SEQUOYAH FUELS
A GENERAL ATOMICS COMPANY

RE: 1608-N

March 29, 2016

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Receipt No. 7011 0110 0000 0858 4862

Ken Kalman, Project Manager
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Material Safety
U.S. Nuclear Regulatory Commission
Two White Flint North, Mail Stop T8F5
Rockville, MD 20852-2738

RE: Sequoyah Fuels Corporation
2015 Annual Groundwater Report
License No. SUB-1010
Docket No. 40-8027

Dear Mr. Kalman:

Enclosed is a copy of the 2015 Annual Groundwater Report required by Condition 49 of Amendment 33 to the above referenced license.

Let me know if you have any questions or comments pertaining to the report.

Sincerely,

Scott C. Munson

Scott C. Munson, Manager
Environmental

Enclosures as Stated

cc: Saba Tahmassebi, Oklahoma Department of Environmental Quality
Robert Evans, U.S. Nuclear Regulatory Commission, Region IV
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2015 ANNUAL GROUNDWATER REPORT

Sequoyah Fuels Corporation
Gore, Oklahoma

Submitted to:

Fuel Cycle Facilities Branch
U.S. Nuclear Regulatory Commission
Headquarters Office, Rockville, MD

March 16, 2016

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Sequoyah Fuels Corporation

1.0 INTRODUCTION

On August 22, 2005, the U.S. Nuclear Regulatory Commission (NRC) amended Source Materials License No. SUB-1010 to authorize implementation of SFC's Groundwater Monitoring Plan (GWMP) dated February 25, 2005. This license amendment requires SFC to submit, by April 1 of each year, a groundwater compliance monitoring report. Groundwater monitoring data collected during calendar year 2015 is provided herein in fulfillment of the above requirement.

1.1 Background

SFC conducts groundwater monitoring through a monitoring well network described in the GWMP. This network includes corrective action, seep, drainage, surface water and groundwater monitoring. New groundwater monitoring wells required by the GWMP were installed during late 2005 and early 2006. Initial sampling of these wells was completed during early 2006. A map of the site showing corrective action, seep, drainage and groundwater monitoring locations is presented in Figure 1. Surface water sampling locations are shown in Figure 2. Groundwater monitoring wells are completed at various depths to monitor different groundwater units. The groundwater monitoring units at the Sequoyah Facility have been designated as Terrace/Shale 1, Shale 2, Shale 3, Shale 4 and Shale 5. The GWMP includes a general description of the geologic, hydrogeologic, and geochemical conditions at the Facility.

A detailed discussion of the geology and hydrogeology of the Facility was presented in the Final RFI Report submitted to EPA Region 6 on October 11, 1996. An additional site investigation was conducted during 2001 by Shepherd Miller Inc. (SMI) in support of the development of a site conceptual model for geology and hydrogeology. The conceptual model refined the site

geology into individual shale and sandstone units and was submitted to NRC and EPA during October 2002 in a report titled Final Hydrogeological and Geochemical Site Characterization Report (HGSCR). The HGSCR was updated and republished on June 30, 2009.

License Condition 49 of SUB-1010 required SFC to submit a groundwater monitoring plan to NRC on or before June 15, 2003. SFC evaluated the groundwater monitoring requirements at the Sequoyah Facility during 2003 and submitted the GWMP to NRC and EPA on June 12, 2003. The GWMP provides a comprehensive groundwater monitoring program that meets the objectives of the GMIM and NRC license requirements. The GWMP was modified based on comments received from regulatory agencies and resubmitted to NRC and EPA on February 25, 2005. This GWMP was approved by NRC and EPA during August and November of 2005, respectively.

1.2 Scope

Routine groundwater monitoring is conducted for constituents of concern that have previously been identified in the groundwater at the Facility. The primary constituents of concern present in the Facility groundwater are arsenic, fluoride, nitrate and uranium. Barium has also been identified as a constituent of concern but the extent of impact is limited to a small area. Monitoring is conducted in accordance with the requirements of the GWMP and Amendment No. 31 to NRC License SUB-1010.

Routine groundwater sampling will normally be completed in April each year. Quarterly sampling will typically be completed during January, April, July and December of each year. Quarterly sampling of some locations is required for a year and annually thereafter. Table 1 provides the GWMP sampling and analysis schedule. Samples were collected by SFC employees using procedures and protocols defined in the GWMP. Laboratory analyses were conducted by Outreach Laboratory (EPA Lab Number OK00922 and ODEQ ID Number 9517) located in Broken Arrow, Oklahoma.

1.3 Report Organization

The remaining sections of this report describe the groundwater monitoring program changes (Section 2.0), current conditions (Section 3.0) and summarization of Facility groundwater monitoring results (Section 4.0).

2.0 MONITORING PROGRAM CHANGES

As described in Section 1.1 of this report SFC submitted a groundwater monitoring plan to NRC and EPA on June 12, 2003. After responding to several requests for additional information from NRC regarding the plan, SFC submitted a revised plan to NRC and EPA on February 25, 2005. This revised plan was approved by NRC and EPA during 2005.

Condition Number 49 to Amendment No. 35 of SFC's NRC License Number SUB-1010 includes a requirement to implement a groundwater compliance monitoring program as described in SFC's GWMP submitted to NRC on February 25, 2005. This condition included the following groundwater protection standards, referred to as Maximum Contaminant Levels (MCL's) in this report: Antimony = 0.006 mg/l, arsenic = 0.01 mg/l, barium = 1.0 mg/l, beryllium = 0.004 mg/l, cadmium = 0.01 mg/l, chromium = 0.05 mg/l, fluoride = 4.0 mg/l, lead = 0.05 mg/l, mercury = 0.002 mg/l, molybdenum = 0.012 mg/l, nickel = 0.023 mg/l, nitrate = 10 mg/l, combined radium-226 and radium-228 = 5.0 pCi/l, selenium = 0.01 mg/l, silver = 0.05 mg/l, thallium = 0.005 mg/l, thorium-230 = 1.2 pCi/l and uranium = 30 µg/l.

In addition to groundwater monitor well compliance locations the GWMP requires SFC to monitor corrective action, seep, drainage and surface water locations. Corrective action monitoring includes collecting samples from groundwater recovery systems and monitoring locations down-gradient of the recovery systems. Seep and drainage samples are collected along the western perimeter of the Facility where groundwater reaches the ground surface from outcrops of groundwater bearing units. Surface water samples are collected at upstream and downstream locations from the rivers located west and southwest of the Facility. The Groundwater Corrective Action Plan was approved by NRC on September 29, 2010 (NRC License SUB-1010, Amendment No. 34).

Changes in the monitoring program since 2010 include the plugging and/or removal of monitoring wells or recovery systems required for completion of reclamation activities.

3.0 CURRENT CONDITIONS

Disposal cell construction and site reclamation at the Facility has been underway since 2009. Monitoring wells that were located under the disposal cell footprint have been removed or plugged and abandoned. Since there is no longer current sample analyses available from these plugged wells, interpretation of groundwater conditions beneath the cell footprint is not possible. Several impoundments have been excavated down to shallow bedrock as part of the reclamation process. Therefore, the isoconcentration maps have been modified in these areas to represent changes to the upper groundwater units. Future excavations and interpretations will reflect current conditions as deemed appropriate. Isoconcentration maps, Figures 8 through 27, have been modified to show the location of the disposal cell and interpretation of changes from excavations. Furthermore, as structures, impoundments and contaminated soils continue to be removed, recharge to the various groundwater systems will likely be altered and/or eliminated and will ultimately affect future interpretations.

Groundwater flow at the Facility is described as generally westward with some northwesterly and southwesterly movement. This generalization is true for all the groundwater units currently being monitored. The 2015 groundwater level measurements continue to correlate well with the flow directions found during previous measurement events. Groundwater surface contour maps for each groundwater unit are included as Figures 3 through 7. Ten foot contour intervals are shown along with the groundwater elevations measured at each well used to construct the contours. Each contour is labeled with the groundwater surface elevation in feet above mean sea level and provide a general depiction of the groundwater surface elevations for each unit.

The major constituents of concern at the Facility have been established as arsenic, fluoride, nitrate (as N), and uranium. Background quality and compliance groundwater monitoring program data for 2015 are presented in Tables 2 and 3, respectively. Groundwater isoconcentration maps for each groundwater unit (Terrace / Shale 1, Shale 2, Shale 3, Shale 4 and Shale 5) and for each parameter that is a constituent of concern (arsenic, fluoride, nitrate and

uranium) are included as Figures 8 through 27. The isoconcentration maps were prepared by posting the 2015 analyses on the isoconcentration maps prepared for last year's annual groundwater report. Using the posted 2015 analyses the isoconcentration contours have been adjusted to reflect the interpretation of current conditions at the Facility. If more than one analyses was available for a parameter in 2015, an average value was calculated and used. A discussion of the groundwater analyses for arsenic, fluoride, nitrate and uranium is provided below.

3.1 Background Quality Monitoring

The GWMP requires that the designated background groundwater monitoring locations be analyzed annually. Background monitoring wells are analyzed for antimony, arsenic, barium, beryllium, cadmium, chromium, fluoride, lead, nitrate, molybdenum, nickel, selenium, thallium, radium-226, thorium-230 and uranium. Radium-228 is typically analyzed but was not included in the set of parameters analyzed during 2015. The background wells (MW007, MW007A, MW007B, MW070, MW073 and MW110A) were sampled during April 2015. The sampling events since October 2005 have been combined and a statistical analysis completed. This evaluation and statistic analysis are included in Appendix A to this report.

3.2 Compliance Monitoring

The discussion of monitoring results in this section is based on analyses of samples collected during 2015. If more than one sample analysis is available for a monitoring location an average value was calculated and used for data evaluations. Time series graphs for groundwater monitoring wells and recovery systems are included in Appendix B and C to this report. A review of the time series graphs indicates that, depending on the specific monitoring location, the analyses have increased, remained unchanged or decreased.

Minimum detection levels have changed for several parameters since the mid 1990's and is apparent in many of the graphs. The minimum detectable concentration for uranium changed from 5 µg/l to 1 µg/l. The arsenic minimum detectable concentration have typically varied from 0.005 to 0.01 mg/l, with some minimum detectable concentrations near 0.05 mg/l during the early 1990's. Minimum detectable concentrations for fluoride and nitrate are typically 0.2 and 1 mg/l, respectively.

3.2.1 Arsenic

Arsenic has been part of the routine monitoring program for select wells since being identified in Facility groundwater during the Facility Environmental Investigation conducted in the early 1990's. Total arsenic continues to be detected above the maximum contaminant level (MCL) of 0.01 mg/l in the Terrace/Shale1, Shale 2, Shale 3, Shale 4 and Shale 5 groundwater units.

The arsenic levels found in the Terrace/Shale 1 groundwater varied from < 0.005 to 0.175 mg/l. The high of 0.175 mg/l occurred in MW042 located south of the South Yellowcake Sump. Terrace/Shale 1 groundwater monitoring locations with arsenic values in 2015 above the MCL were 2248, MW010, MW031, MW040, MW042, MW045, MW049, MW054, MW062, MWRW7 and MWRW8. An isoconcentration map of arsenic concentrations in Terrace/Shale 1 groundwater is shown in Figure 8.

The arsenic levels found in the Shale 2 groundwater varied from 0.011 to 1.03 mg/l. The high of 1.03 mg/l occurred in MW121A located southwest of Pond 2. Shale 2 groundwater monitoring locations with arsenic values in 2015 above the MCL were MW042A, MW048, MW050A, MW052A, MW065A, MW067A, MW081A, MW121A and 2225. An isoconcentration map of arsenic concentrations in Shale 2 groundwater is shown in Figure 9.

The arsenic levels found in Shale 3 groundwater varied from < 0.005 to 2.62 mg/l. The high of 2.62 mg/l occurred in MW057A located near the southwest corner of Pond 2. Shale 3

groundwater monitoring locations with arsenic values in 2015 above the MCL were 2246, 2224A, 2203A, MW057A, MW089A, MW122A and MW124A. As isoconcentration map of arsenic concentrations in Shale 3 groundwater is shown in Figure 10.

The arsenic levels found in the Shale 4 groundwater varied from < 0.005 to 1.2 mg/l. The high of 1.2 mg/l occurred in MW059A located southwest of Pond 2. Shale 4 groundwater monitoring locations with arsenic values in 2015 above the MCL were 2244, 2246, 2247, 2247A, MW059A, MW062A, MW095A and MW107. An isoconcentration map of arsenic concentrations in Shale 4 groundwater is shown in Figure 11.

The arsenic levels found in the Shale 5 groundwater varied from < 0.005 to 0.019 mg/l. The high value of 0.019 mg/l occurred in MW059B. MW059B is located southwest of Pond 2. Shale 5 groundwater monitoring locations with arsenic values in 2015 above the MCL were 2241 and MW059B. The isoconcentration map of the arsenic concentrations in Shale 5 groundwater does not show any isopleths because none of the arsenic analyses were greater than 0.05 mg/l, however, the arsenic analyses are posted in Figure 12.

3.2.2 Fluoride

Fluoride has been a common parameter monitored for many years in groundwater at SFC. Fluoride was not detected above the MCL in Terrace/Shale 1, Shale2, Shale 3, Shale 4 and Shale 5 groundwater units.

The fluoride levels found in the Terrace/Shale 1 groundwater varied from < 0.2 to 2.7 mg/l. The high of 2.7 mg/l did not exceed the MCL. An isoconcentration map of fluoride concentration in Terrace/Shale 1 groundwater has not been prepared because none of the fluoride analyses were greater than the MCL, however, the fluoride analyses are posted in Figure 13.

The fluoride levels found in the Shale 2 groundwater varied from 0.2 to 3.1 mg/l. The high of 3.1 mg/l did not exceed the MCL. An isoconcentration map of the fluoride concentrations in Shale 2 groundwater has not been prepared because none of the fluoride analyses were greater than the MCL, however, the fluoride analyses are posted in Figure 14.

The fluoride levels found in the Shale 3 groundwater varied from 0.2 to 3.0 mg/l. The high of 3.0 mg/l did not exceed the MCL. An isoconcentration map of the fluoride concentrations in Shale 3 groundwater has not been prepared because none of the fluoride analyses were greater than the MCL, however, the fluoride analyses are posted in Figure 15.

The fluoride levels found in Shale 4 groundwater varied from 0.2 to 1.6 mg/l. The high of 1.6 mg/l was less than the MCL. An isoconcentration map of the fluoride concentrations in Shale 4 groundwater has not been prepared because none of the fluoride analyses were greater than the MCL, however, the fluoride analyses are posted in Figure 16.

The fluoride levels found in the Shale 5 groundwater varied from 0.4 to 2.7 mg/l. The high of 2.7 mg/l was less than the MCL. An isoconcentration map of the fluoride concentrations in Shale 5 groundwater has not been prepared because none of the fluoride analyses were greater than the MCL, however, the fluoride analyses are posted in Figure 17.

3.2.3 Nitrate

Nitrate has also been a common parameter monitored for many years in groundwater at SFC. Nitrate continues to be detected above the MCL of 10 mg/l in the Terrace/Shale 1, Shale 2, Shale 3 and Shale 4 groundwater units. Nitrate was not detected above the MCL in Shale 5 groundwater monitoring wells.

The nitrate levels found in the Terrace/Shale 1 groundwater varied from <1 to 238 mg/l. The high 238 mg/l occurred in MW040 located north of Clarifier Basin 1A. Terrace/Shale 1

groundwater monitoring locations with nitrate values in 2015 above the MCL were MW008, MW040 and MW054. An isoconcentration map of nitrate concentrations in Terrace/Shale 1 groundwater is shown in Figure 18.

The nitrate levels found in the Shale 2 groundwater varied from < 1 to 1240 mg/l. The high 1240 mg/l occurred in MW121A located at the southwest corner of Pond 2. Shale 2 groundwater monitoring locations with nitrate values in 2015 above the MCL were MW042A, MW048, MW065A, MW067A, MW121A and 2225. An isoconcentration map of nitrate concentrations in Shale 2 groundwater is shown in Figure 19.

The nitrate levels found in the Shale 3 groundwater varied from <1 to 5890 mg/l. The high of 5890 mg/l occurred in MW122A located near the northwest corner of Pond 2. Shale 3 groundwater monitoring locations with nitrate values in 2015 above the MCL were 2224A, 2303A, 2346, MW049A, MW057A, MW089A, MW122A and MW124A. An isoconcentration map of nitrate concentrations in Shale 3 groundwater is shown in Figure 20.

The nitrate levels found in the Shale 4 groundwater varied from <1 to 2790 mg/l. The high of 2790 mg/l occurred in MW059A located southwest of Pond 2. Shale 4 groundwater monitoring locations with nitrate values in 2015 above the MCL were 2244, 2247, 2247A, MW059A, MW095A, MW107 and MW108. An isoconcentration map of nitrate concentrations in Shale 4 groundwater is shown in Figure 21.

The nitrate levels found in the Shale 5 groundwater varied from <1 to 6.6 mg/l. The high of 6.6 mg/l was less than the MCL. An isoconcentration map of the nitrate concentrations in Shale 5 groundwater has not been prepared because none of the nitrate analyses in groundwater monitoring wells were greater than the MCL, however, the nitrate analyses are posted in Figure 22.

3.2.4 Uranium

Uranium has been a common parameter monitored in groundwater at SFC for many years. Uranium continues to be detected above the MCL of 30 µg/l in the Terrace/Shale 1, Shale 2 and Shale 3 groundwater units. Uranium was also detected above the MCL in drainage samples that are assigned to Shale 4 and Shale 5 groundwater units.

The uranium levels found in the Terrace/Shale 1 groundwater varied from <1 to 9525 µg/l. The high of 9525 µg/l occurred in MWRW7 located south of the Main Process Building. Terrace/Shale 1 groundwater monitoring locations with uranium values in 2015 above the MCL were 2248, MW010, MW019, MW040, MW045, MW070, MWRW2 and MWRW7. An isoconcentration map of uranium concentrations in Terrace/Shale 1 groundwater is shown in Figure 23.

The uranium levels found in the Shale 2 groundwater varied from <1 to 276 µg/l. The high of 276 µg/l occurred in MW067A located north of the North Burial Area. Shale 2 groundwater monitoring locations with uranium values in 2015 above the MCL were MW048, MW050A, MW067A and MW081A. An isoconcentration map of uranium concentrations in Shale 2 groundwater is shown in Figure 24.

The uranium levels found in the Shale 3 groundwater varied from < 1 to 514 µg/l. The high of 514 µg/l occurred in 2224A located west of the Emergency Basin. Shale 3 groundwater monitoring locations with uranium values in 2015 above the MCL were 2224A and W089A. An isoconcentration map of uranium concentrations in Shale 3 groundwater is shown in Figure 25.

The uranium levels found in the Shale 4 groundwater varied from <1 to 42.6 µg/l. The high of 42.6 µg/l occurred in 2244 located in the 004 drainage. Uranium levels found in the drainage locations (Sample Locations 2242 through 2246) along the west perimeter of the site are

indicative of Shale 4 groundwater at this location. The uranium analyses in Shale 4 groundwater and the drainage locations used to monitor Shale 4 are posted in Figure 26.

The uranium levels found in the Shale 5 groundwater varied from <1 to 59.0 µg/l. The high of 59.0 µg/l occurred in 2241 located in the 005 drainage. The uranium level found in the 005 drainage at Sample Location 2241 is indicative of Shale 5 groundwater at this location. The uranium analyses in Shale 5 groundwater and Sample Location 2241 are posted in Figure 27.

3.2.5 Other Parameters

During the RFI, barium was identified in groundwater in a localized area north of the clarifier basins in MW040. Additional sampling was performed in 1997. A complete discussion of this data was presented in the 1997 Groundwater Report. The barium analysis for the sample collected from MW040 during 2015 was 3.64 mg/l which exceeds the MCL of 2.0 mg/l. The results of the barium analyses for samples collected from this well can be found in Table 3.

3.3 Corrective Action Monitoring

Corrective action monitoring includes the collection of samples from groundwater recovery systems and monitoring locations down-gradient of the recovery locations. The corrective action monitoring locations are included on Figure 1. Details regarding the installation and construction of these systems are included in the GWMP or responses to requests for additional information prepared during the GWMP approval process. The analyses of samples collected from corrective action monitoring locations are included in Table 4 and described below.

3.3.1 005 Drainage Collection Trench

The 005 Drainage Collection Trench (Location Number 2224A) recovers impacted groundwater that flows westward from Unit 1, Unit 2 and/or through the Unit 3 Shale. A monitor trench

(Location Number 2224B) is sampled to monitor the effectiveness of the 005 Drainage Collection Trench. The monitor trench was dry during 2015 so there were no analyses for this location. Analysis of samples collected during 2015 from the 005 Drainage Collection Trench averaged 0.025 mg/l, 25.2 mg/l, 514 µg/l and 0.8 mg/l for arsenic, nitrate, uranium and fluoride, respectively. The arsenic, nitrate and uranium analyses exceeded the respective MCL's for each of these parameters.

Approximately 366,000 gallons of water was recovered from the 005 Collection Trench during 2015. The recovered groundwater was pumped to the Clarifier Basins.

3.3.2 MW095A Collection Trench

The MW095A Collection Trench (Location Number 2247) recovers impacted groundwater that is present in the Shale 4 unit. Monitoring Well MW095A, which is located west of the collection trench, is used to monitor the effectiveness of the trench. Analysis of samples collected during 2015 from the MW095A Collection Trench averaged 0.071 mg/l, 1246 mg/l, 2.6 µg/l and 0.5 mg/l for arsenic, nitrate, uranium and fluoride, respectively. Analysis of samples collected during 2015 from Monitoring Well MW095A averaged 0.025 mg/l, 56.1 mg/l, 3.4 µg/l and 0.4 mg/l for arsenic, nitrate, uranium and fluoride, respectively. Arsenic and nitrate analyses of water recovered from Monitoring Well MW095A and the MW095A Collection Trench exceeded the MCL's for each of these constituents. The uranium and fluoride analyses were below their respective MCL's.

Approximately 215,000 gallons of water was recovered from the MW095A Collection Trench during 2015. The recovered groundwater was pumped to Pond 3W. Although not included in the GWMP an additional recovery system, the MW095A Collection Pit (Location ID 2247A), is located just east of MW095A and recovered an additional 63,000 gallons of water from the Shale 4 unit in this area. This recovered water was also pumped to Pond 3W. Analysis of samples collected during 2015 from the MW095A Collection Pit averaged 0.072 mg/l, 651 mg/l, 3.1 µg/l

and 0.5 mg/l for arsenic, nitrate, uranium and fluoride, respectively. Arsenic and nitrate analyses of water recovered from the MW095A Collection Pit exceeded the MCL's for each of these constituents. The uranium and fluoride analyses were below their respective MCL's.

3.3.3 MW010 Collection Trench

The MW010 Collection Trench (Location Number 2248) recovers impacted groundwater that is present in the Terrace/Shale 1 unit. Monitoring Well MW031, which is located south of the collection trench, is used to monitor the effectiveness of the trench. Analysis of samples collected during 2015 from the MW010 Collection Trench averaged 0.025 mg/l, 4.0 mg/l, 95 µg/l and 0.6 mg/l for arsenic, nitrate, uranium and fluoride, respectively. Analysis of samples collected during 2015 from Monitoring Well MW031 averaged 0.013 mg/l, 1.6 mg/l, 11 µg/l and 0.7 mg/l for arsenic, nitrate, uranium and fluoride, respectively. Arsenic and uranium analyses of water recovered from the MW010 Collection Trench exceeded the MCL's for each of these constituents. The arsenic analyses for samples collected from the Monitor Well MW031 exceeded the MCL.

Approximately 270,000 gallons of water was recovered from the MW010 Collection Trench during 2015. The recovered groundwater was pumped to the Clarifier Basins.

MWRW7 is a recovery well located immediately up-gradient of MW010 Collection Trench. Analysis of samples collected during 2015 from the MWRW7 averaged 0.084 mg/l, 3.2 mg/l, 9525 µg/l and 1.2 mg/l for arsenic, nitrate, uranium and fluoride, respectively. Arsenic and uranium analyses of water recovered from MWRW7 exceeded the MCL's for each of these constituents. The fluoride and nitrate analyses were below their respective MCL's. Approximately 57,000 gallons of water was recovered from MWRW7 during 2015. The recovered groundwater was pumped to the Clarifier Basins.

3.4 Seep and Drainage Monitoring

Seep and drainage samples were attempted to be collected from locations along the western perimeter of the Facility on a quarterly frequency. Due to weather conditions during 2015 water was not available during all quarters when sampling events were attempted. The number of analyses obtained are described below. The monitoring locations are shown on Figure 1. Analyses completed for samples collected during 2015 include antimony, arsenic, fluoride, lead, nitrate, thallium and uranium and are summarized in Table 5. The MCL's for each of these constituents are listed below:

Antimony	0.006 mg/l
Arsenic	0.010 mg/l
Fluoride	4 mg/l
Lead	0.05 mg/l
Nitrate	10 mg/l
Thallium	0.005 mg/l
Uranium	30 µg/l

Location 2241 is located near the property boundary in the 005 Drainage. The uranium MCL was exceeded for two of the three analyses. The arsenic and thallium MCL's were exceeded for one of the three analyses. Antimony, lead and nitrate analyses were not detected above the respective MCL's at this location.

Location 2242 is located in the 005 Drainage near Monitoring Well MW100B. The arsenic, thallium and uranium MCL's were exceeded for one of the four analyses. Antimony, nitrate and lead analyses were not detected above the respective MCL at this location.

Location 2243 is located in the 007 Drainage north of the Facility. The arsenic MCL was exceeded for one of the four analyses. Uranium, nitrate, antimony, lead and thallium analyses were not detected above the respective MCL's at this location.

Location 2244 is located in the 004 Drainage west of the Facility. The lead, thallium and uranium MCL's were exceeded for one of the three analyses. The nitrate MCL was exceeded for two of the three analyses. The arsenic MCL was exceeded for three of the three analyses. Antimony analyses were not detected above the respective MCL at this location.

Location 2245 is a seep located just north of the Port Road Bridge and just east of the 001 Drainage. Antimony, arsenic, fluoride, lead, nitrate, thallium and uranium were not detected above the respective MCL's at this location.

Location 2246 is located in the 001 Drainage north of the Port Road Bridge. The thallium MCL was exceeded for two of the four analyses. The arsenic MCL was exceeded for one of four analyses. Antimony, lead, nitrate and uranium analyses were not detected above the respective MCL's at this location.

3.5 Surface Water Monitoring

Surface water samples are collected annually at the locations shown in Figure 2. The analyses for samples collected on August 27, 2015 are included in Table 6. All analyses were at background levels.

4.0 SUMMARY

Monitoring completed during 2015 has been grouped by the type of sampling that was conducted and summarized in a series of tables. The types of sampling includes background quality monitoring; compliance groundwater monitoring; corrective action monitoring; seep and drainage monitoring; and surface water monitoring. These results have been described in Section 3.0, Current Conditions, of this report. A few of the groundwater monitoring wells, drainage and other sample locations were dry when sampling was attempted so samples could not be obtained.

More than 100 monitoring wells used for analyses since early 1990's have been plugged and abandoned or completely removed. As decommissioning continues, even more monitoring wells will be removed. Therefore, as monitoring points are being eliminated, there is less data available for interpretation. Soils and shale present in several impacted areas have been totally excavated down to sandstone bedrock. As excavations continue, nearby saturated soils are drained and no longer transmit groundwater under non-saturated conditions. As the impacted soils and shale are removed the sources of groundwater contamination are being removed and/or eliminated. SFC will attempt to present the altered current groundwater conditions in this report.

Tables

Table 1
Groundwater Monitoring Plan
Sampling and Analysis Schedule

Monitor ID	Location	Groundwater Unit Monitored	Parameters Analyzed
Background Quality Monitoring (Annual Sampling Frequency)			
MW007	Northeast of Main Process Building	Terrace / Shale 1	See Note 1
MW070	NE of DUF4 Building Near Property Boundary	Terrace / Shale 1	See Note 1
MW073	East of OG&E Substation Near Property Line	Terrace / Shale 1	See Note 1
MW007A	Northeast of Main Process Building	Shale 3	See Note 1
MW110A	East of Facility	Shale 4	See Note 1
MW007B	Northeast of Main Process Building	Shale 5	See Note 1
Compliance Monitoring (Annual Sampling Frequency)			
MW008[2]	Between MPB and Administration Building	Terrace / Shale 1	U, NO_3(N), F, As
MW010[2]	Southwest of Main Process Building	Terrace / Shale 1	U, NO_3(N), F, As
MW014[5]	South of Bechtel Building	Terrace / Shale 1	U, NO_3(N), F, As
MW019[2]	South of Loading Dock	Terrace / Shale 1	U, NO_3(N), F, As
MW025[2]	SX Yard North of SX Building	Terrace / Shale 1	U, NO_3(N), F, As
MW035[5]	North of Pond 1 Spoils Pile	Terrace / Shale 1	U, NO_3(N), F, As
MW036[5]	West of Sanitary Lagoon on Pond 1 Spoils Pile	Terrace / Shale 1	U, NO_3(N), F, As
MW040	North of Basin 1 of Clarifier A	Terrace / Shale 1	U, NO_3(N), F, As, Ba
MW042	South of Yellowcake Sump	Terrace / Shale 1	U, NO_3(N), F, As
MW045	Northeast Corner of Pond 2	Terrace / Shale 1	U, NO_3(N), F, As
MW049	South of Fluorisde Sludge Holding Basin 2 (North)	Terrace / Shale 1	U, NO_3(N), F, As
MW053[5]	North of Sanitary Lagoon on Emergency Basin Bank	Terrace / Shale 1	U, NO_3(N), F, As
MW054[2]	West of Pond 1 Spoils Pile at Base of Slope	Terrace / Shale 1	U, NO_3(N), F, As
MW056	Northwest Corner of ’86 Incident Sod Storage Area	Terrace / Shale 1	U, NO_3(N), F, As
MW062	South of Fluoride Sludge Holding Basin1 (South)	Terrace / Shale 1	U, NO_3(N), F, As
MW075[5]	South of Incinerator	Terrace / Shale 1	U, NO_3(N), F, As
MW077[2]	NW of DUF4 Building Near Fence	Terrace / Shale 1	U, NO_3(N), F, As
MW079[5]	NE of Bechtel Building on UF6 Cylinder Pad	Terrace / Shale 1	U, NO_3(N), F, As
MW080[5]	West of DUF4 Building in Concrete Pad	Terrace / Shale 1	U, NO_3(N), F, As
MW086[5]	NE Corner of Cooling Tower	Terrace / Shale 1	U, NO_3(N), F, As
MW087[5]	Old Contaminated Solid Waste Burial Area	Terrace / Shale 1	U, NO_3(N), F, As
MW014A[5]	South of Bechtel Building	Shale 2, 3	U, NO_3(N), F, As
MW018A[5]	Southwest Corner of MPB	Shale 2	U, NO_3(N), F, As
MW042A	South of South Yellowcake Sump in Parking Lot	Shale 2	U, NO_3(N), F, As

Table 1
Groundwater Monitoring Plan
Sampling and Analysis Schedule

Monitor ID	Location	Groundwater Unit Monitored	Parameters Analyzed
MW047A	Northwest Corner of Pond 2	Shale 2	U, NO_3(N), F, As
MW048	West of Pond 2	Shale 2	U, NO_3(N), F, As
MW050A[2]	North of Fluoride Basin No. 2	Shale 2, 3	U, NO_3(N), F, As
MW052A	West of Fluoride Sludge Holding Basin 2 (North)	Shale 2	U, NO_3(N), F, As
MW065A[2]	South of Fluoride Clarifier	Shale 2	U, NO_3(N), F, As
MW067A[2]	North Solid Waste Burial Area No. 2	Shale 2	U, NO_3(N), F, As
MW081A	N of DUF4 Building Near Perimeter Fence	Shale 2	U, NO_3(N), F, As
MW121A[3]	Southwest of Pond 2	Shale 2	U, NO_3(N), F, As
2303A	North of Clarifier Basins	Shale 3	U, NO_3(N), F, As
2346	Southwest of Pond 6	Shale 3	U, NO_3(N), F, As
MW012A[5]	Northwest of Main Process Building	Shale 3	U, NO_3(N), F, As
MW049A[2]	South of Fluoride Holding Basin No. 2	Shale 3	U, NO_3(N), F, As
MW057A[2]	Southwest of Pond 2	Shale 3	U, NO_3(N), F, As
MW084A[5]	SW of Misc Digestion on YC Pad	Shale 3	U, NO_3(N), F, As
MW086A[5]	NE Corner of Cooling Tower	Shale 3	U, NO_3(N), F, As
MW089A	Northwest of Fluoride Holding Basin No. 2	Shale 3	U, NO_3(N), F, As
MW115A	South of Pond 2	Shale 3	U, NO_3(N), F, As
MW122A[3]	Northwest of Pond 2	Shale 3	U, NO_3(N), F, As
MW123A[3]	Southwest of Pond 2	Shale 3	U, NO_3(N), F, As
MW124A[3]	South of Pond 5	Shale 3	U, NO_3(N), F, As
MW127A[3]	Southwest of Fluoride Holding Basin No. 2	Shale 3	U, NO_3(N), F, As
MW130A[3]	West of Pond 5	Shale 3	U, NO_3(N), F, As
MW059A	Southwest of Pond 2	Shale 4	U, NO_3(N), F, As
MW062A	South of Fluoride Holding Basin No. 1	Shale 4, 2	U, NO_3(N), F, As
MW097A	West of Pond 2 at Property Boundary	Shale 4	U, NO_3(N), F, As
MW099A	Northwest Corner of Industrial Area in Woods	Shale 4	U, NO_3(N), F, As
MW107	800 Feet West of Pond 5	Shale 4	U, NO_3(N), F, As
MW108	800 Feet Southwest of Pond 5	Shale 4	U, NO_3(N), F, As
MW111A	Northeast Portion of Agland	Shale 4	U, NO_3(N), F, As
MW112A	Southwest Portion of Facility on Agland Field	Shale 4	U, NO_3(N), F, As
MW125A[3]	South of Pond 3 East	Shale 4	U, NO_3(N), F, As

Table 1
Groundwater Monitoring Plan
Sampling and Analysis Schedule

Monitor ID	Location	Groundwater Unit Monitored	Parameters Analyzed
MW126A[3]	Southwest of Pond 5	Shale 4	U, NO_3(N), F, As
MW129A[3]	Southwest of Pond 2 Near Facility West Boundary	Shale 4	U, NO_3(N), F, As
MW059B	Southwest of Pond 2	Shale 5	U, NO_3(N), F, As
MW090B	Northwest of Pond 5 Near Reservoir Weir	Shale 5	U, NO_3(N), F, As
STA04	Southwest of Pond 2 Near Port Road Bridge	Shale 5	U, NO_3(N), F, As
MW098B	West of Pond 2 at Property Boundary (old 004 Path)	Shale 5	U, NO_3(N), F, As
MW100B	West of Fluoride Sludge Holding Basin 2 in 005 Drainage	Shale 5	U, NO_3(N), F, As
MW105B	West of Pond 5	Shale 5	U, NO_3(N), F, As
MW128B[3]	SW portion of the Agland	Shale 5	U, NO_3(N), F, As
Corrective Action Monitoring (Quarterly Sampling Frequency)			
2224A	005 Collection Trench	Shale 3	U, $N0_3$(N), F, As
2224B	005 Monitor Trench	Shale 3	U, $N0_3$(N), F, As
2247	95A Collection Trench	Shale 4	U, $N0_3$(N), F, As
MW095A	Southwest of Pond 2 Near Facility West Boundary	Shale 4	U, $N0_3$(N), F, As
2248	10 Collection Trench	Terrace/Shale 1	U, $N0_3$(N), F, As
MW031	South of Main Process Building	Terrace/Shale 1	U, $N0_3$(N), F, As
Seep and Drainage Monitoring (Quarterly Sampling Frequency)			
2241	005 Drainage - 25 feet East of COE Property Boundary Fence	Shale 5	See Note 4
2242	005 Drainage - Pool Near MW100B	Shale 4	See Note 4
2243	007 Drainage at Drainage from North Holding Basin	Shale 4	See Note 4
2244	004 Drainage - 20 feet East of COE Property Boundary Fence	Shale 4	See Note 4
2245	Seep North of Port Road Bridge and East of 001 Drainage	Shale 4	See Note 4, F
2246	001 Drainage N of Port Road Bridge	Shale 4	See Note 4
Surface Water Monitoring (Annual Sampling Frequency)			
2201	Illinois River - 1600 feet Upstream of 001 Confluence		U, $N0_3$(N), As, Ra-226
2202	Illinois River - 600 feet Downstream of 001 Confluence		U, $N0_3$(N), As, Ra-226
2203	Arkansas River - Upstream Towards Highway 64 Bridge		U, $N0_3$(N), As, Ra-226
2204	Arkansas River - Downstream Near I-40 Bridge		U, $N0_3$(N), As, Ra-226

Note 1: Analyze for antimony, arsenic, barium, beryllium, cadmium, chromium, fluoride, lead, molybdenum, nickel, nitrate(as N), radium-226, selenium, thallium, thorium-230 and uranium.
Note 2: Well will be abandoned and plugged as necessary to allow reclamation activities.
Note 3: Well installed upon approval of GWMP.
Note 4: Analyze for antimony, arsenic, nitrate (as N), lead, thallium and uranium.
Note 5: Well has been plugged and abandoned to allow reclamation activities.

Table 2
Background Quality Monitoring Analyses

Well ID	GW Unit Monitored	Date Sampled	Uranium µg/l	Thorium-230 pCi/l	Radium-226 pCi/l	Radium-228 pCi/l	Nitrate(as N) mg/l	Fluoride mg/l	Antimony mg/l	Arsenic mg/l
MW007	Terrace / Shale 1	04/16/15	< 1	0.763 ± 0.222	0.057 ± 0.079	No Analyses	3.7	0.7	0.002	0.005
MW070	Terrace / Shale 1	04/16/15	58.6	0.300 ± 0.144	0.414 ± 0.152	No Analyses	1.5	0.5	< 0.002	< 0.005
MW073	Terrace / Shale 1	04/16/15	< 1	-0.063 ± 0.128	0.114 ± 0.100	No Analyses	4	0.4	< 0.002	< 0.005
MW007A	Shale 3	04/16/15	< 1	-0.196 ± 0.091	0.069 ± 0.080	No Analyses	4.7	0.7	< 0.002	< 0.005
MW110A	Shale 4	04/16/15	1.46	-0.229 ± 0.069	0.448 ± 0.164	No Analyses	< 1	0.5	< 0.002	< 0.005
MW007B	Shale 5	04/16/15	1.18	0.022 ± 0.120	0.064 ± 0.082	No Analyses	< 1	2	< 0.002	< 0.005

Well ID	Date Sampled	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Lead mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Thallium mg/l
MW007	04/16/15	0.045	0.0022	< 0.0006	0.018	< 0.005	0.008	0.007	0.017	0.013
MW070	04/16/15	0.106	< 0.0002	< 0.0006	0.022	< 0.005	< 0.001	0.004	< 0.005	0.007
MW073	04/16/15	0.028	< 0.0002	< 0.0006	0.02	< 0.005	< 0.001	0.007	< 0.005	0.008
MW007A	04/16/15	0.017	< 0.0002	< 0.0006	0.017	< 0.005	0.001	< 0.002	< 0.005	0.006
MW110A	04/16/15	0.008	< 0.0002	< 0.0006	0.031	< 0.005	< 0.001	0.002	< 0.005	0.012
MW007B	04/16/15	0.039	< 0.0002	< 0.0006	0.009	< 0.005	0.003	0.009	< 0.005	0.007

Table 3
Compliance Groundwater Monitoring Analyses

Location ID	GW Unit Monitored	Date Sampled	Uranium µg/l	Nitrate (as N) mg/l	Fluoride mg/l	Arsenic mg/l	Barium mg/l
MW008	Terrace / Shale 1	5/6/2015	< 1	36.1	0.4	0.006	
MW010	Terrace / Shale 1	5/6/2015	212	< 1	0.6	0.016	
MW014	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW019	Terrace / Shale 1	5/6/2015	26.2	1	0.2	0.006	
MW025	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW035	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW036	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW040	Terrace / Shale 1	10/27/2015	35.9	238	2.6	0.028	3.64
MW042	Terrace / Shale 1	5/6/2015	< 1	< 1	0.9	0.175	
MW045	Terrace / Shale 1	5/6/2015	57.9	1.6	2.7	0.068	
MW049	Terrace / Shale 1	5/6/2015	1.13	< 1	0.3	0.021	
MW053	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW054	Terrace / Shale 1	5/6/2015	4.99	199	0.8	0.064	
MW056	Terrace / Shale 1	5/6/2015	Dry	Dry	Dry	Dry	
MW062	Terrace / Shale 1	4/22/2015	1.05	2.1	0.6	0.037	
MW075	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW077	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW079	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW080	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW086	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW087	Terrace / Shale 1	Plugged	Plugged	Plugged	Plugged	Plugged	
MW014A	Shale 2,3	Plugged	Plugged	Plugged	Plugged	Plugged	
MW018A	Shale 2	Plugged	Plugged	Plugged	Plugged	Plugged	
MW042A	Shale 2	5/6/2015	< 1	22.4	1.7	0.897	
MW047A	Shale 2	5/6/2015	Dry	Dry	Dry	Dry	
MW048	Shale 2	5/6/2015	31.3	36.4	3.1	0.067	
MW050A	Shale 2, 3	5/6/2015	243	< 1	0.2	0.040	
MW052A	Shale 2	5/1/2015	< 1	< 1	0.4	0.012	
MW065A	Shale 2	5/6/2015	1.88	19	0.7	0.473	
MW067A	Shale 2	5/6/2015	276	65	0.2	0.046	
MW081A	Shale 2	5/6/2015	30.6	1.5	1.2	0.011	
MW121A	Shale 2	5/6/2015	< 1	1240	1.1	1.03	
2303A	Shale 3	5/6/2015	5.66	340	0.2	0.058	
2346	Shale 3	4/22/2015	2.41	223	0.3	0.041	
MW012A	Shale 3	Plugged	Plugged	Plugged	Plugged	Plugged	
MW049A	Shale 3	5/6/2015	2.39	57.5	0.3	0.008	
MW057A	Shale 3	5/6/2015	2.14	5890	3	2.62	
MW084A	Shale 3	Plugged	Plugged	Plugged	Plugged	Plugged	
MW086A	Shale 3	Plugged	Plugged	Plugged	Plugged	Plugged	
MW089A	Shale 3	5/1/2015	42.0	24.7	0.3	0.019	
MW115A	Shale 3	4/22/2015	Dry	Dry	Dry	Dry	
MW122A	Shale 3	5/6/2015	4.08	1640	0.4	0.186	
MW123A	Shale 3	4/22/2015	Dry	Dry	Dry	Dry	
MW124A	Shale 3	4/22/2015	2.78	504	0.3	0.049	
MW127A	Shale 3	5/1/2015	< 1	< 1	0.2	0.005	
MW130A	Shale 3	4/29/2015	Dry	Dry	Dry	Dry	
MW059A	Shale 4	5/6/2015	4.41	2790	1.6	1.20	
MW062A	Shale 4, 2	4/22/2015	< 1	< 1	0.6	0.205	
MW097A	Shale 4	5/1/2015	< 1	< 1	0.3	< 0.005	
MW099A	Shale 4	5/1/2015	7.61	< 1	< 0.2	0.007	
MW107	Shale 4	4/22/2015	< 1	30.4	0.3	0.012	
MW108	Shale 4	4/22/2015	< 1	34.1	< 0.2	< 0.005	
MW111A	Shale 4	4/22/2015	1.84	< 1	0.7	< 0.005	
MW112A	Shale 4	4/22/2015	< 1	3.9	0.3	< 0.005	
MW125A	Shale 4	4/22/2015	1.71	< 1	0.4	0.010	
MW126A	Shale 4	4/22/2015	< 1	< 1	0.6	0.006	

Table 3
Compliance Groundwater Monitoring Analyses

Location ID	GW Unit Monitored	Date Sampled	Uranium µg/l	Nitrate (as N) mg/l	Fluoride mg/l	Arsenic mg/l	Barium mg/l
MW129A	Shale 4	4/22/2015	< 1	< 1	0.3	< 0.005	
MW059B	Shale 5	5/6/2015	< 1	6.6	1.5	0.019	
MW090B	Shale 5	4/29/2015	< 1	< 1	2.3	< 0.005	
STA04	Shale 5	4/29/2015	< 1	< 1	1.7	< 0.005	
MW098B	Shale 5	5/1/2015	< 1	< 1	0.5	< 0.005	
MW100B	Shale 5	5/1/2015	< 1	1.6	0.4	< 0.005	
MW105B	Shale 5	4/29/2015	< 1	1.3	2.7	< 0.005	
MW128B	Shale 5	4/22/2015	6.17	< 1	1.6	< 0.005	

Table 4
Corrective Action Monitoring Analyses

Location ID	GW Unit Monitored	Date Sampled	Uranium µg/l	Nitrate (as N) mg/l	Fluoride mg/l	Arsenic mg/l
2224A	Shale 3	1/28/2015	500	35.5	0.8	0.023
2224A	Shale 3	2/4/2015	454	24.4	0.7	0.023
2224A	Shale 3	3/11/2015	402	13.5	0.6	0.018
2224A	Shale 3	4/1/2015	3.18	151	0.3	0.045
2224A	Shale 3	5/20/2015	61.1	1.6	1.1	0.018
2224A	Shale 3	6/10/2015	326	20.3	1.1	0.036
2224A	Shale 3	7/15/2015	614	18.9	0.8	0.019
2224A	Shale 3	8/5/2015	586	36.6	0.9	0.035
2224A	Shale 3	9/2/2015	524	33	0.8	0.032
2224A	Shale 3	10/14/2015	470	36.4	0.9	0.026
2224A	Shale 3	11/4/2015	408	21.3	0.9	0.02
2224A	Shale 3	12/9/2015	858	12.1	0.7	0.019
2224B	Shale 3	1/28/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	2/4/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	3/11/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	4/1/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	5/20/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	6/10/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	7/15/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	8/5/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	9/2/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	10/14/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	11/4/2015	Dry	Dry	Dry	Dry
2224B	Shale 3	12/9/2015	Dry	Dry	Dry	Dry
2247	Shale 4	1/28/2015	3.71	1270	0.5	0.058
2247	Shale 4	2/4/2015	2.53	1240	0.5	0.051
2247	Shale 4	3/11/2015	1.24	703	0.3	0.080
2247	Shale 4	4/1/2015	< 1	463	0.2	0.046
2247	Shale 4	5/20/2015	1.6	46.5	0.4	0.007
2247	Shale 4	6/10/2015	1.64	672	0.3	0.041
2247	Shale 4	7/15/2015	< 1	19.5	0.3	< 0.005
2247	Shale 4	8/5/2015	8.45	9.7	0.2	0.008
2247	Shale 4	9/2/2015	< 1	16.2	0.3	< 0.005
2247	Shale 4	10/14/2015	1.05	1440	0.5	0.104
2247	Shale 4	11/4/2015	4.66	1260	0.5	0.092
2247	Shale 4	12/9/2015	1.27	1020	0.4	0.048
MW095A	Shale 4	1/30/2015	< 1	21.8	0.3	0.02
MW095A	Shale 4	4/22/2015	3.09	14.8	0.6	0.02
MW095A	Shale 4	7/30/2015	6.19	35.9	0.3	0.033
MW095A	Shale 4	10/27/2015	3.38	152	0.2	0.028
2248	Terrace / Shale 1	1/28/2015	138	2.2	1.3	0.023
2248	Terrace / Shale 1	2/4/2015	93.4	2.6	0.6	0.017
2248	Terrace / Shale 1	3/11/2015	107	2.1	0.6	0.020
2248	Terrace / Shale 1	4/1/2015	74.9	2.7	0.3	0.019
2248	Terrace / Shale 1	5/20/2015	66.9	4.6	0.3	0.024
2248	Terrace / Shale 1	6/10/2015	54.3	7.5	0.3	0.026
2248	Terrace / Shale 1	7/15/2015	190	2.6	0.4	0.014
2248	Terrace / Shale 1	8/5/2015	88.4	6.8	0.7	0.034
2248	Terrace / Shale 1	9/2/2015	37.8	8.2	0.6	0.035
2248	Terrace / Shale 1	10/14/2015	169	3.9	0.4	0.04
2248	Terrace / Shale 1	11/4/2015	72	2.9	0.7	0.034
2248	Terrace / Shale 1	12/9/2015	49.6	2.4	0.5	0.018
MW031	Terrace / Shale 1	1/30/2015	3.09	1.4	0.4	0.005
MW031	Terrace / Shale 1	5/6/2015	8.23	< 1	0.7	0.017
MW031	Terrace / Shale 1	7/30/2015	24.2	< 1	1	0.016
MW031	Terrace / Shale 1	10/27/2015	8.53	2.98	0.8	< 0.010

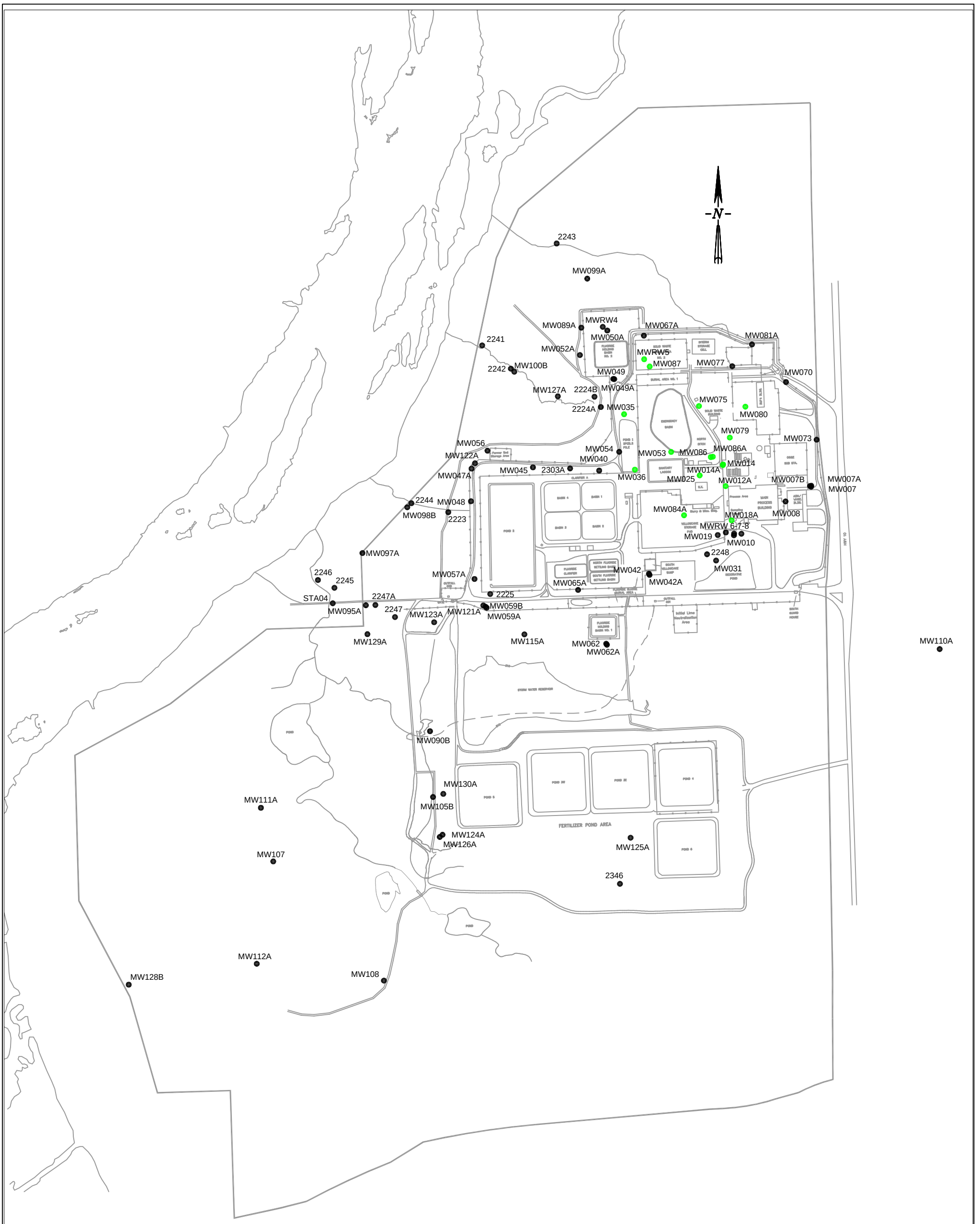
Table 5
Seep and Drainage Monitoring Analyses

Location ID	GW Unit Monitored	Date Sampled	Uranium µg/l	Nitrate (N) mg/l	Fluoride mg/l	Antimony mg/l	Arsenic mg/l	Lead mg/l	Thallium mg/l
2241	Shale 5	3/24/2015	37.1	< 1		< 0.002	0.009	0.02	0.011
2241	Shale 5	6/8/2015	117	< 1		< 0.003	0.014	0.006	< 0.003
2241	Shale 5	9/10/2015	Dry	Dry		Dry	Dry	Dry	Dry
2241	Shale 5	12/1/2015	23.2	1.8		< 0.010	< 0.010	< 0.005	< 0.010
2242	Shale 4	3/24/2015	33.9	1.3		< 0.002	< 0.003	0.025	0.003
2242	Shale 4	6/8/2015	27.2	< 1		0.004	0.011	0.006	0.006
2242	Shale 4	9/10/2015	14	0.2		< 0.010	< 0.010	< 0.005	< 0.010
2242	Shale 4	12/1/2015	23.3	2.3		< 0.010	< 0.010	< 0.005	< 0.010
2243	Shale 4	3/24/2015	11.40	< 1		< 0.002	< 0.003	0.012	0.005
2243	Shale 4	6/8/2015	1.95	< 1		< 0.003	0.011	0.007	< 0.003
2243	Shale 4	9/10/2015	9.88	< 0.01		< 0.010	< 0.010	< 0.005	< 0.010
2243	Shale 4	12/1/2015	3.41	1.05		< 0.010	< 0.010	0.006	< 0.010
2244	Shale 4	3/24/2015	16.5	14.3		< 0.002	0.017	0.024	0.004
2244	Shale 4	6/8/2015	107.0	3.1		0.006	0.051	0.06	0.011
2244	Shale 4	9/10/2015	Dry	Dry		Dry	Dry	Dry	Dry
2244	Shale 4	12/1/2015	4.34	26.9		< 0.010	0.016	0.007	< 0.010
2245	Shale 4	3/24/2015	< 1	< 1	0.2	< 0.002	< 0.003	0.02	0.003
2245	Shale 4	6/8/2015	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2245	Shale 4	9/10/2015	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2245	Shale 4	12/1/2015	1.67	0.278	0.2	< 0.010	< 0.010	0.006	< 0.010
2246	Shale 4	3/24/2015	18.1	2.54		< 0.002	0.015	0.022	0.01
2246	Shale 4	6/8/2015	1.77	1.1		< 0.003	0.009	0.006	0.006
2246	Shale 4	9/10/2015	11.70	2.56		< 0.010	< 0.010	< 0.005	< 0.010
2246	Shale 4	12/1/2015	4.5	0.538		< 0.010	< 0.010	0.009	< 0.010

Table 6
Surface Water Monitoring Analyses

Location ID	Date Sampled	Uranium µg/l	Radium-226 pCi/l	Radium-228 pCi/l	Nitrate (N) mg/l	Arsenic mg/l
2201	8/27/2015	< 1	0.073 ± 0.058	-1.12 ± 0.777	1.1	< 0.010
2202	8/27/2015	< 1	0.079 ± 0.077	-0.682 ± 0.682	1.4	< 0.010
2203	8/27/2015	< 1	0.239 ± 0.117	0.438 ± 0.706	< 1	< 0.010
2204	8/27/2015	< 1	0.268 ± 0.121	0.301 ± 0.883	1	< 0.010

Figures



Legend

- Active Groundwater Monitoring Location
- Monitor Well Plugged and Abandoned

Note: MW077 was not sampled in 2015 due to soil excavation around the well.

