carbonate in the sub-surface formations will neutralize the pH in any potential tailings seepage, thereby increasing the pH in the seepage as it is carried by the water through the formations. Since chloride moves with the speed of the water in the formation, any influence of pH from potential tailings seepage could not be detected any faster than chloride from potential tailings seepage would be detected. Therefore, it is not possible to see a significant impact in the form of a declining trend in pH caused by any potential tailings seepage without also seeing a significant increase in chloride concentrations.

3.5.1 Cadmium in MW-24

Results of the geochemical analysis of cadmium concentrations in MW-24 show that there is a significantly increasing trend. This trend was identified during the analysis associated with the 2012 SAR and did not exist at the time of the New Wells Background Report (see **Appendix E**). However, early data show that cadmium was reported as non-detected at a Reporting Limit ("RL") of 0.5 micrograms per liter (µg/L) almost exclusively from 2005 to 2007. These non-detected values are partially responsible for the increasing trend. More importantly, however, indicator parameters chloride, sulfate, and uranium in MW-24 do not exhibit significantly increasing trends now or at the time of the Background Report (**Appendix E**).

The pH analysis in MW-24 indicates a significantly decreasing trend in pH (see **Appendices D-1** and **D-4**). The cause of the decreasing trend in pH in MW-24, and in most other monitoring wells at the site, including upgradient and far downgradient wells, has been related to the presence and potential oxidation of pyrite in the Dakota Sandstone and Burro Canyon Formations (HGC, 2012).

The decreasing trend in pH in MW-24 is the likely cause of the increasing trend in cadmium in that well. The dominant cadmium species in groundwater below pH values of 8.2 s.u. is Cd^{2+} (Rai and Zachara, 1984). At low pH, there is greater competition for negative adsorption sites that might remove Cd^{2+} ions from solution. Therefore, Cd^{2+} concentrations are expected to increase in groundwater as pH falls.

A simple ferrihydrite sorption model (**Figure 4**) shows the influence that pH has on sorption of cadmium and thallium. Amorphous iron oxy-hydroxides, commonly referred to as ferrihydrite [Fe(OH)3], are primary sorption substrate in many aquifers due to their sorptive capacity and frequent occurrence. Sorption is controlled by pH and competition for sorption sites on the sorption media, in this case ferrihydrite. The sorption curves show pH on the X axis and "Sorbed Fraction" on the Y-axis, where 1.0 corresponds with 100 percent sorption with no concentration remaining in solution and 0.0 corresponds with no sorption, where all ions remain in solution.

Note that cadmium is completely sorbed above pH ~7; the sorbed fraction decreases quickly as pH decreases, releasing the sorbed cadmium to solution. The model uses the Geochemist's Workbench FeOH_minteq.sdat sorption database, the most recent groundwater chemistry from MW-24, an oxygen fugacity [log f (O2)] of -0.68 bar, and 6.6 g/L of ferrihydrite estimated from the iron analyses from the Pyrite Investigation (HGC, 2012). Although identification of ferrihydrite was not a goal of the Pyrite Investigation, it does note that most of the cores (including MW-24) contain red, iron bearing minerals and identifies iron that is not associated with pyrite, magnetite, or hematite.

The mobility of cadmium is therefore increased in groundwater with low pH, and since the increasing trend in cadmium cannot be correlated with a significantly increasing trend in the indicator parameters, the concentration of cadmium in MW-24 can be attributed to natural background and site-wide influences. The GWCL for cadmium in MW-24 should therefore be changed to reflect these natural influences.

The current GWCL for cadmium in MW-24 is 4.28 µg/L. In accordance with the Flowsheet, a revised GWCL for cadmium in MW-24 of 6.72 µg/L (**Appendix B-1**), which is the highest historical value of cadmium in MW-24, is being proposed.

3.5.2 Thallium in MW-24

Geochemical analysis of thallium in MW-24 shows a significantly increasing trend at the time of this SAR and at the time of the 2012 SAR, but not at the time of the New Wells Background Report (see **Appendix E**). This increasing trend could be partially related to the early non-detected data, and to the decreasing trend in pH. Indicator parameters chloride, fluoride, sulfate, and uranium in MW-24 do not show any significantly increasing trends at the time of the New Wells Background

Report. Chloride, sulfate, and uranium concentrations are stable below GWCLs and do not exhibit any increasing trends at the time of this SAR (**Appendix C-7** and **E**).

The decreasing trends in pH are likely a cause of or contributor to the increasing trends in thallium in MW-24. Sorption of thallium onto ferrihydrite is strongly pH-dependent. The same sorption model (**Figure 4**) shows the influence that pH has on sorption of thallium. Note that thallium is nearly completely sorbed above pH ~6; the sorbed fraction decreases quickly as pH decreases, releasing the sorbed thallium to solution. The model uses the same assumptions discussed in section 3.5.1, with the exception of the sorption database. In this case, the FeOH_minteq.sdat database has been updated with more recent estimates of coefficients of thallium sorption onto ferrihydrite (Lin & Nriagu, 1998). These sources are discussed in the literature as being more representative of thallium sorption (Karlsson, 2006; Twidwell & Williams-Beam, 2002).

The current GWCL for thallium in MW-24 is 1.57 µg/L. In accordance with the Flowsheet, a revised GWCL for thallium in MW-24 of 2.1 µg/L (**Appendix B-1**), which is the highest historical value of thallium in MW-24, is being proposed.

3.6 Other Constituents and Wells

Fluoride and pH in this category were subjected to the same geochemical analysis as the categories above. The primary focus of this analysis was to determine whether or not there is any new information that would suggest that the previous analyses conducted in the Background Reports have changed since the dates of those reports.

3.6.1 Fluoride in MW-24

Fluoride concentrations in MW-24 are exhibiting a significantly increasing trend. As discussed in Section 3.2.2 and demonstrated in **Appendix C**, other indicator parameters, most notably chloride, are not exhibiting any increasing trends. The New Wells Background Report discusses why chloride is the most reliable indicator of potential tailings seepage, since chloride moves most readily with water and participates in relatively few chemical reactions. A lack of a rising trend in chloride indicates there has been no impact from potential tailings seepage; however a rising trend in chloride could also be due to natural influences (INTERA, 2008). Changes in fluoride concentrations in MW-24 are likely caused by natural background or analytical reporting changes; therefore the GWCL for fluoride in MW-24 should be revised to reflect these changes.

The current GWCL for fluoride in MW-24 is 0.36 mg/L. In accordance with the Flowsheet, a revised GWCL for fluoride in MW-24 of 0.558 mg/L (**Appendix B-1**), which is the highest historical value of fluoride in MW-24, is being proposed. Since fluoride in MW-24 is exhibiting a significantly increasing trend, this proposed GWCL has been determined based on the modified

approach of the highest of either the highest historical value or the mean plus two standard deviations.

4.0 CALCULATION OF GROUNDWATER COMPLIANCE LIMITS

The findings of analyses discussed above support the conclusions that (1) MW-18 and MW-24 are not being impacted by any potential tailings system seepage; and (2) increasing concentrations of constituents in MW-18 and MW-24 are the result of background and/or site-wide influences, such as a site-wide decline in pH.

4.1 Modified Approach to Calculation of GWCLs for Trending Constituents

According to the DWMRC-approved Flowsheet, if an increasing trend is present, a modified approach should be considered for determining GWCLs. All of the constituents included in this SAR are exhibiting significantly increasing trends that can be attributed to one or more of the following: (1) natural background conditions; (2) pyrite oxidation in the aquifer, which can decrease pH and increase mobility of metals; and/or (3) effects of events on groundwater in MW-24, such as well redevelopment and analytical method/laboratory change, as described in Section 3.1 of this SAR.

Therefore, a modified approach calculating GWCLs was considered for significantly trending constituents in MW-18 and MW-24. This approach, in accordance with the flowsheet, uses the higher of either the highest historical value or the mean plus two standard deviation (lowest historical value and mean minus two standard deviations for pH). The original flowsheet calculations along with the final proposed GWCLs using the modified approach, where appropriate, are presented in **Appendix B-1**.

4.2 Proposed Revised GWCLs

In accordance with the Flowsheet, the increasing trends identified (sulfate in MW-18 and cadmium, fluoride, pH, and thallium in MW-24) warrant a modified approach to the calculation of GWCLs. As discussed detail in Section 3.0 and demonstrated in **Appendices B** and **C**, the changes observed in groundwater at MW-18 and MW-24 are consistent with conclusions from the Background Reports and recent investigations into site-wide influences, such as oxidation of pyrite causing decreasing pH.

GWCLs determined according to the Flowsheet are presented in **Table 2** with a modified approach to GWCLs presented where appropriate.

Table 2
Proposed GWCLs

Well	Parameter	GWCL[a]	DWMRC-Approved GWCL[b]	Flowsheet Revised GWCL[c]	Rationale	Modified Approach GWCL[d]	Modified Approach Rationale
MW-18	Sulfate (mg/L)	1938.9	NA	2020	HHV	2220.3	Mean+2σ
MW-24	Cadmium (µg/L)	2.5	4.28	6.72	HHV	NA	NA
MW-24	Fluoride (mg/L)	0.36	0.36	0.558	HHV	NA	NA
MW-24	pH (s.u.)	6.5-8.5	5.55-8.5	5.03-8.5	Mean-2σ	4.83-8.5	LHV
MW-24	Thallium (µg/L)	1	1.57	2.1	HHV	NA	NA

Notes:

HHV = highest historical value
LHV = lowest historical value
SD = standard deviation
a = 2011 GWDP
b = DWMRC-Approved revised GWCLs presented in 2012 SAR and pH Report (INTERA, 2012 and 2012a)
c = GWCL calculated using complete historic data set
d = Modified Approach using higher of Mean plus (or minus) 2σ or highest/lowest historical value

5.0 CONCLUSIONS AND RECOMMENDATIONS

Background at the Mill site was recently thoroughly studied in the Background Reports (INTERA, 2007, 2008) and in the University of Utah Study (Hurst and Solomon, 2008). Conditions in MW-18 and MW-24 have been studied more recently in the 2012 SAR (INTERA, 2012a). The Background Reports and the University of Utah Study concluded that groundwater at the Mill site has not been impacted by Mill operations. Both of those studies also acknowledged that there are natural influences at play at the Mill site that have given rise to increasing trends and general variability of background groundwater at the Mill site. The conclusion of the 2012 SAR, that groundwater in MW-18 and MW-24 has not been impacted by potential tailings system seepage, is consistent with the conclusions of the Background Reports and the University of Utah Study.

The focus of this SAR was to identify any changes in the circumstances identified in those studies. Groundwater in upgradient monitoring well MW-18 remains consistent with conditions at the time of the Existing Wells Background Report. MW-18 has been influenced by its proximity to the northern wildlife ponds, and has historically had some of the highest concentrations and some of the most significantly increasing trends at the site. Since removal of the wildlife ponds, water levels in MW-18 appear to have reached a maximum elevation and appear to be decreasing. In a letter dated April 25, 2013, DWMRC agreed to remove GWCLs from upgradient wells in the next GWDP amendment. Until such time that the GWDP is amended, the revised GWCLs proposed in this SAR should be used for compliance in accordance with the current GWDP.

Groundwater conditions in MW-24 are being influenced by the site-wide decrease in pH. pH in MW-24 is decreasing due to oxidation of pyrite, which appears to be occurring site-wide (HGC, 2012). Decreasing pH is affecting the mobility of cadmium and thallium. Increasing fluoride concentrations in MW-24 may be caused by an increase in sensitivity in analytical reporting; however, indicator parameters chloride, sulfate, and uranium are not trending, indicating that groundwater in MW-24 is not affected by potential tailings seepage. Revised GWCLs in MW-24 are proposed to reflect natural site-wide influences.

Table 3
Summary of Findings

Well	Out-of-Compliance Constituent	Summary	Path Forward
MW-18	Sulfate	Sulfate concentrations were identified as having a significantly increasing trend at the time of the Existing Wells Background Report and the time of the 2012 SAR. Water in this well has been impacted from the northern wildlife ponds, which have been taken out of service.	Modified approach GWCL until GWDP renewal and removal of GWCLs
MW-24	Cadmium	Cadmium concentrations were significantly increasing at the time of the 2012 SAR. Cadmium solubility and mobility is affected by decreasing pH. Indicator parameters chloride, sulfate, and uranium are not exhibiting increasing trends; pH is significantly decreasing.	Flowsheet GWCL
	Fluoride	Fluoride concentrations are exhibiting a significantly increasing trend. Other indicator parameters are not exhibiting increasing trends.	Modified approach GWCL
	pH	pH is significantly decreasing and has been since the time of the New Wells Background Report and pH Report. This decrease is likely due to oxidation of pyrite site-wide.	Modified approach GWCL
	Thallium	Thallium concentrations were significantly increasing at the time of the 2012 SAR. Thallium solubility and mobility is affected by decreasing pH. Indicator parameters chloride, sulfate, and uranium are not exhibiting increasing trends; pH is significantly decreasing.	Flowsheet GWCL

INTERA recommends adopting the revised GWCLs for MW-18 and MW-24 based on the Flowsheet and the modified approach to address constituents with increasing trends in accordance with the Flowsheet. Regular revisions to GWCLs for constituents in wells with significantly increasing trends due to background is consistent with the USEPA's Unified Guidance (USEPA, 2009). Such revisions account for the trends and minimize unwarranted OOC status in such wells.

6.0 REFERENCES

Brookins. D.G. 1988. *Eh-pH Diagrams for Geochemistry*. New York: Springer-Verlag, 176 pp.

Division of Waste Management and Radiation Control (DWMRC), State of Utah. 2012. Ground Water Discharge Permit No. UGW370004. August 24.

_____. 2013. Re: Energy Fuels Resources (USA) Inc. October 10, 2012 *Source Assessment Report White Mesa Uranium Mill* and Associated pH assessment documents (dated November 9, 2012, pH Report and December 7, 2012, Pyrite Investigation Report). Letter to Jo Ann Tischler, Director of Energy Fuels Resources (USA) Inc. April 25.

Hurst, T.G., and Solomon, D.K. 2008. Summary of Work Completed, Data Results, Interpretations and Recommendations for the July 2007 Sampling Event at the Denison Mines, USA, White Mesa Uranium Mill Near Blanding Utah. Prepared by Department of Geology and Geophysics, University of Utah.

Hydro Geo Chem (HGC). 2011. Redevelopment of Existing Perched Monitoring Wells White Mesa Uranium Mill Near Blanding, Utah.

———. 2012. Investigation of Pyrite in the Perched Zone, White Mesa Uranium Mill Site, Blanding, Utah. Prepared for Energy Fuels Resources (USA) Inc. December 7.

INTERA Incorporated. 2007. Revised Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah. Prepared for Denison Mines (USA) Corp. October

———. 2008. Revised Addendum, Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site, San Juan County, Utah. Prepared for Denison Mines (USA) Corp. April 30.

———. 2012a. Source Assessment Report White Mesa Uranium Mill, Blanding, Utah. Prepared for Energy Fuels Resources (USA) Inc. October 10.

———. 2012b. PH Report White Mesa Uranium Mill, Blanding, Utah. Prepared for Energy Fuels Resources (USA) Inc. November 9.

Karlsson, U. Environmental Levels of Thallium – Influence of Redox Properties and Anthropogenic Sources. Universitetsbiblioteket 2006.

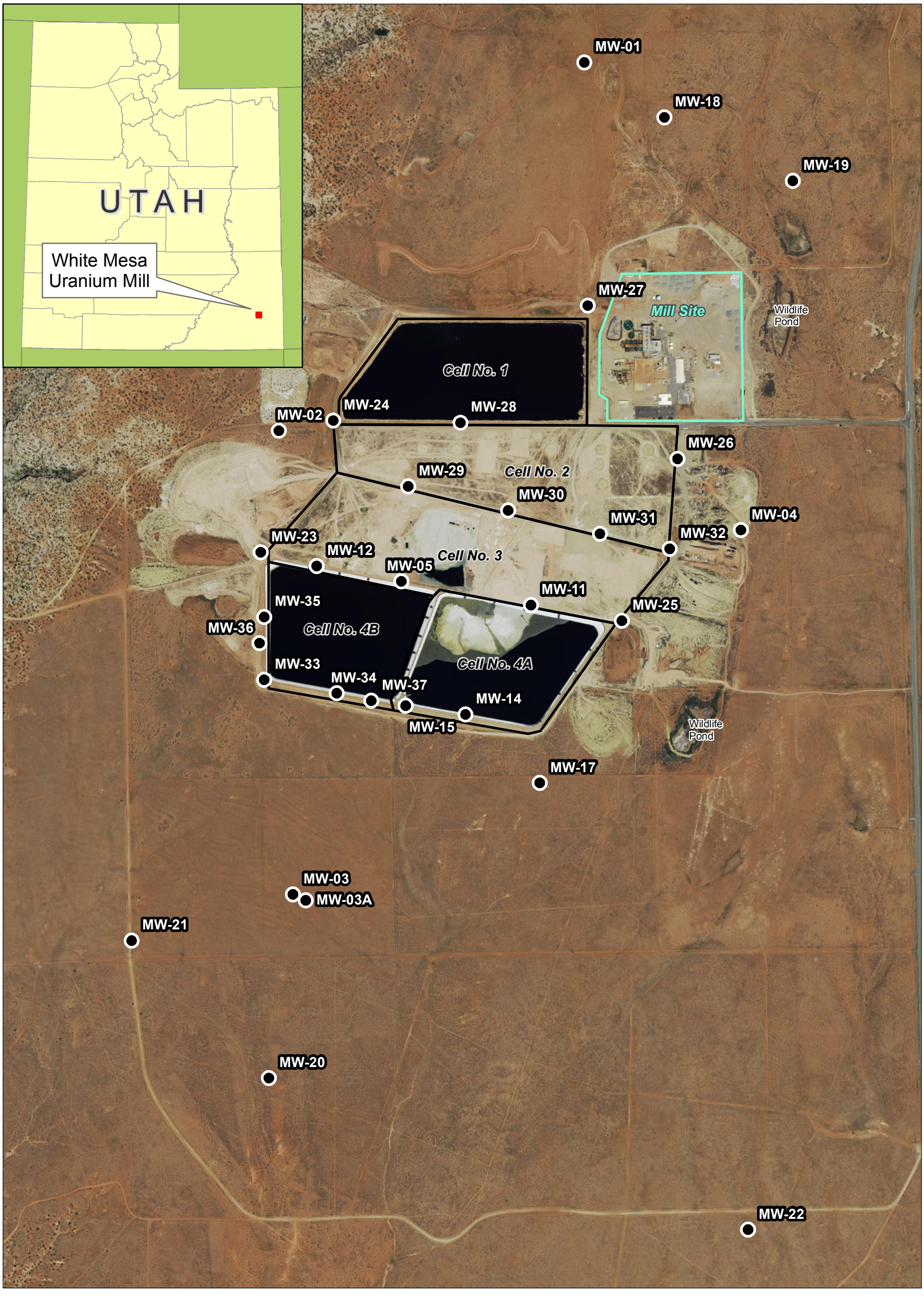
Lin, T.S., Nriagu, J.O., Speciation of Thallium in Natural Waters. In: *Thallium in the Environment*, Vol. 29, Advances in Environmental Sci. and Tech., Ed., J.O. Nriagu, Wiley and Sons, NY, 1998, pp.31-44.

Shapiro, S.S., and M.B. Wilk. 1965. An Analysis of Variance Test for Normality (Complete Samples). *Biometrika* 52:591-611.

Twidwell, L.G., and Williams-Beam, C. 2002. Potential Technologies for Removing Thallium from Mine and Process Wastewater: An Abbreviated Annotation of the Literature. *The European Journal of Mineral Processing and Environmental Protection* 2:1-10.

United States Environmental Protection Agency ("USEPA"). 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/ R-09-007.

FIGURES



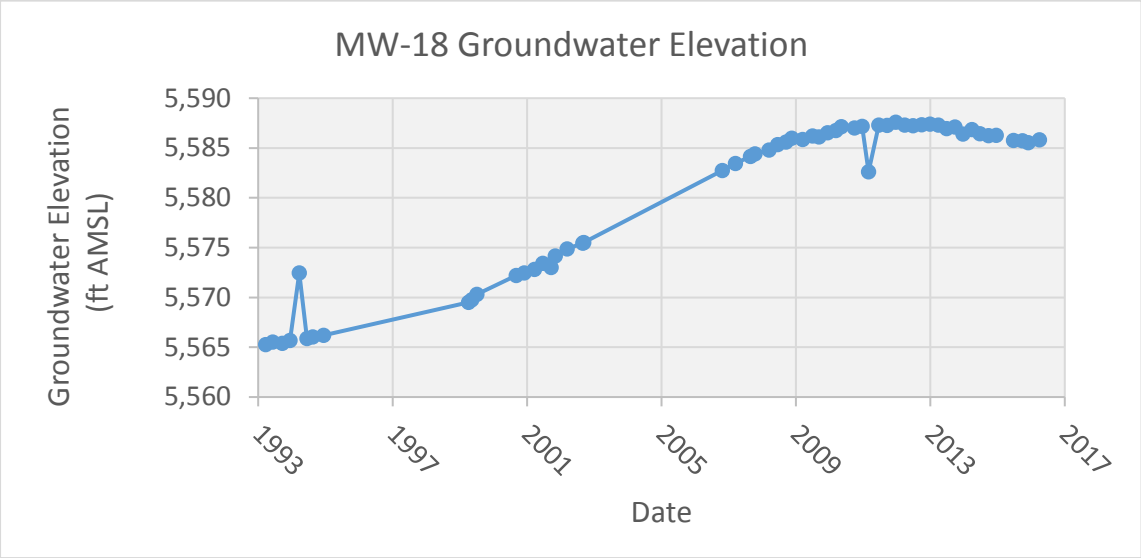
Legend

- Groundwater Monitoring Wells

Source(s): Aerial – ESRI ArcGIS online, dated 2014;
Wells – HGC, Inc., May 2008 report.

Figure 1
Location of White Mesa Mill Site
White Mesa Uranium Mill

S:\Projects\IUC-001-01-001 Denison Mines\GIS\mapdocs\2015_SARs\MW-31\Fig01_LocationMap.mxd Date: 10/16/2015



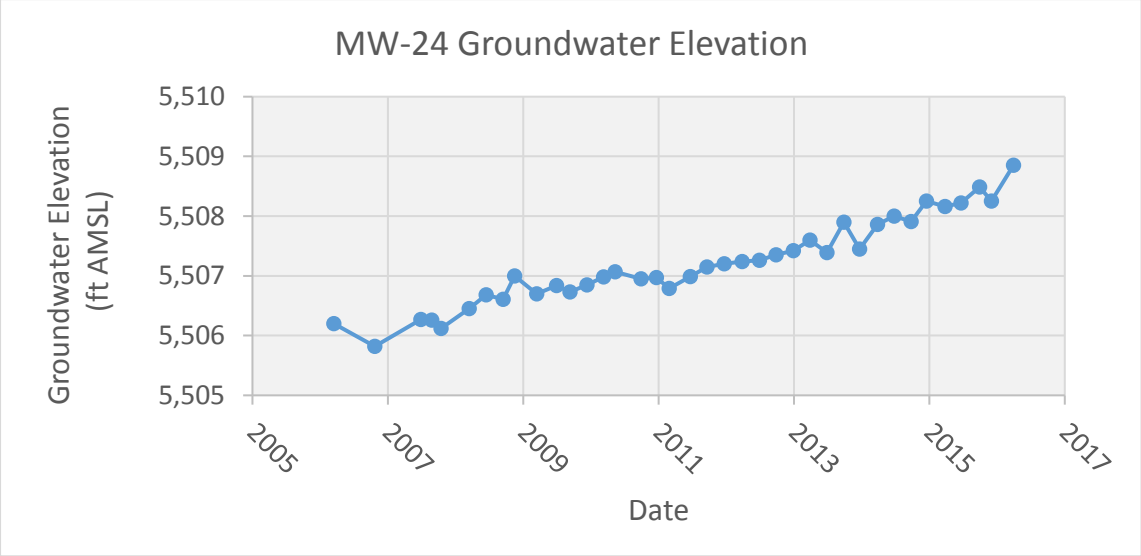


Figure 2
Groundwater Elevations for
MW-18 and MW-24
White Mesa Uranium Mill

INTERA

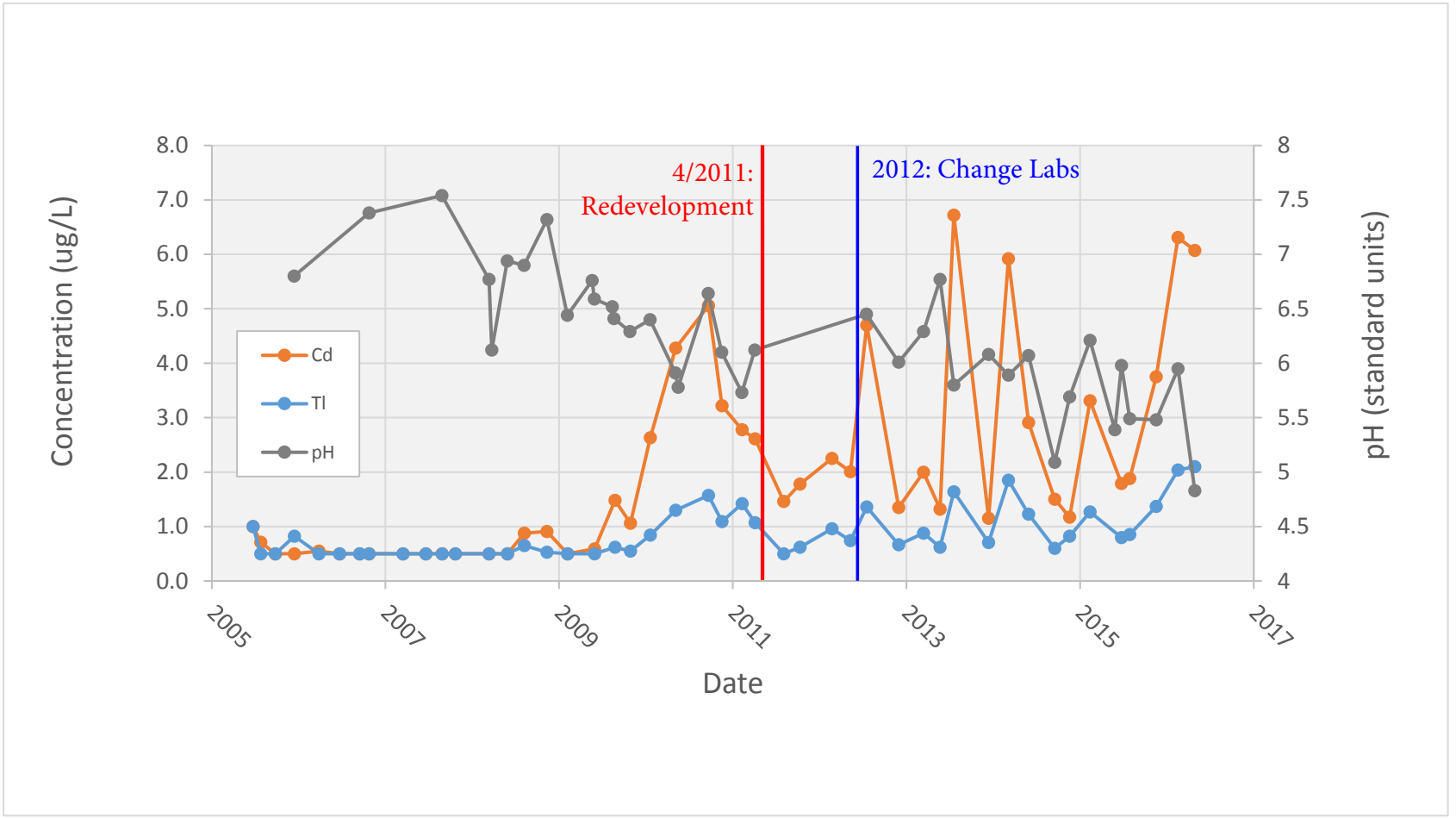


Figure 3

MW-24 pH, Cd, & Tl Time Series

White Mesa Uranium Mill

INTERA

\\intera.com\dfs\Projects\ABQ\IUC-001-01-001 Denison Mines\2016\MW18MW24\Figures\Fig3_MW-24_Timeseries.xlsx

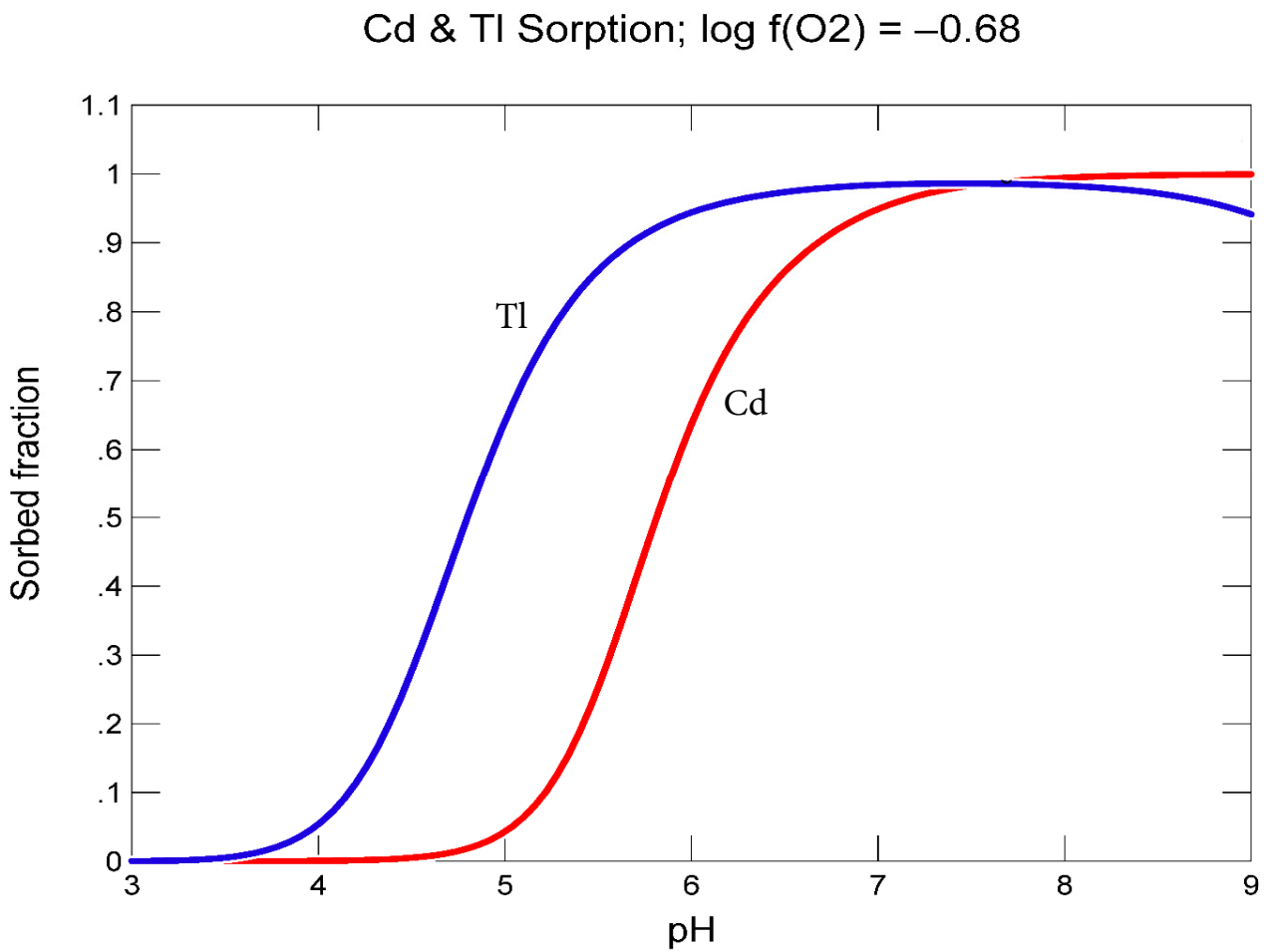


Figure 4
Cd & Tl Sorption Curves
White Mesa Uranium Mill

INTERA

APPENDIX A

GWCL Exceedances for First Quarter 2015
Under the August 24, 2012, GWDP

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Q1 2010 Results					Q2 2010 Results						Q3 2010 Results						Q4 2010 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in August 24, 2012 GWDP	Q1 2010 Sample Date	Q1 2010 Result	Q2 2010 Sample Date	Q2 2010 Result	May 2010 Monthly Sample Date	May 2010 Monthly Result	June 2010 Monthly Sample Date	June 2010 Monthly Result	July 2010 Monthly Sample Date	July 2010 Monthly Result	August 2010 Monthly Sample Date	August 2010 Monthly Result	Q3 2010 Sample Date	Q3 2010 Result	October 2010 Monthly Sample Date	October 2010 Monthly Result	Q4 2010 Sample Date	Q4 2010 Result	December 2010 Monthly Sample Date	December 2010 Monthly Result
Required Quarterly Sampling Wells																						
MW-11 (Class II)	Manganese (ug/L)	131.29	2/10/2010	***134***	4/28/2010	***137***	5/24/2010	122	6/16/2010	99	7/20/2010	123	8/25/2010	138	9/8/2010	128	10/20/2010	***141***	11/11/2010	***133***	12/15/10	***158***
MW-14 (Class III)	Field pH (S.U.)	6.5 - 8.5	2/2/2010	***6.45***	4/21/2010	***6.29***	5/21/2010	***6.36***	6/16/2010	***6.45***	7/20/2010	7.19	8/25/2010	***6.48***	9/8/2010	6.51	10/20/2010	6.60	11/10/2010	***6.37***	12/15/2010	***6.47***
MW-25 (Class III)	Field pH (S.U.)	6.5 - 8.5	2/3/2010	6.53	4/28/2010	7.2	NS	NA	NS	NA	NS	NA	NS	NA	9/8/2010	6.58	NS	NA	11/10/2010	***6.36***	NS	NA
	Chloride (mg/L)	35		31		31		NA		NA		NA		NA		31		NA		31		NA
	Cadmium (ug/L)	1.5		1.26		1.44		NA		NA		NA		NA		1.4		NA		1.26		NA
	Uranium (ug/L)	6.5		5.93		6.43		NA		NA		NA		NA		***6.57***		NA		5.89		NA
MW-26 (Class III)	Nitrate + Nitrite (as N) (mg/L)	0.62	2/2/2010	***1.3***	4/22/2010	***2***	5/21/2010	0.3	6/16/2010	0.4	7/21/2010	0.6	8/16/2010	0.6	9/26/2010	***0.7***	10/20/2010	0.4	11/15/2010	0.2	12/15/2010	0.4
	Uranium (ug/L)	41.8		***58.7***		***66.7***		37.4		36.6		34.4		***71.8***		***72.7***		37.5		30.4		29.6
	Chloroform (ug/L)	70		***700***		***1700***		***800***		***940***		***900***		***2800***		***2100***		***1000***		***1900***		***1400***
	Chloride (mg/L)	58.31		***72***		57		***80***		47		52		49		***64***		52		48		52
	Field pH (S.U.)	6.74 - 8.5		***6.59***		7.18		***6.36***		6.98		***6.45***		***6.39***		***6.60***		***6.61***		***6.49***		***6.45***
	Dichloromethane (Methylene Chloride) (ug/L)	5		1		***9.9***		NR		2.2		***12***		***24***		***45***		***5.5***		***16***		1.2
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	2/9/2010	***16.1***	4/27/2010	***15.8***	5/21/2010	***17***	6/15/2010	***15.3***	7/21/2010	***16***	8/24/2010	***16***	9/14/2010 9/21/2010	***15***	10/19/2010	***15***	11/9/2010	***15***	12/14/2010	***16***
	Chloride (mg/L)	128		127		97		NA		NA	NS	NA	NS	NA		111		NA		126		NA
	Uranium (ug/L)	8.32		6.82		6.82		NA		NA	NS	NA	NS	NA		7.10		NA		6.64		NA
	Field pH (S.U.)	6.5 - 8.5		6.81		6.55		6.62		7.47	7/21/2010 7/27/2010	6.80 (6.82)	8/24/2010	6.73		6.80 (6.84)		6.77		6.75		6.65
	Ammonia (mg/L)	0.14		<0.05		<0.05		NA		NA	NS	NA	NS	NA		<0.05		NA		0.05		NA
	Fluoride (mg/L)	0.51		0.35		0.35		NA		NA	NS	NA	NS	NA		0.36		NA		0.36		NA
	Selenium (ug/L)	34		32		***35.3***		NA		NA	7/27/2010	33.5	8/24/2010	***35.6***		32.6		32.4		32.2		30.5
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	2/9/2010	***21.7***	4/20/2010	***22.5***	5/21/2010	***23***	6/15/2010	***21.1***	7/21/2010	***20***	8/24/2010	***22***	9/13/2010 (9/21/10)	***21***	10/19/2010	***20***	11/9/2010	***20***	12/14/2010	***20***
	TDS (mg/L)	1320		1150		1220	NS	NA	NS	NA	NS	NA	NS	NA		***1330***	NS	NA		1320		NS
	Chloride (mg/L)	143		128		128	NS	NA	NS	NA	NS	NA	NS	NA		139	NS	NA		138		NS
	Selenium (ug/L)	71		60.8		59.6	NS	NA	NS	NA	NS	NA	NS	NA		64.4	NS	NA		60		NS
	Field pH (S.U.)	6.5 - 8.5		6.96		7.38	5/21/2010	6.95	6/15/2010	7.01	7/21/2010	7.80	8/24/2010	7.10		7.66 (7.13)	10/19/2010	6.92		6.98		6.95
	Sulfate (mg/L)	532		507		522	NS	NA	NS	NA	NS	NA	NS	NA		527	NS	NA		***539***		NS
MW-35 (Class II)	Manganese (ug/L)	200	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	11/30/2010	***698***	NS	NA
	Thallium (ug/l)	0.5		NA		NA		NA		NA		NA		NA		NA		NA		***1.14***		NA
	Gross Alpha minus Rn & U (pCi/L)	3.75		NA		NA		NA		NA		NA		NA		NA		NA		2.6		NA
	Field pH (S.U.)	6.5 - 8.5		NA		NA		NA		NA		NA		NA		NA		NA		7.46		NA
	Selenium (ug/L)	12.5		NA		NA		NA		NA		NA		NA		NA		NA		ND		NA
	Uranium (ug/L)	7.5		NA		NA		NA		NA		NA		NA		NA		NA		***27.2***		NA
Required Semi-Annual Sampling Wells																						
MW-01 (Class II)	Chloride (mg/L)	22.1	NS	NA	5/5/2010	18	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	11/8/2010	15	NS	NA
	Field pH (S.U.)	6.77 - 8.5		NA		7.86 (6.87)		NA		NA		NA		NA		NA		NA		6.96		NA
	Sulfate (mg/L)	838		NA		805		NA		NA		NA		NA		NA		NA		792		NA
MW-03 (Class III)	Selenium (ug/L)	37	NS	NA	5/3/2010	***37.2***	NS	NA	NS	NA	NS	NA	NS	NA	9/20/2010	35.5	NS	NA	11/19/2010	***38.8***	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		***6.14 (6.25)***		NA		NA		NA		NA		***6.39***		NA		***6.35***		NA
	Beryllium (ug/L)	2		NA		<0.5		NA		NA		NA		NA		NA		NA		<0.5		NA
	Cadmium (ug/L)	4.67		NA		0.78		NA		NA		NA		NA		NA		NA		0.63		NA
	Zinc (ug/L)	173.19		NA		96		NA		NA		NA		NA		NA		NA		40		NA
	Thallium (ug/l)	1.6		NA		1.31		NA		NA		NA		NA		NA		NA		1.34		NA
	Sulfate (mg/L)	3663		NA		3490		NA		NA		NA		NA		NA		NA		3430		NA
	Nitrate + Nitrite (as N) (mg/L)	0.73		NA		0.3		NA		NA		NA		NA		NA		NA		0.4		NA
	Fluoride (Mg/L)	0.68		NA		***0.71***		NA		NA		NA		NA		0.63		NA		***0.77***		NA
MW-3A (Class III)	Field pH (S.U.)	6.5 - 8.5	NS	NA	5/4/2010	***6.23 (6.24)***	NS	NA	NS	NA	NS	NA	NS	NA	9/21/2010	***6.42***	NS	NA	11/22/2010	***6.21***	NS	NA
	Sulfate (mg/L)	3640		NA		***3680***		NA		NA		NA		NA		3630		NA		***3850***		NA
	Nitrate + Nitrite (as N) (mg/L)	1.3		NA		1.0		NA		NA		NA		NA		NA		NA		1.2		NA
	TDS (mg/L)	5805		NA		***5860***		NA		NA		NA		NA		5470		NA		5330		NA
	Selenium (ug/L)	89		NA		81.4		NA		NA		NA		NA		NS		NA		***94.8***		NA
MW-05 (Class II)	Uranium (ug/L)	7.5	NS	NA	4/26/2010	0.39	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	11/11/2010	***11.6***	NS	NA
MW-12 (Class III)	Selenium (ug/L)	25	NS	NA	4/27/2010	***25.7***	NS	NA	NS	NA	NS	NA	NS	NA	9/20/2010	***31.9***	NS	NA	11/19/2010	***27.6***	NS	NA
	Field pH (S.U.)	6.5 - 8.5	NS	NA		7.16		NA		NA		NA		NA		6.62		NA		***6.47***		NA
MW-15 (Class III)	Selenium (ug/L)	128.7	NS	NA	4/21/2010	100	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	11/11/2010	99.5	NS	NA
	Field pH (S.U.)	6.62 - 8.5		NA		6.98		NA		NA		NA		NA		NA		NA		6.57		NA

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2010 Results		Q2 2010 Results						Q3 2010 Results						Q4 2010 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in Current GWDP	Q1 Sample Date	Q1 Result	Q2 Sample Date	Q2 Result	May Monthly Sample Date	May Monthly Result	June Monthly Sample Date	June Monthly Result	July Monthly Sample Date	July Monthly Result	August Monthly Sample Date	August Monthly Result	Q3 Sample Date	Q3 Result	October Monthly Sample Date	October Monthly Result	Q4 Sample Date	Q4 Result	December Monthly Sample Date	December Monthly Result
Required Semi-Annual Sampling Wells, continued																						
MW-18 (Class III)	Thallium (ug/l)	1.95	NS	NA	5/4/2010	***3.73***	NS	NA	NS	NA	NS	NA	NS	NA	9/15/2010	***3.64***	NS	NA	11/18/2010	***3.57***	NS	NA
	Sulfate (mg/L)	1938.9		NA		***1950***		NA		NA		NA		NA		1930		NA		1910		NA
	Field pH (S.U.)	6.25-8.5		NA		***6.2***		NA		NA		NA		NA		7.23		NA		6.37		NA
	TDS (mg/L)	3198.77		NA		***3280***		NA		NA		NA		NA		3190		NA		3030		NA
MW-19 (Class III)	Field pH (S.U.)	6.78-8.5	NS	NA	5/4/2010	***6.61 (6.66)***	NS	NA	NS	NA	NS	NA	NS	NA	9/15/2010	6.93	NS	NA	11/18/2010	6.8	NS	NA
	Nitrate + Nitrite (as N) (mg/L)	2.83		NA		2.6		NA		NA		NA		NA		NA		NA		2.4		NA
MW-24 (Class III)	Cadmium (ug/L)	2.5	NS	NA	5/6/2010	***4.28***	NS	NA	NS	NA	NS	NA	NS	NA	9/21/2010	***5.06***	NS	NA	11/17/2010	***3.22***	NS	NA
	Fluoride (mg/L)	0.36		NA		0.14		NA		NA		NA		NA		NA		NA		0.18		NA
	Sulfate (mg/L)	2903		NA		2560		NA		NA		NA		NA		NA		NA		2760		NA
	Thallium (ug/L)	1		NA		***1.3***		NA		NA		NA		NA		***1.57***		NA		***1.09***		NA
	Field pH (S.U.)	6.5 - 8.5		NA		***5.91 (5.78)***		NA		NA		NA		NA		6.64		NA		***6.1***		NA
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	NS	NA	5/3/2010	***5.8***	NS	NA	NS	NA	NS	NA	NS	NA	9/14/2010	***5.9***	NS	NA	11/12/2010	***5.7***	NS	NA
	Chloride (mg/L)	38		NA		***42***		NA		NA		NA		NA		***42***		NA		***45***		NA
	Sulfate (mg/L)	462		NA		***469***		NA		NA		NA		NA		461		NA		452		NA
	Field pH (S.U.)	6.5 - 8.5		NA		6.78		NA		NA		NA		NA		7.68		NA		6.84		NA
	TDS (mg/L)	1075		NA		***1160***		NA		NA		NA		NA		1060		NA		***1110***		NA
	Gross Alpha minus Rn & U (pCi/L)	2		NA		1.6		NA		NA		NA		NA		NA		NA		***2.4***		NA
MW-28 (Class III)	Chloride (mg/L)	105	NS	NA	4/19/2010	***108***	NS	NA	NS	NA	NS	NA	NS	NA	9/14/2010	***106***	NS	NA	11/12/2010	***107***	NS	NA
	Cadmium (ug/L)	5.2		NA		4.20		NA		NA		NA		NA		NA		NA		4.11		NA
	Uranium (ug/L)	4.9		NA		3.36		NA		NA		NA		NA		NA		NA		3.45		NA
	Vanadium (ug/L)	30		NA		<15.0		NA		NA		NA		NA		NA		NA		<15.0		NA
	Field pH (S.U.)	6.1 - 8.5		NA		***5.67***		NA		NA		NA		NA		***5.91***		NA		***5.72***		NA
MW-29 (Class III)	TDS (mg/L)	4400	NS	NA	4/27/2010	4400	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	11/9/2010	4390	NS	NA
	Sulfate (mg/L)	2946		NA		2770		NA		NA		NA		NA		NA		NA		2690		NA
	Field pH (S.U.)	6.46 - 8.5		NA		6.82		NA		NA		NA		NA		NA		NA		***6.17***		NA
MW-32 (Class III)	Gross Alpha minus Rn & U (pCi/L)	3.33	NS	NA	4/20/2010	***4.5***	NS	NA	NS	NA	NS	NA	NS	NA	9/13/2010	2.9	NS	NA	11/10/2010	***8.8***	NS	NA
	Chloride (mg/L)	35.39		NA		30		NA		NA		NA		NA		NA		NA		35		NA
	Field pH (S.U.)	6.4 - 8.5		NA		***6.03***		NA		NA		NA		NA		***6.33***		NA		***6.05***		NA

Notes:

GWCL values are taken from August 24, 2012 version of GWDP.