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: Corrective Action, Seep, Drainage and Groundwater Monitor Well Locations

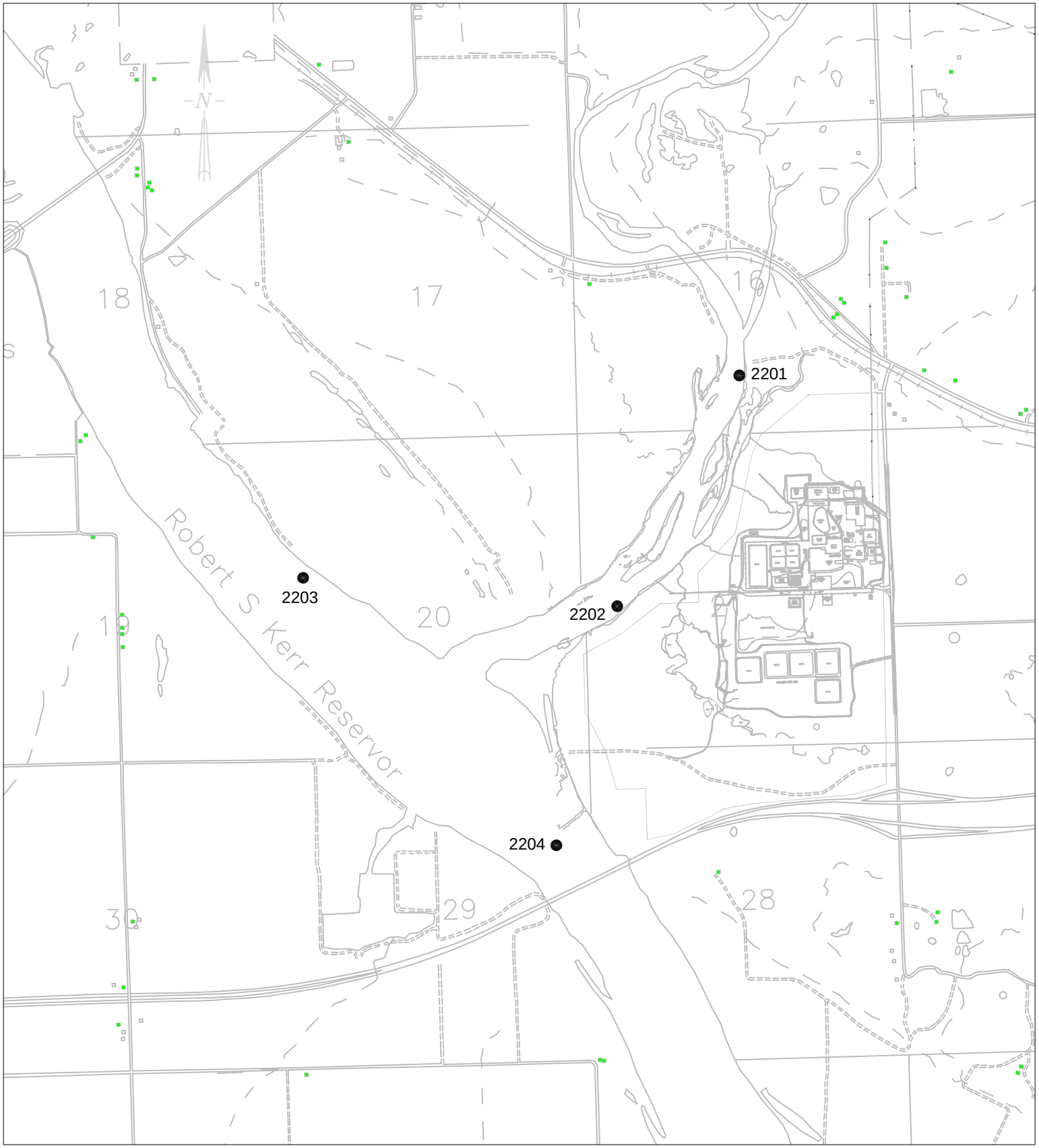
PREPARED BY: SCM

REVIEWED BY: CLH

DATE: 29 Feb 2016

FILENAME: Figure01_Monitoringlocs2015.dwg

FIGURE NO. 1



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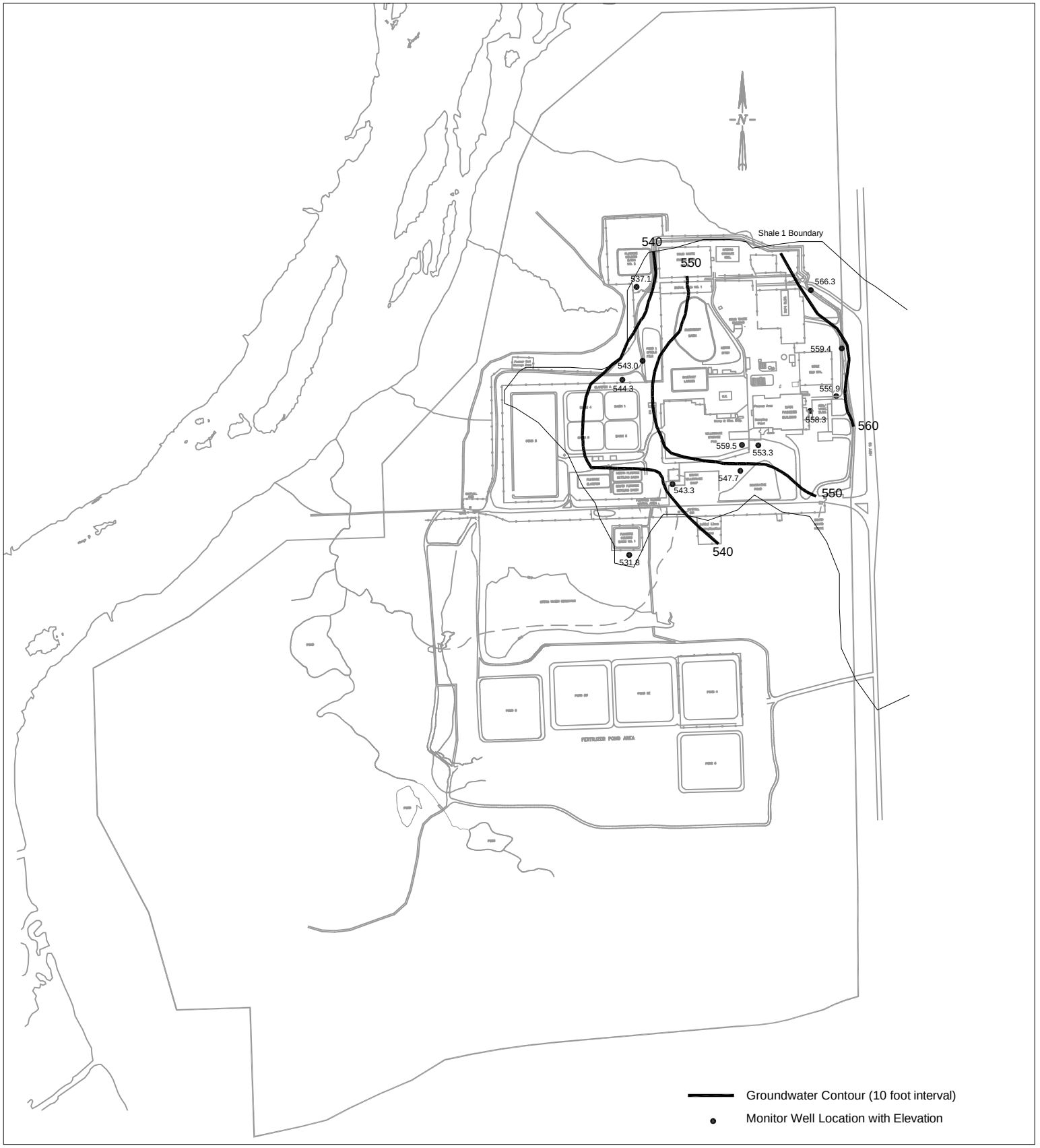
Annual Groundwater Report

TITLE: Surface Water Sample Locations	
PREPARED BY: SCM	FILENAME: Figure02_SurfaceWaterLocs2015.dwg
REVIEWED BY: CLH	FIGURE NO. 2
DATE: 29 Feb 2016	



SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: *Groundwater Contour Map Terrace / Shale 1 Groundwater System*	
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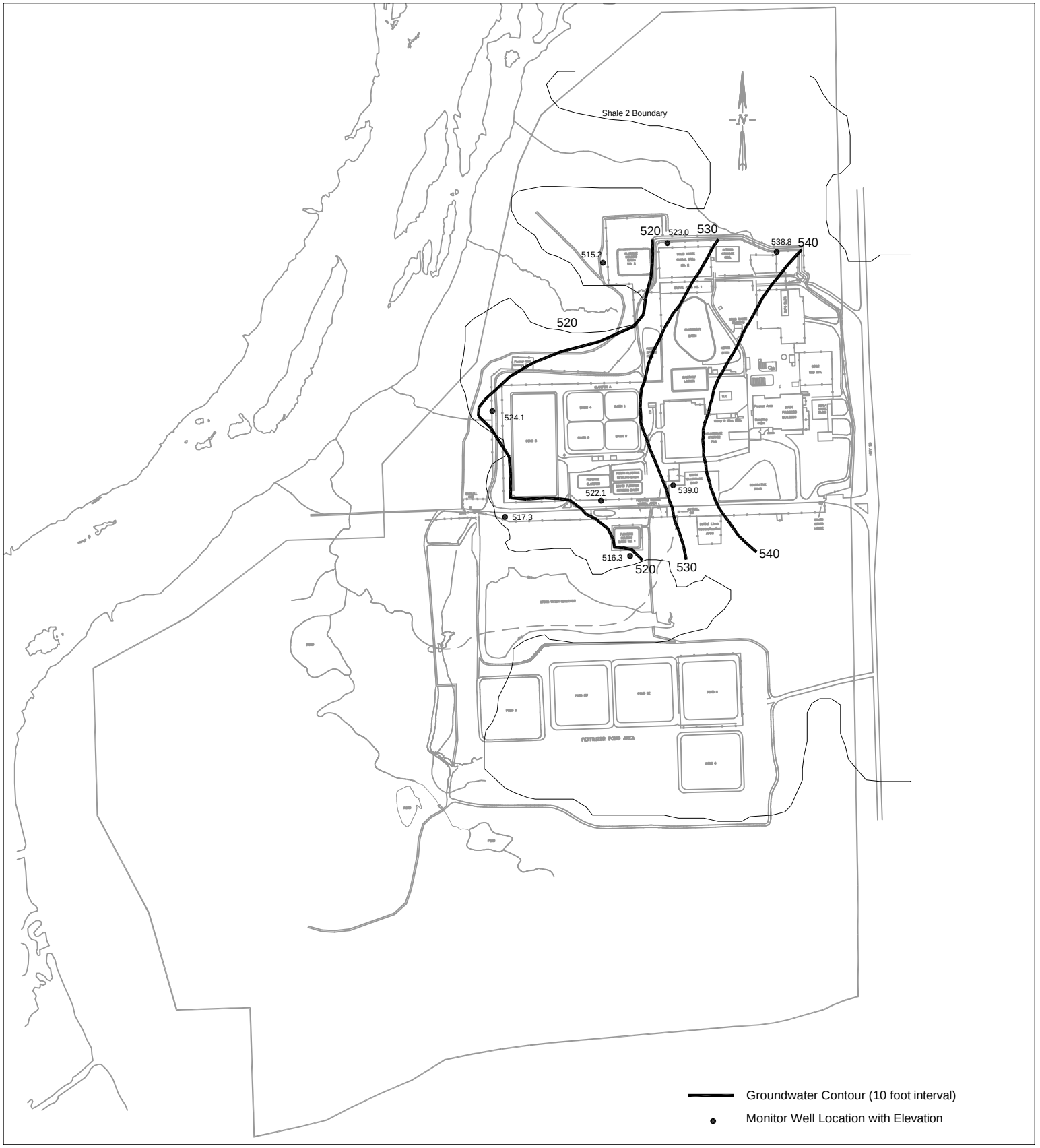
REVIEWED BY: *SCM*	FIGURE NO. 3
DATE: *22 Feb 2016*	



SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

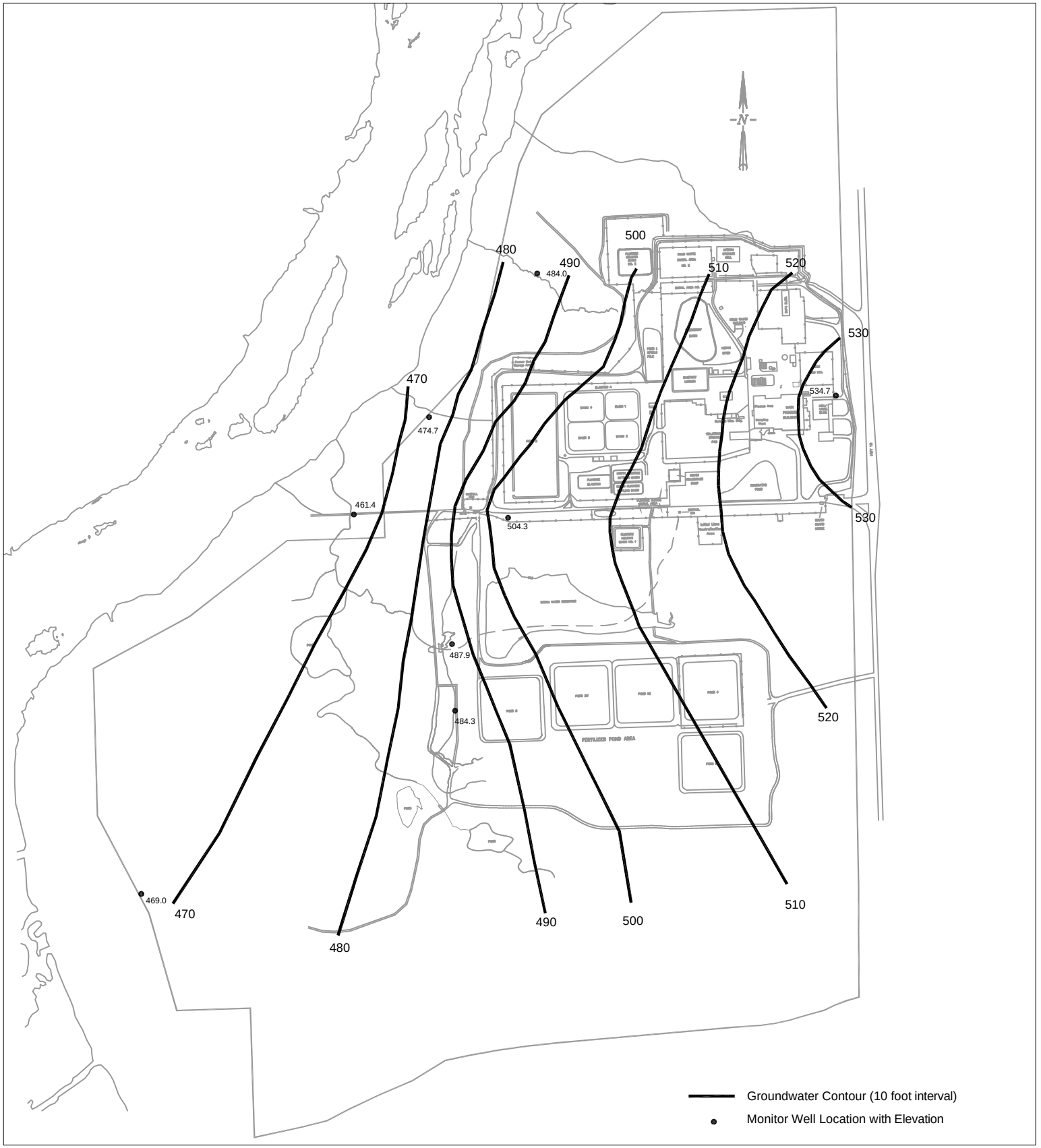
TITLE: *Groundwater Contour Map Shale 2 Groundwater System*	
PREPARED BY: *SCM*	FILENAME: *Figure04_Shale2WL15.dwg*
REVIEWED BY: *SCM*	FIGURE NO. 4
DATE: *22 Feb 2016*	

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

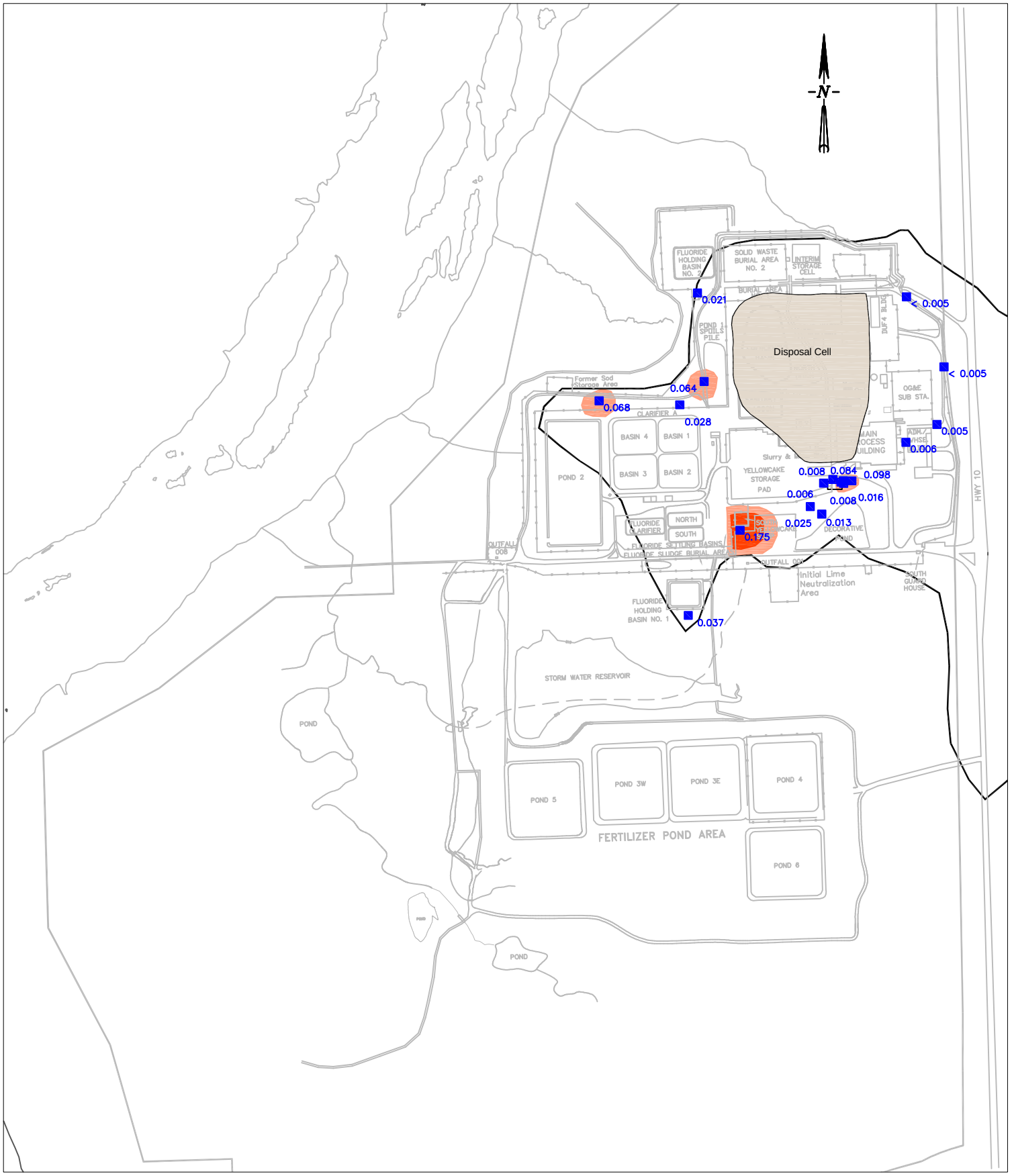
TITLE: *Groundwater Contour Map Shale 3 Groundwater System*	
PREPARED BY: *SCM*	FILENAME: *Figure05_Shale3WL15.dwg*
REVIEWED BY: *SCM*	FIGURE NO. 5
DATE: *22 Feb 2016*	

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE:	*Groundwater Contour Map Shale 4 Groundwater System*		
PREPARED BY:	*SCM*	FILENAME:	*Figure06_Shale4WL15.dwg*
REVIEWED BY:	*SCM*		FIGURE NO. 6
DATE:	*22 Feb 2016*		



SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Groundwater Contour Map Shale 5 Groundwater System	
PREPARED BY: SCM	FILENAME: Figure07_Shale5WL15.dwg
REVIEWED BY: SCM	FIGURE NO. 7
DATE: 22 Feb 2016	



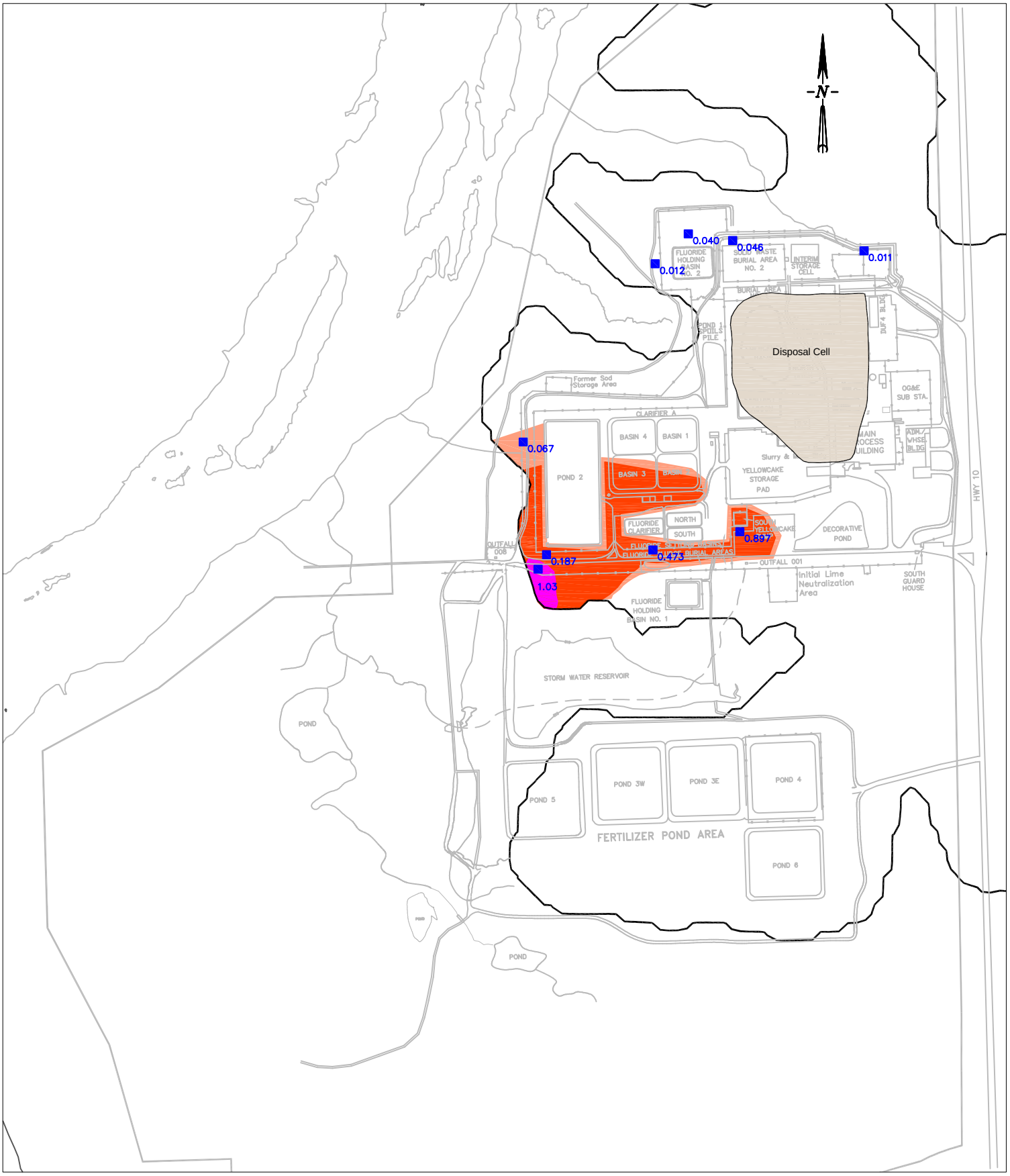
Arsenic, mg/l

- 1
- 0.1
- 0.05
- BDL

Extent of Terrace / Shale 1

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Arsenic Isoconcentration Diagram Terrace / Shale 1 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure08_As_SH1_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 8
DATE: 22 Feb 2016	



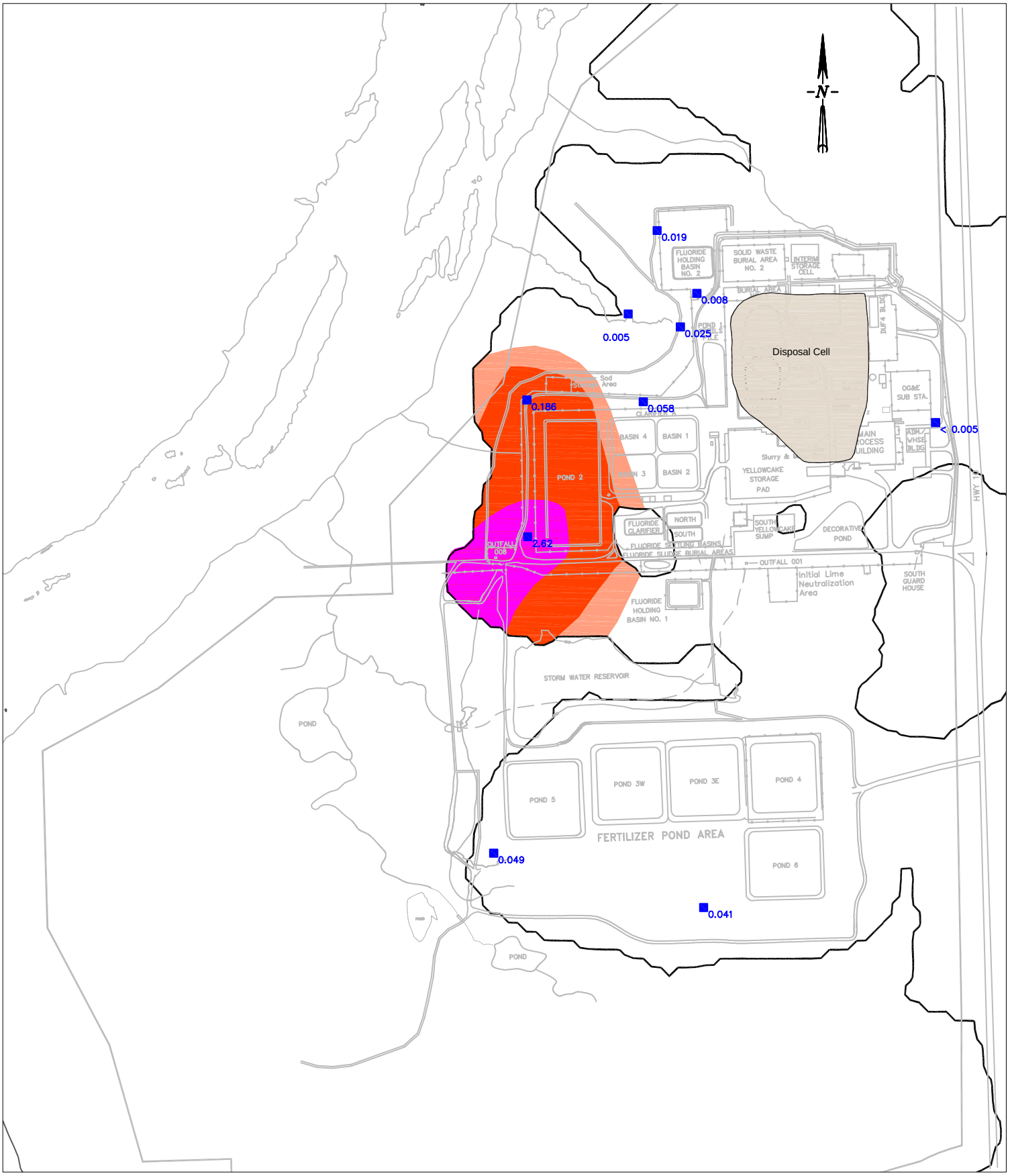
Arsenic, mg/l

- 1
- 0.1
- 0.05
- BDL

Extent of Shale 2

Concentration

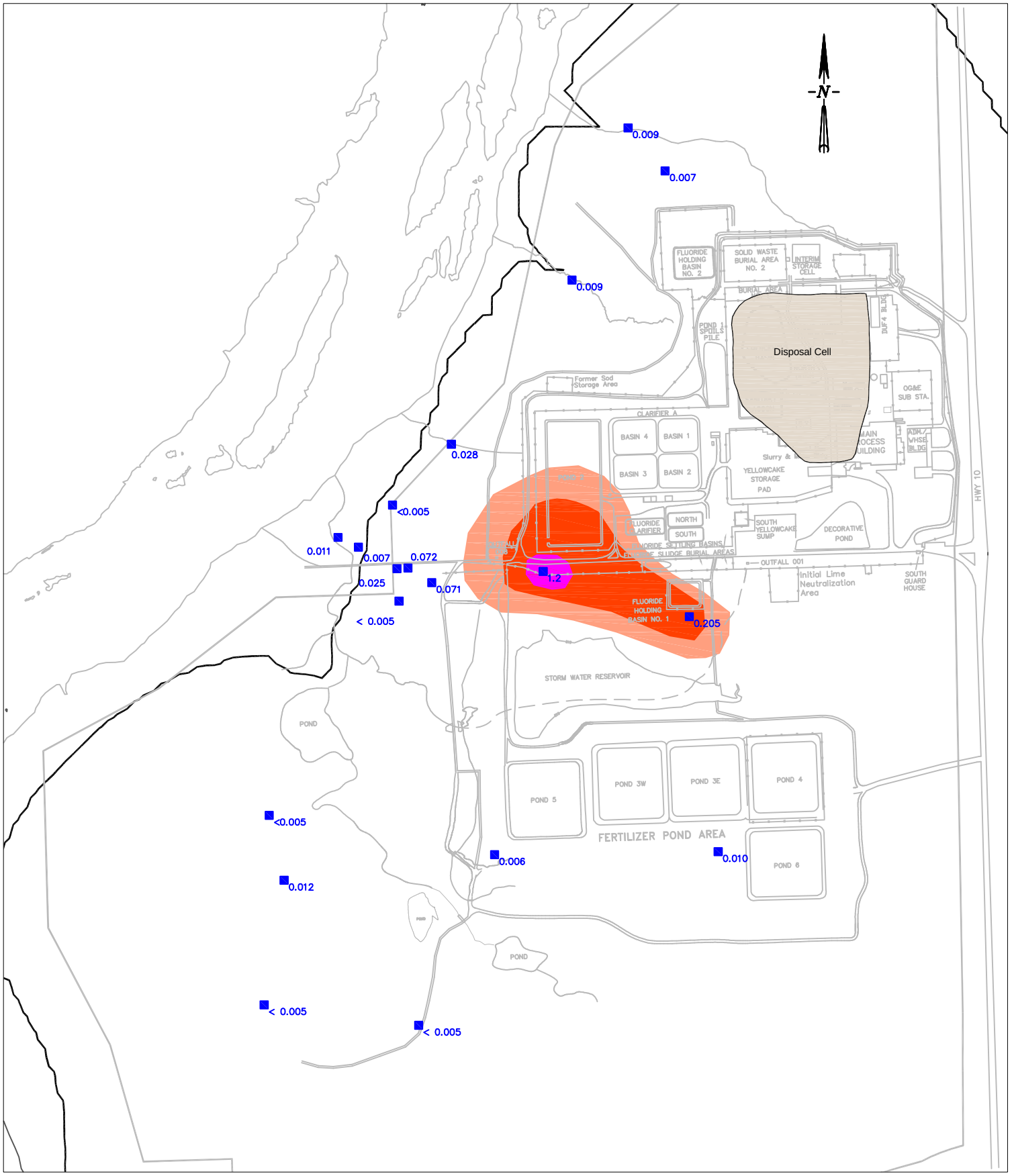
SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Arsenic Isoconcentration Diagram Shale 2 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure09_As_SH2_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 9
DATE: 22 Feb 2016	



Arsenic, mg/l

- 1
- 0.1
- 0.05
- BDL
- Extent of Shale 3
- Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Arsenic Isoconcentration Diagram Shale 3 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure10_As_SH3_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 10
DATE: 22 Feb 2016	



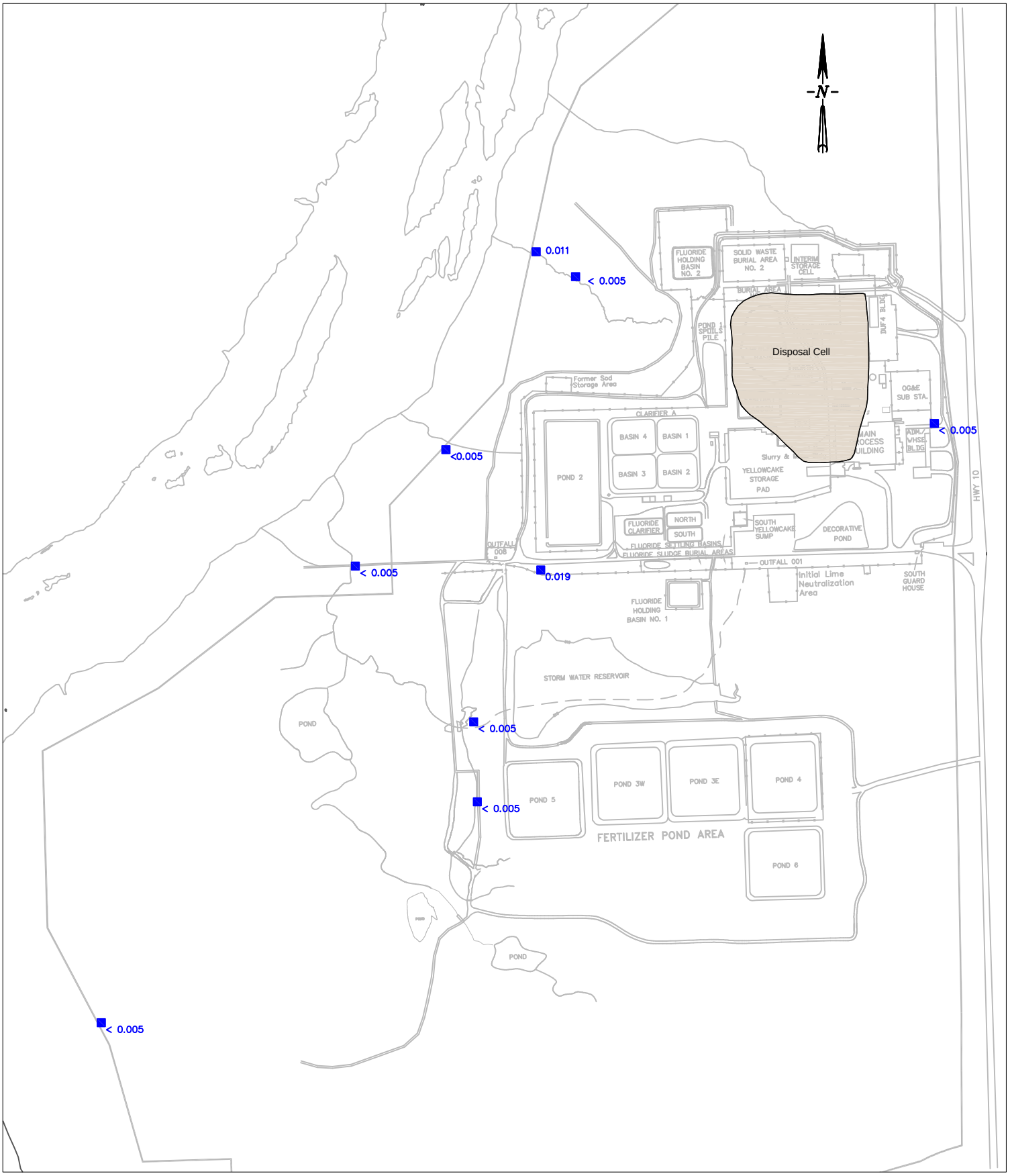
Arsenic, mg/l

- 1
- 0.1
- 0.05
- BDL

Extent of Shale 4

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Arsenic Isoconcentration Diagram Shale 4 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure11_As_SH4_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 11
DATE: 22 Feb 2016	



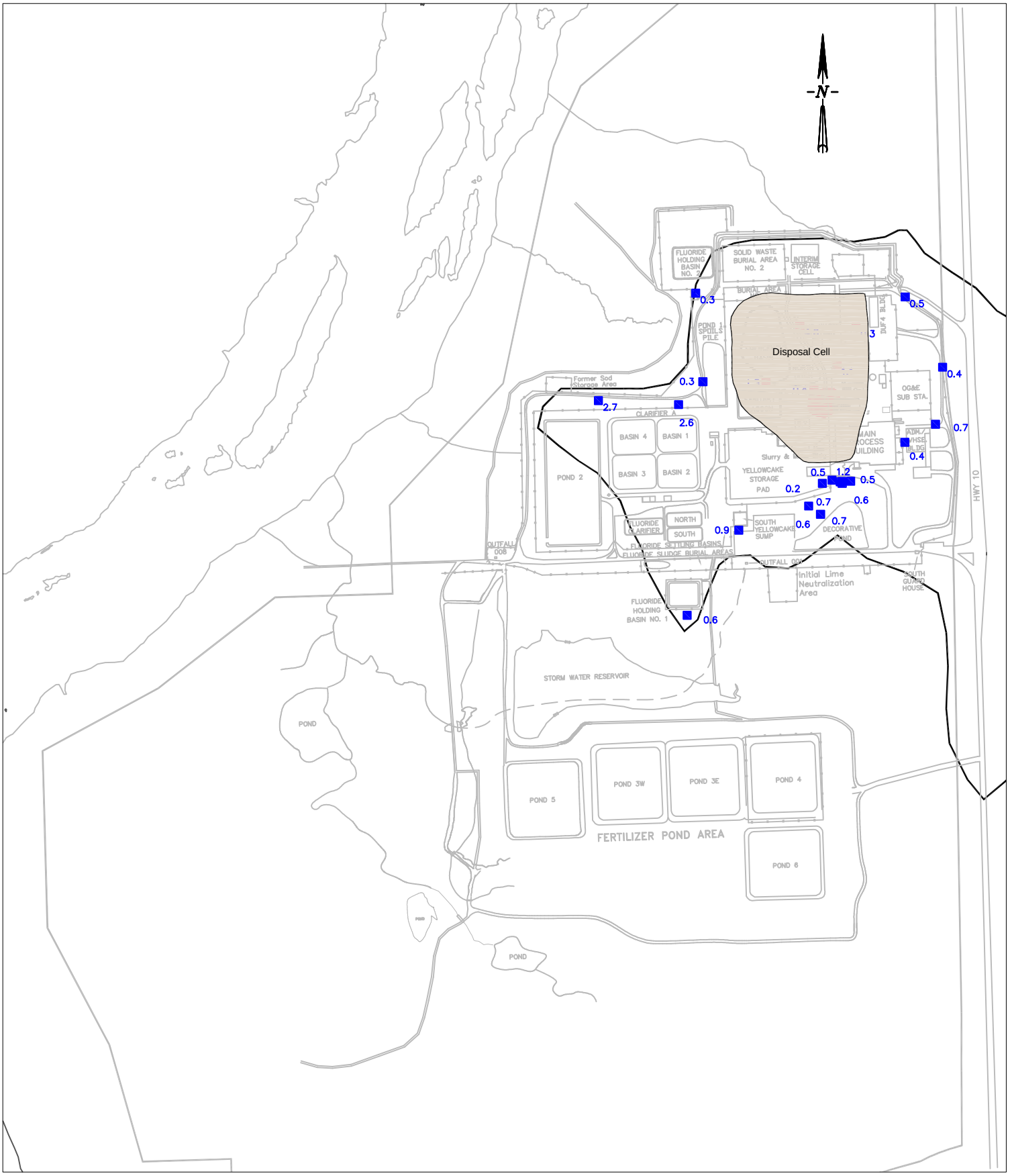
Arsenic, mg/l

- 1
- 0.1
- 0.05
- BDL

Extent of Shale 5

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Arsenic Isoconcentration Diagram Shale 5 Groundwater Unit	
PREPARED BY: SCM	FILENAME: As_SH5_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 12
DATE: 22 Feb 2016	



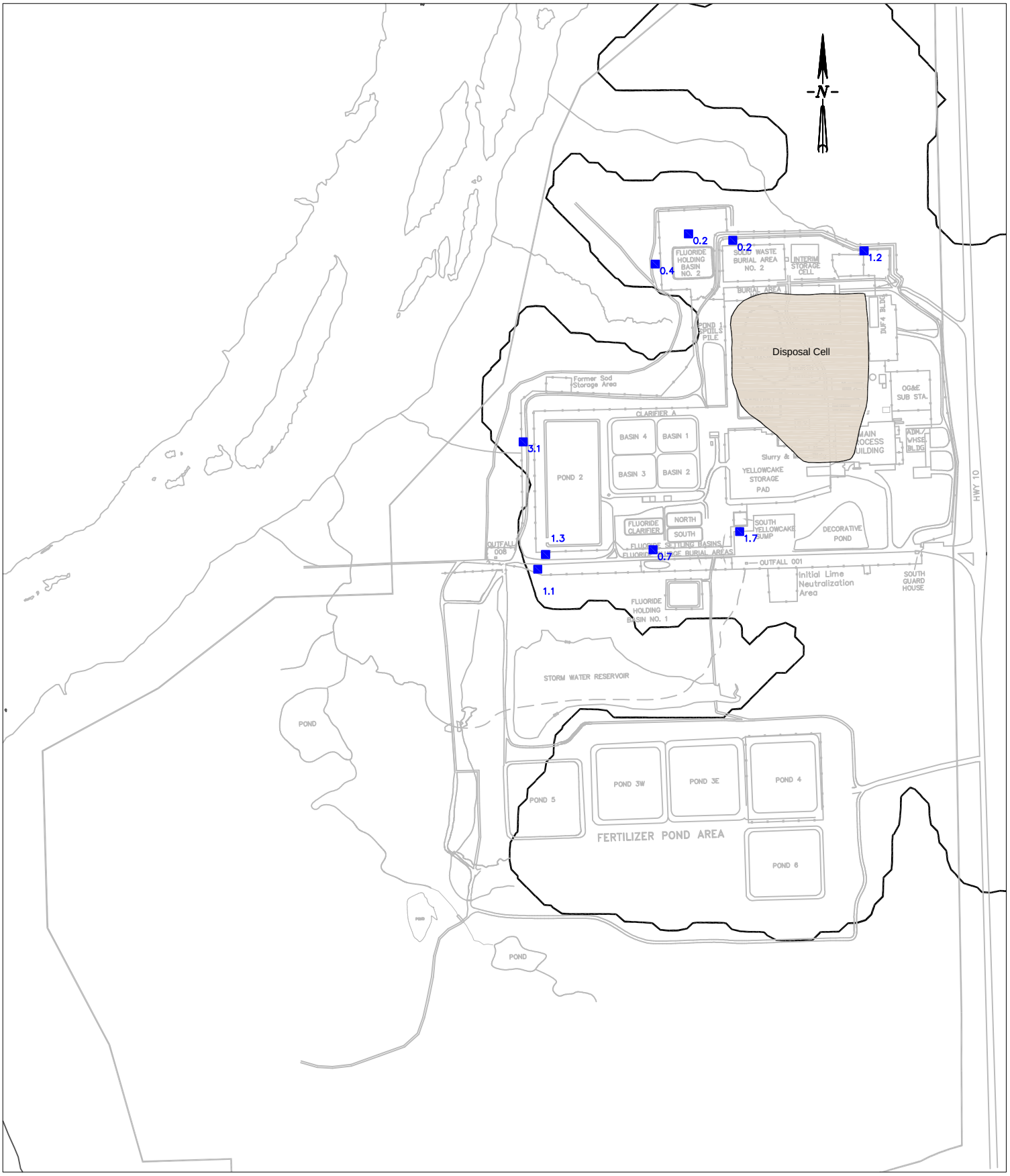
Fluoride, mg/l

6
4
BDL

Extent of Terrace / Shale 1

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Fluoride Isoconcentration Diagram Terrace / Shale 1 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure13_F_SH1_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 13
DATE: 22 Feb 2016	



Fluoride, mg/l

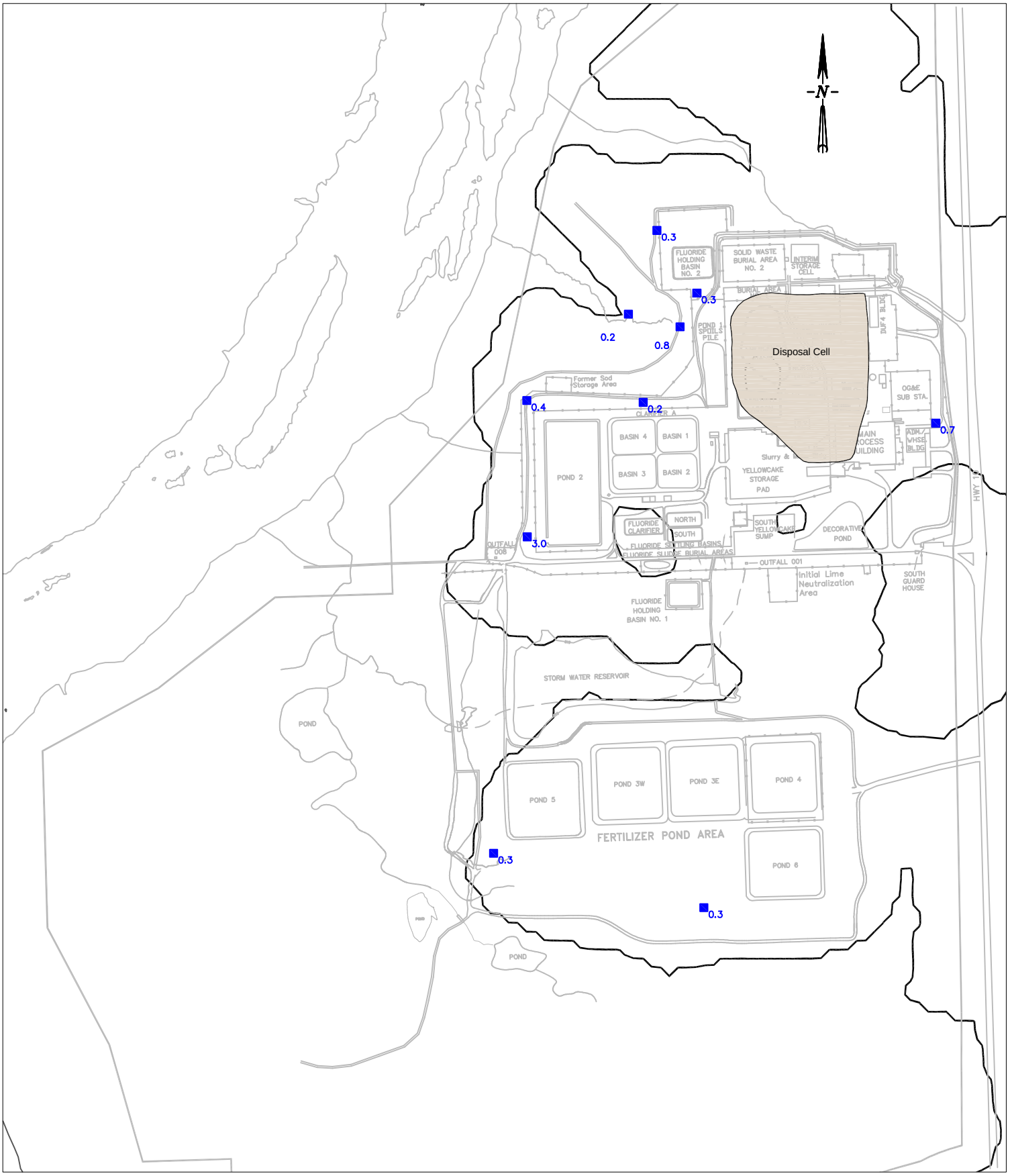
6
4
BDL

Extent of Shale 2

Concentration

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: Fluoride Isoconcentration Diagram Shale 2 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure14_F_SH2_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 14
DATE: 22 Feb 2016	



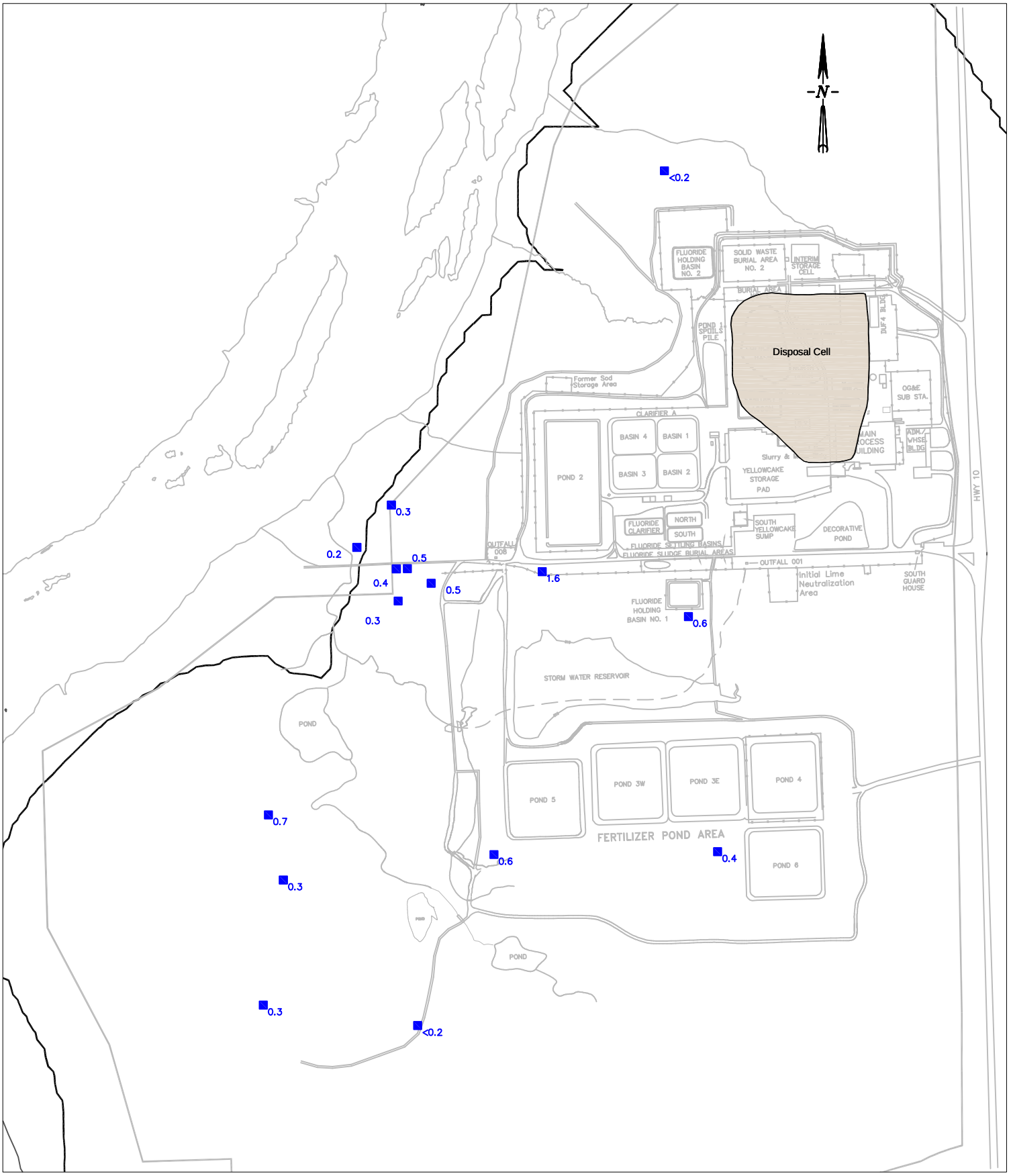
Fluoride, mg/l

6
4
BDL

Extent of Shale 3

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Fluoride Isoconcentration Diagram Shale 3 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure15_F_SH3_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 15
DATE: 22 Feb 2016	



Fluoride, mg/l

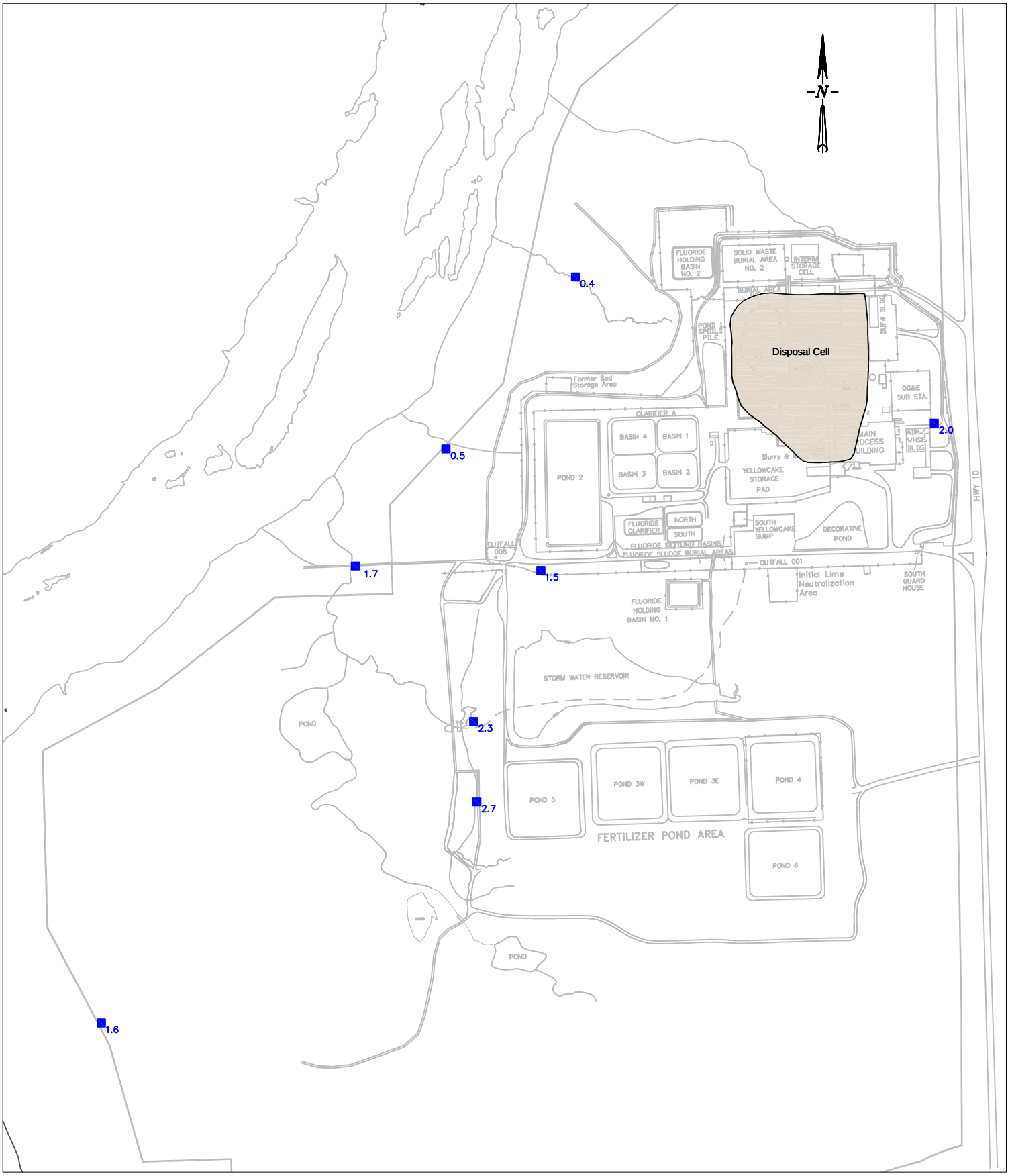
6
4
BDL

Extent of Shale 4

Concentration

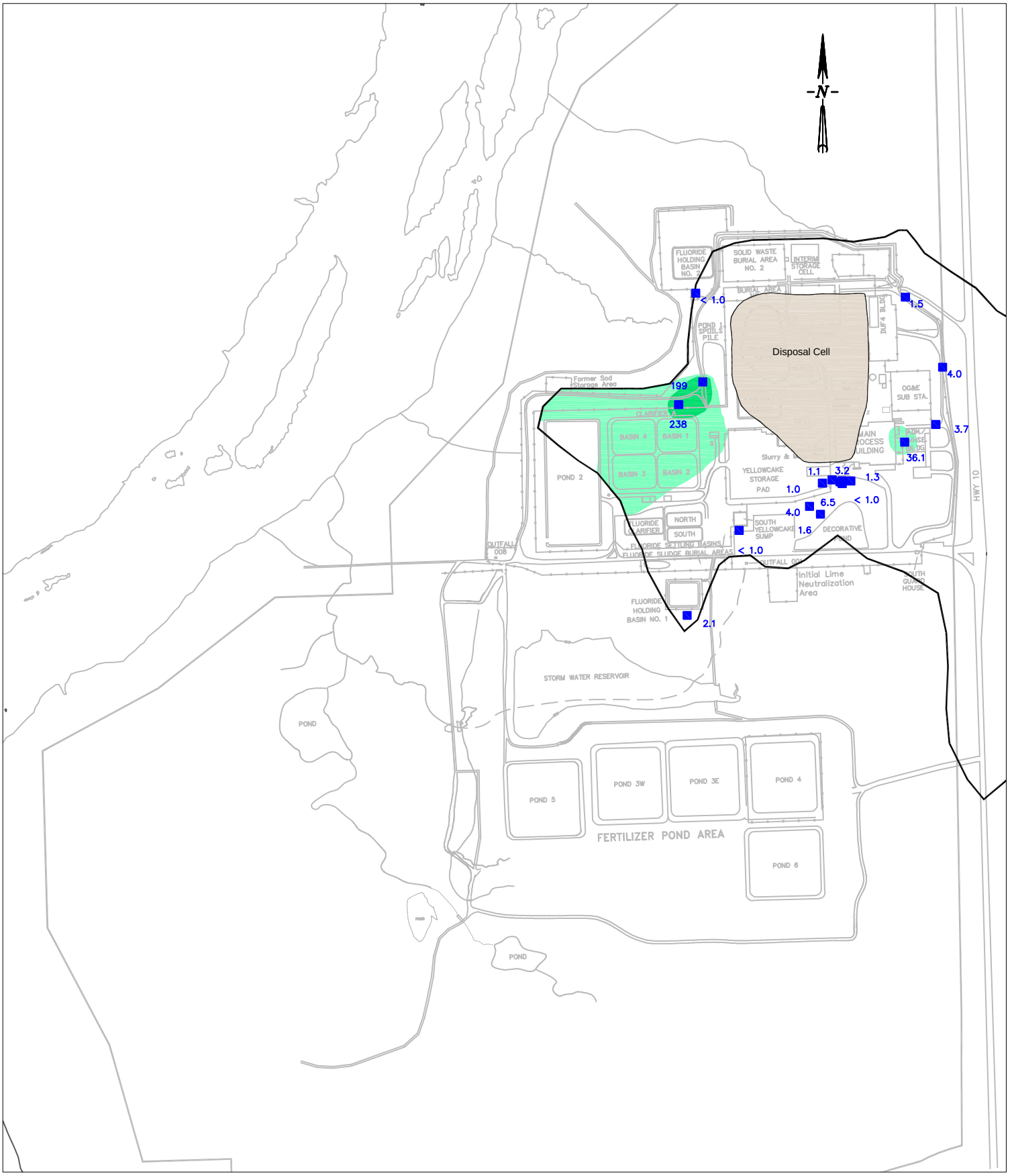
SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE:	*Fluoride Isoconcentration Diagram Shale 4 Groundwater Unit*		
PREPARED BY:	*SCM*	FILENAME:	*Figure16_F_SH4_2015.dwg*
REVIEWED BY:	*SCM*		FIGURE NO. 16
DATE:	*22 Feb 2016*		



SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: Fluoride Isoconcentration Diagram Shale 5 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure17_F_SH5_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 17
DATE: 22 Feb 2016	



Nitrate, mg/l

10000
1000
100
10
BDL

Extent of Terrace / Shale 1

Concentration

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: *Nitrate Isoconcentration Diagram*
Terrace / Shale 1 Groundwater Unit

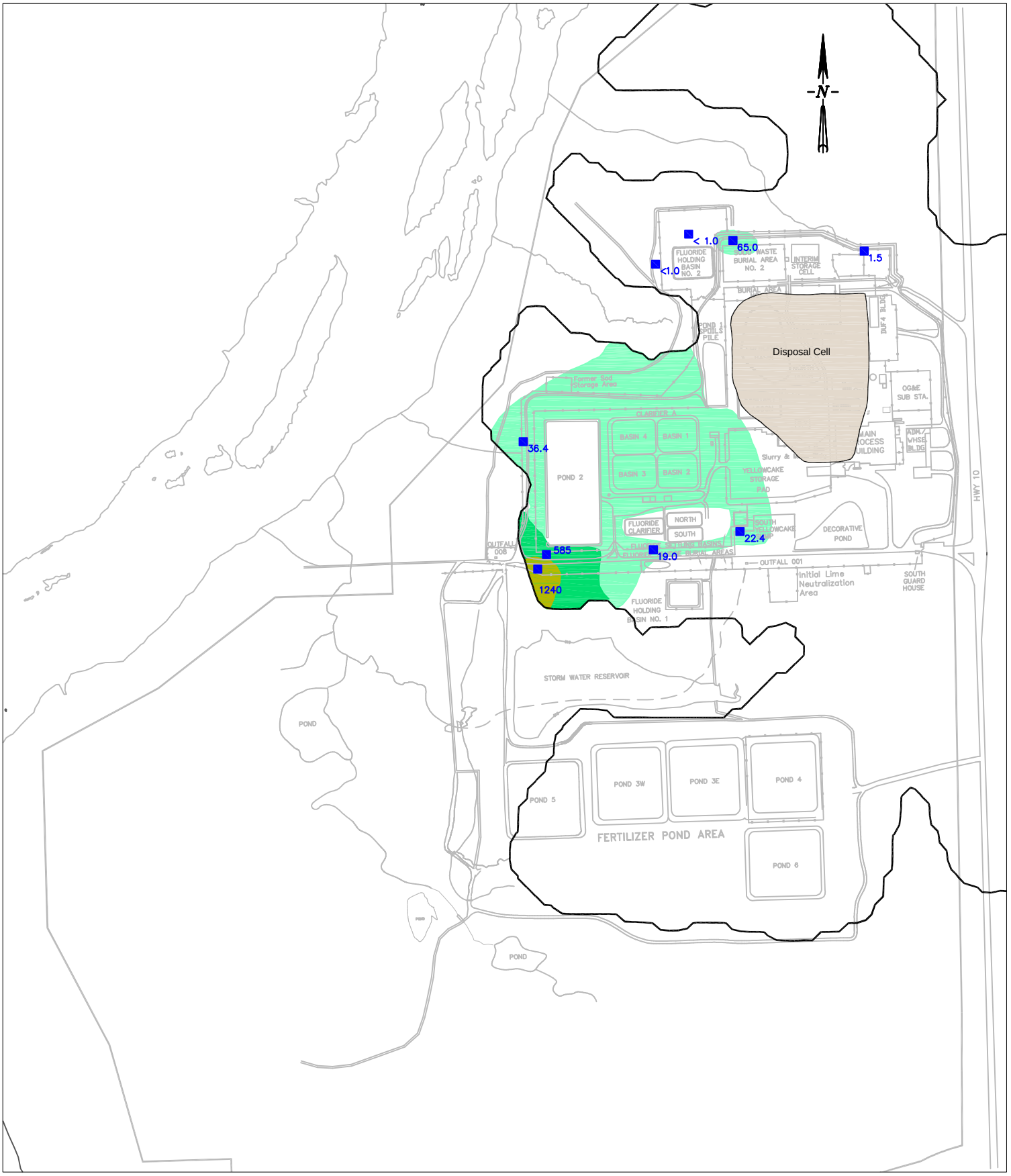
PREPARED BY: *SCM*

FILENAME: *Figure18_NO_SH1_2015.dwg*

REVIEWED BY: *SCM*

DATE: *22 Feb 2016*

FIGURE NO. 18



Nitrate, mg/l

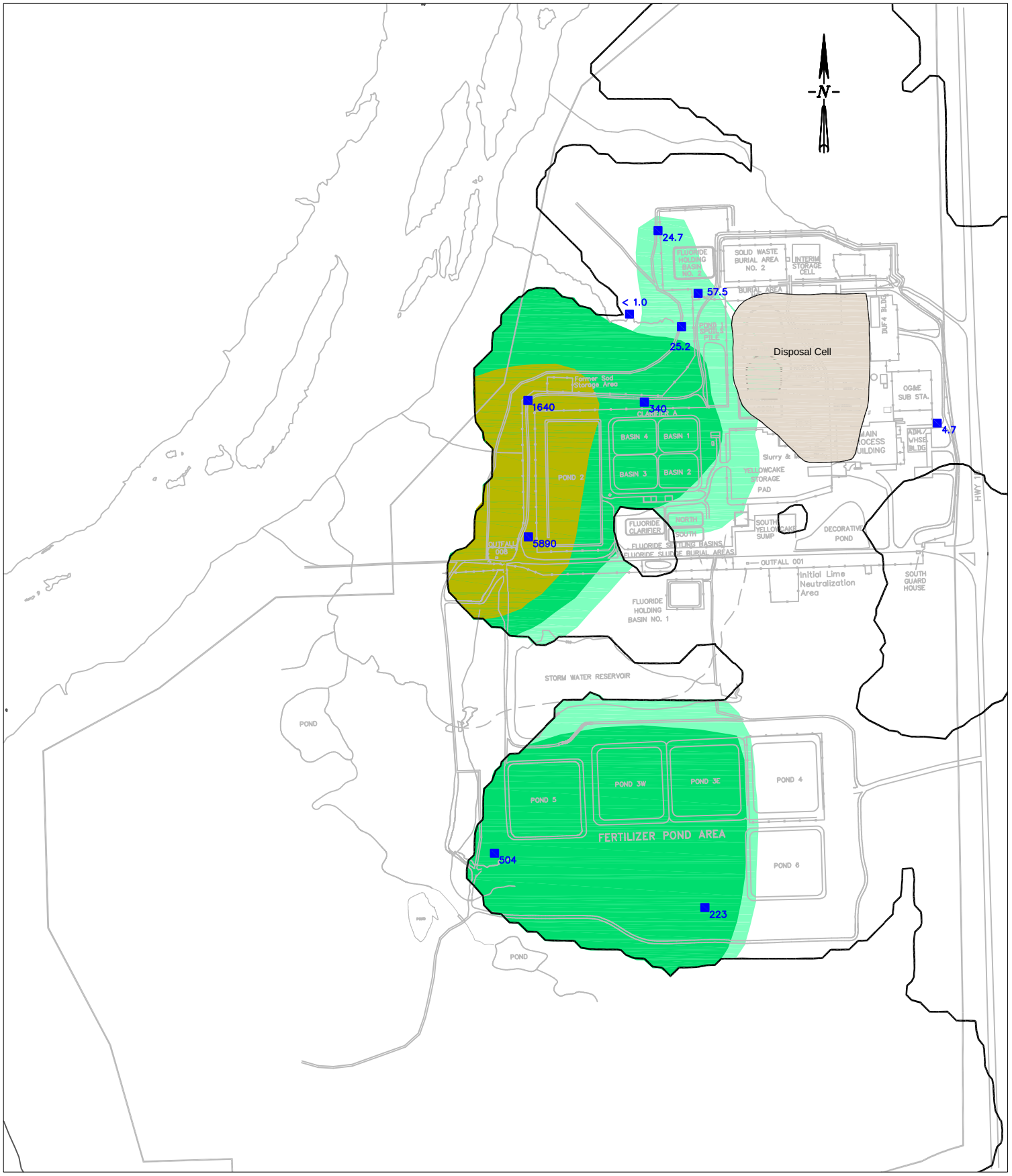
- 10000
- 1000
- 100
- 10
- BDL

Extent of Shale 2

Concentration

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: Nitrate Isoconcentration Diagram Shale 2 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure19_NO_SH2_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 19
DATE: 22 Feb 2016	