NS = Not Required and Not Sampled
NR = Required and
NA = Not
Exceedances are shown in yellow
Values in () parentheses are the field pH measurements for the resampled analyses.

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2011 Results						Q2 2011 Results						Q3 2011 Results						Q4 2011 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in August 24, 2012 GWDP	January 2011 Monthly Sample Date	January 2011 Monthly Sample Result	Q1 2011 Sample Date	Q1 2011 Result	March 2011 Monthly Sample Date	March 2011 Monthly Result	Q2 2011 Sample Date	Q2 2011 Result	May 2011 Monthly Sample Date	May 2011 Monthly Result	June 2011 Monthly Sample Date	June 2011 Monthly Result	July 2011 Monthly Sample Date	July 2011 Monthly Result	Q3 2011 Sample Date	Q3 2011 Result	September 2011 Monthly Sample Date	September 2011 Monthly Result	Q4 2011 Sample Date	Q4 2011 Result	November 2011 Monthly Sample Date	November 2011 Monthly Result	December 2011 Monthly Sample Date	December 2011 Monthly Result
Required Quarterly Sampling Wells																										
MW-11 (Class II)	Manganese (ug/L)	131.29	1/11/2011	121	2/2/2011	***145***	3/15/2011	68	4/4/2011	***148***	5/10/2011	***170***	6/15/2011	121	7/6/2011	***151***		118	9/7/2011	106	10/4/2011	112	11/9/2011	105	12/14/2011	100
MW-14 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/11/2011	***6.37***	2/7/2011	***6.22***	3/14/2011	6.76	4/4/2011	6.63	5/10/2011	***6.37***	6/15/2011	***5.83***	7/5/2011	***6.4***	8/3/2011	***6.23 (6.41)***	9/8/2011	6.50	10/4/2011	6.71 (6.82)	11/9/2011	6.63	12/12/2011	6.84
MW-25 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/11/2011	***6.44***	2/2/2011	6.66	3/15/2011	6.79	4/4/2011	6.7	5/11/2011	***6.1***	6/20/2011	***5.77***	7/6/2011	***6.29***	8/3/2011 8/30/11	***6.42 (6.54)***	9/7/2011	6.54	10/4/2011	6.6	11/9/2011	6.51	12/12/2011	6.87
	Chloride (mg/L)	35		NA		30		NA		31		NA		NA		NA	8/3/2011	32		NA		32		NA		NA
	Cadmium (ug/L)	1.5		NA		1.34		NA		1.27		NA		NA		NA	8/30/2012	1.19		NA		1.27		NA		NA
	Uranium (ug/L)	6.5		***7.02***		4.77		***6.8***		5.56		***6.72***		***7.06***		***6.74***		6.37		5.96		5.27		***6.56***		6.1
MW-26 (Class III)	Nitrate + Nitrite (as N) (mg/L)	0.62	1/12/2011	0.2	2/16/2011	0.25	3/15/2011	0.6	4/1/2011	***0.8***	5/10/2011	0.4	6/20/2011	0.3	7/6/2011	***0.9***	8/3/2011 8/30/11	0.6	9/7/2011	***2.4***	10/12/2011	***0.9***	11/9/2011	***1.3***	12/14/2011	***2.3***
	Uranium (ug/L)	41.8		32		***69.3***		31.8		***60.2***		***57.4***		18.5		***57.1***		19.0		***56.1***		***58.9***		***55.6***		***57***
	Chloroform (ug/L)	70		***800***		***730***		***1200***		***390***		***1900***		***730***		***300***		***1000***		***1300***		***440***		***1200***		***1400***
	Chloride (mg/L)	58.31		52		***59***		***64***		***64***		54		39		***64***		***60***		***66***		***61***		55		***62***
	Field pH (S.U.)	6.74 - 8.5		6.83		***6.06***		6.89		***6.22***		***6.43***		***6.52***		***6.35***		***6.07 (6.58)***		***6.71***		6.82		6.75		7.1
	Dichloromethane (Methylene Chloride) (ug/L)	5		<1.0		***10***		***14***		3.1		***20***		***7***		2.4		***10***		***7.9***		2.6		***8.9***		***11***
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	1/10/2011	***15***	2/1/2011	***16***	3/14/2011	***17***	4/11/2011	***16***	5/10/2011	***16***	6/20/2011	***17***	7/5/2011	***17***	8/3/2011	***14***	9/7/2011	***16***	10/4/2011 11/29/2011	***16***	11/8/2011	***16***	12/12/2011	***16***
	Chloride (mg/L)	128		NA		***134***		NA		***134***		128		127		127		126		***145***		***129***		122		124
	Uranium (ug/L)	8.32		NA		5.97		NA		6.49		NA		NA		NA		8		NA		***9.83***		NA		NA
	Field pH (S.U.)	6.5 - 8.5		6.65		6.96		7.10		6.83		6.70		***5.66***		6.65		6.61		6.80		6.96 (6.73)		6.83		7.14
	Ammonia (mg/L)	0.14		NA		0.05		NA		<0.05		NA		NA		NA		<0.05		NA		<0.05		NA		NA
	Fluoride (mg/L)	0.51		NA		0.34		NA		0.34		NA		NA		NA		0.33		NA		0.37		NA		NA
	Selenium (ug/L)	34		***36.2***		***34.7***		***34***		***44.4***		***38.3***		***38.7***		32.4		***39.7***		32.4		***36.6***		***36.8***		***38***
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	1/10/2011	***19***	2/1/2011	***21***	3/14/2011	***22***	4/1/2011	***21***	5/10/2011	***20***	6/20/2011	***22***	7/5/2011	***22***	8/2/2011	***20***	9/6/2011	***21***	10/3/2011	***21***	11/8/2011 (11/29/12)	***21***	12/12/2011	***21***
	TDS (mg/L)	1320		1240		1220		1250		***1370***		1290		***1330***		1280		1300		1300		1320		1290		***1330***
	Chloride (mg/L)	143		NS		***145***		NA		143		143		***145***		***148***		***148***		***148***		***145***		***145***		***148***
	Selenium (ug/L)	71		NS		64.6		NA		65.2		NS		NS		NS		66.2		NS		68.8		NS		NS
	Field pH (S.U.)	6.5 - 8.5		6.65		7.21		7.43		7.01		6.73		***6.16!***		6.64		6.67		7.03		7.28		7.01 (7.34)		7.46
	Sulfate (mg/L)	532		NS		***538***		531		503		512		***540***		532		***537***		***541***		***539***		***552***		530
MW-35 (Class II)	Manganese (ug/L)	200	NS	NA	2/15/2011	***248***	NS	NA	6/7/2011	***369***	NS	NA	NS	NA	7/20/11	***348***	8/30/2011	***267***	9/7/11	***270***	10/3/11	***271***	11/8/2011	***283***	12/14/11	***247***
	Thallium (ug/l)	0.5		NA		< 0.50		NA		< 0.50		NA		NA		NA		***0.52***		NA		***0.57***		< 0.50		***0.63***
	Gross Alpha minus Rn & U (pCi/L)	3.75		NA		2.6		NA		3.7		NA		NA		NA		***4.5***		NA		***4.4***		***4.7***		***4.2***
	Field pH (S.U.)	6.5 - 8.5		NA		7.17		NA		7.31		NA		NA		***6.49***		***6.40***		***6.47***		6.59		6.51		6.90
	Selenium (ug/L)	12.5		NA		ND		NA		ND		NA		NA		NA		9.3		NA		10.5		NA		NA
	Uranium (ug/L)	7.5		NA		***12.7***		NA		***21.7***		NA		NA		***24.2***		***18.3***		***22.3***		***20.1***		***24***		***23.6***
Required Semi-Annual Sampling Wells																										
MW-01 (Class II)	Chloride (mg/L)	22.1	NS	NA	NS	NA	NS	NA	4/11/2011	18	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	10/11/2011	17	NS	NA	NS	NA
	Field pH (S.U.)	6.77 - 8.5		NA		NA		NA		7.06 (7.67)		NA		NA		NA		NA		NA		7.08 (7.51)		NA		NA
	Sulfate (mg/L)	838		NA		NA		NA		704		NA		NA		NA		NA		NA		713		NA		NA
MW-03 (Class III)	Selenium (ug/L)	37	NS	NA	2/15/2011	***40.5***	NS	NA	4/13/2011	***45.4***	NS	NA	NS	NA	NS	NA	8/10/2011	***46***	NS	NA	10/10/2011	***46.7***	NS	NA	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		***6.09***		NA		***6.46***		NA		NA		NA		***6.32***		NA		6.53 (6.83)		NA		NA
	Beryllium (ug/L)	2		NA		NA		NA		<0.5		NA		NA		NA		NA		NA		<0.5		NA		NA
	Cadmium (ug/L)	4.67		NA		NA		NA		1.26		NA		NA		NA		NA		NA		1.01		NA		NA
	Zinc (ug/L)	173.19		NA		NA		NA		104		NA		NA		NA		NA		NA		74		NA		NA
	Thallium (ug/l)	1.6		NA		NA		NA		1.02		NA		NA		NA		NA		NA		1.38		NA		NA
	Sulfate (mg/L)	3663		NA		NA		NA		3060		NA		NA		NA		NA		NA		3470		NA		NA
	Nitrate + Nitrite (as N) (mg/L)	0.73		NA		NA		NA		0.3		NA		NA		NA		NA		NA		0.3		NA		NA
	Fluoride (Mg/L)	0.68		NA		***0.69***		NA		0.68		NA		NA		NA		***0.96***		NA		***0.91***		NA		NA
MW-03A (Class III)	Field pH (S.U.)	6.5 - 8.5	NS	NA	2/16/2011	***6.05***	NS	NA	4/13/2011	6.58	NS	NA	NS	NA	NS	NA	8/11/2011	***6.19***	NS	NA	10/11/2011	6.5 (6.92)	NS	NA	NS	NA
	Sulfate (mg/L)	3640		NA		***3730***		NA		3350		NA		NA		NA		3560		NA		***3750***		NA		NA
	Nitrate + Nitrite (as N) (mg/L)	1.3		NA		NA		NA		1.2		NA		NA		NA		NA		NA		1.1		NA		NA
	TDS (mg/L)	5805		NA		5770		NA		5720		NA		NA		NA		***5810***		NA		5630		NA		NA
	Selenium (ug/L)	89		NA		***99***		NA		85.8		NA		NA		NA		88.5		NA		***95***		NA		NA
MW-05 (Class II)	Uranium (ug/L)	7.5	NS	NA	2/14/2011	***29.5***	NS	NA	4/12/2011	7.16	NS	NA	NS	NA	NS	NA	8/9/2011	0.5	NS	NA	10/10/2011	4.52	NS	NA	NS	NA
MW-12 (Class III)	Selenium (ug/L)	25	NS	NA	2/15/2011	***39.0***	NS	NA	4/5/2011	21.7	NS	NA	NS	NA	NS	NA	8/9/2011	***25.4***	NS	NA	10/6/2011	***35.4***	NS	NA	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		***6.43***		NA		6.67		NA		NA		NA		***6.13***		NA		6.7 (6.97)		NA		NA
MW-15 (Class III)	Selenium (ug/L)	128.7	NS	NA	NS	NA	NS	NA	4/12/2011	116	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	10/10/2011	112	NS	NA	NS	NA
	Field pH (S.U.)	6.62 - 8.5		NA		NA		NA		6.88		NA		NA		NA		NA		NA		6.70		NA		NA

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2011 Results						Q2 2011 Results						Q3 2011 Results						Q4 2011 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in Current GWDP	January 2011 Monthly Sample Date	January 2011 Monthly Sample Result	Q1 2011 Sample Date	Q1 2011 Result	March 2011 Monthly Sample Date	March 2011 Monthly Result	Q2 2011 Sample Date	Q2 2011 Result	May 2011 Monthly Sample Date	May 2011 Monthly Result	June 2011 Monthly Sample Date	June 2011 Monthly Result	July 2011 Monthly Sample Date	July 2011 Monthly Result	Q3 2011 Sample Date	Q3 2011 Result	September 2011 Monthly Sample Date	September 2011 Monthly Result	Q4 2011 Sample Date	Q4 2011 Result	November 2011 Monthly Sample Date	November 2011 Monthly Result	December 2011 Monthly Sample Date	December 2011 Monthly Result
Required Semi-Annual Sampling Wells, continued																										
MW-18 (Class III)	Thallium (ug/l)	1.95	NS	NA	2/15/2011	***3.49***	NS	NA	4/6/2011	***3.74***	NS	NA	NS	NA	NS	NA	8/10/2011 9/21/11	***4.0 3.39***	NS	NA	10/11/2011	***3.83***	NS	NA	NS	NA
	Sulfate (mg/L)	1938.9		NA		1770		NA		1780		NA		NA		NA		1910		NA		***2020***		NA		NA
	Field pH (S.U.)	6.25-8.5		NA		6.27		NA		6.71		NA		NA		NA		***5.95 (6.30)***		NA		6.55 (6.63)		NA		NA
	TDS (mg/L)	3198.77		NA		***3250***		NA		***3250***		NA		NA		NA		3190		NA		***3220***		NA		NA
MW-19 (Class III)	Field pH (S.U.)	6.78-8.5	NS	NA	2/21/2011	6.78	NS	NA	4/5/2011	7.03	NS	NA	NS	NA	NS	NA	7/20/3011	***6.65***	NS	NA	10/12/2011	6.88 (7.02)	NS	NA	NS	NA
	Nitrate + Nitrite (as N) (mg/L)	2.83		NA		NS		NA		2.6		NA		NA		NA		NS		NA		***4.0***		NA		NA
MW-24 (Class III)	Cadmium (ug/L)	2.5	NS	NA	2/10/2011	***2.78***	NS	NA	4/5/2011	***2.61***	NS	NA	NS	NA	NS	NA	8/4/2011	1.46	NS	NA	10/11/2011	1.78	NS	NA	NS	NA
	Fluoride (mg/L)	0.36		NA		NA		NA		0.19		NA		NA		NA		NA		NA		0.36		NA		NA
	Sulfate (mg/L)	2903		NA		NA		NA		2560		NA		NA		NA		NA		NA		2500		NA		NA
	Thallium (ug/L)	1		NA		***1.42***		NA		***1.07***		NA		NA		NA		<0.50		NA		0.62		NA		NA
	Field pH (S.U.)	6.5 - 8.5		NA		***5.73***		NA		***6.12***		NA		NA		NA		***6.45***		NA		***6.44***		NA		NA
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	NS	NA	2/9/2011	***6***	NS	NA	4/5/2011	***6.4***	NS	NA	NS	NA	NS	NA	8/8/2011	***6***	NS	NA	10/5/2011	***6.3***	NS	NA	NS	NA
	Chloride (mg/L)	38		NA		***46***		NA		***43***		NA		NA		NA		***43***		NA		***44***		NA		NA
	Sulfate (mg/L)	462		NA		455		NA		442		NA		NA		NA		424		NA		456		NA		NA
	Field pH (S.U.)	6.5 - 8.5		NA		6.71		NA		6.79		NA		NA		NA		***6.39***		NA		7.17		NA		NA
	TDS (mg/L)	1075		NA		***1090***		NA		***1190***		NA		NA		NA		***1090***		NA		***1110***		NA		NA
	Gross Alpha minus Rn & U (pCi/L)	2		NA		0.7		NA		1.1		NA		NA		NA		0.8		NA		1.5		NA		NA
MW-28 (Class III)	Chloride (mg/L)	105	NS	NA	2/14/2011	***114***	NS	NA	4/11/2011	***109***	NS	NA	NS	NA	NS	NA	8/8/2011	105	NS	NA	10/5/2011	***143***	NS	NA	NS	NA
	Cadmium (ug/L)	5.2		NA		NA		NA		4.13		NA		NA		NA		NA		NA		3.99		NA		NA
	Uranium (ug/L)	4.9		NA		NA		NA		3.29		NA		NA		NA		NA		NA		3.19		NA		NA
	Vanadium (ug/L)	30		NA		NA		NA		<15.0		NA		NA		NA		NA		NA		<15.0		NA		NA
	Field pH (S.U.)	6.1 - 8.5		NA		***5.69***		NA		***6.01***		NA		NA		NA		***5.78***		NA		***6.07*** (6.11)		NA		NA
MW-29 (Class III)	TDS (mg/L)	4400	NS	NA	NS	NA	NS	NA	4/18/2011	4080	NS	NA	NS	NA	NS	NA	8/9/2011	NA	NS	NA	10/5/2011	4280	NS	NA	NS	NA
	Sulfate (mg/L)	2946		NA		NA		NA		2600		NA		NA		NA		NA		NA		2850		NA		NA
	Field pH (S.U.)	6.46 - 8.5		NA		NA		NA		***6.45***		NA		NA		NA		***6.20***		NA		6.52		NA		NA
MW-32 (Class III)	Gross Alpha minus Rn & U (pCi/L)	3.33	NS	NA	2/9/2011	1.5	NS	NA	4/1/2011	***4.6***	NS	NA	NS	NA	NS	NA	8/2/2011 8/30/11	1.9	NS	NA	10/3/2011	***3.7***	NS	NA	NS	NA
	Chloride (mg/L)	35.39		NA		NA		NA		33		NA		NA		NA		NA		NA		34		NA		NA
	Field pH (S.U.)	6.4 - 8.5		NA		***5.99***		NA		***6.14***		NA		NA		NA		***6.10 (6.20)***		NA		***6.35***		NA		NA

Notes:

GWCL values are taken from August 24, 2012 version of GWDP.

NS = Not Required and Not Sampled

NR =

NA = Not

Exceedances are shown in yellow

Values in () parentheses are the field pH measurements for the resampled analyses.

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2012 Results						Q2 2012 Results						Q3 2012 Results						Q4 2012 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in August 24, 2012 GWDP	January 2012 Monthly Sample Date	January 2012 Monthly Result	Q1 2012 Sample Date	Q1 2012 Result	March 2012 Monthly Sample Date	March 2012 Monthly Result	April 2012 Monthly Sample Date	April 2012 Monthly Result	Q2 2012 Sample Date	Q2 2012 Result	June 2012 Monthly Sample Date	June 2012 Monthly Result	Q3 2012 Sample Date	Q3 2012 Result	August 2012 Monthly Sample Date	August 2012 Monthly Result	September 2012 Monthly Sample Date	September 2012 Monthly Result	October 2012 Monthly Sample Date	October 2012 Monthly Result	Q4 2012 Sample Date	Q4 2012 Result	December 2012 Monthly Sample Date	December 2012 Monthly Result
Required Quarterly Sampling Wells																										
MW-11 (Class II)	Manganese (ug/L)	131.29	1/26/2012	102	2/13/2012	***154***	3/13/2012	121	4/10/2012	***132***	5/8/2012	127	6/19/2012	122	7/11/2012	***135***	8/7/2012	***166***	9/19/2012	130	10/23/2012	***161***	11/12/2012	***138***	12/24/2012	***137***
MW-14 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/24/2012	***6.36***	2/21/2012	6.57	3/14/2012	6.51	4/12/2012	6.97	5/9/2012	6.73	6/19/2012	6.90	7/11/2012	6.89	8/7/2012	6.58	9/18/2012	7.08	10/23/2012	6.83	11/27/2012	6.52	12/18/2012	6.60
MW-25 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/25/2012	6.63	2/14/2012	6.83	3/14/2012	6.55	4/9/2012	6.58	5/2/2012	6.73	6/18/2012	6.99	7/10/2012	6.88	8/6/2012	6.55	9/18/2012	6.54	10/22/2012	6.54	11/12/2012	***6.47***	12/24/2012	6.62
	Chloride (mg/L)	35		NA		30		NA		NA		30		NA		33		NA		NA		NA		28.8		NA
	Cadmium (ug/L)	1.5		NA		1.31		NA		NA		1.33		NA		1.24		NA		NA		NA		***1.56***		NA
	Uranium (ug/L)	6.5		***6.6***		6.5		***6.93***		***6.52***		5.90		***7.6***		6.45		***6.72***		6.01		6.37		***6.61***		4.83
MW-26 (Class III)	Nitrate + Nitrite (as N) (mg/L)	0.62	1/25/2012	***1.9***	2/15/2012	***1.2***	3/14/2012	***3***	4/11/2012	***3.4***	5/7/2012 6/26/2012	***2.9***	6/19/2012	***2.3***	7/11/2012	***1.9***	8/8/2012	***1.6***	9/19/2012	***1.8***	10/24/2012	***3.5***	11/15/2012	0.55	12/24/2012	***1.46***
	Uranium (ug/L)	41.8		***64.6***	2/21/2012	***59.4***		31.2		***42.2***		18.2		***66.0***		28.4		***67.4***		***64.9***		26.9		***56.8***		***51.3***
	Chloroform (ug/L)	70		***1900***	2/15/2012	***3300***		***2900***		***2900***		***1700***		***2400***	8/16/2012	***970***		***2200***		***2300***		***4720***		***4020***		***1250***
	Chloride (mg/L)	58.31		***68***		40		***74***		***82***		***74***		***85***	7/11/2012	***78***		***78***		***67***		2.62		52.9		***65.9***
	Field pH (S.U.)	6.74 - 8.5		***6.59***	2/15/2012 2/21/2012 3/8/2012	***6.72*** (6.91) (***6.71***)		***6.39***		6.88		7.00 (7.01)		7.00	7/11/2012 8/16/2012	7.10 (6.80)		***6.60***		7.40		***6.63***		***6.60***		6.78
	Dichloromethane (Methylene Chloride) (ug/L)	5		***13***	2/15/2012	***24***		***27***		***20***		***10***		***16***	8/16/2012	4.9		***17***		***9.8***		***15.0***		***34.6***		***5.5***
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	1/24/2012	***17***	2/14/2012	***17***	3/14/2012	***18***	4/10/2012	***17***	5/2/2012	***16***	6/18/2012	***15***	7/10/2012	***17***	8/7/2012	***18***	9/19/2012	***16***	10/23/2012	***16.2***	11/13/2012	***18.5***	12/26/2012	***17.2***
	Chloride (mg/L)	128		124		126		128		128		124		***131***		128		***139***		***130***		***135***		114		122
	Uranium (ug/L)	8.32	NS	NA		7.42		***8.38***		7.84		6.81		7.8		7.64		8.04		7.67		7.86		7.03		5.80
	Field pH (S.U.)	6.5 - 8.5	1/24/2012	6.52		7.12		6.86		7.05		6.95		7.10		7.25		6.95		7.85		6.80		6.67		6.95
	Ammonia (mg/L)	0.14	NS	NA		<0.05		NA		NA		<0.05		NA		<0.05		NA		NA		NA		<0.05		NA
	Fluoride (mg/L)	0.51	NS	NA		0.38		NA		NA		0.34		NA		0.33		NA		NA		NA		0.329		NA
	Selenium (ug/L)	34	1/24/2012	33.3		***35***		***39.5***		***39.1***		32.3		***37***		***38.5***		***38.4***		***41.9***		***45.2***		***36***		31.6
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	1/24/2012	***21***	2/13/2012	***21***	3/13/2012	***22***	4/9/2012	***21***	5/2/2012	***20***	6/18/2012 6/29/2012	***21.6***	7/9/2012	***21***	8/6/2012	***21***	9/18/2012	***21***	10/22/2012	***18***	11/6/2012	***23.6***	12/18/2012	***22.2***
	TDS (mg/L)	1320		***1360***		1240		***1400***		***1380***		***1410***		***1460***		***1400***		***1400***		***1460***		1320		1230		1270
	Chloride (mg/L)	143		***155***		***150***		***152***		***160***		***151***		138		***161***		***175***		***172***		***157***		***189***		***170***
	Selenium (ug/L)	71		***NS***		67.8		NS		NS		70.2		NA		***74***		NA		NA		NA		***76.9***		NA
	Field pH (S.U.)	6.5 - 8.5		6.78		7.37		7.13		7.14		7.19		7.28 (7.63)		7.53		6.96		7.1		7.05		7.04		7.10
	Sulfate (mg/L)	532		***539***		***538***		517		***547***		532		497		529		***571***		***561***		***545***		***557***		***664***
MW-35 (Class II)	Manganese (ug/L)	200	1/24/2012	***264***	2/14/2012	***253***	3/13/2012	***269***	4/10/2012	***277***	5/2/2012	***258***	6/19/2012	***304***	7/10/2012	***272***	8/8/2012	***273***	9/19/2012	***283***	10/23/2012	***253***	11/13/2012	***241***	12/18/2012	***240***
	Thallium (ug/l)	0.5		< 0.50		***0.65***		***0.71***		***0.59***		***0.66***		< 0.50		***0.57***		***0.61***		***0.54***		***0.517***		***0.554***		0.5
	Gross Alpha minus Rn & U (pCi/L)	3.75		***6.5***		***4.1***		***6.2***		***4.1***		***4.5***		***4.9***		3.5		***4.2***		***5.4***		***4.31***		***4.23***		***6.5***
	Field pH (S.U.)	6.5 - 8.5		***6.35***		6.67		***6.48***		6.84		6.61		6.90		6.87		6.74		6.81		***6.43***		6.50		6.60
	Selenium (ug/L)	12.5		NA		***19.7***		NA		NA		11.4		7.0		***15.9***		***18.8***		8.2		***19.0***		***15.4***		12.1
	Uranium (ug/L)	7.5		***16.1***		***24.7***		***24.9***		***22.4***		***22.2***		***22.5***		***24.5***		***26.2***		***22.9***		***22.4***		***21.8***		***21***
Required Semi-Annual Sampling Wells																										
MW-01 (CLASS II)	Chloride (mg/L)	22.1	NS	NA	NS	NA	NS	NA	NS	NA	5/1/2012	18	NS	NA	NS	NA	NS	NA	NS	NA	NS	NA	11/27/2012	18.5	NS	NA
	Field pH (S.U.)	6.77 - 8.5		NA		NA		NA		NA		7.19		NA		NA		NA		NA		NA		6.98		NA
	Sulfate (mg/L)	838		NA		NA		NA		NA		659		NA		NA		NA		NA		NA		***846***		NA
MW-03 (Class III)	Selenium (ug/L)	37	NS	NA	2/29/2012	***43.1***	NS	NA	NS	NA	5/14/2012	***52.8***	NS	NA	NA	***51.1***	NS	NA	NS	NA	NS	NA	11/28/2012	***58.9***	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		6.63		NA		NA		6.67		NA		6.99		NA		NA		NA		6.55		NA
	Beryllium (ug/L)	2		NA		NA		NA		NA		<0.5		NA		NA		NA		NA		NA		<0.5		NA
	Cadmium (ug/L)	4.67		NA		NA		NA		NA		1.06		NA		NA		NA		NA		NA		0.954		NA
	Zinc (ug/L)	173.19		NA		NA		NA		NA		68		NA		NA		NA		NA		NA		46.1		NA
	Thallium (ug/l)	1.6		NA		NA		NA		NA		1.37		NA		NA		NA		NA		NA		1.16		NA
	Sulfate (mg/L)	3663		NA		NA		NA		NA		3140		NA		NA		NA		NA		NA		2340		NA
	Nitrate + Nitrite (as N) (mg/L)	0.73		NA		NA		NA		NA		0.4		NA		NA		NA		NA		NA		0.419		NA
	Fluoride (Mg/L)	0.68		NA		***0.86***		NA		NA		***1.04***		NA		***0.96***		NA		NA		NA		***1.26***		NA
MW-03A (Class III)	Field pH (S.U.)	6.5 - 8.5	NS	NA	3/1/2012	***6.46***	NS	NA	NS	NA	5/15/2012	6.68	NS	NA	7/19/2012	7.01	NS	NA	NS	NA	NS	NA	***6.35***	NS	NA
	Sulfate (mg/L)	3640		NA		3020		NA		NA		3220		NA		***3700***		NA		NA		NA		2780		NA
	Nitrate + Nitrite (as N) (mg/L)	1.3		NA		NA		NA		NA		1.1		NA		NA		NA		NA		NA	11/29/2012	***1.31***		NA
	TDS (mg/L)	5805		NA		5690		NA		NA		5730		NA		5720		NA		NA		NA		5610		NA
	Selenium (ug/L)	89		NA		65.8		NA		NA		85.1		NA		***99.3***		NA		NA		NA		***111***		NA
MW-05 (Class II)	Uranium (ug/L)	7.5	NS	NA	2/28/2012	***18.6***	NS	NA	NS	NA	5/9/2012	1.23	NS	NA	7/16/2012	0.75	NS	NA	NS	NA	NS	NA	11/27/2012	0.402	NS	NA
MW-12 (Class III)	Selenium (ug/L)	25	NS	NA	2/29/2012	NA	NS	NA	NS	NA	5/10/2012	19.6	NS	NA	7/17/2012	20.7	NS	NA	NS	NA	NS	NA	11/27/2012	23.0	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		6.81		NA		NA		6.91		NA		6.98		NA		NA		NA		6.54		NA
MW-15 (Class III)	Selenium (ug/L)	128.7	NS	NA	2/22/2012	NA	NS	NA	NS	NA	5/9/2012	***152***	NS	NA	7/17/2012	120	NS	NA	NS	NA	NS	NA	11/14/2012	117	NS	NA
	Field pH (S.U.)	6.62 - 8.5		NA		6.84		NA		NA		6.63		NA		7.05		NA		NA		NA		6.86		NA

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2012 Results						Q2 2012 Results						Q3 2012 Results						Q4 2012 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in Current GWDP	January 2012 Monthly Sample Date	January 2012 Monthly Result	Q1 2012 Sample Date	Q1 2012 Result	March 2012 Monthly Sample Date	March 2012 Monthly Result	April 2012 Monthly Sample Date	April 2012 Monthly Result	Q2 2012 Sample Date	Q2 2012 Result	June 2012 Monthly Sample Date	June 2012 Monthly Result	Q3 2012 Sample Date	Q3 2012 Result	August 2012 Monthly Sample Date	August 2012 Monthly Result	September 2012 Monthly Sample Date	September 2012 Monthly Result	October 2012 Monthly Sample Date	October 2012 Monthly Result	Q4 2012 Sample Date	Q4 2012 Result	December 2012 Monthly Sample Date	December 2012 Monthly Result
Required Semi-Annual Sampling Wells, continued																										
MW-18 (Class III)	Thallium (ug/l)	1.95	NS	NA	2/27/2012	***3.63***	NS	NA	NS	NA	4/30/2012	***3.51***	NS	NA	7/18/2012	***3.73***	NS	NA	NS	NA	NS	NA	11/26/2012	***3.2***	NS	NA
	Sulfate (mg/L)	1938.9		NA		1920		NA		NA		1790		NA		1900		NA		NA		NA		1210		NA
	Field pH (S.U.)	6.25-8.5		NA		6.6		NA		NA		6.59		NA		6.64		NA		NA		NA		6.51		NA
	TDS (mg/L)	3198.77		NA		***3230***		NA		NA		***3280***		NA		***3220***		NA		NA		NA		3160		NA
MW-19 (Class III)	Field pH (S.U.)	6.78-8.5	NS	NA	2/28/2012	6.83	NS	NA	NS	NA	5/16/2012	6.86	NS	NA	7/19/2012	7.21	NS	NA	NS	NA	NS	NA	12/13/2012	***6.71***	NS	NA
	Nitrate + Nitrite (as N) (mg/L)	2.83		NA		***3.9***		NA		NA		***3.7***		NA		***4***		NA		NA		NA		***3.96***		NA
MW-24 (Class III)	Cadmium (ug/L)	2.5	NS	NA	2/23/2012	2.25	NS	NA	NS	NA	5/10/2012	2.01	NS	NA	7/18/2012	***4.7***	NS	NA	NS	NA	NS	NA	11/29/2012	1.35	NS	NA
	Fluoride (mg/L)	0.36		NA		NA		NA		NA		0.14		NA		NA		NA		NA		NA		***0.558***		NA
	Sulfate (mg/L)	2903		NA		NA		NA		NA		2490		NA		NA		NA		NA		NA		2310		NA
	Thallium (ug/L)	1		NA		0.96		NA		NA		0.74		NA		***1.36***		NA		NA		NA		0.666		NA
	Field pH (S.U.)	6.5 - 8.5		NA		***6.03***		NA		NA		***6.21***		NA		***6.45***		NA		NA		NA		***6.01***		NA
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	NS	NA	2/28/2012	***6.4***	NS	NA	NS	NA	5/1/2012	***6.2***	NS	NA	7/16/2012	***6.7***	NS	NA	NS	NA	NS	NA	11/13/2012	***6.9***	NS	NA
	Chloride (mg/L)	38		NA		***45***		NA		NA		***46***		NA		***47***		NA		NA		NA		***44.2***		NA
	Sulfate (mg/L)	462		NA		451		NA		NA		446		NA		453		NA		NA		NA		451		NA
	Field pH (S.U.)	6.5 - 8.5		NA		7.24		NA		NA		7.03		NA		7.40		NA		NA		NA		6.69		NA
	TDS (mg/L)	1075		NA		***1140***		NA		NA		***1170***		NA		***1150***		NA		NA		NA		1070		NA
	Gross Alpha minus Rn & U (pCi/L)	2		NA		***2.3***		NA		NA		0.8		NA		1.2		NA		NA		NA		1.33		NA
MW-28 (Class III)	Chloride (mg/L)	105	NS	NA	2/28/2012	***109***	NS	NA	NS	NA	5/8/2012	***114***	NS	NA	7/16/2012 8/1/2012	105	NS	NA	NS	NA	NS	NA	11/14/2012	***115***	NS	NA
	Cadmium (ug/L)	5.2		NA		NA		NA		NA		3.85		NA	NS	NA		NA		NA		NA		4.37		NA
	Uranium (ug/L)	4.9		NA		NA		NA		NA		3.44		NA	NS	NA		NA		NA		NA		3.45		NA
	Vanadium (ug/L)	30		NA		NA		NA		NA		<15.0		NA	NS	NA		NA		NA		NA		<15.0		NA
	Field pH (S.U.)	6.1 - 8.5		NA		6.22		NA		NA		6.15		NA	7/16/2012 8/1/2012	***6.38 (5.81)***		NA		NA		NA		***5.98***		NA
MW-29 (Class III)	TDS (mg/L)	4400	NS	NA	2/22/2012	NA	NS	NA	NS	NA	5/8/2012	***4600***	NS	NA	8/1/2012	***4420***	NS	NA	NS	NA	NS	NA	11/14/2012	***4430***	NS	NA
	Sulfate (mg/L)	2946		NA		NA		NA		NA		2750		NA	NS	NA		NA		NA		NA		1340		NA
	Field pH (S.U.)	6.46 - 8.5		NA		7.12		NA		NA		6.47		NA	7/16/2012 8/1/2012	***6.68 (6.45)***		NA		NA		NA		6.48		NA
MW-32 (Class III)	Gross Alpha minus Rn & U (pCi/L)	3.33	NS	NA	2/21/2012	1.8	NS	NA	NS	NA	4/30/2012	2.4	NS	NA	7/9/2012	1.4	NS	NA	NS	NA	NS	NA	11/6/2012	2.97	NS	NA
	Chloride (mg/L)	35.39		NA		NA		NA		NA		33		NA		1.4		NA		NA		NA		32.1		NA
	Field pH (S.U.)	6.4 - 8.5		NA		6.57		NA		NA		6.40		NA		6.72		NA		NA		NA		***6.23***		NA

Notes:

GWCL values are taken from August 24, 2012 version of GWDP.

NS = Not Required and Not Sampled

NR = Required and

NA = Not

Exceedances are shown in yellow

Values in () parentheses are the field pH measurements for the resampled analyses.

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2013 Results						Q2 2013 Results						Q3 2013 Results						Q4 2013 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in August 24, 2012 GWDP	January 2013 Monthly Sample Date	January 2013 Monthly Result	Q1 2013 Sample Date	Q1 2013 Result	March 2013 Monthly Sample Date	March 2013 Monthly Result	April 2013 Monthly Sample Date	April 2013 Monthly Result	Q2 2013 Sample Date	Q2 2013 Result	June 2013 Monthly Sample Date	June 2013 Monthly Result	Q3 2013 Sample Date	Q3 2013 Result	August 2013 Monthly Sample Date	August 2013 Monthly Result	September 2013 Monthly Sample Date	September 2013 Monthly Result	October 2013 Monthly Sample Date	October 2013 Monthly Result	Q4 2013 Sample Date	Q4 2013 Result	December 2013 Monthly Sample Date	December 2013 Monthly Result
Required Quarterly Sampling Wells																										
MW-11 (Class II)	Manganese (ug/L)	131.29	1/23/2013	115	2/20/2013	***139***	3/20/2013	***164***	4/16/2013	***181***	5/14/2013	***144***	6/25/2013	***135***	7/10/2013	***138***	8/20/2013	***158***	9/18/2013	***134***	10/22/2013	129	11/19/2013	***152***	12/18/2013	***196***
MW-14 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/23/2013	***6.48***	2/26/2013	6.52	3/20/2013	***6.48***	4/16/2013	7.58	5/14/2013	7.39	6/25/2013	6.54	7/11/2013	***6.47***	8/20/2013	6.86	9/19/2013	***6.48***	10/22/2013	6.77	11/20/2013	6.51	12/18/2013	6.74
MW-25 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/22/2013	6.65	2/20/2013	6.62	3/19/2013	***6.41***	4/17/2013	7.00	5/14/2013	7.19	6/24/2013	6.61	7/10/2013	***6.32***	8/19/2013	6.74	9/17/2013	6.54	10/22/2013	6.81	11/19/2013	6.62	12/17/2013	6.73
	Chloride (mg/L)	35		NA		***36.1***		NA		NA		28.1		30.4		28		31.1		29.6		28.6		29		31.2
	Cadmium (ug/L)	1.5		NA		1.35		1.40		1.36		***1.52***		1.31		1.41		***1.57***		1.31		1.50		1.35		1.23
	Uranium (ug/L)	6.5		5.97		5.39		5.68		5.56		5.88		5.35		6.22		6.42		5.99		5.94		***7.13***		NA
MW-26 (Class III)	Nitrate + Nitrite (as N) (mg/L)	0.62	1/24/2013	***1.66***	2/20/2013	***1.38***	3/20/2013	***1.61***	4/17/2013	***1.73***	5/23/2013	***2.01***	6/5/2013 6/25/2013	***3.04 2.11****	7/11/2013	***1.98***	8/20/2013	***1.77***	9/18/2013	***3.60***	10/23/2013	***4.10***	11/20/2013	***1.38***	12/18/2013	***2.56***
	Uranium (ug/L)	41.8		***65.7***		***57.8***		***69***		***58.8***		***64.3***		***71.3***		***70***		***72.3***		19.9		***58.8***		***75.8***		***70.4***
	Chloroform (ug/L)	70		***1270***		***1500***		***1340***		***1680***		***1210***		***4030****		***2410***		***2110***		***4170***		***3420***		***1220***		***1680***
	Chloride (mg/L)	58.31		***63.5***		***77***		***73.6***		***70.4***		***63.1***		***87.8 77.9****		***72.1***		***70.8***		***77.3***		***63.8***		***62.3***		***65.7***
	Field pH (S.U.)	6.74 - 8.5		***6.51***		***6.71***		***6.70***		6.96		7.31		6.85		***6.43***		7.41		***6.71***		6.82		6.83		6.93
	Dichloromethane (Methylene Chloride) (ug/L)	5		***6.49***		***5.53***		***8.31***		***10.2***		4.07		***52.4* [12.1]***		***14.2***		***14.6***		***42.4***		***29.8***		***7.64***		***7.48***
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	1/23/2013	***19.2***	2/26/2013	***21.4***	3/20/2013	***14.3***	4/17/2013	***16.8***	5/15/2013	***18.8***	6/25/2013	***16.1***	7/10/2013	***17.6***	8/20/2013	***16.4***	9/18/2013	***16.9***	10/22/2013	***19.7***	11/20/2013	***19.5***	12/18/2013	***20.7***
	Chloride (mg/L)	128		128		***129***		126		117		119		127		***130***		126		***131***		***128***		124		***134***
	Uranium (ug/L)	8.32		***8.36***		7.4		6.85		7.08		6.31		8.22		7.48		7.07		7.00		6.91		***8.57***		NA
	Field pH (S.U.)	6.5 - 8.5		6.88		6.93		6.91		7.42		7.54		6.93		6.87		7.06		6.78		6.96		6.84		7.10
	Ammonia (mg/L)	0.14		NA		<0.05		NA		NA		<0.05		NA		<0.05		NA		NA		NA		<0.05		NA
	Fluoride (mg/L)	0.51		NA		0.373		NA		NA		0.331		NA		0.368		NA		NA		NA		0.335		NA
	Selenium (ug/L)	34		***37.2***		***42.3***		***39***		***37.3***		***39.4***		32.1		***36.5***		***36.3***		***35.2***		***39.5***		***36.6***		***35.1***
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	1/22/2013	***22.8***	2/19/2013	***19.3***	3/19/2013	***19.1***	4/16/2013	***18.8***	5/13/2013	***23.8***	6/24/2013	***20.0***	7/9/2013	***21.7***	8/19/2013	***16.0***	9/17/2013	***21.2***	10/23/2013	***21.2***	11/18/2013	***23.9***	12/17/2013	***24.2***
	TDS (mg/L)	1320		1270		***1390***		***1420***		1260		***1540***		***1380***		***1510***		***1440***		***1500***		***1460***		1320		***1500***
	Chloride (mg/L)	143		***176***		***174***		***168***		***171***		***169***		***179***		***182***		***183***		***193***		***188***		***174***		***203***
	Selenium (ug/L)	71		NS		***74.1***		***81.8***		***72.9***		***75.9***		***73.7***		***75.7***		***73.2***		***72.6***		***80.7***		***74.5***		***79.8***
	Field pH (S.U.)	6.5 - 8.5		6.94		7.32		7.28		***6.37***		7.92		7.10		6.98		7.36		7.06		7.35		6.99		7.23
	Sulfate (mg/L)	532		***611***		***644***		***611***		***668***		***630***		***659***		***659***		***656***		***666***		***637***		***609***		***656***
MW-35 (Class II)	Manganese (ug/L)	200	1/23/2013	***247***	2/26/2013	***272***	3/19/13	***246***	4/17/2013	***243***	5/13/2013	***252***	6/24/2013	***243***	7/9/2013	***250***	8/19/2013	***262***	9/17/2013	***257***	10/23/2013	***240***	11/19/2013	***251***	12/17/2013	***260***
	Thallium (ug/l)	0.5		<0.5		<0.5		***0.505***		<0.5		***0.715***		***0.946***		<0.5		<0.5		<0.5		<0.5		<0.5		<0.5
	Gross Alpha minus Rn & U (pCi/L)	3.75		***6.62***		***5.09***		***9.51***		***4.75***		***4.92***		3.24		***5.70***		***3.92***		***5.10***		3.73		***5.39***		***4.74***
	Field pH (S.U.)	6.5 - 8.5		6.54		6.68		***6.43***		6.96		7.33		6.70		6.51		7.02		6.50		6.83		6.52		6.73
	Selenium (ug/L)	12.5		11.0		10.8		***22.6***		11.8		***16.1***		***13.6***		8.01		<5		<5		***19.8***		<5		<5
	Uranium (ug/L)	7.5		***23.6***		***21.3***		***22.1***		***20.0***		***22.0***		***19.3***		***23.0***		***21.4***		***20.2***		***21.8***		***24.1***		***20***
Required Semi-Annual Sampling Wells																										
MW-01 (Class II)	Chloride (mg/L)	22.1	NS	NA	3/12/2013	NA	NS	NA	NS	NA	5/21/2013	17.8	NS	NA	7/23/2013	NA	NS	NA	NS	NA	NS	NA	12/4/2013	18.7	NS	NA
	Field pH (S.U.)	6.77 - 8.5		NA		6.77		NA		NA		7.57		NA		7.04		NA		NA		NA		7.04		NA
	Sulfate (mg/L)	838		NA		761		NA		NA		***839***		NA		***911***		NA		NA		NA		***930***		NA
MW-03 (Class III)	Selenium (ug/L)	37	NS	NA	3/12/2013	***51.8***	NS	NA	NS	NA	5/22/2013	***46.3***	NS	NA	7/18/2013	***52.0***	NS	NA	NS	NA	NS	NA	12/11/2013	32.8	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		***6.20***		NA		NA		7.14		NA		***6.46***		NA		NA		NA		6.78		NA
	Beryllium (ug/L)	2		NA		NA		NA		NA		<0.5		NA		NA		NA		NA		NA		<0.5		NA
	Cadmium (ug/L)	4.67		NA		NA		NA		NA		1.42		NA		NA		NA		NA		NA		<0.5		NA
	Zinc (ug/L)	173.19		NA		NA		NA		NA		72.1		NA		NA		NA		NA		NA		20.3		NA
	Thallium (ug/l)	1.6		NA		NA		NA		NA		1.21		NA		NA		NA		NA		NA		1.1		NA
	Sulfate (mg/L)	3663		NA		NA		NA		NA		2180		NA		NA		NA		NA		NA		***3760***		NA
	Nitrate + Nitrite (as N) (mg/L)	0.73		NA		NA		NA		NA		0.456		NA		NA		NA		NA		NA		***1.21***		NA
	Fluoride (Mg/L)	0.68		NA		***0.902***		NA		NA		***0.994***		NA		***1.18***		NA		NA		NA		***1.28***		NA
MW-03A (Class III)	Field pH (S.U.)	6.5 - 8.5	NS	NA	3/13/2013	6.84	NS	NA	NS	NA	5/23/2013	7.10	NS	NA	7/19/2013	6.50	NS	NA	NS	NA	NS	NA	12/11/2013	6.98	NS	NA
	Sulfate (mg/L)	3640		NA		3480		NA		NA		3120		NA		***3670***		NA		NA		NA		3360		NA
	Nitrate + Nitrite (as N) (mg/L)	1.3		NA		1.22		NA		NA		1.11		NA		1.09		NA		NA		NA		***1.52***		NA
	TDS (mg/L)	5805		NA		5750		NA		NA		***6020***		NA		***5860***		NA		NA		NA		***5940***		NA
	Selenium (ug/L)	89		NA		88.7		NA		NA		75.6		NA		79.7		NA		NA		NA		77.9		NA
MW-05 (Class II)	Uranium (ug/L)	7.5	NS	NA	3/11/2013	***36***	NS	NA	NS	NA	5/14/2013	1.33	NS	NA	7/18/2013	0.574	NS	NA	NS	NA	NS	NA	12/4/2013	***20.1***	NS	NA
MW-12 (Class III)	Selenium (ug/L)	25	NS	NA	3/6/2013	19.6	NS	NA	NS	NA	5/15/2013	19	NS	NA	7/17/2013	20.5	NS	NA	NS	NA	NS	NA	12/9/2013	21.7	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		6.56		NA		NA		7.19		NA		6.60		NA		NA		NA		6.69		NA
MW-15 (Class III)	Selenium (ug/L)	128.7	NS	NA	3/5/2013	***137***	NS	NA	NS	NA	5/15/2013	120	NS	NA	7/18/2013	100	NS	NA	NS	NA	NS	NA	11/20/2013	106	NS	NA
	Field pH (S.U.)	6.62 - 8.5		NA		6.75		NA		NA		7.27		NA		6.68		NA		NA		NA		***6.61***		NA

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2013 Results						Q2 2013 Results						Q3 2013 Results						Q4 2013 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in Current GWDP	January 2013 Monthly Sample Date	January 2013 Monthly Result	Q1 2013 Sample Date	Q1 2013 Result	March 2013 Monthly Sample Date	March 2013 Monthly Result	April 2013 Monthly Sample Date	April 2013 Monthly Result	Q2 2013 Sample Date	Q2 2013 Result	June 2013 Monthly Sample Date	June 2013 Monthly Result	Q3 2013 Sample Date	Q3 2013 Result	August 2013 Monthly Sample Date	August 2013 Monthly Result	September 2013 Monthly Sample Date	September 2013 Monthly Result	October 2013 Monthly Sample Date	October 2013 Monthly Result	Q4 2013 Sample Date	Q4 2013 Result	December 2013 Monthly Sample Date	December 2013 Monthly Result
Required Semi-Annual Sampling Wells, continued																										
MW-18 (Class III)	Thallium (ug/l)	1.95	NS	NA	2/25/2013	***3.26***	NS	NA	NS	NA	5/20/2013	***2.81***	NS	NA	7/15/2013	***3.32***	NS	NA	NS	NA	NS	NA	12/3/2013	***3.06***	NS	NA
	Sulfate (mg/L)	1938.9		NA		1270		NA		NA		1860		NA		1860		NA		NA		NA		***2000***		NA
	Field pH (S.U.)	6.25-8.5		NA		6.35		NA		NA		6.97		NA		6.45		NA		NA		NA		6.38		NA
	TDS (mg/L)	3198.77		NA		***3350***		NA		NA		3160		NA		3170		NA		NA		NA		***3240***		NA
MW-19 (Class III)	Field pH (S.U.)	6.78-8.5	NS	NA	3/13/2013	***6.50***	NS	NA	NS	NA	5/20/2013	7.16	NS	NA	7/15/2013	6.91	NS	NA	NS	NA	NS	NA	12/3/2013	***6.58***	NS	NA
	Nitrate + Nitrite (as N) (mg/L)	2.83		NA		***3.61***		NA		NA		***4.21***		NA		***3.66***		NA		NA		NA		***3.70***		NA
MW-24 (Class III)	Cadmium (ug/L)	2.5	NS	NA	3/13/2013	2.0	NS	NA	NS	NA	5/22/2013	1.32	NS	NA	7/19/2013	***6.72***	NS	NA	NS	NA	NS	NA	12/12/2013	1.15	NS	NA
	Fluoride (mg/L)	0.36		NA		0.355		NA		NA		0.211		NA		0.288		NA		NA		NA		0.310		NA
	Sulfate (mg/L)	2903		NA		NA		NA		NA		2070		NA		NA		NA		NA		NA		2490		NA
	Thallium (ug/L)	1		NA		0.88		NA		NA		0.618		NA		***1.64***		NA		NA		NA		0.707		NA
	Field pH (S.U.)	6.5 - 8.5		NA		***6.29***		NA		NA		6.77		NA		***5.80***		NA		NA		NA		***6.08***		NA
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	NS	NA	2/25/2013	***7.94***	NS	NA	NS	NA	5/21/2013	***7.09***	NS	NA	7/17/2013	***6.97***	NS	NA	NS	NA	NS	NA	12/4/2013	***7.89***	NS	NA
	Chloride (mg/L)	38		NA		***50.3***		NA		NA		***44.3***		NA		***44.2***		NA		NA		NA		***45.0***		NA
	Sulfate (mg/L)	462		NA		431		NA		NA		***497***		NA		NA		NA		NA		NA		442		NA
	Field pH (S.U.)	6.5 - 8.5		NA		7.03		NA		NA		7.58		NA		7.00		NA		NA		NA		7.16		NA
	TDS (mg/L)	1075		NA		***1140***		NA		NA		***1110***		NA		***1110***		NA		NA		NA		***1100***		NA
	Gross Alpha minus Rn & U (pCi/L)	2		NA		<1.0		NA		NA		1.57		NA		<1.00		NA		NA		NA		1.28		NA
MW-28 (Class III)	Chloride (mg/L)	105	NS	NA	3/5/2013	***110***	NS	NA	NS	NA	5/15/2013	102	NS	NA	7/17/2013	***107***	NS	NA	NS	NA	NS	NA	12/4/2013	***109***	NS	NA
	Cadmium (ug/L)	5.2		NA		NA		NA		NA		4.61		NA		NA		NA		NA		NA		4.74		NA
	Uranium (ug/L)	4.9		NA		NA		NA		NA		3.58		NA		NA		NA		NA		NA		3.34		NA
	Vanadium (ug/L)	30		NA		NA		NA		NA		<15.0		NA		NA		NA		NA		NA		<15.0		NA
	Field pH (S.U.)	6.1 - 8.5		NA		***6.00***		NA		NA		6.63		NA		***5.97***		NA		NA		NA		6.10		NA
MW-29 (Class III)	TDS (mg/L)	4400	NS	NA	3/6/2013	***4500***	NS	NA	NS	NA	5/23/2013	4340	NS	NA	7/17/2013	4270	NS	NA	NS	NA	NS	NA	11/20/2013	4370	NS	NA
	Sulfate (mg/L)	2946		NA		NA		NA		NA		2450		NA		NA		NA		NA		NA		2750		NA
	Field pH (S.U.)	6.46 - 8.5		NA		***6.36***		NA		NA		6.88		NA		***6.37***		NA		NA		NA		***6.35***		NA
MW-32 (Class III)	Gross Alpha minus Rn & U (pCi/L)	3.33	NS	NA	2/19/2013	***5.02***	NS	NA	NS	NA	5/13/2013	***3.72***	NS	NA	7/9/2013	***6.46***	NS	NA	NS	NA	NS	NA	11/18/2013	1.86	NS	NA
	Chloride (mg/L)	35.39		NA		NA		NA		NA		32.3		NA		NA		NA		NA		NA		33.7		NA
	Field pH (S.U.)	6.4 - 8.5		NA		6.52		NA		NA		7.10		NA		***6.39***		NA		NA		NA		***6.29***		NA

Notes:

GWCL values are taken from August 24, 2012 version of GWDP.

NS = Not Required and Not Sampled
NR = Required
NA = Not
Exceedances are shown in yellow
Values in () parentheses are the field pH measurements for the resampled analyses.

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2014 Results						Q2 2014 Results						Q3 2014 Results						Q4 2014 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in August 24, 2012 GWDP	January 2014 Monthly Sample Date	January 2014 Monthly Result	February 2014 Monthly Sample Date	February 2014 Monthly Result	Q1 2014 Sample Date	Q1 2014 Result	April 2014 Monthly Sample Date	April 2014 Monthly Result	May 2014 Monthly Sample Date	May 2014 Monthly Result	Q2 2014 Sample Date	Q2 2014 Result	July 2014 Monthly Sample Date	July 2014 Monthly Result	August 2014 Monthly Sample Date	August 2014 Monthly Result	Q3 2014 Sample Date	Q3 2014 Result	October 2014 Monthly Sample Date	October 2014 Monthly Result	Q4 2014 Sample Date	Q4 2014 Result	December 2014 Monthly Sample Date	December 2014 Monthly Result
Required Quarterly Sampling Wells																										
MW-11 (Class II)	Manganese (ug/L)	131.29	1/8/2014	***141***	2/24/2014	***163***	3/11/2014	***134***	4/25/2014	***136***	5/14/2014	128	6/3/2014	***166***	7/29/2014	***139***	8/20/2014	***139***	9/8/2014	74.0	10/6/2014	***157***	11/17/2014	125	12/10/2014	***186***
MW-14 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/8/2014	6.60	2/24/2014	***6.16***	3/11/2014	***6.33***	4/23/2014	6.84	5/13/2014	6.60	6/3/2014	7.63	7/28/2014	***6.44***	8/20/2014	7.07	9/2/2014	***6.41***	10/7/2014	***6.46***	11/12/2014	***6.25***	12/10/2014	***6.40***
MW-25 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/7/2014	***6.37***	2/13/2014	***6.10***	3/10/2014	***6.27***	4/28/2014	7.18	5/13/2014	6.80	6/2/2014	6.74	7/28/2014	***6.36***	8/18/2014	7.17	9/3/2014	6.50	10/6/2014	***6.49***	11/4/2014	***6.31***	12/9/2014	***6.36***
	Chloride (mg/L)	35		31		30.4		31.5		31		26.4		30.9		NA		NA		30		NA		29.6		NA
	Cadmium (ug/L)	1.5		1.39		1.29		1.29		***1.51***		1.34		1.24		1.30		1.30		1.30		1.41		***1.57***		1.27
	Uranium (ug/L)	6.5		NA		5.83		6.26		***10.6***		***7.43***		6.07		5.9		6.1		6.0		***6.67***		6.04		5.75
MW-26 (Class III)	Nitrate + Nitrite (as N) (mg/L)	0.62	1/8/2014	***2.42***	2/24/2014	***2.12***	3/12/2014	***1.30***	4/30/2014	***1.20***	5/14/2014	***1.64***	6/5/2014	***1.42***	7/29/2014	***2.0***	8/20/2014	***1.00***	9/4/2014	***1.10***	10/7/2014	***0.704***	11/18/2014	***1.09***	12/10/14 12/15/14	<0.100
	Uranium (ug/L)	41.8		***81.7***		***72.2***		***51.8***		***96.0***		***90.6***		***75.0***		***86.5***		***74.4***		***48.4***		***75.4***		***66.0***		***42.5***
	Chloroform (ug/L)	70		***1580***		***2810***		***2800***		***1310***		***1580***		***1450***		***2330***		***2200***		***1580***		***894***		***1520***		***2280***
	Chloride (mg/L)	58.31		***69.7***		***70.4***		***61.0***		***62.1***		***61.0***		***63.2***		***80.0***		***59.0***		***68.0***		57.7		54.2		***65.5***
	Field pH (S.U.)	6.74 - 8.5		6.80		6.78		***6.50***		7.19		7.13		6.78		***6.60***		7.28		***6.67***		6.85		***6.09***		***6.25 (6.44)***
	Dichloromethane (Methylene Chloride) (ug/L)	5		***6.52***		***25.8***		***15.5***		***5.54***		***10.2***		***6.73***		***9.6***		***43.3***		***10.9***		3.78		***7.34***		***28.4***
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	1/8/2014	***20.3***	2/25/2014	***18.4***	3/11/2014	***21.3***	4/23/2014	***18.3***	5/14/2014	***17.9***	6/3/2014	***19.4***	7/29/2014	***15.6***	8/20/2014	***13.8***	9/9/2014	***16.8***	10/7/2014	***11.0***	11/10/2014	***16.2***	12/10/2014	***17.1***
	Chloride (mg/L)	128		***131***		***135***		***144***		***154***		128		128		***140***		***139***		***136***		***136***		***154***		***138***
	Uranium (ug/L)	8.32		NA		6.83		7.84		6.84		***9.82***		7.35		7.40		7.60		7.70		7.76		7.65		7.67
	Field pH (S.U.)	6.5 - 8.5		6.74		6.80		6.56		7.06		6.88		6.89		6.76		7.51		6.82		6.92		***6.22***		6.77
	Ammonia (mg/L)	0.14		NA		NA		<0.05		NA		NA		<0.05		NA		NA		<0.05		NA		***0.30***		NA
	Fluoride (mg/L)	0.51		NA		0.332		0.357		NA		NA		0.342		NA		NA		0.40		NA		0.262		NA
	Selenium (ug/L)	34		***35.6***		***35.8***		***38.0***		32.8		***37.0***		***35.4***		***42.9***		***48.5***		***53.6***		***38.9***		***36.8***		***37.5***
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	1/7/2014	***24.0***	2/17/2014	***20.6***	3/10/2014	***26.2***	4/28/2014	***19.1***	5/13/2014	***23.3***	6/2/2014	***23.1***	7/28/2014	***19.0***	8/18/2014	***15.2***	9/3/2014	***18.9***	10/6/2014	***15.9***	11/14/2014	***20.9***	12/9/2014	***17.0***
	TDS (mg/L)	1320		***1510***		***1460***		***1490***		***1440***		***1510***		***1520***		***1400***		***1410***		***1460***		***1420***		***1520***		***1450***
	Chloride (mg/L)	143		***194***		***197***		***230***		***230***		***200***		***173***		***200***		***210***		***210***		***205***		***204***		***215***
	Selenium (ug/L)	71		***74.4***		***75.8***		***77.2***		***85.4***		***74.5***		69.4		***77.9***		***82.8***		***81.5***		***78.9***		***73.0***		***71.1***
	Field pH (S.U.)	6.5 - 8.5		7.13		***6.45***		6.53		7.45		6.83		8.23		6.88		7.60		6.94		6.97		6.69		6.73
	Sulfate (mg/L)	532		***558***		480		***681***		527		***639***		***555***		***600***		***620***		***560***		***606***		***639***		***687***
MW-35 (Class II)	Manganese (ug/L)	200	1/8/2014	***252***	2/11/2014	***247***	3/11/14	***204***	4/25/2014	194	5/14/2014	***249***	6/4/2014	***202***	7/29/2014	***212***	8/20/2014	191	9/3/2014	177	10/6/2014	***228***	11/12/2014	***222***	12/9/2014	***232***
	Thallium (ug/l)	0.5		***0.535***		<0.5		<0.5		***0.582***		***0.521***		<0.5		<0.5		<0.5		***0.6***		<0.5		<0.5		<0.5
	Gross Alpha minus Rn & U (pCi/L)	3.75		***4.12***		***3.98***		***4.33***		2.95		3.67		3.36		3.09		***4.70***		***3.93***		***4.14***		***3.92***		***4.54***
	Field pH (S.U.)	6.5 - 8.5		6.54		***6.07***		***6.32***		6.79		7.10		6.83		6.55		7.07		***6.46***		6.54		***6.35***		***6.25***
	Selenium (ug/L)	12.5		8.95		12.3		***14.1***		***18.6***		***17.0***		***13.9***		***13.2***		***28.9***		***31.4***		***15.5***		10.1		7.5
	Uranium (ug/L)	7.5		***20.8***		***20.6***		***21.5***		***30.6***		***26.9***		***21.9***		***26.5***		***20.3***		***23.6***		***23.9***		***19.6***		***20.3***
Required Semi-Annual Sampling Wells																										
MW-01 (Class II)	Chloride (mg/L)	22.1	NS	NA	NS	NA	2/20/2014	NA	NS	NA	NS	NA	5/28/2014	20.4	NS	NA	NS	NA	9/10/2014	NA	NS	NA	11/17/2014	19	NS	NA
	Field pH (S.U.)	6.77 - 8.5		NA		NA		6.61		NA		NA		7.11		NA		NA		***6.75***		NA		6.87		NA
	Sulfate (mg/L)	838		NA		NA		836		NA		NA		***909***		NA		NA		810		NA		***920***		NA
MW-03 (Class III)	Selenium (ug/L)	37	NS	NA	NS	NA	2/26/2014	37.0	NS	NA	NS	NA	5/30/2014	***69.5***	NS	NA	NS	NA	9/16/2014	***94.0***	NS	NA	11/17/2014	***62.4***	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		NA		***6.23***		NA		NA		6.56		NA		NA		***6.13***		NA		***6.37***		NA
	Beryllium (ug/L)	2		NA		NA		NA		NA		NA		<0.5		NA		NA		NA		NA		<0.5		NA
	Cadmium (ug/L)	4.67		NA		NA		NA		NA		NA		1.7		NA		NA		NA		NA		2		NA
	Zinc (ug/L)	173.19		NA		NA		NA		NA		NA		94.5		NA		NA		NA		NA		98.3		NA
	Thallium (ug/l)	1.6		NA		NA		NA		NA		NA		1.28		NA		NA		NA		NA		1.32		NA
	Sulfate (mg/L)	3663		NA		NA		NA		NA		NA		3460		NA		NA		3120		NA		***3800***		NA
	Nitrate + Nitrite (as N) (mg/L)	0.73		NA		NA		NA		NA		NA		0.573		NA		NA		0.6		NA		0.330		NA
	Fluoride (Mg/L)	0.68		NA		NA		***0.771***		NA		NA		***1.02***		NA		NA		***1.0***		NA		***1.08***		NA
MW-03A (Class III)	Field pH (S.U.)	6.5 - 8.5	NS	NA	NS	NA	3/5/2014	6.58	NS	NA	NS	NA	5/30/2014	6.60	NS	NA	NS	NA	9/17/2014	***6.40***	NS	NA	11/12/2014	***6.41***	NS	NA
	Sulfate (mg/L)	3640		NA		NA		3100		NA		NA		***3830***		NA		NA		3350		NA		***3770***		NA
	Nitrate + Nitrite (as N) (mg/L)	1.3		NA		NA		0.849		NA		NA		0.97		NA		NA		1.0		NA		1.11		NA
	TDS (mg/L)	5805		NA		NA		5600		NA		NA		5790		NA		NA		5460		NA		5370		NA
	Selenium (ug/L)	89		NA		NA		***92.1***		NA		NA		***104***		NA		NA		***129***		NA		88.5		NA
MW-05 (Class II)	Uranium (ug/L)	7.5	NS	NA	NS	NA	2/12/2014	***22.0***	NS	NA	NS	NA	6/4/2014	2.42	NS	NA	NS	NA	9/11/2014	0.90	NS	NA	11/12/2014	***36.20***	NS	NA
MW-12 (Class III)	Selenium (ug/L)	25	NS	NA	NS	NA	2/12/2014	23.7	NS	NA	NS	NA	6/4/2014	17.20	NS	NA	NS	NA	9/16/2014	NA	NS	NA	11/11/2014	***33.30***	NS	NA
	Field pH (S.U.)	6.5 - 8.5		NA		NA		***6.13***		NA		NA		7.10		NA		NA		***6.47***		NA		***6.25***		NA
MW-15 (Class III)	Selenium (ug/L)	128.7	NS	NA	NS	NA	2/25/2014	110	NS	NA	NS	NA	6/4/2014	105	NS	NA	NS	NA	9/2/2014	***273***	NS	NA	11/12/2014	106	NS	NA
	Field pH (S.U.)	6.62 - 8.5		NA		NA		***6.51***		NA		NA		6.91		NA		NA		***6.38***		NA		***6.41***		NA

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2014 Results						Q2 2014 Results						Q3 2014 Results						Q4 2014 Results					
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in Current GWDP	January 2014 Monthly Sample Date	January 2014 Monthly Result	February 2014 Monthly Sample Date	February 2014 Monthly Result	Q1 2014 Sample Date	Q1 2014 Result	April 2014 Monthly Sample Date	April 2014 Monthly Result	May 2014 Monthly Sample Date	May 2014 Monthly Result	Q2 2014 Sample Date	Q2 2014 Result	April 2014 Monthly Sample Date	April 2014 Monthly Result	May 2014 Monthly Sample Date	May 2014 Monthly Result	Q3 2014 Sample Date	Q3 2014 Result	October 2014 Monthly Sample Date	October 2014 Monthly Result	Q4 2014 Sample Date	Q4 2014 Result	December 2014 Monthly Sample Date	December 2014 Monthly Result
Required Semi-Annual Sampling Wells, continued																										
MW-18 (Class III)	Thallium (ug/l)	1.95	NS	NA	NS	NA	2/19/2014	***2.77***	NS	NA	NS	NA	5/27/2014	***2.42***	NS	NA	NS	NA	9/9/2014	***2.7***	NS	NA	11/10/2014	***2.88***	NS	NA
	Sulfate (mg/L)	1938.9		NA		NA		1650		NA		NA		***2020***		NA		NA		1760		NA		1810		NA
	Field pH (S.U.)	6.25-8.5		NA		NA		***6.16***		NA		NA		7.04		NA		NA		6.40		NA		***6.10***		NA
	TDS (mg/L)	3198.77		NA		NA		3080		NA		NA		***3260***		NA		NA		3180		NA		2960		NA
MW-19 (Class III)	Field pH (S.U.)	6.78-8.5	NS	NA	NS	NA	2/18/2014	***6.29***	NS	NA	NS	NA	5/27/2014	7.38	NS	NA	NS	NA	9/11/2014	***6.46***	NS	NA	11/11/2014	***6.33***	NS	NA
	Nitrate + Nitrite (as N) (mg/L)	2.83		NA		NA		***3.82***		NA		NA		***3.68***		NA		NA		0.4		NA		***2.91***		NA
MW-24 (Class III)	Cadmium (ug/L)	2.5	NS	NA	NS	NA	3/6/2014	***5.92***	NS	NA	NS	NA	5/30/2014	***2.91***	NS	NA	NS	NA	9/17/2014	1.5	NS	NA	11/19/2014	1.17	NS	NA
	Fluoride (mg/L)	0.36		NA		NA		0.234		NA		NA		0.337		NA		NA		***0.4***		NA		0.109		NA
	Sulfate (mg/L)	2903		NA		NA		NA		NA		NA		2450		NA		NA		NA		NA		***3120***		NA
	Thallium (ug/L)	1		NA		NA		***1.85***		NA		NA		***1.23***		NA		NA		0.6		NA		0.821		NA
	Field pH (S.U.)	6.5 - 8.5		NA		NA		***5.89***		NA		NA		***6.07***		NA		NA		***5.09***		NA		***5.69***		NA
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	NS	NA	NS	NA	2/25/2014	***7.98***	NS	NA	NS	NA	5/28/2014	***7.35***	NS	NA	NS	NA	9/8/2014	***6.30***	NS	NA	11/5/2014	***7.70***	NS	NA
	Chloride (mg/L)	38		NA		NA		***47.0***		NA		NA		***45.9***		NA		NA		***46.0***		NA		***42.6***		NA
	Sulfate (mg/L)	462		NA		NA		411		NA		NA		***484***		NA		NA		414		NA		419		NA
	Field pH (S.U.)	6.5 - 8.5		NA		NA		6.62		NA		NA		7.80		NA		NA		6.97		NA		6.70		NA
	TDS (mg/L)	1075		NA		NA		1040		NA		NA		1040		NA		NA		1020		NA		***1090***		NA
	Gross Alpha minus Rn & U (pCi/L)	2		NA		NA		1.08		NA		NA		***2.33***		NA		NA		1.16		NA		<1.0		NA
MW-28 (Class III)	Chloride (mg/L)	105	NS	NA	NS	NA	2/26/2014	***113***	NS	NA	NS	NA	6/18/2014	***114***	NS	NA	NS	NA	9/16/2014	***112***	NS	NA	11/5/2014	***117***	NS	NA
	Cadmium (ug/L)	5.2		NA		NA		NA		NA		NA		***5.41***		NA		NA		4.7		NA		4.15		NA
	Uranium (ug/L)	4.9		NA		NA		NA		NA		NA		***61.3***		NA		NA		***10.6***		NA		***21.2***		NA
	Vanadium (ug/L)	30		NA		NA		NA		NA		NA		***109***		NA		NA		18.5		NA		29.3		NA
	Field pH (S.U.)	6.1 - 8.5		NA		NA		***6.01***		NA		NA		6.78		NA		NA		***5.79***		NA		***5.72***		NA
MW-29 (Class III)	TDS (mg/L)	4400	NS	NA	NS	NA	2/25/2014	***4500***	NS	NA	NS	NA	6/3/2014	4200	NS	NA	NS	NA	9/10/2014	4280	NS	NA	11/10/2014	4210	NS	NA
	Sulfate (mg/L)	2946		NA		NA		NA		NA		NA		2510		NA		NA		NA		NA		2760		NA
	Field pH (S.U.)	6.46 - 8.5		NA		NA		6.78		NA		NA		7.98		NA		NA		***6.10***		NA		***6.11***		NA
MW-32 (Class III)	Gross Alpha minus Rn & U (pCi/L)	3.33	NS	NA	NS	NA	2/11/2014	1.94	NS	NA	NS	NA	5/23/2014	***4.35***	NS	NA	NS	NA	9/2/2014	***3.69***	NS	NA	11/5/2014	2.56	NS	NA
	Chloride (mg/L)	35.39		NA		NA		NA		NA		NA		***35.6***		NA		NA	8/26/2014	34		NA		33.3		NA
	Field pH (S.U.)	6.4 - 8.5		NA		NA		***6.15***		NA		NA		6.64		NA		NA	9/2/2014	***6.17***		NA		***6.08***		NA

Notes:

GWCL values are taken from August 24, 2012 version of GWDP.

NS = Not Required and Not Sampled

NR = Required and Not Reported
NA = Not Applicable
Exceedances are shown in yellow
Values in () parentheses are the field pH measurements for the resampled analyses.

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2015 Results						Q2 2015 Results						Q3 2015 Results						Q4 2015 Results						
Monitoring Well (Water Class)	Constituent Exceeding GWCL	GWCL in August 24, 2012 GWDP	January 2015 Monthly Sample Date	January 2015 Monthly Result	Q1 2015 Sample Date	Q1 2015 Result	March 2015 Monthly Sample Date	March 2015 Monthly Result	Q2 2015 Sample Date	Q2 2015 Result	May 2015 Monthly Sample Date	May 2015 Monthly Result	June 2015 Monthly Sample Date	June 2015 Monthly Result	July 2015 Monthly Sample Date	July 2015 Monthly Result	Q3 2015 Sample Date	Q3 2015 Result	September 2015 Monthly Sample Date	September 2015 Monthly Result	October 2015 Monthly Sample Date	October 2015 Monthly Result	Q4 2015 Sample Date	Q4 2015 Result	December 2015 Monthly Sample Date	December 2015 Monthly Result	Sample Frequency
Required Quarterly Sampling Wells																											
MW-11 (Class II)	Manganese (ug/L)	131.29	1/21/2015	***177***	2/3/2015	***138***	3/3/2015	***149***	4/8/2015	***170***	5/11/2015	123	6/23/2015	***149***	7/7/2015	***178***	8/10/2015	***138***	9/16/2015	***160***	10/7/2015	***237***	11/11/2015	126	12/8/2015	***139***	Quarterly
MW-14 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/21/2015	***6.49***	2/3/2015	***6.44***	3/5/2015	***6.05***	4/8/2015	6.55	5/11/2015	***6.30***	6/1/2015	6.65	7/7/2015	6.57	8/11/2015	***6.37***	9/16/2015	6.51	10/8/2015	***6.45***	11/3/2015	6.52	12/8/2015	***6.45***	Quarterly
MW-25 (Class III)	Field pH (S.U.)	6.5 - 8.5	1/20/2015	***6.19***	2/4/2015	***6.46***	3/4/2015	***6.32***	4/7/2015	6.52	5/11/2015	***6.46***	6/1/2015 6/23/2015	6.59, 6.53	7/6/2015	6.70	8/10/2015	***6.47***	9/15/2015	6.58	10/6/2015	***6.45***	11/11/2015	6.79	12/8/2015	***6.41***	Quarterly
	Chloride (mg/L)	35		NA		30.5		NA		31.1		NA	NS	NA		NA		***36.8***		NA		NA		29.8		31.1	Quarterly
	Cadmium (ug/L)	1.5		1.44		1.33		1.37		1.27		1.38	6/23/2015	1.42		1.43		1.41		1.31		1.5		1.38		1.45	Quarterly
	Uranium (ug/L)	6.5		***6.54***		***6.81***		6.43		5.86		6.38		5.88		6.25		6.39		6.20		6.40		6.19		6.00	Quarterly
MW-26 (Class III)	Nitrate + Nitrate (as N) (mg/L)	0.62	1/21/2015	0.30	2/11/2015	***2.68***	3/4/2015	***0.965***	4/9/2015	***0.845***	5/12/2015	0.606	6/24/2015	0.588	7/7/2015	***1.15***	8/10/2015 8/17/2015	***1.75***	9/16/2015	***0.795***	10/7/2015	***2.36***	11/11/2015	***1.11***	12/8/2015	***1.200***	Quarterly
	Uranium (ug/L)	41.8		2.96		***78.1***		***72.6***		***75.7***		***63.3***		***67.4***		***72.1***		***61.9***		***56.0***		***61.2***		***66.0***		***65.2***	Quarterly
	Chloroform (ug/L)	70		***3570***		***1190***		***1020***		***1520***		***1160***		***2610***		***2560***		***1240***		***2150***		***2400***		***2660***		***3140***	Quarterly
	Chloride (mg/L)	58.31		***59.9***		***77.2***		***67.2***		***61.0***		***61.4***		***60.8***		***67.4***		***88.3***		***74.5***		***74.4***		***75.3***		***66.0***	Quarterly
	Field pH (S.U.)	6.74 - 8.5		***6.25***		***6.20***		***6.23***		***6.60***		***6.46***	6/3/2015 6/24/2015	***6.58, 6.20***		6.87		***6.54*** 6.81		***6.48***		6.80		***6.65***		***6.30***	Quarterly
	Dichloromethane (Methylene Chloride) (ug/L)	5		***6.42***		***5.89***		***6.95***		3.99		4.44	6/24/2015	***9.38***		***11.4***		2.17		<1.0		4.27		***9.89***		***12.0***	Quarterly
MW-30 (Class II)	Nitrate + Nitrite (as N) (mg/L)	2.5	1/21/2015	***19.5***	2/4/2015	***14.9***	3/3/2015	***17.3***	4/8/2015	***17***	5/12/2015	***16.1***	6/24/2015	***15.8***	7/7/2015	***15.3***	8/11/2015	***17.9***	9/15/2015	***17.3***	10/7/2015	***19.1***	11/11/2015	***16.3***	12/9/2015	***18.2***	Quarterly
	Chloride (mg/L)	128		***144***		***136***		***132***		***142***		***145***		***142***		***145***		***165***		***165***		***137***		***140***		***144***	Quarterly
	Uranium (ug/L)	8.32		8.06		8.23		***8.35***		7.45		***8.38***		7.46		7.98		8.16		7.72		8.10		7.99		8.22	Quarterly
	Field pH (S.U.)	6.5 - 8.5		***6.41***		6.59		***6.32***		6.67		6.76	6/2/2015 6/24/2015	6.94, ***6.32***		6.85		6.73		6.65		6.88		6.83		6.79	Quarterly
	Ammonia (mg/L)	0.14		NS		<0.05		<0.05		0.0960		0.0824		0.0997		0.0692		<0.05		<0.05		0.0540		<0.05		<0.05	Quarterly
	Fluoride (mg/L)	0.51		NA		0.324		NA		0.286		NA	6/24/2015	NA		NA		0.247		NA		NA		***0.572***		NA	Quarterly
	Selenium (ug/L)	34		***37.2***		***40.9***		***38.0***		***37.3***		***35.7***		***37.2***		***39.2***		***41.6***		***39.1***		***43.9***		***38.6***		***40.7***	Quarterly
MW-31 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5	1/20/2015	***20.9***	2/2/2015	***18.7***	3/3/2015	***19.8***	4/7/2015	***19.0***	5/11/2015	***18.4***	6/23/2015	***18.0***	7/6/2015	***18.8***	8/10/2015	***19.9***	9/15/2015	***18.9***	10/6/2015	***22.0***	11/9/2015	***18.4***	12/8/2015	***19.5***	Quarterly
	TDS (mg/L)	1320		***1540***		***1520***		***1530***		***1680***		***1700***		***1630***		***1440***		***1530***		***1480***		***1540***		***1460***		***1580***	Quarterly
	Chloride (mg/L)	143		***226***		***211***		***209***		***211***		***225***		***228***		***222***		***264***		***231***		***222***		***215***		***231***	Quarterly
	Selenium (ug/L)	71		***75.6***		***79.2***		***76.2***		***75.7***		***71.6***		***74.4***		***78.2***		***82.2***		***79.0***		***78.6***		***77.7***		***80.4***	Quarterly
	Field pH (S.U.)	6.5 - 8.5		***6.49***		***6.42***		***6.40***		6.80		6.74	6/1/2015 6/23/2015	7.14, 7.08		7.22		6.80		6.73		***6.47***		***6.36***		6.70	Quarterly
	Sulfate (mg/L)	532		***669***		***623***		***616***		***642***		***668***	6/23/2015	***691***		***684***		***640***		***638***		***655***		***646***		***690***	Quarterly
MW-35 (Class II)	Manganese (ug/L)	200	1/20/2015	***228***	2/5/2015	***223***	3/4/2015	190	4/9/2015	***237***	5/12/2015	***207.0***	6/23/2015	***214***	7/7/2015	185	8/10/2015	198	9/15/15 9/22/15 9/28/15	***201,*** 176	10/6/2015	169	11/3/2015	***210***	12/14/2015	177	Quarterly
	Thallium (ug/l)	0.5		<0.5		<0.5		<0.5		<0.5		<0.5		<0.5		<0.5		<0.5		<0.5, <0.5		***0.638***		<0.5		<0.5	Quarterly
	Gross Alpha minus Rn & U (pCi/L)	3.75		***6.86***		***5.61***		***3.81***		***4.25***		***4.47***	6/2/2015	***4.01***		***4.93***		3.24		***4.81, 6.13***		***4.04***		***4.47***		***4.69***	Quarterly
	Field pH (S.U.)	6.5 - 8.5		***6.22***		6.53		***6.26***		6.64		***6.46***	6/2/2015 6/23/2015	6.50, ***6.41***		6.56		***6.40***		6.52, ***6.41, 6.49***		***6.29***		6.72		6.57	Quarterly
	Selenium (ug/L)	12.5		8.21		***14.2***		***26.6***		<5.0		9.11	6/23/2015	***13.6***		***26.1***		***12.5***		***16.7, 28.5***		***39.8***		9.96		***25.0***	Quarterly
	Uranium (ug/L)	7.5		***21.8***		***20.6***		***24.4***		***20.2***		***22.5***		***20.7***		***22.0***		***22.1***		***21.3, 22.3***		***23.8***		***22.7***		***21.8***	Quarterly
Required Semi-Annual Sampling Wells																											
MW-01 (Class II)	Chloride (mg/L)	22.1	NS	NA	2/10/2015	NA	NS	NA	4/15/2015	***23.9***	NS	NA	NS	NA	NS	NA	7/27/2015	NA	NS	NA	NS	NA	11/11/2015	21.9	NS	NA	Semi-Annually
	Field pH (S.U.)	6.77 - 8.5		NA		***6.66***		NA		7.15		NA		NA		NA		7.12		NA		NA		6.83		NA	Semi-Annually
	Sulfate (mg/L)	838		NA		813		NA		***892***		NA		NA		NA		***876***		NA		NA		830		NA	Semi-Annually
MW-03 (Class III)	Selenium (ug/L)	37	NS	NA	2/11/2015	***61.1***	NS	NA	4/23/2015 5/20/2015	***81, 61.7***	NS	NA	NS	NA	NS	NA	7/28/2015	***68.3***	NS	NA	NS	NA	11/3/2015	***76.0***	NS	NA	Semi-Annually
	Field pH (S.U.)	6.5 - 8.5		NA		***6.12***		NA	4/23/2015 4/29/2015 5/20/2015	***6.18,*** 6.51, ***6.23***		NA		NA		NA		***6.16***		NA		NA		***6.25***		NA	Semi-Annually
	Beryllium (ug/L)	2		NA		NA		NA	4/23/2015 5/20/2015	1.44, ***2.08***		NA		NA		NA		NA		NA		NA		1.84		NA	Semi-Annually
	Cadmium (ug/L)	4.67		NA		NA		NA		***5.03, 14.2***		NA		NA		NA		NA		NA		NA		***12.9***		NA	Semi-Annually
	Zinc (ug/L)	173.19		NA		NA		NA		***238, 373***		NA		NA		NA		NA		NA		NA		***275***		NA	Semi-Annually
	Thallium (ug/l)	1.6		NA		NA		NA	4/23/2015 5/20/2015	1.47, 1.51		NA		NA		NA		NA		NA		NA		***1.61***		NA	Semi-Annually
	Sulfate (mg/L)	3663		NA		3260		NA	4/23/2015	***3700***		NA		NA		NA		***3670***		NA		NA		3360		NA	Semi-Annually
	Nitrate + Nitrite (as N) (mg/L)	0.73		NA		0.638		NA		0.642		NA		NA		NA		0.406		NA		NA		0.487		NA	Semi-Annually
	Fluoride (mg/L)	0.68		NA		***1.08***		NA		***1.00***		NA		NA		NA		***1.58***		NA		NA		***1.35***		NA	Semi-Annually
MW-03A (Class III)	Field pH (S.U.)	6.5 - 8.5	NS	NA	2/12/2015	***6.15***	NS	NA	4/23/2015 4/29/2015	6.59, ***6.24***	NS	NA	NS	NA	NS	NA	7/29/2015	***6.34***	NS	NA	NS	NA	11/4/2015	6.63	NS	NA	Semi-Annually
	Sulfate (mg/L)	3640		NA		3450		NA	4/23/2015	***3720***		NA		NA		NA		***3860***		NA		NA		3380		NA	Semi-Annually
	Nitrate + Nitrite (as N) (mg/L)	1.3		NA		1.05		NA		1.1		NA		NA		NA		0.435		NA		NA		0.903		NA	Semi-Annually
	TDS (mg/L)	5805		NA		5470		NA		5410		NA		NA		NA		5660		NA		NA		5510		NA	Semi-Annually
	Selenium (ug/L)	89		NA		***94.1***		NA		***101***		NA		NA		NA		85.9		NA		NA		***91.7***		NA	Semi-Annually
MW-05 (Class II)	Uranium (ug/L)	7.5	NS	NA	2/10/2015	2.94	NS	NA	4/21/2015	1.3	NS	NA	NS	NA	NS	NA	7/21/2015	0.887	NS	NA	NS	NA	11/4/2015	2.35	NS	NA	Semi-Annually
MW-12 (Class III)	Selenium (ug/L)	25	NS	NA	2/9/2015	***30.0***	NS	NA	4/21/2015	***29.4***	NS	NA	NS	NA	NS	NA	7/21/2015	24.6	NS	NA	NS	NA	11/17/2015	24.7	NS	NA	Semi-Annually
	Field pH (S.U.)	6.5 - 8.5		NA		***6.33***		NA	4/21/2015 4/28/2015	6.50, 6.70		NA		NA		NA		6.70		NA		NA		6.65		NA	Semi-Annually
MW-15 (Class III)	Selenium (ug/L)	128.7	NS	NA	2/4/2015	125	NS	NA	4/13/2015	***137***	NS	NA	NS	NA	NS	NA	7/22/2015	104	NS	NA	NS	NA	11/16/2015	107	NS	NA	Semi-Annually
	Field pH (S.U.)	6.62 - 8.5		NA		***6.50***		NA		6.82		NA		NA		NA		***6.61***		NA		NA		6.81		NA	Semi-Annually

Appendix A. GWCL Exceedances for Fourth Quarter 2015 under the August 24, 2012 GWDP
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

			Q1 2015 Results						Q2 2015 Results						Q3 2015 Results						Q4 2015 Results				
Monitoring Well (Water Class)	**Constituent Exceeding GWCL**	**GWCL in August 24, 2012 GWDP**	**January 2015 Monthly Sample Date**	**January 2015 Monthly Result**	**Q1 2015 Sample Date**	**Q1 2015 Result**	**March 2015 Monthly Sample Date**	**March 2015 Monthly Result**	**Q2 2015 Sample Date**	**Q2 2015 Result**	**May 2015 Monthly Sample Date**	**May 2015 Monthly Result**	**June 2015 Monthly Sample Date**	**June 2015 Monthly Result**	**July 2015 Monthly Sample Date**	**July 2015 Monthly Result**	**Q3 2015 Sample Date**	**Q3 2015 Result**	**September 2015 Monthly Sample Date**	**September 2015 Monthly Result**	**October 2015 Monthly Sample Date**	**October 2015 Monthly Result**	**Q4 2015 Sample Date**	**Q4 2015 Result**	**December 2015 Monthly Sample Date**	**December 2015 Monthly Result**	**Sample Frequency**
Required Semi-Annual Sampling Wells, continued																											
MW-18 (Class III)	Thallium (ug/l)	1.95	NS	NA	2/3/2015	***2.89***	NS	NA	4/15/2015	***2.81***	NS	NA	NS	NA	NS	NA	7/27/2015	***2.69***	NS	NA	NS	NA	11/9/2015	***2.68***	NS	NA	Semi-Annually
	Sulfate (mg/L)	1938.9		NA		1810		NA		1790		NA		NA		NA		***1990***		NA		NA		***2000***		NA	Semi-Annually
	Field pH (S.U.)	6.25-8.5		NA		6.27		NA		6.40		NA		NA		NA		6.43		NA		NA		6.30		NA	Semi-Annually
	TDS (mg/L)	3198.77		NA		***3240***		NA		***3350***		NA		NA		NA		3190		NA		NA		3000		NA	Semi-Annually
MW-19 (Class III)	Field pH (S.U.)	6.78-8.5	NS	NA	2/2/2015	***6.45***	NS	NA	4/14/2015	6.79	NS	NA	NS	NA	NS	NA	7/27/2015	6.78	NS	NA	NS	NA	11/10/2015	***6.70***	NS	NA	Semi-Annually
	Nitrate + Nitrite (as N) (mg/L)	2.83		NA		***2.91***		NA		***3.58***		NA		NA		NA		2.82		NA		NA		2.23		NA	Semi-Annually
MW-24 (Class III)	Cadmium (ug/L)	2.5	NS	NA	2/12/2015	***3.31***	NS	NA		1.79	NS	NA	NS	NA	NS	NA	7/29/2015	1.88	NS	NA	NS	NA	11/18/2015	***3.75***	NS	NA	Semi-Annually
	Fluoride (mg/L)	0.36		NA		***0.397***		NA		0.293		NA		NA		NA		***0.388***		NA		NA		***0.372***		NA	Semi-Annually
	Sulfate (mg/L)	2903		NA		2620		NA		2840		NA		NA		NA		2880		NA		NA		2790		NA	Semi-Annually
	Thallium (ug/L)	1		NA		***1.27***		NA		0.796		NA		NA		NA		0.85		NA		NA		***1.37***		NA	Semi-Annually
	Field pH (S.U.)	6.5 - 8.5		NA		***6.21***		NA	5/28/2015 6/24/2015	***5.39, 5.98***		NA		NA		NA		***5.49***		NA		NA		***5.48***		NA	Semi-Annually
MW-27 (Class III)	Nitrate + Nitrite (as N) (mg/L)	5.6	NS	NA	2/9/2015	3.15	NS	NA	4/20/2015	***6.27***	NS	NA	NS	NA	NS	NA	7/21/2015	***7.35***	NS	NA	NS	NA	11/10/2015	5.60	NS	NA	Semi-Annually
	Chloride (mg/L)	38		NA		***44.2***		NA		***47.6***		NA		NA		NA		***43.7***		NA		NA		***42.9***		NA	Semi-Annually
	Sulfate (mg/L)	462		NA		402		NA		429		NA		NA		NA		425		NA		NA		430		NA	Semi-Annually
	Field pH (S.U.)	6.5 - 8.5		NA		6.82		NA		7.09		NA		NA		NA		6.84		NA		NA		***6.48***		NA	Semi-Annually
	TDS (mg/L)	1075		NA		996		NA		1040		NA		NA		NA		1010		NA		NA		1000		NA	Semi-Annually
	Gross Alpha minus Rn & U (pCi/L)	2		NA		<1.0		NA		<1.0		NA		NA		NA		<1.0		NA		NA		<1.0		NA	Semi-Annually
MW-28 (Class III)	Chloride (mg/L)	105	NS	NA	2/9/2015	***130***	NS	NA	4/21/2015	***125***	NS	NA	NS	NA	NS	NA	7/21/2015	***113***	NS	NA	NS	NA	11/10/2015	***116***	NS	NA	Semi-Annually
	Cadmium (ug/L)	5.2		NA		4.83		NA		4.59		NA		NA		NA		4.97		NA		NA		4.73		NA	Semi-Annually
	Uranium (ug/L)	4.9		NA		4.48		NA		***6.13***		NA		NA		NA		4.87		NA		NA		4.84		NA	Semi-Annually
	Vanadium (ug/L)	30		NA		<15.0		NA		<15.0		NA		NA		NA		<15.0		NA		NA		<15.0		NA	Semi-Annually
	Field pH (S.U.)	6.1 - 8.5		NA		***5.86***		NA	4/21/2015 4/27/2015	***6.08,*** 6.17		NA		NA		NA		***5.91***		NA		NA		6.22		NA	Semi-Annually
MW-29 (Class III)	TDS (mg/L)	4400	NS	NA	2/10/2015	***4430***	NS	NA	4/30/2015	4190	NS	NA	NS	NA	NS	NA	7/22/2015	4310	NS	NA	NS	NA	11/16/2015	4110	NS	NA	Semi-Annually
	Sulfate (mg/L)	2946		NA		NA		NA		***2960***		NA		NA		NA		NA		NA		NA		2740		NA	Semi-Annually
	Field pH (S.U.)	6.46 - 8.5		NA		***6.42***		NA		***6.36***		NA		NA		NA		***6.30***		NA		NA		***6.37***		NA	Semi-Annually
MW-32 (Class III)	Gross Alpha minus Rn & U (pCi/L)	3.33	NS	NA	2/9/2015	2.19	NS	NA	4/8/2015	1.81	NS	NA	NS	NA	NS	NA	7/23/2015	1.89	NS	NA	NS	NA	11/3/2015	2.19	NS	NA	Semi-Annually
	Chloride (mg/L)	35.39		NA	3/17/2015	***36.3***		NA		***37.8***		NA		NA		NA		***37.3***		NA		NA		34.1		NA	Semi-Annually
	Field pH (S.U.)	6.4 - 8.5		NA	2/9/2015	***6.29***		NA		***6.37***		NA		NA		NA		***6.26***		NA		NA		6.41		NA	Semi-Annually

Notes:

GWCL values are taken from August 24, 2012 version of GWDP.