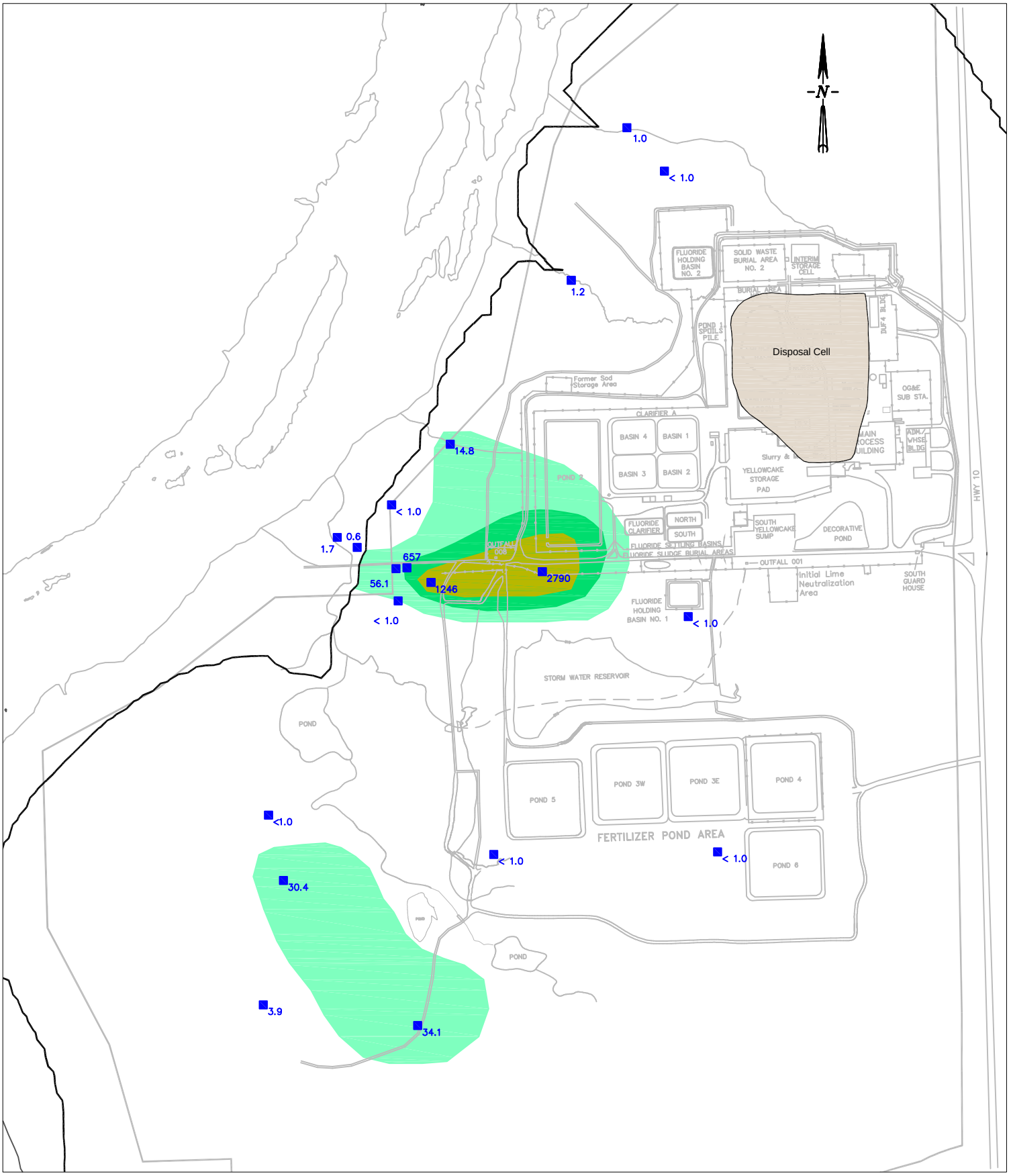
Nitrate, mg/l

- 10000
- 1000
- 100
- 10
- BDL

Extent of Shale 3

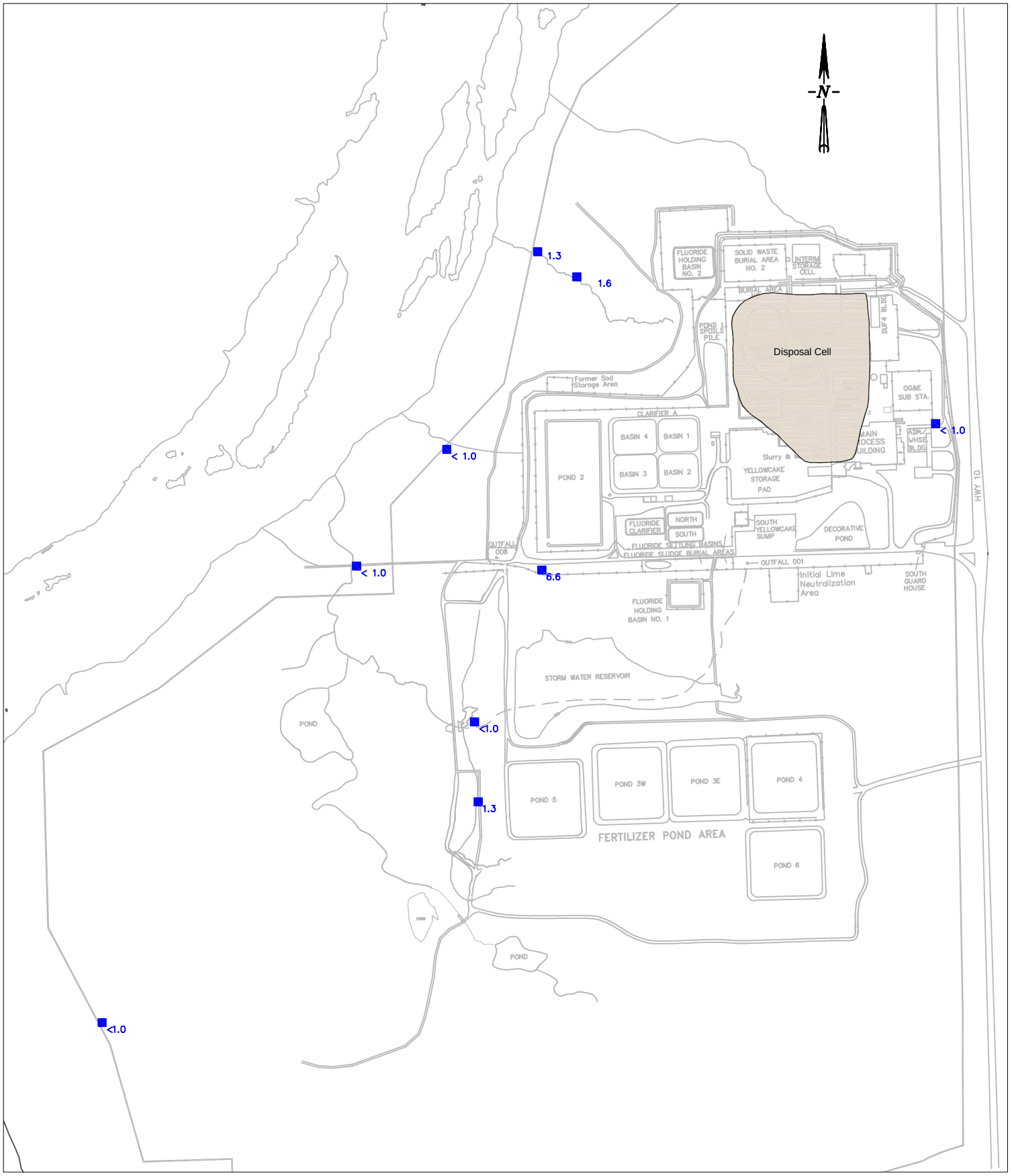
Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Nitrate Isoconcentration Diagram Shale 3 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure20_NO_SH3_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 20
DATE: 22 Feb 2016	



SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: *Nitrate Isoconcentration Diagram Shale 4 Groundwater Unit*	
PREPARED BY: *SCM*	FILENAME: *Figure21_NO_SH4_2015.dwg*
REVIEWED BY: *SCM*	FIGURE NO. 21
DATE: *22 Feb 2016*	



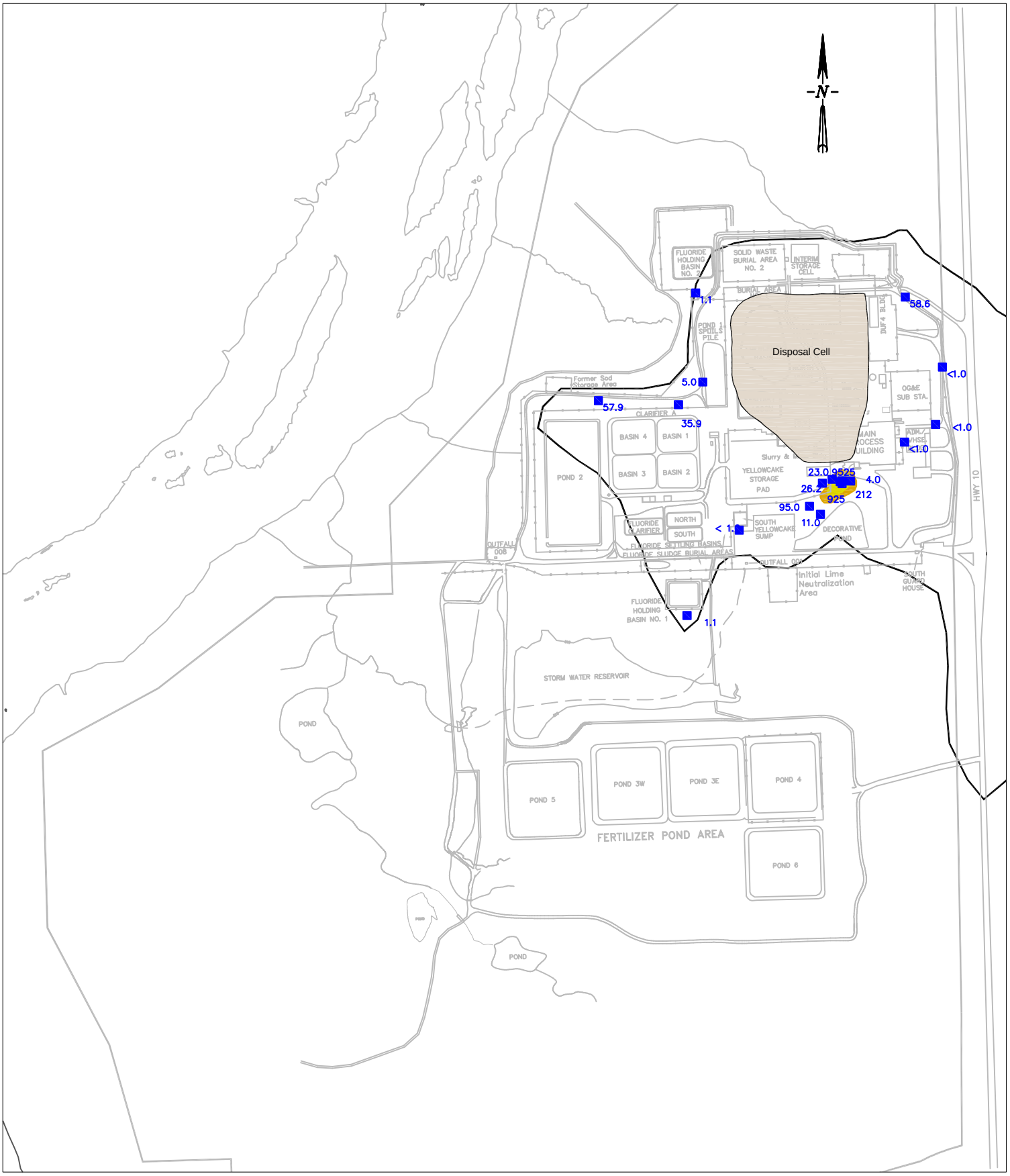
Nitrate, mg/l

- 10000
- 1000
- 100
- 10
- BDL

Extent of Shale 5

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Nitrate Isoconcentration Diagram Shale 5 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure22_NO_SH5_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 22
DATE: 22 Feb 2016	



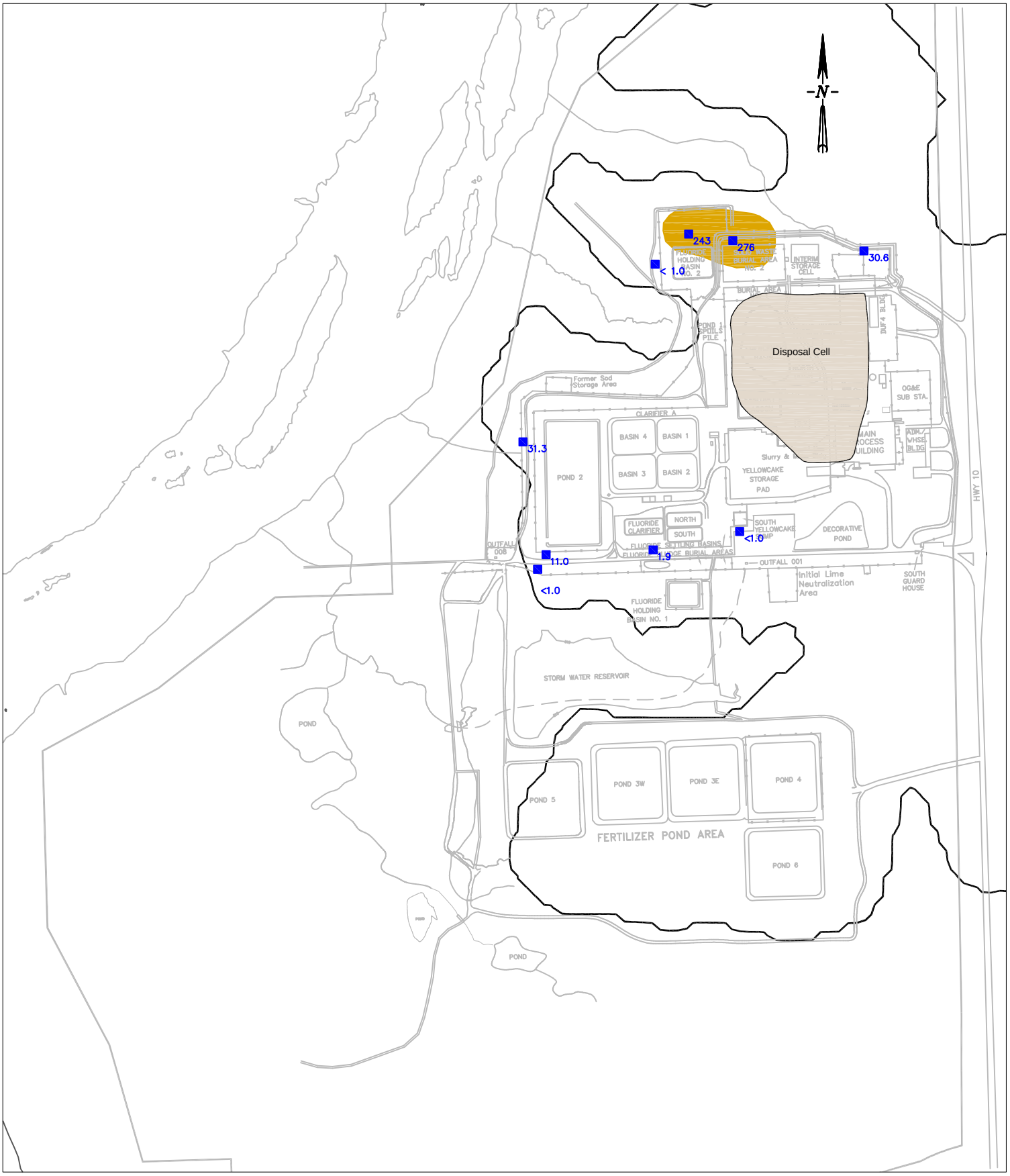
Uranium, µg/l

- 10000
- 1000
- 100
- BDL

Extent of Terrace / Shale 1

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Uranium Isoconcentration Diagram Terrace / Shale 1 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure23_U_SH1_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 23
DATE: 22 Feb 2016	



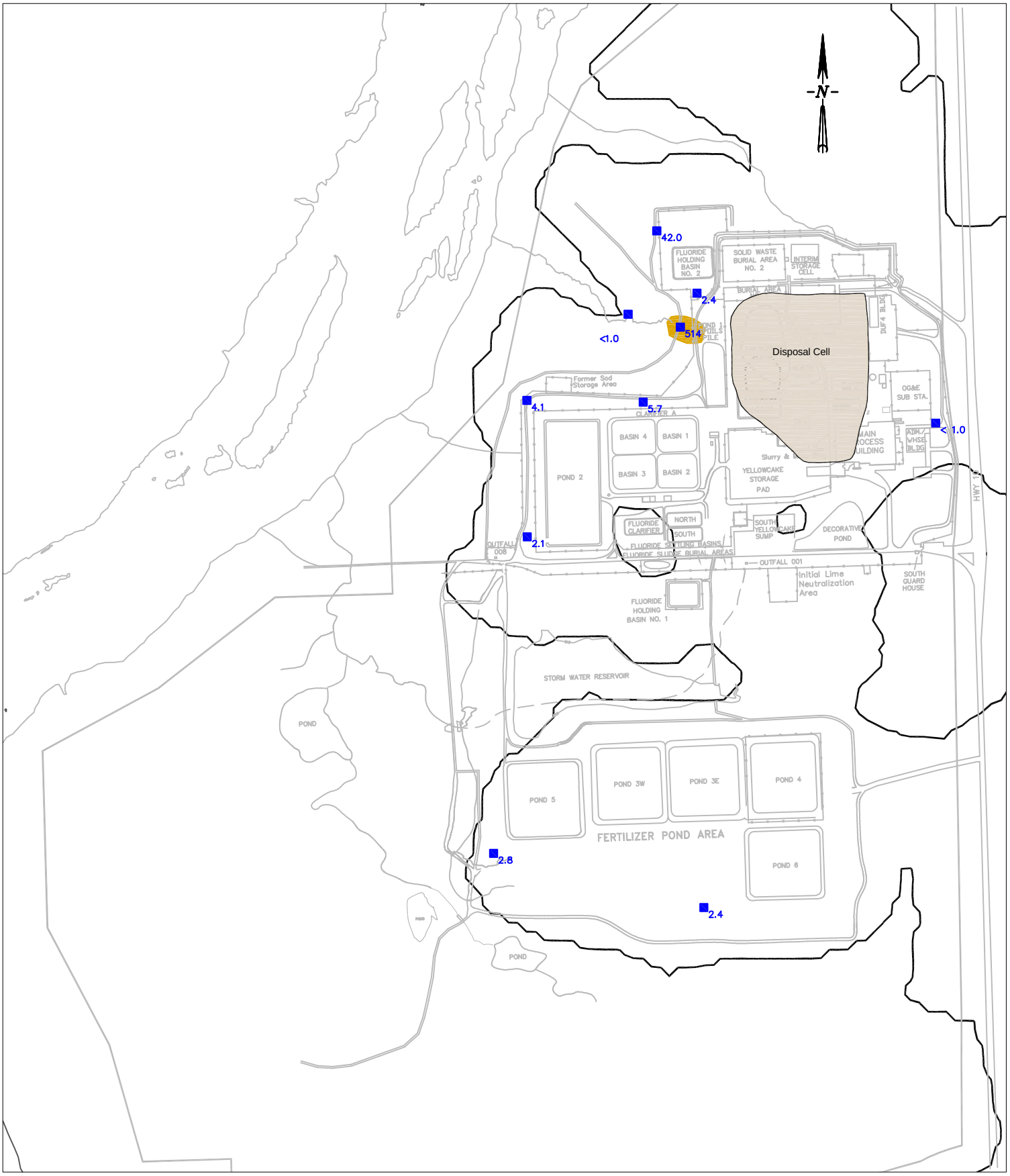
Uranium, µg/l

- 10000
- 1000
- 100
- BDL

Extent of Shale 2

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Uranium Isoconcentration Diagram Shale 2 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure24_U_SH2_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 24
DATE: 22 Feb 2016	



Uranium, µg/l

- 10000
- 1000
- 100
- BDL
- Extent of Shale 3
- Concentration

SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: *Uranium Isoconcentration Diagram Shale 3 Groundwater Unit*

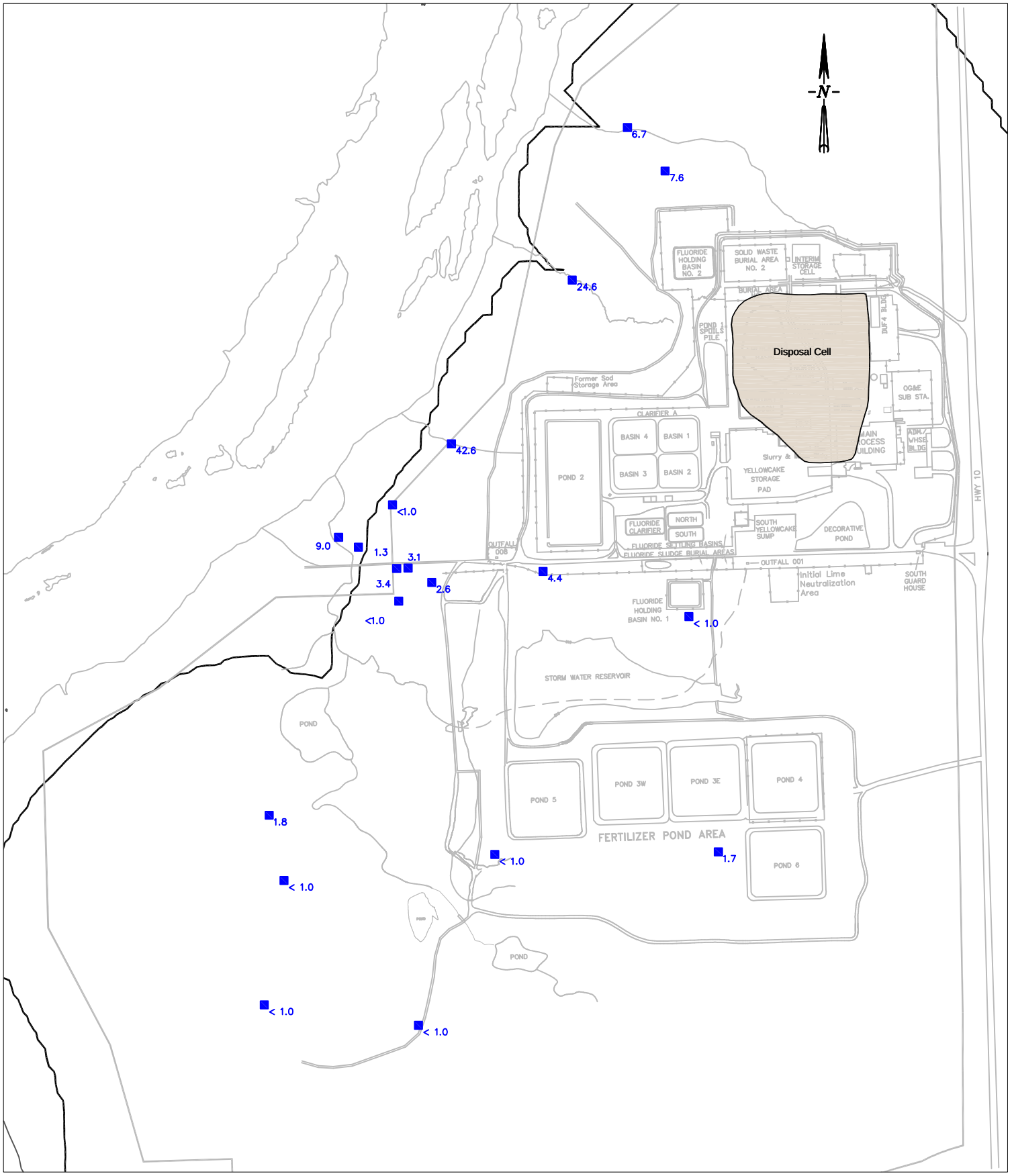
PREPARED BY: *SCM*

FILENAME: *Figure26_U_SH3_2015.dwg*

REVIEWED BY: *SCM*

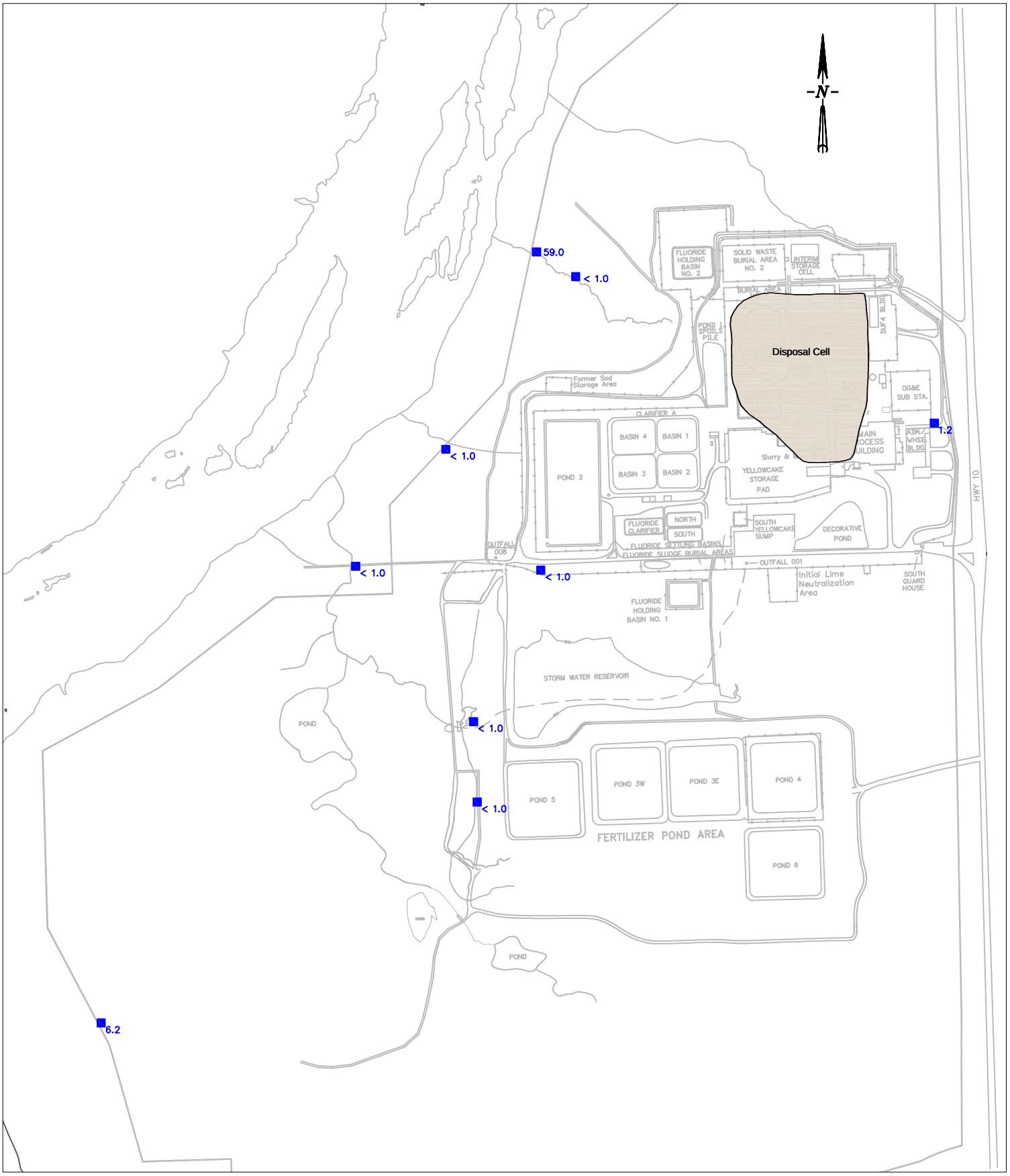
DATE: *22 Feb 2016*

FIGURE NO. 25



SEQUOYAH FUELS CORPORATION
Annual Groundwater Report

TITLE: *Uranium Isoconcentration Diagram Shale 4 Groundwater Unit*	
PREPARED BY: *SCM*	FILENAME: *Figure26_U_SH4_2015.dwg*
REVIEWED BY: *SCM*	FIGURE NO. 26
DATE: *22 Feb 2016*	



Uranium, µg/l

10000
1000
100
BDL

Extent of Shale 5

Concentration

SEQUOYAH FUELS CORPORATION Annual Groundwater Report	
TITLE: Uranium Isoconcentration Diagram Shale 5 Groundwater Unit	
PREPARED BY: SCM	FILENAME: Figure27_U_SH5_2015.dwg
REVIEWED BY: SCM	FIGURE NO. 27
DATE: 22 Feb 2016	

Appendices

Appendix A

Evaluation of Background Monitoring Data

Evaluation of Background Groundwater Monitoring Data
Sequoyah Fuels Corporation

Introduction

Sequoyah Fuels Corporation (SFC) has evaluated the data collected at background groundwater monitoring wells located up-gradient of Facility operations. A total of six background wells, including one sampling event during 2005, four events from 2006 and one event from 2007 through 2015 for each well, have been used for this evaluation. Parameters analyzed for are uranium, thorium-230, radium-226, radium-228, nitrate, fluoride, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, molybdenum, nickel, selenium and thallium. During 2015 radium-228 was not analyzed due to an oversight on the part of SFC personnel. Radium-228 is not a parameter required in the Groundwater Monitoring Plan but has been analyzed for in the past.

The spreadsheet program Excel was used for sorting and formatting the data for inclusion in this report. Some basic statistical evaluations and tabulation of analyses have also been completed using Excel. ChemStat[1], an application for the statistical analysis of groundwater monitoring data, was used to generate the box plots provided in this evaluation.

Description of Background Monitoring Well System

A map of the site showing locations of the background groundwater monitoring wells is provided as Figure 1. Monitoring wells are typically found as clusters at each location. Each well in a cluster is completed at different depths to monitor separate groundwater systems. Facility hydrogeology is described in the Groundwater Monitoring Plan[2] and in other documents presented with the Reclamation Plan[3]. Wells monitoring the Terrace Groundwater System are identified as “MWXXX” (e.g. MW072). Well identifications that end with an “A” (e.g. MW072A), monitor the Shallow Bedrock Groundwater System and well identifications ending with a “B” (e.g. MW072B) designation monitor the Deep Bedrock Groundwater System. The Terrace Groundwater System includes the terrace deposits and Unit 1 Shale, the Shallow Bedrock System includes Units 2, 3 or 4 Shale, and the Deep Bedrock System includes Unit 5 Shale. Well completion summary information is included in Table 1. Sampling methods and quality control practices are described in the Groundwater Monitoring Plan.

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[1] ChemStat, Environmental Data Statistical Analysis for Windows, Starpoint Software.

[2] Groundwater Monitoring Plan, Sequoyah Fuels Corporation, February 2005.

[3] Reclamation Plan, Sequoyah Fuels Corporation, January, 2003.

Data Analysis

The box plots (Figures 2 - 19) were reviewed with several significant observations made. Fluoride concentrations in the Deep Bedrock Groundwater System is significantly higher than in the Terrace and Shallow Bedrock Groundwater Systems. Analyses of samples collected from Monitoring Well MW007B, located in the Deep Bedrock system, supports this observation. A natural occurring constituent in this geological formation appears to be causing these elevated concentrations of fluoride. The second observation is that the nitrate concentration in Monitoring Well MW007A is significantly higher than in the other wells. Both of these observation have been made previously and are described in the Groundwater Monitoring Plan (see Groundwater Monitoring Plan, Appendix B, Evaluation of Background Monitoring Data, February 2005). A third observation, not discussed in the Groundwater Monitoring Plan, is the elevated nitrate concentration in Monitor Well MW073. Monitor Well MW073 is located in the same general area as MW007A and is likely impacted from the same source. An additional observation is the elevated uranium analyses at MW070, which has been confirmed thru multiple sampling events over several years. Several metals, including arsenic and barium appear to be slightly elevated at MW070.

Descriptive Statistics of Background Monitoring Wells and Groundwater Systems

Basic statistics for the background monitoring wells are presented in Table 3. For each monitoring well the total number of measurements, total non-detects, mean and standard deviation are listed. Non-detects have been replaced with the minimum detection limit. A review of the data indicates that the fluoride concentration in the Deep Bedrock Groundwater System is higher than in the other systems and the nitrate levels appear to be elevated in groundwater sampled from MW007A and MW073. The uranium concentration from MW070 is also elevated. These observations are consistent with the graphical analysis.

Conclusion

This evaluation updates the information previously included in the Groundwater Monitoring Plan that was limited to arsenic, fluoride, nitrate and uranium. Additional parameters included in this evaluation are antimony, barium, beryllium, cadmium, lead, molybdenum, nickel, radium-226, radium-228, selenium, thallium and thorium-230. Sampling of background monitoring wells was conducted on an annual basis during 2015.

Table 1

Background Well Completion Summary Information

Well ID	GW Unit Monitored	Total Depth, ft	Top Sand ft	Screen Bottom, ft	Ground Elev.	Case Top Elev.
MW007	Terrace / Shale 1	18.2	7.0	17.8	569.9	572.01
MW070	Terrace / Shale 1	13.7	2.6	13.0	567.7	569.94
MW073	Terrace / Shale 1	27.0	15.2	26.3	580.5	582.85
MW007A	Shale 3	35.0	22.0	34.8	570.2	572.63
MW110A	Shale 4	45.0	32.0	44.7	552.6	554.93
MW007B	Shale 5	82.8	72.0	82.1	570.3	572.89

Well ID	GW Unit Monitored	Date Sampled	U µg/l	Th-230 pCi/l	Ra-226 pCi/l	Ra-228 pCi/l	NO3(N) mg/l	F mg/l	Sb mg/l	As mg/l
MW007	Terrace / Shale 1	10/20/2005	< 1	1.05 ± 0.188	0.176 ± 0.075	1.09 ± 0.123	2	0.8	0.015	0.006
		1/10/2006	2.42	0.464 ± 0.334	0.934 ± 0.351	0.965 ± 0.134	2.1	1.3	< 0.005	0.005
		4/11/2006	< 1	2.71 ± 0.330	0.734 ± 0.244	0.757 ± 0.102	1.2	1.0	< 0.007	< 0.005
		7/25/2006	< 1	0 ± 0.278	0.353 ± 0.112	0.780 ± 0.131	1.1	0.7	< 0.005	< 0.009
		10/4/2006	< 1	0 ± 0.220	0.267 ± 0.126	0.112 ± 0.053	1.5	0.6	0.011	< 0.009
		4/12/2007	1.05	0.139 ± 0.317	0.118 ± 0.215	2.46 ± 0.065	1.7	0.6	< 0.010	< 0.009
		4/23/2008	< 1	1.18 ± 0.324	0.128 ± 0.277	0 ± 1.65	2.5	0.6	0.006	0.015
		5/1/2009	< 1	0.445 ± 0.136	0.238 ± 0.133	0 ± 0.189	2.4	0.6	< 0.010	< 0.010
		4/21/2010	< 1	0.392 ± 0.147	0.268 ± 0.125	0 ± 0.055	1.4	0.6	< 0.010	< 0.010
		4/12/2011	< 1	0.184 ± 0.199	0.189 ± 0.174	0.385 ± 0.055	1.7	0.6	0.005	0.005
		4/18/2012	1.18	0.505 ± 0.181	-0.067 ± 0.062	0.013 ± 0.096	5.5	0.7	< 0.003	< 0.005
		4/24/2013	< 1	0.366 ± 0.165	0.171 ± 0.089	1.00 ± 0.171	4.5	0.7	< 0.005	< 0.005
		4/24/2014	< 1	-0.098 ± 0.092	0.134 ± 0.087	1.30 ± 0.132	4	0.7	0.003	0.005
		4/16/2015	< 1	0.763 ± 0.222	0.057 ± 0.079	No Analyses	3.7	0.7	0.002	0.005
MW070	Terrace / Shale 1	10/20/2005	1.67	0.531 ± 0.164	0.756 ± 0.230	3.51 ± 0.294	1.7	1.1	< 0.005	0.009
		1/10/2006	1.26	1.94 ± 0.447	1.81 ± 0.718	1.68 ± 0.130	1.6	0.6	< 0.005	0.010
		4/11/2006	1.41	0.166 ± 0.117	0.626 ± 0.225	0.247 ± 0.494	< 1	1.1	0.007	0.013
		7/25/2006	1.47	0.913 ± 0.276	1.46 ± 0.393	1.02 ± 0.112	< 1	1.1	< 0.005	< 0.009
		10/4/2006	< 1	0 ± 0.235	0 ± 0.296	0.453 ± 0.049	1.8	0.9	< 0.011	< 0.009
		4/12/2007	6.66	0.744 ± 0.218	0.649 ± 0.323	0.417 ± 0.051	1.9	0.5	< 0.010	< 0.009
		4/23/2008	13.5	0 ± 0.107	0.015 ± 0.113	1.34 ± 1.19	2.1	0.4	0.016	< 0.010
		7/11/2008	15.8							
		10/16/2008	7.78				4.6	0.5		< 0.010
		5/1/2009	14.5	0.305 ± 0.097	0.786 ± 0.171	0 ± 0.261	1.5	0.9	< 0.010	0.013
		4/13/2010	15.3	0.284 ± 0.205	1.34 ± 0.630	0.469 ± 0.060	1.9	0.5	0.010	0.022
		4/12/2011	46	0.195 ± 0.184	0.553 ± 0.341	0.019 ± 0.061	2.9	0.3	< 0.005	0.009
		4/18/2012	25.3	0.372 ± 0.166	0.236 ± 0.127	0.399 ± 0.107	4.31	0.7	< 0.003	< 0.005
		4/24/2013	24.4	0.305 ± 0.156	0.583 ± 0.159	1.20 ± 0.113	2.2	0.8	< 0.005	0.005
		4/24/2014	47.5	6.57 ± 0.522	0.723 ± 0.280	2.17 ± 0.126	4.3	2.6	< 0.003	0.013
		4/16/2015	58.6	0.300 ± 0.144	0.414 ± 0.152	No Analyses	1.5	0.5	< 0.002	< 0.005
MW073	Terrace / Shale 1	10/20/2005	1.08	0.262 ± 0.103	0.161 ± 0.168	1.63 ± 0.287	5.3	0.5	< 0.005	< 0.005
		1/10/2006	< 1	0.558 ± 0.399	0.670 ± 0.281	2.31 ± 0.127	4.1	0.7	0.016	< 0.005
		4/11/2006	< 1	1.30 ± 0.266	0.254 ± 0.104	0.457 ± 0.103	3.0	0.7	< 0.007	< 0.005
		7/25/2006	< 1	0 ± 0.252	0.190 ± 0.185	0.895 ± 0.119	3.2	0.7	< 0.005	< 0.009
		10/4/2006	< 1	0.048 ± 0.101	0.572 ± 0.186	0 ± 0.049	4	0.4	< 0.011	< 0.009
		4/12/2007	< 1	0.406 ± 0.153	0.142 ± 0.346	0.370 ± 0.048	1.4	0.5	< 0.010	< 0.009
		4/23/2008	< 1	0.213 ± 0.146	0 ± 0.115	1.25 ± 1.29	6.9	0.5	0.006	0.015
		5/1/2009	< 1	0.493 ± 0.217	0.070 ± 0.090	0 ± 0.103	3.7	0.4	< 0.010	< 0.010
		4/13/2010	< 1	0.203 ± 0.208	0.134 ± 0.447	0.024 ± 0.064	4.9	0.4	0.009	< 0.010
		4/12/2011	< 1	0.593 ± 0.251	0.476 ± 0.335	0.069 ± 0.052	3.8	0.5	< 0.005	< 0.005
		4/18/2012	1.16	0.288 ± 0.177	0.121 ± 0.092	-0.120 ± 0.087	4.3	0.5	< 0.003	< 0.005
		4/24/2013	< 1	0.387 ±0.166	0.096 ± 0.092	0.132 ± 0.162	4.4	0.5	< 0.005	< 0.005
		4/24/2014	< 1	-0.122 ± 0.089	0.019 ± 0.086	-0.066 ± 0.129	4.8	0.5	0.003	0.004
		4/16/2015	< 1	-0.063 ± 0.128	0.114 ± 0.100	No Analyses	4	0.4	< 0.002	< 0.005

Well ID	GW Unit Monitored	Date Sampled	U µg/l	Th-230 pCi/l	Ra-226 pCi/l	Ra-228 pCi/l	NO3(N) mg/l	F mg/l	Sb mg/l	As mg/l
MW007A	Shale 3	10/20/2005	1.92	0.441 ± 0.149	0.054 ± 0.073	1.17 ± 0.118	6.5	0.8	< 0.005	< 0.005
		1/10/2006	1.44	2.56 ± 0.539	0.130 ± 0.131	3.12 ± 0.130	6.7	0.7	< 0.005	0.006
		4/11/2006	< 1	0.027 ± 0.109	0.090 ± 0.216	0.120 ± 0.104	5.2	0.6	< 0.007	0.005
		7/25/2006	< 1	0.332 ± 0.224	0.211 ± 0.182	0.642 ± 0.107	4.7	0.6	< 0.005	< 0.009
		10/4/2006	< 1	0 ± 0.105	0.139 ± 0.107	0.382 ± 0.054	5.23	0.6	< 0.011	< 0.009
		4/12/2007	1.7	0 ± 0.372	0 ± 0.304	0 ± 0.049	6	0.7	< 0.010	< 0.009
		4/23/2008	1.23	0.045 ± 0.134	0 ± 0.253	0 ± 0.959	6.1	0.7	< 0.005	< 0.010
		5/1/2009	< 1	0.401 ± 0.146	0.035 ± 0.084	2.88 ± 0.165	7.2	0.7	< 0.010	< 0.010
		4/21/2010	1.34	0 ± 0.111	0.138 ± 0.088	0 ± 0.064	5.0	0.6	0.012	< 0.010
		4/12/2011	1.75	0.022 ± 0.155	0.048 ± 0.067	0.033 ± 0.053	5.8	0.7	< 0.005	< 0.005
		4/18/2012	1.87	-0.022 ± 0.139	0.017 ± 0.113	1.35 ± 0.093	3.9	0.8	< 0.003	< 0.005
		4/24/2013	1.31	0.402 ± 0.186	0.063 ± 0.051	0.418 ± 0.117	6.4	0.8	< 0.005	< 0.005
		4/24/2014	1.15	-0.125 ± 0.094	0.072 ± 0.072	0.698 ± 0.115	6.3	0.6	< 0.003	0.004
		4/16/2015	< 1	-0.196 ± 0.091	0.069 ± 0.080	No Analyses	4.7	0.7	< 0.002	< 0.005
MW110A	Shale 4	10/13/2005	2.4	0.826 ± 0.308	1.18 ± 0.283	1.81 ± 0.142	1.1	0.6	< 0.007	0.009
		1/10/2006	2.94	0.619 ± 0.359	0.606 ± 0.290	2.31 ± 0.127	1.3	0.6	< 0.005	< 0.005
		4/11/2006	1.21	0.588 ± 0.204	0.266 ± 0.128	0.753 ± 0.055	< 1	0.5	< 0.007	< 0.005
		7/25/2006	2.46	0.034 ± 0.177	1.00 ± 0.241	2.77 ± 0.119	< 1	0.5	< 0.005	< 0.009
		10/4/2006	< 1	0.130 ± 0.128	0.374 ± 0.129	1.51 ± 0.068	< 1	0.5	< 0.011	< 0.009
		4/12/2007	2	0.112 ± 0.153	0.597 ± 0.236	0.87 ± 0.052	< 1	0.5	< 0.010	< 0.009
		4/23/2008	1.73	0.620 ± 0.169	0.533 ± 0.360	4.58 ± 1.26	3.3	0.6	0.008	0.012
		5/1/2009	< 1	0.338 ± 0.130	0.124 ± 0.311	0 ± 0.186	< 1	0.5	< 0.010	< 0.010
		4/13/2010	2.56	0.264 ± 0.149	1.04 ± 0.368	1.44 ± 0.073	1.2	0.4	0.015	< 0.010
		4/12/2011	2.80	0.218 ± 0.198	0.140 ± 0.112	1.00 ± 0.060	< 1	0.4	< 0.005	0.012
		4/18/2012	2.92	-0.021 ± 0.169	0.458 ± 0.140	1.82 ± 0.093	< 1	0.6	< 0.003	< 0.005
		4/24/2013	2.05	-0.098 ± 0.127	0.287 ± 0.103	0.702 ± 0.143	< 1	0.5	< 0.005	< 0.005
		4/24/2014	1.17	0.094 ± 0.141	0.242 ± 0.178	1.99 ± 0.129	1	0.5	0.003	0.002
		4/16/2015	1.46	-0.229 ± 0.069	0.448 ± 0.164	No Analyses	< 1	0.5	< 0.002	< 0.005
MW007B	Shale 5	10/13/2005	5.47	0.389 ± 0.121	0.393 ± 0.18	2.87 ± 0.162	1	1.9	0.013	0.014
		1/10/2006	2.36	1.58 ± 0.504	1.15 ± 0.423	0 ± 0.100	1.2	2.9	< 0.005	0.006
		4/11/2006	< 1	0.450 ± 0.157	0.516 ± 0.327	0 ± 0.309	1.3	2.6	0.008	0.006
		7/25/2006	2.05	0 ± 0.274	0.978 ± 0.349	0 ± 0.117	< 1	2	< 0.005	< 0.009
		10/4/2006	< 1	0 ± 0.199	0.538 ± 0.172	1.61 ± 0.058	< 1	2.7	< 0.011	< 0.009
		4/12/2007	2.26	0.716 ± 0.402	0.609 ± 0.172	0.22 ± 0.048	< 1	2.5	< 0.010	< 0.009
		4/23/2008	1.69	0.281 ± 0.125	0 ± 0.083	1.71 ± 1.24	1.4	2.7	0.011	0.005
		5/1/2009	< 1	0.070 ± 0.188	0.373 ± 0.230	0.730 ± 0.053	1.1	2.7	< 0.010	0.010
		4/21/2010	10.5	0.066 ± 0.129	0.126 ± 0.122	0.874 ± 0.069	< 1	2.8	< 0.010	< 0.010
		4/12/2011	2.99	0.009 ± 0.154	0.565 ± 0.385	1.53 ± 0.062	< 1	2.6	< 0.005	0.007
		4/18/2012	3.39	0.285 ± 0.164	0.237 ± 0.117	1.32 ± 0.095	< 1	3	< 0.003	0.007
		4/24/2013	3.7	-0.006 ± 0.162	0.420 ± 0.126	3.59 ± 0.129	< 1	2.7	< 0.005	0.006
		4/24/2014	3.65	0.266 ± 0.148	0.264 ± 0.108	2.41 ± 0.144	1.4	2.7	< 0.003	0.006
		4/16/2015	1.18	0.022 ± 0.120	0.064 ± 0.082	No Analyses	< 1	2	< 0.002	< 0.005

Well ID	Date Sampled	Ba mg/l	Be mg/l	Cd mg/l	Cr mg/l	Pb mg/l	Mo mg/l	Ni mg/l	Se mg/l	Tl mg/l
MW007	10/20/2005	0.042	< 0.006	< 0.006	0.008	0.01	0.011	< 0.006	0.01	< 0.009
	1/10/2006	0.167	< 0.006	< 0.006	0.065	0.029	< 0.007	0.038	< 0.007	< 0.004
	4/11/2006	0.097	< 0.005	0.001	0.031	0.017	< 0.007	0.037	< 0.007	< 0.004
	7/25/2006	0.059	< 0.006	< 0.001	0.011	0.018	< 0.007	< 0.008	0.011	< 0.003
	10/4/2006	0.033	< 0.010	< 0.008	< 0.009	0.011	< 0.009	< 0.008	0.009	< 0.006
	4/12/2007	0.050	< 0.001	< 0.001	0.004	< 0.010	< 0.011	< 0.011	< 0.007	< 0.007
	4/23/2008	0.037	< 0.010	< 0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.035
	5/1/2009	0.028	< 0.010	< 0.010	0.012	0.01	< 0.010	< 0.010	< 0.010	< 0.010
	4/21/2010	0.050	< 0.005	< 0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	4/12/2011	0.043	0.001	< 0.001	0.01	0.006	< 0.005	< 0.010	< 0.010	< 0.005
	4/18/2012	0.039	< 0.002	< 0.0010	< 0.010	< 0.005	< 0.005	0.002	< 0.005	< 0.010
	4/24/2013	0.036	< 0.002	< 0.0012	< 0.005	< 0.010	0.011	< 0.005	0.019	0.008
	4/24/2014	0.041	0.004	< 0.0001	0.014	< 0.003	< 0.001	0.008	< 0.003	0.009
	4/16/2015	0.045	0.0022	< 0.0006	0.018	< 0.005	0.008	0.007	0.017	0.013
MW070	10/20/2005	0.3	< 0.006	< 0.006	0.015	0.018	< 0.007	0.023	< 0.007	< 0.009
	1/10/2006	0.287	< 0.006	< 0.006	0.036	0.019	< 0.007	0.036	< 0.007	< 0.004
	4/11/2006	0.411	< 0.005	0.003	0.056	0.038	< 0.007	0.052	< 0.007	< 0.004
	7/25/2006	0.334	< 0.006	0.001	0.023	0.023	< 0.007	0.02	< 0.007	< 0.003
	10/4/2006	0.236	< 0.010	< 0.008	0.012	0.019	< 0.009	0.015	< 0.009	< 0.006
	4/12/2007	0.226	< 0.001	0.002	0.014	< 0.010	< 0.011	0.028	< 0.007	< 0.007
	4/23/2008	0.085	< 0.010	< 0.001	< 0.010	0.014	< 0.010	< 0.010	< 0.010	0.02
	7/11/2008									
	10/16/2008									
	5/1/2009	0.193	< 0.010	< 0.010	0.013	0.012	< 0.010	0.017	< 0.010	< 0.010
	4/13/2010	0.231	< 0.005	< 0.005	0.034	0.011	< 0.010	0.034	< 0.010	0.006
	4/12/2011	0.078	< 0.001	0.001	< 0.010	0.008	0.005	< 0.010	< 0.010	< 0.005
	4/18/2012	0.175	0.005	< 0.0010	< 0.010	0.006	< 0.005	0.019	< 0.005	< 0.010
	4/24/2013	0.182	0.003	0.0013	0.013	0.017	0.014	0.023	0.02	< 0.005
	4/24/2014	0.686	0.006	0.012	0.115	0.111	0.044	0.153	0.011	< 0.003
	4/16/2015	0.106	< 0.0002	< 0.0006	0.022	< 0.005	< 0.001	0.004	< 0.005	0.007
MW073	10/20/2005	0.038	< 0.006	< 0.006	< 0.007	0.007	< 0.007	< 0.006	< 0.007	< 0.009
	1/10/2006	0.081	< 0.006	< 0.006	0.026	0.014	< 0.007	0.010	0.009	< 0.004
	4/11/2006	0.058	< 0.005	0.002	0.016	0.014	< 0.007	0.014	0.012	< 0.004
	7/25/2006	0.035	< 0.006	< 0.001	< 0.009	< 0.007	< 0.007	0.03	0.014	< 0.003
	10/4/2006	0.033	< 0.010	< 0.008	< 0.009	0.01	< 0.009	< 0.008	0.011	< 0.006
	4/12/2007	0.044	< 0.001	< 0.001	0.004	< 0.010	< 0.011	0.011	< 0.007	< 0.007
	4/23/2008	0.022	< 0.010	< 0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.010
	5/1/2009	0.023	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	4/13/2010	0.031	< 0.005	< 0.005	0.013	< 0.010	< 0.010	< 0.010	< 0.010	0.006
	4/12/2011	0.026	< 0.001	< 0.001	< 0.010	0.012	< 0.005	< 0.010	< 0.010	< 0.005
	4/18/2012	0.028	0.002	< 0.0010	< 0.010	< 0.005	< 0.005	0.003	< 0.005	< 0.010
	4/24/2013	0.035	< 0.002	< 0.0012	< 0.005	0.01	0.011	0.007	0.037	< 0.005
	4/24/2014	0.027	0.001	< 0.0001	0.017	0.01	0.019	< 0.002	0.022	0.013
	4/16/2015	0.028	< 0.0002	< 0.0006	0.02	< 0.005	< 0.001	0.007	< 0.005	0.008

Well ID	Date Sampled	Ba mg/l	Be mg/l	Cd mg/l	Cr mg/l	Pb mg/l	Mo mg/l	Ni mg/l	Se mg/l	Tl mg/l
MW007A	10/20/2005	0.018	< 0.006	< 0.006	< 0.007	< 0.005	0.008	< 0.006	0.009	< 0.009
	1/10/2006	0.017	< 0.006	< 0.006	< 0.007	0.010	0.008	< 0.006	0.011	0.008
	4/11/2006	0.016	< 0.005	< 0.001	< 0.007	0.022	< 0.007	< 0.006	< 0.007	0.004
	7/25/2006	0.017	< 0.006	< 0.001	< 0.009	< 0.007	< 0.007	< 0.008	0.01	< 0.003
	10/4/2006	0.02	< 0.010	< 0.008	< 0.009	< 0.007	< 0.009	< 0.008	< 0.009	< 0.006
	4/12/2007	0.022	< 0.001	< 0.001	< 0.001	< 0.010	< 0.011	< 0.011	< 0.007	< 0.007
	4/23/2008	0.014	< 0.010	< 0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.005
	5/1/2009	0.013	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	4/21/2010	0.021	< 0.005	< 0.001	< 0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	4/12/2011	0.019	< 0.001	< 0.001	< 0.010	< 0.010	< 0.005	< 0.010	< 0.010	< 0.005
	4/18/2012	0.018	< 0.002	< 0.0010	< 0.010	< 0.005	< 0.005	< 0.002	< 0.005	< 0.010
	4/24/2013	0.018	< 0.002	< 0.0012	< 0.005	0.012	0.012	< 0.005	0.025	0.007
	4/24/2014	0.019	0.004	0.0002	0.017	< 0.003	< 0.001	0.005	< 0.003	0.015
	4/16/2015	0.017	< 0.0002	< 0.0006	0.017	< 0.005	0.001	< 0.002	< 0.005	0.006
MW110A	10/13/2005	0.01	< 0.006	< 0.006	< 0.007	< 0.006	< 0.007	0.008	< 0.007	< 0.004
	1/10/2006	0.012	< 0.006	< 0.006	< 0.007	0.010	< 0.007	< 0.006	< 0.007	< 0.004
	4/11/2006	0.014	< 0.005	< 0.001	< 0.007	0.006	< 0.007	0.009	< 0.007	< 0.004
	7/25/2006	0.014	< 0.006	< 0.001	< 0.009	< 0.007	< 0.007	< 0.008	0.012	< 0.003
	10/4/2006	0.017	< 0.010	< 0.008	< 0.009	0.007	< 0.009	< 0.008	< 0.009	< 0.006
	4/12/2007	0.014	< 0.001	< 0.001	< 0.001	0.03	< 0.011	0.038	< 0.007	< 0.007
	4/23/2008	< 0.010	< 0.010	< 0.001	< 0.010	0.014	< 0.010	< 0.010	< 0.010	0.036
	5/1/2009	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.014
	4/13/2010	0.012	< 0.005	< 0.005	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.010
	4/12/2011	0.011	< 0.001	0.001	< 0.010	< 0.005	0.01	< 0.010	< 0.010	< 0.005
	4/18/2012	0.009	< 0.002	< 0.0010	< 0.010	< 0.005	< 0.005	0.004	< 0.005	< 0.005
	4/24/2013	< 0.016	< 0.002	< 0.0012	< 0.005	< 0.010	0.027	< 0.005	0.05	0.008
	4/24/2014	0.009	0.001	< 0.0001	< 0.002	0.004	0.031	< 0.002	0.054	0.003
	4/16/2015	0.008	< 0.0002	< 0.0006	0.031	< 0.005	< 0.001	0.002	< 0.005	0.012
MW007B	10/13/2005	< 0.287	< 0.006	< 0.006	0.012	< 0.006	< 0.007	0.008	< 0.007	< 0.004
	1/10/2006	0.071	< 0.006	< 0.006	0.011	0.019	< 0.007	< 0.006	< 0.007	0.006
	4/11/2006	0.054	< 0.005	< 0.001	0.007	0.007	< 0.007	0.008	< 0.007	0.004
	7/25/2006	0.060	< 0.006	< 0.001	< 0.009	< 0.007	< 0.007	< 0.008	0.008	< 0.003
	10/4/2006	0.075	< 0.010	< 0.008	< 0.009	0.011	< 0.009	< 0.008	< 0.009	< 0.006
	4/12/2007	0.075	< 0.001	< 0.001	0.003	< 0.010	< 0.011	0.011	< 0.007	< 0.007
	4/23/2008	0.049	< 0.010	< 0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.033
	5/1/2009	0.052	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	4/21/2010	0.048	< 0.005	< 0.001	< 0.010	< 0.010	< 0.010	0.011	< 0.010	0.015
	4/12/2011	0.049	< 0.001	0.001	< 0.010	< 0.005	< 0.005	< 0.010	< 0.010	< 0.005
	4/18/2012	0.046	< 0.002	< 0.0010	< 0.010	< 0.005	< 0.005	0.003	< 0.005	< 0.010
	4/24/2013	0.055	< 0.002	< 0.0012	< 0.005	0.012	0.003	0.005	< 0.008	< 0.005
	4/24/2014	0.056	0.003	< 0.0001	0.003	< 0.003	< 0.001	0.01	< 0.003	0.019
	4/16/2015	0.039	< 0.0002	< 0.0006	0.009	< 0.005	0.003	0.009	< 0.005	0.007

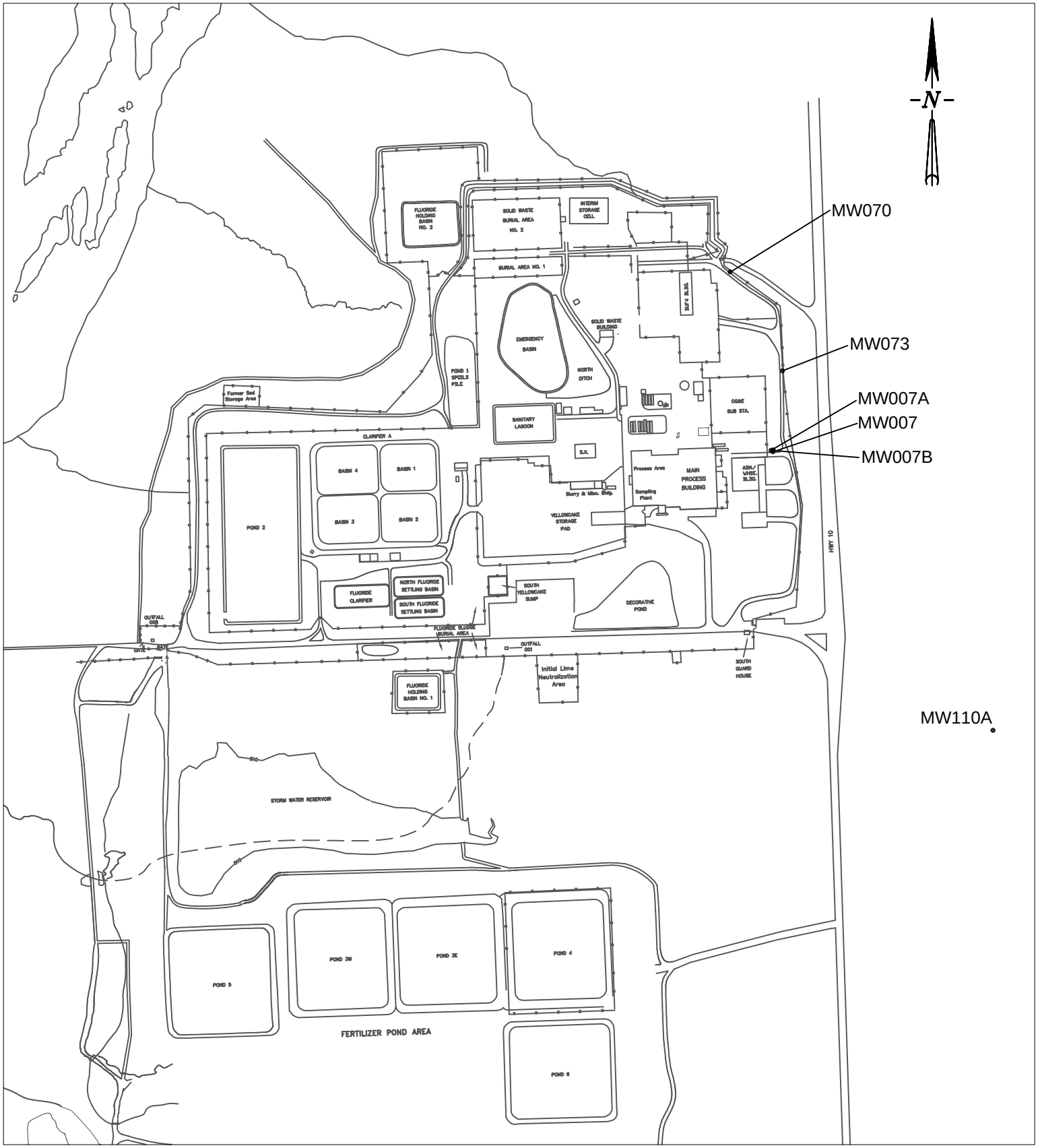
Table 3

Basic Statistics for Background Monitoring Wells

(Sample Analyses from 2005 through 2015)