NS = Not Required and Not Sampled

NR = Required and Not Reported
NA = Not Applicable
Exceedances are shown in yellow
Values in () parentheses are the field pH measurements for the resampled analyses.
Reported from the quarterly chloroform sample

APPENDIX B

Geochemical Analysis for SAR Constituents in MW-18 and MW-24

B-1. Geochemical Analysis Summary Table

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Constituent and Units	N	% Non-Detected Values	Mean	Standard Deviation	Shapiro-Wilk Test for Normality		Normally or Lognormally distributed?	Mann-Kendall Trend Analysis		Least Squares Regression Trend Analysis		2012 SAR[1] Significant Trend?	Previously Identified Increasing Trend?	HHV	Mean + $2\sigma^{A}$	Current GWCL*	Flowsheet GWCL	Flowsheet GWCL Rationale	Proposed GWCLs
						W	p		S	p	r^2	p								
MW-18	Sulfate mg/L	47	0.0%	1713	254	0.8646	0.0001	No	428	0.0000	-	-	Yes, Increasing	Yes	2020	2220.30	1938.9	2020.0	HHV	2220.3[B]
MW-24	Cadmium µg/L	46	31.1%	2.02	1.79	0.9073	0.0014	No	539	0.0000	-	-	Yes, Increasing	No	6.72	5.59	4.28	6.72	HHV	6.72
MW-24	Fluoride mg/L	40	0.0%	0.237	0.115	0.9522	0.0903	Yes	-	-	0.1687	0.0085	Yes, Increasing	No	0.558	0.47	0.36	0.47	Mean + 2σ	0.558[B]
MW-24	pH s.u.	38	0.0%	6.24	0.602	0.9864	0.9179	Yes	-	-	0.5856	0.0000	Yes, Decreasing	Yes	4.83	5.03	5.55-8.5	5.03-8.5	Mean - 2σ	4.83-8.5[B]
MW-24	Thallium µg/L	46	34.8%	0.871	0.447	0.8689	0.0001	No	497	0.0000	-	-	Yes, Increasing	No	2.1	1.76	1.57	2.1	HHV	2.1

Notes:

µg/L = micrograms per liter

mg/L = milligrams per liter

s.u. = standard units of pH

N = number of valid data points

Mean = The arithmatic mean as determined for normally or lognormally distributed constituents with % Detect > 50%

Standard Deviation = The standard deviation as determined for normally or lognormally distributed constituents with % Detect > 85%

W = Shapiro Wilk test value

p = p-value, where any value smaller than 0.05 is significant

S = Mann-Kendall statistic

r^2 = The measure of how well the trendline fits the data where r^2=1 represents a perfect fit.

[1] = 2012 SAR is in reference to INTERA Incorporated. 2012. *Source Assessment Report White Mesa Uranium Mill, Blanding, Utah*. Prepared for Energy Fuels Resources (USA) Inc. October 10

HHV = Highest Historical Value; lowest historical value in the case of pH

Highest Historical Value = The highest observed value for constituents with % Detect < 50%

σ = sigma

GWCL = Groundwater Compliance Limit

* = GWCL is based on the Groundwater Discharge Permit (GWDP) or most recent GWCLs from DWMRC-approved Source Assessment Reports (SARs), where applicable.

A= mean plus two standard deviations, or mean minus two standard deviations in the case of pH

B = Modified approach for consttuents that are exhibiting significanlty increasing (or decreasing for pH) trends. The higher (or lower for pH) of the mean+2σ or the HHV is selected for the proposed GWCL.

B-2. Comparison of Calculated and Measured TDS for Samples with Complete Major Ions in MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Location ID	Sample Date	Bicarbonate as HCO_3 (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-18	12/1/2000	501.42	467	47.3	88.3	7	180	1600	2770	2891	104.4%
MW-18	11/6/2001	463.6	432	47.6	73.8	7.8	155	1380	2460	2560	104.1%
MW-18	9/9/2002	994.3	944	80.6	195.2	7.51	192	3530	5196	5944	114.4%
MW-18	12/14/2005	524.6	579	47	123	8.6	184	1740	3020	3206	106.2%
MW-18	6/21/2006	535.58	534	50	121	10	176	1700	3030	3127	103.2%
MW-18	10/26/2006	511.18	515	50	117	8.6	179	1870	2940	3251	110.6%
MW-18	10/30/2007	523.38	501	48	104	9.5	196	1700	2840	3082	108.5%
MW-18	6/4/2008	423	546	55	126	9.6	193	1870	3100	3223	104.0%
MW-18	11/4/2008	436	578	42	132	9.47	197	1880	3110	3274	105.3%
MW-18	5/27/2009	449	543	68	129	8.7	188	1930	3200	3316	103.6%
MW-18	10/21/2009	468	549	58	128	8.9	179	1900	3150	3291	104.5%
MW-18	5/4/2010	478	540	52	127	8.76	172	1950	3280	3328	101.5%
MW-18	11/18/2010	469	564	52	126	9.6	174	1910	3030	3305	109.1%
MW-18	4/6/2011	473	566	46	130	9.6	187	1780	3250	3192	98.2%
MW-18	10/11/2011	435	586	53	132	9	161	2020	3220	3396	105.5%
MW-18	4/30/2012	471	562	55	131	11.6	155	1790	3280	3176	96.8%
MW-18	11/26/2012	479.46	574	54	131	11.7	193	1210	3160	2653	84.0%
MW-18	5/20/2013	451.4	572	50.3	128	9.08	181	1860	3160	3252	102.9%
MW-18	12/3/2013	463.6	524	50.7	115	8.88	171	2000	3240	3333	102.9%
MW-18	5/27/2014	472.14	536	55	133	7.93	173	2020	3260	3397	104.2%
MW-18	11/10/2014	483.12	696	48.1	167	8.42	235	1810	2960	3448	116.5%
MW-18	4/15/2015	467.26	622	52.7	138	9.78	208	1790	3350	3288	98.1%
MW-18	11/9/2015	463.6	558	49.2	130	7.94	177	2000	3000	3386	112.9%
MW-18	4/19/2016	380	582	43.6	138	8.69	182	1890	3190	3224	101.1%
MW-24	12/14/2005	308.66	512	45	194	13.6	454	2680	4170	4207	100.9%
MW-24	10/24/2006	486.78	489	46	176	14.3	458	2680	3820	4350	113.9%
MW-24	3/16/2007	472.14	478	45	178	13.6	425	2520	4140	4132	99.8%
MW-24	6/20/2007	359.9	496	44	181	14.8	454	2680	4160	4230	101.7%
MW-24	8/28/2007	379.42	504	45	187	12.6	427	2720	4280	4275	99.9%

B-2. Comparison of Calculated and Measured TDS for Samples with Complete Major Ions in MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Location ID	Sample Date	Bicarbonate as HCO_3 (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-24	10/23/2007	366	509	45	183	14.5	495	2620	4180	4233	101.3%
MW-24	3/12/2008	520	462	44	167	12.9	469	2560	4090	4235	103.5%
MW-24	5/29/2008	188	500	45	186	12.7	502	2770	4030	4204	104.3%
MW-24	8/7/2008	270	492	39	181	13	514	2730	4270	4239	99.3%
MW-24	11/11/2008	225	494	43	182	13.2	517	2800	4170	4274	102.5%
MW-24	2/5/2009	231	466	44	164	14	538	2630	4310	4087	94.8%
MW-24	5/30/2009	233	441	44	164	12.2	489	2670	4220	4053	96.0%
MW-24	10/28/2009	257	488	46	177	12.6	488	2950	4120	4419	107.2%
MW-24	1/19/2010	270	492	46	175	13	500	2740	4080	4236	103.8%
MW-24	5/6/2010	306	485	46	178	12.5	510	2560	4320	4098	94.8%
MW-24	11/17/2010	197	478	48	173	12.8	475	2760	4200	4144	98.7%
MW-24	4/5/2011	173	474	45	169	12.5	508	2560	4330	3942	91.0%
MW-24	5/10/2012	222	507	42	171	13.7	474	2490	4170	3920	94.0%
MW-24	11/29/2012	179.34	469	48.1	156	12.5	509	2310	3980	3684	92.6%
MW-24	5/22/2013	285.48	465	44.4	165	13	510	2070	4360	3553	81.5%
MW-24	12/12/2013	248.88	455	46	169	13.8	508	2490	4030	3931	97.5%
MW-24	5/30/2014	135.42	463	44.7	187	11.9	498	2450	3970	3790	95.5%
MW-24	11/19/2014	273.28	474	40.9	171	11.8	478	3120	3960	4569	115.4%
MW-24	6/24/2015	69.418	508	48.1	168	12.5	540	2840	3960	4186	105.7%
MW-24	11/18/2015	50.386	497	45	170	12.2	505	2790	3840	4070	106.0%
MW-24	4/28/2016	20.6	484	47.4	175	11.8	485	2760	4220	3984	94.4%

Notes:

mg/L = milligrams per liter

TDS = total dissolved solids

B-3. Charge Balance Calculations for Major Cations and Anions in MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Location	Date Sampled	Calcium (mEq/L)	Magnesium (mEq/L)	Potassium (mEq/L)	Sodium (mEq/L)	Total Cation Charge (meq/L)	Bicarbonate as HCO_3 (mEq/L)	Chloride (mEq/L)	Sulfate (mEq/L)	Total Anion Charge (meq/L)	Percent Difference
MW-18	12/1/2000	23.30	7.27	0.18	7.83	38.58	-8.22	-1.33	-33.31	-42.86	11.1%
MW-18	11/6/2001	21.56	6.07	0.20	6.74	34.57	-7.60	-1.34	-28.73	-37.67	9.0%
MW-18	9/9/2002	47.11	16.06	0.19	8.35	71.71	-16.30	-2.27	-73.50	-92.06	28.4%
MW-18	12/14/2005	28.89	10.12	0.22	8.00	47.24	-8.60	-1.33	-36.23	-46.15	2.3%
MW-18	6/21/2006	26.65	9.96	0.26	7.66	44.52	-8.78	-1.41	-35.39	-45.58	2.4%
MW-18	10/26/2006	25.70	9.63	0.22	7.79	43.33	-8.38	-1.41	-38.93	-48.72	12.4%
MW-18	10/30/2007	25.00	8.56	0.24	8.53	42.33	-8.58	-1.35	-35.39	-45.33	7.1%
MW-18	6/4/2008	27.25	10.37	0.25	8.40	46.26	-6.93	-1.55	-38.93	-47.42	2.5%
MW-18	11/4/2008	28.84	10.86	0.24	8.57	48.52	-7.15	-1.18	-39.14	-47.47	2.2%
MW-18	5/27/2009	27.10	10.62	0.22	8.18	46.11	-7.36	-1.92	-40.18	-49.46	7.3%
MW-18	10/21/2009	27.40	10.53	0.23	7.79	45.94	-7.67	-1.64	-39.56	-48.86	6.4%
MW-18	5/4/2010	26.95	10.45	0.22	7.48	45.10	-7.83	-1.47	-40.60	-49.90	10.6%
MW-18	11/18/2010	28.15	10.37	0.25	7.57	46.33	-7.69	-1.47	-39.77	-48.92	5.6%
MW-18	4/6/2011	28.24	10.70	0.25	8.13	47.32	-7.75	-1.30	-37.06	-46.11	2.6%
MW-18	10/11/2011	29.24	10.86	0.23	7.00	47.34	-7.13	-1.49	-42.06	-50.68	7.1%
MW-18	4/30/2012	28.05	10.78	0.30	6.74	45.86	-7.72	-1.55	-37.27	-46.54	1.5%
MW-18	11/26/2012	28.64	10.78	0.30	8.40	48.12	-7.86	-1.52	-25.19	-34.57	28.1%
MW-18	5/20/2013	28.54	10.53	0.23	7.87	47.18	-7.40	-1.42	-38.73	-47.54	0.8%
MW-18	12/3/2013	26.15	9.46	0.23	7.44	43.28	-7.60	-1.43	-41.64	-50.67	17.1%
MW-18	5/27/2014	26.75	10.94	0.20	7.53	45.42	-7.74	-1.55	-42.06	-51.35	13.0%
MW-18	11/10/2014	34.73	13.74	0.22	10.22	58.91	-7.92	-1.36	-37.68	-46.96	20.3%
MW-18	4/15/2015	31.04	11.36	0.25	9.05	51.69	-7.66	-1.49	-37.27	-46.41	10.2%
MW-18	11/9/2015	27.85	10.70	0.20	7.70	46.45	-7.60	-1.39	-41.64	-50.63	9.0%
MW-18	4/19/2016	29.04	11.36	0.22	7.92	48.54	-6.23	-1.23	-39.35	-46.81	3.6%
MW-18	12/14/2005	25.55	15.96	0.35	19.75	61.61	-5.06	-1.27	-55.80	-62.13	0.8%
MW-18	10/24/2006	24.40	14.48	0.37	19.92	59.17	-7.98	-1.30	-55.80	-65.07	10.0%
MW-18	3/16/2007	23.85	14.65	0.35	18.49	57.33	-7.74	-1.27	-52.47	-61.47	7.2%
MW-18	6/20/2007	24.75	14.89	0.38	19.75	59.77	-5.90	-1.24	-55.80	-62.94	5.3%
MW-18	8/28/2007	25.15	15.39	0.32	18.57	59.43	-6.22	-1.27	-56.63	-64.12	7.9%
MW-18	10/23/2007	25.40	15.06	0.37	21.53	62.36	-6.00	-1.27	-54.55	-61.82	0.9%
MW-18	3/12/2008	23.06	13.74	0.33	20.40	57.53	-8.52	-1.24	-53.30	-63.06	9.6%
MW-18	5/29/2008	24.95	15.31	0.32	21.84	62.42	-3.08	-1.27	-57.67	-62.02	0.6%
MW-18	8/7/2008	24.55	14.89	0.33	22.36	62.14	-4.43	-1.10	-56.84	-62.36	0.4%

B-3. Charge Balance Calculations for Major Cations and Anions in MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Location	Date Sampled	Calcium (mEq/L)	Magnesium (mEq/L)	Potassium (mEq/L)	Sodium (mEq/L)	Total Cation Charge (meq/L)	Bicarbonate as HCO_3 (mEq/L)	Chloride (mEq/L)	Sulfate (mEq/L)	Total Anion Charge (meq/L)	Percent Difference
MW-24	11/11/2008	24.65	14.98	0.34	22.49	62.45	-3.69	-1.21	-58.30	-63.20	1.2%
MW-24	2/5/2009	23.25	13.50	0.36	23.40	60.51	-3.79	-1.24	-54.76	-59.78	1.2%
MW-24	5/30/2009	22.01	13.50	0.31	21.27	57.08	-3.82	-1.24	-55.59	-60.65	6.2%
MW-24	10/28/2009	24.35	14.56	0.32	21.23	60.47	-4.21	-1.30	-61.42	-66.93	10.7%
MW-24	1/19/2010	24.55	14.40	0.33	21.75	61.03	-4.43	-1.30	-57.05	-62.77	2.8%
MW-24	5/6/2010	24.20	14.65	0.32	22.18	61.35	-5.02	-1.30	-53.30	-59.61	2.8%
MW-24	11/17/2010	23.85	14.24	0.33	20.66	59.08	-3.23	-1.35	-57.46	-62.05	5.0%
MW-24	4/5/2011	23.65	13.91	0.32	22.10	59.98	-2.84	-1.27	-53.30	-57.40	4.3%
MW-24	5/10/2012	25.30	14.07	0.35	20.62	60.34	-3.64	-1.18	-51.84	-56.67	6.1%
MW-24	11/29/2012	23.40	12.84	0.32	22.14	58.70	-2.94	-1.36	-48.09	-52.39	10.7%
MW-24	5/22/2013	23.20	13.58	0.33	22.18	59.30	-4.68	-1.25	-43.10	-49.03	17.3%
MW-24	12/12/2013	22.71	13.91	0.35	22.10	59.06	-4.08	-1.30	-51.84	-57.22	3.1%
MW-24	5/30/2014	23.10	15.39	0.30	21.66	60.46	-2.22	-1.26	-51.01	-54.49	9.9%
MW-24	11/19/2014	23.65	14.07	0.30	20.79	58.82	-4.48	-1.15	-64.96	-70.59	20.0%
MW-24	6/24/2015	25.35	13.82	0.32	23.49	62.98	-1.14	-1.36	-59.13	-61.62	2.2%
MW-24	11/18/2015	24.80	13.99	0.31	21.97	61.07	-0.83	-1.27	-58.09	-60.18	1.4%
MW-24	4/28/2016	24.15	14.40	0.30	21.10	59.95	-0.34	-1.34	-57.46	-59.14	1.4%

Note:
meq/L= milliequivalent per liter

B-4. Descriptive Statistics for SAR Constituents in MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Location	MW-18			MW-24			MW-24			MW-24		MW-24		
Data Set	2016 SAR[1]	2012 SAR[2]	2007 Background Report[3]	2016 SAR[1]	2012 SAR[2]	2008 Background Report[4]	2016 SAR[1]	2012 SAR[2]	2008 Background Report[4]	2016 SAR[1]	2012 pH Report[5]	2016 SAR[1]	2012 SAR[2]	2008 Background Report[4]
Analyte	Sulfate			Cadmium			Fluoride			pH		Thallium		
Units	mg/L			mg/L			mg/L			s.u.		µg/L		
% Non-Detects	0%	0%	0%	31%	44%	89%	0%	0%	0%	0%	0%	36%	50%	100%
Number of Valid Data Points	47	30	19	46	27	9	40	26	8	38	25	46	28	11
Normally or Lognormally Distributed?	No	No	NA	No	No	NA	Yes	Yes	NA	Yes	NA	No	No	NA
Mean	1712.511	1668.467	1478.158	2.02	1.28	0.3	0.237	0.181	0.2	6.235	6.5	0.871	0.71	NA
Minimum Concentration	1023	1069	1023	0.5	0.5	0.3	0.1	0.1	0.2	4.83	5.73	0.5	0.5	NA
Maximum Concentration	2020	2020	1940	6.72	4.28	0.6	0.558	0.36	0.2	7.54	7.54	2.1	1.57	NA
Standard Deviation	253.894	249.162	230.260	1.79	1.06	0.1	0.115	0.0722	0	0.602	0.48	0.447	0.31	NA
Range	997	951	917	6.22	3.78	0.3	0.458	0.26	0	2.71	1.81	1.6	1.07	NA
Geometric Mean	1692.075	1649.304	1460.783	1.41	0.96	0.3	0.212	0.17	0.2	6.21	6.49	0.781	0.66	NA
Skewness	-0.839	-0.464	0.105	1.30	1.32	3	0.797	0.0688	0	0.014	0.492	1.27	1.56	NA
Q25	1456.5	1446	1371	0.513	0.5	0.3	0.14	0.13	0.2	5.90	6.12	0.5	0.5	NA
Median	1790	1720	1446	1.41	0.59	0.3	0.2055	0.163	0.2	6.17	6.44	0.687	0.52	NA
Q75	1905	1910	1600	2.74	2.01	0.3	0.317	0.22	0.2	6.63	6.77	1.09	0.83	NA

Notes:

mg/L = milligrams per liter

µg/L = micrograms per liter

s.u. = standard units

[1] 2016 SAR is in reference to the current Source Assessment Report

[2] "2012 SAR" is in reference to: INTERA Incorporated. 2012. Source Assessment Report, White Mesa Uranium Mill, Blanding, Utah. Prepared for Energy Fuels Resources (USA) Inc.October.

[3] "2007 Background Report" is in reference to: INTERA Incorporated. 2007. *Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'sWhite Mesa Uranium Mil, San Juan County, Utah* . Prepared for Denison Mines (USA) Corp. October.

[4] "2008 Background Report" is in reference to: INTERA Incorporated. 2008. *Revised Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'sWhite Mesa Uranium Mil, San Juan County, Utah* . Prepared for Denison Mines (USA) Corp. April.

[5] "2012 pH Report" is in reference to: INTERA Incorporated. 2012. PH Report, White Mesa Uranium Mill, Blanding, Utah. November.

B-5: Data Used for Statistical Analysis of MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type
MW-18_03241993	MW-18	3/24/1993	Sulfate	1371	mg/L		Y	Water	REG	GW
MW-18_06091993	MW-18	6/9/1993	Sulfate	1431	mg/L		Y	Water	REG	GW
MW-18_09221993	MW-18	9/22/1993	Sulfate	1466	mg/L		Y	Water	REG	GW
MW-18_12141993	MW-18	12/14/1993	Sulfate	1446	mg/L		Y	Water	REG	GW
MW-18_03291994	MW-18	3/29/1994	Sulfate	1370	mg/L		Y	Water	REG	GW
MW-18_03301994s	MW-18	3/30/1994	Sulfate	1447	mg/L		Y	Water	REG	GW
MW-18_06161994	MW-18	6/16/1994	Sulfate	1416	mg/L		Y	Water	REG	GW
MW-18_08191994	MW-18	8/19/1994	Sulfate	1388	mg/L		Y	Water	REG	GW
MW-18_12141994	MW-18	12/14/1994	Sulfate	1023	mg/L		Y	Water	REG	GW
MW-18_05121999	MW-18	5/12/1999	Sulfate	1340	mg/L		Y	Water	REG	GW
MW-18_12012000	MW-18	12/1/2000	Sulfate	1600	mg/L		Y	Water	REG	GW
MW-18_11062001	MW-18	11/6/2001	Sulfate	1380	mg/L		Y	Water	REG	GW
MW-18_09092002s	MW-18	9/9/2002	Sulfate	1940	mg/L		Y	Water	REG	GW
MW-18_09092002	MW-18	9/9/2002	Sulfate	1590	mg/L		Y	Water	REG	GW
MW-18_12142005	MW-18	12/14/2005	Sulfate	1740	mg/L		Y	Water	REG	GW
MW-18_06212006	MW-18	6/21/2006	Sulfate	1700	mg/L	D	Y	Water	REG	GW
MW-18_10262006	MW-18	10/26/2006	Sulfate	1870	mg/L	D	Y	Water	REG	GW
MW-18_10302007	MW-18	10/30/2007	Sulfate	1700	mg/L	D	Y	Water	REG	GW
MW 18_06042008	MW-18	6/4/2008	Sulfate	1870	mg/L	D	Y	WATER	REG	GW
MW 18_11042008	MW-18	11/4/2008	Sulfate	1880	mg/L	D	Y	WATER	REG	GW
MW 18_05272009	MW-18	5/27/2009	Sulfate	1930	mg/L	D	Y	WATER	REG	GW
MW 18_10212009	MW-18	10/21/2009	Sulfate	1900	mg/L	D	Y	WATER	REG	GW
MW 18_05042010	MW-18	5/4/2010	Sulfate	1950	mg/L	D	Y	WATER	REG	GW
MW 18_09152010	MW-18	9/15/2010	Sulfate	1930	mg/L	D	Y	WATER	REG	GW
MW 18_11182010	MW-18	11/18/2010	Sulfate	1910	mg/L	D	Y	WATER	REG	GW
MW-18_02152011	MW-18	2/15/2011	Sulfate	1770	mg/L	D	Y	WATER	REG	GW
MW-18_04062011	MW-18	4/6/2011	Sulfate	1780	mg/L	D	Y	WATER	REG	GW
MW-18_08102011	MW-18	8/10/2011	Sulfate	1910	mg/L	D	Y	WATER	REG	GW
MW-18_10112011	MW-18	10/11/2011	Sulfate	2020	mg/L	D	Y	WATER	REG	GW
MW-18_02272012	MW-18	2/27/2012	Sulfate	1920	mg/L	D	Y	Water	REG	GW
MW-18_04302012	MW-18	4/30/2012	Sulfate	1790	mg/L	D	Y	WATER	REG	GW
MW-18_07182012	MW-18	7/18/2012	Sulfate	1900	mg/L	D	Y	WATER	REG	GW
MW-18_11262012	MW-18	11/26/2012	Sulfate	1210	mg/L		Y	WATER	REG	GW
MW-18_02252013	MW-18	2/25/2013	Sulfate	1270	mg/L		Y	WATER	REG	GW
MW-18_05202013	MW-18	5/20/2013	Sulfate	1860	mg/L		Y	WATER	REG	GW
MW-18_07152013	MW-18	7/15/2013	Sulfate	1860	mg/L		Y	WATER	REG	GW
MW-18_12032013	MW-18	12/3/2013	Sulfate	2000	mg/L		Y	WATER	REG	GW
MW-18_02192014	MW-18	2/19/2014	Sulfate	1650	mg/L		Y	WATER	REG	GW
MW-18_05272014	MW-18	5/27/2014	Sulfate	2020	mg/L		Y	WATER	REG	GW
MW-18_09092014	MW-18	9/9/2014	Sulfate	1760	mg/L		Y	WATER	REG	GW
MW-18_11102014	MW-18	11/10/2014	Sulfate	1810	mg/L		Y	WATER	REG	GW
MW-18_02032015	MW-18	2/3/2015	Sulfate	1810	mg/L		Y	WATER	REG	GW
MW-18_04152015	MW-18	4/15/2015	Sulfate	1790	mg/L		Y	WATER	REG	GW
MW-18_07272015	MW-18	7/27/2015	Sulfate	1990	mg/L		Y	WATER	REG	GW
MW-18_11092015	MW-18	11/9/2015	Sulfate	2000	mg/L		Y	WATER	REG	GW
MW-18_02092016	MW-18	2/9/2016	Sulfate	1890	mg/L		Y	WATER	REG	GW
MW-18_04192016	MW-18	4/19/2016	Sulfate	1890	mg/L		Y	WATER	REG	GW
MW-24_06232005	MW-24	6/23/2005	Cadmium	1	µg/L	U	N	Water	REG	GW
MW-24_07262005	MW-24	7/26/2005	Cadmium	0.71	µg/L	D U	N	Water	REG	GW
MW-24_09252005	MW-24	9/25/2005	Cadmium	0.5	µg/L	U D	N	Water	REG	GW
MW-24_12142005	MW-24	12/14/2005	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW-24_03272006	MW-24	3/27/2006	Cadmium	0.55	µg/L		Y	Water	REG	GW
MW-24_06222006	MW-24	6/22/2006	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW-24_09152006	MW-24	9/15/2006	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW-24_10242006	MW-24	10/24/2006	Cadmium	0.5	µg/L	U	N	Water	REG	GW

B-5: Data Used for Statistical Analysis of MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type
MW-24_03162007	MW-24	3/16/2007	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW-24_06202007	MW-24	6/20/2007	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW-24_08282007	MW-24	8/28/2007	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW-24_10232007	MW-24	10/23/2007	Cadmium	0.5	µg/L	U	N	Water	REG	GW
MW 24_03122008	MW-24	3/12/2008	Cadmium	0.5	µg/L	U	N	WATER	REG	GW
MW 24_05292008	MW-24	5/29/2008	Cadmium	0.5	µg/L	U	N	WATER	REG	GW
MW 24_08072008	MW-24	8/7/2008	Cadmium	0.88	µg/L		Y	WATER	REG	GW
MW 24_11112008	MW-24	11/11/2008	Cadmium	0.91	µg/L		Y	WATER	REG	GW
MW 24_02052009	MW-24	2/5/2009	Cadmium	0.5	µg/L	U	N	WATER	REG	GW
MW 24_05302009	MW-24	5/30/2009	Cadmium	0.59	µg/L		Y	WATER	REG	GW
MW 24_08242009	MW-24	8/24/2009	Cadmium	1.48	µg/L		Y	WATER	REG	GW
MW 24_10282009	MW-24	10/28/2009	Cadmium	1.06	µg/L		Y	WATER	REG	GW
MW 24_01192010	MW-24	1/19/2010	Cadmium	2.63	µg/L		Y	WATER	REG	GW
MW 24_05062010	MW-24	5/6/2010	Cadmium	4.28	µg/L		Y	WATER	REG	GW
MW 24_09212010	MW-24	9/21/2010	Cadmium	5.06	µg/L		Y	WATER	REG	GW
MW 24_11172010	MW-24	11/17/2010	Cadmium	3.22	µg/L		Y	WATER	REG	GW
MW-24_02102011	MW-24	2/10/2011	Cadmium	2.78	µg/L		Y	WATER	REG	GW
MW-24_04052011	MW-24	4/5/2011	Cadmium	2.61	µg/L		Y	WATER	REG	GW
MW-24_08042011	MW-24	8/4/2011	Cadmium	1.46	µg/L		Y	WATER	REG	GW
MW-24_10112011	MW-24	10/11/2011	Cadmium	1.78	µg/L		Y	WATER	REG	GW
MW-24_02232012	MW-24	2/23/2012	Cadmium	2.25	µg/L		Y	Water	REG	GW
MW-24_05102012	MW-24	5/10/2012	Cadmium	2.01	µg/L		Y	WATER	REG	GW
MW-24_07182012	MW-24	7/18/2012	Cadmium	4.7	µg/L		Y	WATER	REG	GW
MW-24_11292012	MW-24	11/29/2012	Cadmium	1.35	µg/L		Y	WATER	REG	GW
MW-24_03142013	MW-24	3/14/2013	Cadmium	2	µg/L		Y	WATER	REG	GW
MW-24_05222013	MW-24	5/22/2013	Cadmium	1.32	µg/L		Y	WATER	REG	GW
MW-24_07192013	MW-24	7/19/2013	Cadmium	6.72	µg/L		Y	WATER	REG	GW
MW-24_12122013	MW-24	12/12/2013	Cadmium	1.15	µg/L		Y	WATER	REG	GW
MW-24_03062014	MW-24	3/6/2014	Cadmium	5.92	µg/L		Y	WATER	REG	GW
MW-24_05302014	MW-24	5/30/2014	Cadmium	2.91	µg/L		Y	WATER	REG	GW
MW-24_09172014	MW-24	9/17/2014	Cadmium	1.5	µg/L		Y	WATER	REG	GW
MW-24_11192014	MW-24	11/19/2014	Cadmium	1.17	µg/L		Y	WATER	REG	GW
MW-24_02122015	MW-24	2/12/2015	Cadmium	3.31	µg/L		Y	WATER	REG	GW
MW-24_06242015	MW-24	6/24/2015	Cadmium	1.79	µg/L		Y	WATER	REG	GW
MW-24_07292015	MW-24	7/29/2015	Cadmium	1.88	µg/L		Y	WATER	REG	GW
MW-24_11182015	MW-24	11/18/2015	Cadmium	3.75	µg/L		Y	WATER	REG	GW
MW-24_02172016	MW-24	2/17/2016	Cadmium	6.31	µg/L		Y	WATER	REG	GW
MW-24_04282016	MW-24	4/28/2016	Cadmium	6.07	µg/L		Y	WATER	REG	GW
MW-24_06232005	MW-24	6/23/2005	Fluoride	0.4	mg/L		Y	Water	REG	GW
MW-24_09252005	MW-24	9/25/2005	Fluoride	0.22	mg/L		Y	Water	REG	GW
MW-24_12142005	MW-24	12/14/2005	Fluoride	0.15	mg/L		Y	Water	REG	GW
MW-24_03272006	MW-24	3/27/2006	Fluoride	0.22	mg/L		Y	Water	REG	GW
MW-24_06222006	MW-24	6/22/2006	Fluoride	0.2	mg/L		Y	Water	REG	GW
MW-24_09152006	MW-24	9/15/2006	Fluoride	0.24	mg/L		Y	Water	REG	GW
MW-24_10242006	MW-24	10/24/2006	Fluoride	0.31	mg/L		Y	Water	REG	GW
MW-24_03162007	MW-24	3/16/2007	Fluoride	0.2	mg/L		Y	Water	REG	GW
MW-24_06202007	MW-24	6/20/2007	Fluoride	0.23	mg/L		Y	Water	REG	GW
MW-24_08282007	MW-24	8/28/2007	Fluoride	0.19	mg/L		Y	Water	REG	GW
MW-24_10232007	MW-24	10/23/2007	Fluoride	0.11	mg/L		Y	Water	REG	GW
MW 24_03122008	MW-24	3/12/2008	Fluoride	0.2	mg/L		Y	WATER	REG	GW
MW 24_05292008	MW-24	5/29/2008	Fluoride	0.12	mg/L		Y	WATER	REG	GW
MW 24_08072008	MW-24	8/7/2008	Fluoride	0.13	mg/L		Y	WATER	REG	GW
MW 24_11112008	MW-24	11/11/2008	Fluoride	0.14	mg/L		Y	WATER	REG	GW
MW 24_02052009	MW-24	2/5/2009	Fluoride	0.13	mg/L		Y	WATER	REG	GW
MW 24_05302009	MW-24	5/30/2009	Fluoride	0.11	mg/L		Y	WATER	REG	GW

B-5: Data Used for Statistical Analysis of MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type
MW 24_08242009	MW-24	8/24/2009	Fluoride	0.1	mg/L		Y	WATER	REG	GW
MW 24_10282009	MW-24	10/28/2009	Fluoride	0.15	mg/L		Y	WATER	REG	GW
MW 24_01192010	MW-24	1/19/2010	Fluoride	0.1	mg/L		Y	WATER	REG	GW
MW 24_05062010	MW-24	5/6/2010	Fluoride	0.14	mg/L		Y	WATER	REG	GW
MW 24_11172010	MW-24	11/17/2010	Fluoride	0.18	mg/L		Y	WATER	REG	GW
MW-24_04052011	MW-24	4/5/2011	Fluoride	0.19	mg/L		Y	WATER	REG	GW
MW-24_10112011	MW-24	10/11/2011	Fluoride	0.36	mg/L		Y	WATER	REG	GW
MW-24_05102012	MW-24	5/10/2012	Fluoride	0.14	mg/L		Y	WATER	REG	GW
MW-24_11292012	MW-24	11/29/2012	Fluoride	0.558	mg/L		Y	WATER	REG	GW
MW-24_03142013	MW-24	3/14/2013	Fluoride	0.355	mg/L		Y	WATER	REG	GW
MW-24_05222013	MW-24	5/22/2013	Fluoride	0.211	mg/L		Y	WATER	REG	GW
MW-24_07192013	MW-24	7/19/2013	Fluoride	0.288	mg/L		Y	WATER	REG	GW
MW-24_12122013	MW-24	12/12/2013	Fluoride	0.31	mg/L		Y	WATER	REG	GW
MW-24_03062014	MW-24	3/6/2014	Fluoride	0.234	mg/L		Y	WATER	REG	GW
MW-24_05302014	MW-24	5/30/2014	Fluoride	0.337	mg/L		Y	WATER	REG	GW
MW-24_09172014	MW-24	9/17/2014	Fluoride	0.4	mg/L		Y	WATER	REG	GW
MW-24_11192014	MW-24	11/19/2014	Fluoride	0.109	mg/L		Y	WATER	REG	GW
MW-24_02122015	MW-24	2/12/2015	Fluoride	0.397	mg/L		Y	WATER	REG	GW
MW-24_06242015	MW-24	6/24/2015	Fluoride	0.293	mg/L		Y	WATER	REG	GW
MW-24_07292015	MW-24	7/29/2015	Fluoride	0.388	mg/L		Y	WATER	REG	GW
MW-24_11182015	MW-24	11/18/2015	Fluoride	0.372	mg/L		Y	WATER	REG	GW
MW-24_02172016	MW-24	2/17/2016	Fluoride	0.117	mg/L		Y	WATER	REG	GW
MW-24_04282016	MW-24	4/28/2016	Fluoride	0.446	mg/L		Y	WATER	REG	GW
MW-24	MW-24	12/13/2005	pH	6.8	s.u.		Y	WATER	REG	GW
MW-24	MW-24	10/24/2006	pH	7.38	s.u.		Y	WATER	REG	GW
MW-24	MW-24	8/27/2007	pH	7.54	s.u.		Y	WATER	REG	GW
MW-24	MW-24	3/12/2008	pH	6.77	s.u.		Y	WATER	REG	GW
MW-24	MW-24	3/24/2008	pH	6.12	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/28/2008	pH	6.94	s.u.		Y	WATER	REG	GW
MW-24	MW-24	8/6/2008	pH	6.9	s.u.		Y	WATER	REG	GW
MW-24	MW-24	11/10/2008	pH	7.32	s.u.		Y	WATER	REG	GW
MW-24	MW-24	2/4/2009	pH	6.44	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/20/2009	pH	6.76	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/29/2009	pH	6.59	s.u.		Y	WATER	REG	GW
MW-24	MW-24	8/12/2009	pH	6.52	s.u.		Y	WATER	REG	GW
MW-24	MW-24	8/19/2009	pH	6.41	s.u.		Y	WATER	REG	GW
MW-24	MW-24	10/26/2009	pH	6.29	s.u.		Y	WATER	REG	GW
MW-24	MW-24	1/18/2010	pH	6.4	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/5/2010	pH	5.91	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/17/2010	pH	5.78	s.u.		Y	WATER	REG	GW
MW-24	MW-24	9/20/2010	pH	6.64	s.u.		Y	WATER	REG	GW
MW-24	MW-24	11/16/2010	pH	6.1	s.u.		Y	WATER	REG	GW
MW-24	MW-24	2/9/2011	pH	5.73	s.u.		Y	WATER	REG	GW
MW-24	MW-24	4/4/2011	pH	6.12	s.u.		Y	WATER	REG	GW
MW-24	MW-24	7/17/2012	pH	6.45	s.u.		Y	WATER	REG	GW
MW-24	MW-24	11/29/2012	pH	6.01	s.u.		Y	WATER	REG	GW
MW-24	MW-24	3/14/2013	pH	6.29	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/22/2013	pH	6.77	s.u.		Y	WATER	REG	GW
MW-24	MW-24	7/19/2013	pH	5.8	s.u.		Y	WATER	REG	GW
MW-24	MW-24	12/12/2013	pH	6.08	s.u.		Y	WATER	REG	GW
MW-24	MW-24	3/6/2014	pH	5.89	s.u.		Y	WATER	REG	GW
MW-24	MW-24	5/30/2014	pH	6.07	s.u.		Y	WATER	REG	GW
MW-24	MW-24	9/17/2014	pH	5.09	s.u.		Y	WATER	REG	GW
MW-24	MW-24	11/19/2014	pH	5.69	s.u.		Y	WATER	REG	GW
MW-24	MW-24	2/12/2015	pH	6.21	s.u.		Y	WATER	REG	GW

B-5: Data Used for Statistical Analysis of MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type
MW-24	MW-24	5/28/2015	pH	5.39	s.u.		Y	WATER	REG	GW
MW-24	MW-24	6/24/2015	pH	5.98	s.u.		Y	WATER	REG	GW
MW-24	MW-24	7/29/2015	pH	5.49	s.u.		Y	WATER	REG	GW
MW-24	MW-24	11/18/2015	pH	5.48	s.u.		Y	WATER	REG	GW
MW-24	MW-24	2/17/2016	pH	5.95	s.u.		Y	WATER	REG	GW
MW-24	MW-24	4/28/2016	pH	4.83	s.u.		Y	WATER	REG	GW
MW-24_06232005	MW-24	6/23/2005	Sulfate	2450	mg/L		Y	Water	REG	GW
MW-24_09252005	MW-24	9/25/2005	Sulfate	2850	mg/L	D	Y	Water	REG	GW
MW-24_12142005	MW-24	12/14/2005	Sulfate	2680	mg/L	D	Y	Water	REG	GW
MW-24_03272006	MW-24	3/27/2006	Sulfate	2470	mg/L	D	Y	Water	REG	GW
MW-24_06222006	MW-24	6/22/2006	Sulfate	2580	mg/L	D	Y	Water	REG	GW
MW-24_09152006	MW-24	9/15/2006	Sulfate	2290	mg/L	D	Y	Water	REG	GW
MW-24_10242006	MW-24	10/24/2006	Sulfate	2680	mg/L	D	Y	Water	REG	GW
MW-24_03162007	MW-24	3/16/2007	Sulfate	2520	mg/L	D	Y	Water	REG	GW
MW-24_06202007	MW-24	6/20/2007	Sulfate	2680	mg/L	D	Y	Water	REG	GW
MW-24_08282007	MW-24	8/28/2007	Sulfate	2720	mg/L	D	Y	Water	REG	GW
MW-24_10232007	MW-24	10/23/2007	Sulfate	2620	mg/L	D	Y	Water	REG	GW
MW 24_03122008	MW-24	3/12/2008	Sulfate	2560	mg/L	D	Y	WATER	REG	GW
MW 24_05292008	MW-24	5/29/2008	Sulfate	2770	mg/L	D	Y	WATER	REG	GW
MW 24_08072008	MW-24	8/7/2008	Sulfate	2730	mg/L	D	Y	WATER	REG	GW
MW 24_11112008	MW-24	11/11/2008	Sulfate	2800	mg/L	D	Y	WATER	REG	GW
MW 24_02052009	MW-24	2/5/2009	Sulfate	2630	mg/L	D	Y	WATER	REG	GW
MW 24_05302009	MW-24	5/30/2009	Sulfate	2670	mg/L	D	Y	WATER	REG	GW
MW 24_08242009	MW-24	8/24/2009	Sulfate	2740	mg/L	D	Y	WATER	REG	GW
MW 24_10282009	MW-24	10/28/2009	Sulfate	2950	mg/L	D	Y	WATER	REG	GW
MW 24_01192010	MW-24	1/19/2010	Sulfate	2740	mg/L	D	Y	WATER	REG	GW
MW 24_05062010	MW-24	5/6/2010	Sulfate	2560	mg/L	D	Y	WATER	REG	GW
MW 24_11172010	MW-24	11/17/2010	Sulfate	2760	mg/L	D	Y	WATER	REG	GW
MW-24_04052011	MW-24	4/5/2011	Sulfate	2560	mg/L	D	Y	WATER	REG	GW
MW-24_10112011	MW-24	10/11/2011	Sulfate	2500	mg/L	D	Y	WATER	REG	GW
MW-24_05102012	MW-24	5/10/2012	Sulfate	2490	mg/L	D	Y	WATER	REG	GW
MW-24_11292012	MW-24	11/29/2012	Sulfate	2310	mg/L		Y	WATER	REG	GW
MW-24_05222013	MW-24	5/22/2013	Sulfate	2070	mg/L		Y	WATER	REG	GW
MW-24_12122013	MW-24	12/12/2013	Sulfate	2490	mg/L		Y	WATER	REG	GW
MW-24_05302014	MW-24	5/30/2014	Sulfate	2450	mg/L		Y	WATER	REG	GW
MW-24_11192014	MW-24	11/19/2014	Sulfate	3120	mg/L		Y	WATER	REG	GW
MW-24_02122015	MW-24	2/12/2015	Sulfate	2620	mg/L		Y	WATER	REG	GW
MW-24_06242015	MW-24	6/24/2015	Sulfate	2840	mg/L		Y	WATER	REG	GW
MW-24_07292015	MW-24	7/29/2015	Sulfate	2880	mg/L		Y	WATER	REG	GW
MW-24_11182015	MW-24	11/18/2015	Sulfate	2790	mg/L		Y	WATER	REG	GW
MW-24_02172016	MW-24	2/17/2016	Sulfate	2750	mg/L		Y	WATER	REG	GW
MW-24_04282016	MW-24	4/28/2016	Sulfate	2760	mg/L		Y	WATER	REG	GW
MW-24_06232005	MW-24	6/23/2005	Thallium	1	µg/L	U	N	Water	REG	GW
MW-24_07262005	MW-24	7/26/2005	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_09252005	MW-24	9/25/2005	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_12142005	MW-24	12/14/2005	Thallium	0.82	µg/L		Y	Water	REG	GW
MW-24_03272006	MW-24	3/27/2006	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_06222006	MW-24	6/22/2006	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_09152006	MW-24	9/15/2006	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_10242006	MW-24	10/24/2006	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_03162007	MW-24	3/16/2007	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_06202007	MW-24	6/20/2007	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_08282007	MW-24	8/28/2007	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW-24_10232007	MW-24	10/23/2007	Thallium	0.5	µg/L	U	N	Water	REG	GW
MW 24_03122008	MW-24	3/12/2008	Thallium	0.5	µg/L	U	N	WATER	REG	GW

B-5: Data Used for Statistical Analysis of MW-18 and MW-24

Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type
MW 24_05292008	MW-24	5/29/2008	Thallium	0.5	µg/L	U	N	WATER	REG	GW
MW 24_08072008	MW-24	8/7/2008	Thallium	0.65	µg/L		Y	WATER	REG	GW
MW 24_11112008	MW-24	11/11/2008	Thallium	0.53	µg/L		Y	WATER	REG	GW
MW 24_02052009	MW-24	2/5/2009	Thallium	0.5	µg/L	U	N	WATER	REG	GW
MW 24_05302009	MW-24	5/30/2009	Thallium	0.5	µg/L	U	N	WATER	REG	GW
MW 24_08242009	MW-24	8/24/2009	Thallium	0.62	µg/L		Y	WATER	REG	GW
MW 24_10282009	MW-24	10/28/2009	Thallium	0.55	µg/L		Y	WATER	REG	GW
MW 24_01192010	MW-24	1/19/2010	Thallium	0.84	µg/L		Y	WATER	REG	GW
MW 24_05062010	MW-24	5/6/2010	Thallium	1.3	µg/L		Y	WATER	REG	GW
MW 24_09212010	MW-24	9/21/2010	Thallium	1.57	µg/L		Y	WATER	REG	GW
MW 24_11172010	MW-24	11/17/2010	Thallium	1.09	µg/L		Y	WATER	REG	GW
MW-24_02102011	MW-24	2/10/2011	Thallium	1.42	µg/L		Y	WATER	REG	GW
MW-24_04052011	MW-24	4/5/2011	Thallium	1.07	µg/L		Y	WATER	REG	GW
MW-24_08042011	MW-24	8/4/2011	Thallium	0.5	µg/L	U	N	WATER	REG	GW
MW-24_10112011	MW-24	10/11/2011	Thallium	0.62	µg/L		Y	WATER	REG	GW
MW-24_02232012	MW-24	2/23/2012	Thallium	0.96	µg/L		Y	Water	REG	GW
MW-24_05102012	MW-24	5/10/2012	Thallium	0.74	µg/L		Y	WATER	REG	GW
MW-24_07182012	MW-24	7/18/2012	Thallium	1.36	µg/L		Y	WATER	REG	GW
MW-24_11292012	MW-24	11/29/2012	Thallium	0.666	µg/L		Y	WATER	REG	GW
MW-24_03142013	MW-24	3/14/2013	Thallium	0.88	µg/L		Y	WATER	REG	GW
MW-24_05222013	MW-24	5/22/2013	Thallium	0.618	µg/L		Y	WATER	REG	GW
MW-24_07192013	MW-24	7/19/2013	Thallium	1.64	µg/L		Y	WATER	REG	GW
MW-24_12122013	MW-24	12/12/2013	Thallium	0.707	µg/L		Y	WATER	REG	GW
MW-24_03062014	MW-24	3/6/2014	Thallium	1.85	µg/L		Y	WATER	REG	GW
MW-24_05302014	MW-24	5/30/2014	Thallium	1.23	µg/L		Y	WATER	REG	GW
MW-24_09172014	MW-24	9/17/2014	Thallium	0.6	µg/L		Y	WATER	REG	GW
MW-24_11192014	MW-24	11/19/2014	Thallium	0.821	µg/L		Y	WATER	REG	GW
MW-24_02122015	MW-24	2/12/2015	Thallium	1.27	µg/L		Y	WATER	REG	GW
MW-24_06242015	MW-24	6/24/2015	Thallium	0.796	µg/L		Y	WATER	REG	GW
MW-24_07292015	MW-24	7/29/2015	Thallium	0.85	µg/L		Y	WATER	REG	GW
MW-24_11182015	MW-24	11/18/2015	Thallium	1.37	µg/L		Y	WATER	REG	GW
MW-24_02172016	MW-24	2/17/2016	Thallium	2.04	µg/L		Y	WATER	REG	GW
MW-24_04282016	MW-24	4/28/2016	Thallium	2.1	µg/L		Y	WATER	REG	GW

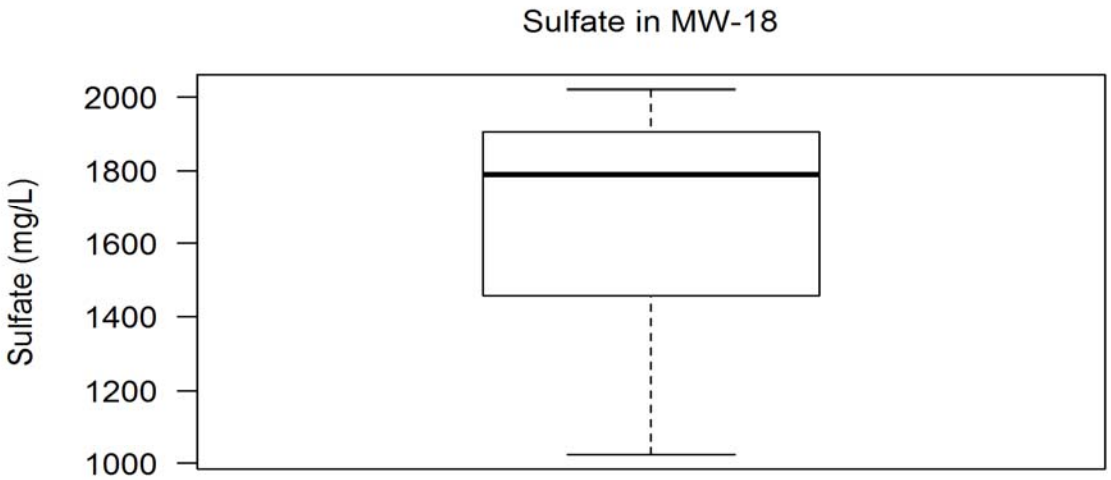
Notes:

U = Lab Qualifier indicated "Nondetect"

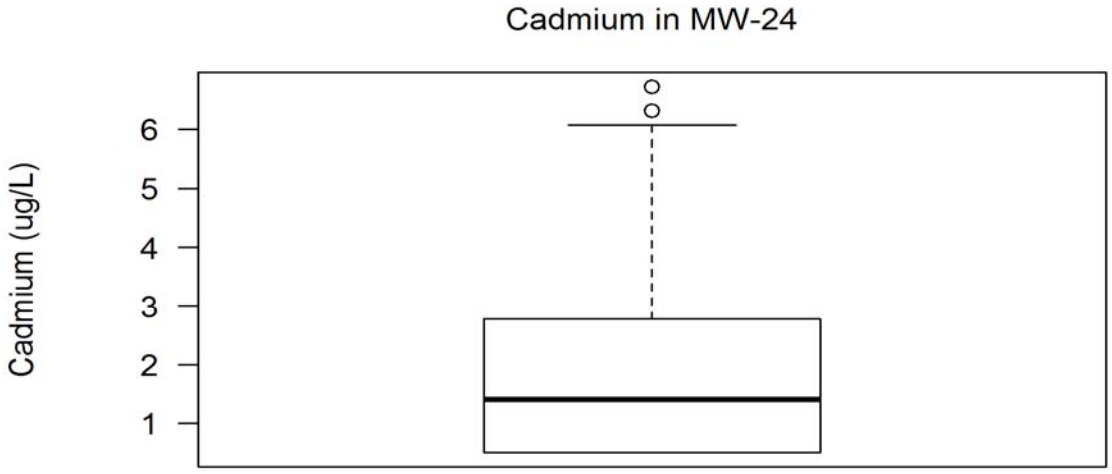
D = Lab Qualifier indicating "Analyte reporting limit increased due to sample matrix"

B-6. Box Plots for SAR Constituents in MW-18 and MW-24

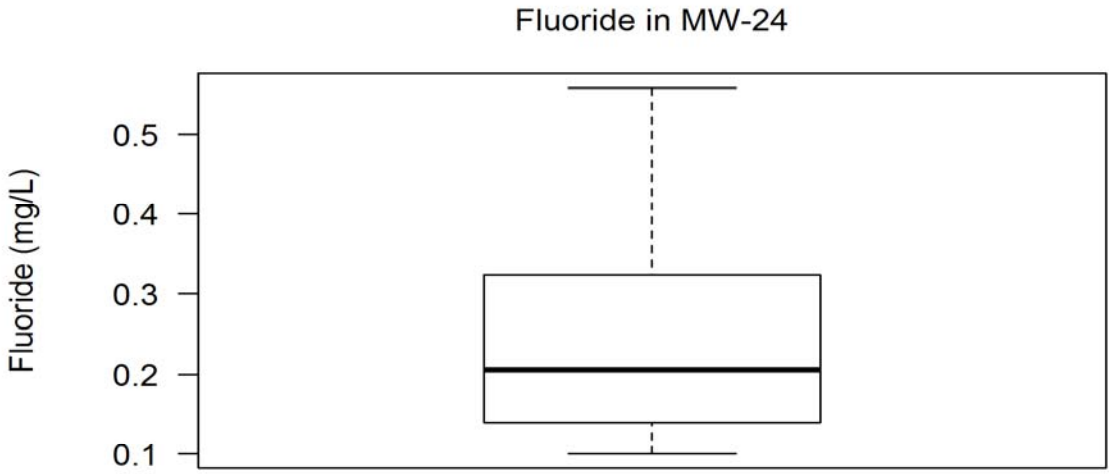
Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah



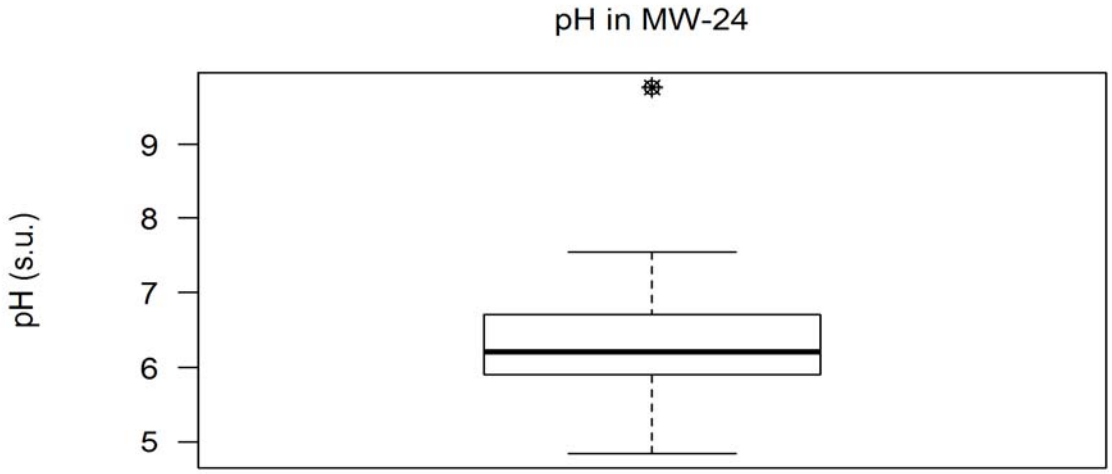
Percent nondetect: 0%
Min: 1023, Mean: 1712.51, Max: 2020, Std Dev: 253.89
Upper extreme threshold (Q75 + 3xH): 3250.5
Lower extreme threshold (Q25 - 3xH): 111



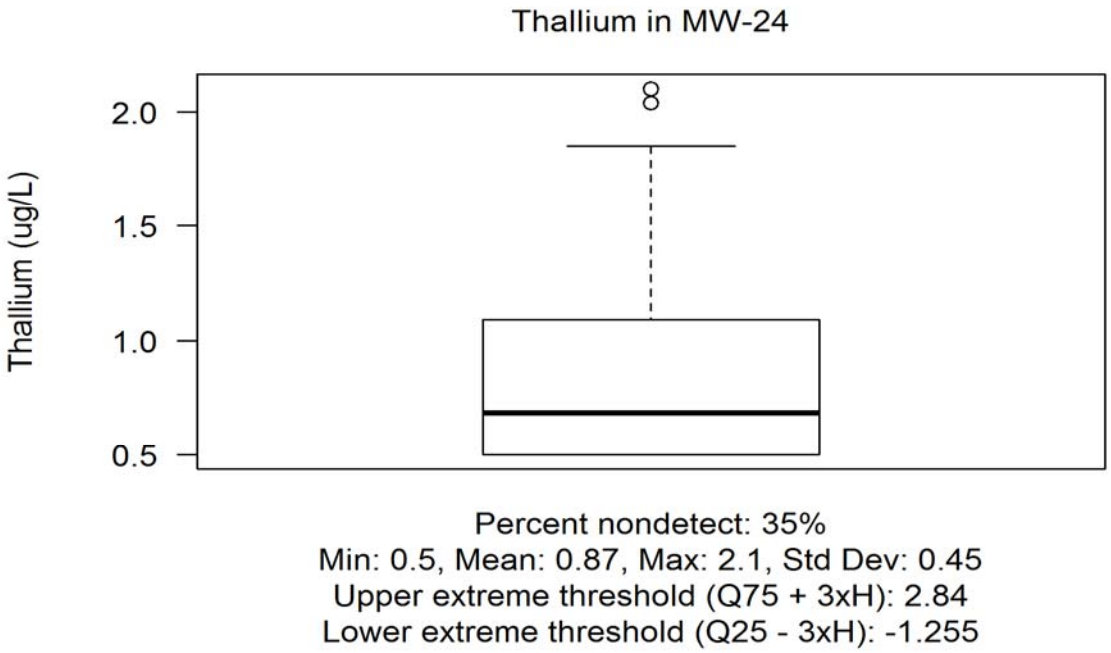
Percent nondetect: 30%
Min: 0.5, Mean: 2.02, Max: 6.72, Std Dev: 1.79
Upper extreme threshold (Q75 + 3xH): 9.4325
Lower extreme threshold (Q25 - 3xH): -6.1775



Percent nondetect: 0%
Min: 0.1, Mean: 0.24, Max: 0.558, Std Dev: 0.11
Upper extreme threshold (Q75 + 3xH): 0.847
Lower extreme threshold (Q25 - 3xH): -0.39025



Percent nondetect: 0%
Min: 4.83, Mean: 6.33, Max: 9.76, Std Dev: 0.82
Upper extreme threshold (Q75 + 3xH): 9.1
Lower extreme threshold (Q25 - 3xH): 3.5



Percent nondetect: 35%
Min: 0.5, Mean: 0.87, Max: 2.1, Std Dev: 0.45
Upper extreme threshold (Q75 + 3xH): 2.84
Lower extreme threshold (Q25 - 3xH): -1.255

B-7. Data Omitted from Statistical Analysis

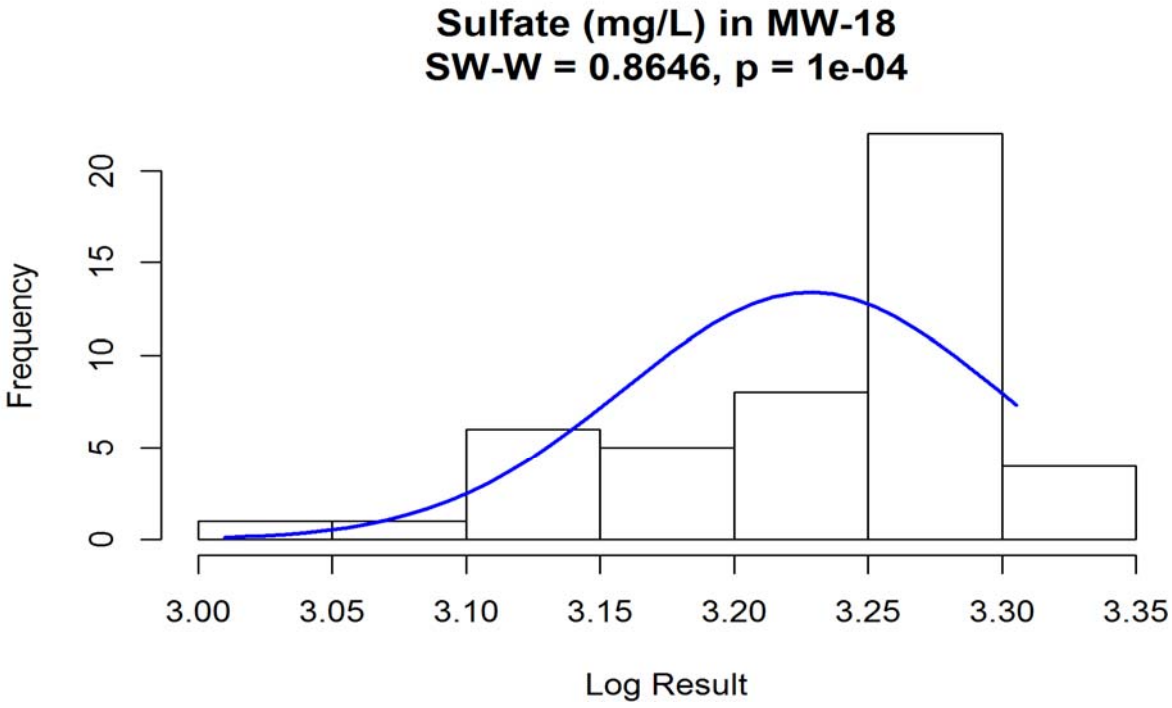
Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24

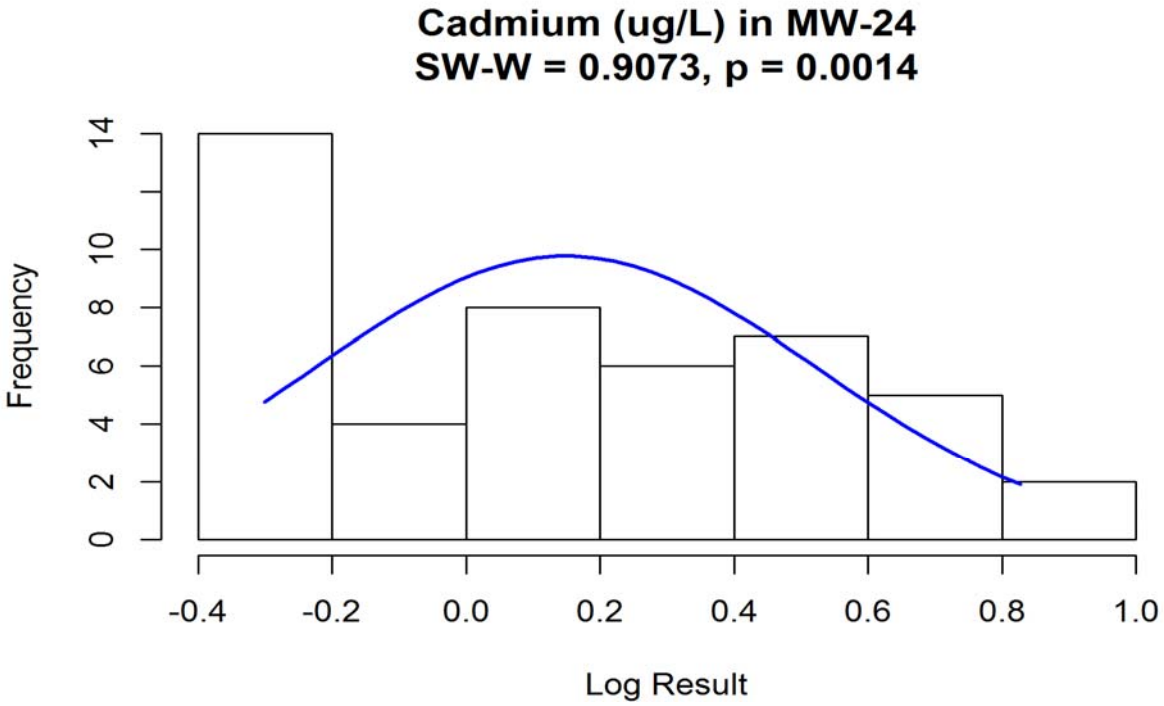
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

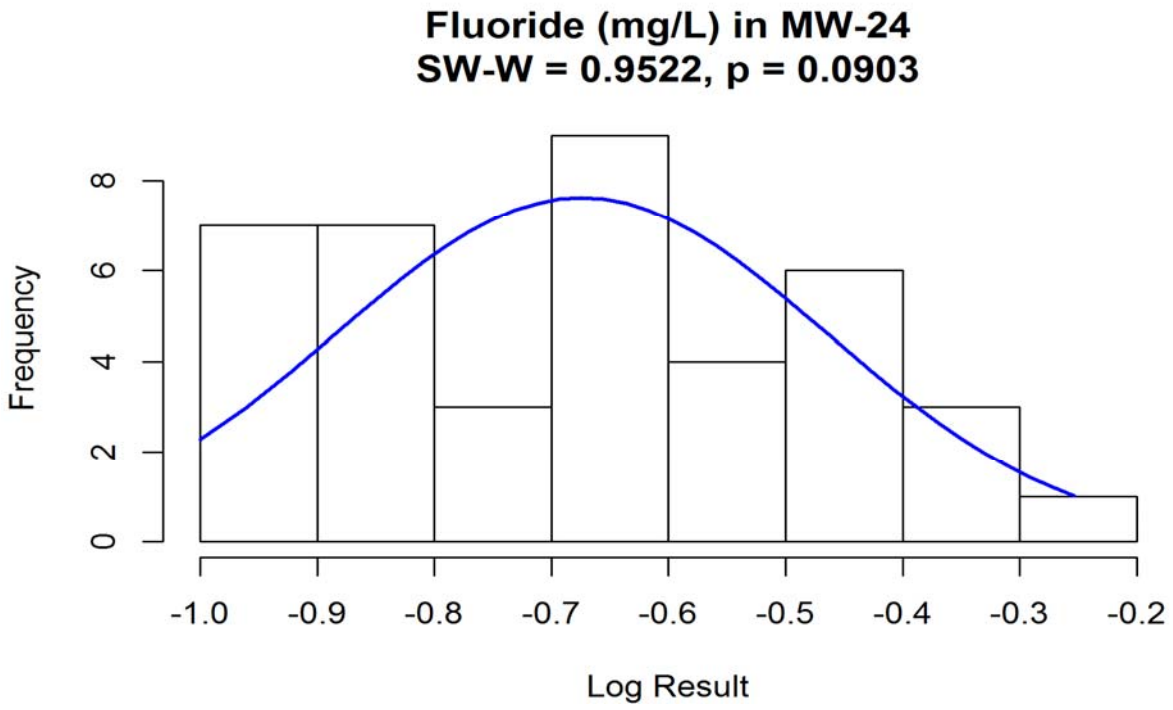
Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Sample Matrix	Sample Purpose	Sample Type	Removal Rationale
MW-24	MW-24	6/20/2007	pH	9.76	s.u.	none	WATER	REG	GW	Extreme outlier

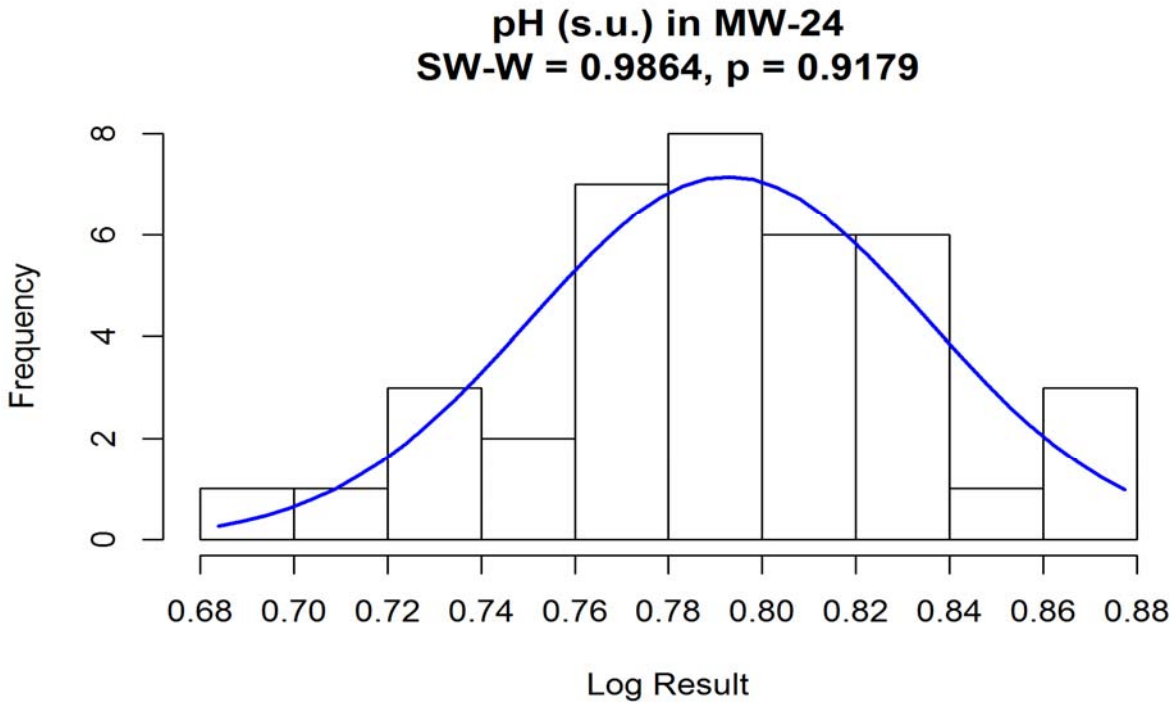
Note:

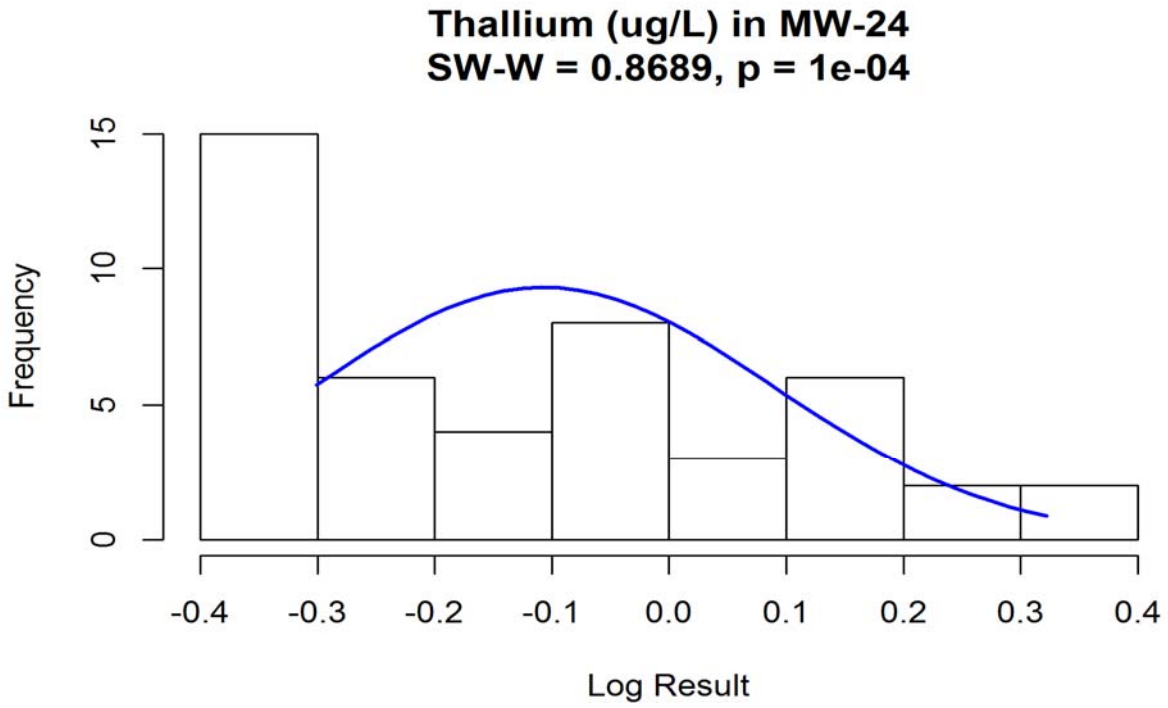
s.u. = standard units for pH


Sulfate (mg/L) in MW-18
SW-W = 0.8646, p = 1e-04
Frequency
0
5
10
15
20
3.00
3.05
3.10
3.15
3.20
3.25
3.30
3.35
Log Result


Cadmium (ug/L) in MW-24
SW-W = 0.9073, p = 0.0014
Frequency
0
2
4
6
8
10
14
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
Log Result


Fluoride (mg/L) in MW-24
SW-W = 0.9522, p = 0.0903
Frequency
0
2
4
6
8
-1.0
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
Log Result

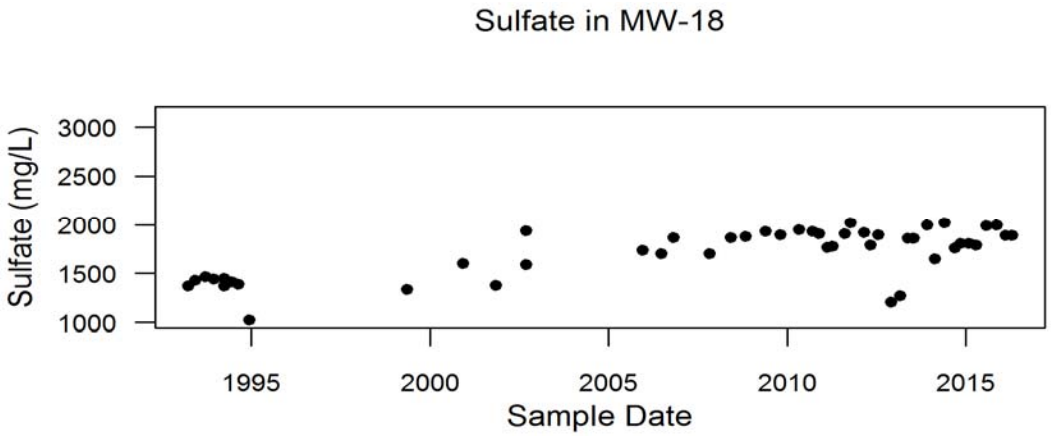

pH (s.u.) in MW-24
SW-W = 0.9864, p = 0.9179
Frequency
0
2
4
6
8
0.68
0.70
0.72
0.74
0.76
0.78
0.80
0.82
0.84
0.86
0.88
Log Result

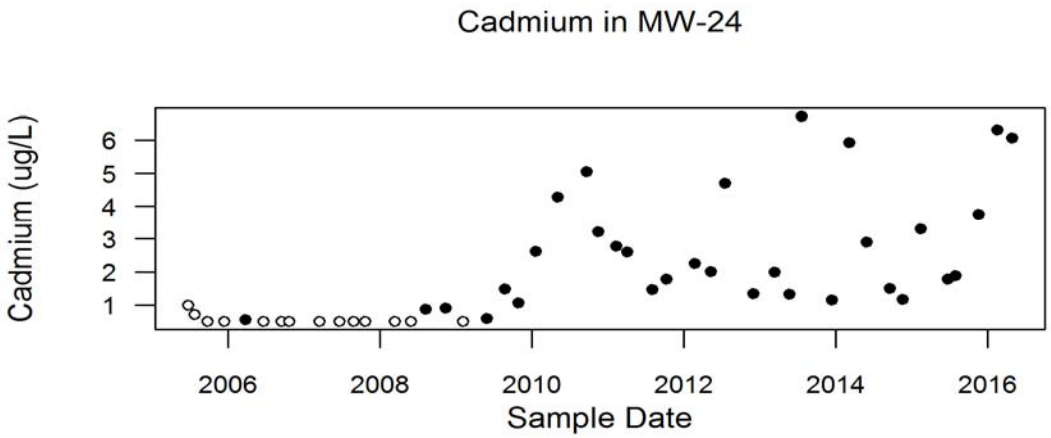

Thallium (ug/L) in MW-24
SW-W = 0.8689, p = 1e-04
Frequency
0
5
10
15
-0.4
-0.3
-0.2
-0.1
0.0
0.1
0.2
0.3
0.4
Log Result

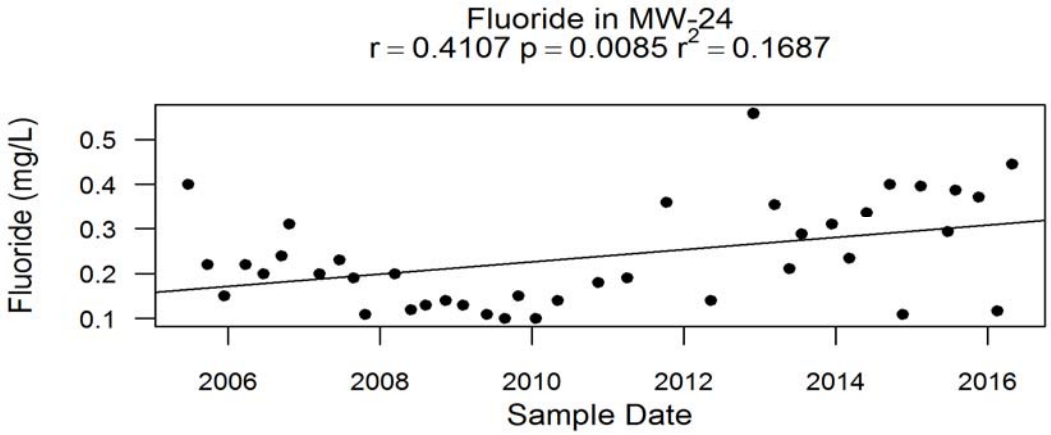
B-9: Linear Regressions for SAR Constituents in MW-18 and MW-24

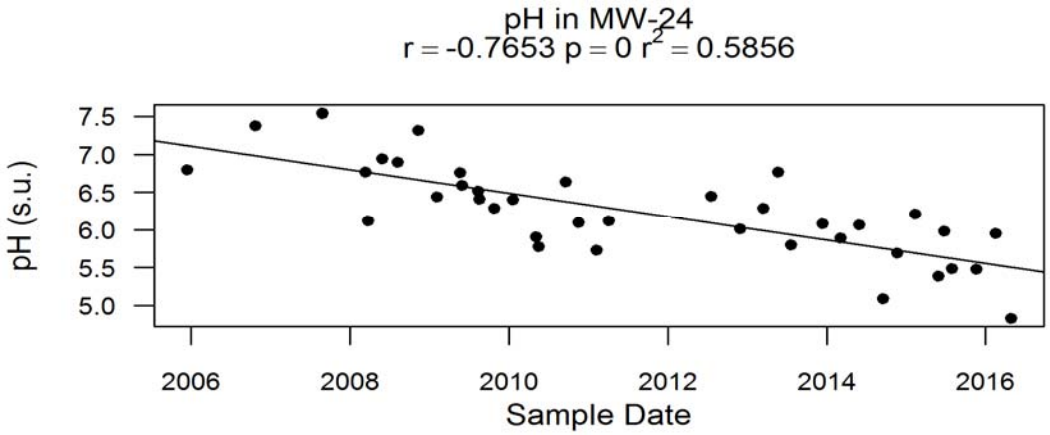
Appendix B. Summary of Geochemical Analysis for SAR Constituents in MW-18 and MW-24

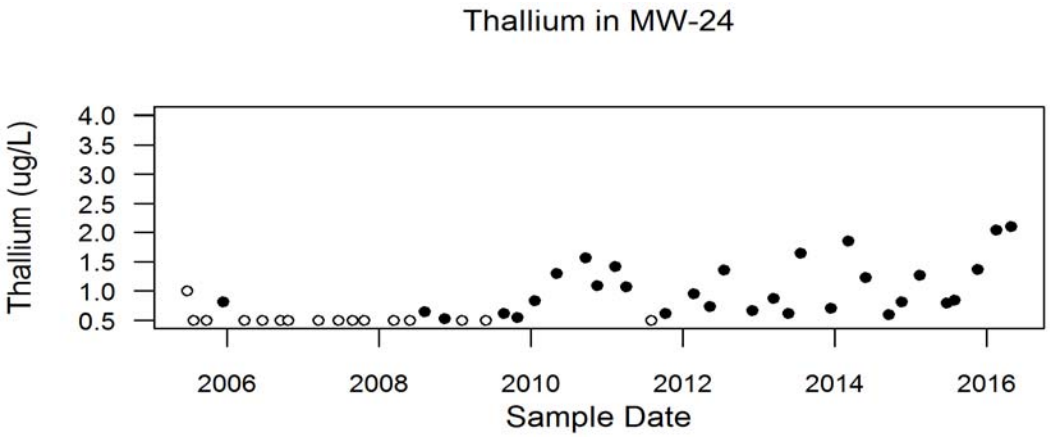
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah











● Indicates a detected result

○ Indicates a non-detect result

r^2 = The measure of how well the trendline fits the data where r^2=1 represents a perfect fit.

APPENDIX C

Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

C-1. Indicator Parameter Analysis Summary Table

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Constituent	N	% Non-Detected Values	Mean	Standard Deviation	Shapiro-Wilk Test for Normality		Normally or Lognormally distributed?	Least Squares Regression Trend Analysis[1]		Mann-Kendall Trend Analysis[2]		2012 SAR[3] Significant Trends?	Background Reports[4] Significant Trend?	2016 Significant Trend?
						W	p		r^2	p	S	p			
MW-18	Chloride mg/L	36	0.0%	48	11	0.9347	0.0348	No	-	-	231.00	0.0009	Yes, Increasing	No	Yes, Increasing
MW-18	Fluoride mg/L	25	0.0%	0.23	0.06	0.9089	0.0288	No	-	-	-160.00	0.0001	Yes, Decreasing	NA	Yes, Decreasing
MW-18	Sulfate mg/L	47	0.0%	1712.511	253.894	0.8646	0.0001	No	-	-	428.00	0.0000	Yes, Increasing	Yes, Increasing	Yes, Increasing
MW-18	Uranium µg/L	40	0.0%	35.62	11.081	0.7125	0.0000	No	-	-	168.00	0.0258	Yes, Increasing	Yes, Increasing	No
MW-24	Chloride mg/L	29	0.0%	44.986	2.661	0.9256	0.0423	No	-	-	-5.00	0.4697	No	Yes, Decreasing	No
MW-24	Fluoride mg/L	40	0.0%	0	0	0.9522	0.0903	Yes	0.1687	0.0085	-	-	Yes, Decreasing	NA	Yes, Increasing
MW-24	Sulfate mg/L	36	0.0%	2641.11	198.16	0.9564	0.1667	Yes	0.0192	0.4199	-	-	No	No	No
MW-24	Uranium µg/L	31	0.0%	3.376	2.834	0.9672	0.4457	Yes	0.0024	0.7941	-	-	Yes, Decreasing	Yes, Decreasing	No

Notes:

mg/L = milligrams per liter

µg/L = micrograms per liter

s.u. = standard units of pH

N = number of valid data points

Mean = The arithmatic mean as determined for normally or lognormally distributed constituents with % Detect > 50%

Standard Deviation = The standard deviation as determined for normally or lognormally distributed constituents with % Detect > 85%

W = Shapiro Wilk test value

p = p-value, where any value smaller than 0.05 is significant

S = Mann-Kendall statistic

r^2 = The measure of how well the trendline fits the data where r^2=1 represents a perfect fit.

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

[2] = The Mann-Kendall test was performed on data that are not normally or lognormally distributec

[3] = 2012 SAR refers to INTERA Incorporated. 2012. *Source Assessment Report White Mesa Uranium Mill, Blanding, Utah*. Prepared for Energy Fuels Resources (USA) Inc. October 10

[4] = Background Reports refers to 2 previous Background Reports for these wells:
MW-18: INTERA Incorporated. 2007. *Evaluation of Available Pre-Operational and Regional Background Data, Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah. Prepared for Denison Mines (USA) Corp. November 16.*
MW-24: INTERA Incorporated. 2008. *Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site, San Juan County, Utah*. Prepared for Denison Mines (USA) Corp. April 30.

HHV = Highest Historical Value; lowest historical value in the case of pH

Highest Historical Value = The highest observed value for constituents with % Detect < 50%

σ = sigma

GWCL = Groundwater Compliance Limit

* = GWCL is based on the Groundwater Discharge Permit (GWDP) or most recent GWCLs from DWMRC-approved Source Assessment Reports (SARs), where applicable.

A= mean plus two standard deviations, or mean minus two standard deviations in the case of pH

NA = Not applicable

C-2: Descriptive Statistics for Indicator Parameters in MW-18 and MW-24

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Location and Data Set	MW-18 2016 SAR[1]				MW-18 2012 SAR[2]				MW-18 2007 Background Report[3]			
Analyte	Chloride	Fluoride	Sulfate	Uranium	Chloride	Fluoride	Sulfate	Uranium	Chloride	Fluoride	Sulfate	Uranium
Units	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	µg/L
% Non-Detects	0	0	0	0	0	0	0	0	0	0	0	0
Number of Valid Data Points	36	25	47	40	27	20	30	33	19	7	19	18
Normally or Lognormally Distributed?	No	No	No	No	Yes	No	No	No	Yes	NA	Yes	Yes
Mean	47.6	0.233	1713	35.6	46.9	0.3	1668	33.2	41.2	0.296	1478	25.0
Minimum Concentration	22.0	0.155	1023	9	19.9	0.0	1069	2.7	19.9	0.200	1023	2.687
Maximum Concentration	75.0	0.4	2020	49.0	75.0	0.4	2020	49.0	75.0	0.4	1940.0	46.9
Standard Deviation	11.0	0.056	253.9	11.08	12.6	0.1	249	14.4	14.0	0.08	230	15.1
Range	53.0	0.245	997	40.0	55.1	0.4	951	46.3	55.1	0.2	917.0	44.2
Geometric Mean	46.3	0.228	1692	33.1	45.2	0.212	1649	27.742	39.1	0.287	1461	19.2
Skewness	0.233	1.694	-0.839	-1.283	0.291	-0.543	-0.464	-0.972	1.070	-0.111	0.105	0.027
Q25	40.5	0.205	1457	34.3	35.0	0.210	1446	18.209	34.0	0.200	1371	13.1
Median	48.7	0.22	1790	39.5	47.6	0.220	1720	40.300	35.1	0.300	1446	22.2
Q75	52.8	0.24	1905	42.6	53.0	0.300	1910	42.700	47.6	0.37	1600	39.6

Location and Data Set	MW-24 2016 SAR[1]				MW-24 2012 SAR[2]				MW-24 2008 Background Report[4]			
Analyte	Chloride	Fluoride	Sulfate	Uranium	Chloride	Fluoride	Sulfate	Uranium	Chloride	Fluoride	Sulfate	Uranium
Units	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	µg/L
% Non-Detects	0	0	0	0	0	0	0	0	0	0	0	0
Number of Valid Data Points	29	40	36	31	22	26	26	24	10	11	11	10
Normally or Lognormally Distributed?	No	Yes	Yes	Yes	No	Yes	Yes	No	No	NA	Yes	Yes
Mean	45.0	0.237	2641	3.4	44.8	0.2	2652	3.0	50.2	0.218	2595	9.0
Minimum Concentration	39.0	0.1	2070	0.5	39.0	0.1	2290	0.5	44.0	0.100	2290	1.460
Maximum Concentration	52.0	0.558	3120	10.4	52.0	0.4	2950	10.4	71.0	0.4	2850.0	46.0
Standard Deviation	2.7	0.115	198	2.834	2.7	0.1	155	3.1	9.1	0.06	154	13.4
Range	13.0	0.458	1050	9.9	13.0	0.3	660	9.9	27.0	0.2	560.0	44.5
Geometric Mean	44.9	0.212	2634	2.4	44.7	0.170	2648	1.962	49.6	0.208	2590	4.8
Skewness	-0.154	0.797	-0.431	1.297	-0.008	1.169	-0.063	1.639	1.780	0.490	-0.434	2.817
Q25	44.0	0.14	2515	1.2	44.0	0.130	2560	1.035	45.0	0.200	2470	2.1
Median	45.0	0.206	2675	2.1	45.0	0.163	2675	1.560	45.5	0.200	2620	4.4
Q75	46.0	0.317	2760	4.3	46.0	0.220	2740	2.930	52.0	0.20	2680	9.7

Notes:

mg/L = milligrams per liter

µg/L = micrograms per liter

[1] 2016 SAR is in reference to the current Source Assessment Report

[2] 2012 SAR is in refererence to INTERA Incorporated. 2012. *Source Assessment Report White Mesa Uranium Mill, Blanding, Utah* . Prepared for Energy Fuels Resources (USA) Inc. October 10

[3] 2007 Background Report is in reference to: INTERA Incorporated. 2007. *Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'sWhite Mesa Uranium Mil, San Juan County, Utah* . Prepared for Denison Mines (USA) Corp. October.

[4] 2008 Background Report is in reference to: INTERA Incorporated. 2008. *Revised Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'sWhite Mesa Uranium Mil, San Juan County, Utah* . Prepared for Denison Mines (USA) Corp. April.