Parameter	Mean ± Standard Deviation (Number of Analyses / Number of Non-Detects)						
	All Wells	**MW007**	**MW070**	**MW073**	**MW007A**	**MW110A**	**MW007B**
Geological Unit	-	Terrace / Shale 1			Shale 3	Shale 4	Shale 5
Antimony, mg/l	0.007 ± 0.004 (84/64)	0.007 ± 0.004 (14/8)	0.007 ± 0.004 (14/11)	0.007 ± 0.004 (14/10)	0.006 ± 0.003 (14/13)	0.007 ± 0.004 (14/11)	0.007 ± 0.004 (14/11)
Arsenic, mg/l	0.008 ± 0.003 (85/53)	0.007 ± 0.003 (14/8)	0.010 ± 0.004 (15/7)	0.007 ± 0.003 (14/12)	0.007 ± 0.002 (14/11)	0.008 ± 0.003 (14/10)	0.008 ± 0.003 (14/5)
Barium, mg/l	0.074 ± 0.107 (84/4)	0.055 ± 0.036 (14/0)	0.252 ± 0.157 (14/0)	0.036 ± 0.016 (14/0)	0.018 ± 0.002 (14/0)	0.012 ± 0.003 (14/3)	0.073 ± 0.063 (14/1)
Beryllium, mg/l	0.005 ± 0.003 (84/73)	0.005 ± 0.003 (14/11)	0.005 ± 0.003 (14/11)	0.005 ± 0.004 (14/12)	0.005 ± 0.003 (14/13)	0.005 ± 0.004 (14/13)	0.005 ± 0.003 (14/13)
Cadmium, mg/l	0.003 ± 0.003 (84/73)	0.003 ± 0.003 (14/13)	0.004 ± 0.004 (14/8)	0.003 ± 0.003 (14/13)	0.003 ± 0.003 (14/13)	0.003 ± 0.003 (14/13)	0.003 ± 0.003 (14/13)
Chromium, mg/l	0.013 ± 0.015 (84/49)	0.016 ± 0.016 (14/5)	0.027 ± 0.028 (14/3)	0.012 ± 0.006 (14/8)	0.009 ± 0.005 (14/12)	0.009 ± 0.007 (14/13)	0.008 ± 0.003 (14/8)
Fluoride, mg/l	0.971 ± 0.771 (85/0)	0.729 ± 0.198 (14/0)	0.833 ± 0.556 (15/0)	0.514 ± 0.110 (14/0)	0.686 ± 0.077 (14/0)	0.514 ± 0.066 (14/0)	2.56 ± 0.344 (14/0)
Lead, mg/l	0.012 ± 0.013 (84/45)	0.011 ± 0.007 (14/7)	0.022 ± 0.027 (14/2)	0.010 ± 0.003 (14/7)	0.009 ± 0.005 (14/11)	0.009 ± 0.007 (14/8)	0.009 ± 0.004 (14/10)
Molybdenum, mg/l	0.009 ± 0.006 (84/67)	0.008 ± 0.003 (14/11)	0.011 ± 0.010 (14/11)	0.009 ± 0.004 (14/12)	0.007 ± 0.003 (14/10)	0.011 ± 0.008 (14/11)	0.007 ± 0.003 (14/12)
Nickel, mg/l	0.013 ± 0.018 (84/46)	0.012 ± 0.011 (14/9)	0.032 ± 0.037 (14/2)	0.010 ± 0.007 (14/7)	0.007 ± 0.003 (14/13)	0.009 ± 0.009 (14/9)	0.008 ± 0.002 (14/6)
Nitrate, mg/l	2.8 ± 1.9 (85/19)	2.5 ± 1.4 (14/0)	2.3 ± 1.2 (15/2)	4.1 ± 1.2 (14/0)	5.7 ± 0.9 (14/0)	1.2 ± 0.6 (14/9)	1.1 ± 0.2 (14/8)
Ra-226 + Ra-228, pCi/l	1.28 ± 1.08	0.98 ± 0.76	1.63 ± 1.30	0.73 ± 0.83	0.91 ± 1.06	1.77 ± 1.05	1.67 ± 1.11
Radium-226, pCi/l	0.375 ± 0.371 (84/6)	0.284 ± 0.248 (14/1)	0.711 ± 0.521 (14/1)	0.216 ± 0.207 (14/1)	0.076 ± 0.060 (14/2)	0.521 ± 0.337 (14/0)	0.445 ± 0.324 (14/1)
Radium-228, pCi/l	1.01 ± 1.02 (78/14)	0.682 ± 0.717 (13/3)	0.994 ± 1.00 (13/1)	0.582 ± 0.734 (13/3)	0.832 ± 1.06 (13/3)	1.66 ± 1.15 (13/1)	1.30 ± 1.15 (13/3)
Selenium, mg/l	0.010 ± 0.008 (84/63)	0.010 ± 0.004 (14/9)	0.009 ± 0.004 (14/12)	0.012 ± 0.008 (14/8)	0.009 ± 0.005 (14/10)	0.015 ± 0.016 (14/11)	0.008 ± 0.002 (14/13)
Thallium, mg/l	0.008 ± 0.006 (84/56)	0.010 ± 0.008 (14/10)	0.007 ± 0.004 (14/11)	0.007 ± 0.003 (14/10)	0.008 ± 0.003 (14/9)	0.009 ± 0.009 (14/8)	0.010 ± 0.008 (14/8)
Thorium-230, pCi/l	0.480 ±0.836 (84/20)	0.593 ± 0.708 (14/3)	0.902 ± 1.70 (14/2)	0.367 ± 0.322 (14/3)	0.353 ± 0.658 (14/6)	0.342 ± 0.240 (14/3)	0.321 ± 0.420 (14/3)
Uranium, µg/l	4.7 ± 10.0 (86/34)	1.1 ± 0.4 (14/11)	17.6 ± 18.4 (16/1)	1.0 ± 0.05 (14/12)	1.3 ± 0.3 (14/5)	2.0 ± 0.7 (14/2)	3.0 ± 2.5 (14/3)

Note: Non-Detects and Negative Values Replaced with Detection Limit
Orignial Data (Not Transformed)



SEQUOYAH FUELS CORPORATION
Background Groundwater Monitoring Well Evaluation

TITLE: *Background Monitoring Well Locations*

PREPARED BY: *SCM*

FILENAME: *Figure1_BkgdWells2015.dwg*

REVIEWED BY: *SCM*

DATE: *29 Feb 2016*

FIGURE NO. 1

Figure 2

Antimony - Box Plot

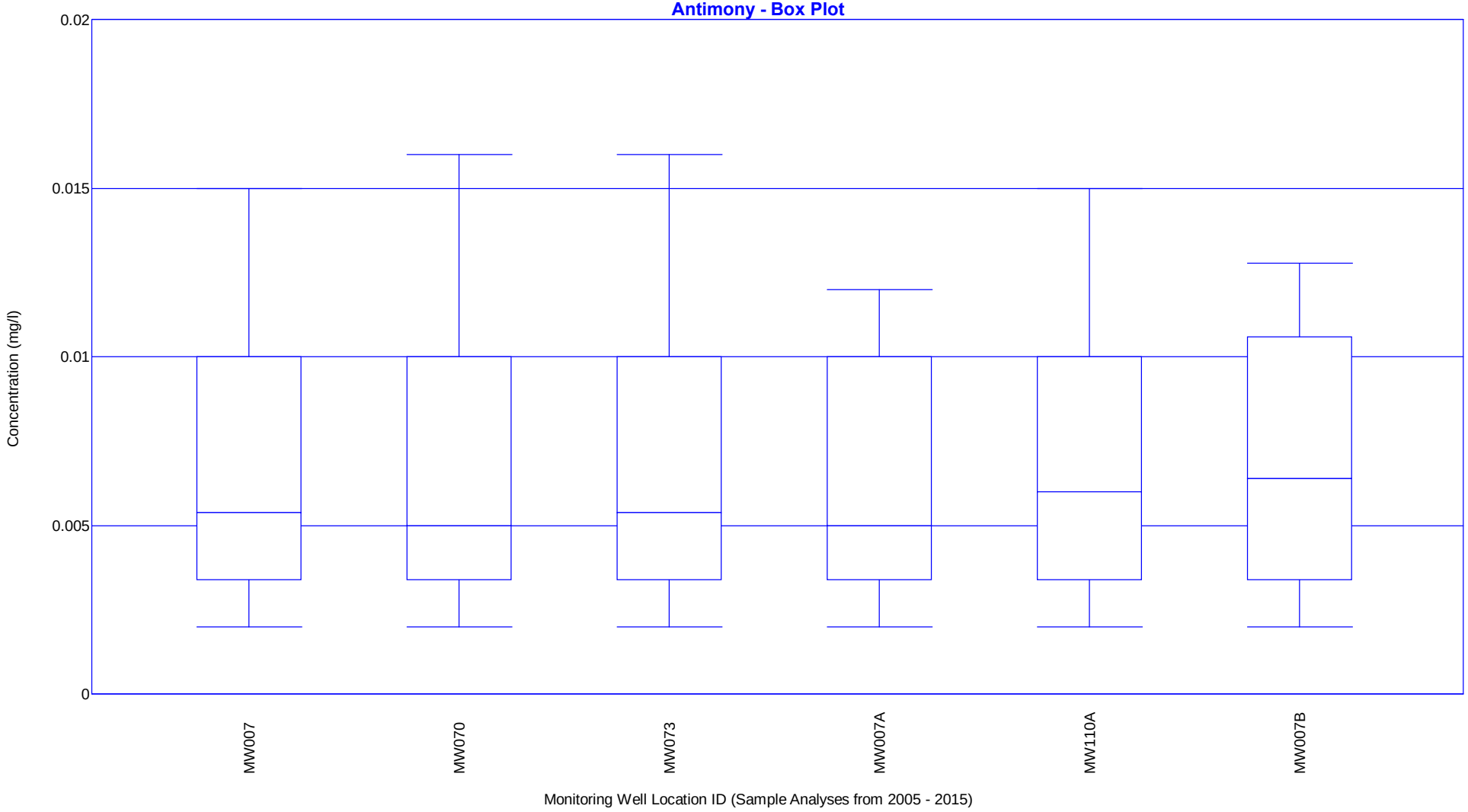


Figure 3

Arsenic - Box Plot

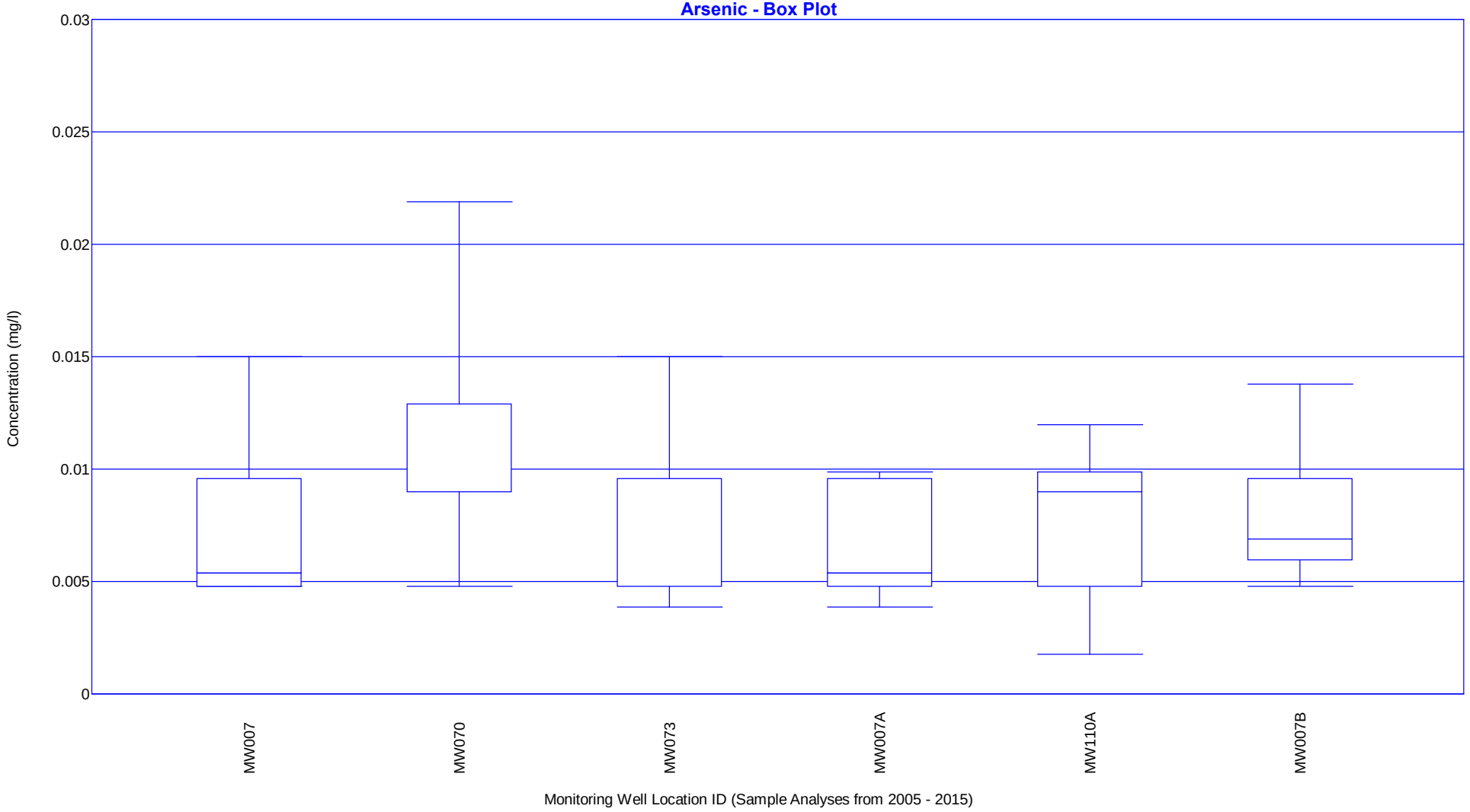


Figure 4

Barium - Box Plot

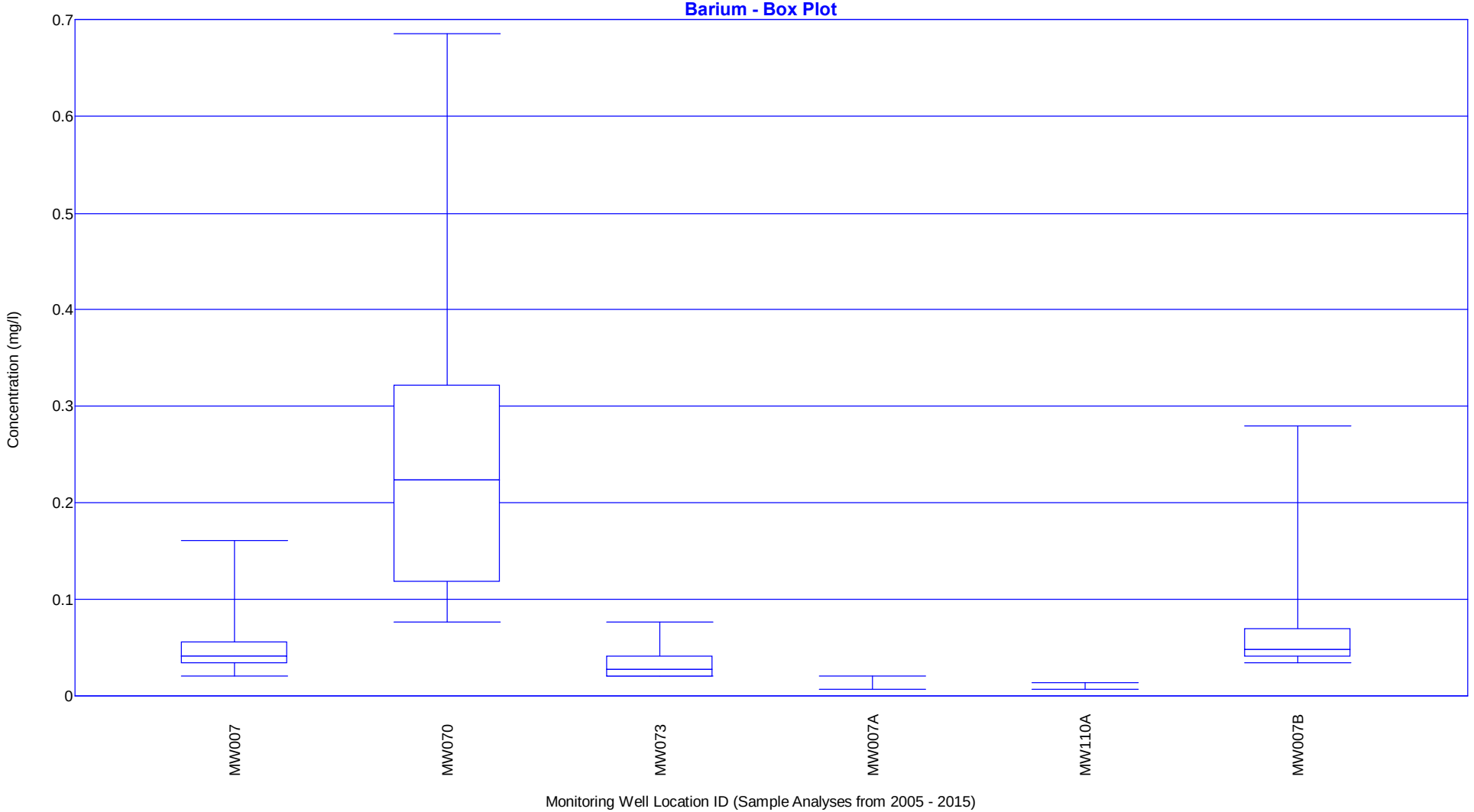


Figure 5

Beryllium - Box Plot

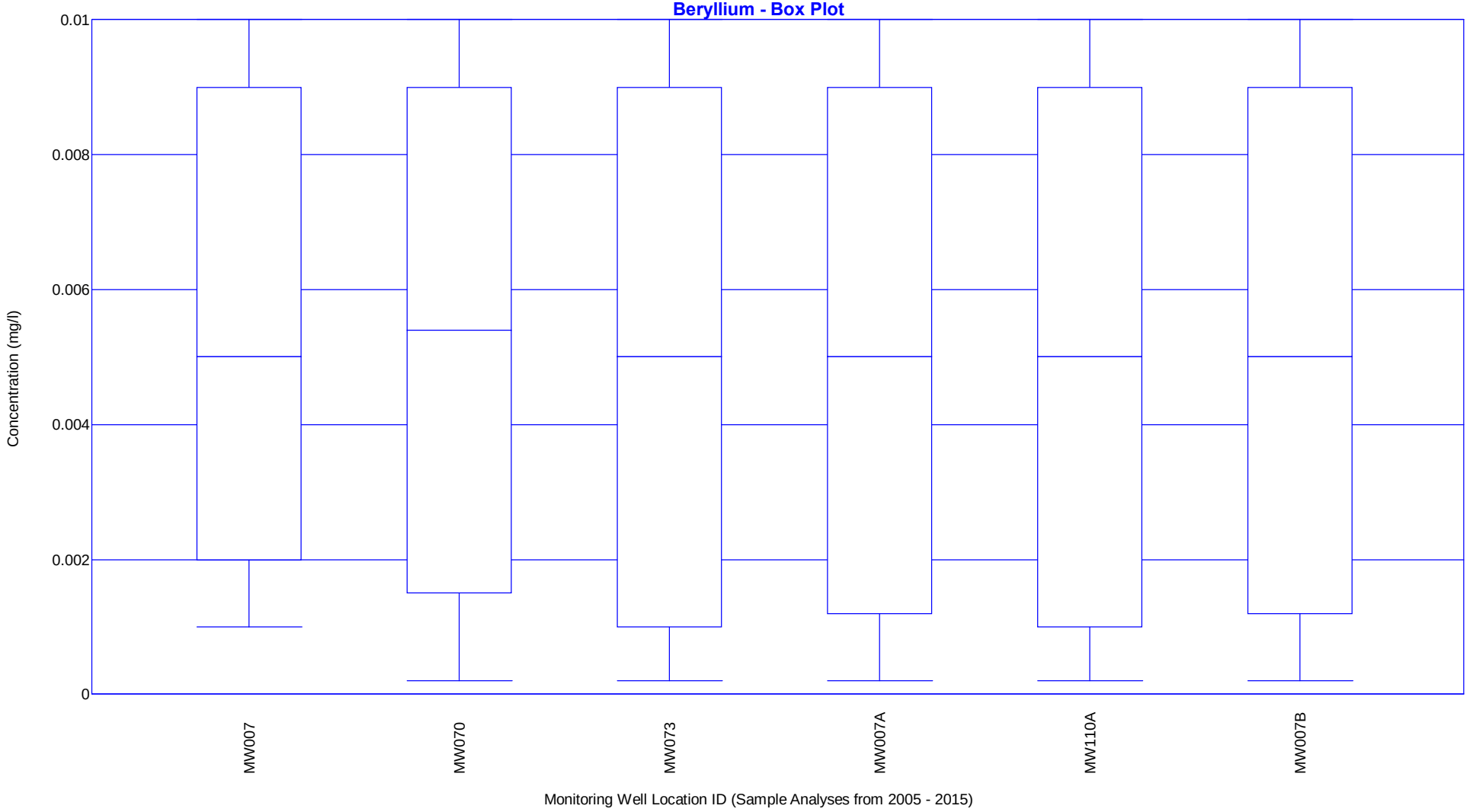


Figure 6

Cadmium - Box Plot

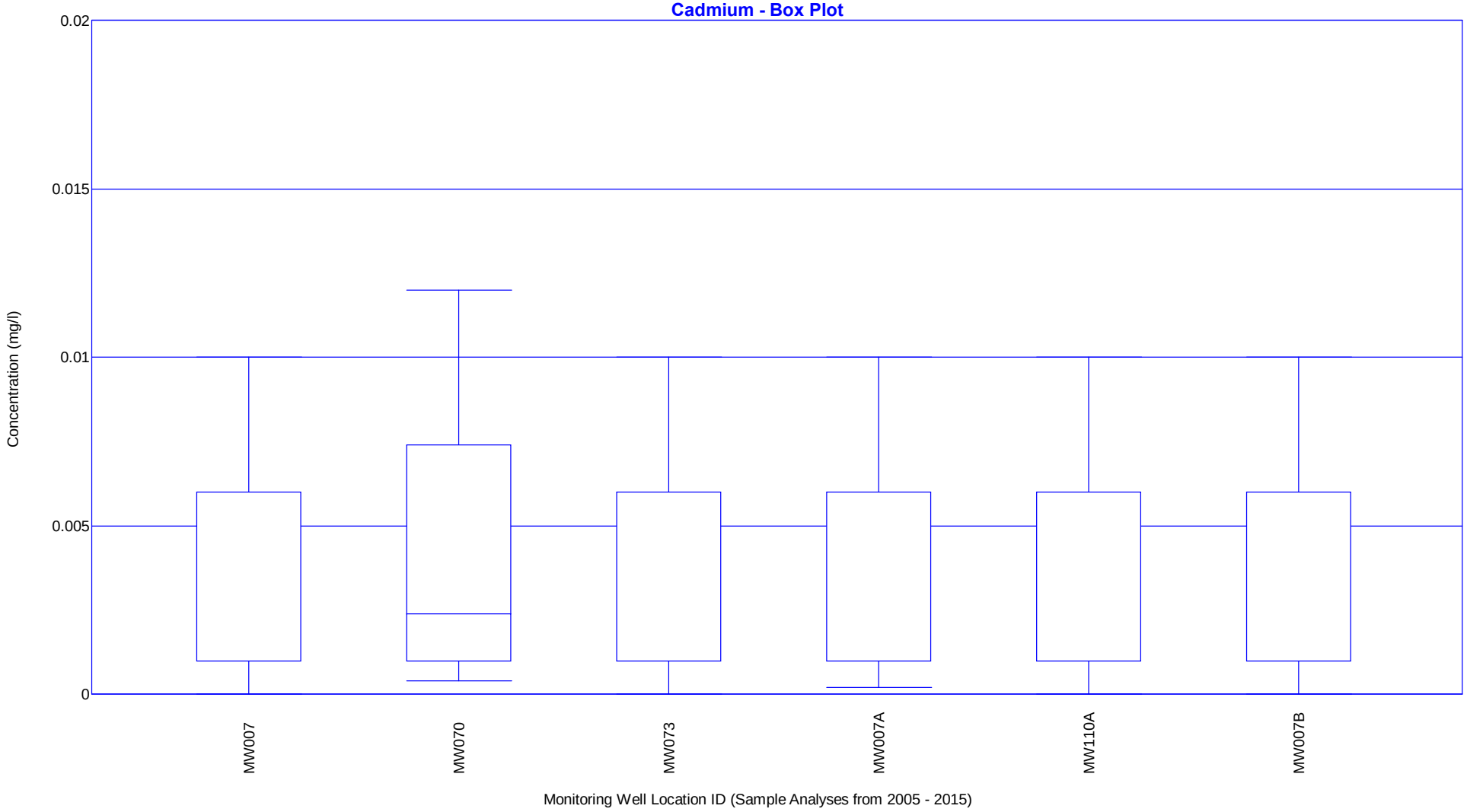


Figure 7

Chromium - Box Plot

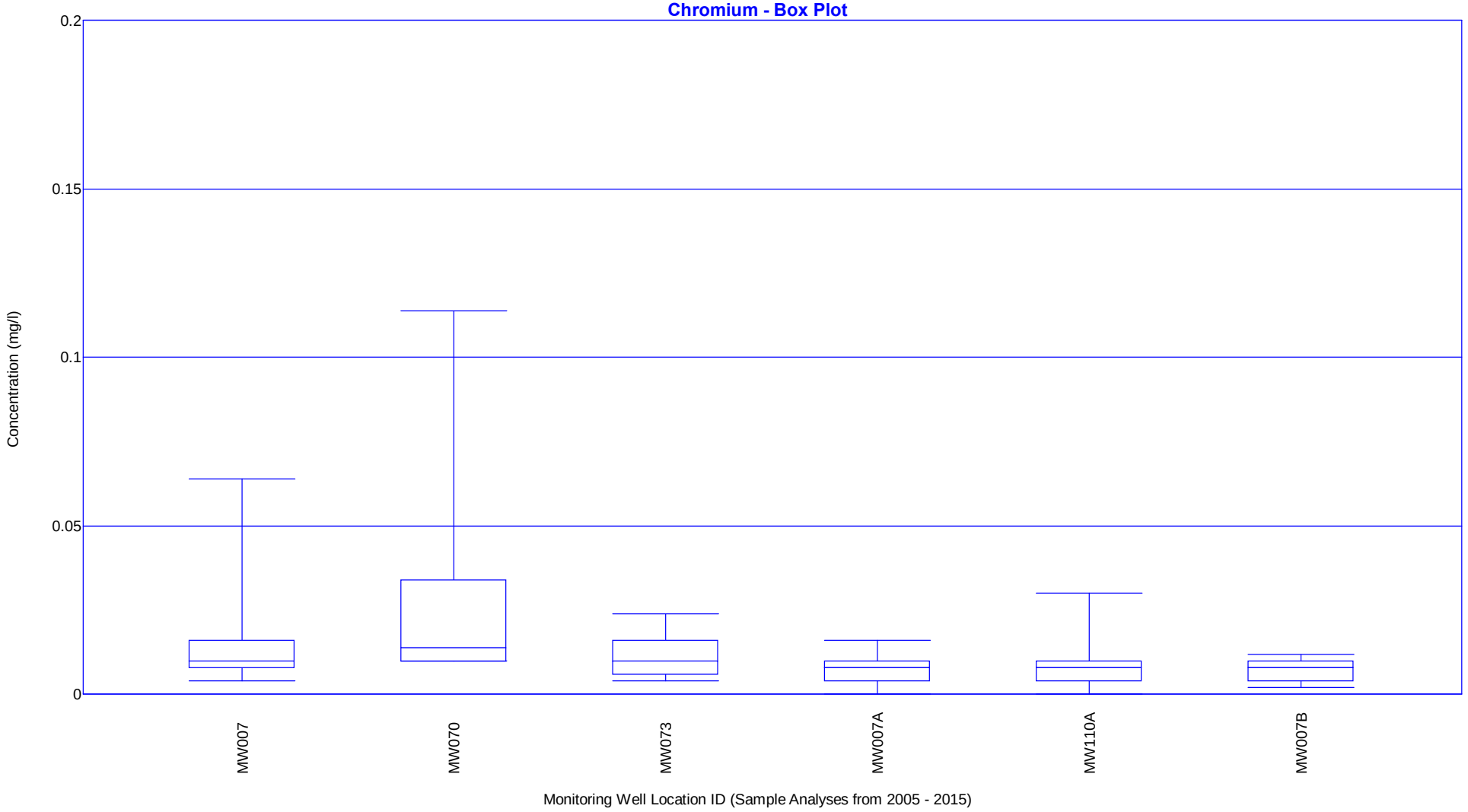


Figure 8

Fluoride - Box Plot

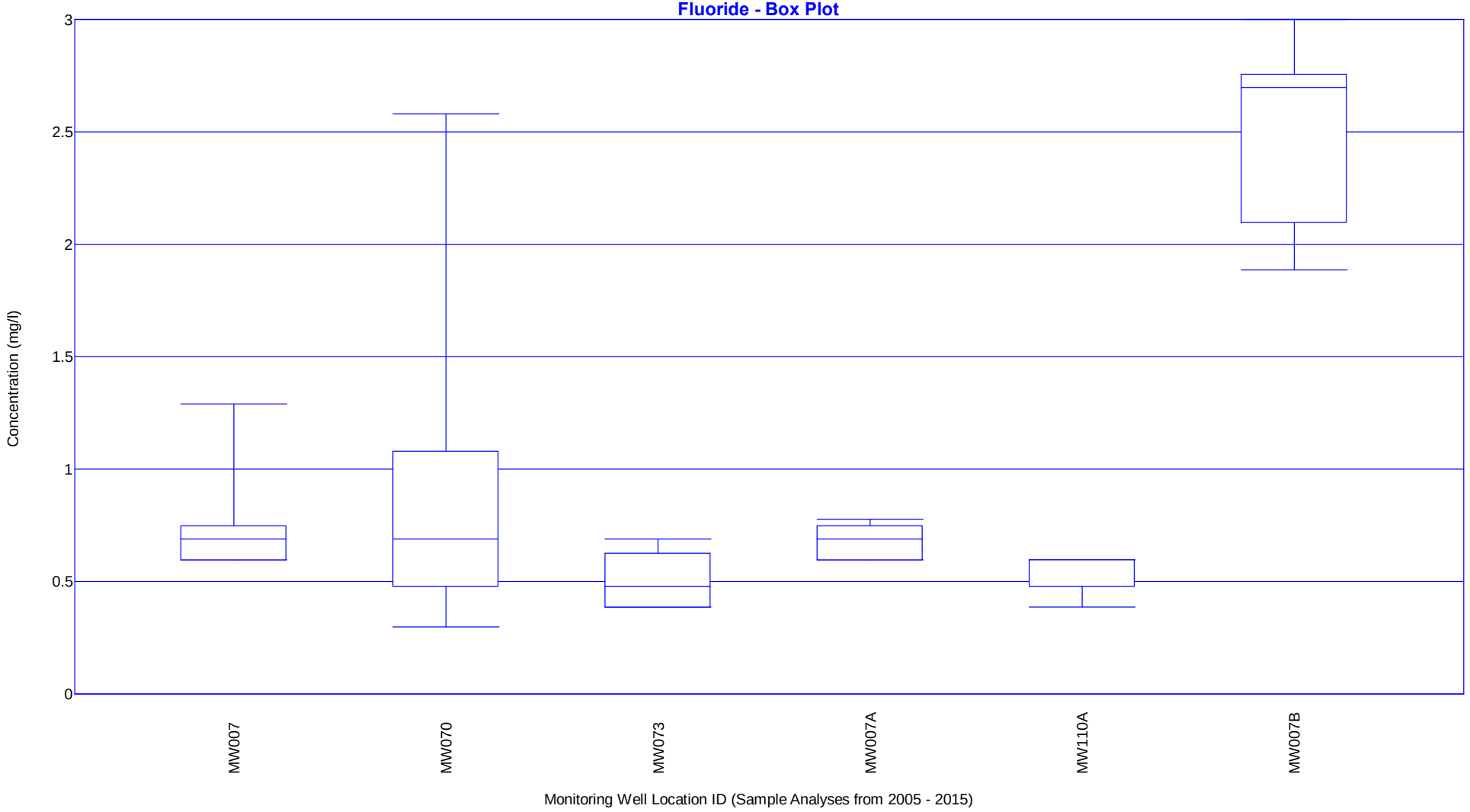


Figure 9

Lead - Box Plot

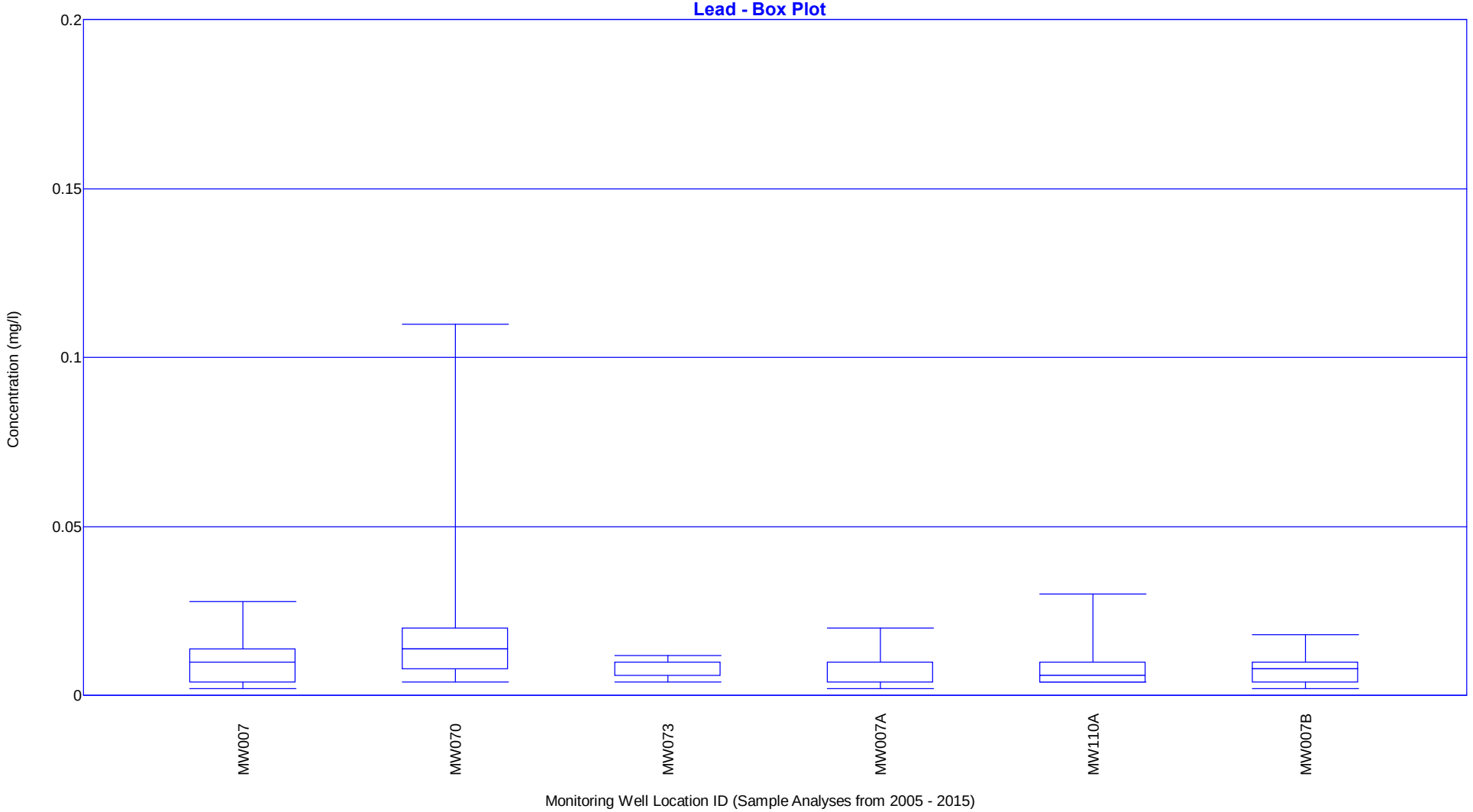


Figure 10

Molybdenum - Box Plot

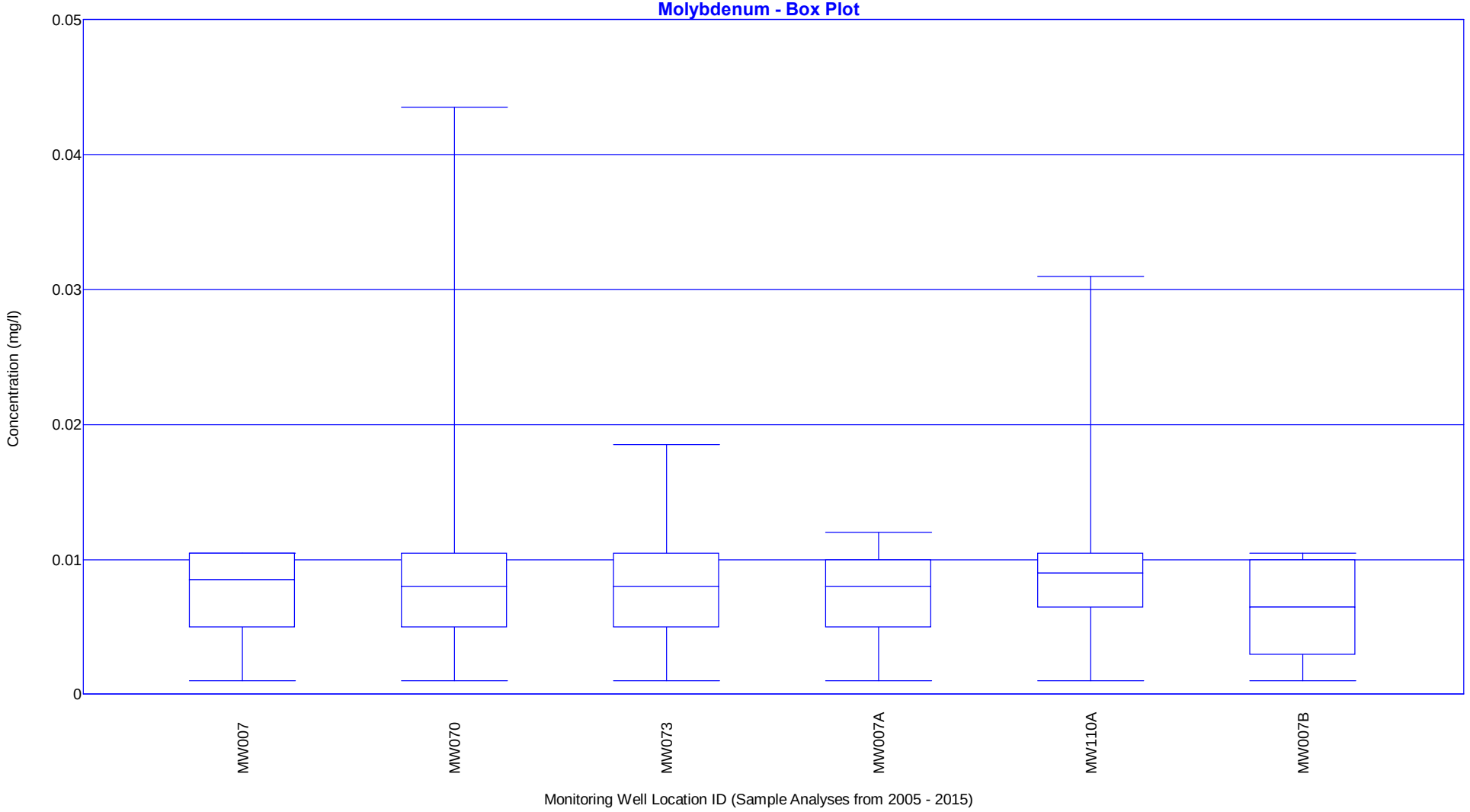


Figure 11

Nickel - Box Plot

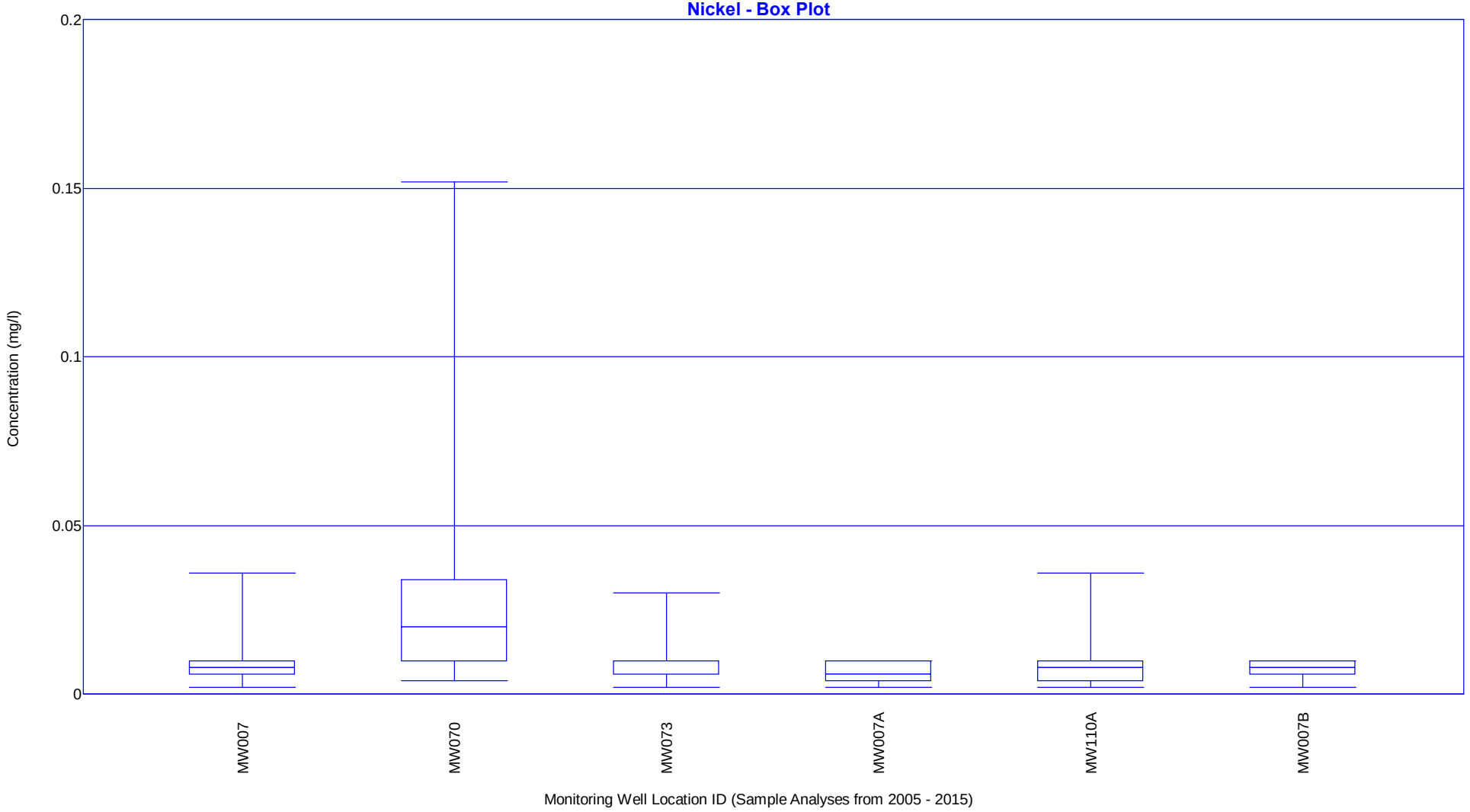


Figure 12

Nitrate - Box Plot

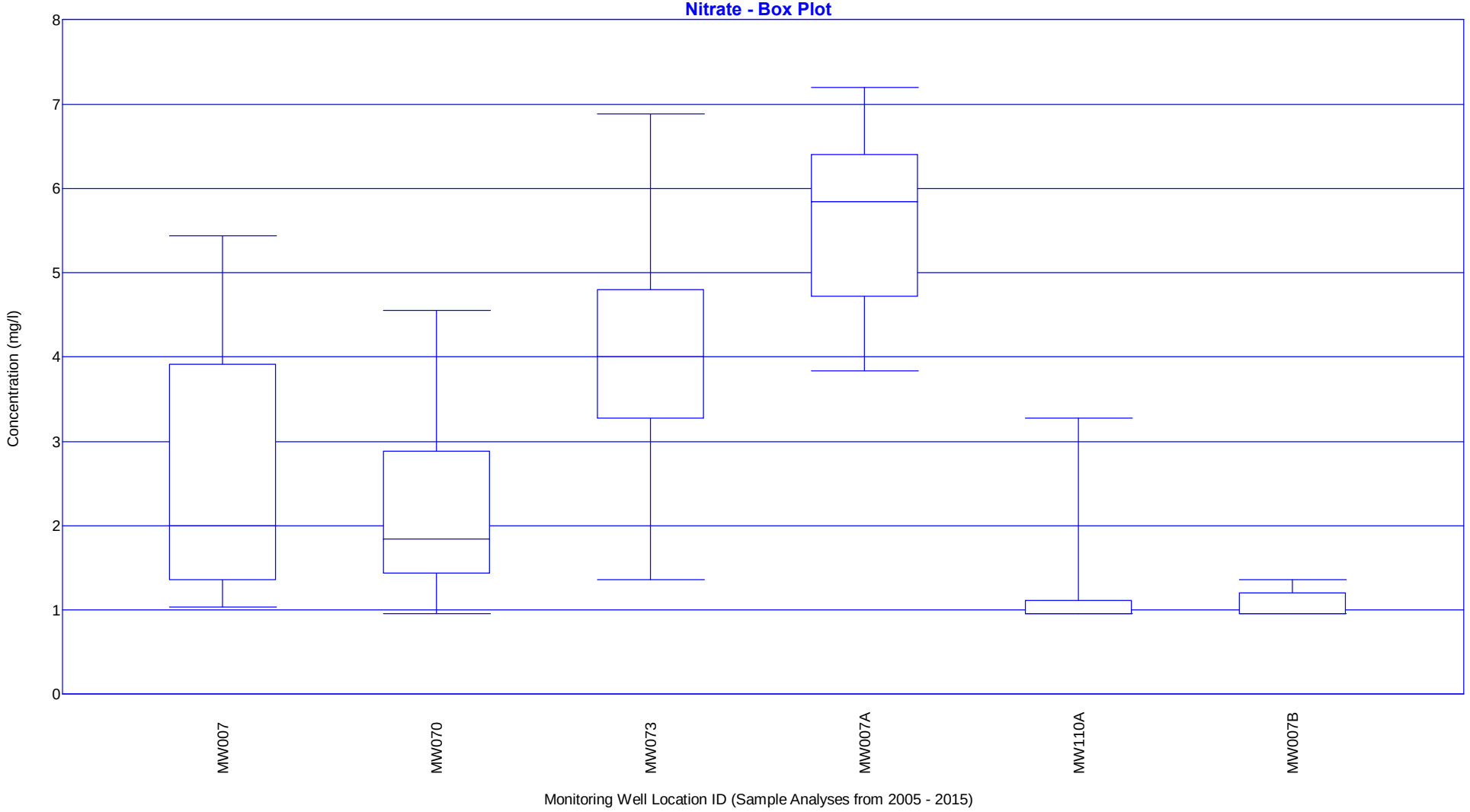


Figure 13

Ra-226 + Ra-228 - Box Plot

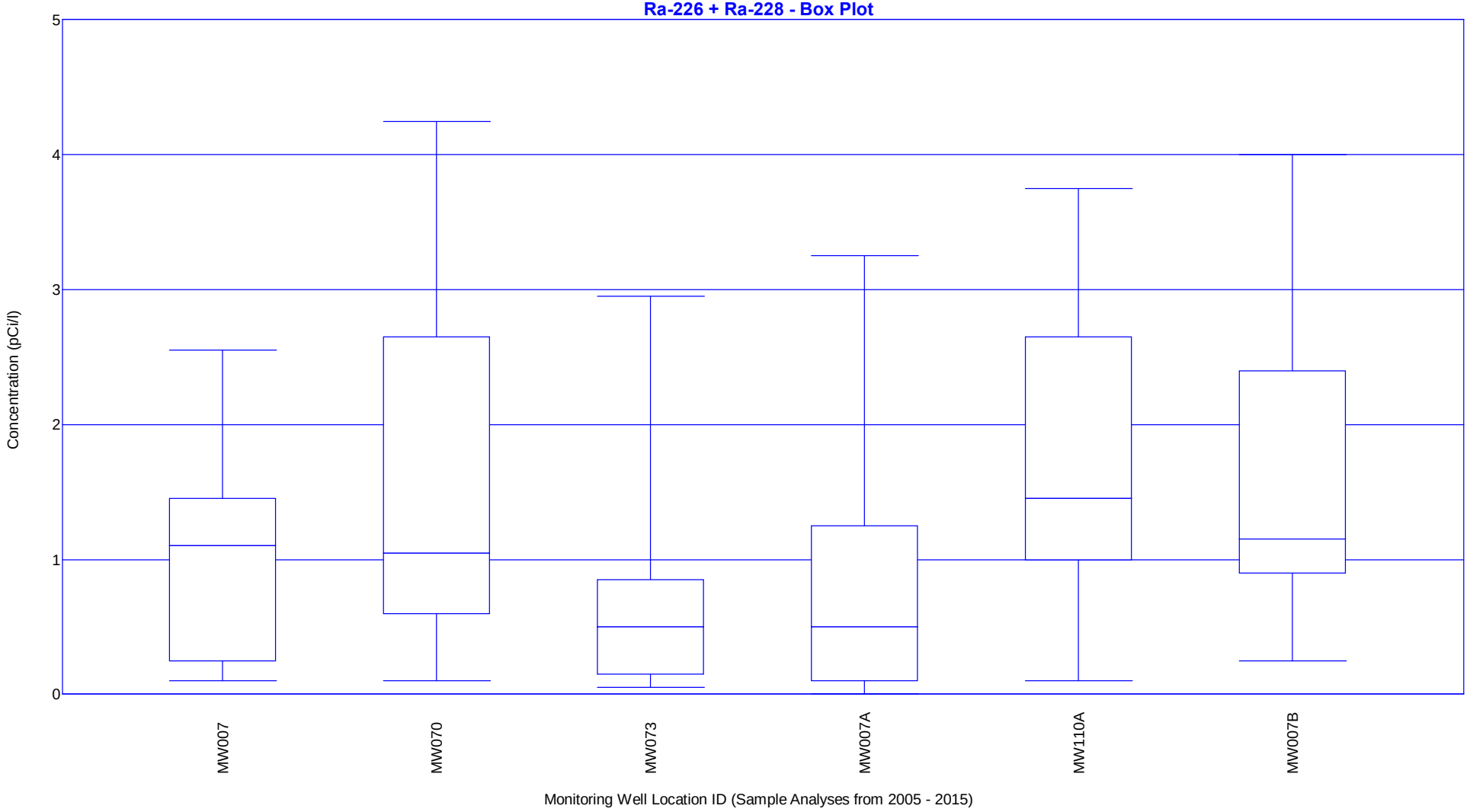


Figure 14

Radium-226 - Box Plot

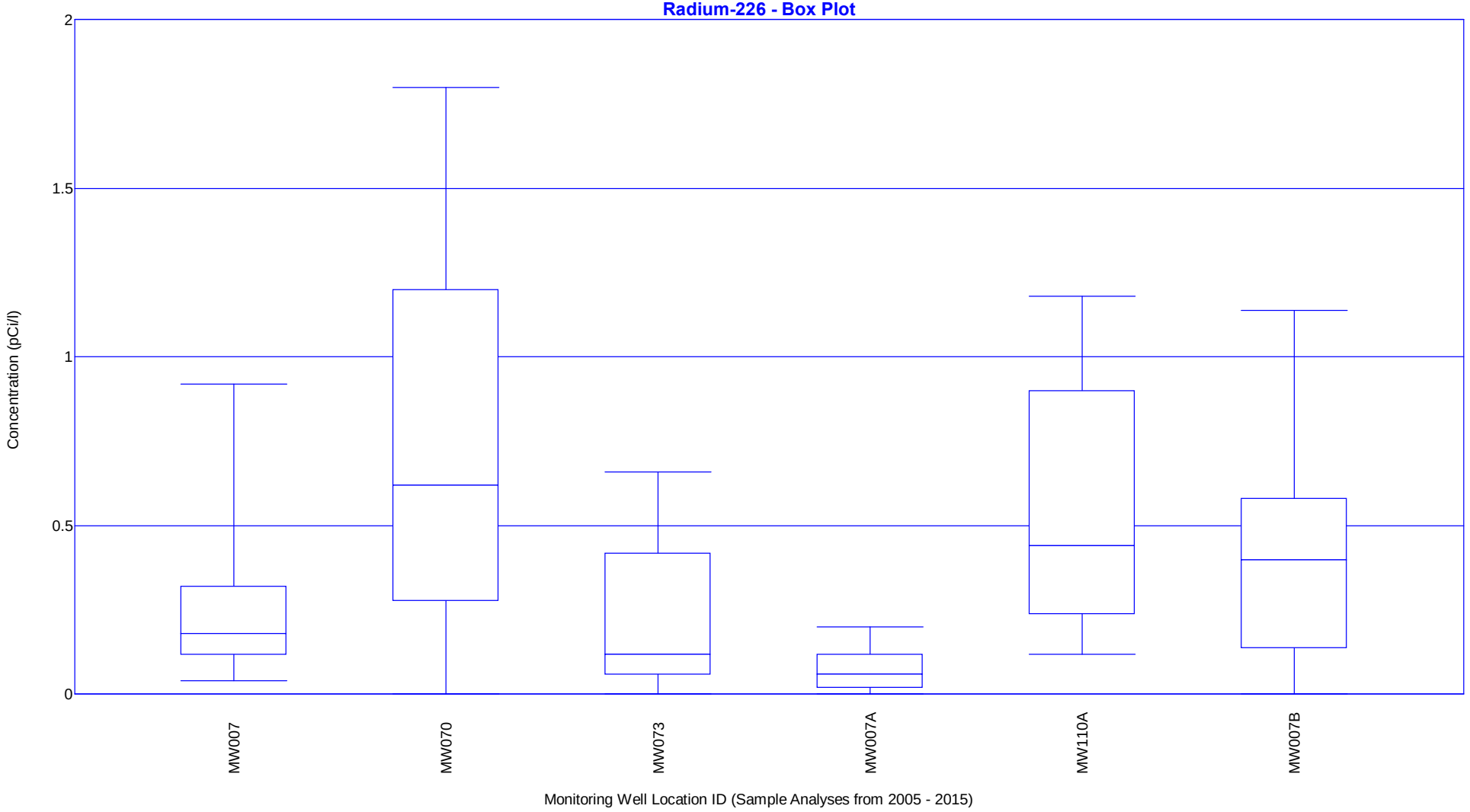


Figure 15

Radium-228 - Box Plot

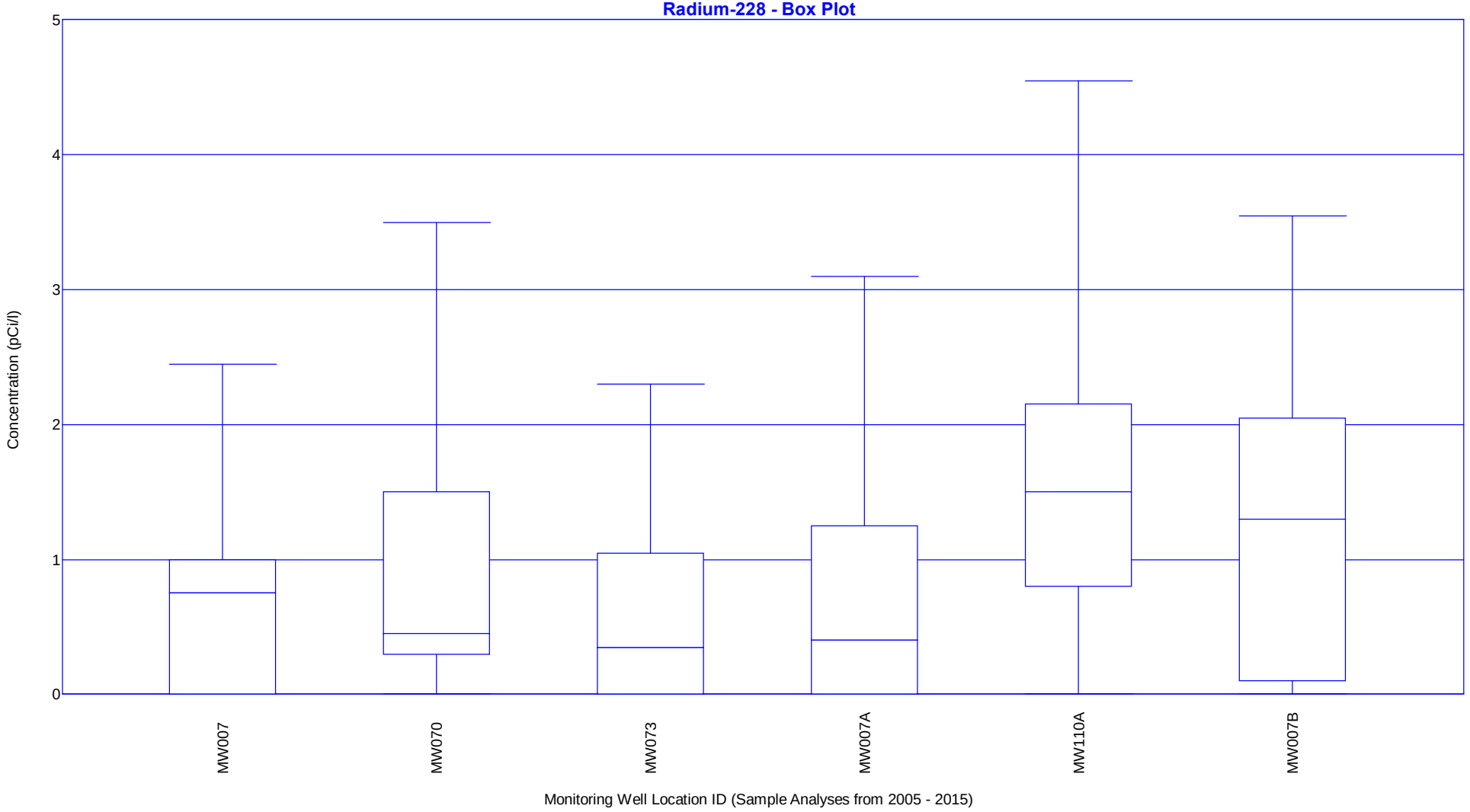


Figure 16

Selenium - Box Plot

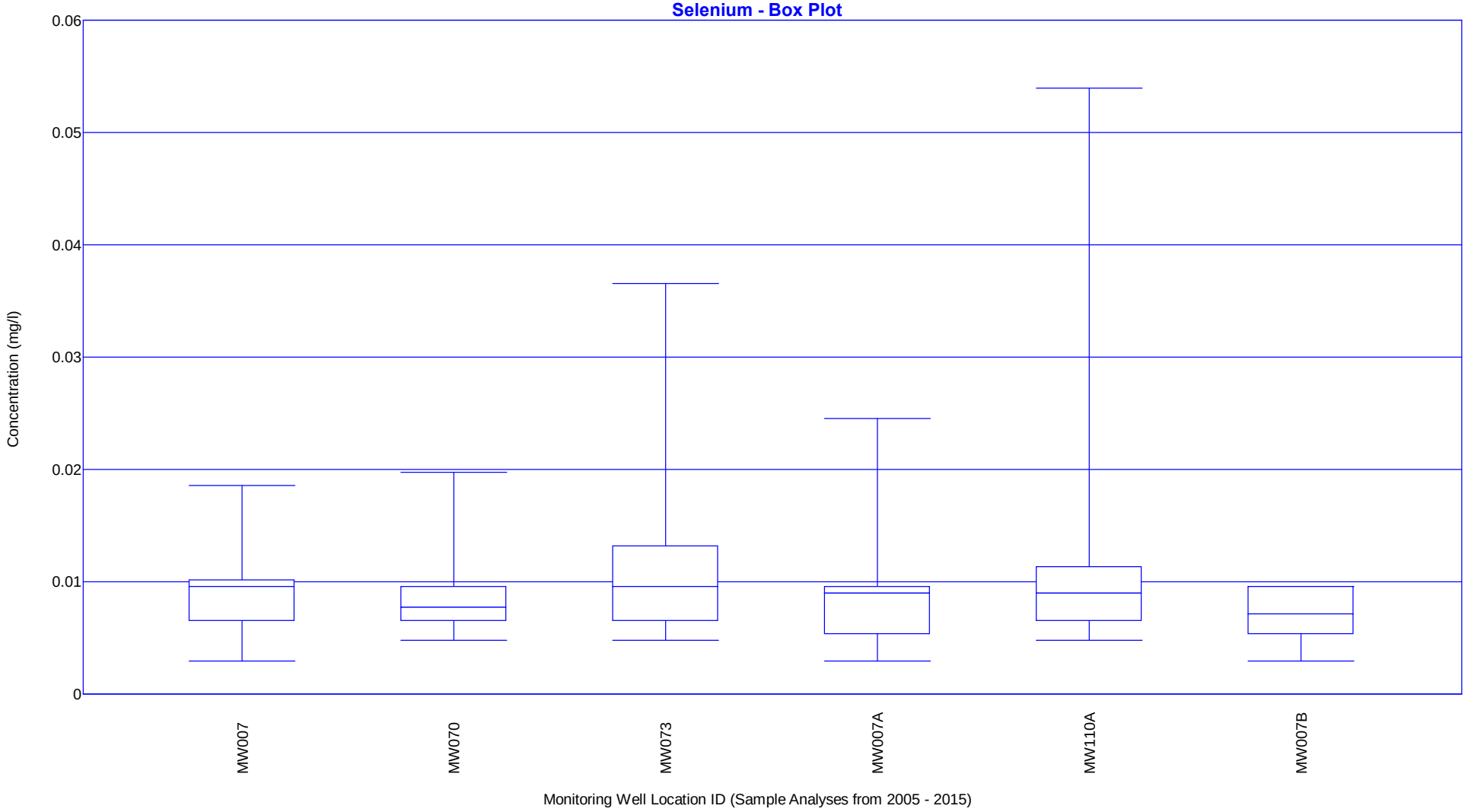


Figure 17

Thallium - Box Plot

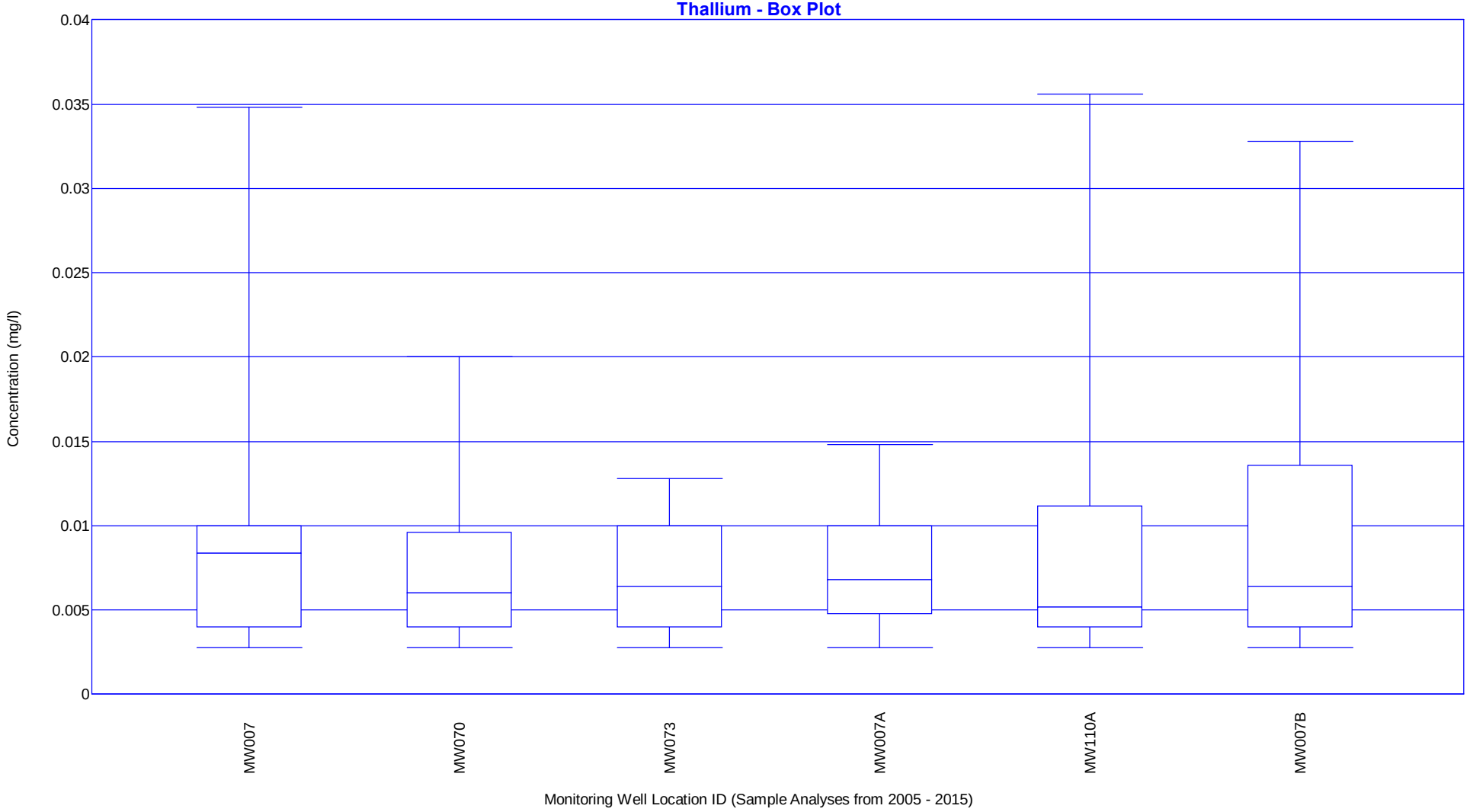


Figure 18

Thorium-230 - Box Plot

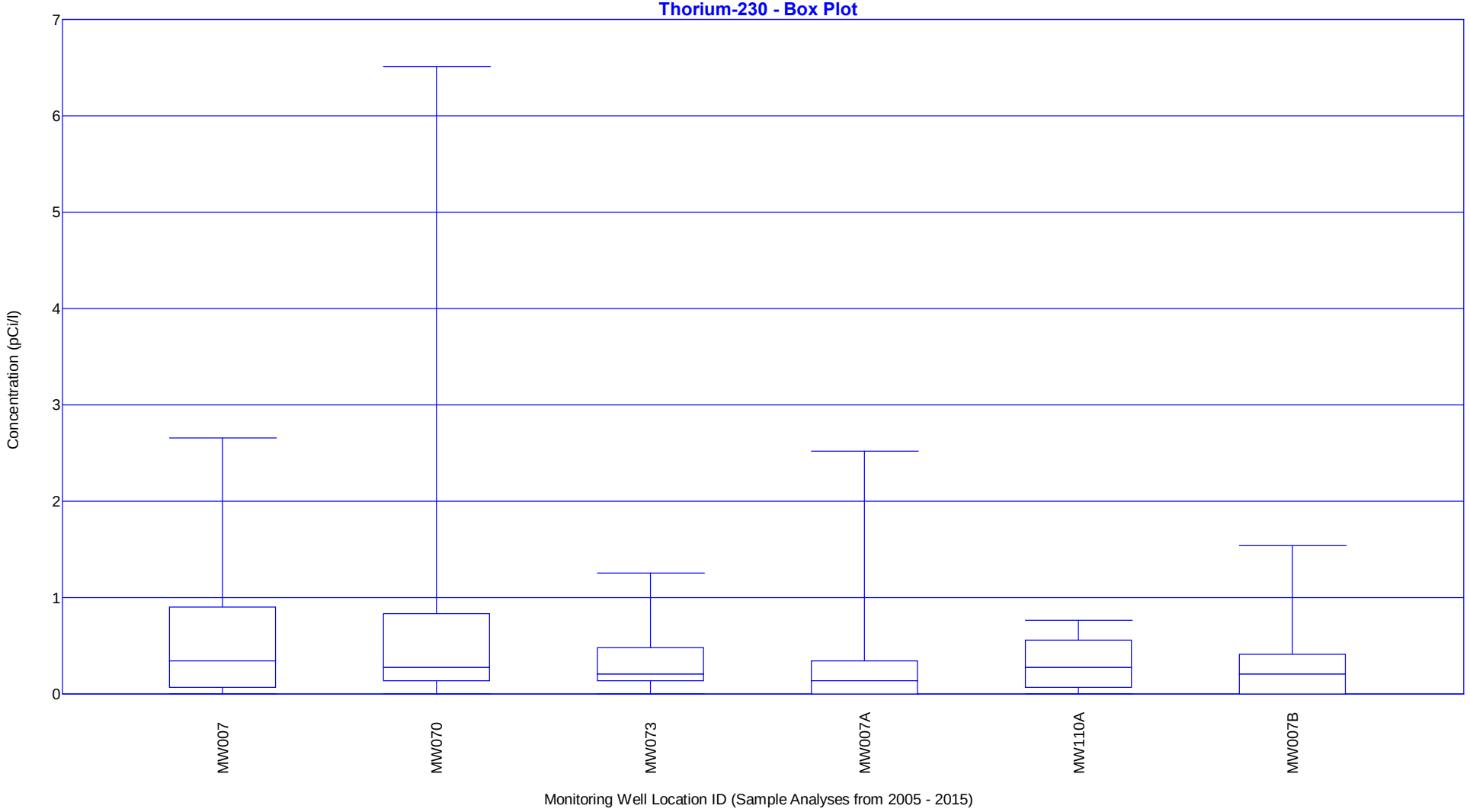
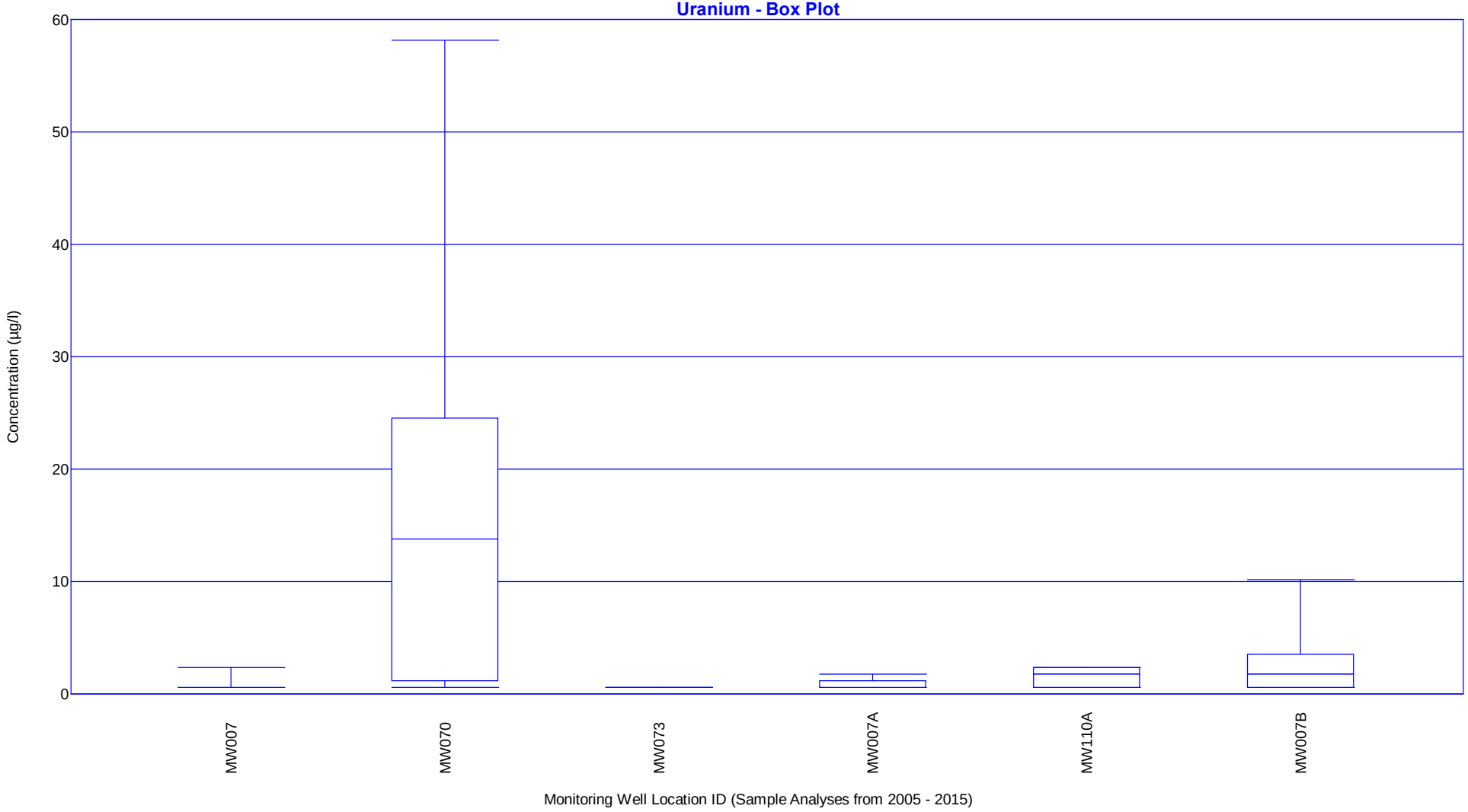


Figure 19

Uranium - Box Plot



Appendix B

Time Series Graphs for Groundwater Monitoring Wells

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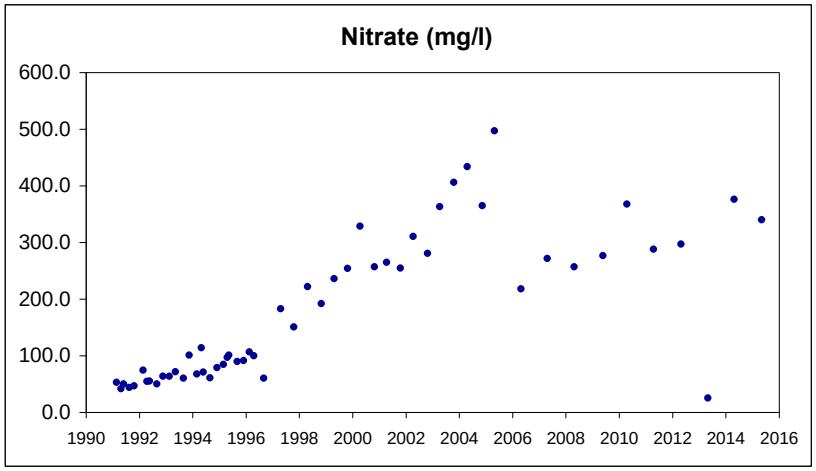

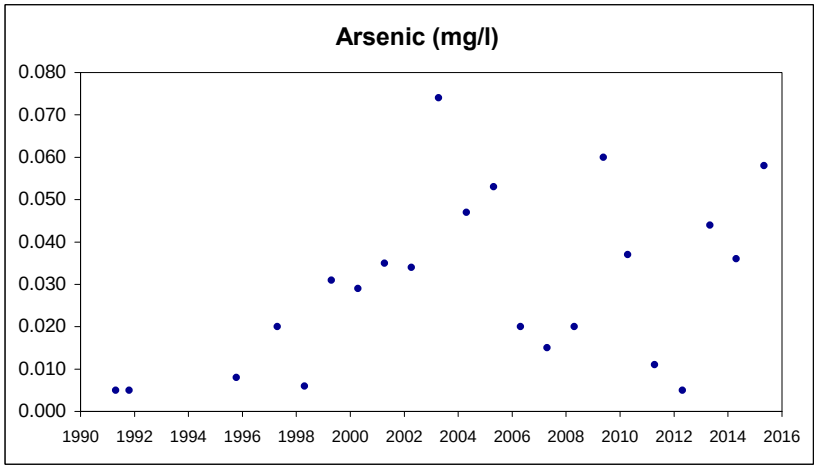

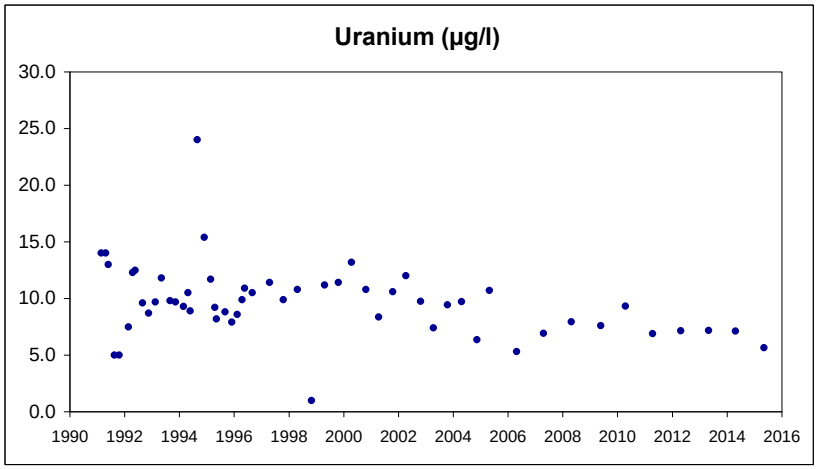

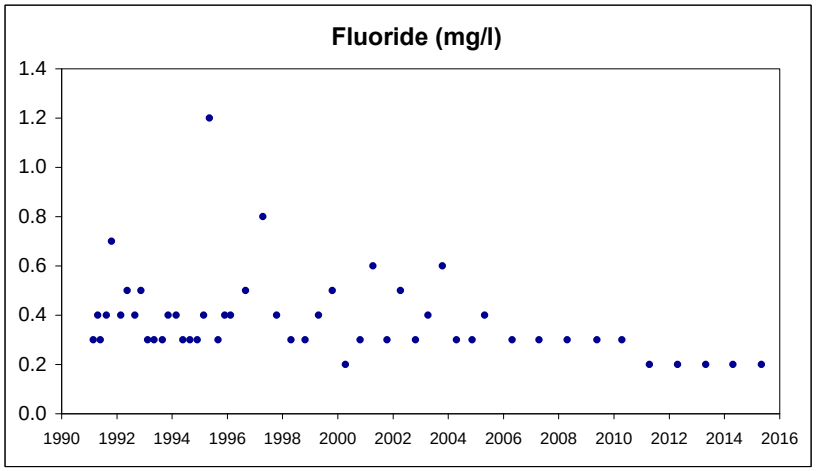

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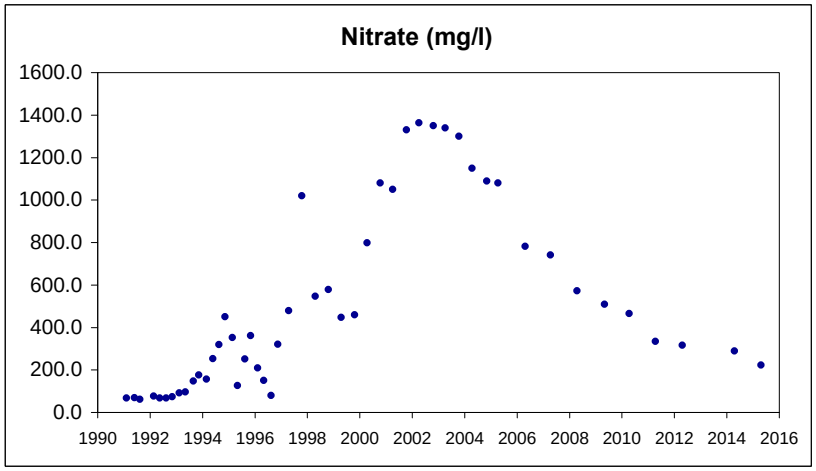

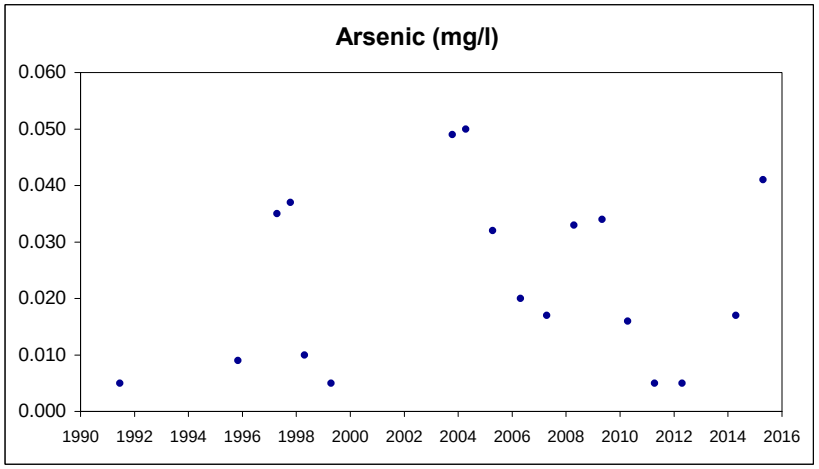

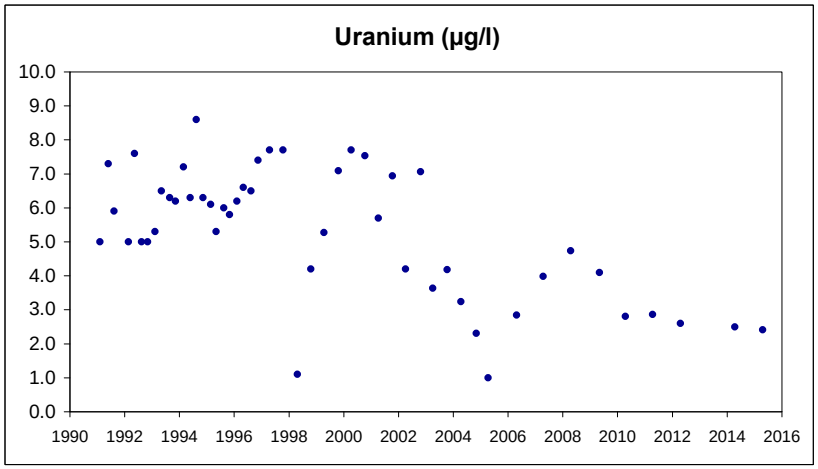

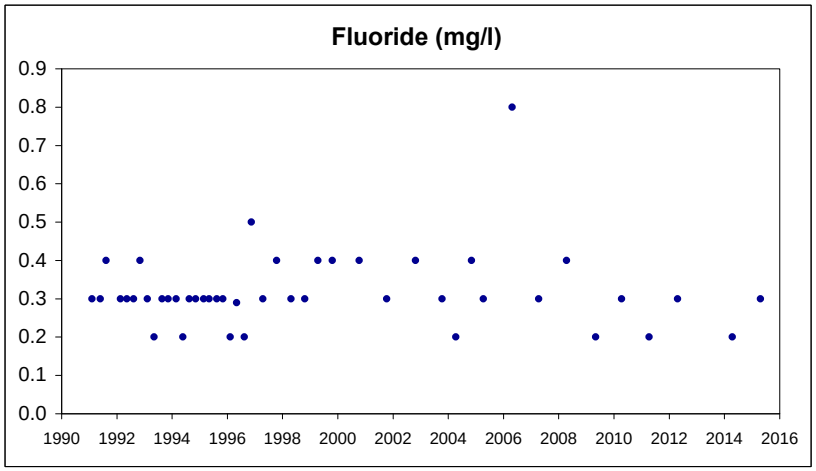

MW048

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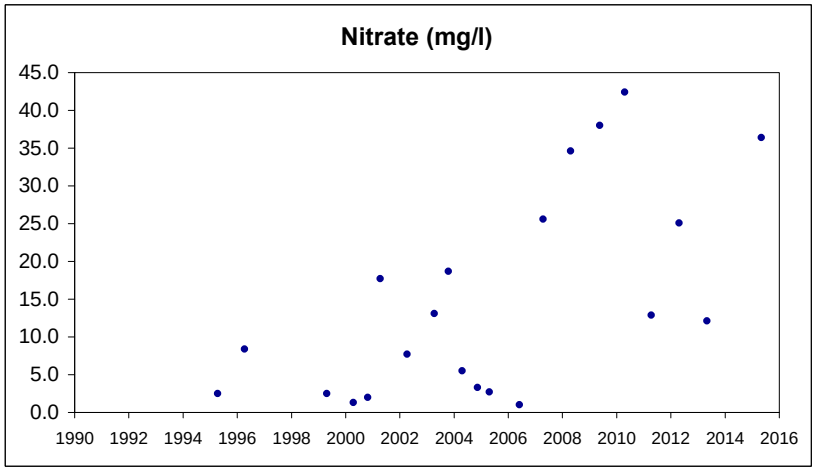

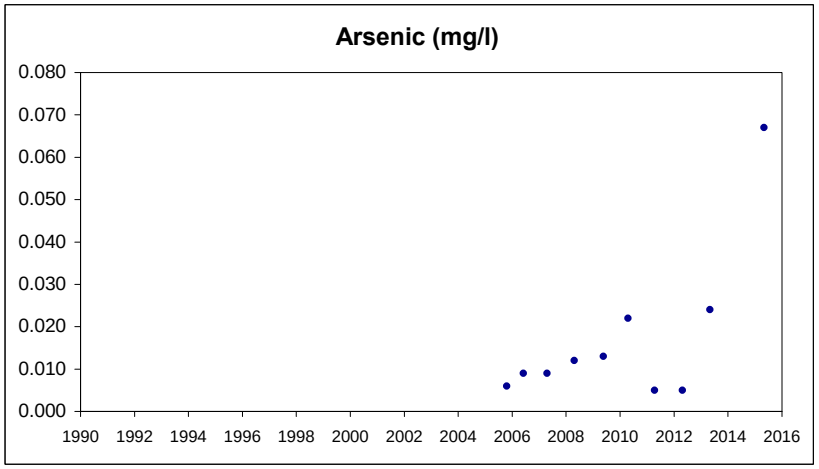

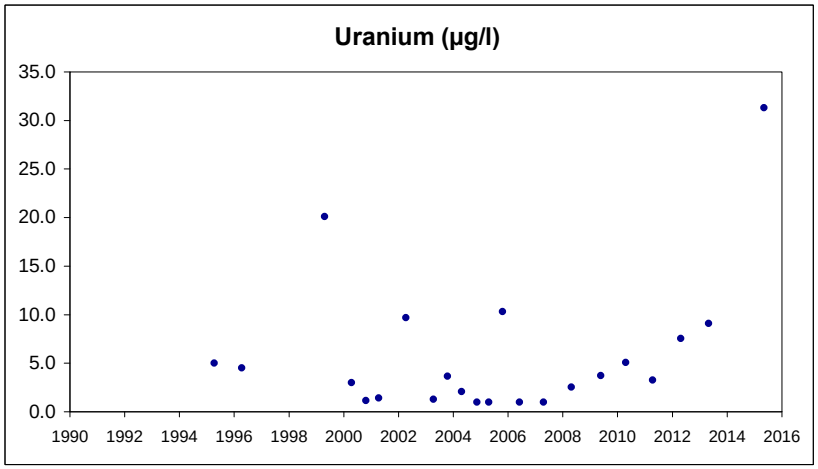

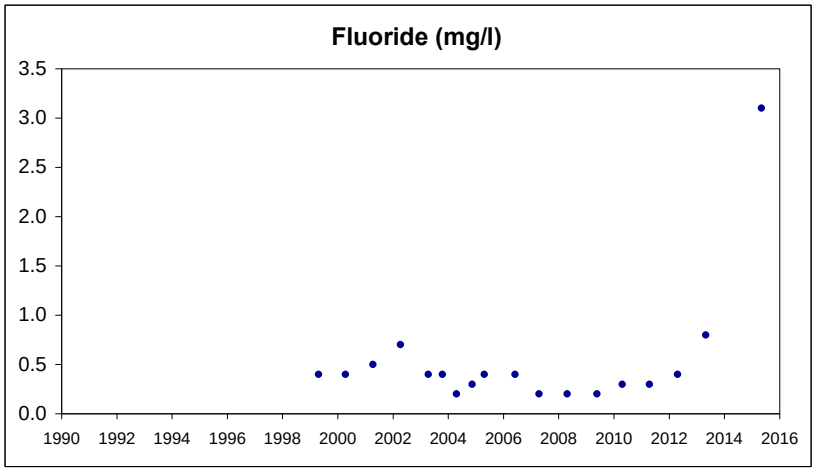

MW007

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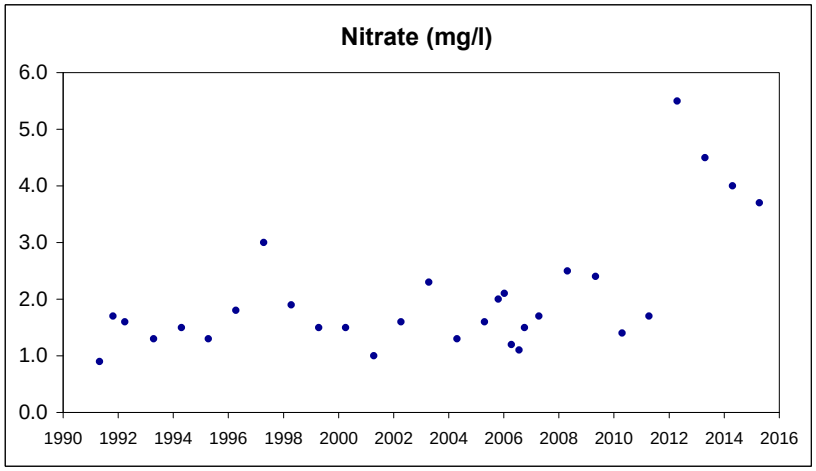

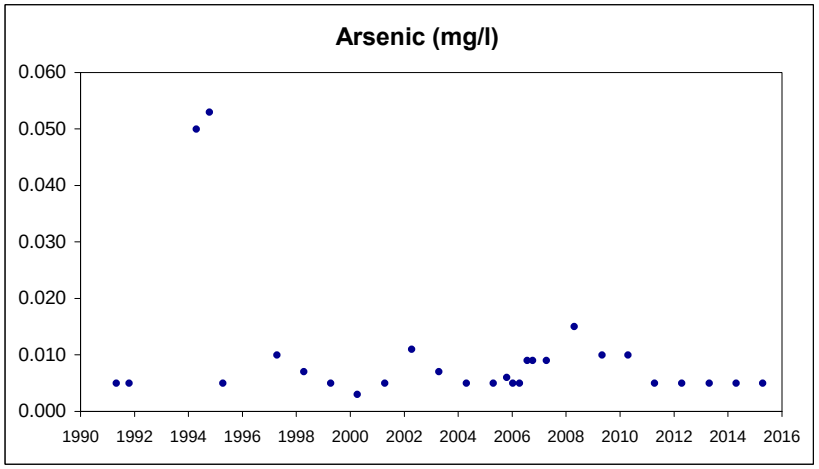

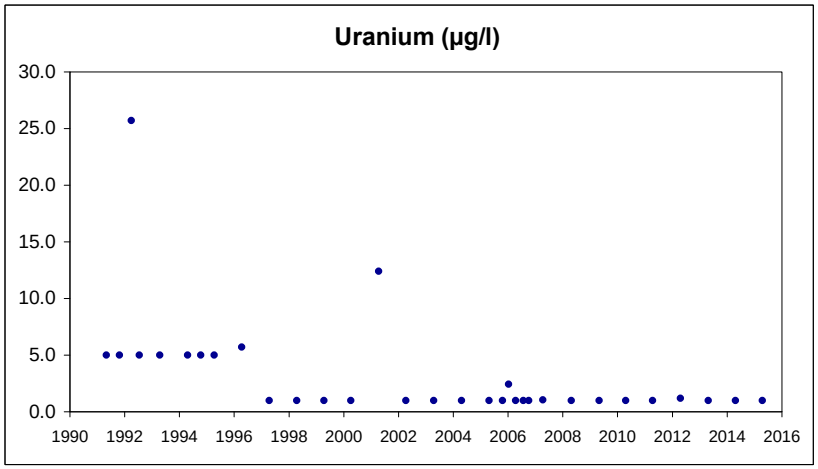

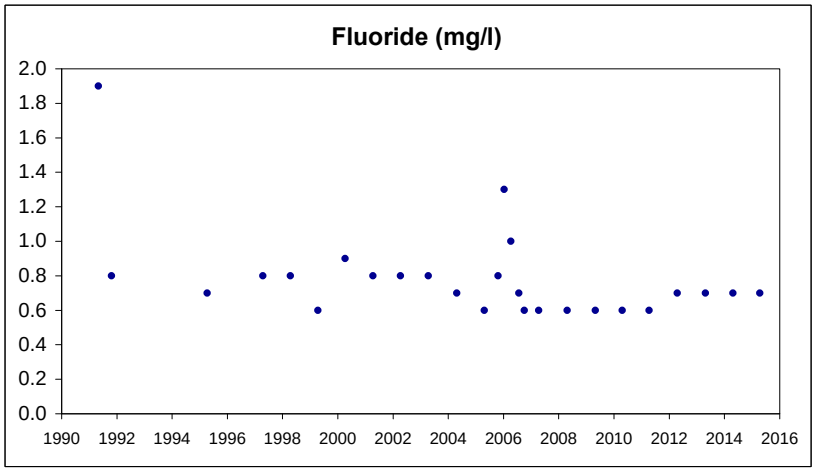

MW007A

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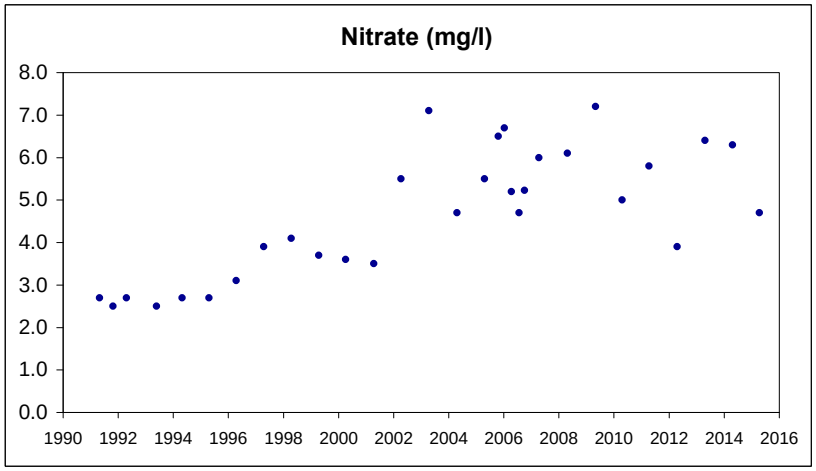

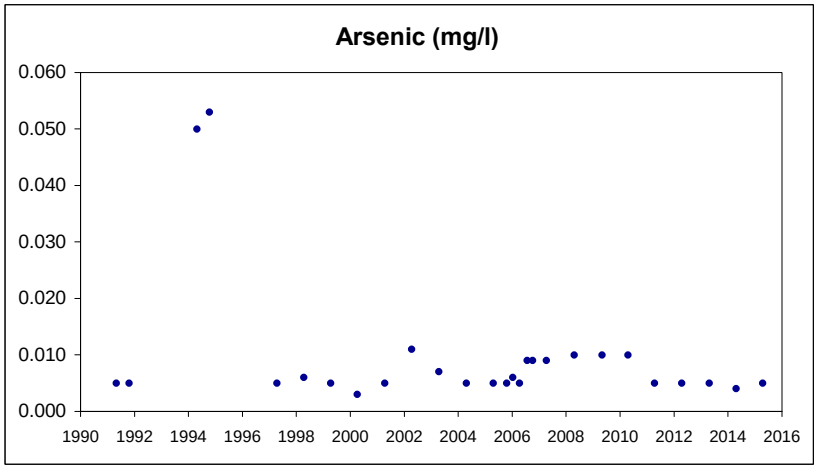

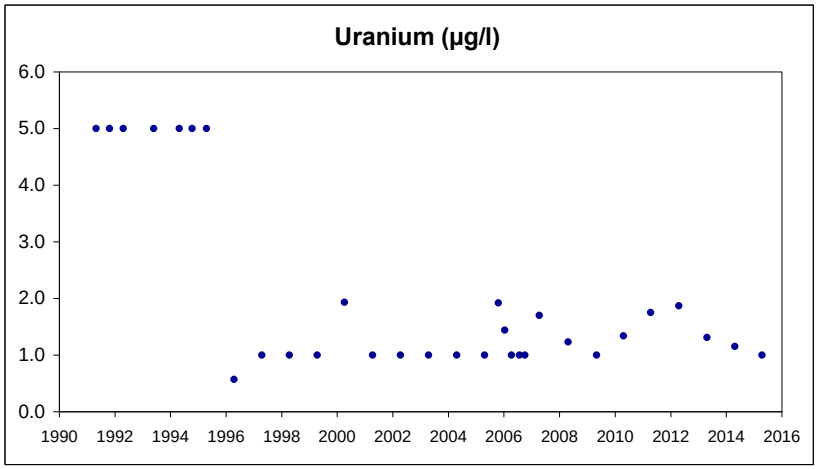

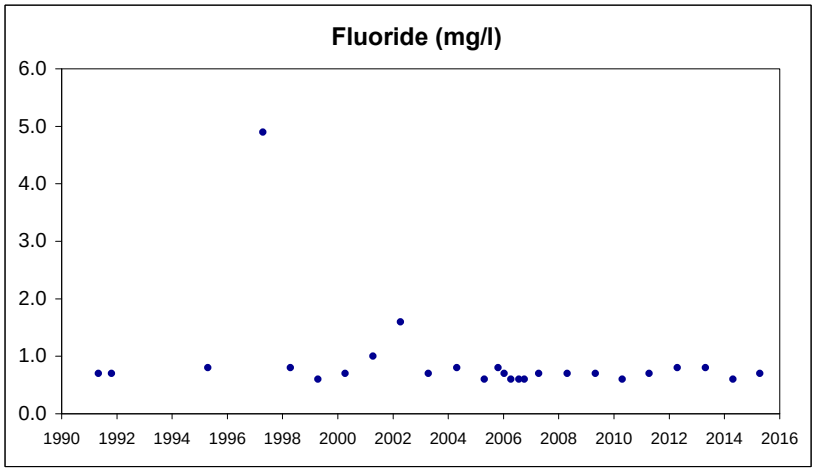

MW007B

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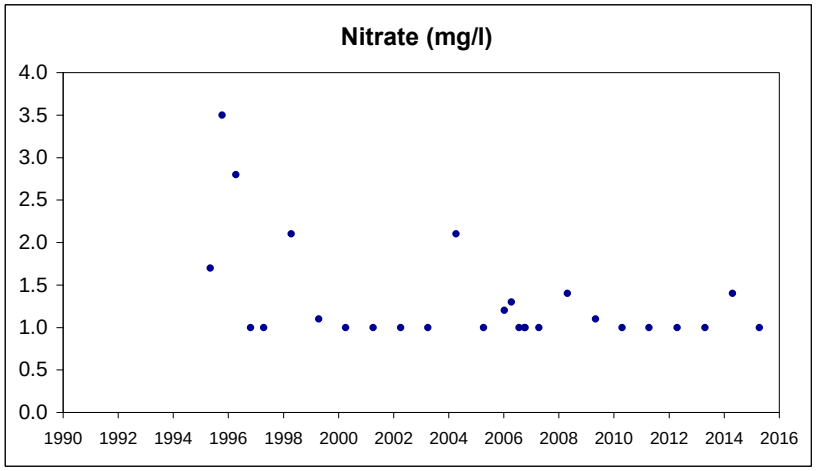
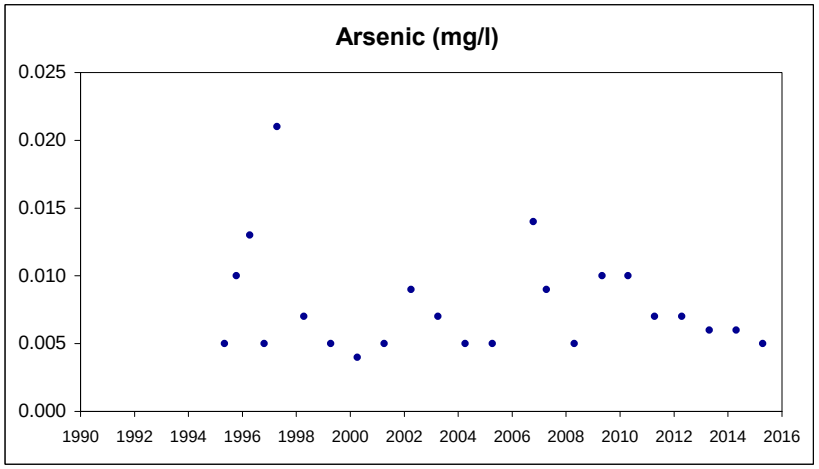
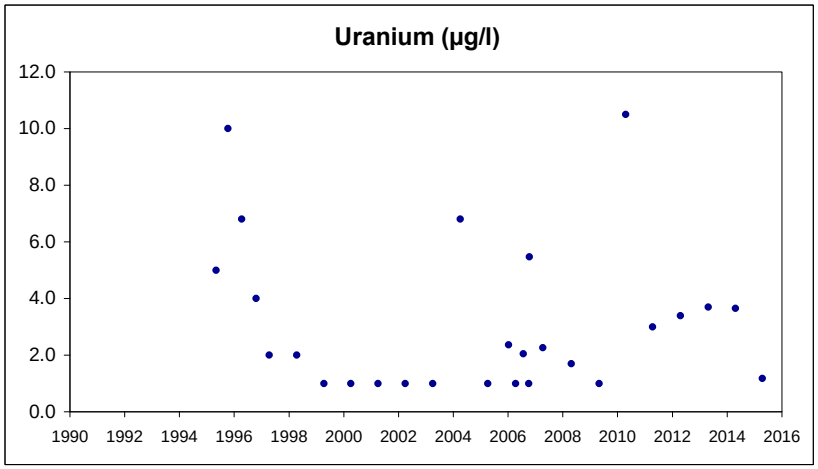
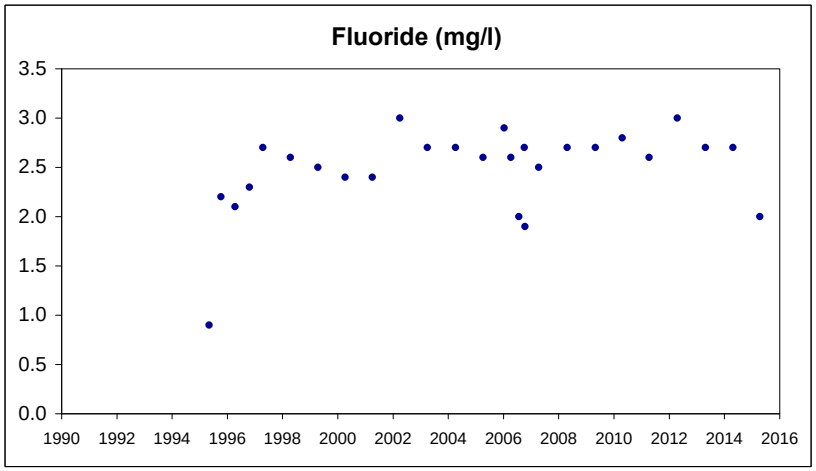




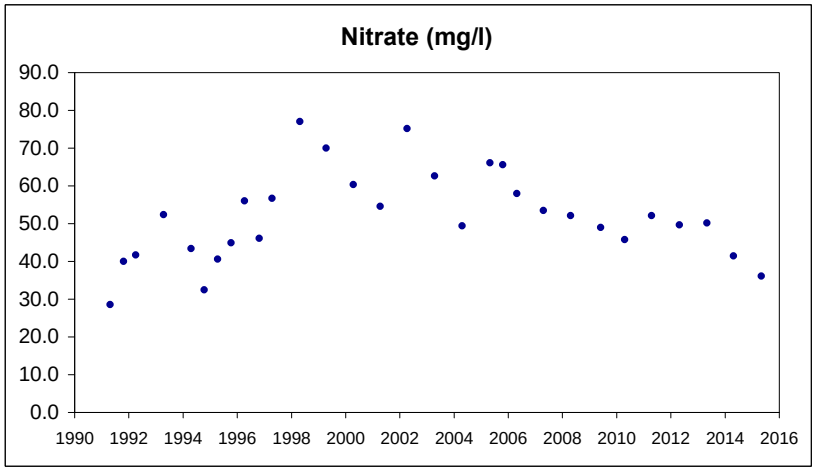


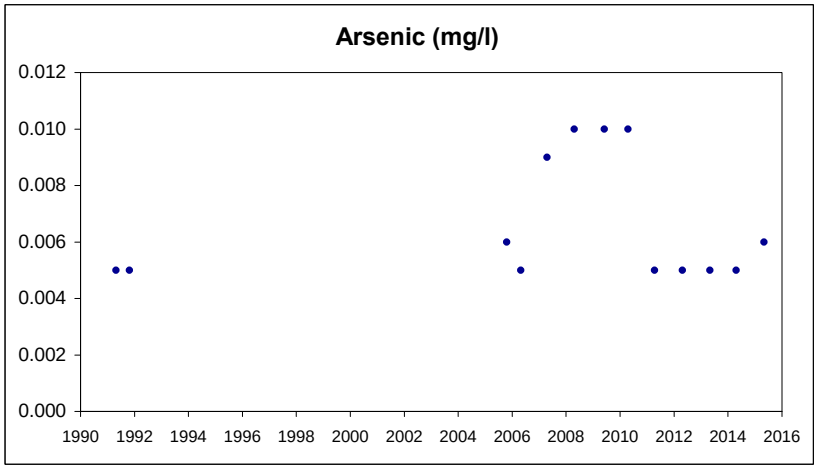


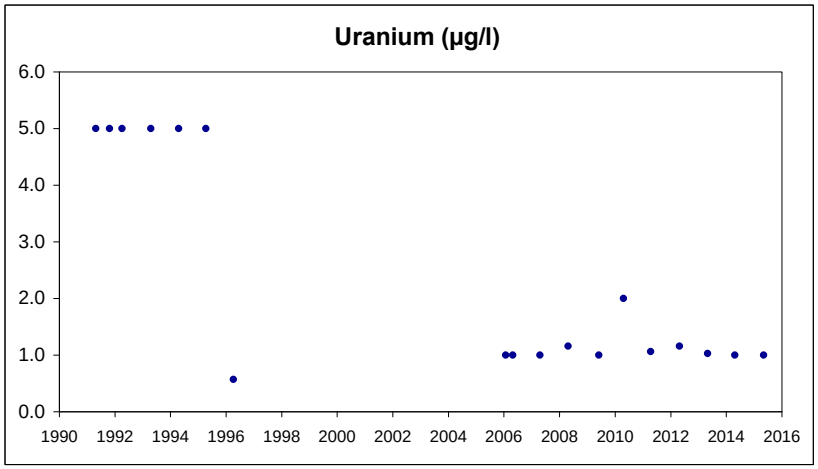
MW008

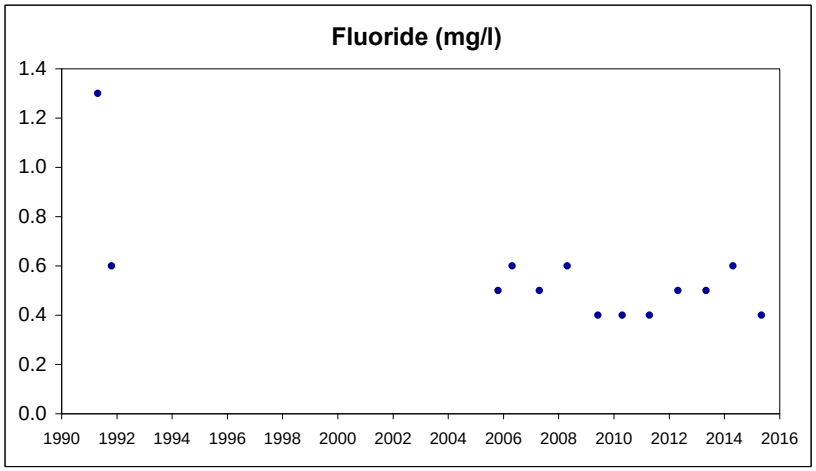
Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

2015 Annual Report









MW010

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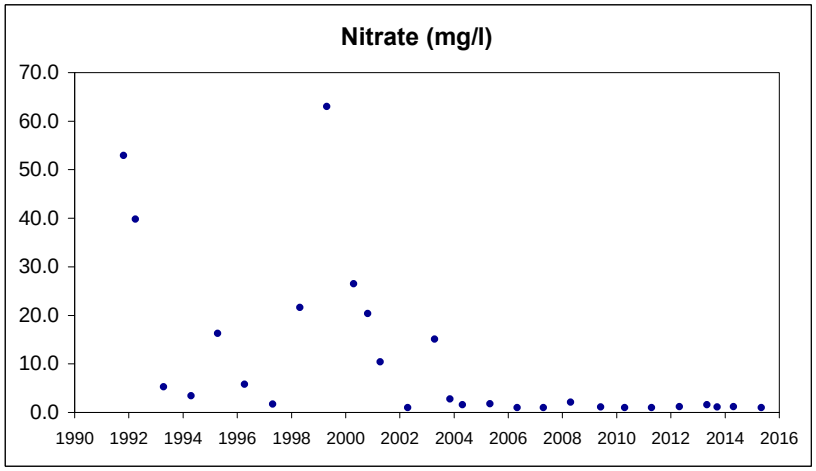
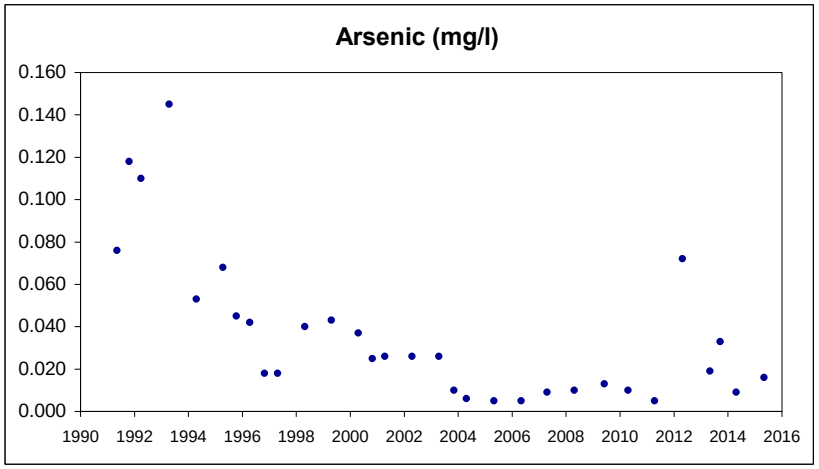
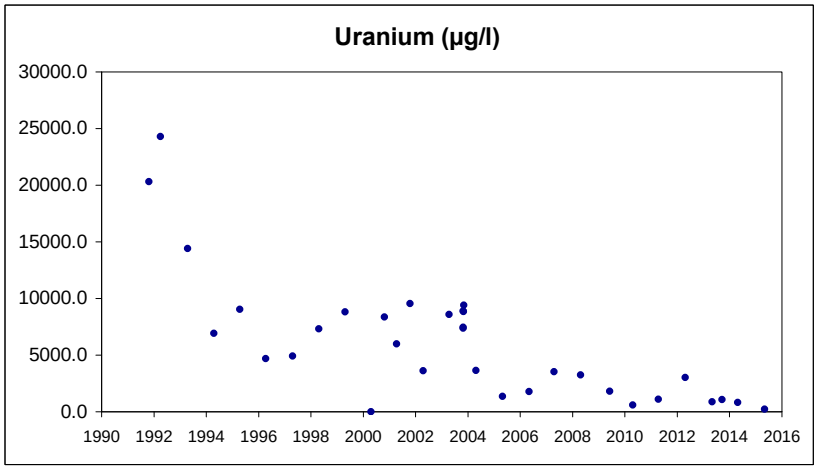
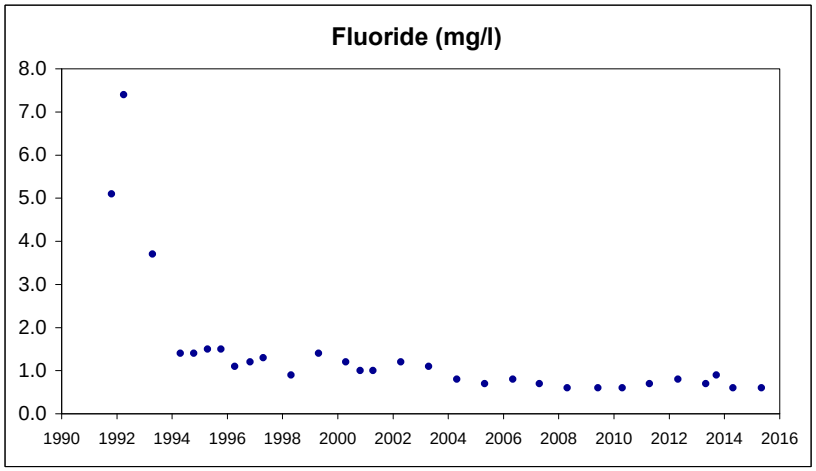
Sequoyah Fuels Corporation

2015 Annual Report







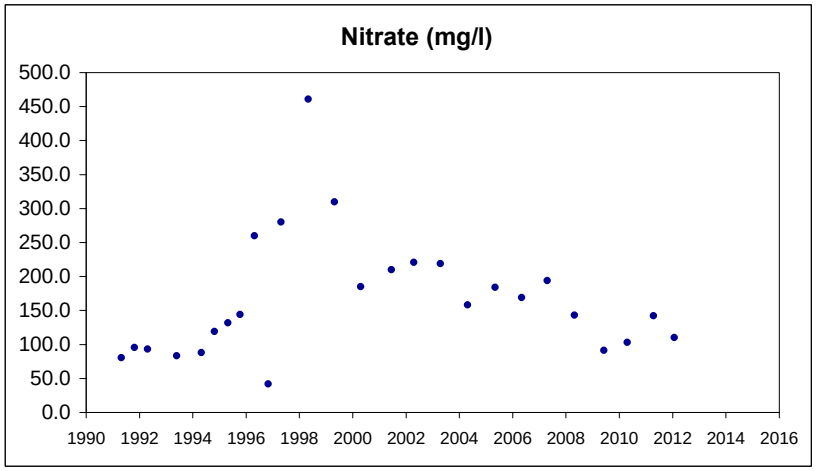


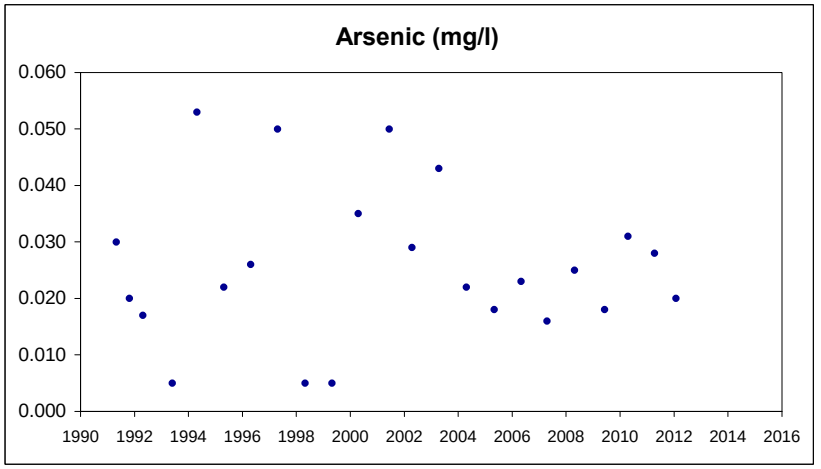
MW012A

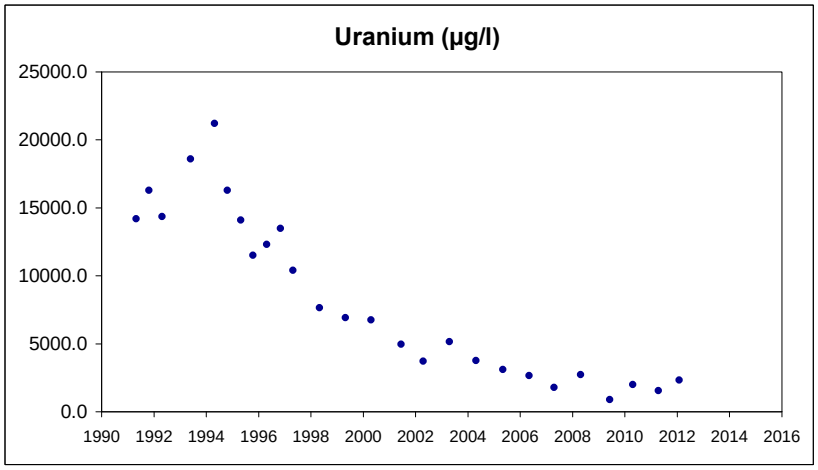
(Plugged on 01Feb2012)

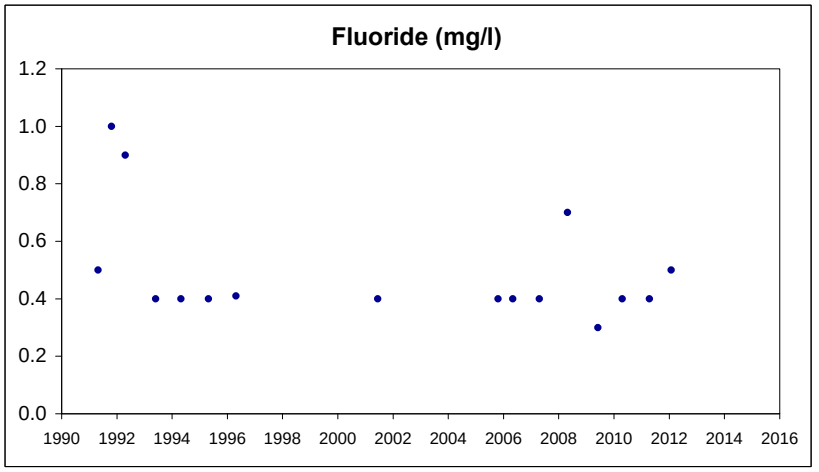
Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

2015 Annual Report









MW014

(Plugged on 01Feb2012)