Mean = The arithmatic mean as determined for normally or lognormally distributed constituents with % Detect > 50%

Standard Deviation = The standard deviation as determined for normally or lognormally distributed constituents with % Detect > 85%

C-3. Data Used for Statistical Analysis

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Sample Date	Parameter	Result	Units	QUAL
MW-18	3/24/1993	Chloride	34	mg/L	
MW-18	6/9/1993	Chloride	34	mg/L	
MW-18	9/22/1993	Chloride	34	mg/L	
MW-18	12/14/1993	Chloride	34	mg/L	
MW-18	3/29/1994	Chloride	71	mg/L	
MW-18	3/30/1994	Chloride	75	mg/L	
MW-18	6/16/1994	Chloride	35	mg/L	
MW-18	8/19/1994	Chloride	33	mg/L	
MW-18	12/14/1994	Chloride	22	mg/L	
MW-18	5/12/1999	Chloride	35.1	mg/L	
MW-18	12/1/2000	Chloride	47.3	mg/L	
MW-18	11/6/2001	Chloride	47.6	mg/L	
MW-18	9/9/2002	Chloride	40	mg/L	
MW-18	9/9/2002	Chloride	40.6	mg/L	
MW-18	12/14/2005	Chloride	47	mg/L	
MW-18	6/21/2006	Chloride	50	mg/L	
MW-18	10/26/2006	Chloride	50	mg/L	
MW-18	10/30/2007	Chloride	48	mg/L	
MW-18	6/4/2008	Chloride	55	mg/L	
MW-18	11/4/2008	Chloride	42	mg/L	
MW-18	5/27/2009	Chloride	68	mg/L	
MW-18	7/14/2009	Chloride	51	mg/L	
MW-18	10/21/2009	Chloride	58	mg/L	
MW-18	5/4/2010	Chloride	52	mg/L	
MW-18	11/18/2010	Chloride	52	mg/L	
MW-18	4/6/2011	Chloride	46	mg/L	
MW-18	10/11/2011	Chloride	53	mg/L	
MW-18	4/30/2012	Chloride	55	mg/L	
MW-18	11/26/2012	Chloride	54	mg/L	
MW-18	5/20/2013	Chloride	50.3	mg/L	
MW-18	12/3/2013	Chloride	50.7	mg/L	
MW-18	5/27/2014	Chloride	55	mg/L	
MW-18	11/10/2014	Chloride	48.1	mg/L	
MW-18	4/15/2015	Chloride	52.7	mg/L	
MW-18	11/9/2015	Chloride	49.2	mg/L	
MW-18	4/19/2016	Chloride	43.6	mg/L	
MW-18	5/12/1999	Fluoride	0.4	mg/L	
MW-18	12/1/2000	Fluoride	0.37	mg/L	
MW-18	11/6/2001	Fluoride	0.3	mg/L	

Well	Sample Date	Parameter	Result	Units	QUAL
MW-18	9/9/2002	Fluoride	0.3	mg/L	
MW-18	12/14/2005	Fluoride	0.24	mg/L	
MW-18	6/21/2006	Fluoride	0.25	mg/L	
MW-18	10/26/2006	Fluoride	0.25	mg/L	
MW-18	10/30/2007	Fluoride	0.22	mg/L	
MW-18	6/4/2008	Fluoride	0.21	mg/L	
MW-18	11/4/2008	Fluoride	0.22	mg/L	
MW-18	5/27/2009	Fluoride	0.22	mg/L	
MW-18	10/21/2009	Fluoride	0.21	mg/L	
MW-18	5/4/2010	Fluoride	0.19	mg/L	
MW-18	11/18/2010	Fluoride	0.22	mg/L	
MW-18	4/6/2011	Fluoride	0.19	mg/L	
MW-18	10/11/2011	Fluoride	0.22	mg/L	
MW-18	4/30/2012	Fluoride	0.2	mg/L	
MW-18	11/26/2012	Fluoride	0.17	mg/L	
MW-18	5/20/2013	Fluoride	0.227	mg/L	
MW-18	12/3/2013	Fluoride	0.235	mg/L	
MW-18	5/27/2014	Fluoride	0.23	mg/L	
MW-18	11/10/2014	Fluoride	0.155	mg/L	
MW-18	4/15/2015	Fluoride	0.188	mg/L	
MW-18	11/9/2015	Fluoride	0.205	mg/L	
MW-18	4/19/2016	Fluoride	0.207	mg/L	
MW-18	3/24/1993	Sulfate	1371	mg/L	
MW-18	6/9/1993	Sulfate	1431	mg/L	
MW-18	9/22/1993	Sulfate	1466	mg/L	
MW-18	12/14/1993	Sulfate	1446	mg/L	
MW-18	3/29/1994	Sulfate	1370	mg/L	
MW-18	3/30/1994	Sulfate	1447	mg/L	
MW-18	6/16/1994	Sulfate	1416	mg/L	
MW-18	8/19/1994	Sulfate	1388	mg/L	
MW-18	12/14/1994	Sulfate	1023	mg/L	
MW-18	5/12/1999	Sulfate	1340	mg/L	
MW-18	12/1/2000	Sulfate	1600	mg/L	
MW-18	11/6/2001	Sulfate	1380	mg/L	
MW-18	9/9/2002	Sulfate	1590	mg/L	
MW-18	9/9/2002	Sulfate	1940	mg/L	
MW-18	12/14/2005	Sulfate	1740	mg/L	
MW-18	6/21/2006	Sulfate	1700	mg/L	D
MW-18	10/26/2006	Sulfate	1870	mg/L	D

C-3. Data Used for Statistical Analysis

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Sample Date	Parameter	Result	Units	QUAL
MW-18	10/30/2007	Sulfate	1700	mg/L	D
MW-18	6/4/2008	Sulfate	1870	mg/L	D
MW-18	11/4/2008	Sulfate	1880	mg/L	D
MW-18	5/27/2009	Sulfate	1930	mg/L	D
MW-18	10/21/2009	Sulfate	1900	mg/L	D
MW-18	5/4/2010	Sulfate	1950	mg/L	D
MW-18	9/15/2010	Sulfate	1930	mg/L	D
MW-18	11/18/2010	Sulfate	1910	mg/L	D
MW-18	2/15/2011	Sulfate	1770	mg/L	D
MW-18	4/6/2011	Sulfate	1780	mg/L	D
MW-18	8/10/2011	Sulfate	1910	mg/L	D
MW-18	10/11/2011	Sulfate	2020	mg/L	D
MW-18	2/27/2012	Sulfate	1920	mg/L	D
MW-18	4/30/2012	Sulfate	1790	mg/L	D
MW-18	7/18/2012	Sulfate	1900	mg/L	D
MW-18	11/26/2012	Sulfate	1210	mg/L	
MW-18	2/25/2013	Sulfate	1270	mg/L	
MW-18	5/20/2013	Sulfate	1860	mg/L	
MW-18	7/15/2013	Sulfate	1860	mg/L	
MW-18	12/3/2013	Sulfate	2000	mg/L	
MW-18	2/19/2014	Sulfate	1650	mg/L	
MW-18	5/27/2014	Sulfate	2020	mg/L	
MW-18	9/9/2014	Sulfate	1760	mg/L	
MW-18	11/10/2014	Sulfate	1810	mg/L	
MW-18	2/3/2015	Sulfate	1810	mg/L	
MW-18	4/15/2015	Sulfate	1790	mg/L	
MW-18	7/27/2015	Sulfate	1990	mg/L	
MW-18	11/9/2015	Sulfate	2000	mg/L	
MW-18	2/9/2016	Sulfate	1890	mg/L	
MW-18	4/19/2016	Sulfate	1890	mg/L	
MW-18	3/24/1993	Uranium	18.20895522	µg/L	
MW-18	6/9/1993	Uranium	14	µg/L	
MW-18	9/22/1993	Uranium	12.11940299	µg/L	
MW-18	12/14/1993	Uranium	16.11940299	µg/L	
MW-18	8/19/1994	Uranium	13.13432836	µg/L	
MW-18	8/19/1994	Uranium	14.34328358	µg/L	
MW-18	12/14/1994	Uranium	9	µg/L	
MW-18	5/12/1999	Uranium	26.1	µg/L	
MW-18	12/1/2000	Uranium	34	µg/L	

C-3. Data Used for Statistical Analysis

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Sample Date	Parameter	Result	Units	QUAL
MW-18	12/14/2005	Uranium	39	µg/L	
MW-18	3/21/2006	Uranium	42.6	µg/L	
MW-18	6/21/2006	Uranium	42.8	µg/L	
MW-18	9/13/2006	Uranium	39.6	µg/L	
MW-18	10/26/2006	Uranium	42.2	µg/L	
MW-18	3/16/2007	Uranium	46.9	µg/L	
MW-18	8/29/2007	Uranium	36.5	µg/L	
MW-18	10/30/2007	Uranium	39.2	µg/L	
MW-18	3/11/2008	Uranium	42.4	µg/L	
MW-18	6/4/2008	Uranium	44.8	µg/L	
MW-18	8/12/2008	Uranium	41.4	µg/L	
MW-18	11/4/2008	Uranium	41	µg/L	
MW-18	2/11/2009	Uranium	39.4	µg/L	
MW-18	5/27/2009	Uranium	41.2	µg/L	
MW-18	8/25/2009	Uranium	41.6	µg/L	
MW-18	10/21/2009	Uranium	44.1	µg/L	
MW-18	1/27/2010	Uranium	47.2	µg/L	
MW-18	3/22/2010	Uranium	49	µg/L	
MW-18	5/4/2010	Uranium	44.3	µg/L	
MW-18	11/18/2010	Uranium	42.7	µg/L	
MW-18	4/6/2011	Uranium	45.4	µg/L	
MW-18	10/11/2011	Uranium	40.3	µg/L	
MW-18	4/30/2012	Uranium	40.7	µg/L	
MW-18	11/26/2012	Uranium	43.9	µg/L	
MW-18	5/20/2013	Uranium	38.7	µg/L	
MW-18	12/3/2013	Uranium	35.7	µg/L	
MW-18	5/27/2014	Uranium	36	µg/L	
MW-18	11/10/2014	Uranium	33.3	µg/L	
MW-18	4/15/2015	Uranium	36.4	µg/L	
MW-18	11/9/2015	Uranium	34.4	µg/L	
MW-18	4/19/2016	Uranium	34.9	µg/L	
MW-24	9/25/2005	Chloride	52	mg/L	
MW-24	12/14/2005	Chloride	45	mg/L	
MW-24	3/27/2006	Chloride	47	mg/L	
MW-24	10/24/2006	Chloride	46	mg/L	
MW-24	3/16/2007	Chloride	45	mg/L	
MW-24	6/20/2007	Chloride	44	mg/L	
MW-24	8/28/2007	Chloride	45	mg/L	
MW-24	10/23/2007	Chloride	45	mg/L	

Well	Sample Date	Parameter	Result	Units	QUAL
MW-24	3/12/2008	Chloride	44	mg/L	
MW-24	5/29/2008	Chloride	45	mg/L	
MW-24	8/7/2008	Chloride	39	mg/L	
MW-24	11/11/2008	Chloride	43	mg/L	
MW-24	2/5/2009	Chloride	44	mg/L	
MW-24	5/30/2009	Chloride	44	mg/L	
MW-24	10/28/2009	Chloride	46	mg/L	
MW-24	1/19/2010	Chloride	46	mg/L	
MW-24	5/6/2010	Chloride	46	mg/L	
MW-24	11/17/2010	Chloride	48	mg/L	
MW-24	4/5/2011	Chloride	45	mg/L	
MW-24	10/11/2011	Chloride	39	mg/L	
MW-24	5/10/2012	Chloride	42	mg/L	
MW-24	11/29/2012	Chloride	48.1	mg/L	
MW-24	5/22/2013	Chloride	44.4	mg/L	
MW-24	12/12/2013	Chloride	46	mg/L	
MW-24	5/30/2014	Chloride	44.7	mg/L	
MW-24	11/19/2014	Chloride	40.9	mg/L	
MW-24	6/24/2015	Chloride	48.1	mg/L	
MW-24	11/18/2015	Chloride	45	mg/L	
MW-24	4/28/2016	Chloride	47.4	mg/L	
MW-24	6/23/2005	Fluoride	0.4	mg/L	
MW-24	9/25/2005	Fluoride	0.22	mg/L	
MW-24	12/14/2005	Fluoride	0.15	mg/L	
MW-24	3/27/2006	Fluoride	0.22	mg/L	
MW-24	6/22/2006	Fluoride	0.2	mg/L	
MW-24	9/15/2006	Fluoride	0.24	mg/L	
MW-24	10/24/2006	Fluoride	0.31	mg/L	
MW-24	3/16/2007	Fluoride	0.2	mg/L	
MW-24	6/20/2007	Fluoride	0.23	mg/L	
MW-24	8/28/2007	Fluoride	0.19	mg/L	
MW-24	10/23/2007	Fluoride	0.11	mg/L	
MW-24	3/12/2008	Fluoride	0.2	mg/L	
MW-24	5/29/2008	Fluoride	0.12	mg/L	
MW-24	8/7/2008	Fluoride	0.13	mg/L	
MW-24	11/11/2008	Fluoride	0.14	mg/L	
MW-24	2/5/2009	Fluoride	0.13	mg/L	
MW-24	5/30/2009	Fluoride	0.11	mg/L	
MW-24	8/24/2009	Fluoride	0.1	mg/L	

Well	Sample Date	Parameter	Result	Units	QUAL
MW-24	10/28/2009	Fluoride	0.15	mg/L	
MW-24	1/19/2010	Fluoride	0.12	mg/L	
MW-24	5/6/2010	Fluoride	0.14	mg/L	
MW-24	11/17/2010	Fluoride	0.18	mg/L	
MW-24	4/5/2011	Fluoride	0.19	mg/L	
MW-24	10/11/2011	Fluoride	0.36	mg/L	
MW-24	5/10/2012	Fluoride	0.14	mg/L	
MW-24	11/29/2012	Fluoride	0.558	mg/L	
MW-24	3/14/2013	Fluoride	0.355	mg/L	
MW-24	5/22/2013	Fluoride	0.211	mg/L	
MW-24	7/19/2013	Fluoride	0.288	mg/L	
MW-24	12/12/2013	Fluoride	0.31	mg/L	
MW-24	3/6/2014	Fluoride	0.234	mg/L	
MW-24	5/30/2014	Fluoride	0.337	mg/L	
MW-24	9/17/2014	Fluoride	0.4	mg/L	
MW-24	11/19/2014	Fluoride	0.109	mg/L	
MW-24	2/12/2015	Fluoride	0.397	mg/L	
MW-24	6/24/2015	Fluoride	0.293	mg/L	
MW-24	7/29/2015	Fluoride	0.388	mg/L	
MW-24	11/18/2015	Fluoride	0.372	mg/L	
MW-24	2/17/2016	Fluoride	0.117	mg/L	
MW-24	4/28/2016	Fluoride	0.446	mg/L	
MW-24	6/23/2005	Sulfate	2450	mg/L	
MW-24	9/25/2005	Sulfate	2850	mg/L	D
MW-24	12/14/2005	Sulfate	2680	mg/L	D
MW-24	3/27/2006	Sulfate	2470	mg/L	D
MW-24	6/22/2006	Sulfate	2580	mg/L	D
MW-24	9/15/2006	Sulfate	2290	mg/L	D
MW-24	10/24/2006	Sulfate	2680	mg/L	D
MW-24	3/16/2007	Sulfate	2520	mg/L	D
MW-24	6/20/2007	Sulfate	2680	mg/L	D
MW-24	8/28/2007	Sulfate	2720	mg/L	D
MW-24	10/23/2007	Sulfate	2620	mg/L	D
MW-24	3/12/2008	Sulfate	2560	mg/L	D
MW-24	5/29/2008	Sulfate	2770	mg/L	D
MW-24	8/7/2008	Sulfate	2730	mg/L	D
MW-24	11/11/2008	Sulfate	2800	mg/L	D
MW-24	2/5/2009	Sulfate	2630	mg/L	D
MW-24	5/30/2009	Sulfate	2670	mg/L	D

C-3. Data Used for Statistical Analysis

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Sample Date	Parameter	Result	Units	QUAL
MW-24	8/24/2009	Sulfate	2740	mg/L	D
MW-24	10/28/2009	Sulfate	2950	mg/L	D
MW-24	1/19/2010	Sulfate	2740	mg/L	D
MW-24	5/6/2010	Sulfate	2560	mg/L	D
MW-24	11/17/2010	Sulfate	2760	mg/L	D
MW-24	4/5/2011	Sulfate	2560	mg/L	D
MW-24	10/11/2011	Sulfate	2500	mg/L	D
MW-24	5/10/2012	Sulfate	2490	mg/L	D
MW-24	11/29/2012	Sulfate	2310	mg/L	
MW-24	5/22/2013	Sulfate	2070	mg/L	
MW-24	12/12/2013	Sulfate	2490	mg/L	
MW-24	5/30/2014	Sulfate	2450	mg/L	
MW-24	11/19/2014	Sulfate	3120	mg/L	
MW-24	2/12/2015	Sulfate	2620	mg/L	
MW-24	6/24/2015	Sulfate	2840	mg/L	
MW-24	7/29/2015	Sulfate	2880	mg/L	
MW-24	11/18/2015	Sulfate	2790	mg/L	
MW-24	2/17/2016	Sulfate	2750	mg/L	
MW-24	4/28/2016	Sulfate	2760	mg/L	
MW-24	3/27/2006	Uranium	10.4	µg/L	
MW-24	6/22/2006	Uranium	7.31	µg/L	
MW-24	9/15/2006	Uranium	5.53	µg/L	
MW-24	10/24/2006	Uranium	3.24	µg/L	
MW-24	3/16/2007	Uranium	2.13	µg/L	
MW-24	6/20/2007	Uranium	1.46	µg/L	
MW-24	8/28/2007	Uranium	2.11	µg/L	
MW-24	10/23/2007	Uranium	1.78	µg/L	
MW-24	3/12/2008	Uranium	0.84	µg/L	
MW-24	5/29/2008	Uranium	0.77	µg/L	
MW-24	8/7/2008	Uranium	0.67	µg/L	
MW-24	11/11/2008	Uranium	0.5	µg/L	
MW-24	2/5/2009	Uranium	1.07	µg/L	
MW-24	5/30/2009	Uranium	1.04	µg/L	
MW-24	8/24/2009	Uranium	1.03	µg/L	
MW-24	10/28/2009	Uranium	1.56	µg/L	
MW-24	1/19/2010	Uranium	9.94	µg/L	
MW-24	5/6/2010	Uranium	1.02	µg/L	
MW-24	11/17/2010	Uranium	1.44	µg/L	
MW-24	4/5/2011	Uranium	1.4	µg/L	

C-3. Data Used for Statistical Analysis

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Sample Date	Parameter	Result	Units	QUAL
MW-24	10/11/2011	Uranium	2.62	µg/L	
MW-24	5/10/2012	Uranium	2.12	µg/L	
MW-24	11/29/2012	Uranium	4.02	µg/L	
MW-24	5/22/2013	Uranium	4.52	µg/L	
MW-24	12/12/2013	Uranium	6.68	µg/L	
MW-24	5/30/2014	Uranium	4.4	µg/L	
MW-24	11/19/2014	Uranium	4.26	µg/L	
MW-24	6/24/2015	Uranium	3.34	µg/L	
MW-24	11/18/2015	Uranium	3.92	µg/L	
MW-24	4/28/2016	Uranium	3.83	µg/L	

Notes:

mg/L = milligrams per liter

µg/L = micrograms per liter

U = Lab Qualifier indicated "Nondetect"

D = Lab Qualifier indicating "Analyte reporting limit increased due to sample matrix"

C-4. Data Omitted from Statistical Analysis

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

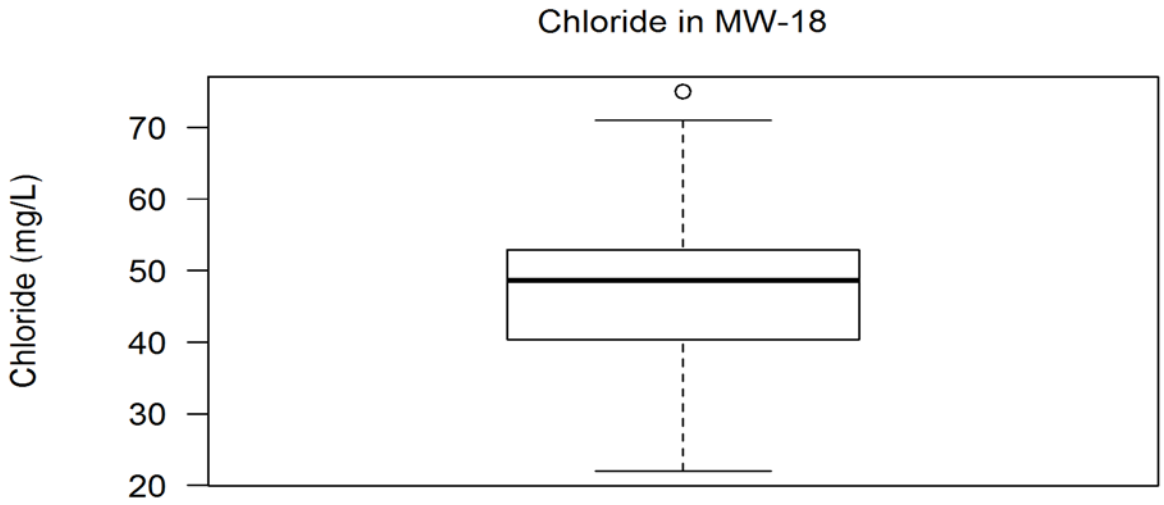
Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type	Removal Rationale
MW-18_06161994	MW-18	6/16/1994	Uranium	2.69	µg/L		Y	WATER	REG	GW	Extreme outlier
MW-18_12141994	MW-18	12/14/1994	Uranium	3.43	µg/L		Y	WATER	REG	GW	Extreme outlier
MW-24_06232005	MW-24	6/23/2005	Chloride	71	mg/L		Y	WATER	REG	GW	Extreme outlier
MW-24_06222006	MW-24	6/22/2006	Chloride	30	mg/L		Y	WATER	REG	GW	Extreme outlier
MW-24_09152006	MW-24	9/15/2006	Chloride	62	mg/L		Y	WATER	REG	GW	Extreme outlier
MW 24_08242009	MW-24	8/24/2009	Chloride	37	mg/L		Y	WATER	REG	GW	Extreme outlier
MW-24_06232005	MW-24	6/23/2005	Uranium	46	µg/L	D	Y	WATER	REG	GW	Extreme outlier
MW-24_07262005	MW-24	7/26/2005	Uranium	126	µg/L		Y	WATER	REG	GW	Extreme outlier
MW-24_09252005	MW-24	9/25/2005	Uranium	223	µg/L		Y	WATER	REG	GW	Extreme outlier

Notes:

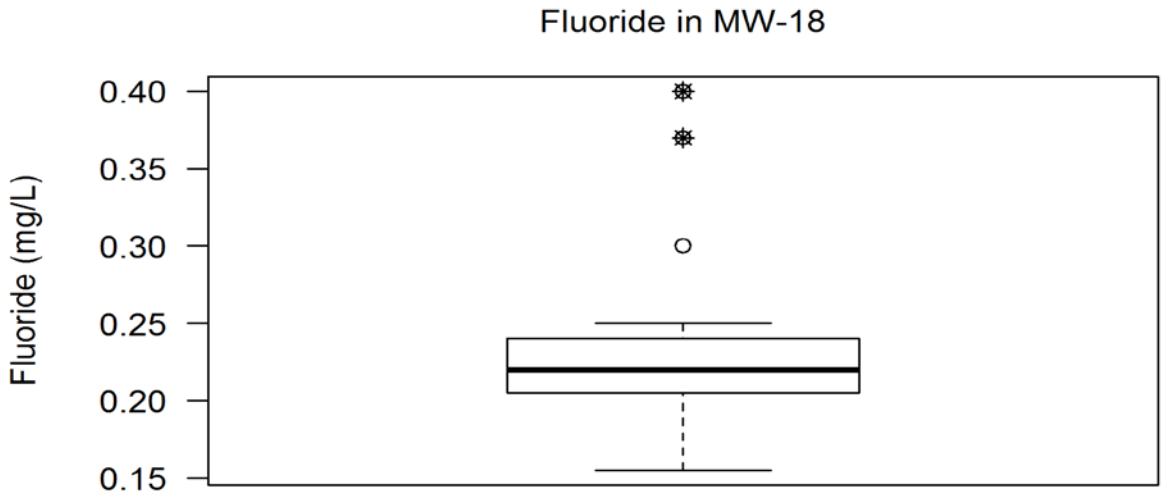
mg/L = milligrams per liter

µg/L = micrograms per liter

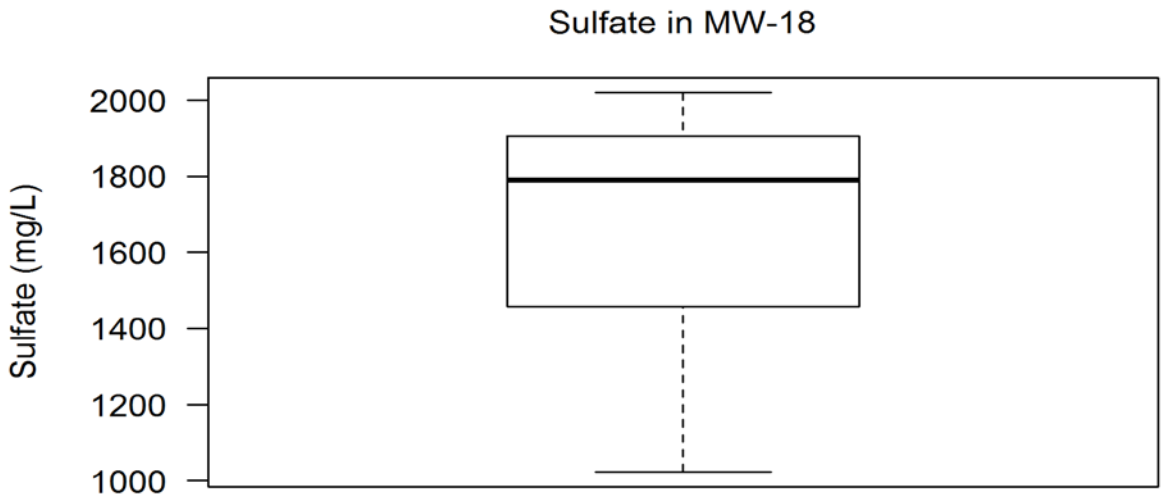
D = Lab Qualifier indicating "Analyte reporting limit increased due to sample matrix"



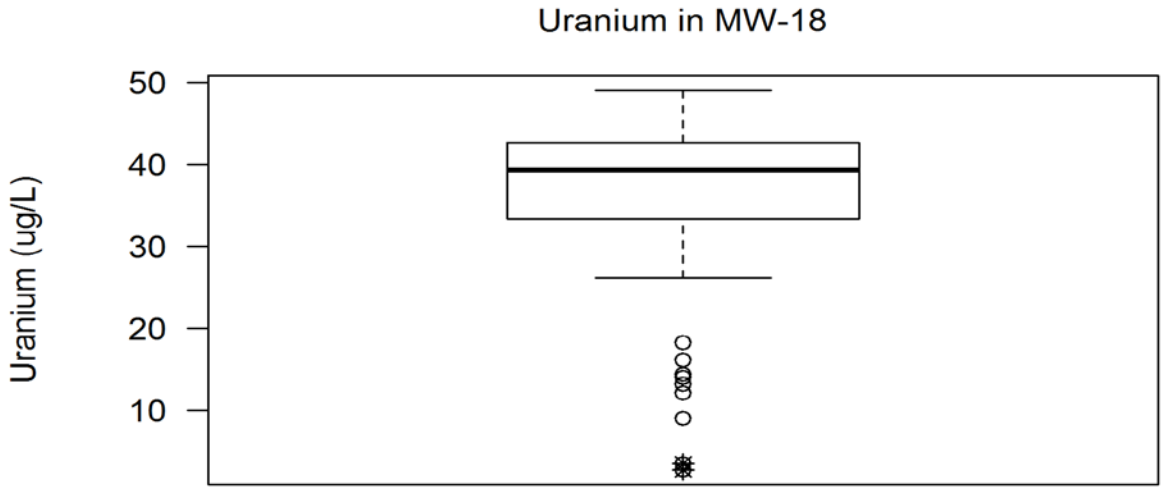
Percent nondetect: 0%
Min: 22, Mean: 47.59, Max: 75, Std Dev: 11.01
Upper extreme threshold (Q75 + 3xH): 89.75
Lower extreme threshold (Q25 - 3xH): 3.47499999999999



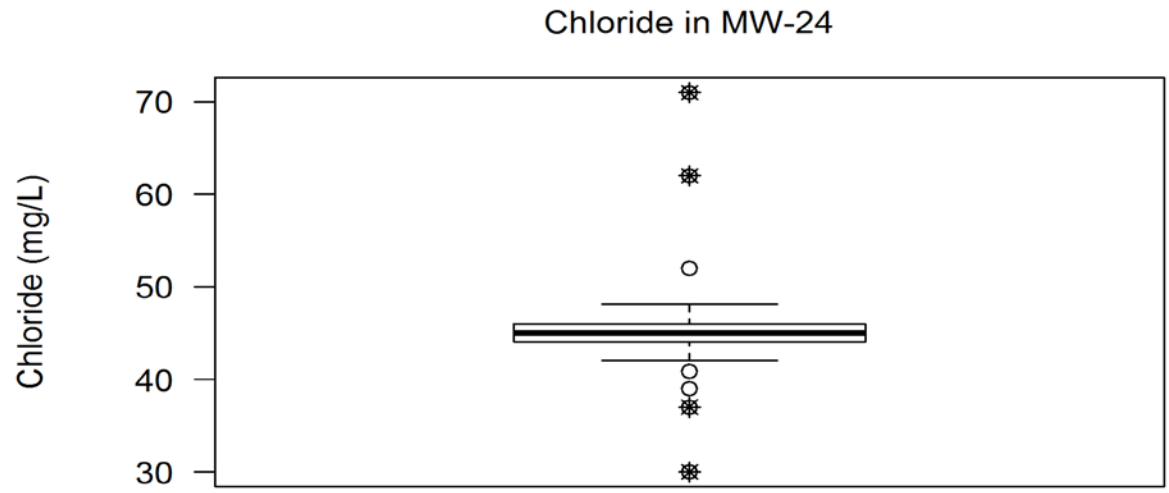
Percent nondetect: 0%
Min: 0.155, Mean: 0.23, Max: 0.4, Std Dev: 0.06
Upper extreme threshold (Q75 + 3xH): 0.345
Lower extreme threshold (Q25 - 3xH): 0.1



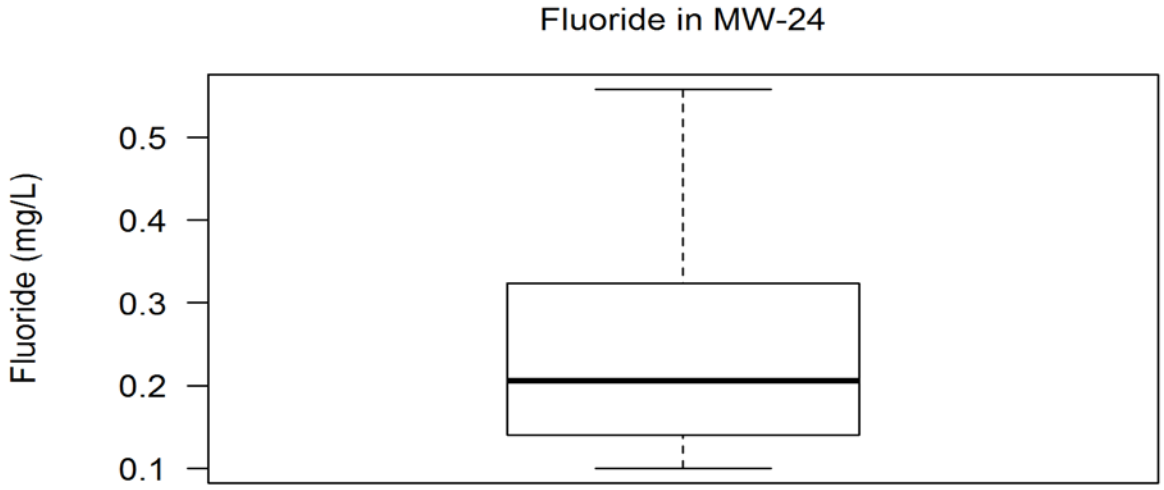
Percent nondetect: 0%
Min: 1023, Mean: 1712.51, Max: 2020, Std Dev: 253.89
Upper extreme threshold (Q75 + 3xH): 3250.5
Lower extreme threshold (Q25 - 3xH): 111



Percent nondetect: 0%
Min: 2.6865671642, Mean: 34.07, Max: 49, Std Dev: 12.89
Upper extreme threshold (Q75 + 3xH): 69.775
Lower extreme threshold (Q25 - 3xH): 6.24999999999996

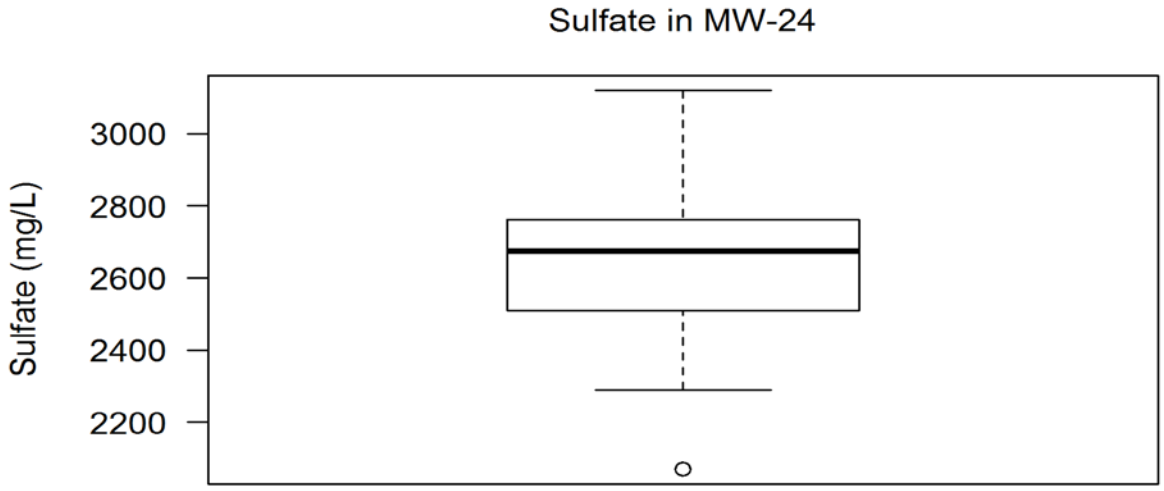


Percent nondetect: 0%
Min: 30, Mean: 45.59, Max: 71, Std Dev: 6.71
Upper extreme threshold (Q75 + 3xH): 52
Lower extreme threshold (Q25 - 3xH): 38

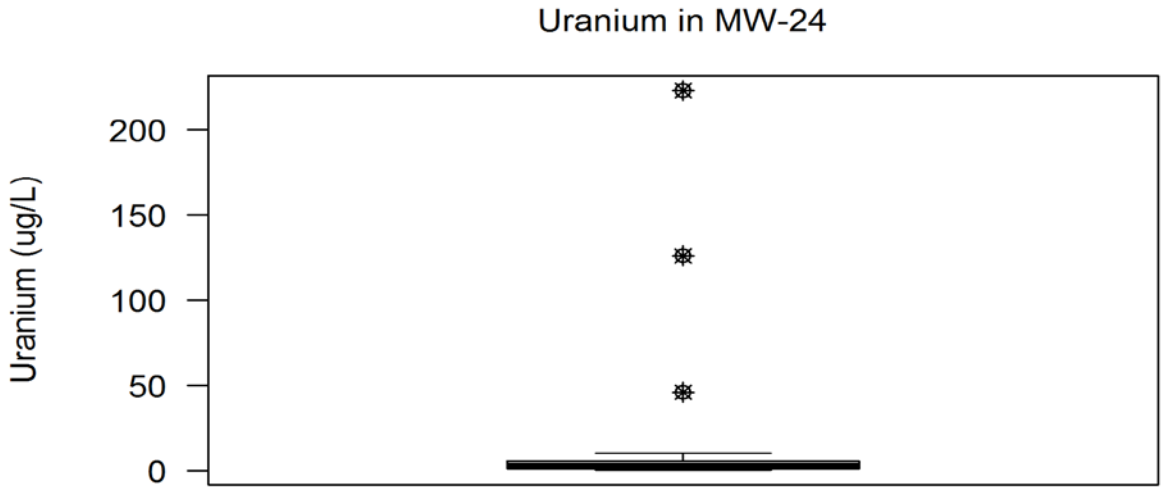


Percent nondetect: 0%
Min: 0.1, Mean: 0.24, Max: 0.558, Std Dev: 0.11
Upper extreme threshold (Q75 + 3xH): 0.847
Lower extreme threshold (Q25 - 3xH): -0.39025

Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah



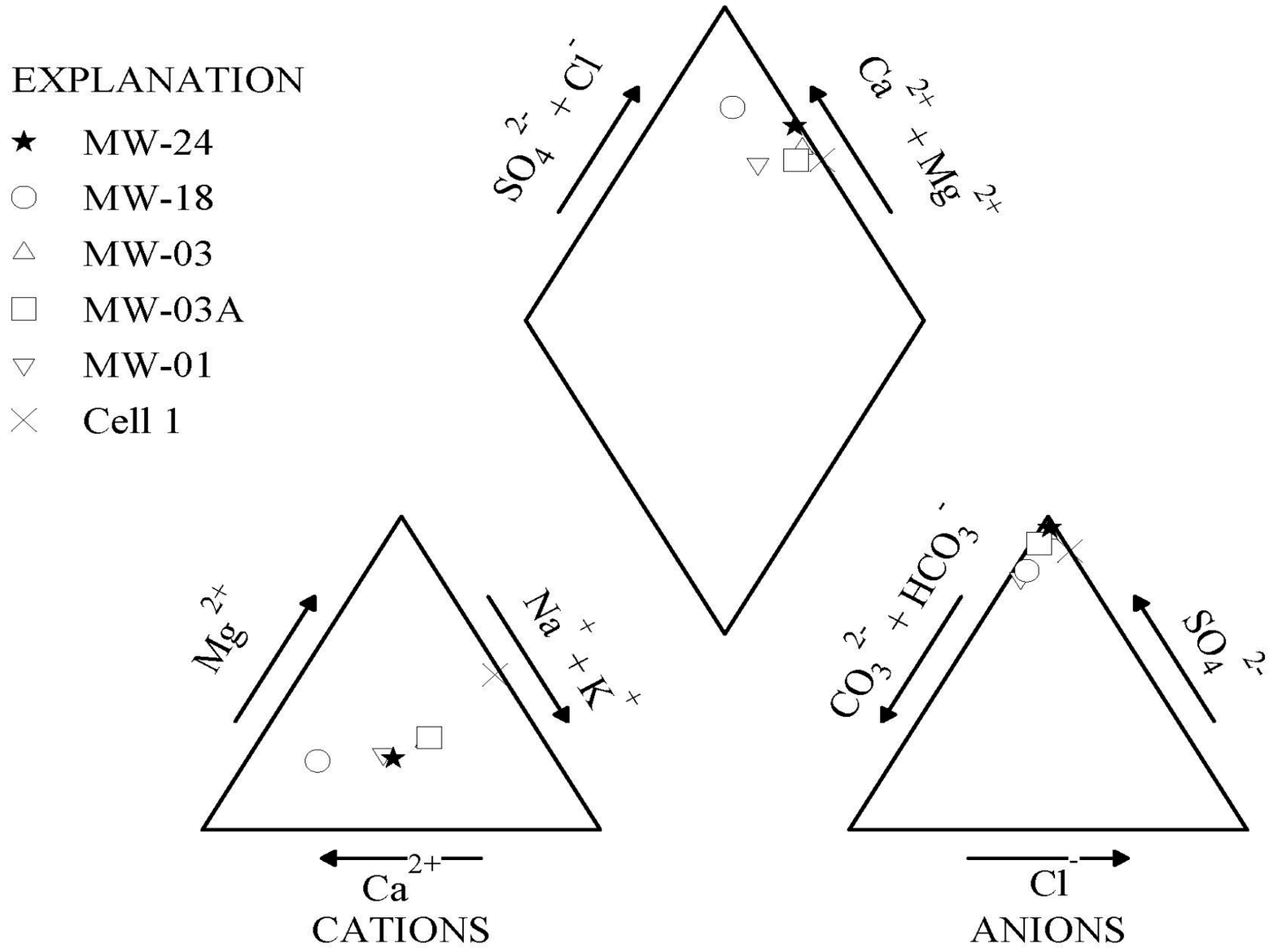
Percent nondetect: 0%
Min: 2070, Mean: 2641.11, Max: 3120, Std Dev: 198.16
Upper extreme threshold (Q75 + 3xH): 3495
Lower extreme threshold (Q25 - 3xH): 1780

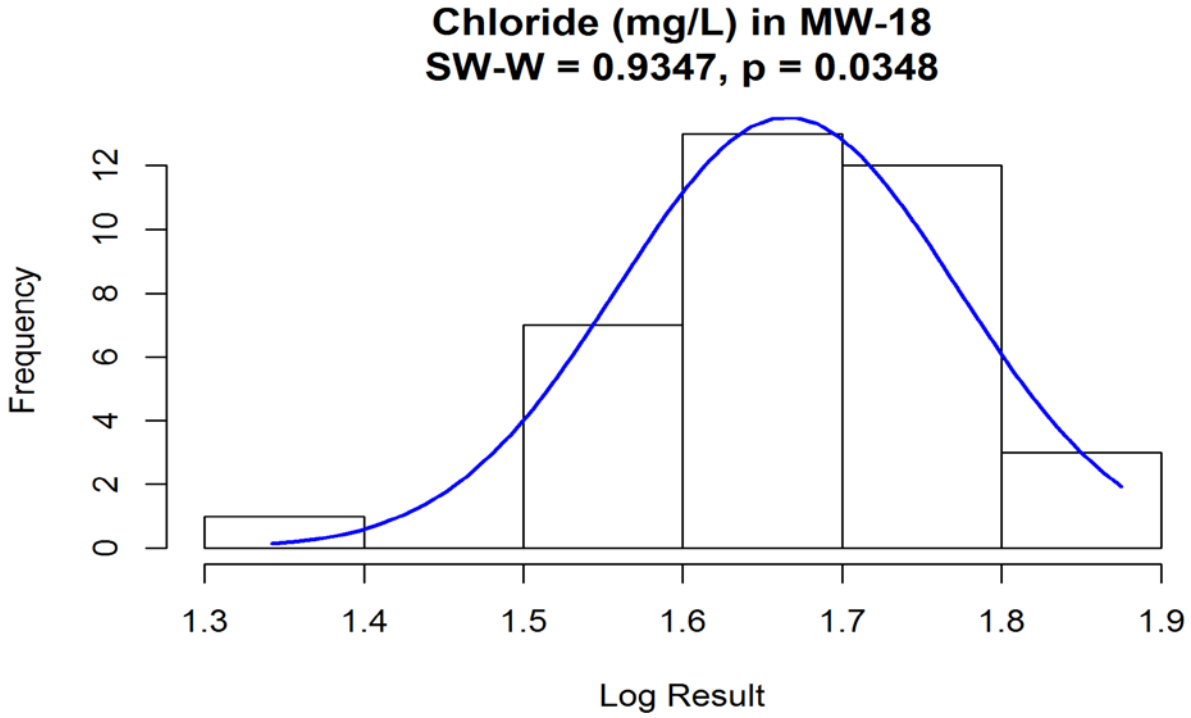


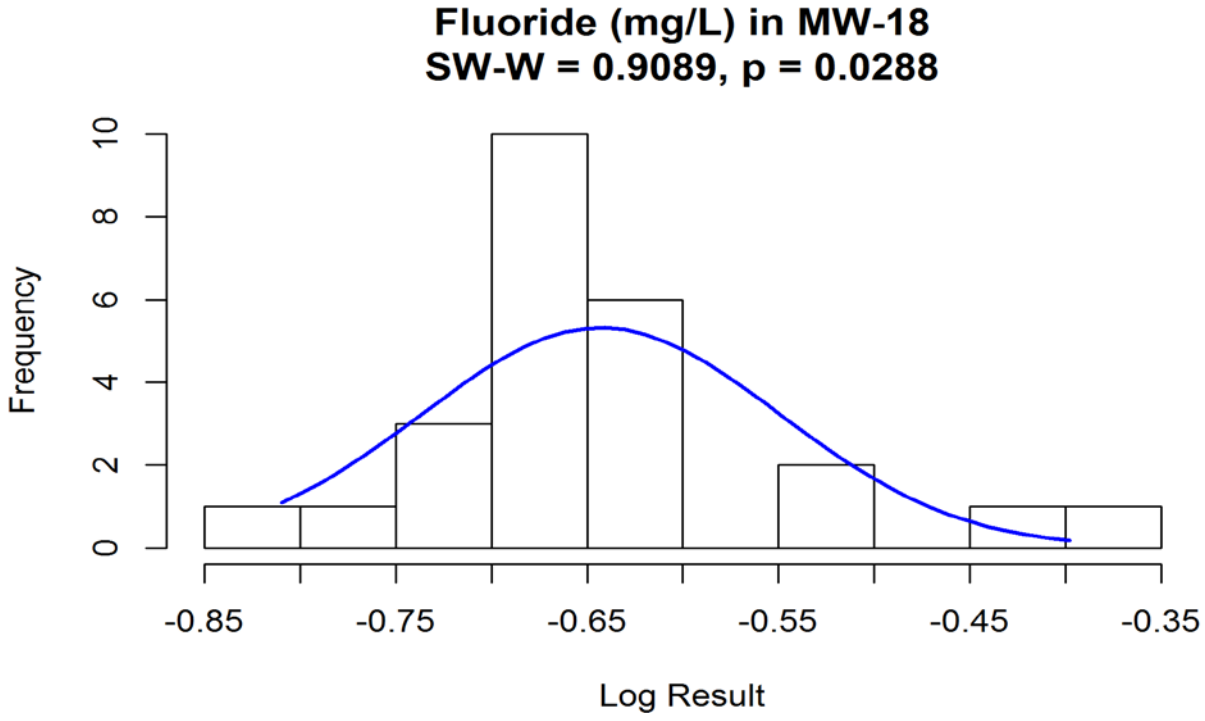
Percent nondetect: 0%
Min: 0.5, Mean: 14.7, Max: 223, Std Dev: 42.98
Upper extreme threshold (Q75 + 3xH): 16.88
Lower extreme threshold (Q25 - 3xH): -10.1925