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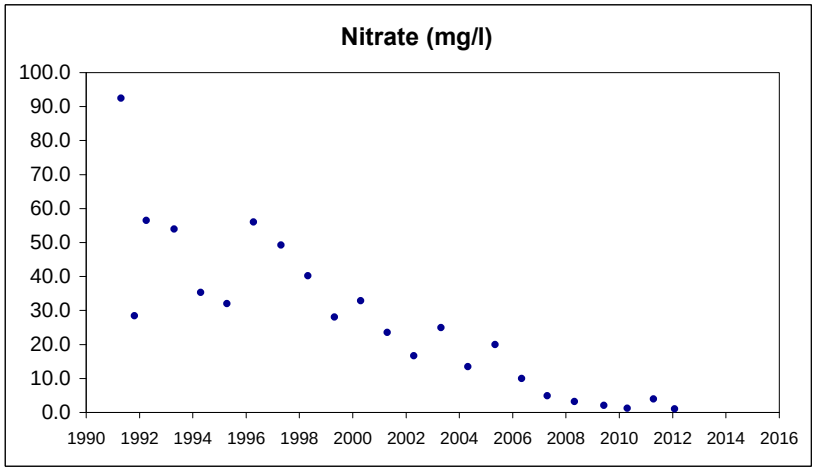
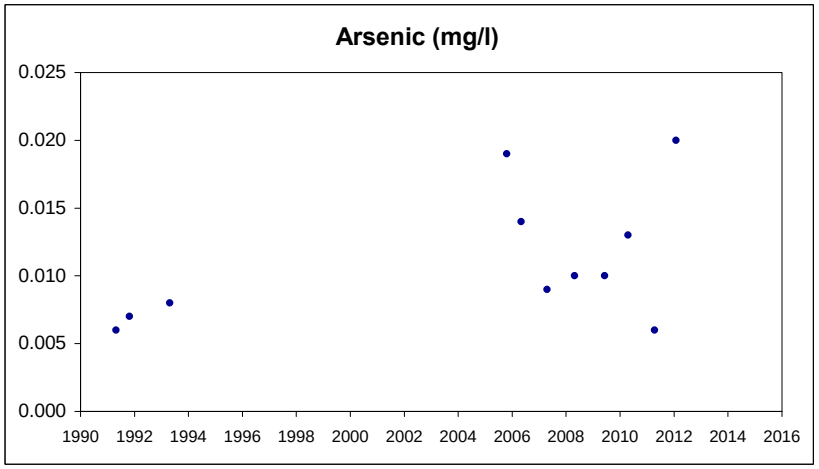
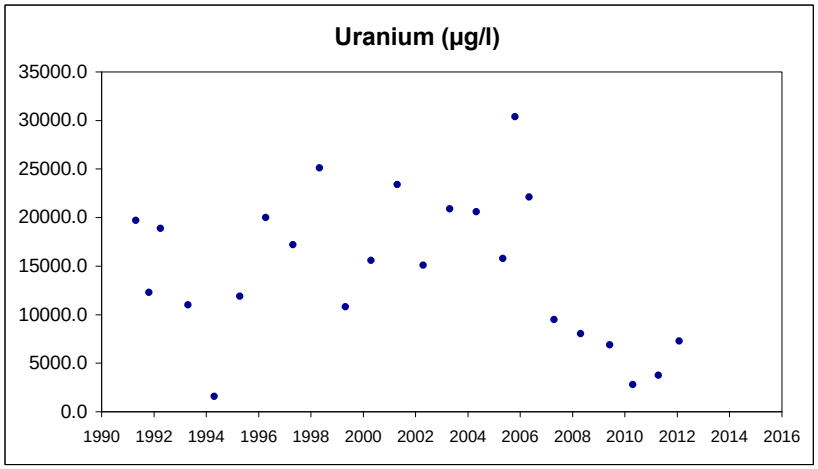
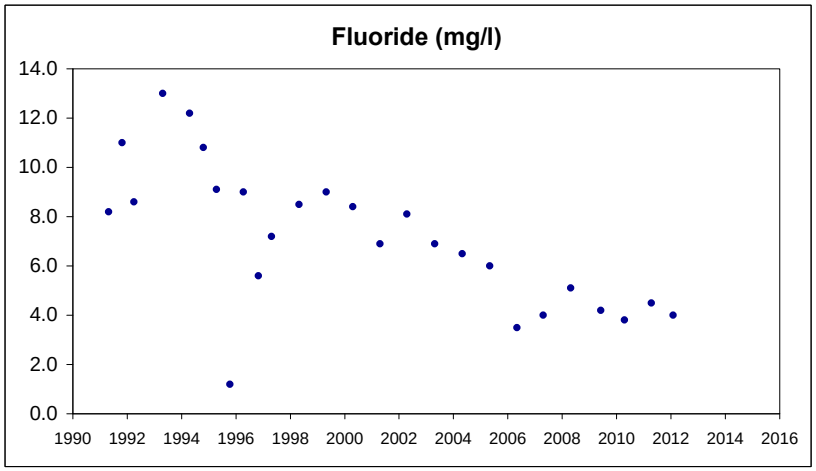
Sequoyah Fuels Corporation

2015 Annual Report







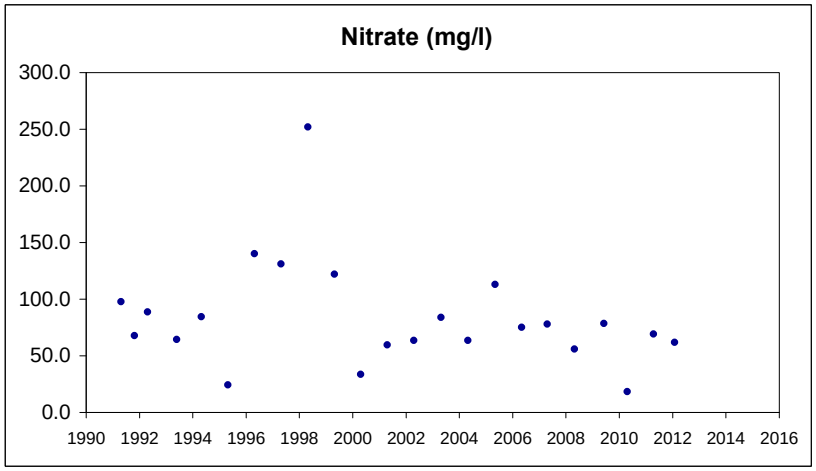


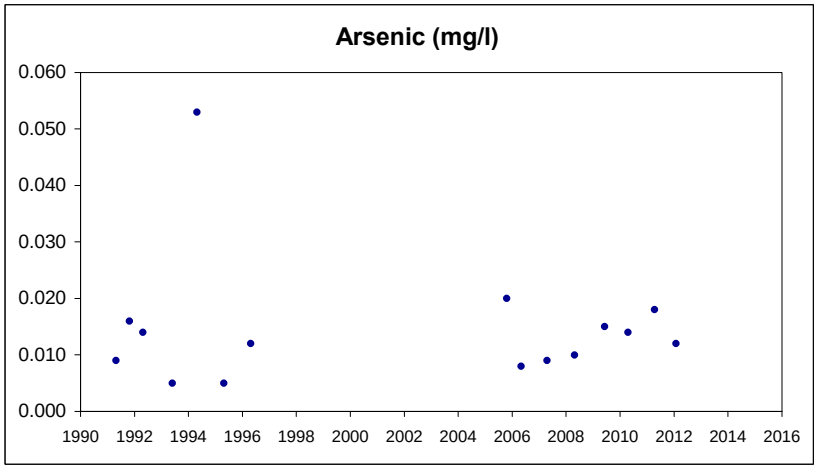
MW014A

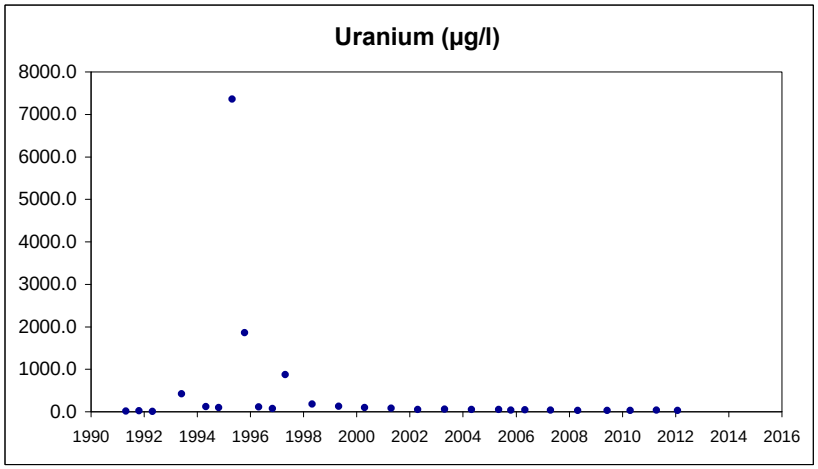
(Plugged on 02Feb2012)

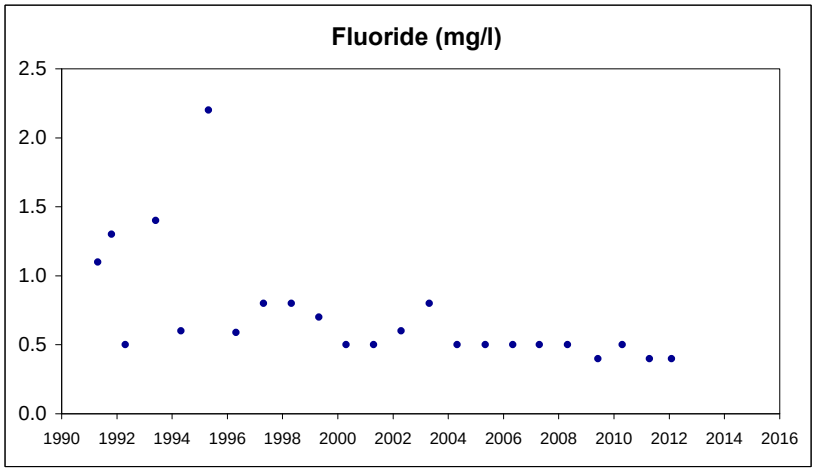
Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

2015 Annual Report









MW018A

(Plugged on 01Feb2012)

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Sequoyah Fuels Corporation

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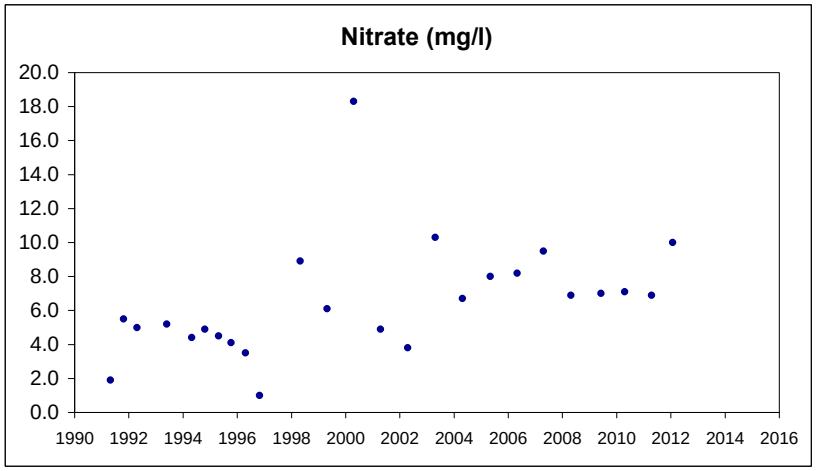

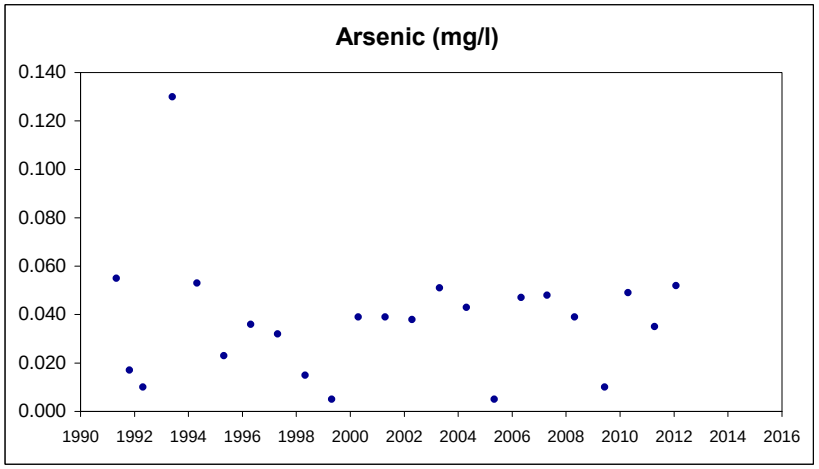

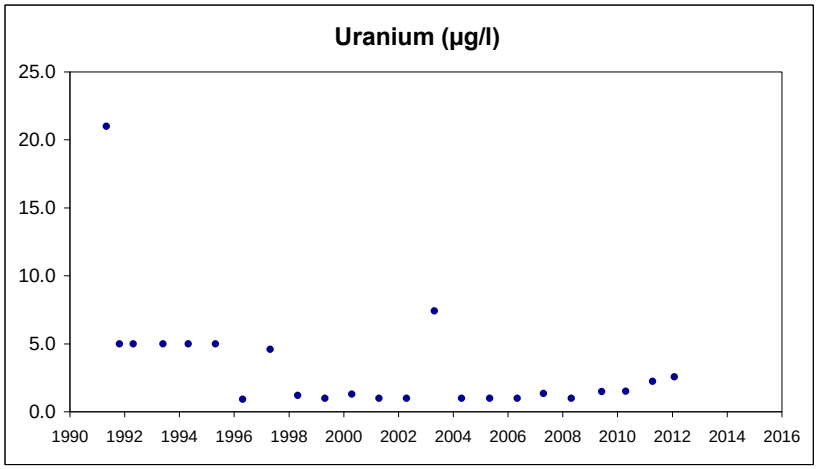

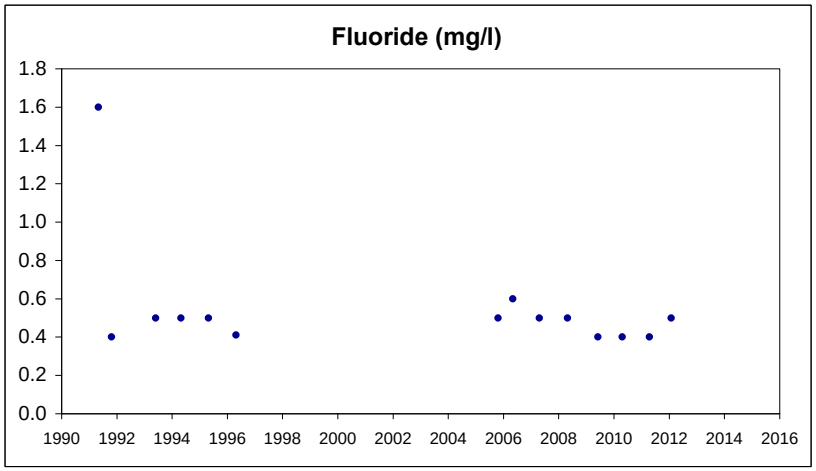

MW019

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Sequoyah Fuels Corporation

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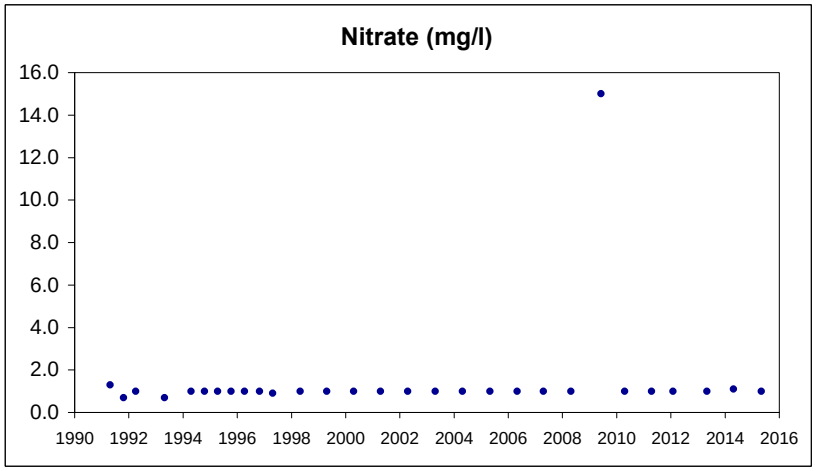
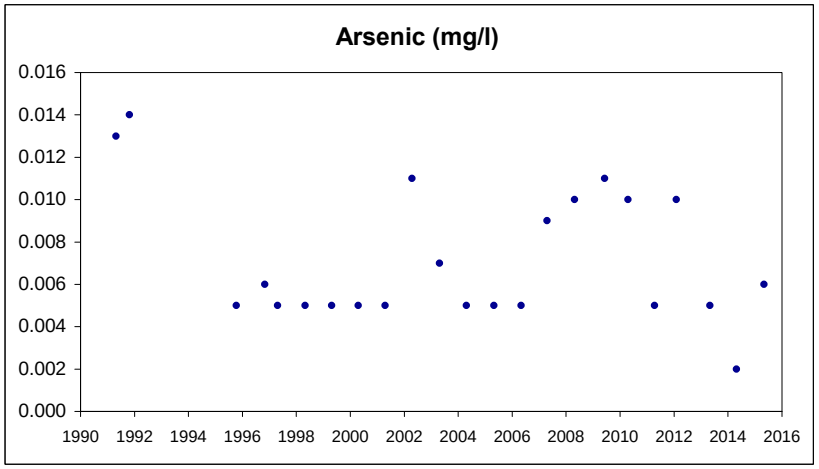
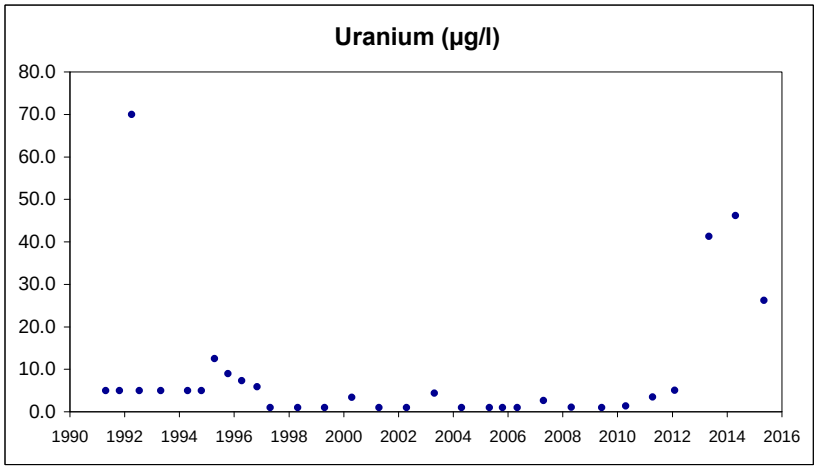
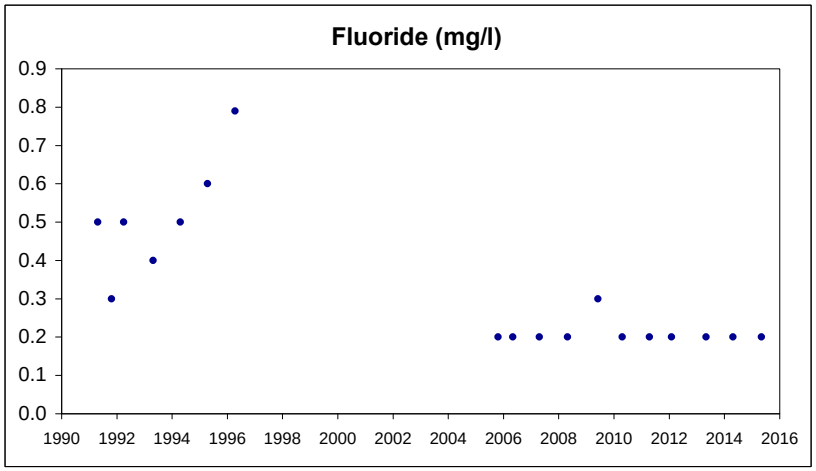






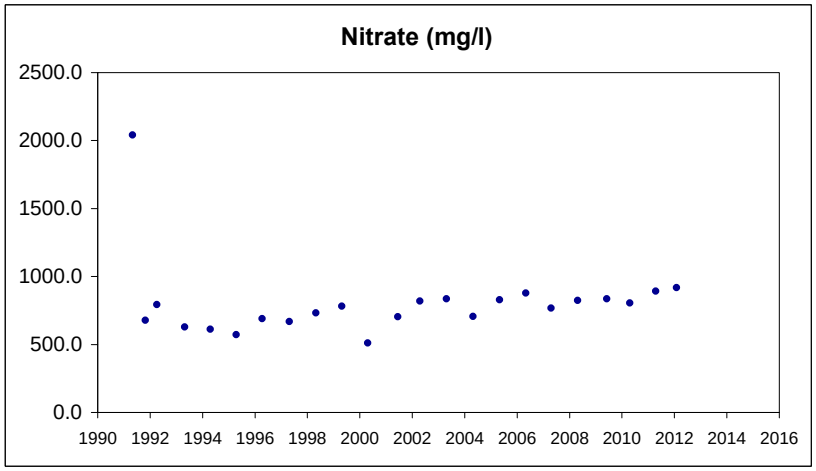


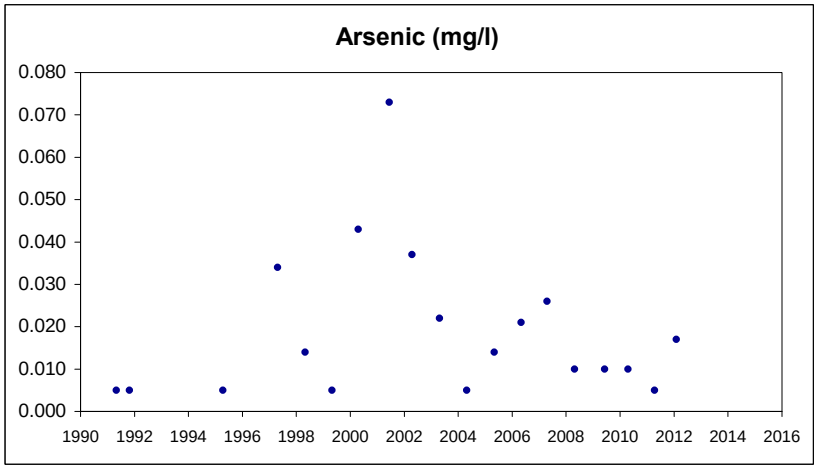
MW025

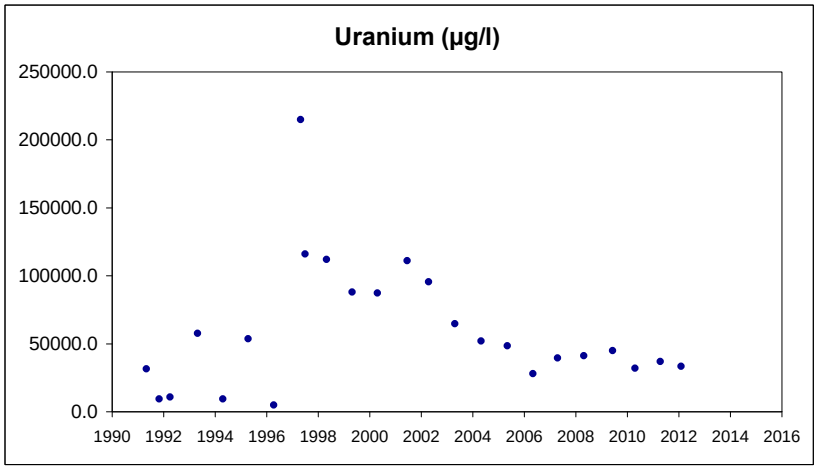
(Removed During Reclamation by Excavation during Sep2012)

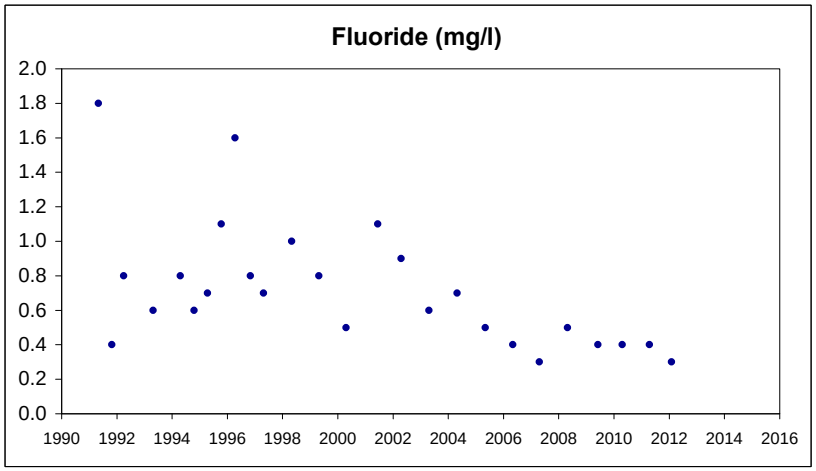
Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

2015 Annual Report









MW031

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Sequoyah Fuels Corporation

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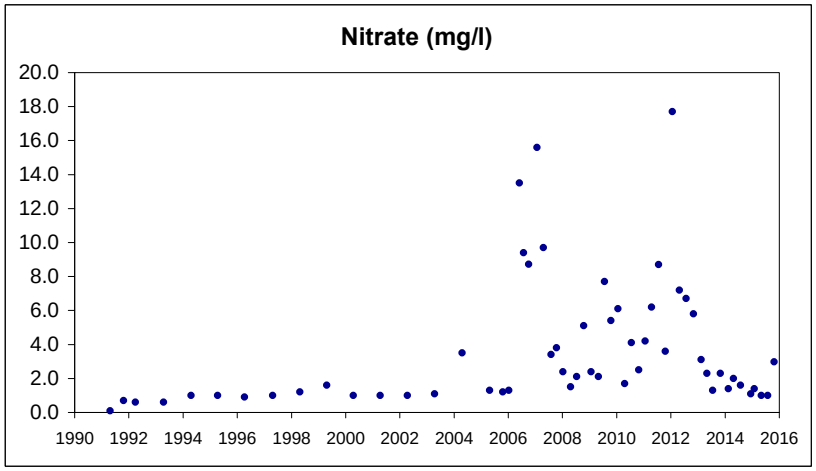

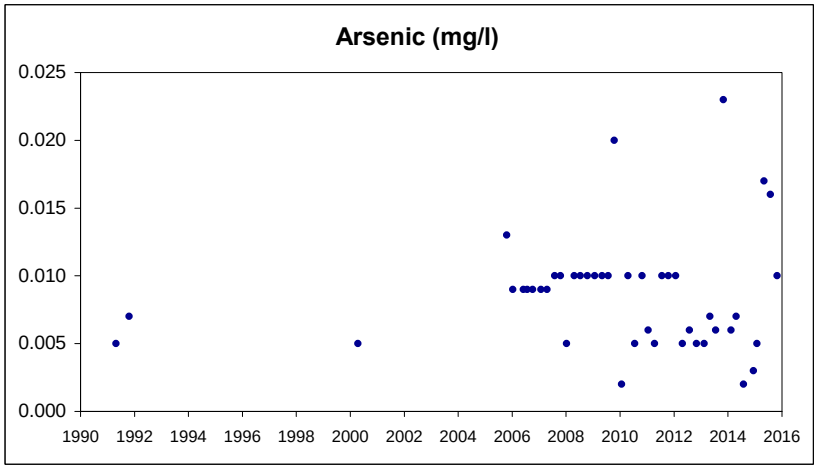

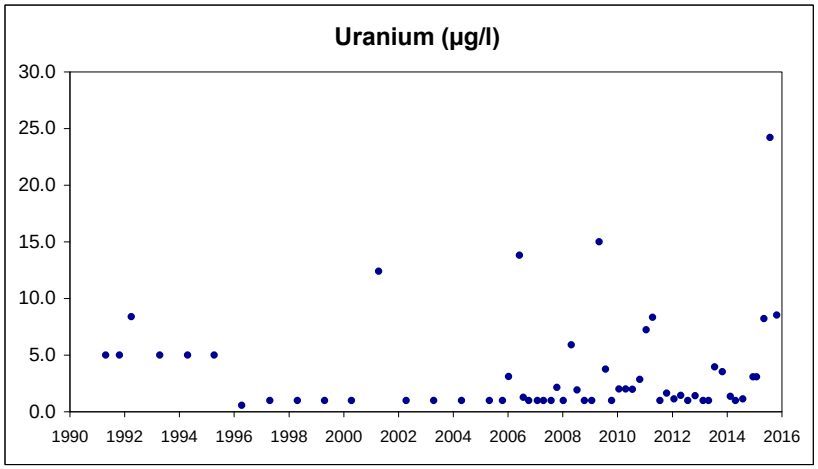

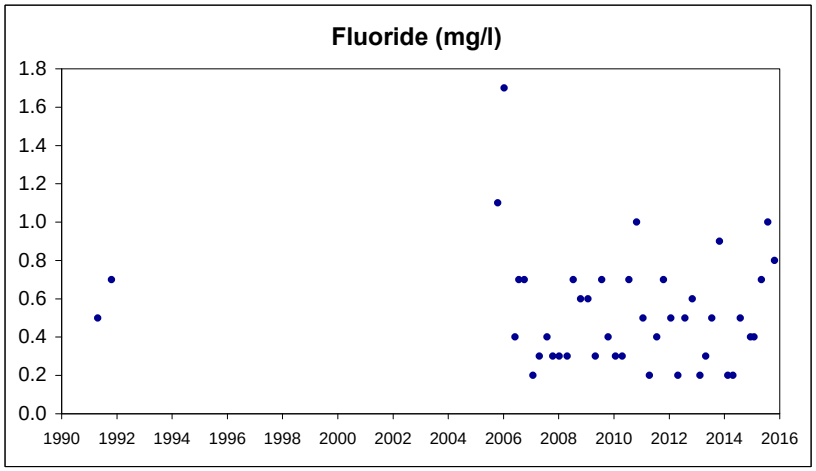

MW035

(Plugged on 18Feb2014)

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Sequoyah Fuels Corporation

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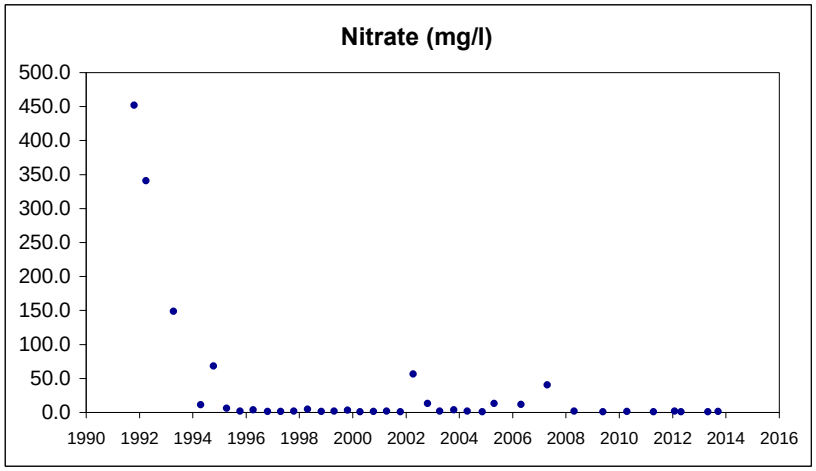

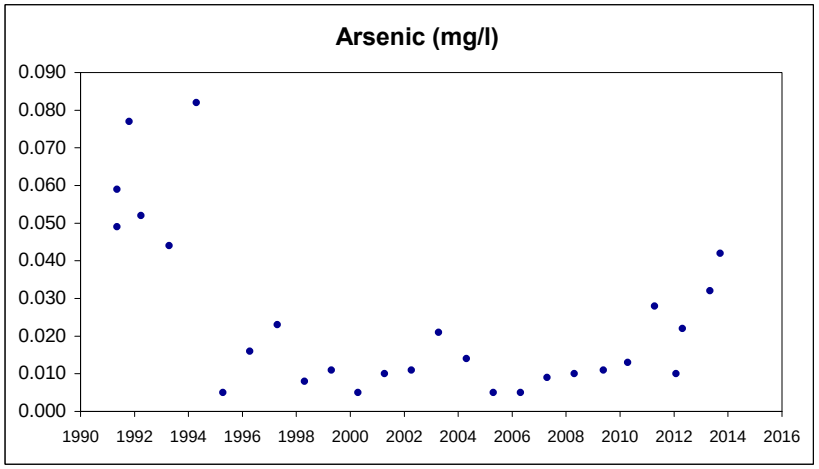

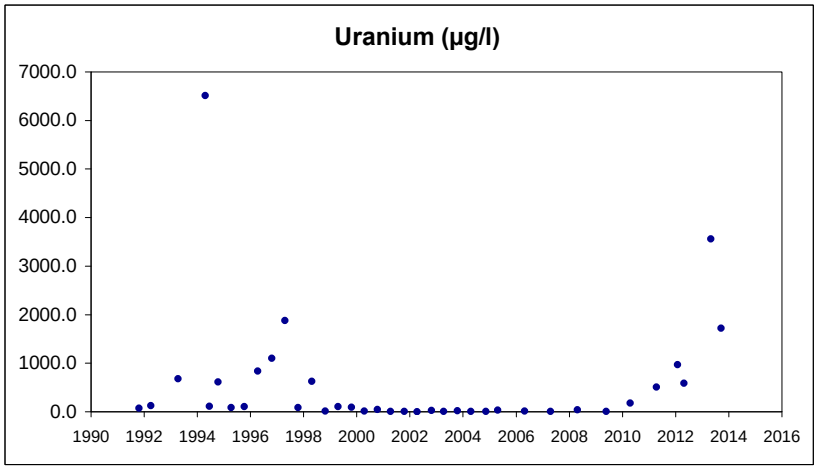

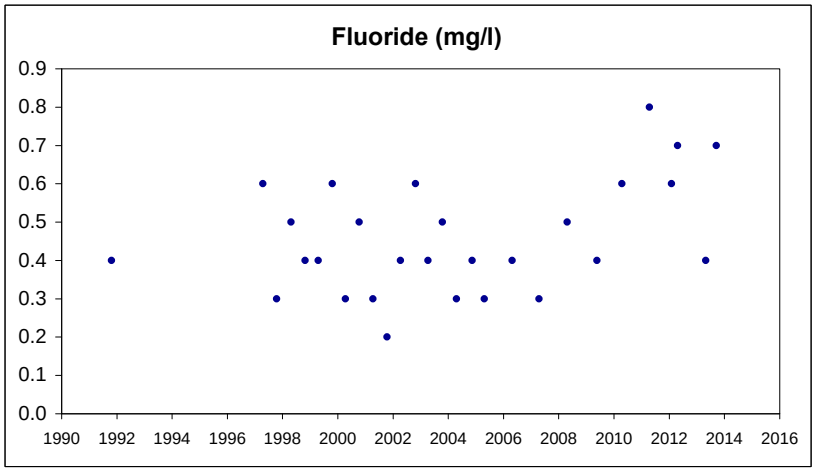

MW036

(Plugged on 2Feb2012)

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Sequoyah Fuels Corporation

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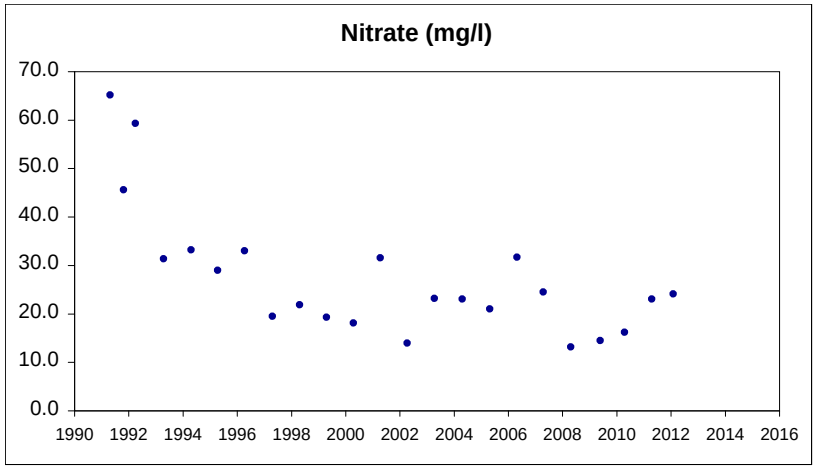

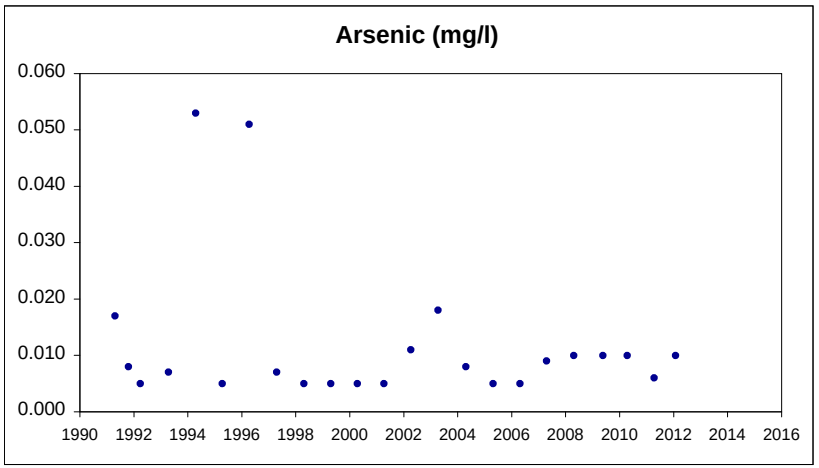

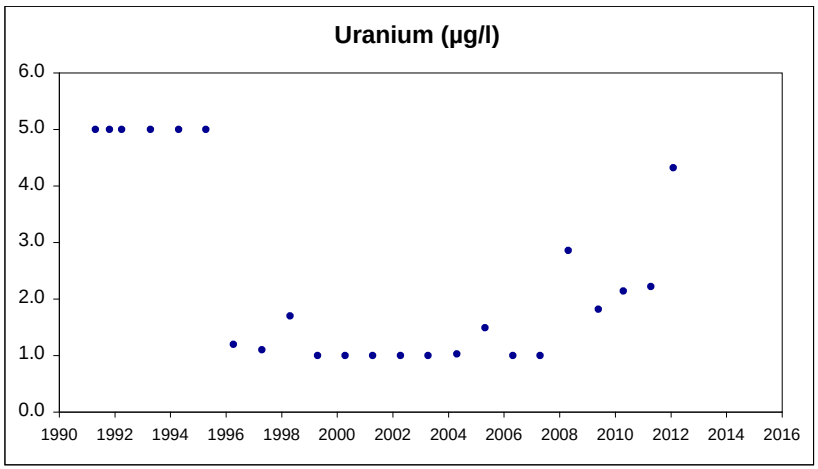

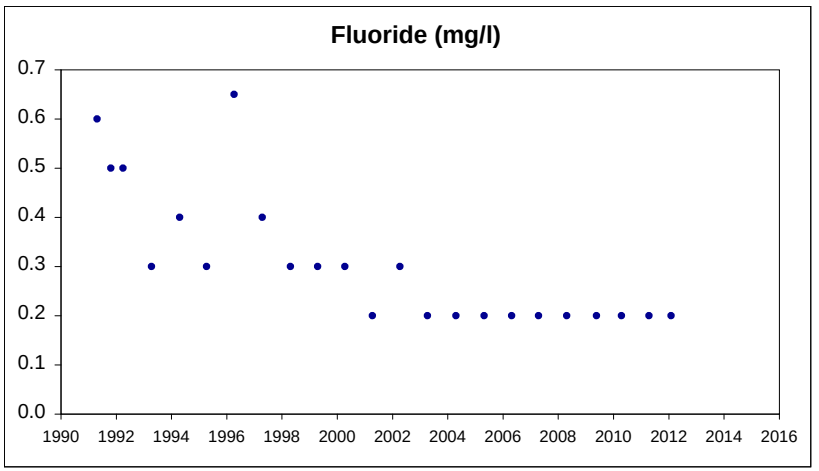

MW040

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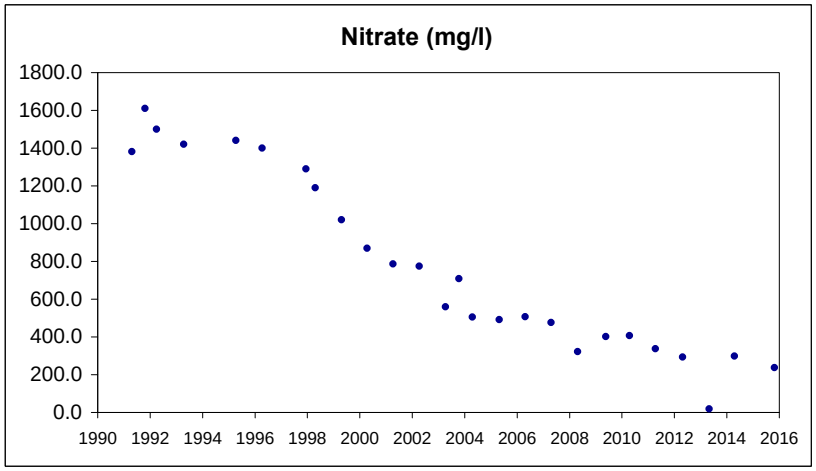

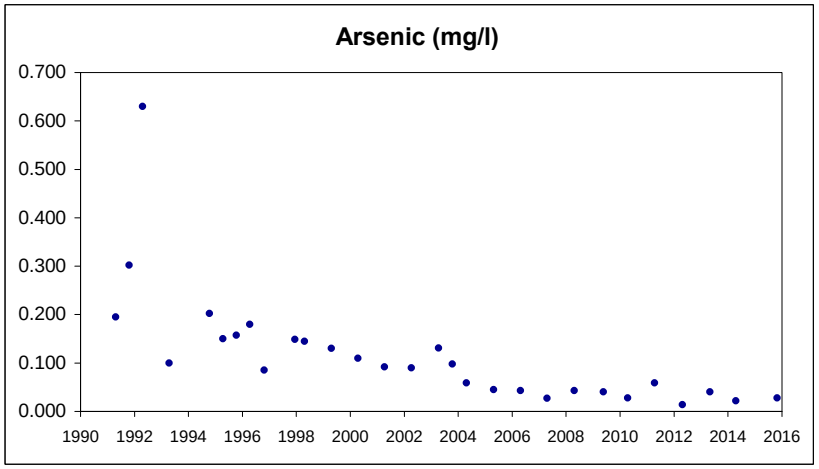

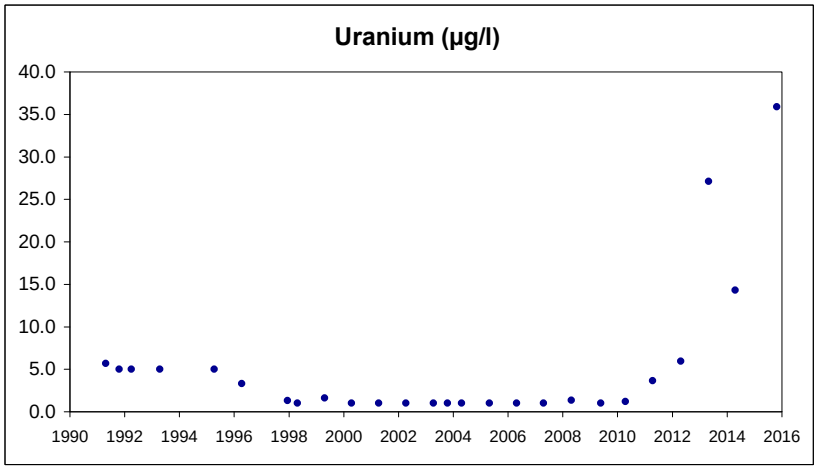

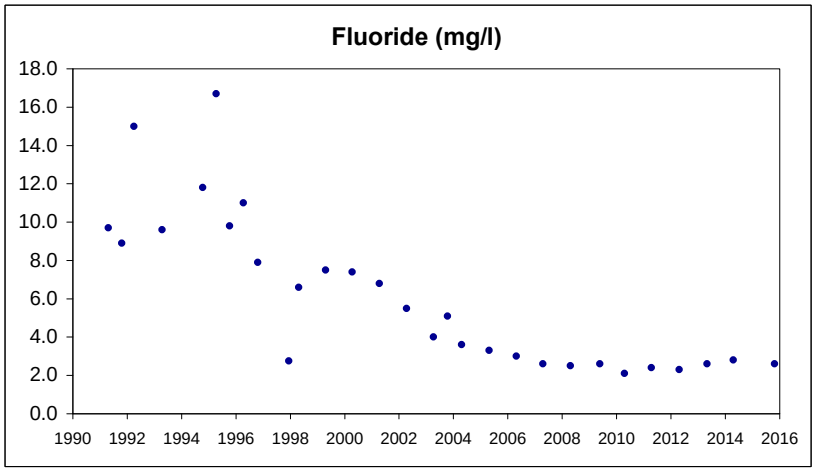

MW042

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Sequoyah Fuels Corporation

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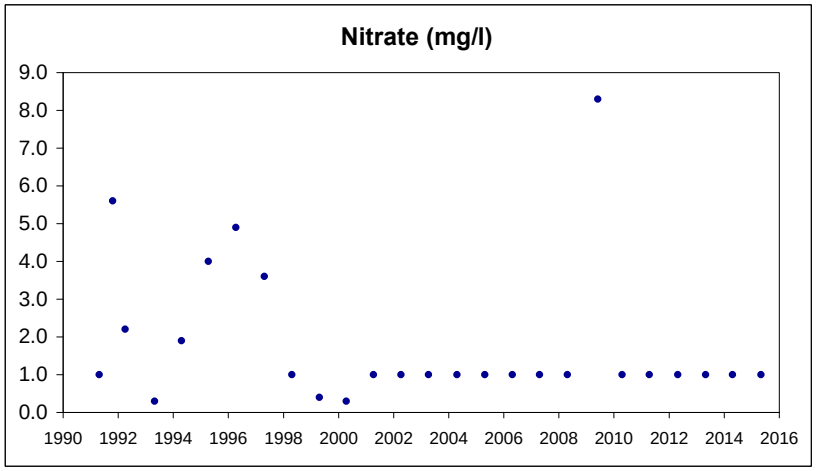

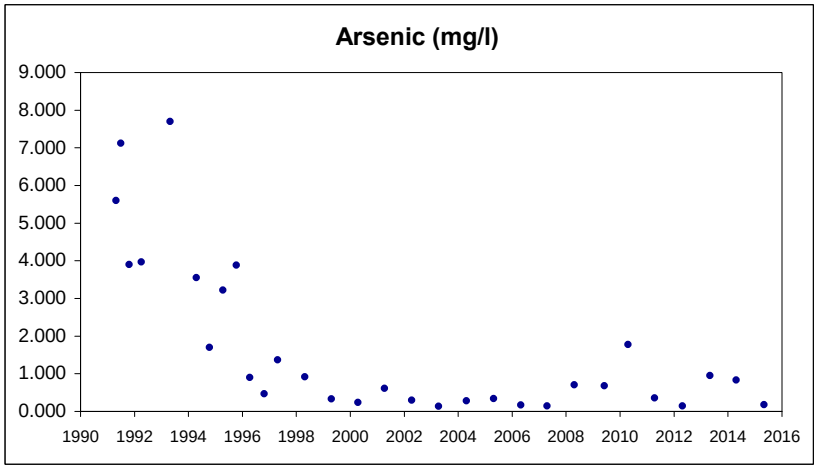

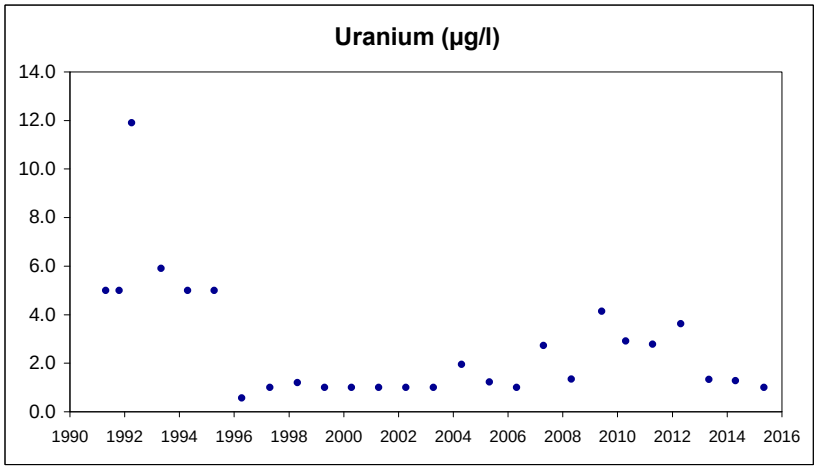

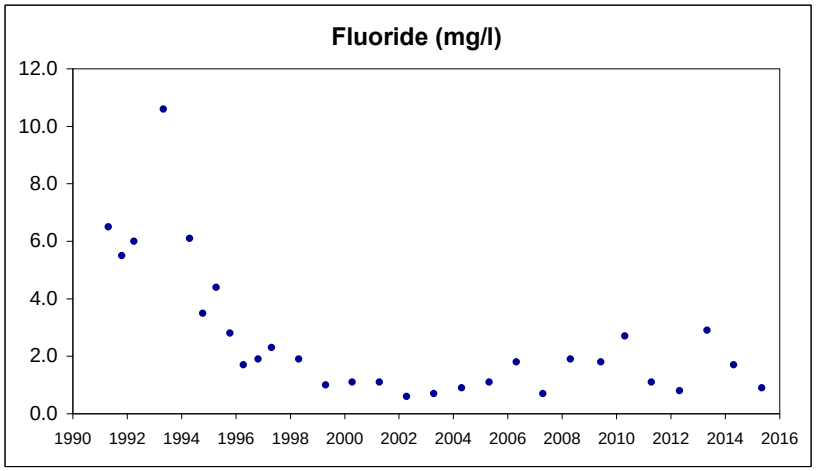

MW042A

Groundwater Monitoring Well Evaluation
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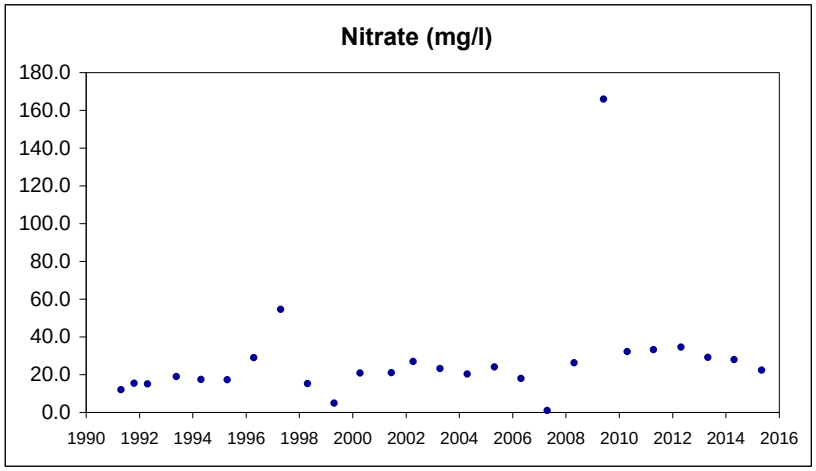

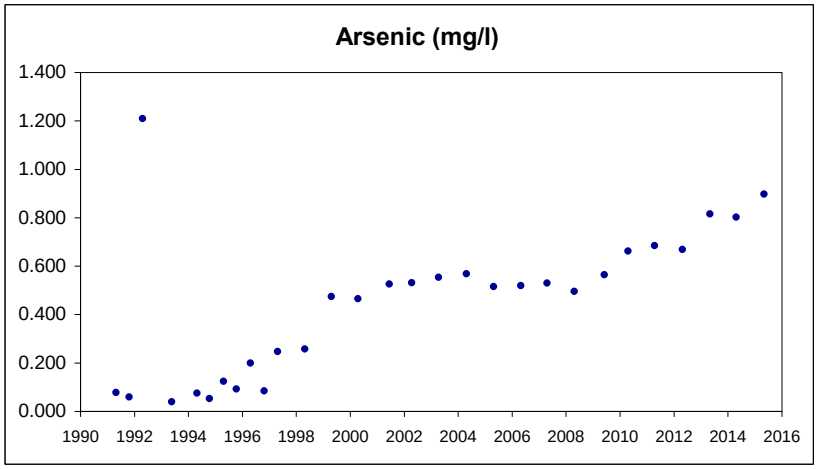

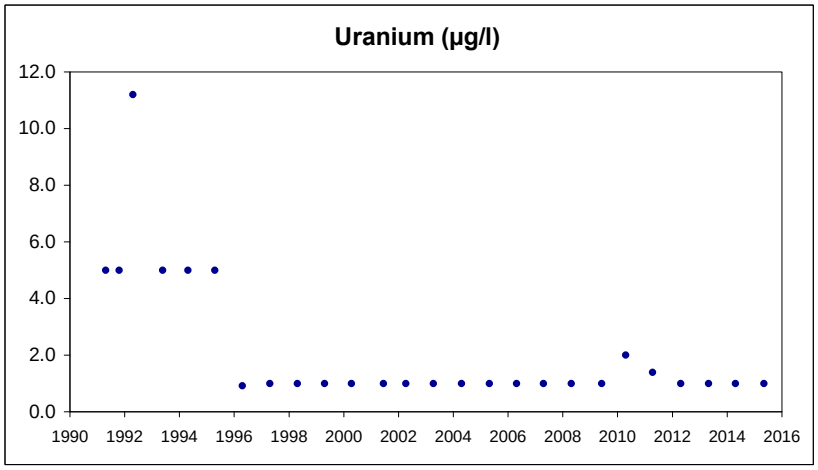

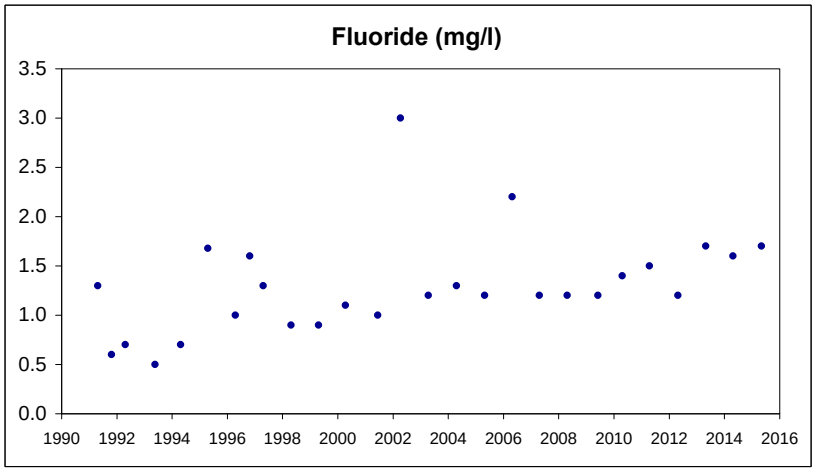

MW045

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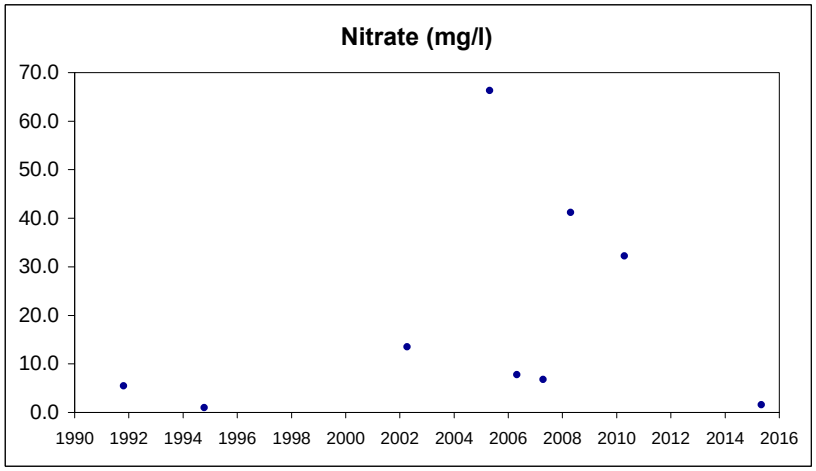

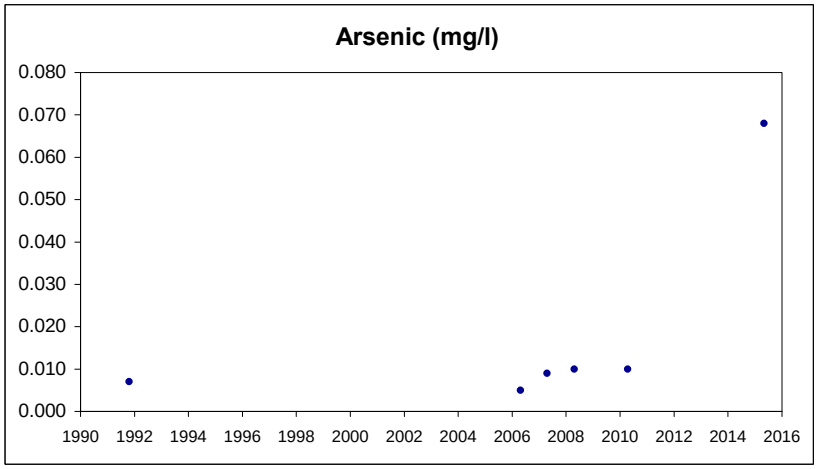

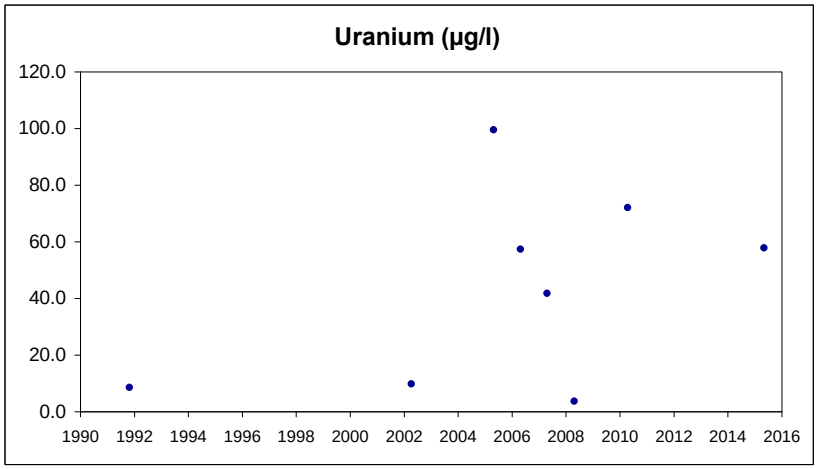

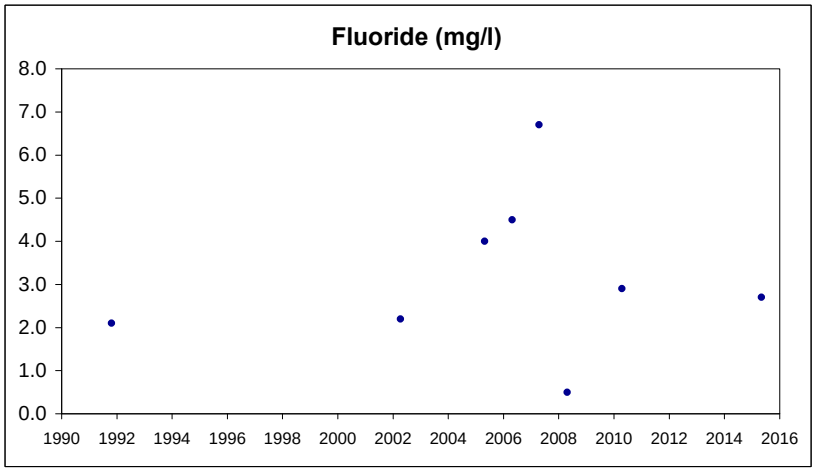

MW047A

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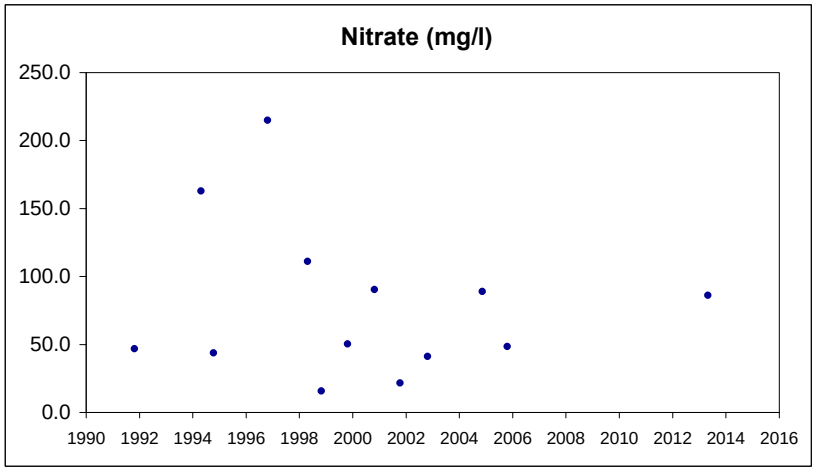