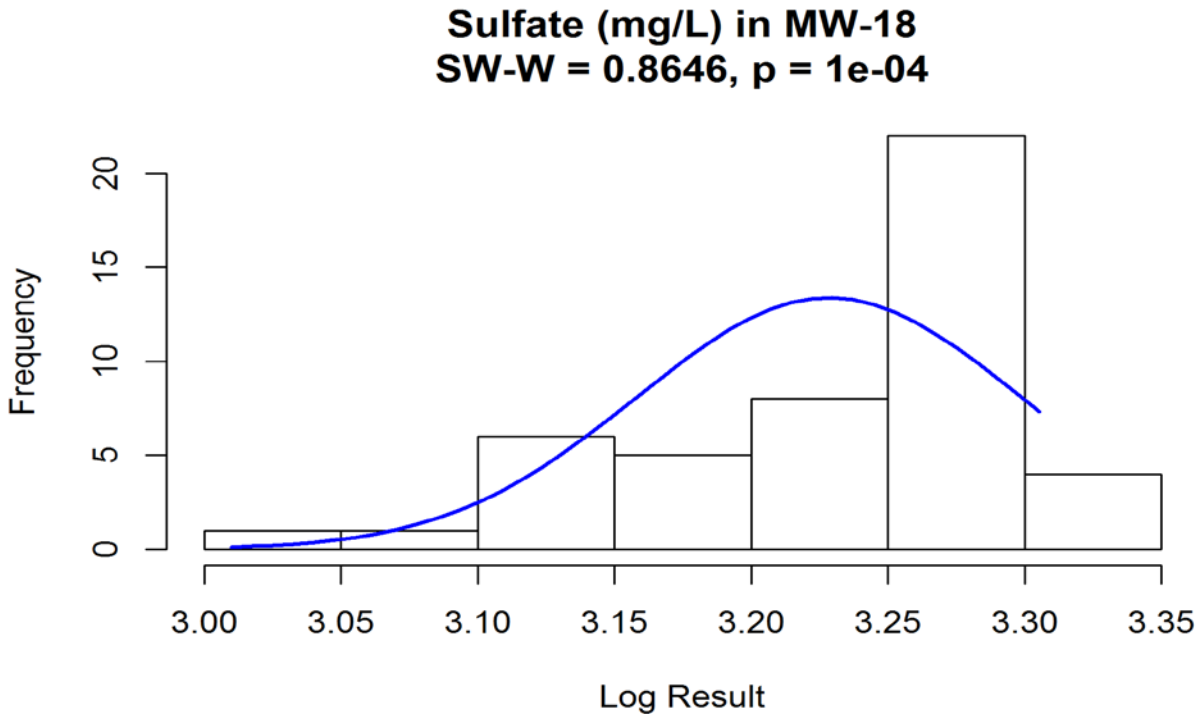
C-6: Piper Diagram for Cell 1, MW-18, MW-24, and Upgradient and Downgradient Wells

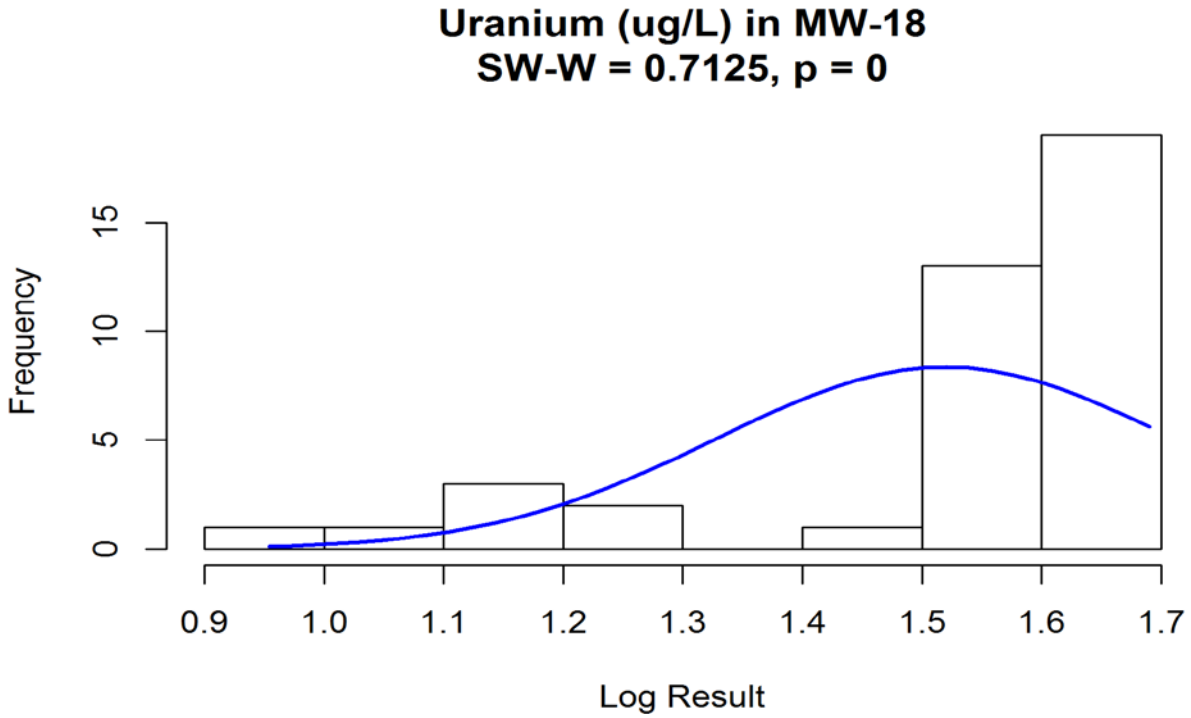
Appendix C. Geochemical Analysis for Indicator Parameters in MW-18 and MW-24
Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

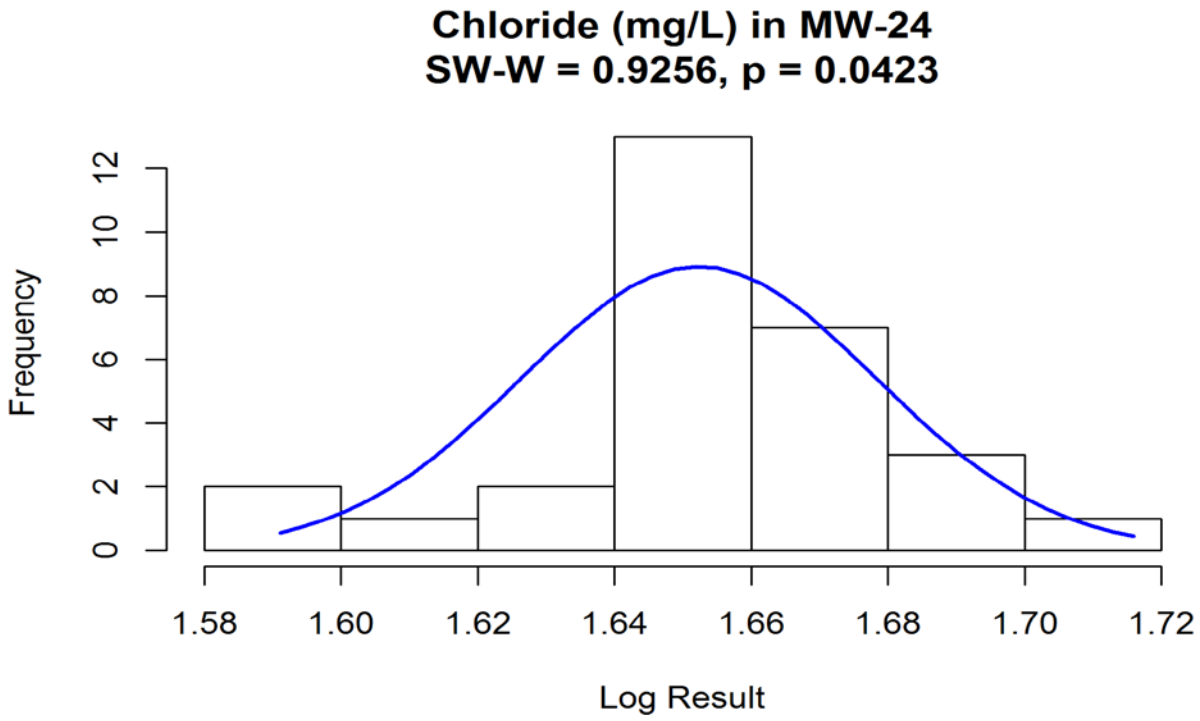


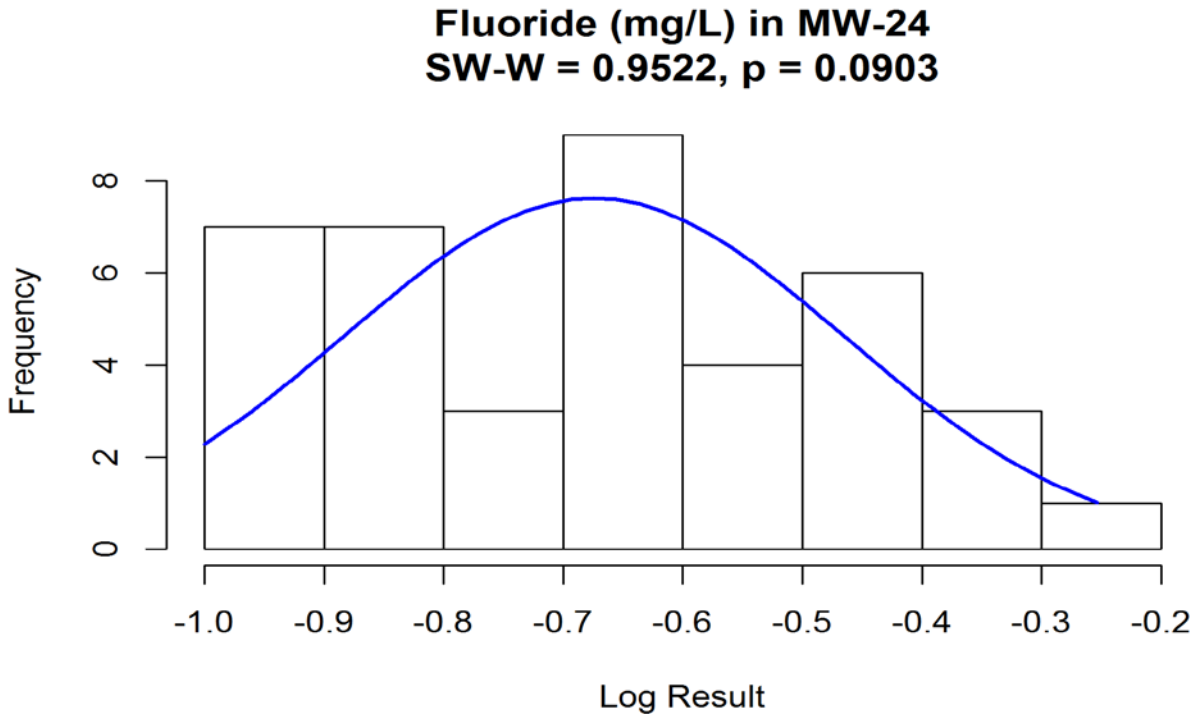

Chloride (mg/L) in MW-18
SW-W = 0.9347, p = 0.0348
Frequency
0
2
4
6
8
10
12
1.3
1.4
1.5
1.6
1.7
1.8
1.9
Log Result

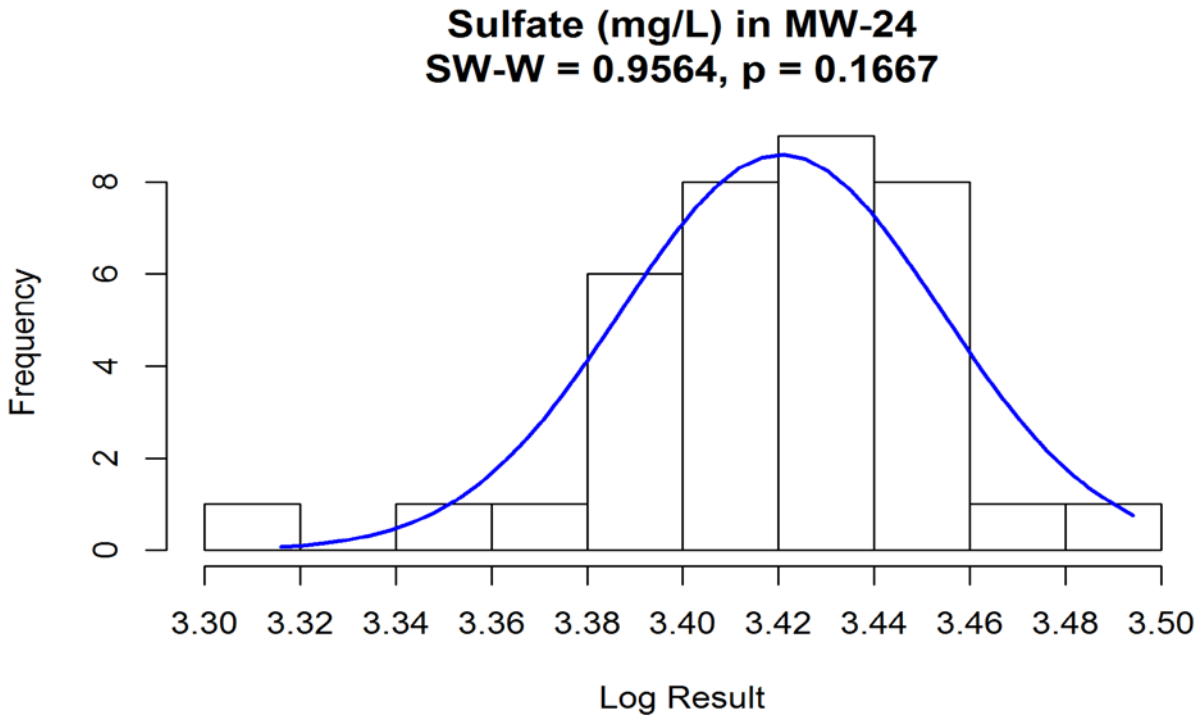

Fluoride (mg/L) in MW-18
SW-W = 0.9089, p = 0.0288
Frequency
0
2
4
6
8
10
-0.85
-0.75
-0.65
-0.55
-0.45
-0.35
Log Result

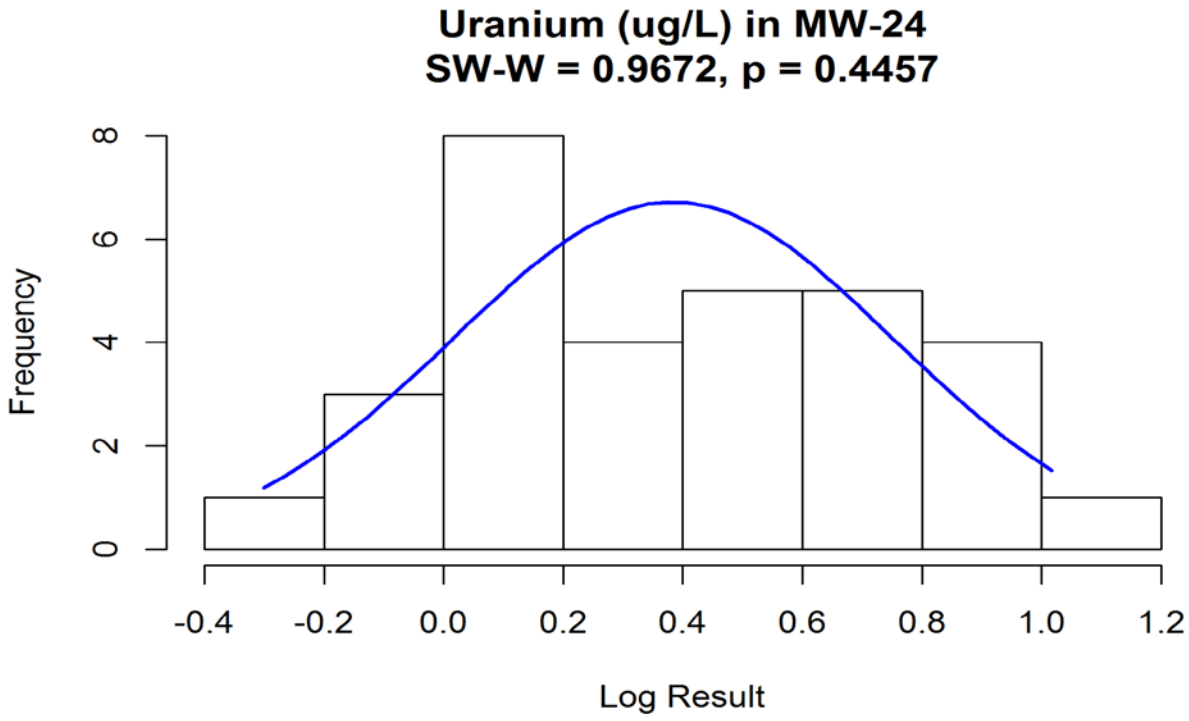

Sulfate (mg/L) in MW-18
SW-W = 0.8646, p = 1e-04
Frequency
0
5
10
15
20
3.00
3.05
3.10
3.15
3.20
3.25
3.30
3.35
Log Result

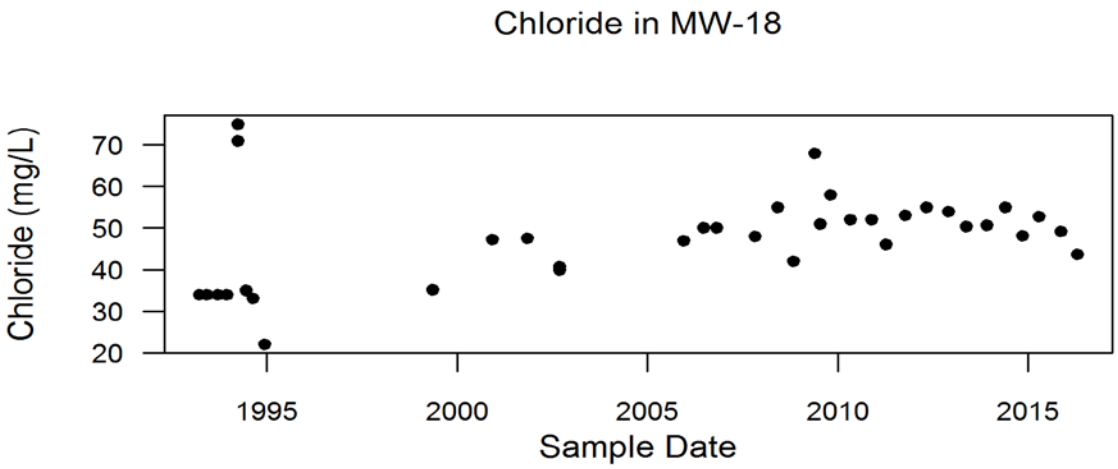

Uranium (ug/L) in MW-18
SW-W = 0.7125, p = 0
Frequency
0
5
10
15
0.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
Log Result

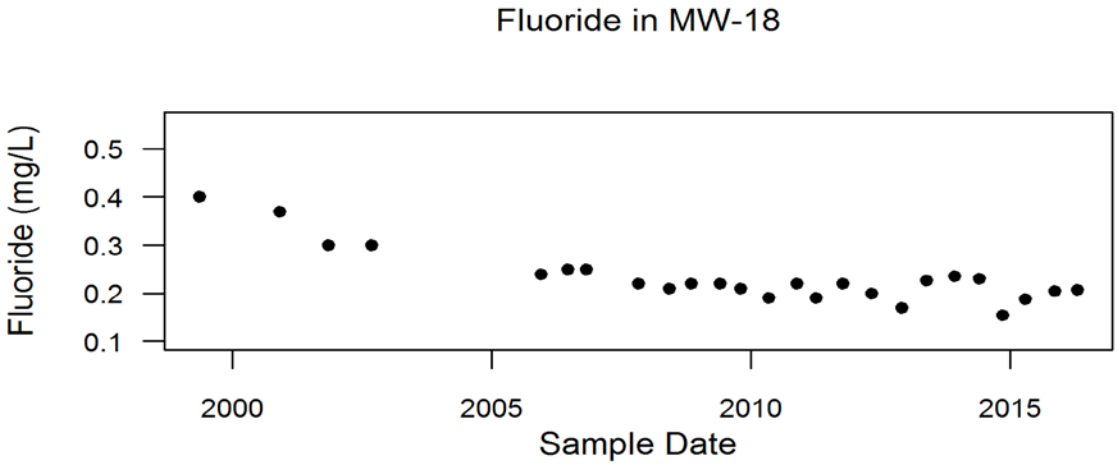

Chloride (mg/L) in MW-24
SW-W = 0.9256, p = 0.0423
Frequency
0
2
4
6
8
10
12
1.58
1.60
1.62
1.64
1.66
1.68
1.70
1.72
Log Result

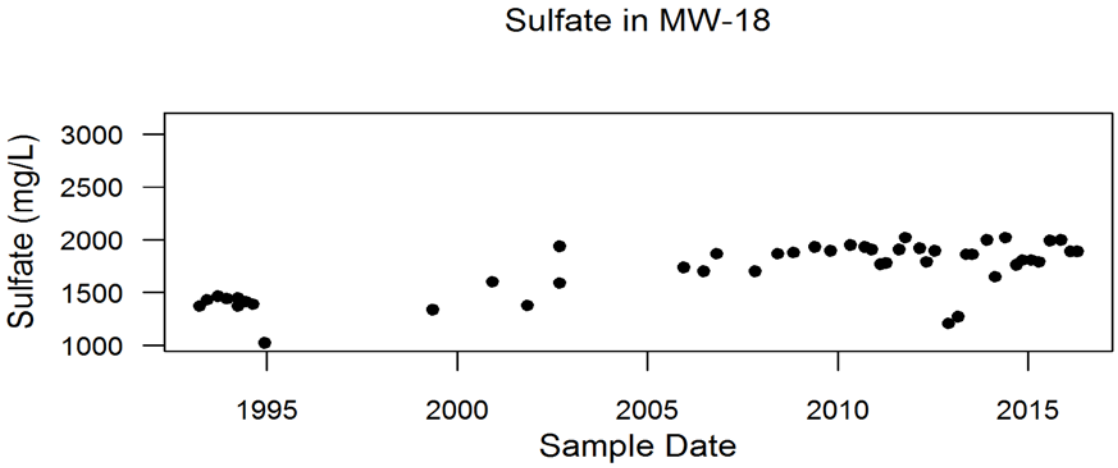

Fluoride (mg/L) in MW-24
SW-W = 0.9522, p = 0.0903
Frequency
0
2
4
6
8
-1.0
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
Log Result

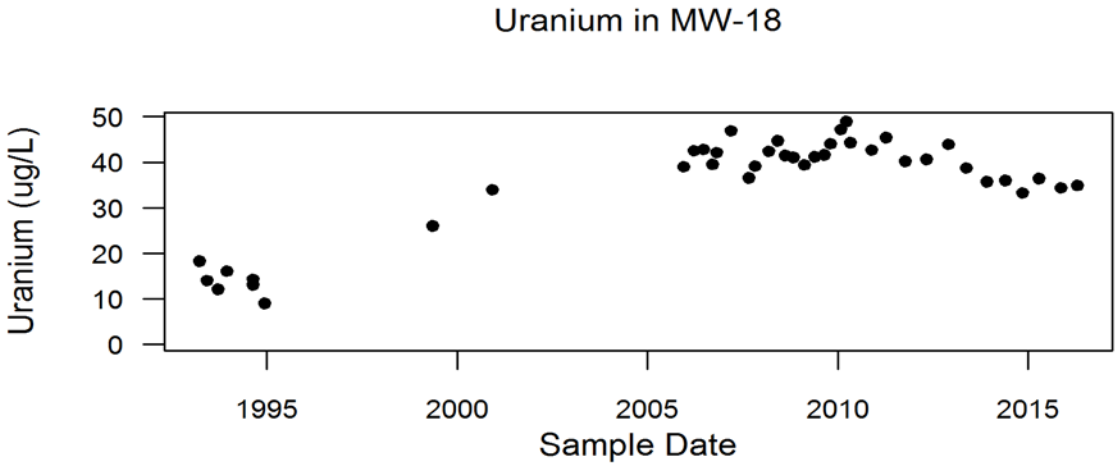

Sulfate (mg/L) in MW-24
SW-W = 0.9564, p = 0.1667
Frequency
0
2
4
6
8
3.30
3.32
3.34
3.36
3.38
3.40
3.42
3.44
3.46
3.48
3.50
Log Result

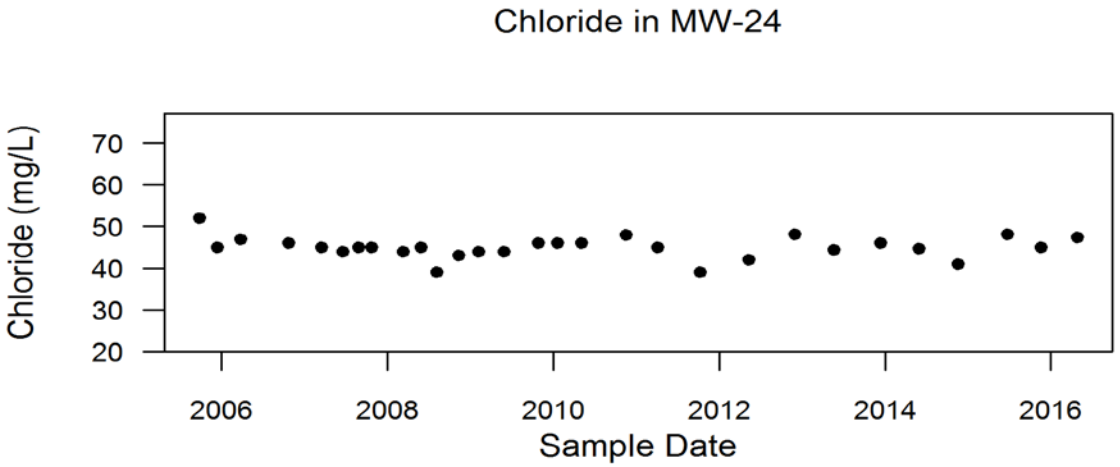

Uranium (ug/L) in MW-24
SW-W = 0.9672, p = 0.4457
Frequency
0
2
4
6
8
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Log Result

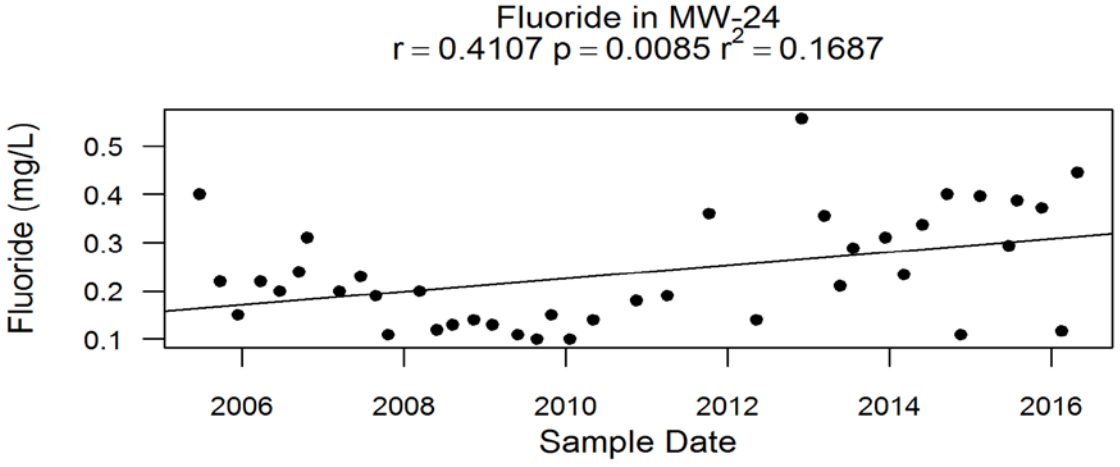

Chloride in MW-18
Chloride (mg/L)
70
60
50
40
30
20
1995
2000
2005
2010
2015
Sample Date

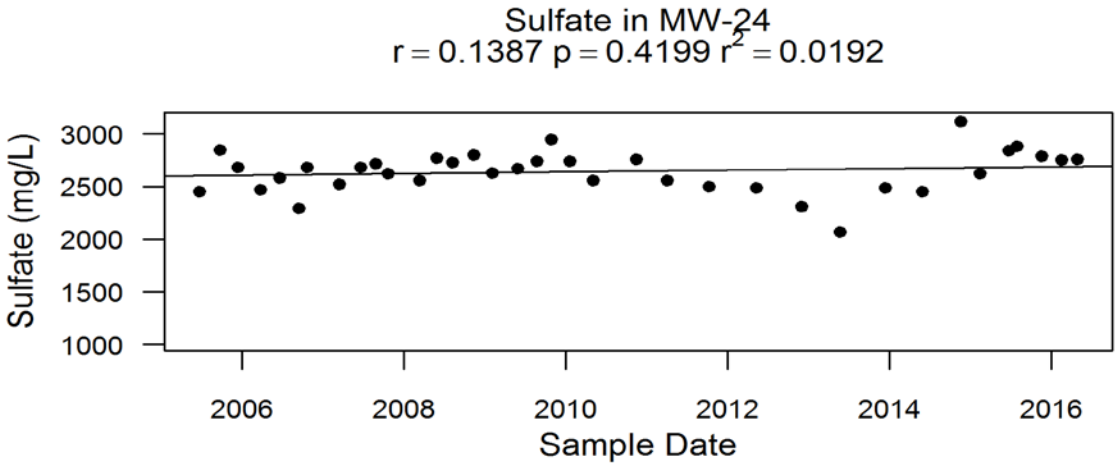

Fluoride in MW-18
Fluoride (mg/L)
0.5
0.4
0.3
0.2
0.1
2000
2005
2010
2015
Sample Date

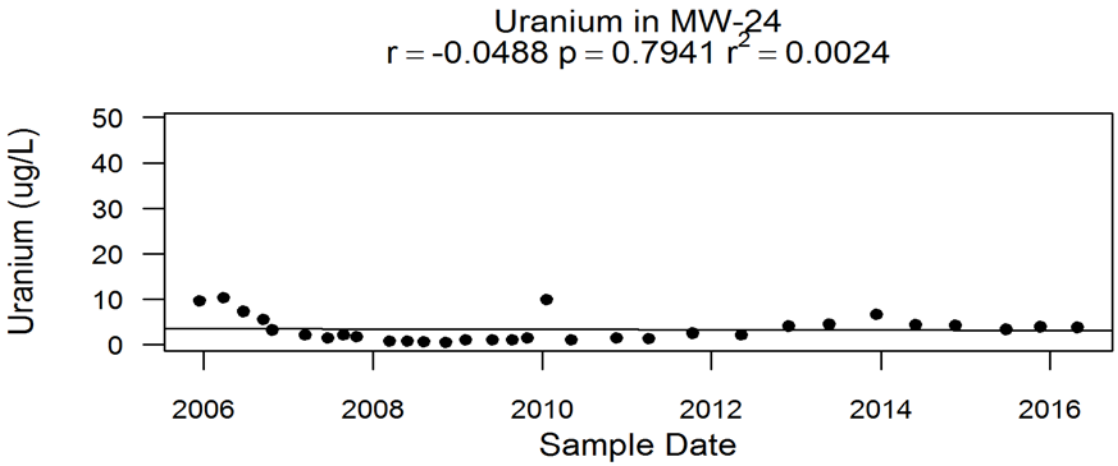

Sulfate in MW-18
Sulfate (mg/L)
3000
2500
2000
1500
1000
1995
2000
2005
2010
2015
Sample Date


Uranium in MW-18
Uranium (ug/L)
0
10
20
30
40
50
1995
2000
2005
2010
2015
Sample Date


Chloride in MW-24
Chloride (mg/L)
20
30
40
50
60
70
2006
2008
2010
2012
2014
2016
Sample Date


Fluoride in MW-24
r = 0.4107 p = 0.0085 r2 = 0.1687
Fluoride (mg/L)
0.1
0.2
0.3
0.4
0.5
2006
2008
2010
2012
2014
2016
Sample Date


Sulfate in MW-24
r = 0.1387 p = 0.4199 r2 = 0.0192
Sulfate (mg/L)
3000
2500
2000
1500
1000
2006
2008
2010
2012
2014
2016
Sample Date


Uranium in MW-24
r = -0.0488 p = 0.7941 r2 = 0.0024
Uranium (ug/L)
50
40
30
20
10
0
2006
2008
2010
2012
2014
2016
Sample Date

APPENDIX D

pH Analysis in MW-24

D-1. pH Analysis Summary Table

Appendix D. pH Analysis in MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Constituent and Unit	N	% Non-Detected Values	Mean	Standard Deviation	Shapiro-Wilk Test for Normality		Normally or Lognormally distributed?	Least Squares Regression Trend Analysis[1]		Mann-Kendall Trend Analysis[2]		2012 pH Report Significant Trend?[3]	2016 SAR Significant Trend?[4]
						W	p		r^2	p	S	p		
MW-24	pH s.u.	38	0.0%	6.24	0.60	0.9864	0.9179	Normal	0.5856	2.20E-08	-	-	Yes, Decreasing	Yes, Decreasing

Notes:

s.u. = standard units

N = number of valid data points

SAR = Source Assessment Report

Mean = The arithmatic mean as determined for normally or lognormally distributed constituents with % Detect > 50%

Standard Deviation = The standard deviation as determined for normally or lognormally distributed constituents with % Detect > 85%

W = Shapiro Wilk test value

p = p-value, where any value smaller than 0.05 is significant

S = Mann-Kendall statistic

r^2 = The measure of how well the trendline fits the data where r^2=1 represents a perfect fit.

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

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

[3] = 2012 pH Report is in reference to INTERA Incorporated. 2012. *PH Report, White Mesa Uranium Mill, Blanding, Utah* . November 9.

[4] = 2016 SAR is in reference to this current Source Assessment Report

D-2: Data used for pH Geochemical Analysis in MW-24

Appendix D. pH Analysis in MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

Well	Sample Date	Parameter	Result	Units	QUAL
MW-24	12/13/2005	pH	6.8	s.u.	
MW-24	10/24/2006	pH	7.38	s.u.	
MW-24	8/27/2007	pH	7.54	s.u.	
MW-24	3/12/2008	pH	6.77	s.u.	
MW-24	3/24/2008	pH	6.12	s.u.	
MW-24	5/28/2008	pH	6.94	s.u.	
MW-24	8/6/2008	pH	6.9	s.u.	
MW-24	11/10/2008	pH	7.32	s.u.	
MW-24	2/4/2009	pH	6.44	s.u.	
MW-24	5/20/2009	pH	6.76	s.u.	
MW-24	5/29/2009	pH	6.59	s.u.	
MW-24	8/12/2009	pH	6.52	s.u.	
MW-24	8/19/2009	pH	6.41	s.u.	
MW-24	10/26/2009	pH	6.29	s.u.	
MW-24	1/18/2010	pH	6.4	s.u.	
MW-24	5/5/2010	pH	5.91	s.u.	
MW-24	5/17/2010	pH	5.78	s.u.	
MW-24	9/20/2010	pH	6.64	s.u.	
MW-24	11/16/2010	pH	6.1	s.u.	
MW-24	2/9/2011	pH	5.73	s.u.	
MW-24	4/4/2011	pH	6.12	s.u.	
MW-24	7/17/2012	pH	6.45	s.u.	
MW-24	11/29/2012	pH	6.01	s.u.	
MW-24	3/14/2013	pH	6.29	s.u.	
MW-24	5/22/2013	pH	6.77	s.u.	
MW-24	7/19/2013	pH	5.8	s.u.	
MW-24	12/12/2013	pH	6.08	s.u.	
MW-24	3/6/2014	pH	5.89	s.u.	
MW-24	5/30/2014	pH	6.07	s.u.	
MW-24	9/17/2014	pH	5.09	s.u.	
MW-24	11/19/2014	pH	5.69	s.u.	
MW-24	2/12/2015	pH	6.21	s.u.	
MW-24	5/28/2015	pH	5.39	s.u.	
MW-24	6/24/2015	pH	5.98	s.u.	
MW-24	7/29/2015	pH	5.49	s.u.	
MW-24	11/18/2015	pH	5.48	s.u.	
MW-24	2/17/2016	pH	5.95	s.u.	
MW-24	4/28/2016	pH	4.83	s.u.	

Notes:

s.u. = standard units

D-3: Data removed for pH Geochemical Analysis in MW-24

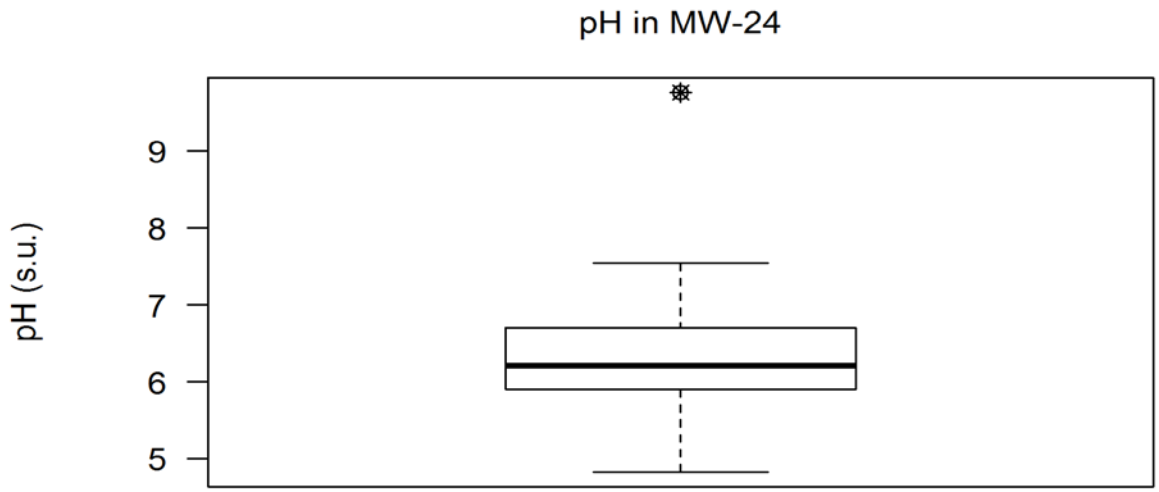
Appendix D. pH Analysis in MW-24

Source Assessment Report for MW-18 and MW-24, White Mesa Uranium Mill, Blanding, Utah

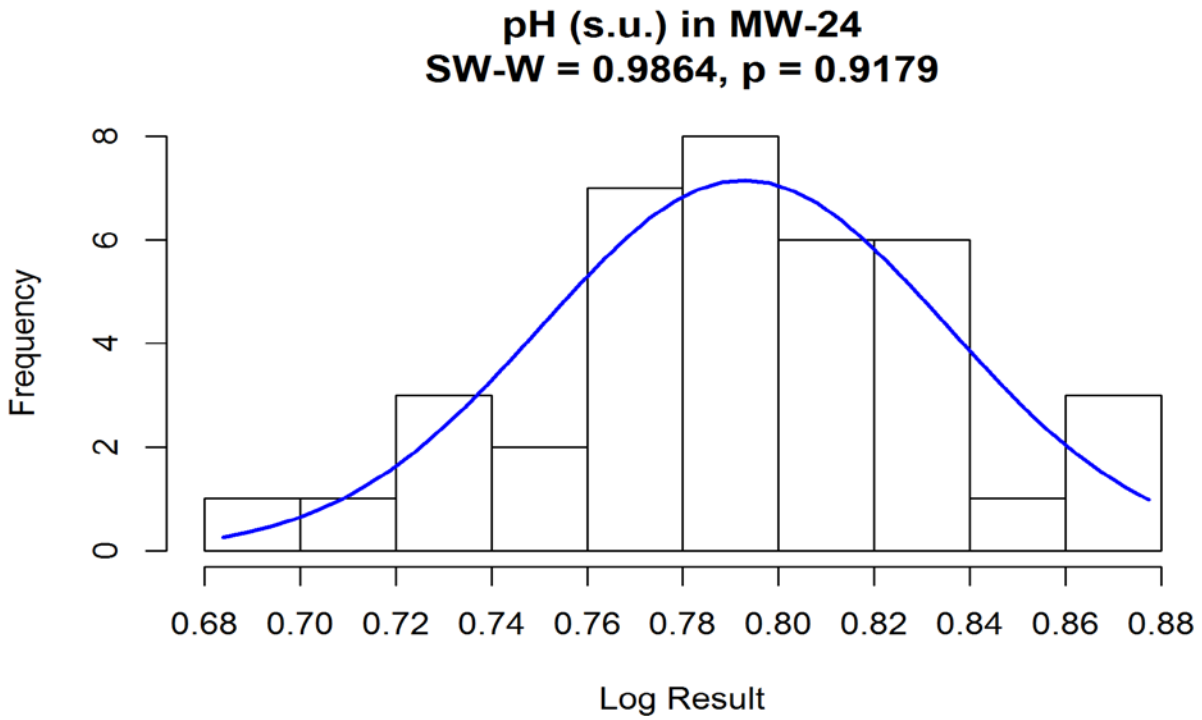
Field Sample ID	Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type	Removal Rationale
MW-24	MW-24	6/20/2007	pH	9.76	s.u.		Y	WATER	REG	GW	Extreme outlier

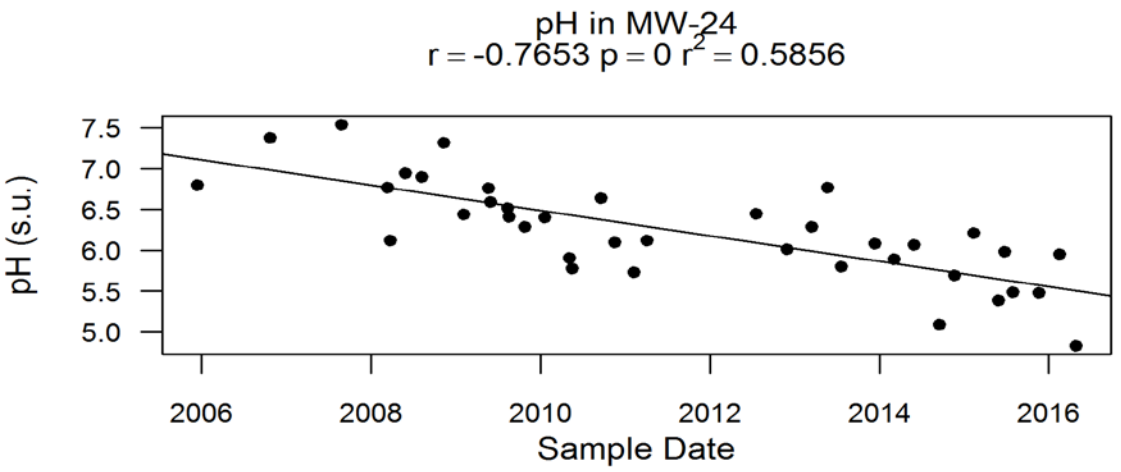
Notes:

s.u. = standard units



Percent nondetect: 0%
Min: 4.83, Mean: 6.33, Max: 9.76, Std Dev: 0.82
Upper extreme threshold (Q75 + 3xH): 9.1
Lower extreme threshold (Q25 - 3xH): 3.5

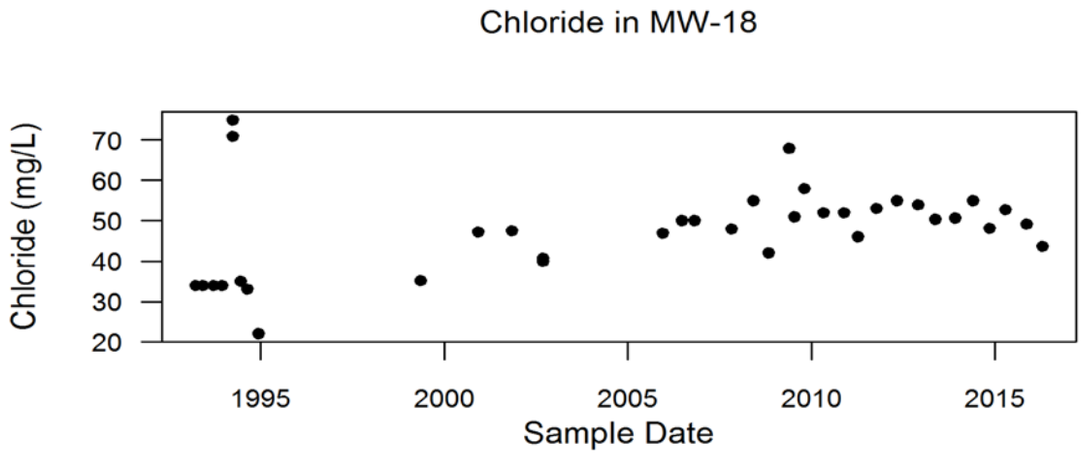

pH (s.u.) in MW-24
SW-W = 0.9864, p = 0.9179
Frequency
0
2
4
6
8
0.68
0.70
0.72
0.74
0.76
0.78
0.80
0.82
0.84
0.86
0.88
Log Result


pH in MW-24
r = -0.7653 p = 0 r2 = 0.5856
pH (s.u.)
7.5
7.0
6.5
6.0
5.5
5.0
2006
2008
2010
2012
2014
2016
Sample Date