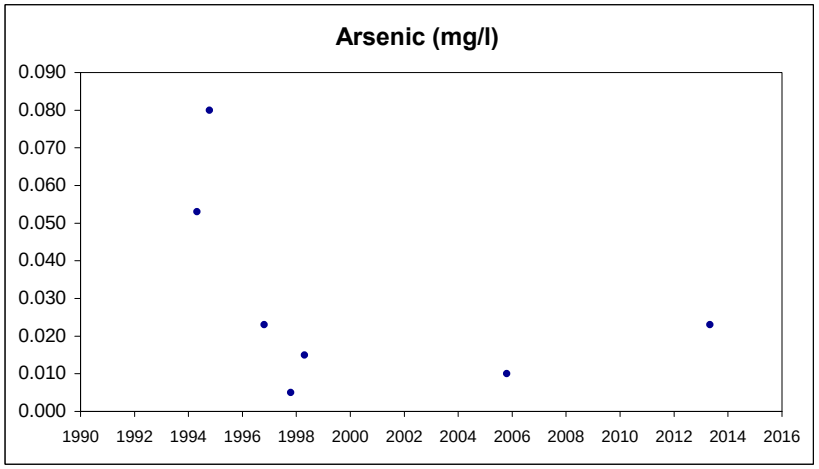

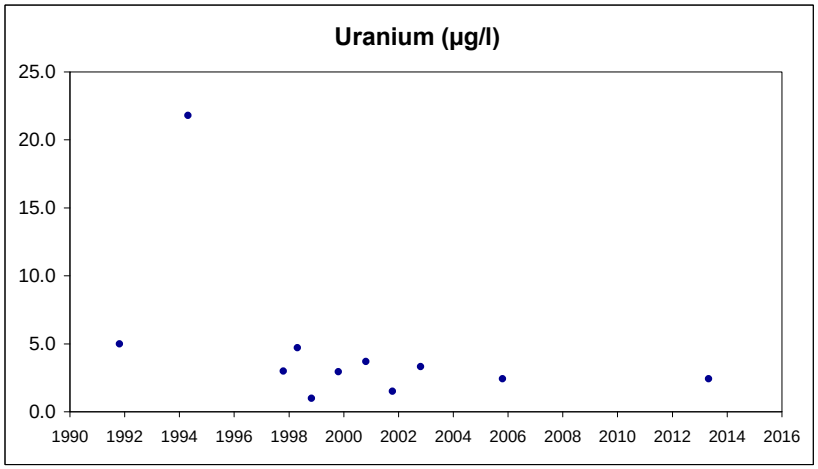

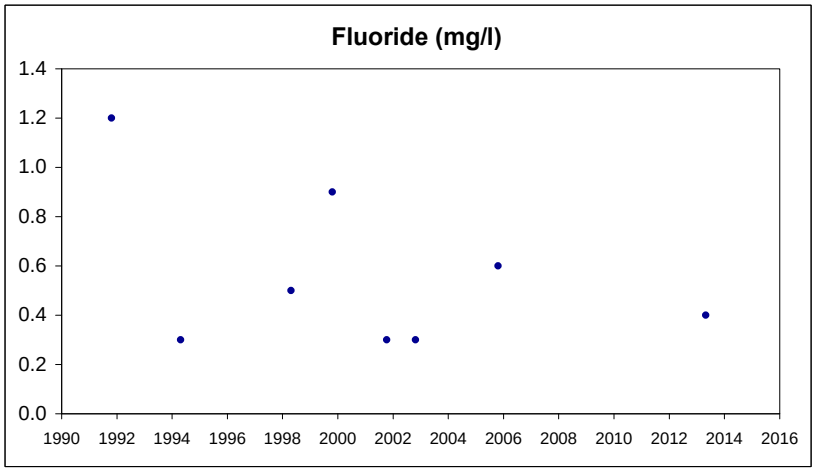

MW048

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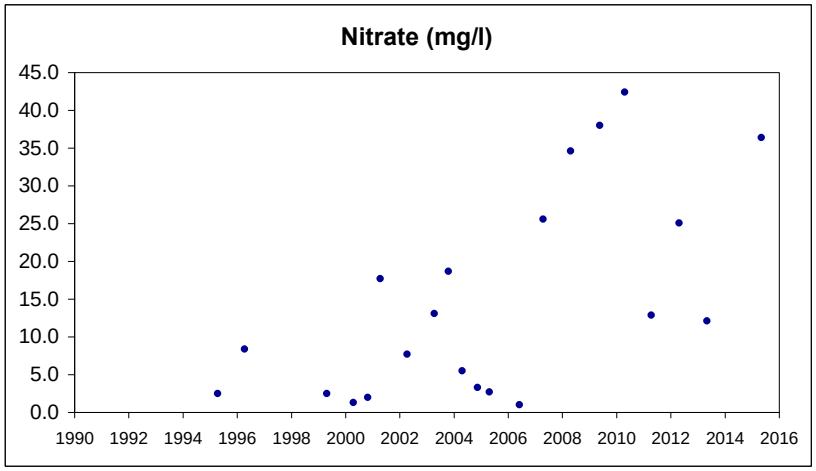

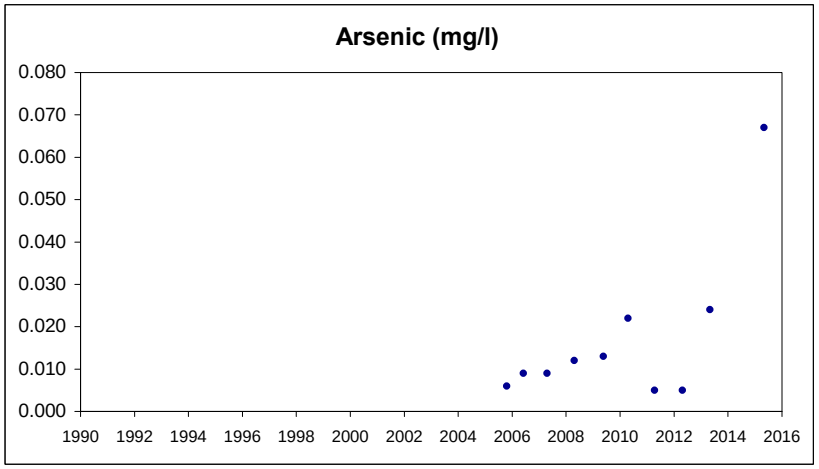

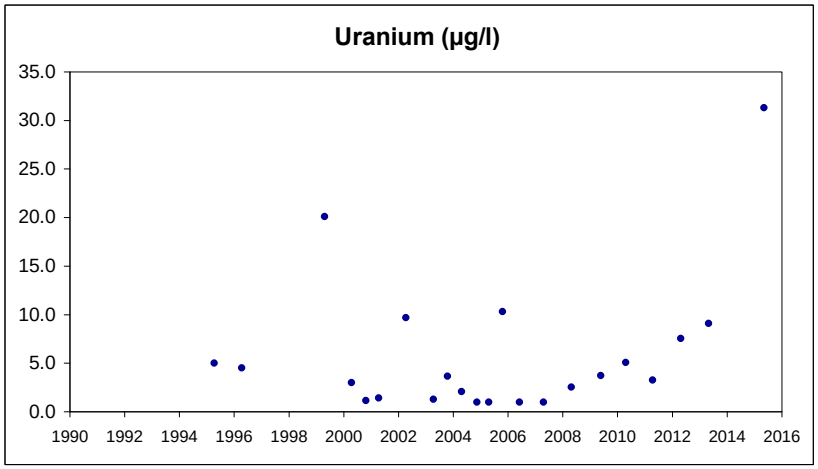

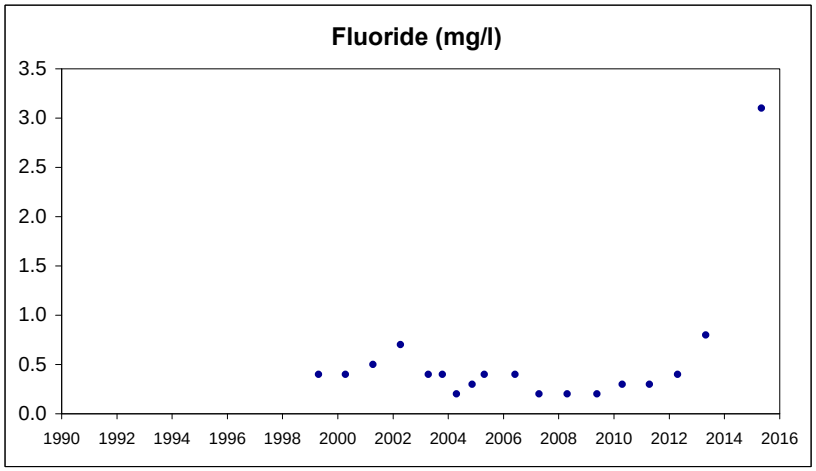

MW049

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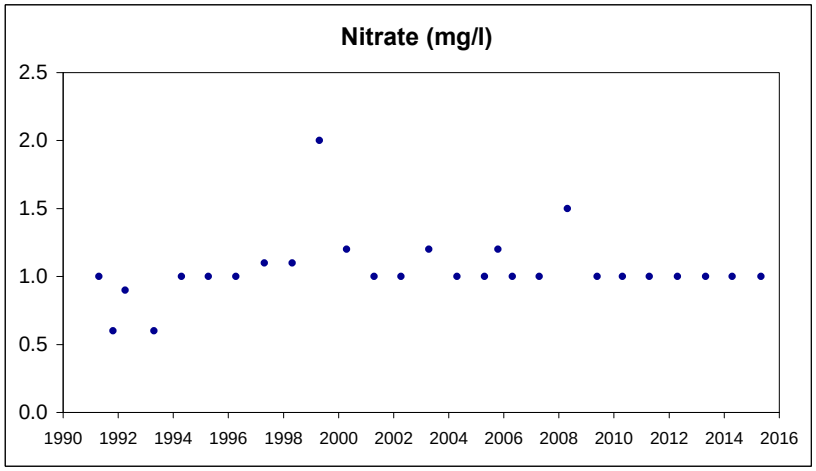

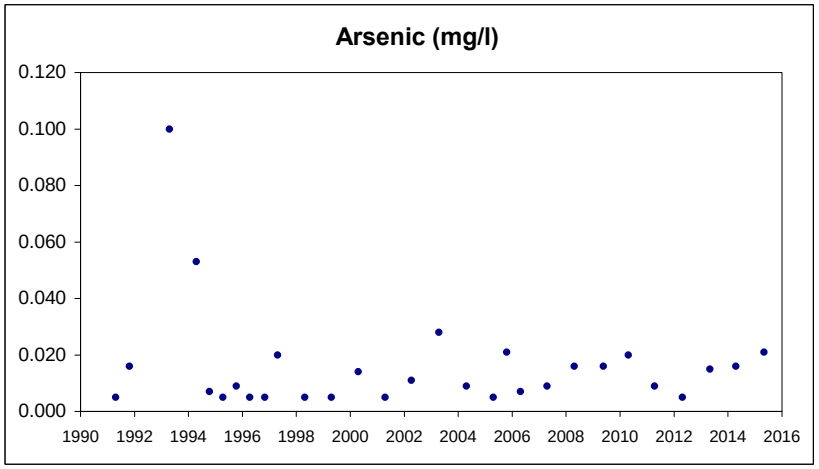

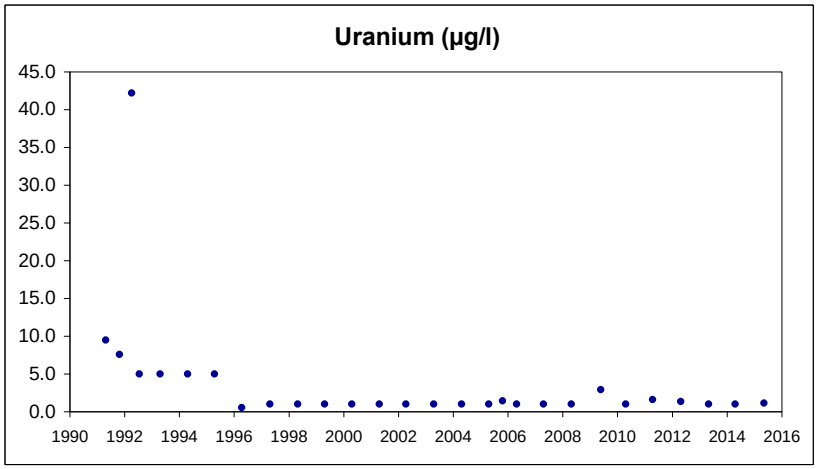

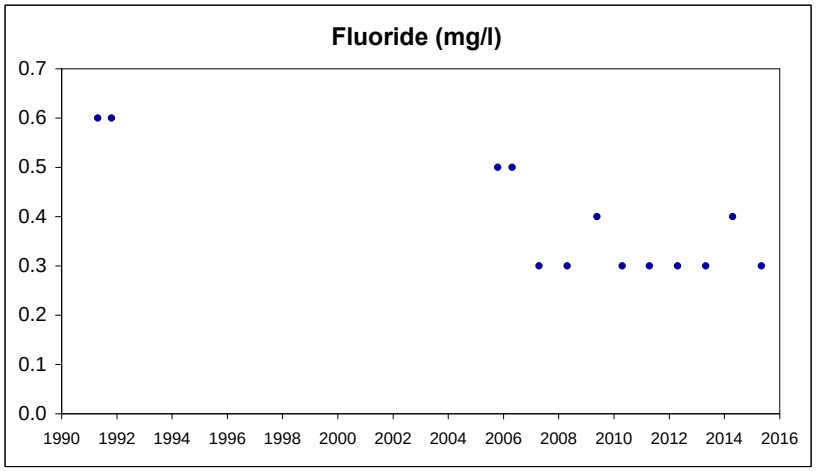

MW049A

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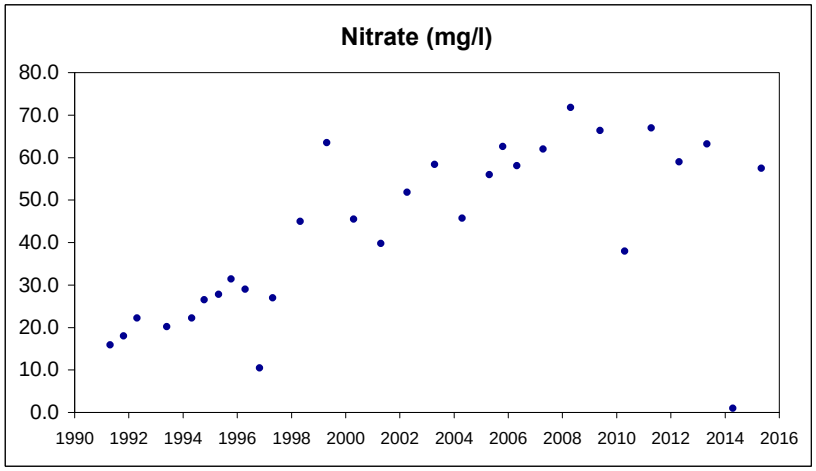

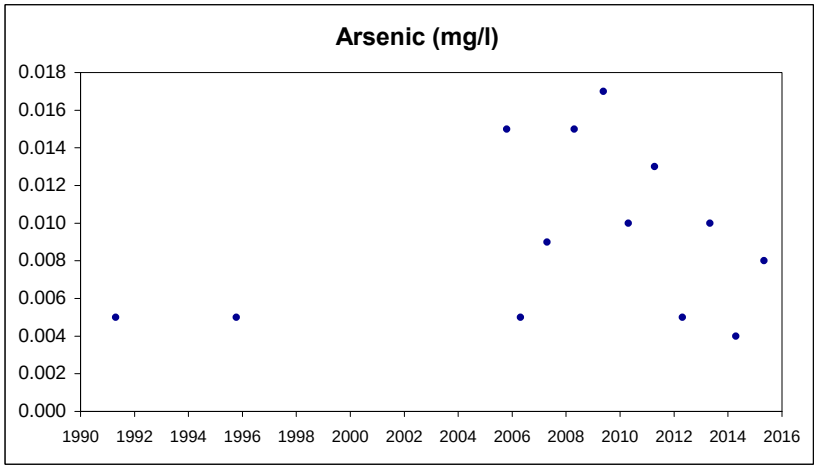

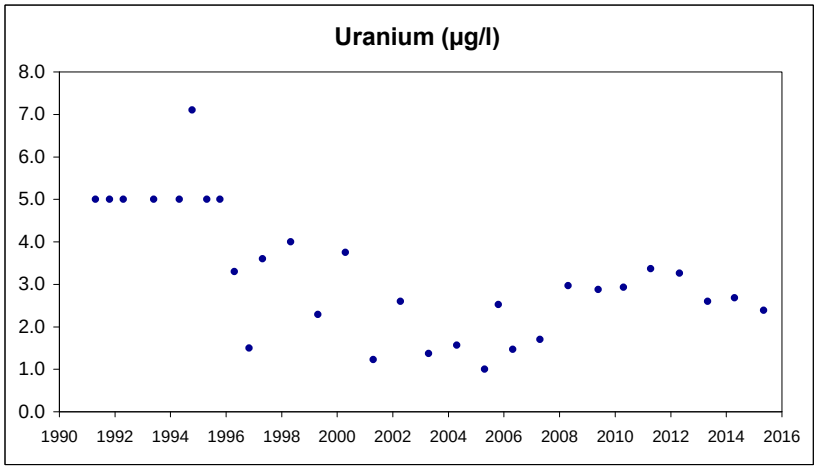

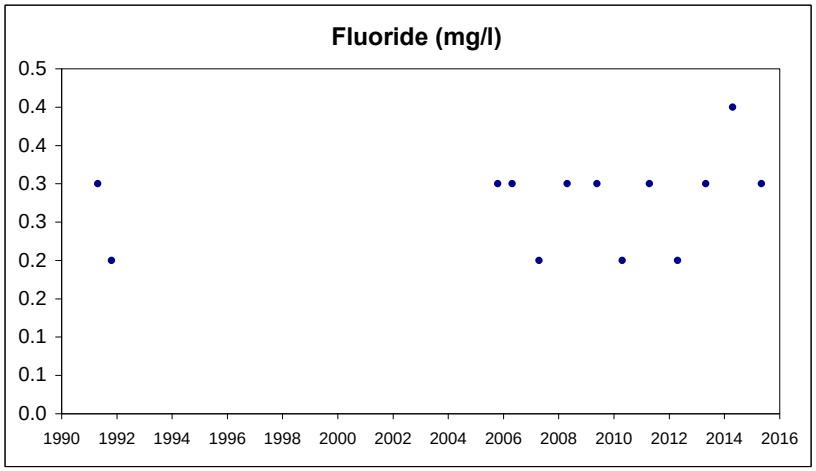

MW050A

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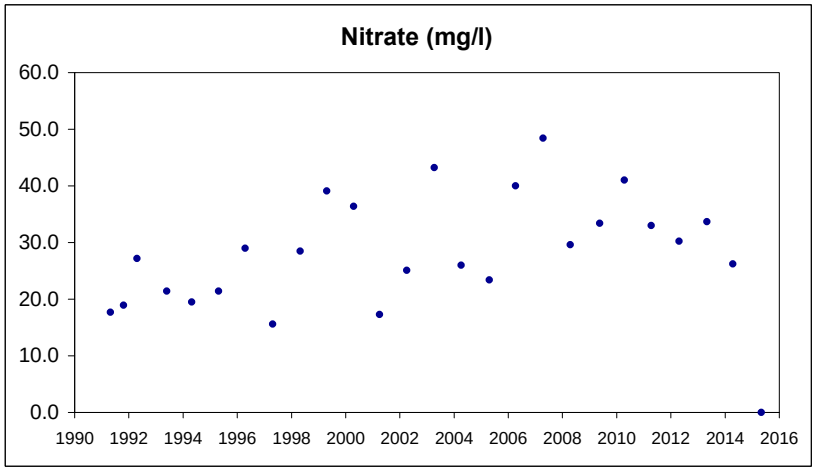

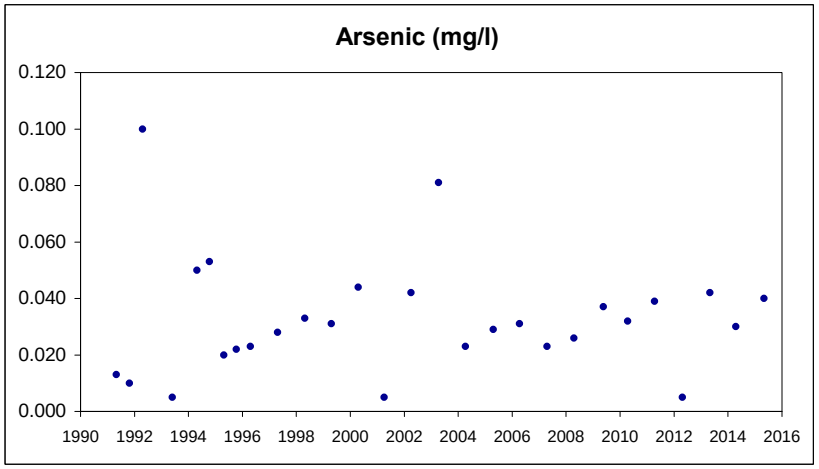

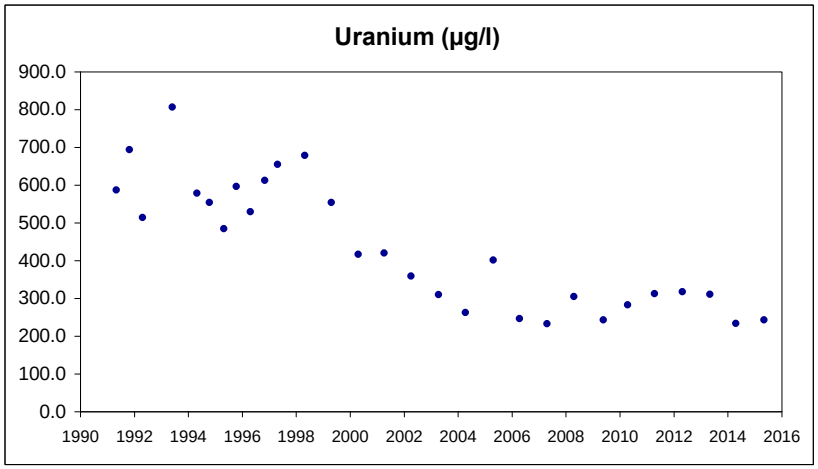

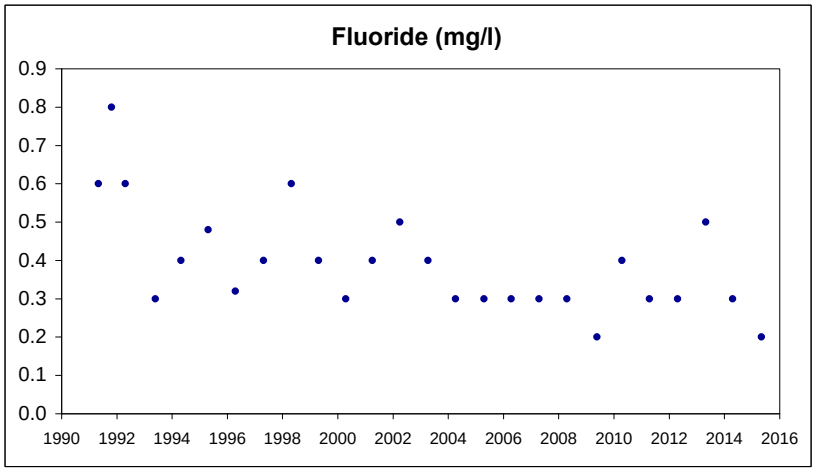

MW052A

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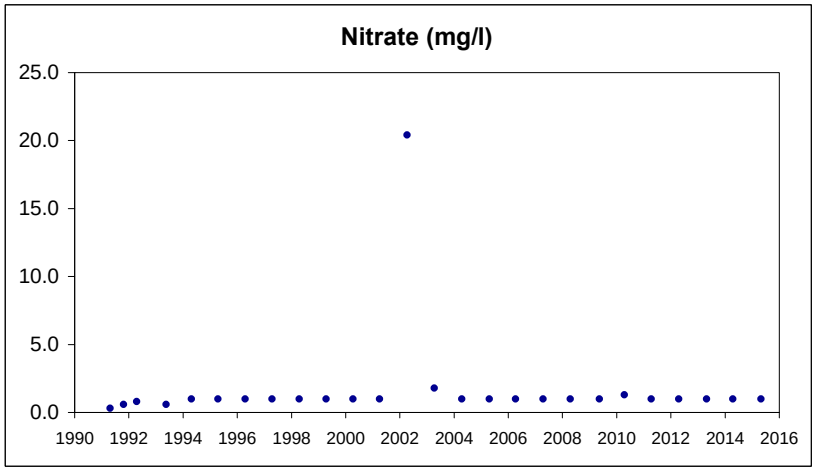

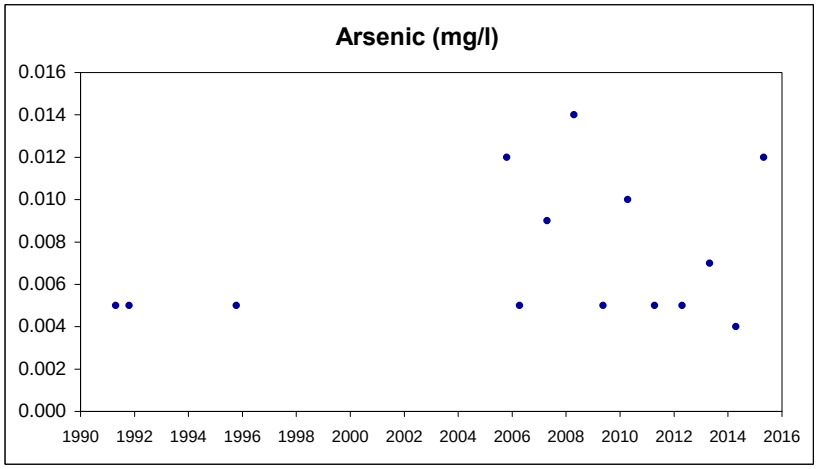

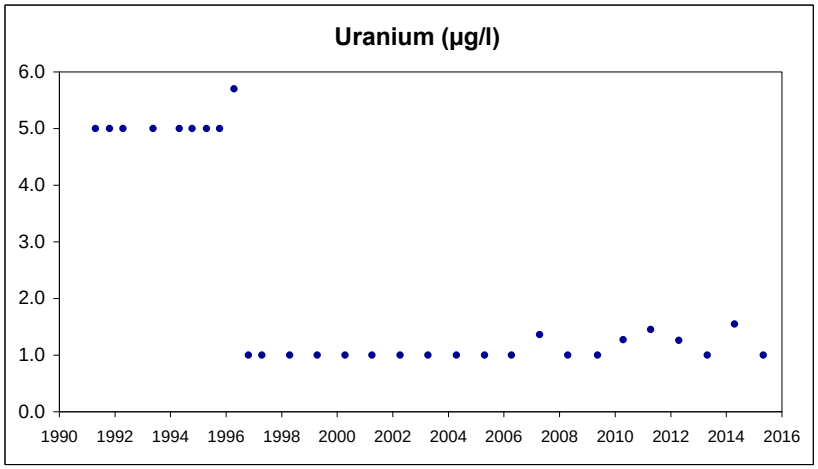

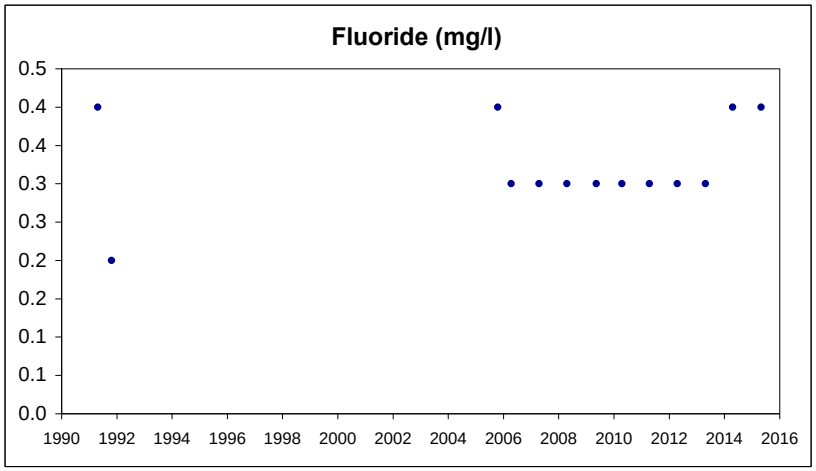

MW053

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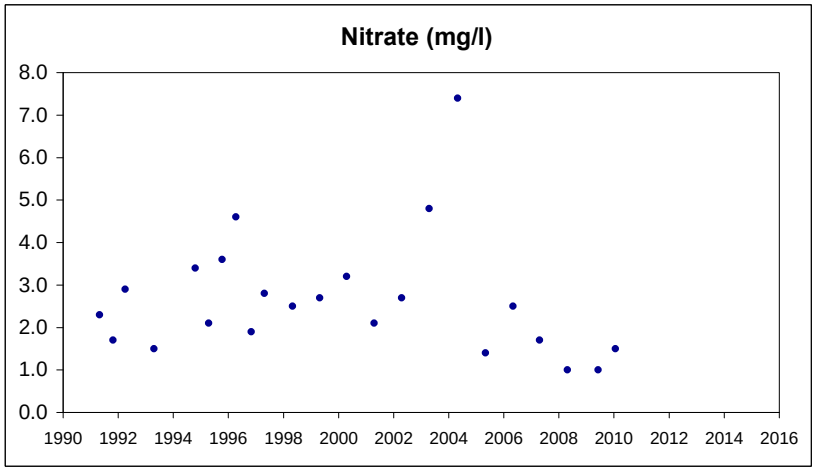

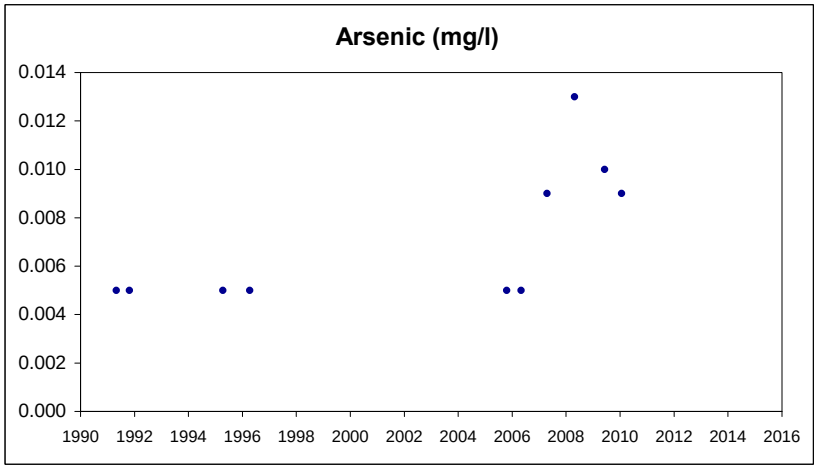

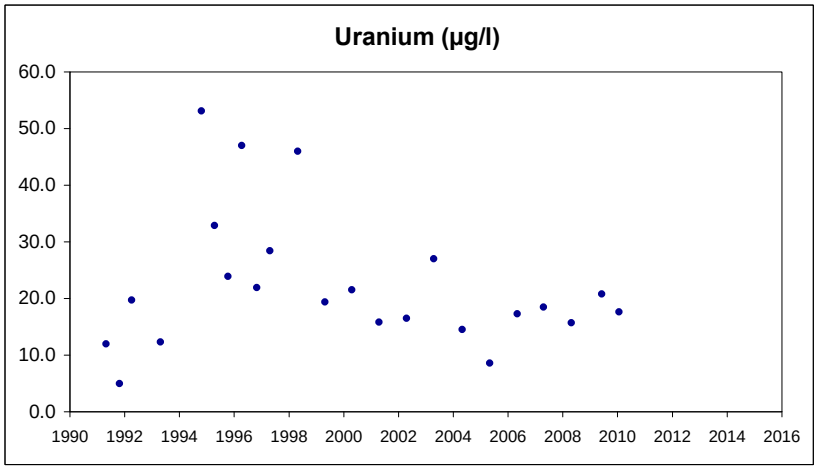

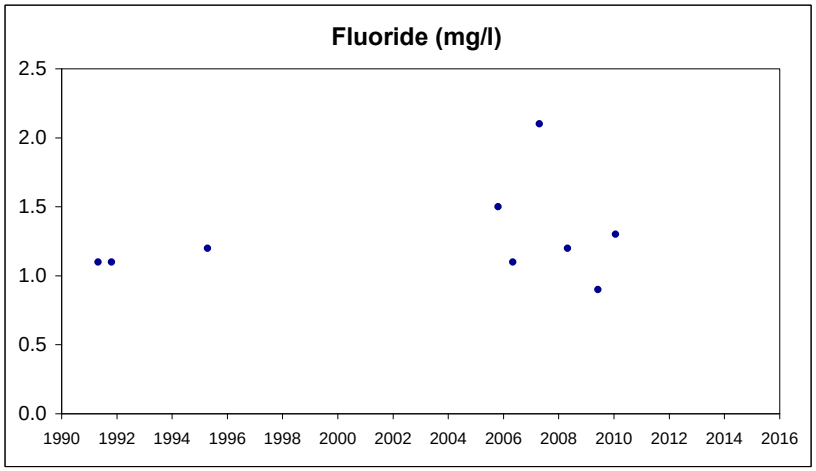

MW054

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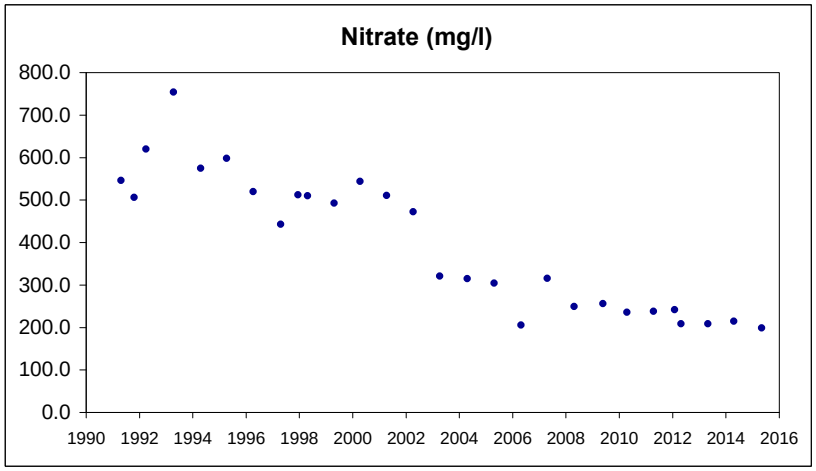

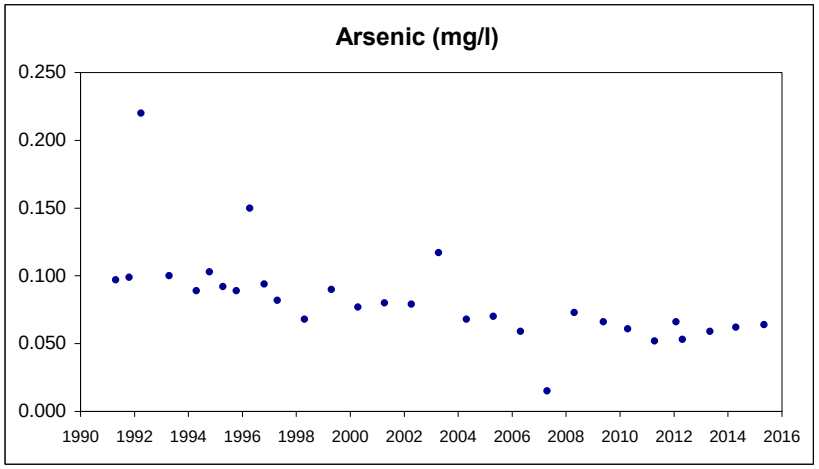

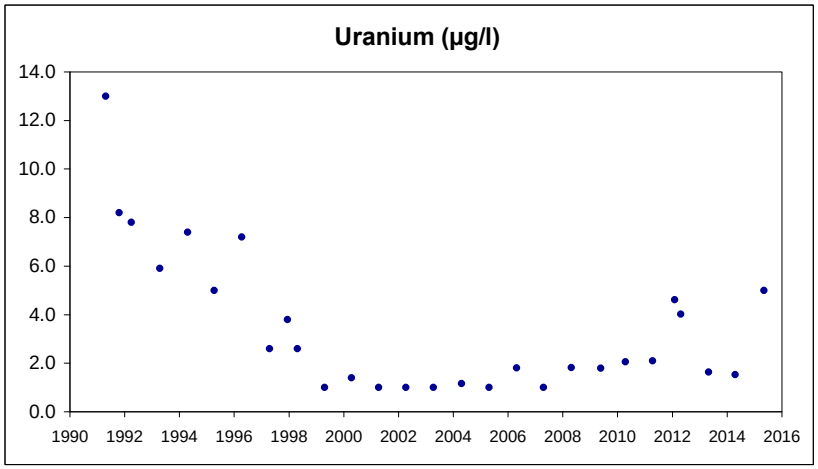

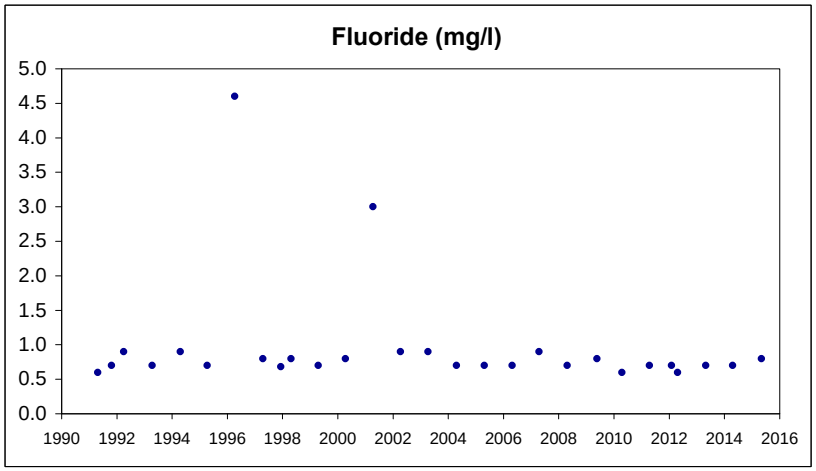

MW056

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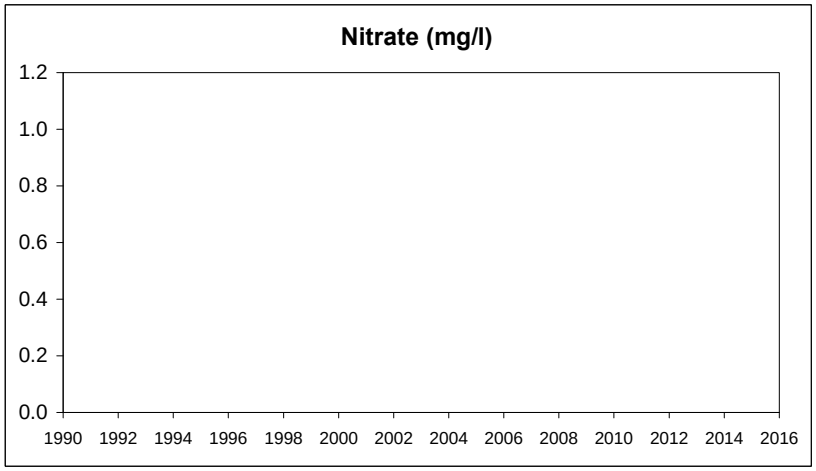

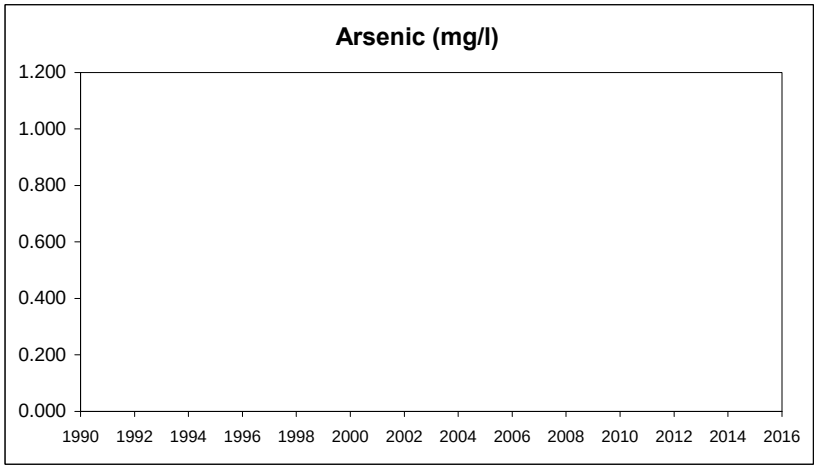

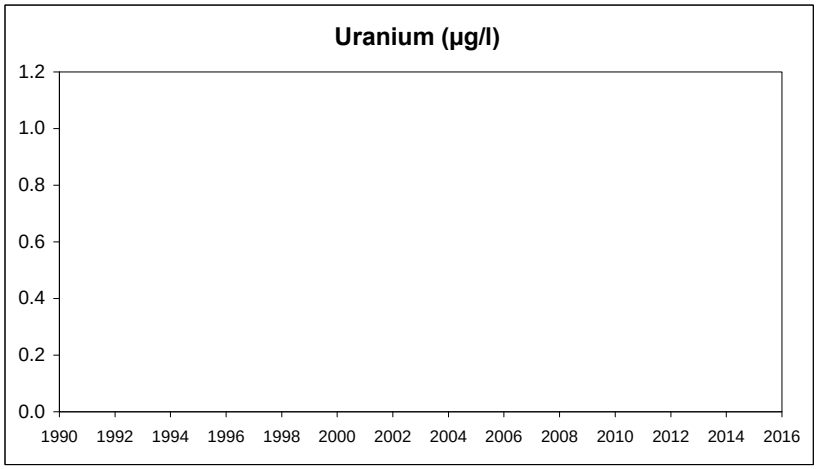

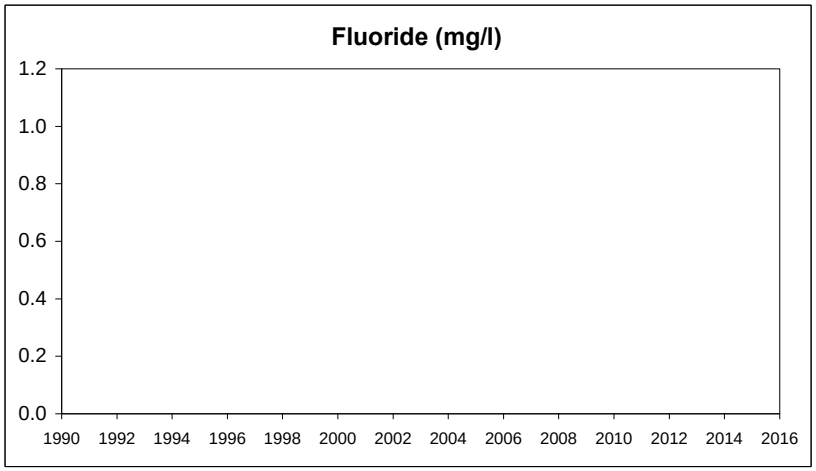

MW057A

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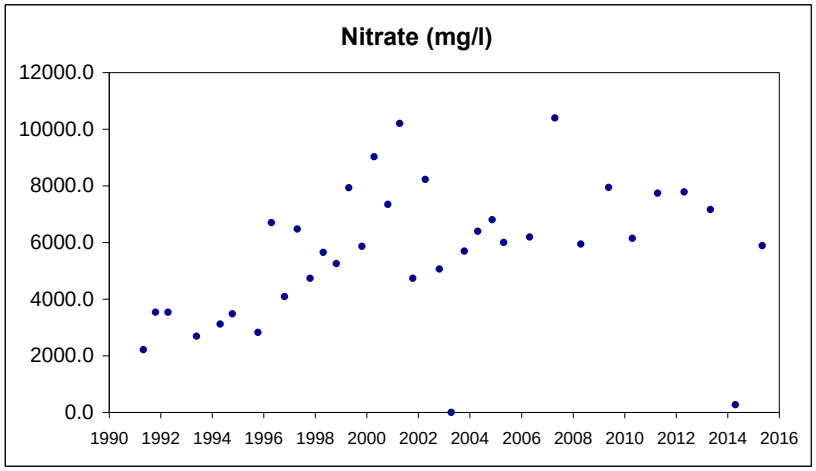

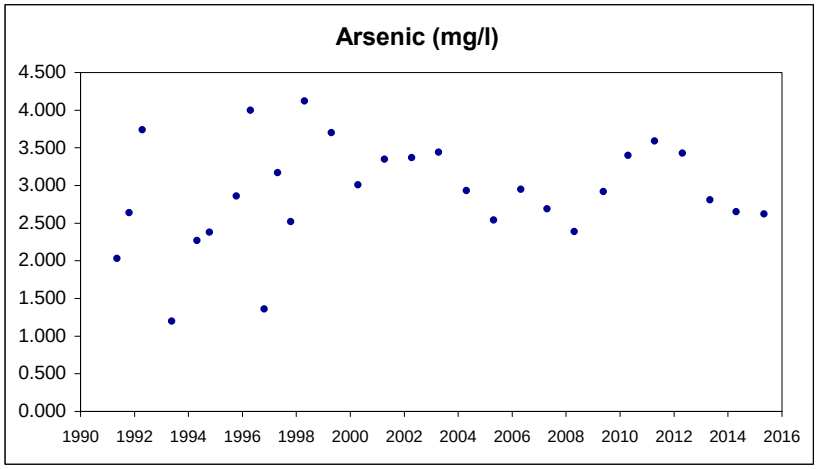

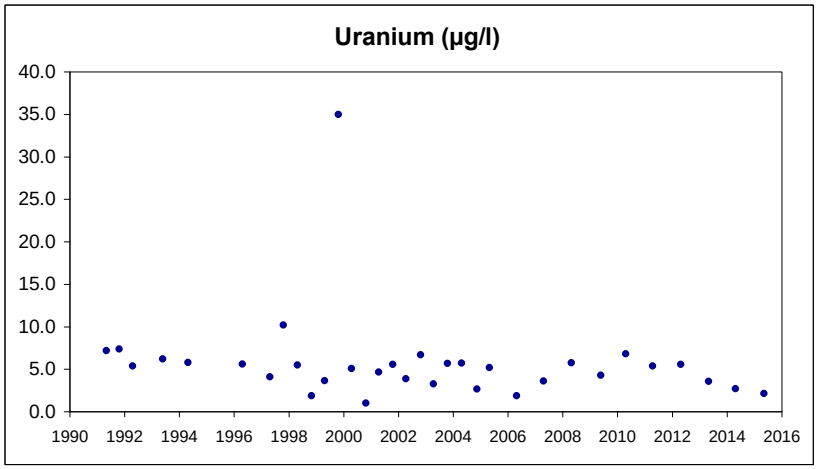

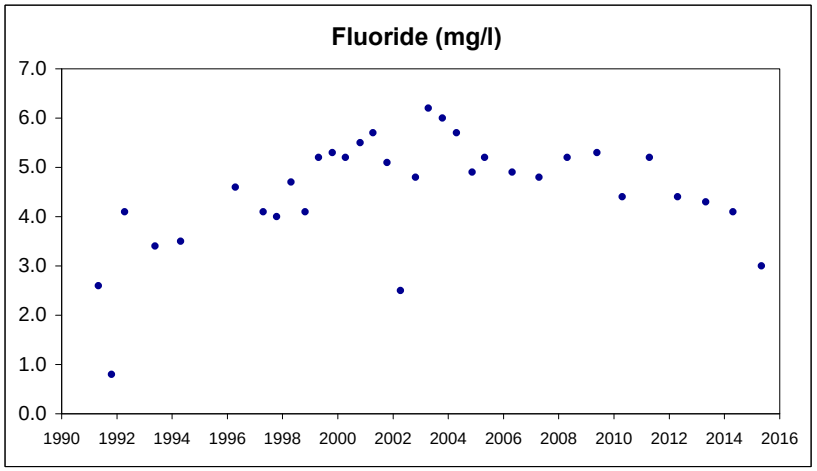

MW059A

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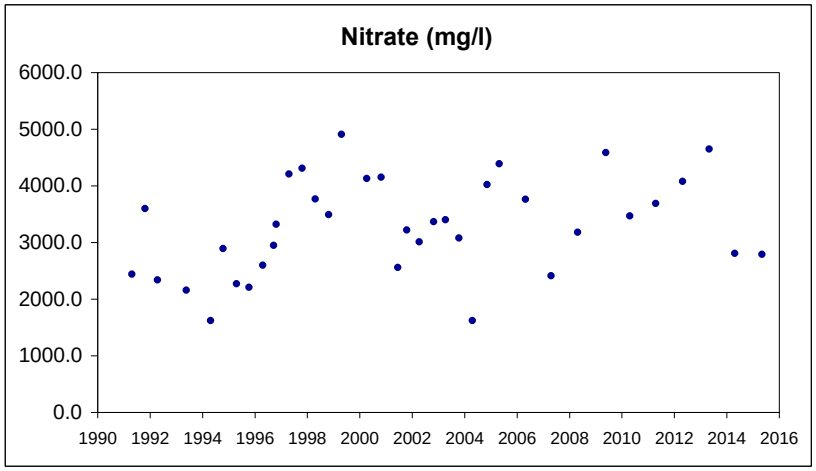

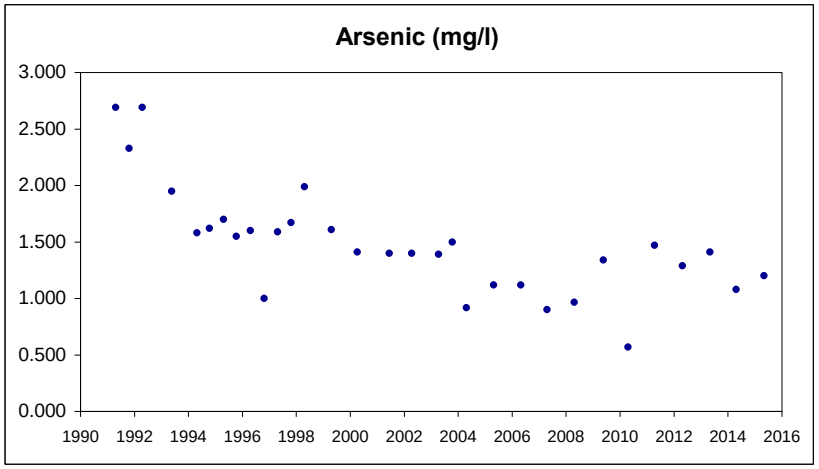

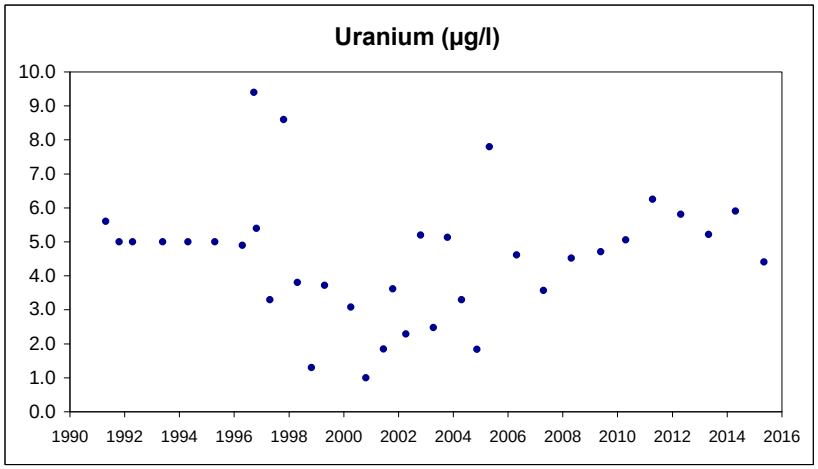

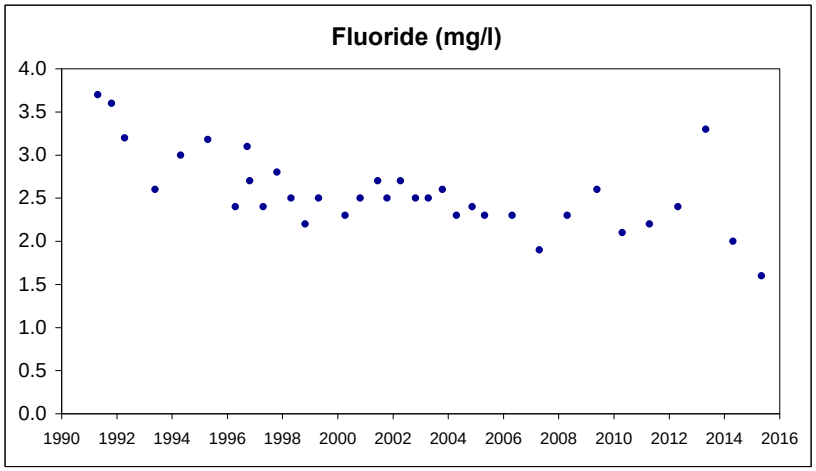

MW059B

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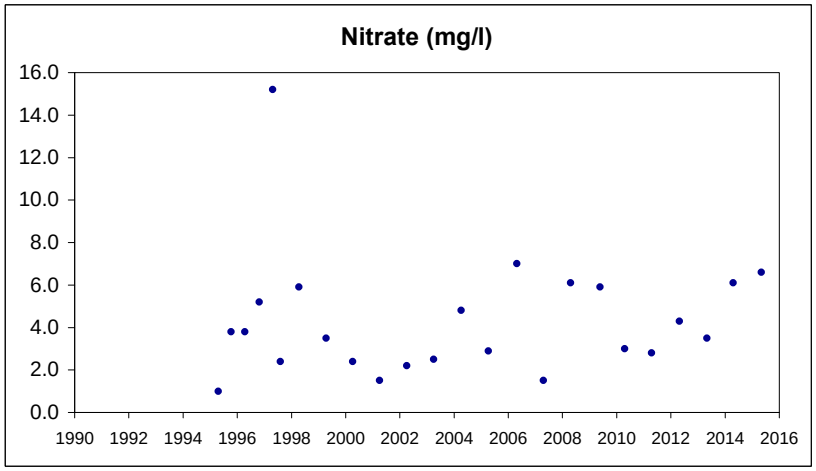

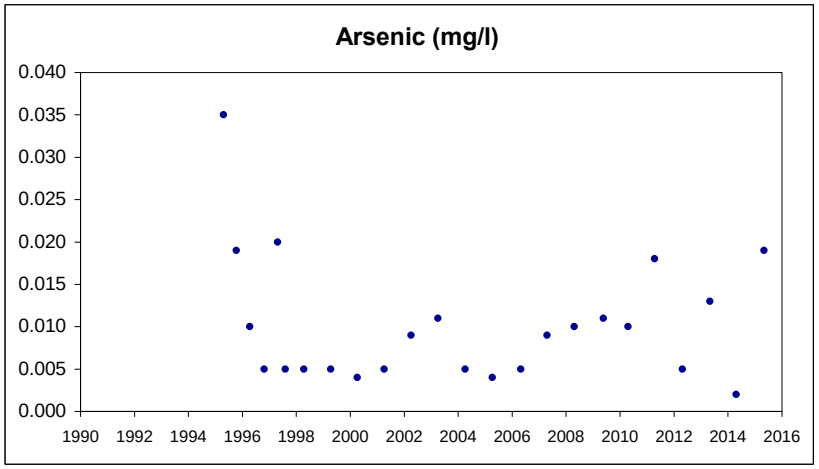

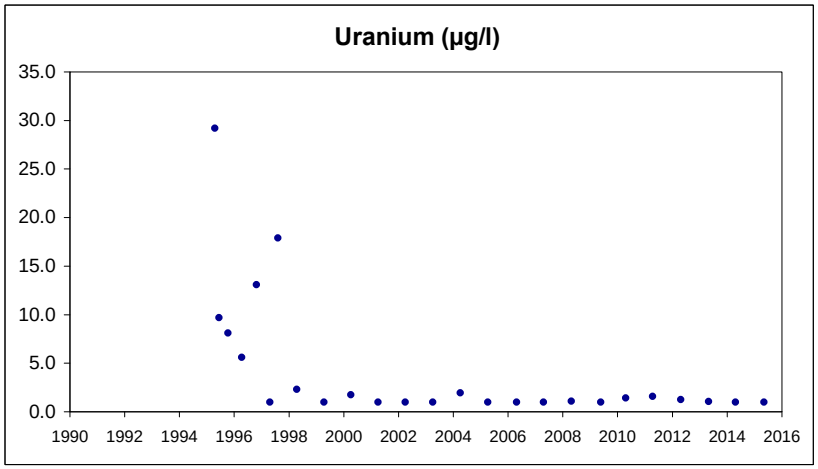

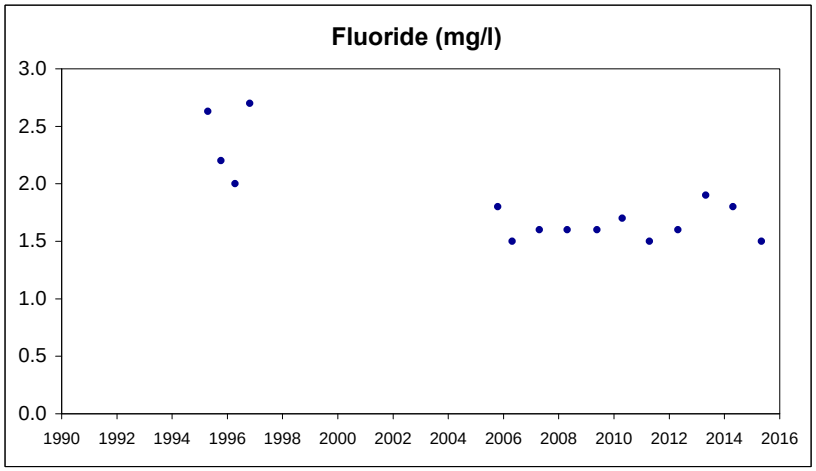

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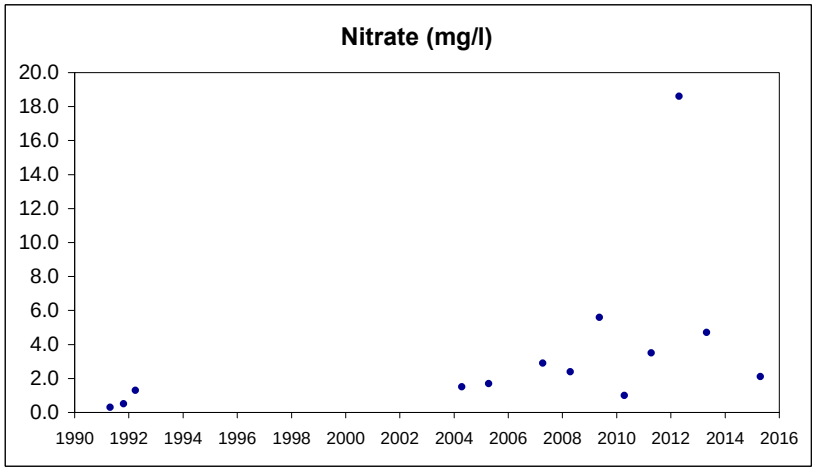

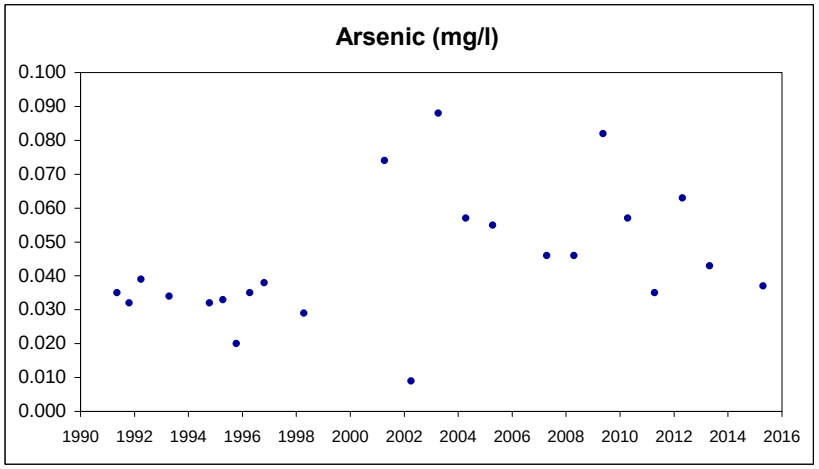

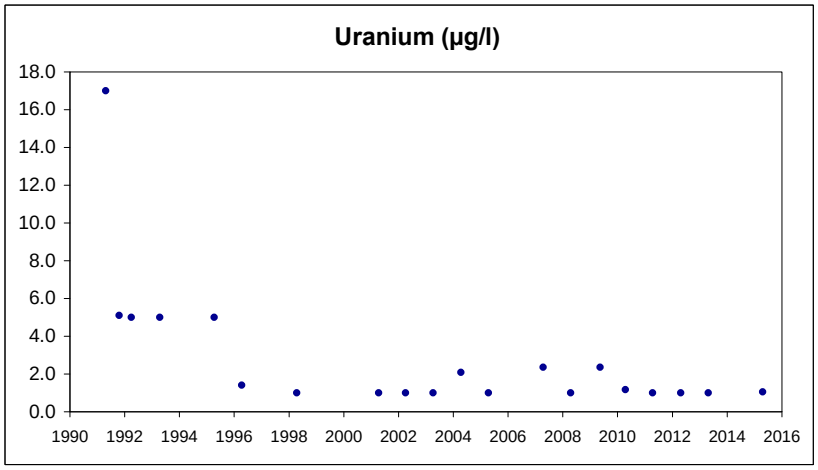

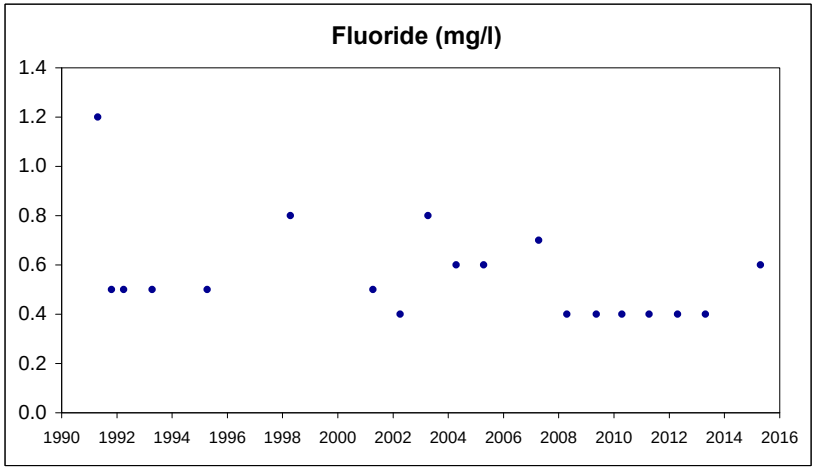

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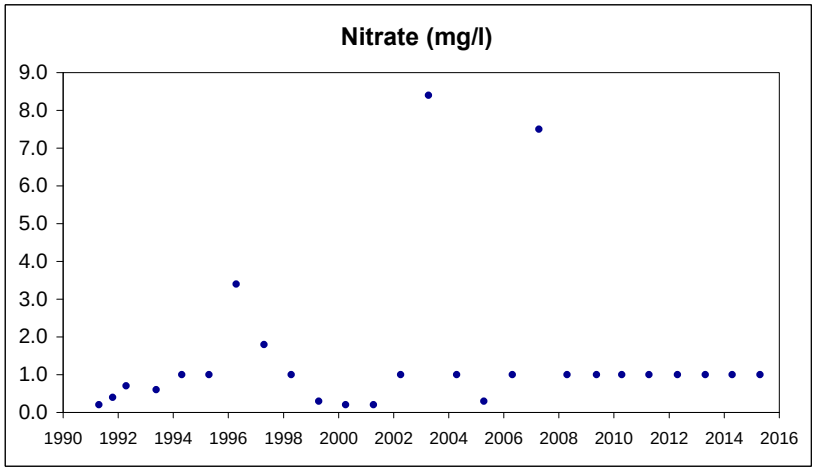
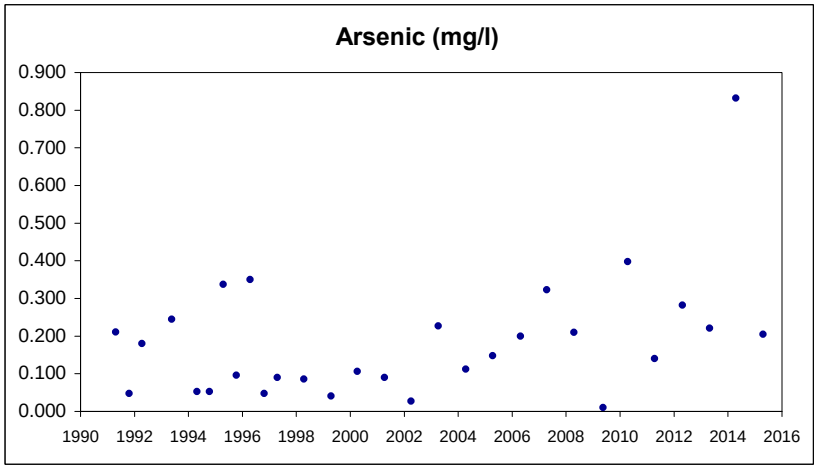
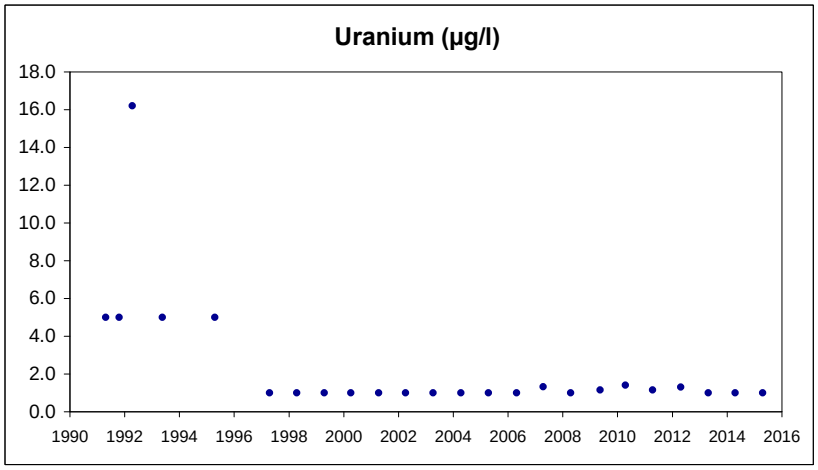
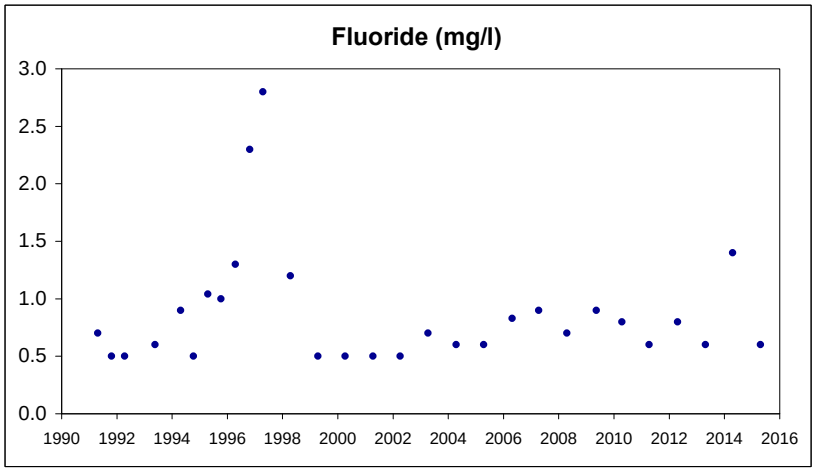
2015 Annual Report