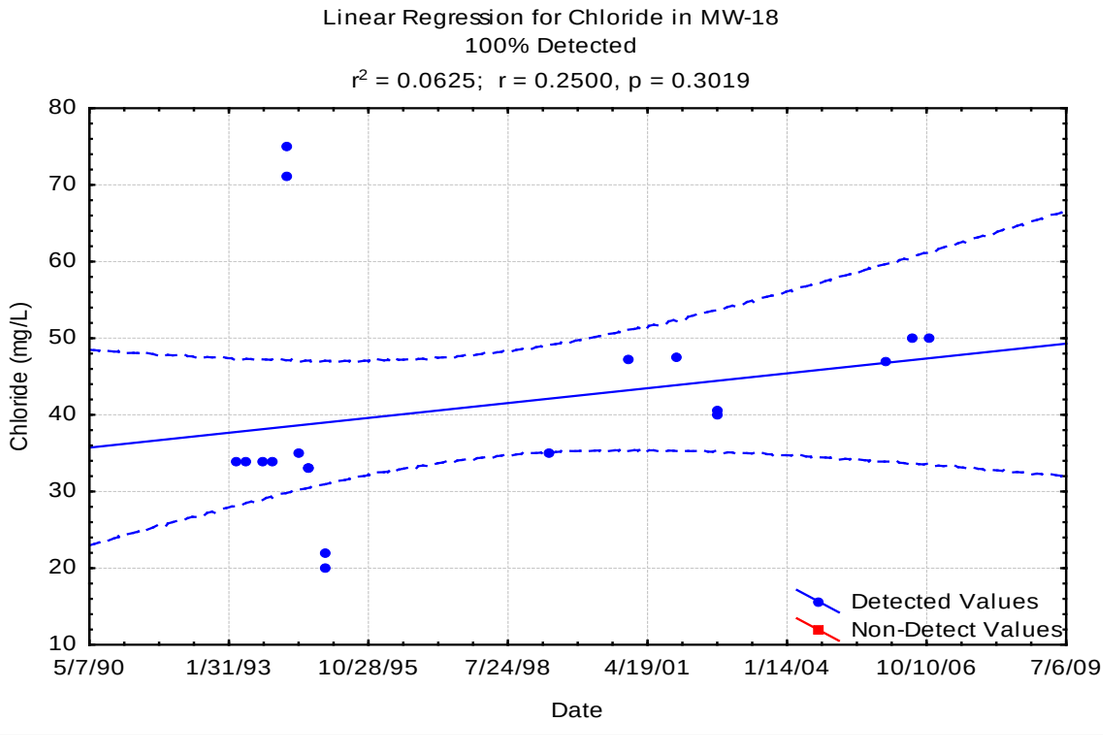
APPENDIX E

Time Concentration Plots Compared to Background Report Plots

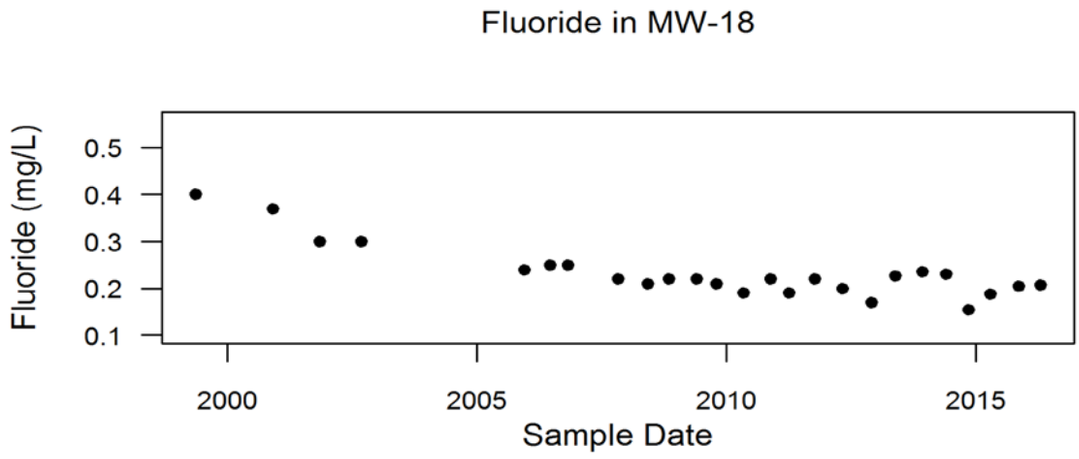
Chloride in MW-18 from 2016 SAR



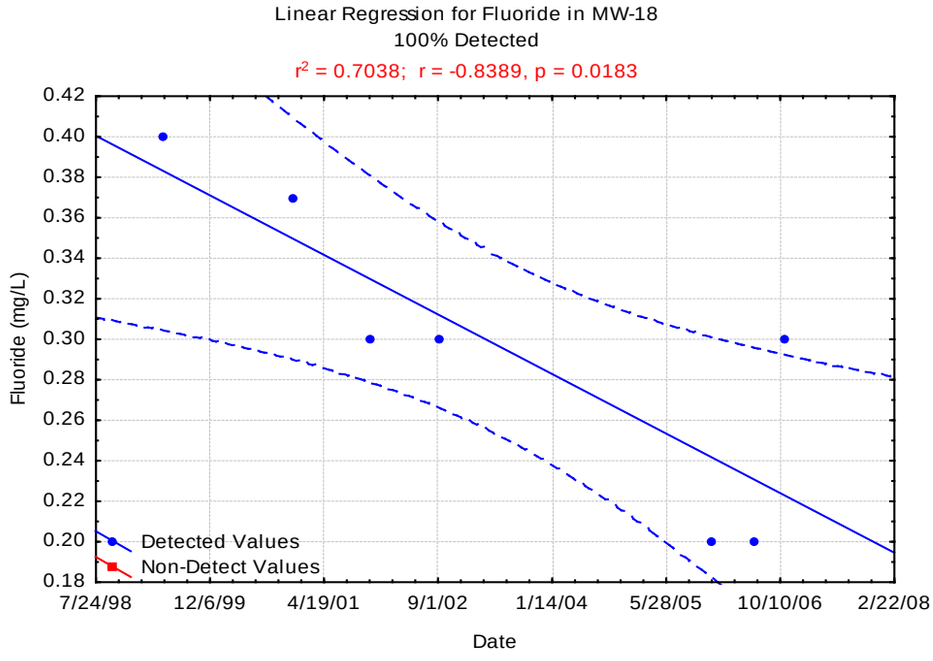
Chloride in MW-18 from Existing Wells Background Report



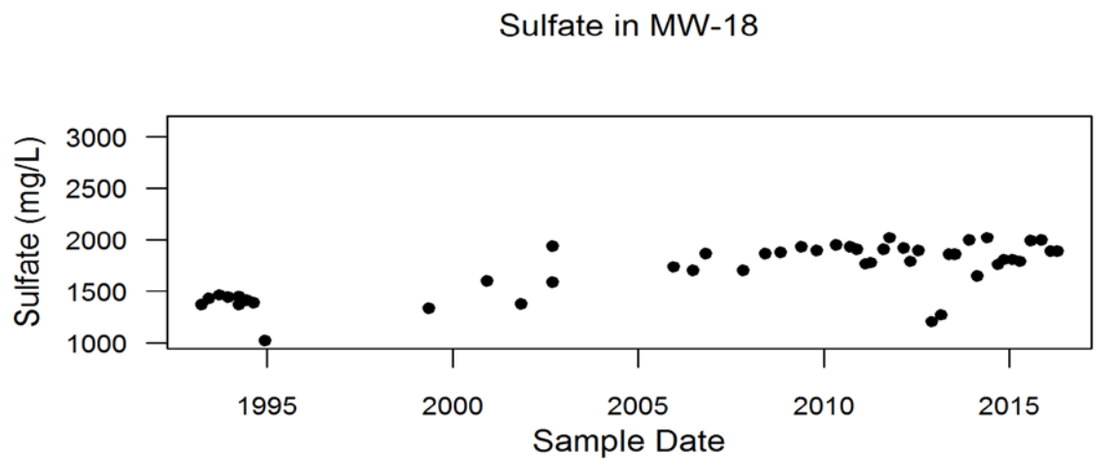
Fluoride in MW-18 from 2016 SAR



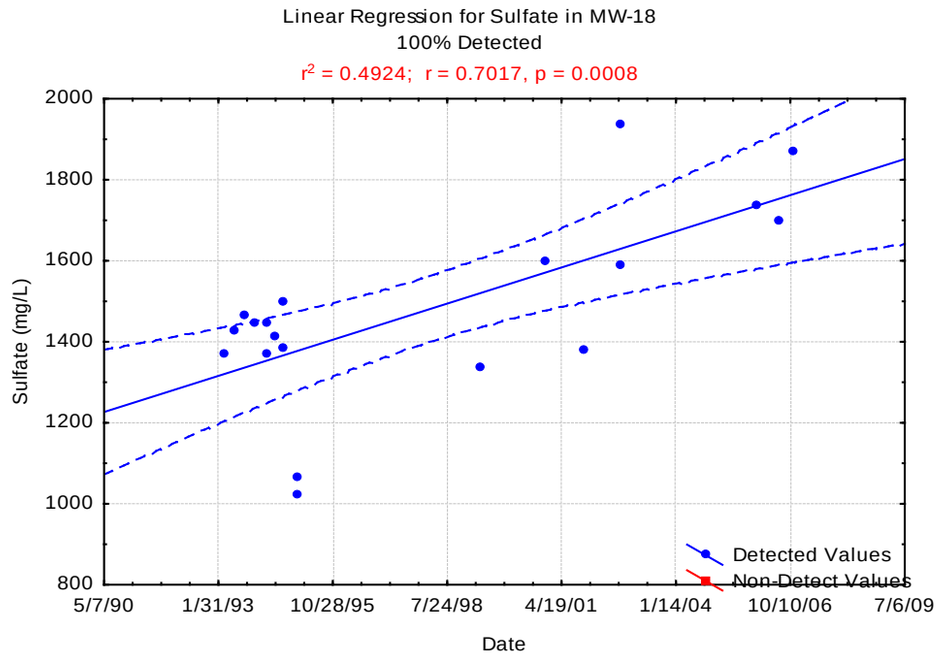
Fluoride in MW-18 from Existing Wells Background Report



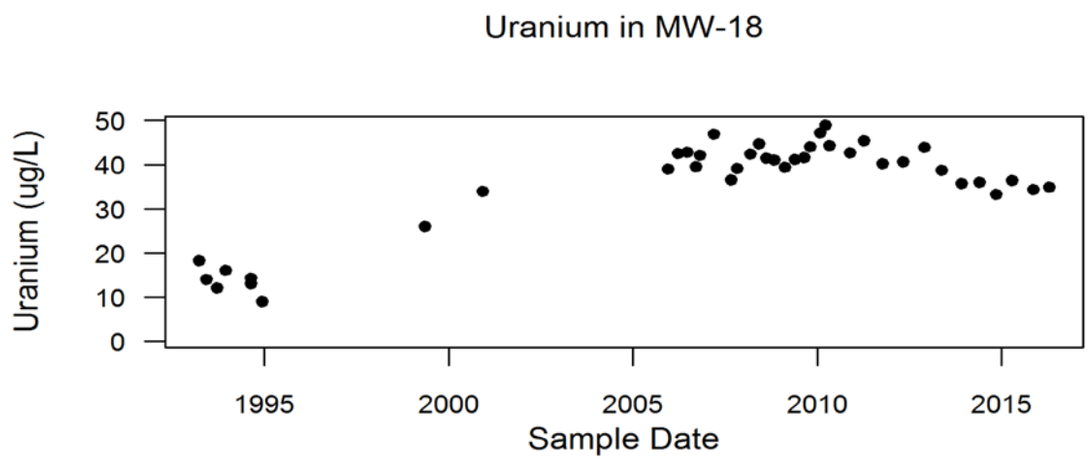
Sulfate in MW-18 from 2016 SAR



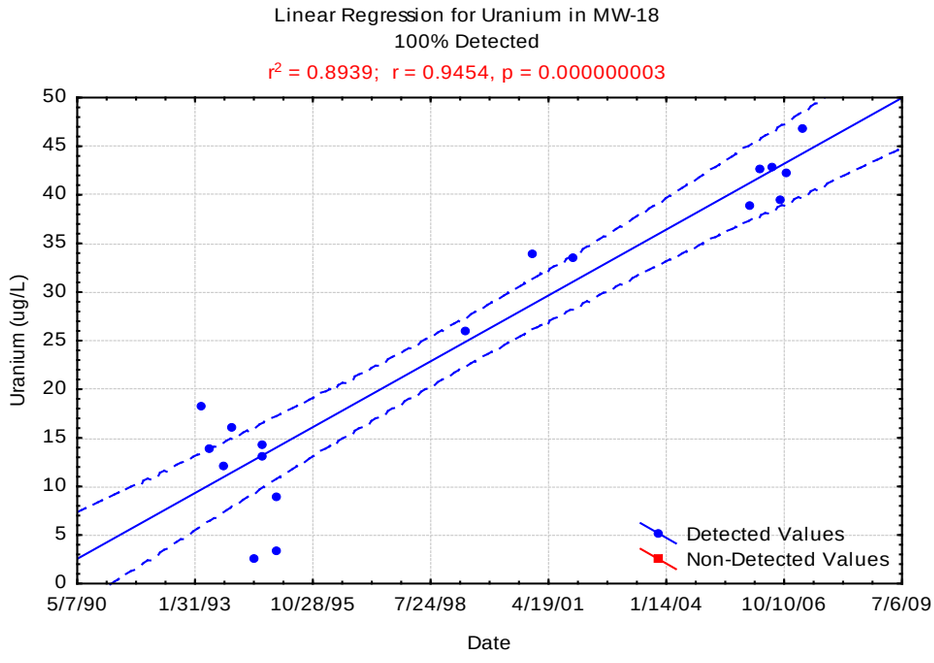
Sulfate in MW-18 from Existing Wells Background Report



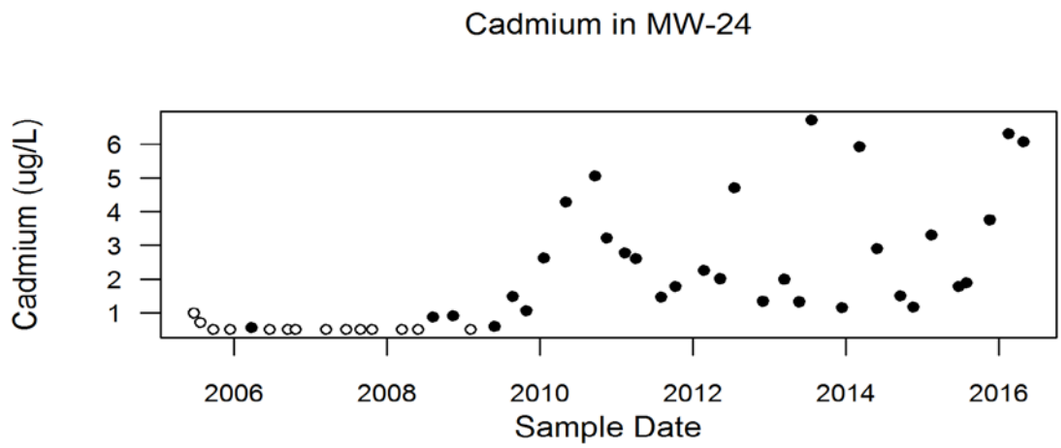
Uranium in MW-18 from 2016 SAR



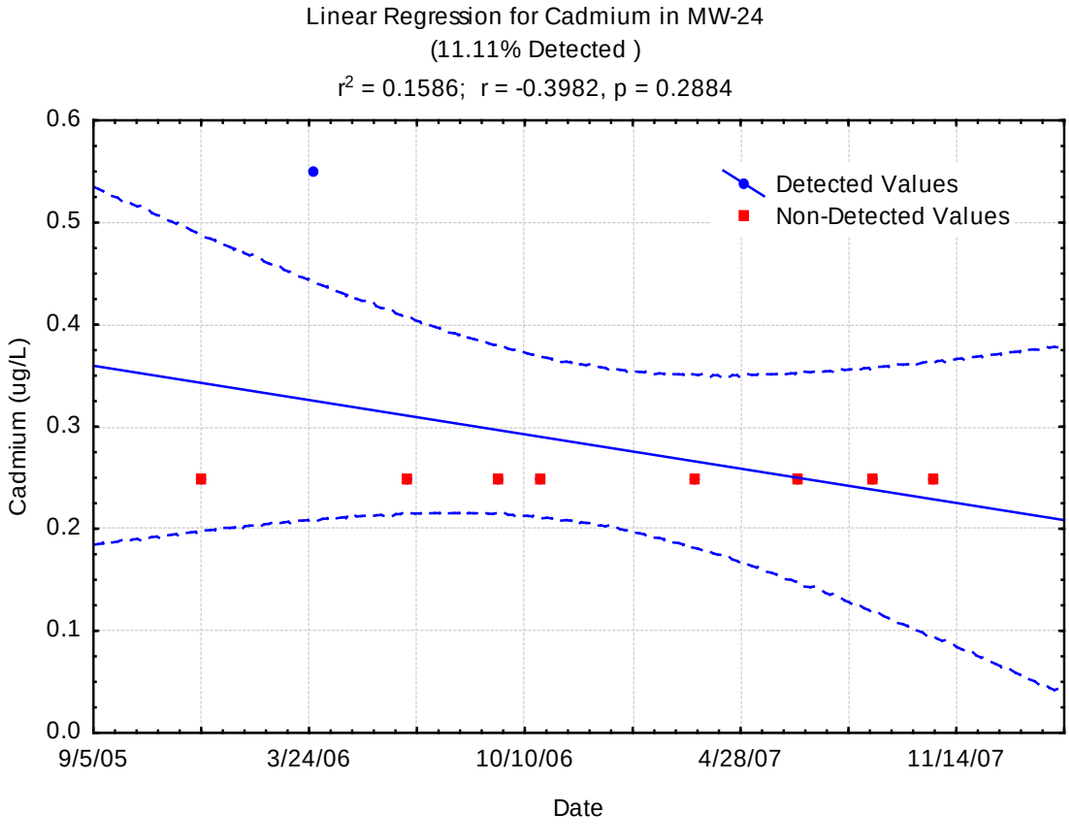
Uranium in MW-18 from Existing Wells Background Report



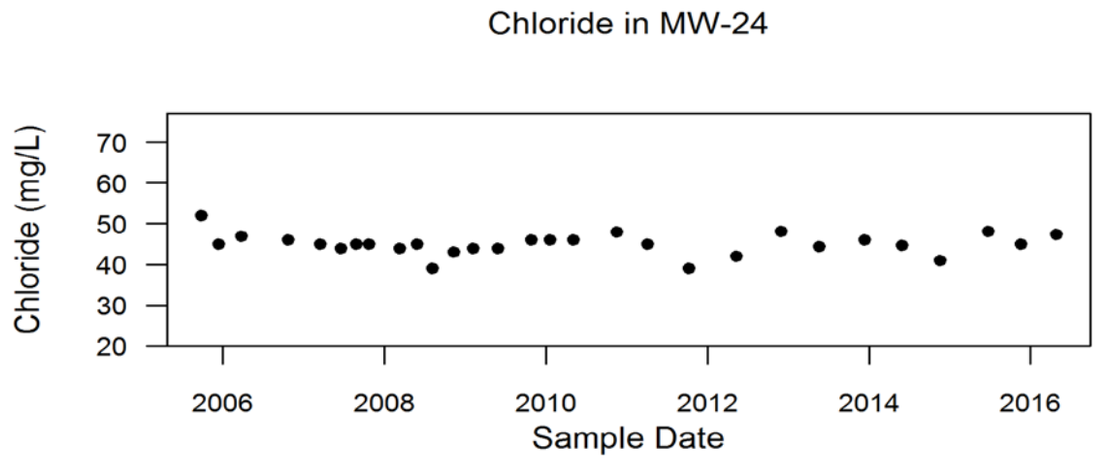
Cadmium in MW-24 from 2016 SAR



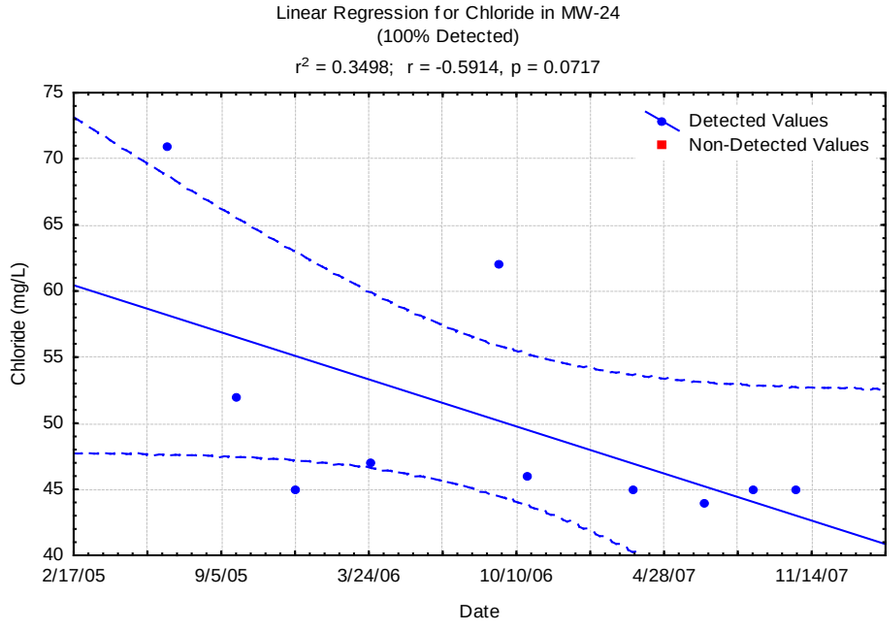
Cadmium in MW-24 from New Wells Background Report



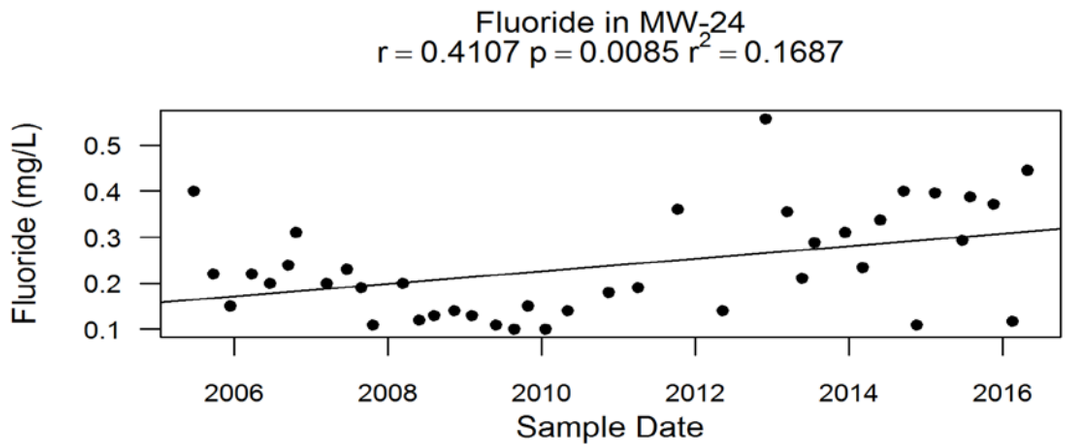
Chloride in MW-24 from 2016 SAR



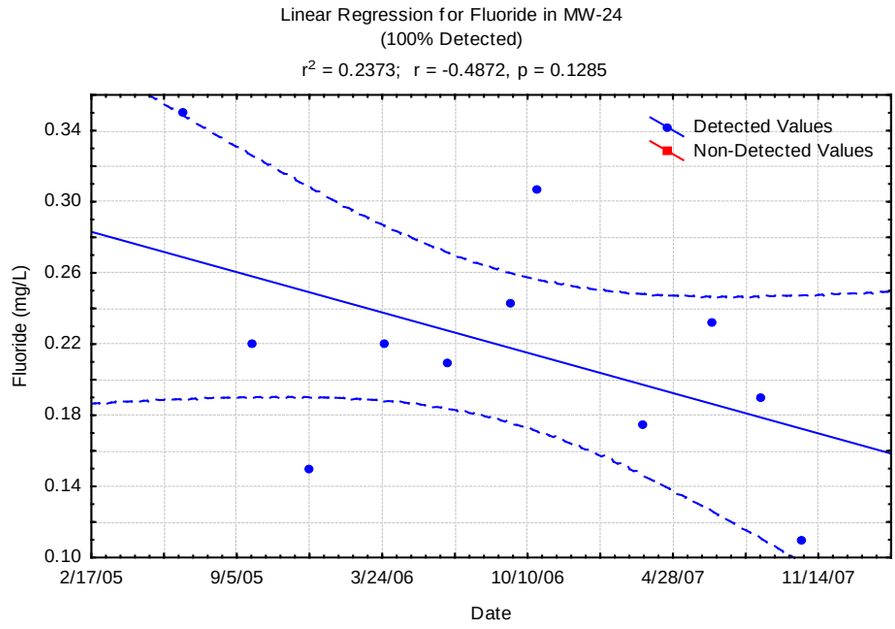
Chloride in MW-24 from New Wells Background Report



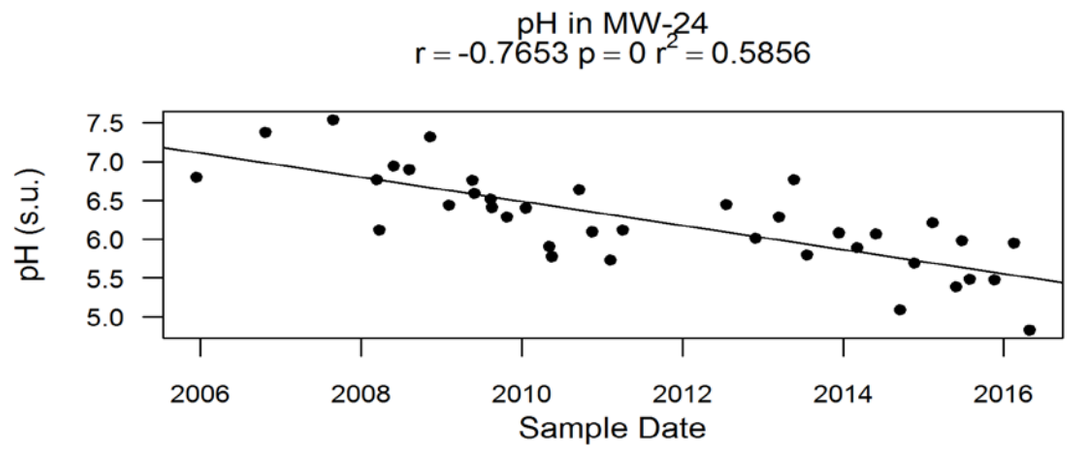
Fluoride in MW-24 from 2016 SAR



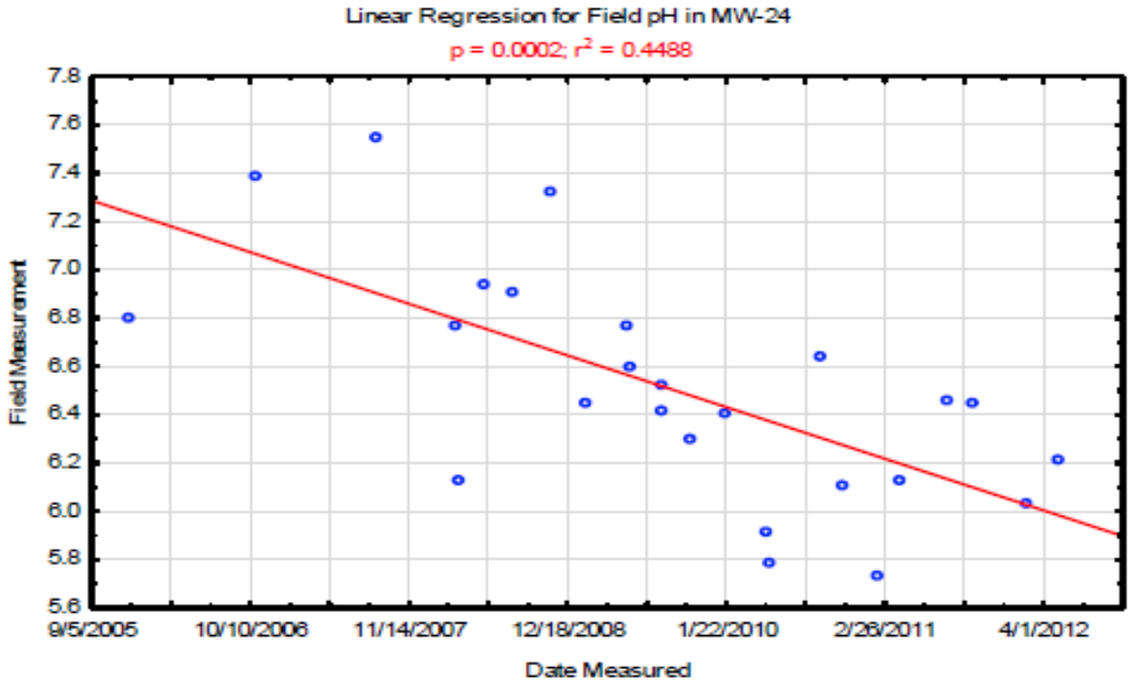
Fluoride in MW-24 from New Wells Background Report



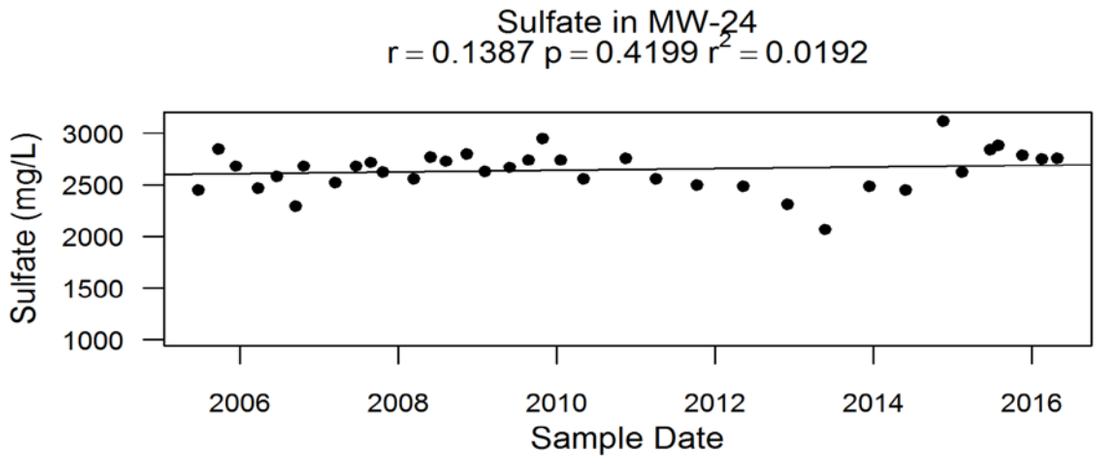
pH in MW-24 from 2016 SAR



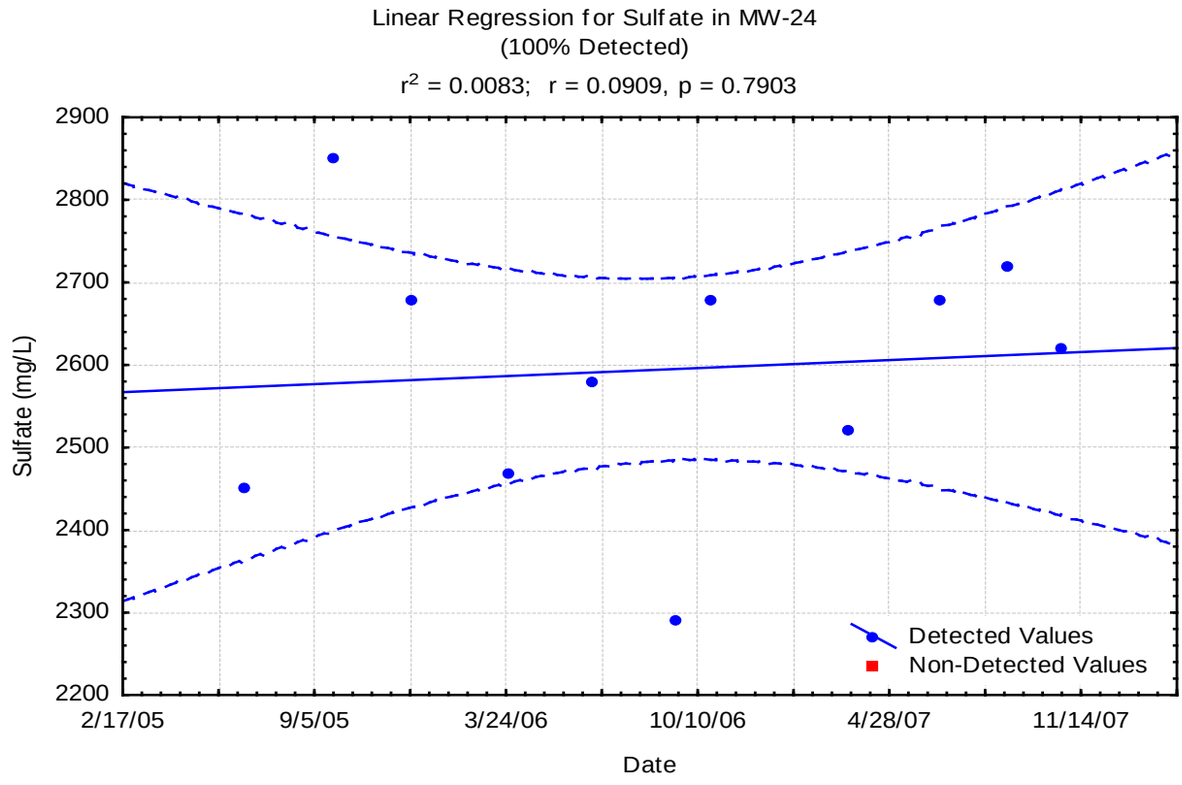
pH in MW-24 from 2012 pH Report



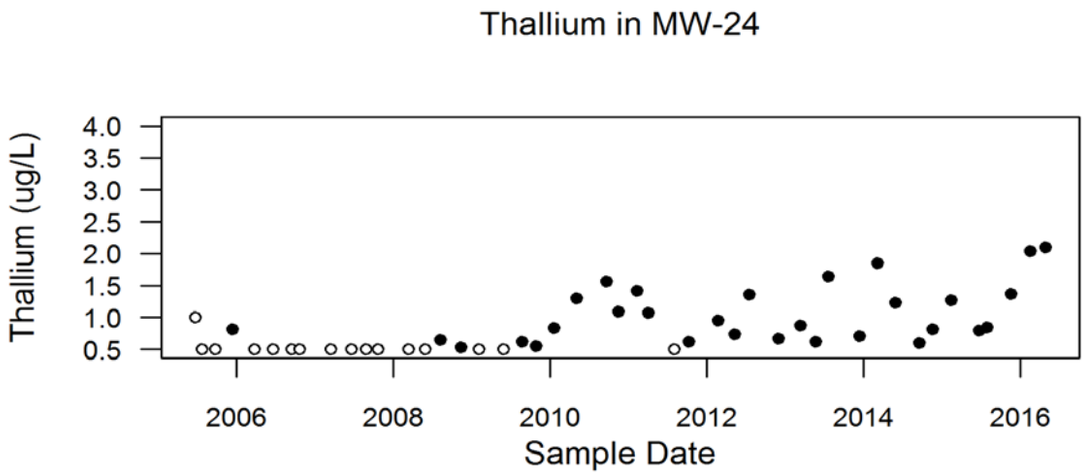
Sulfate in MW-24 from 2016 SAR



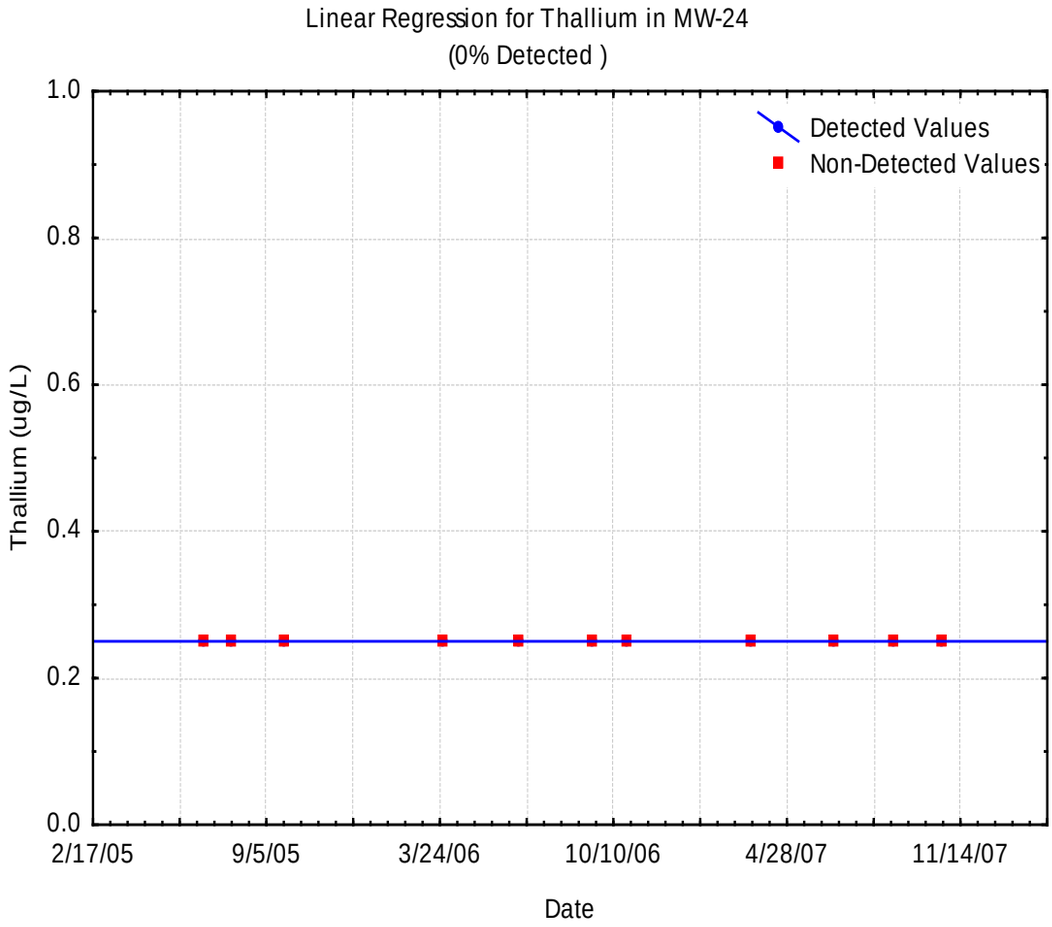
Sulfate in MW-24 from New Wells Background Report



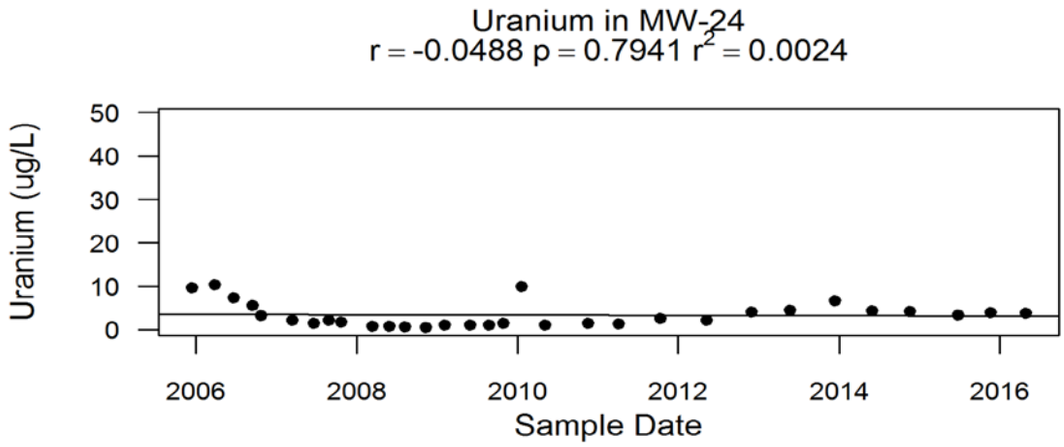
Thallium in MW-24 from 2016 SAR



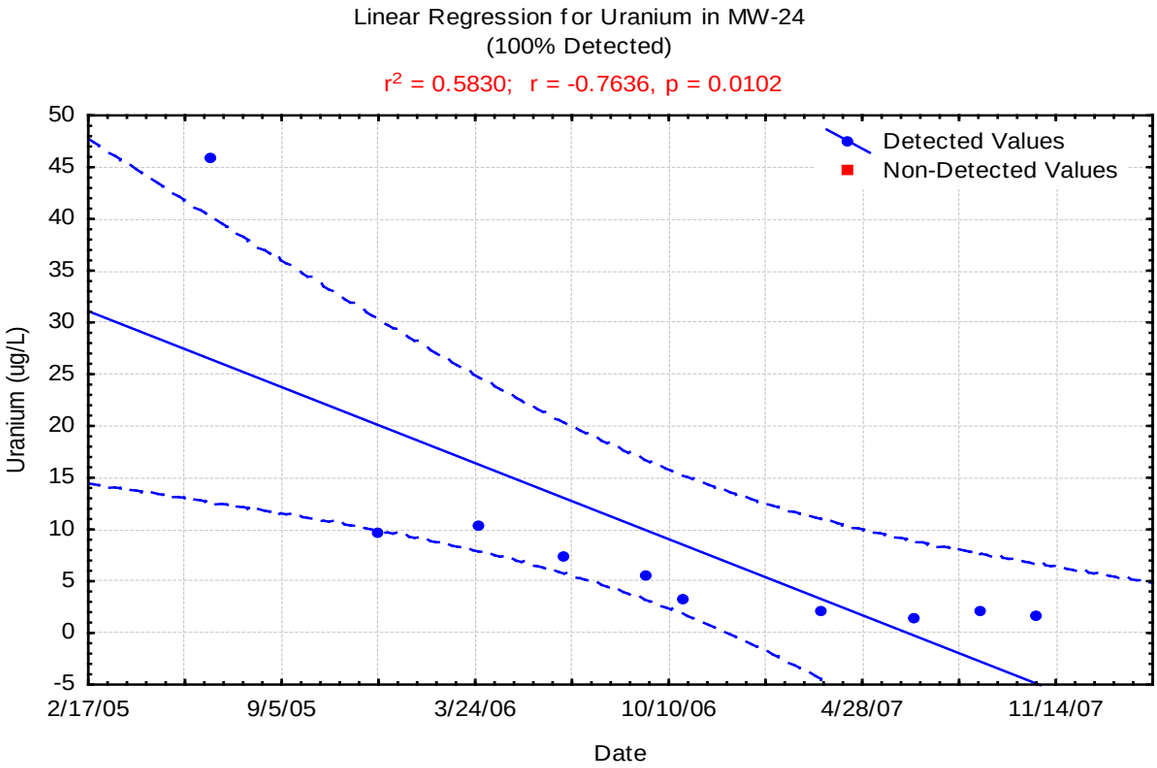
Thallium in MW-24 from New Wells Background Report



Uranium in MW-24 from 2016 SAR



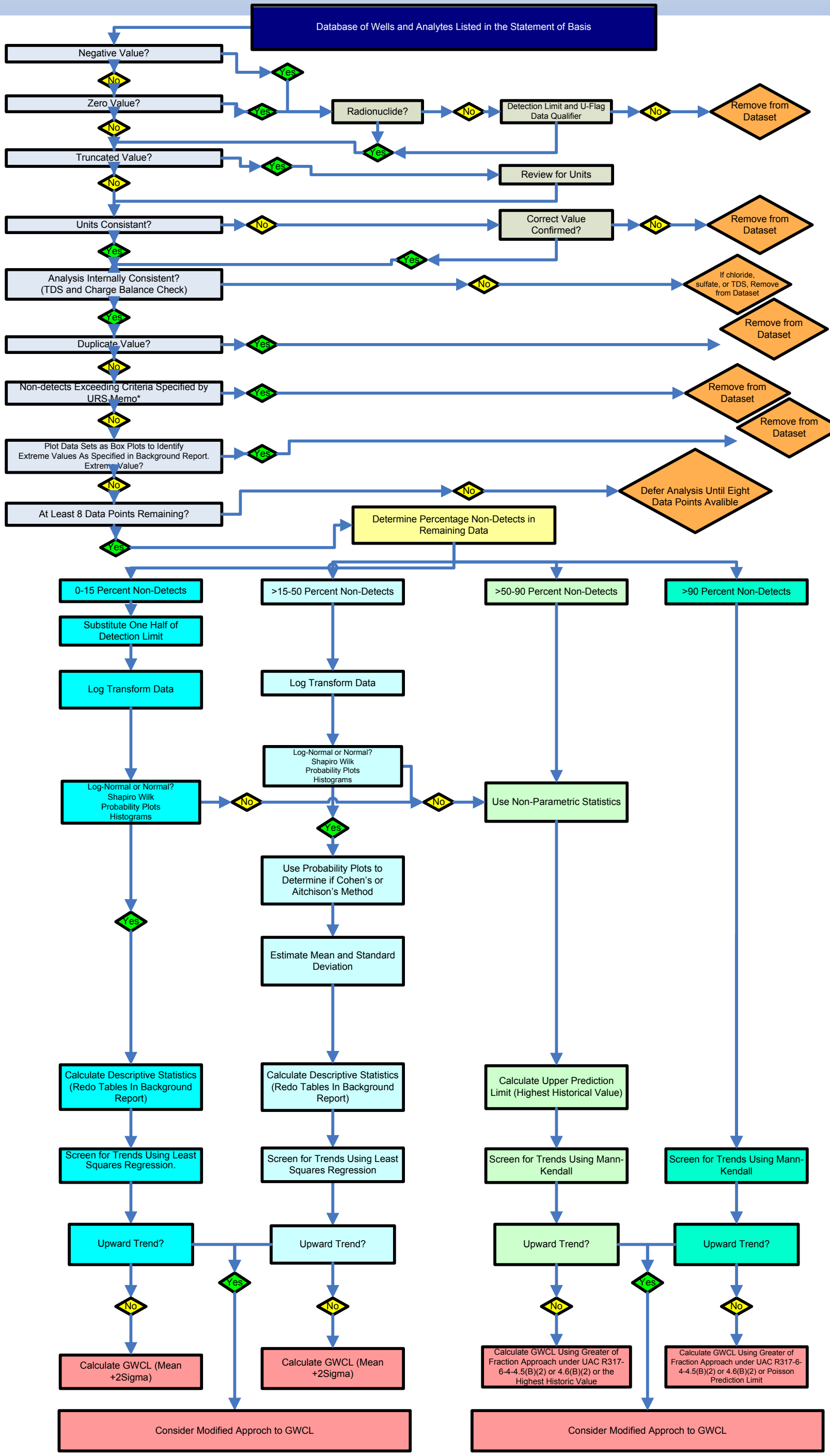
Uranium in MW-24 from New Wells Background Report



APPENDIX F

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

Appendix F. 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).

INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

APPENDIX G

Input and Output Files (Electronic Only)