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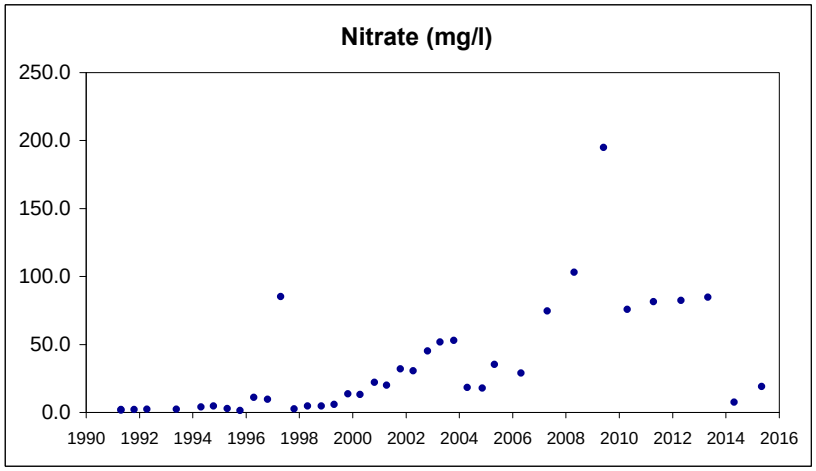

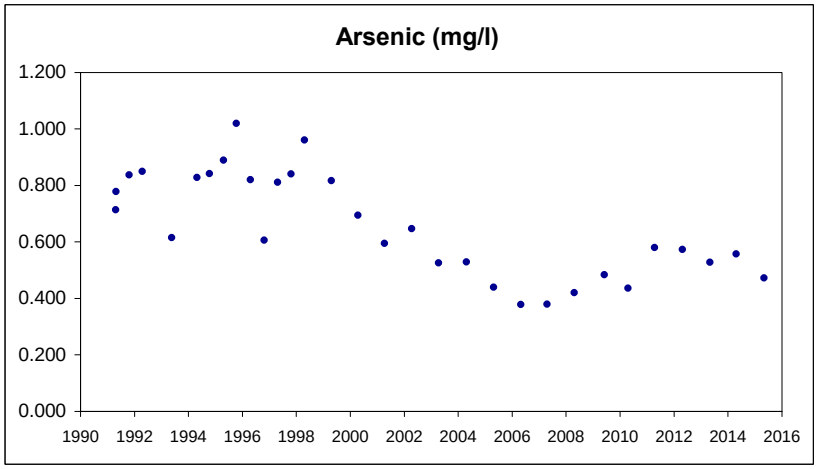

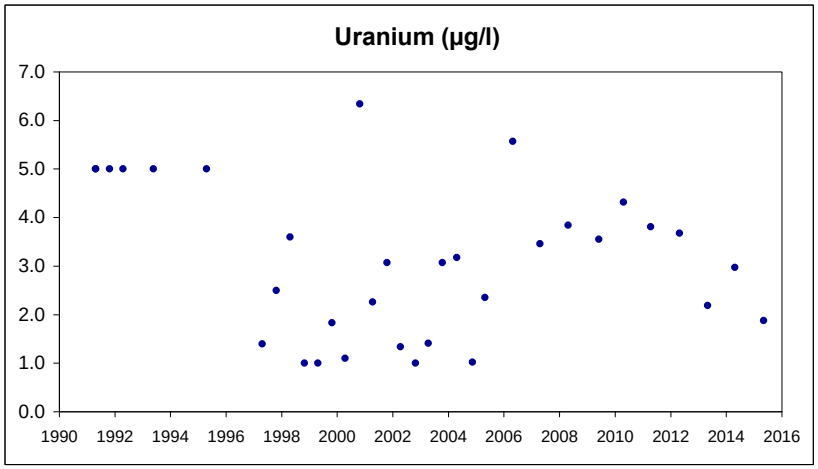

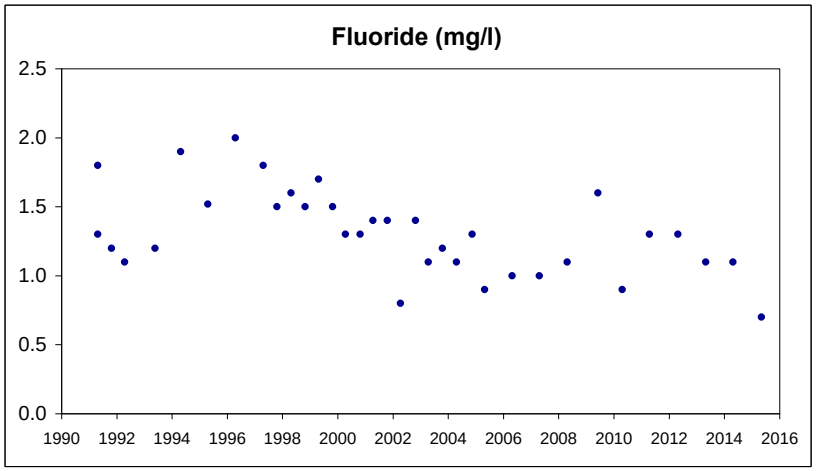

MW067A

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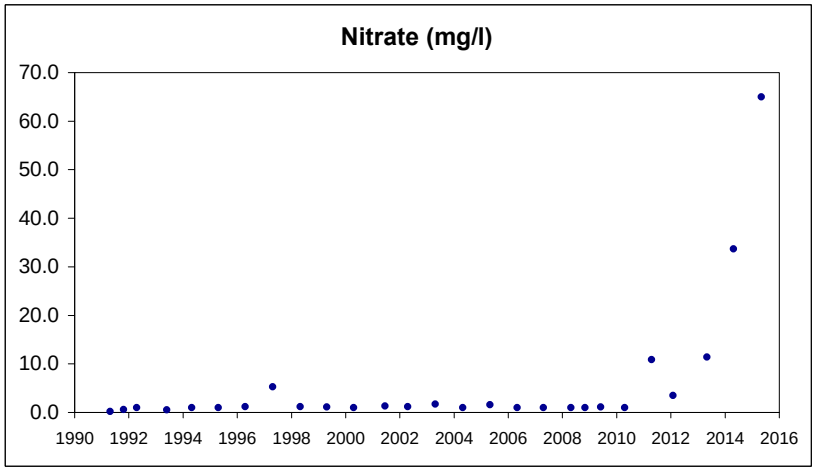

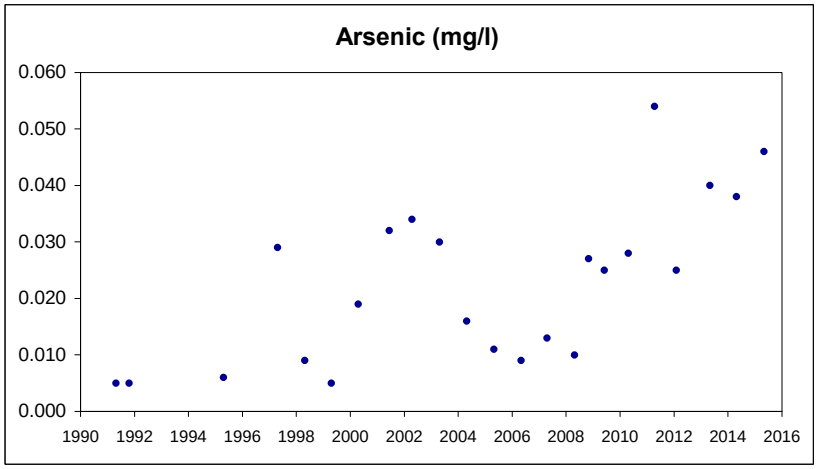

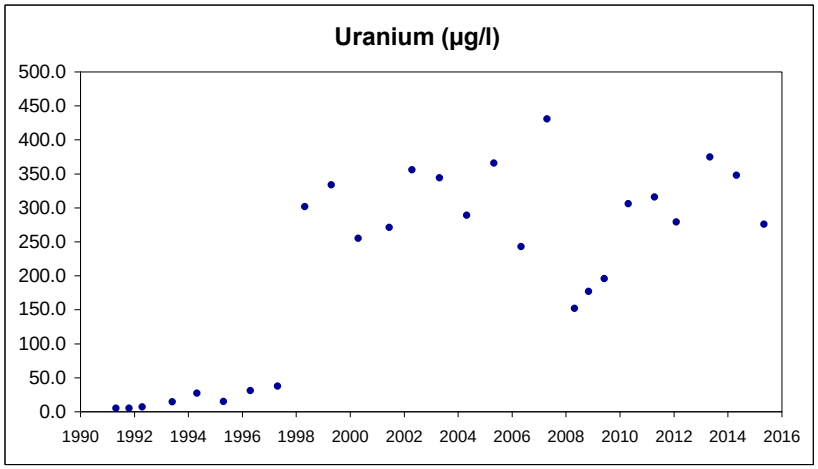

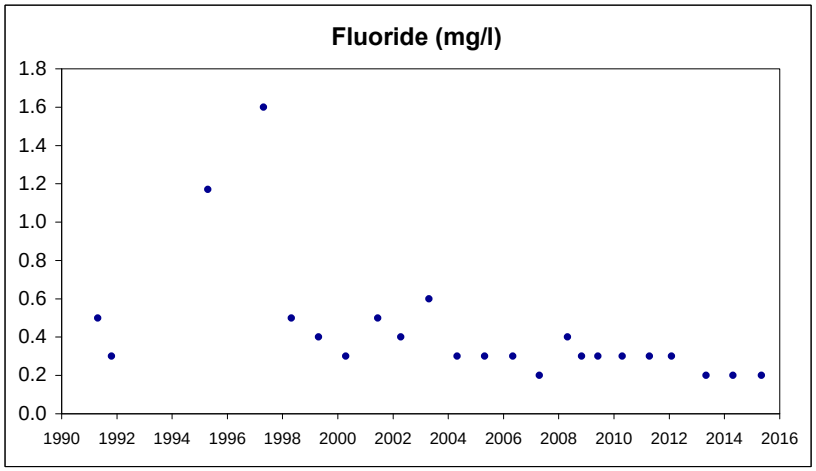

MW070

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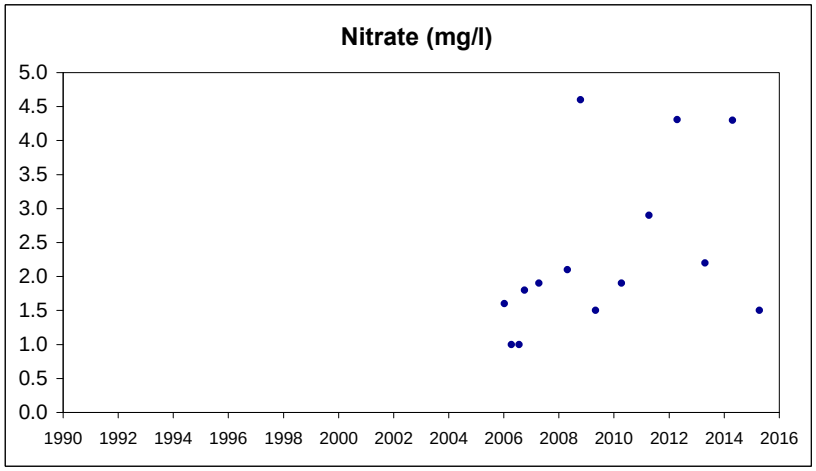

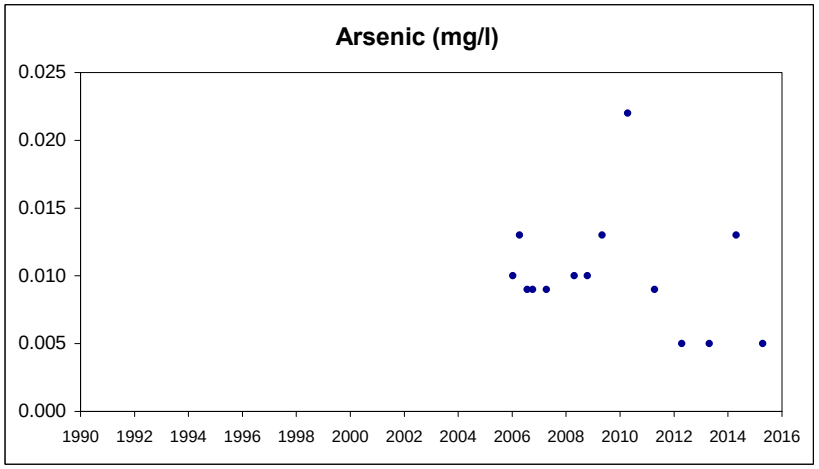

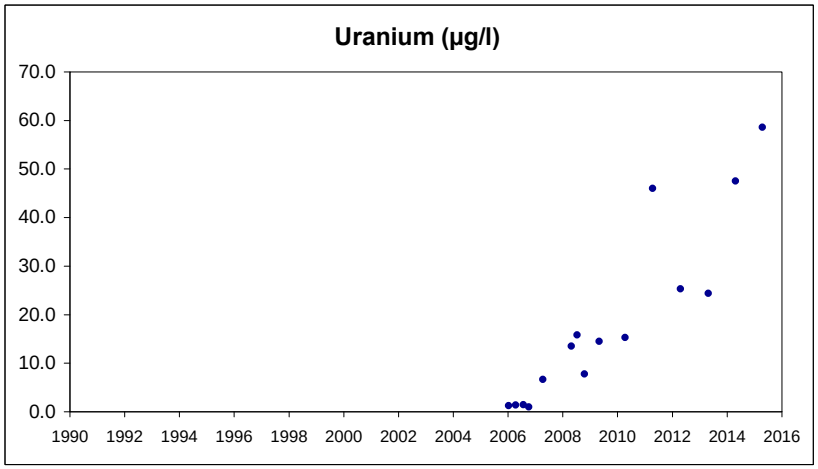

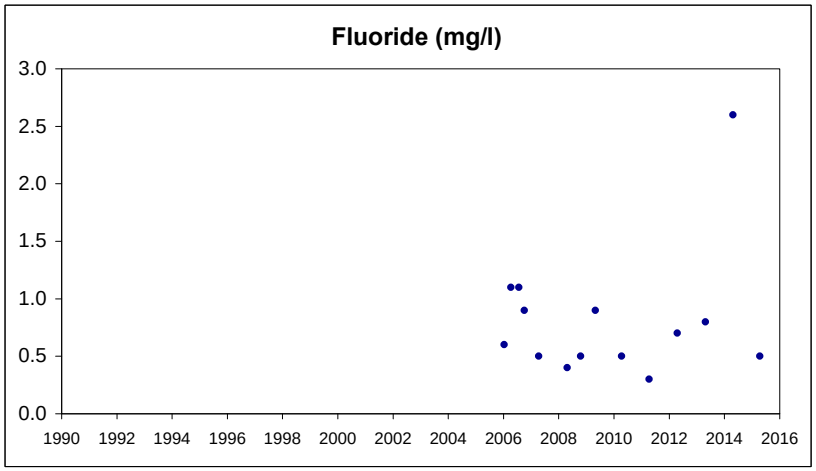

MW073

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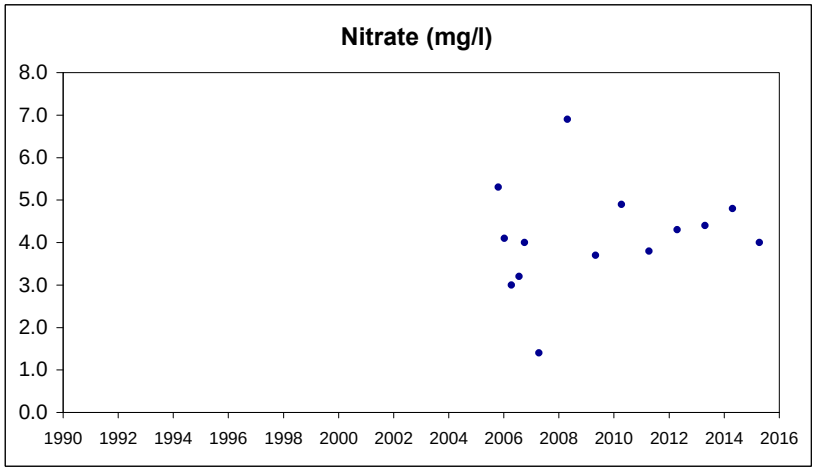

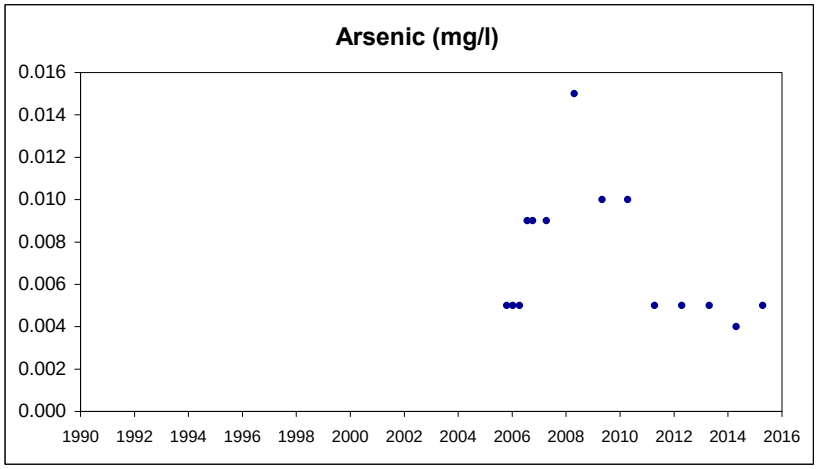

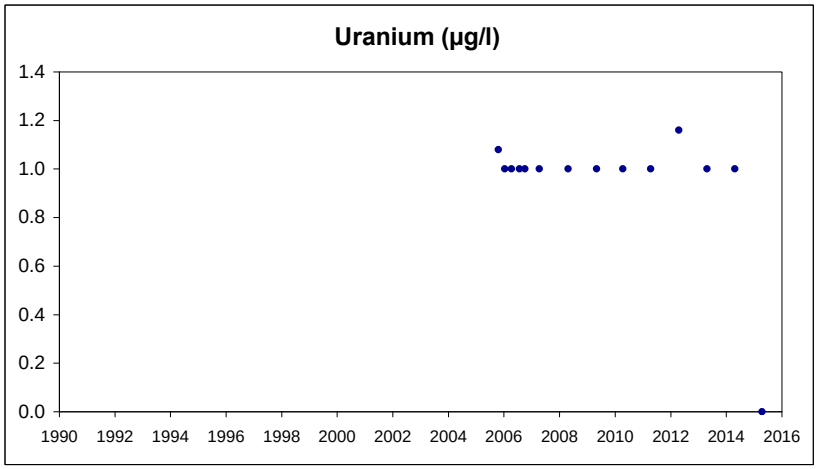

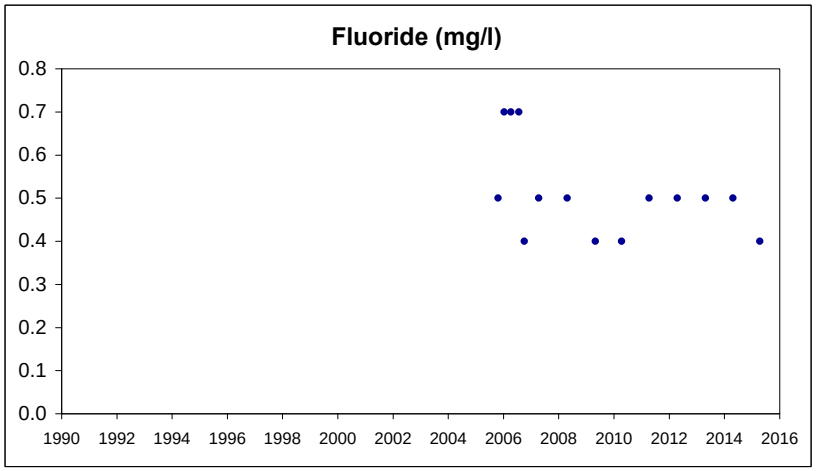

MW075

(Plugged on 08Jul2009)

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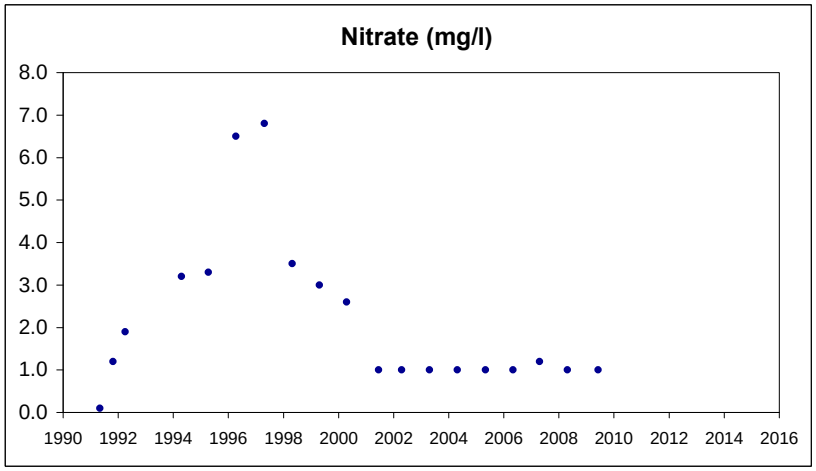

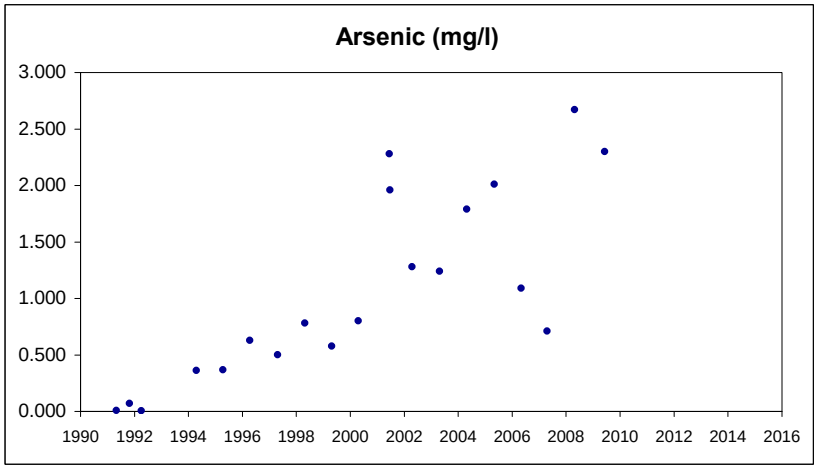

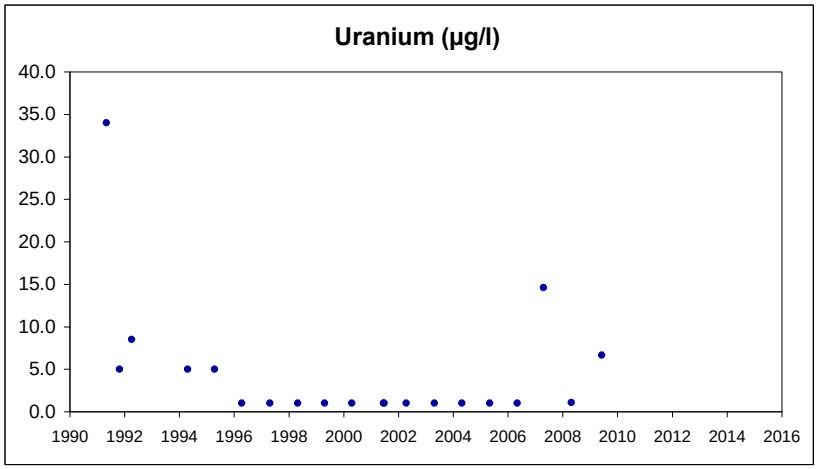

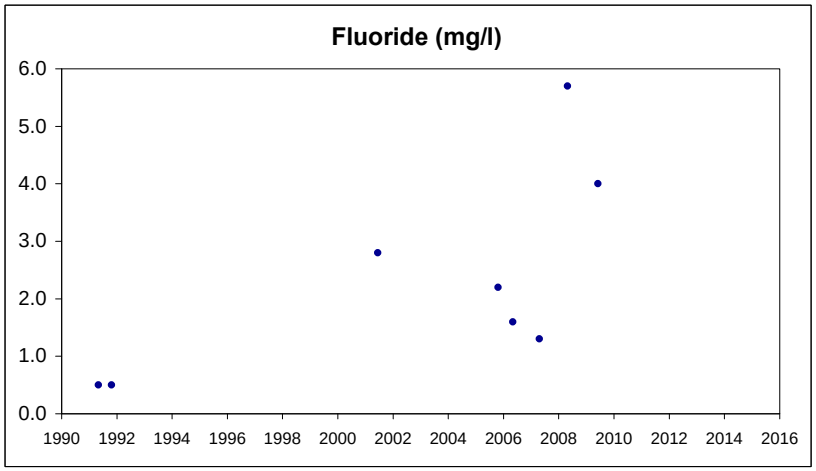

MW077

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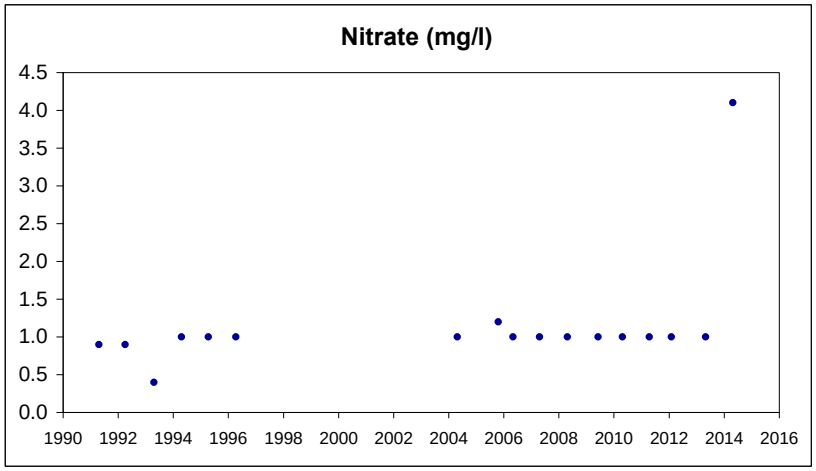

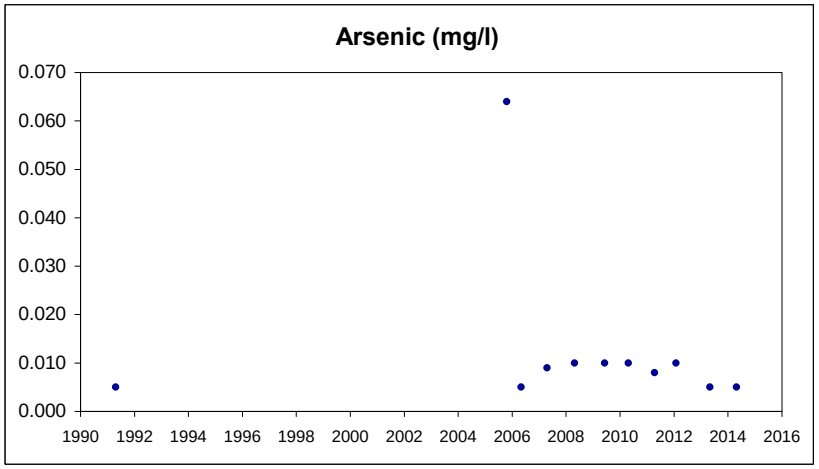

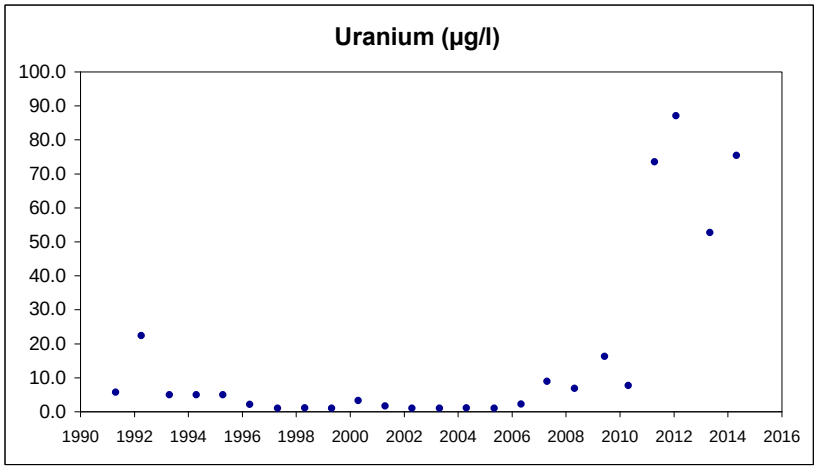

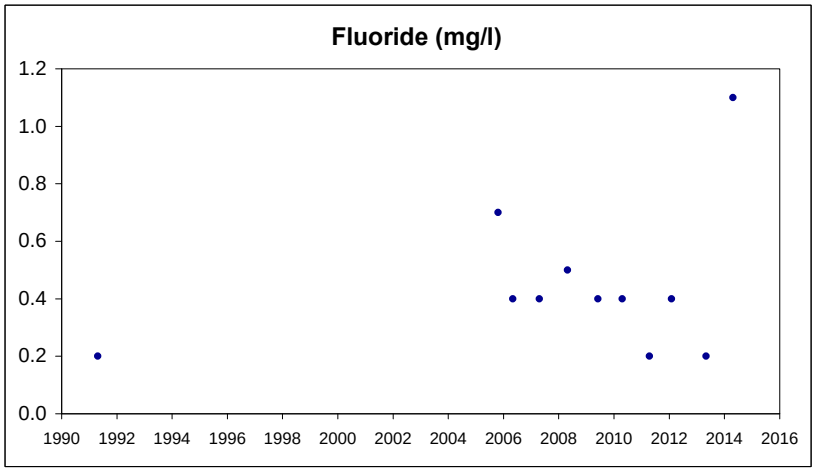

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(Plugged on 08Jul2009)

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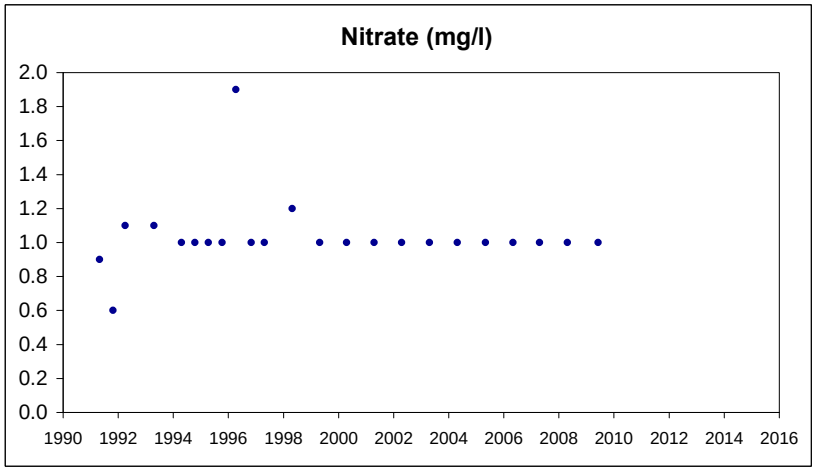

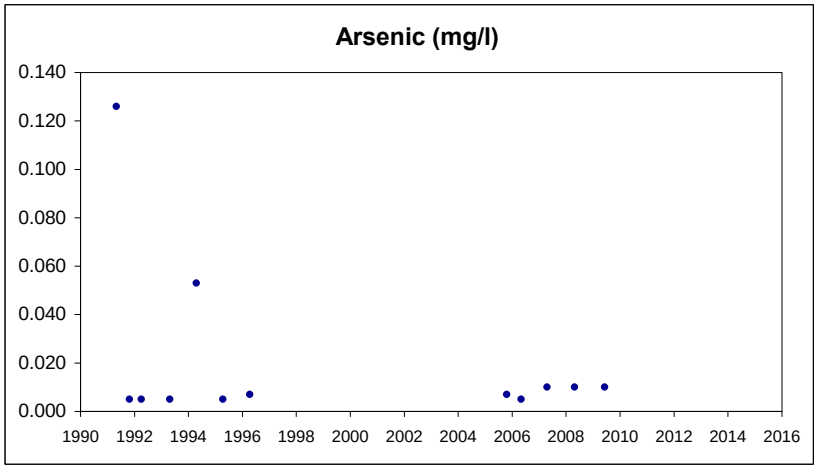

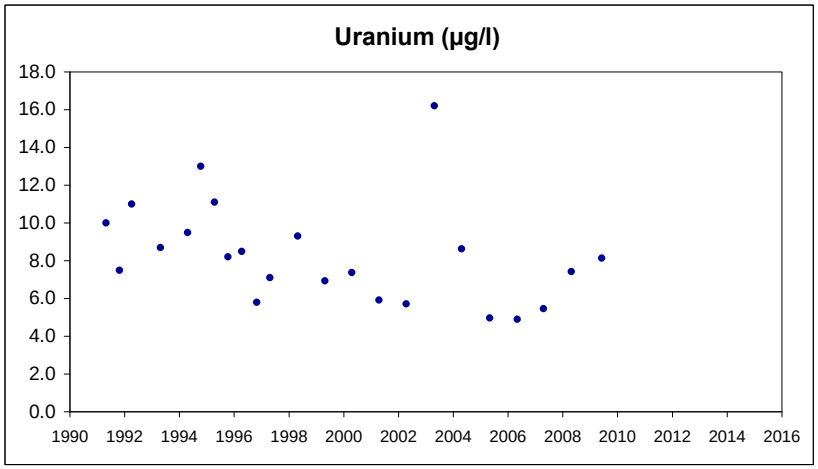

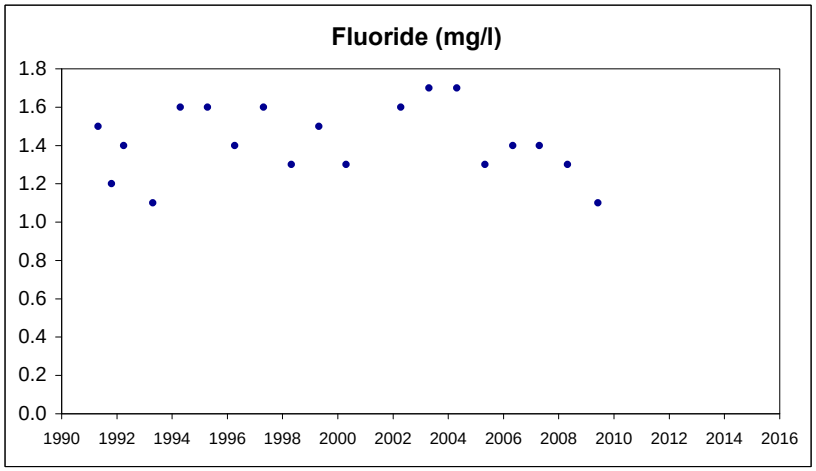

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(Plugged on 08Jul2009)

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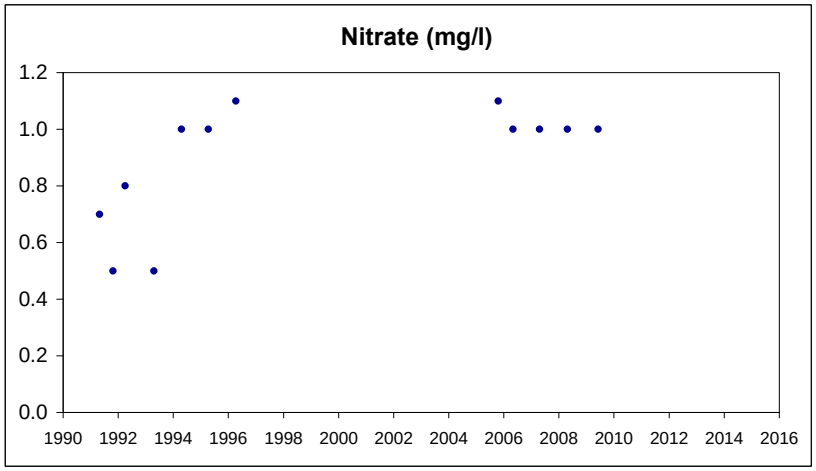

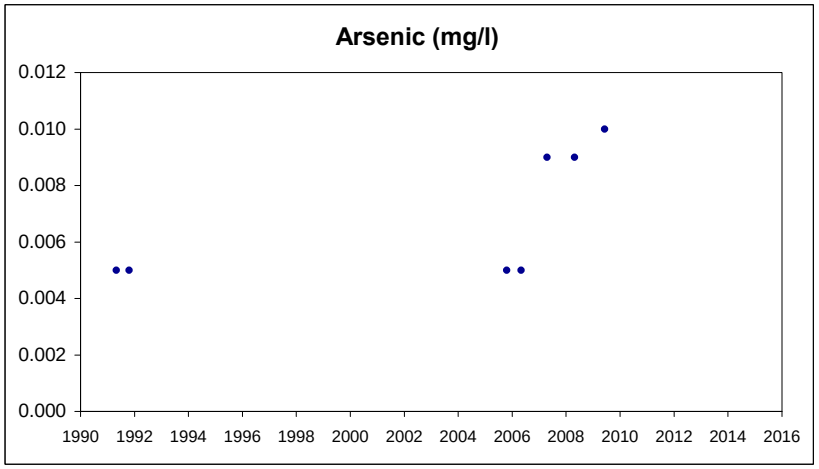

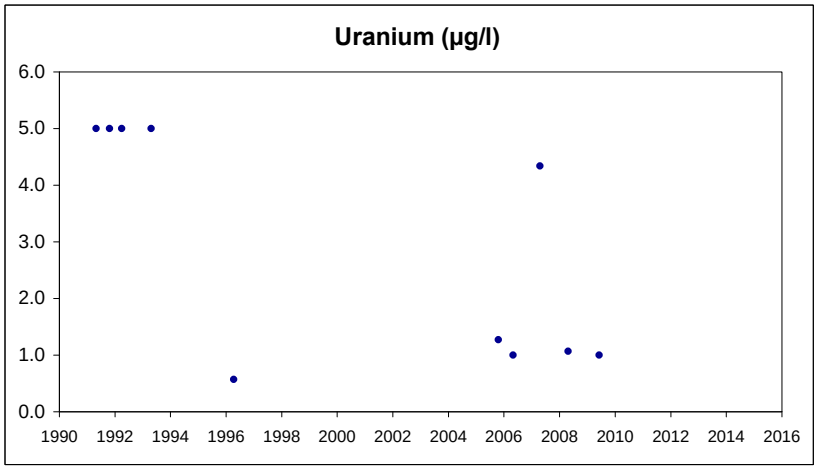

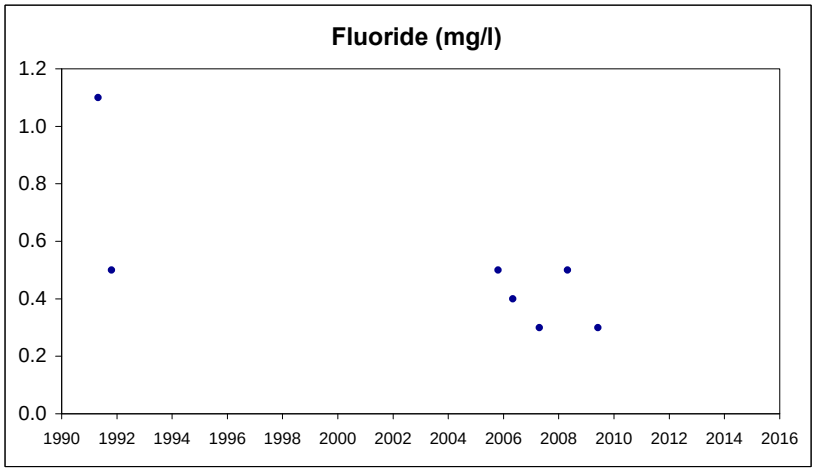

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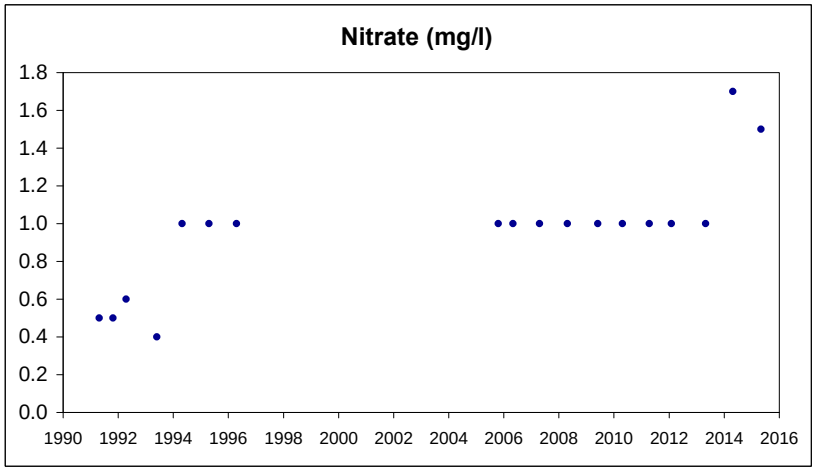

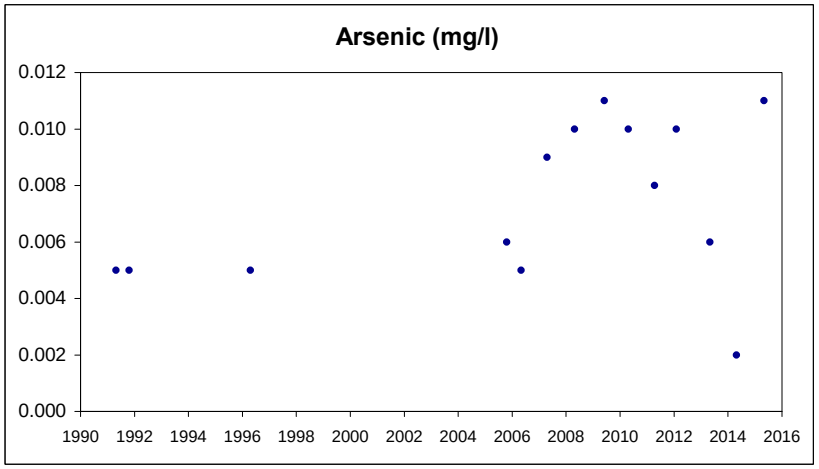

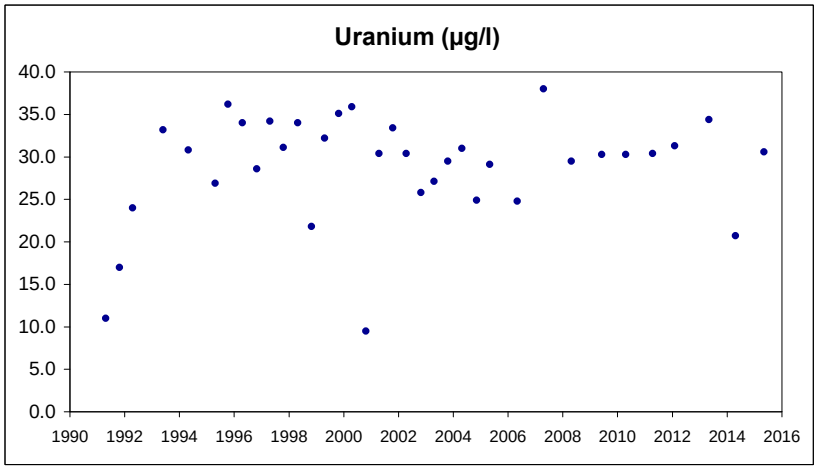

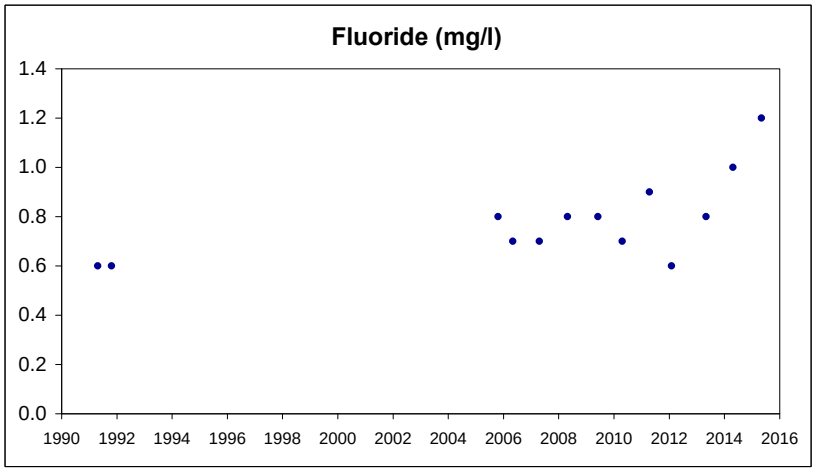

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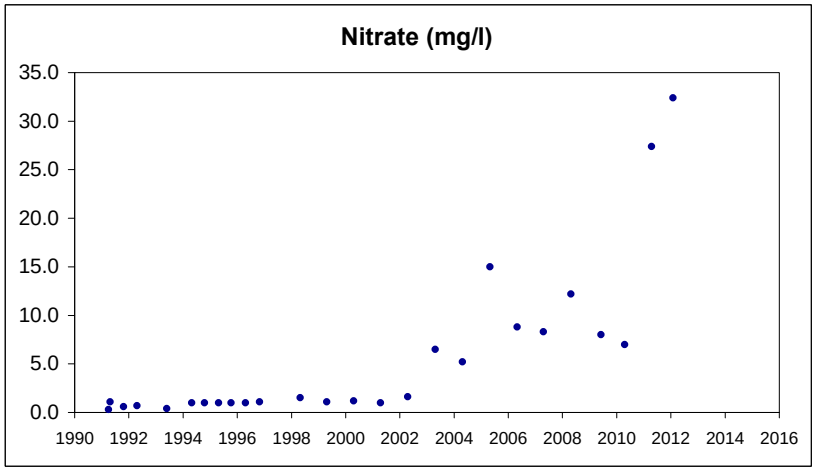

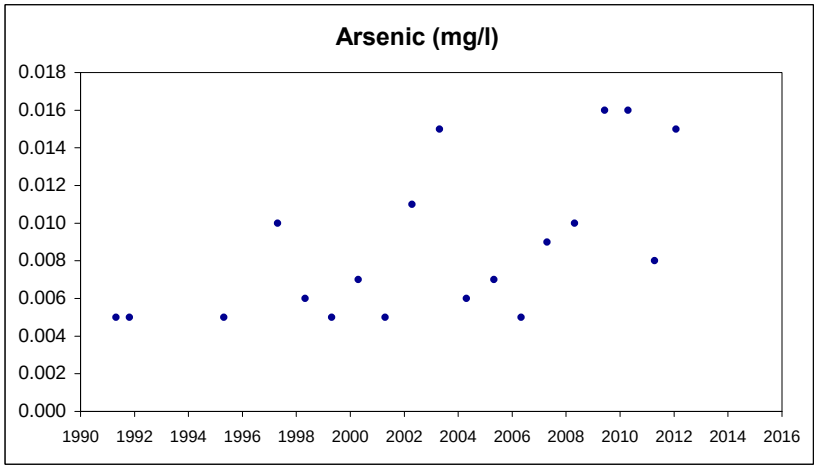

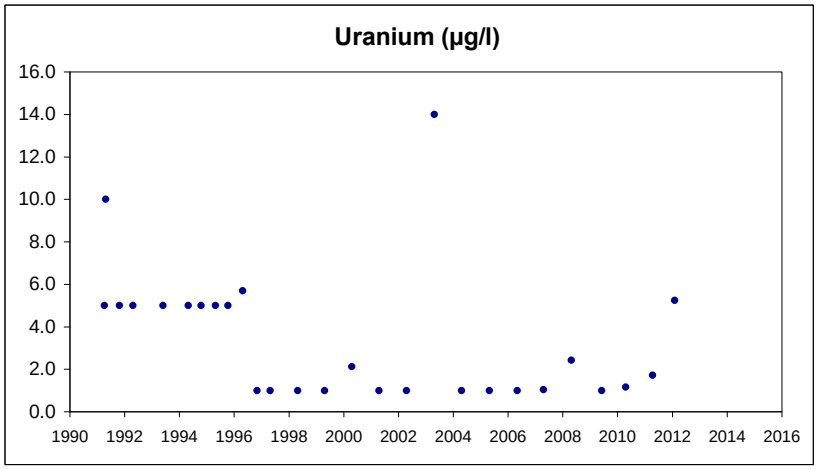

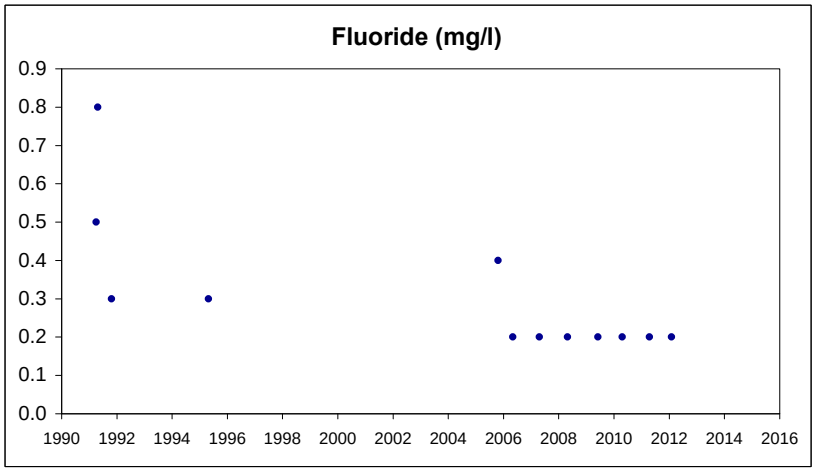

MW086

(Plugged on 03Mar2010)

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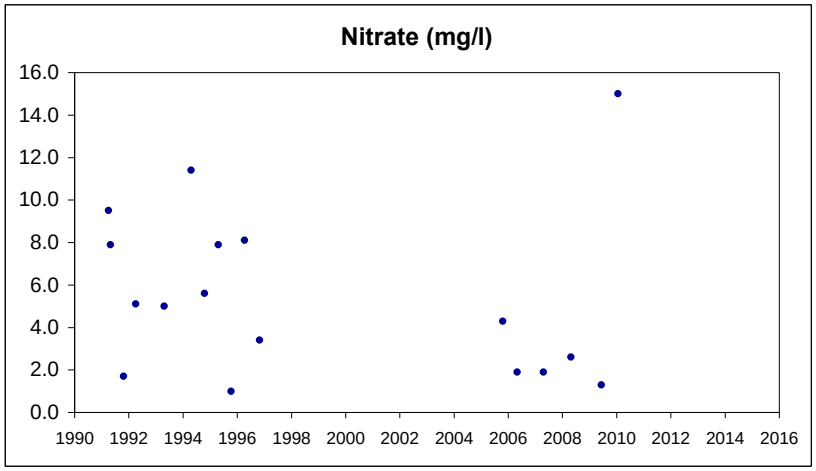

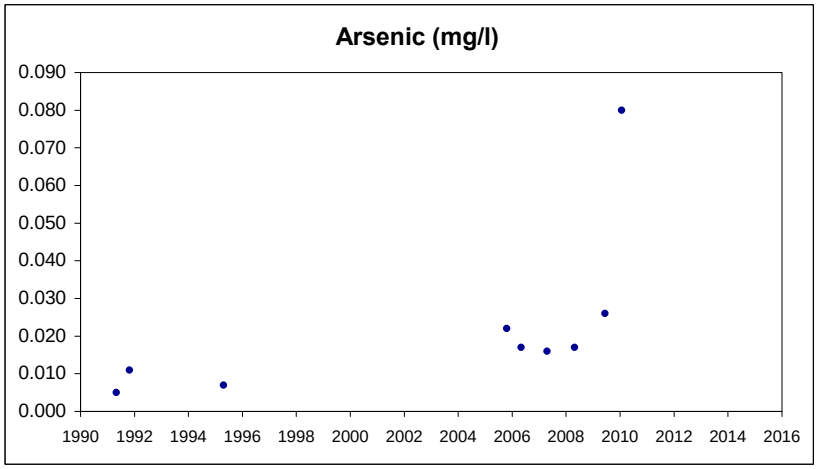

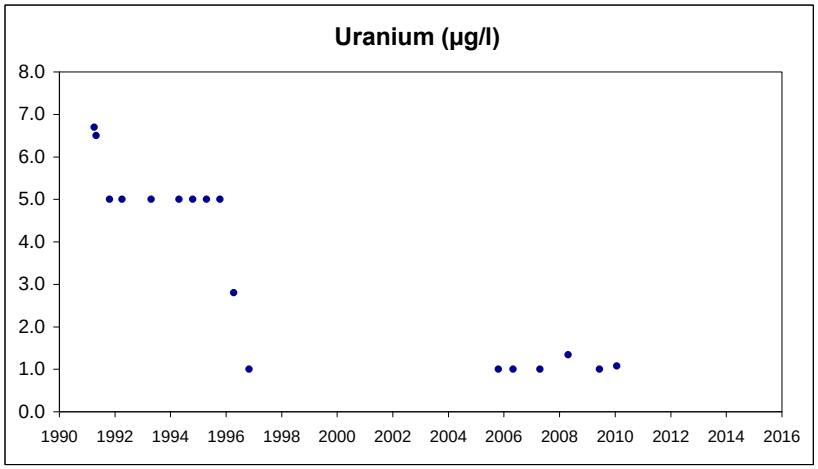

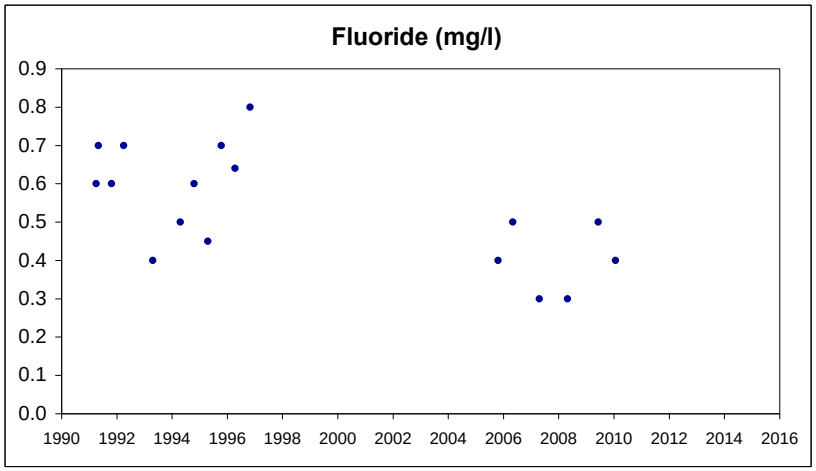

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(Plugged on 03Mar2010)

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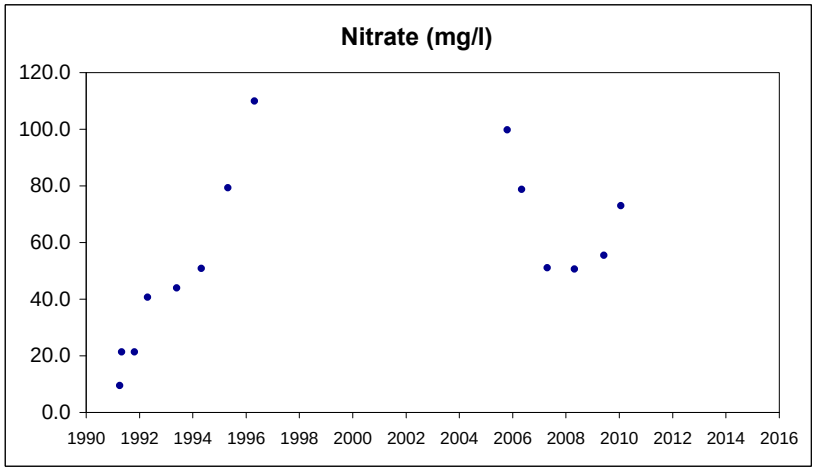

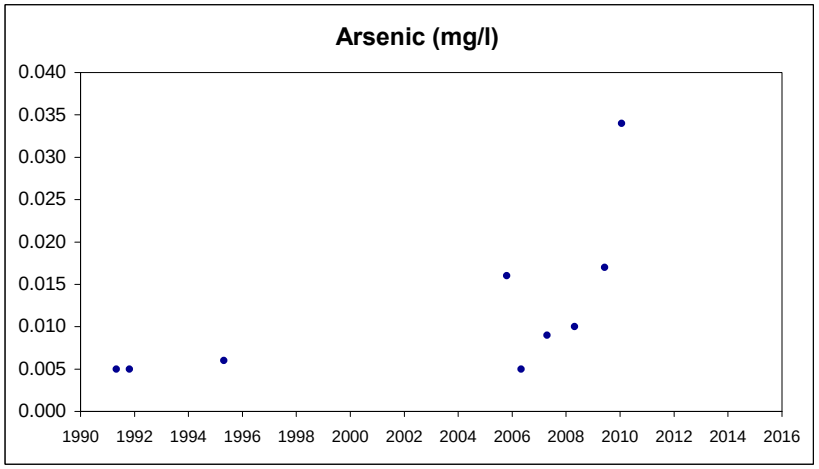

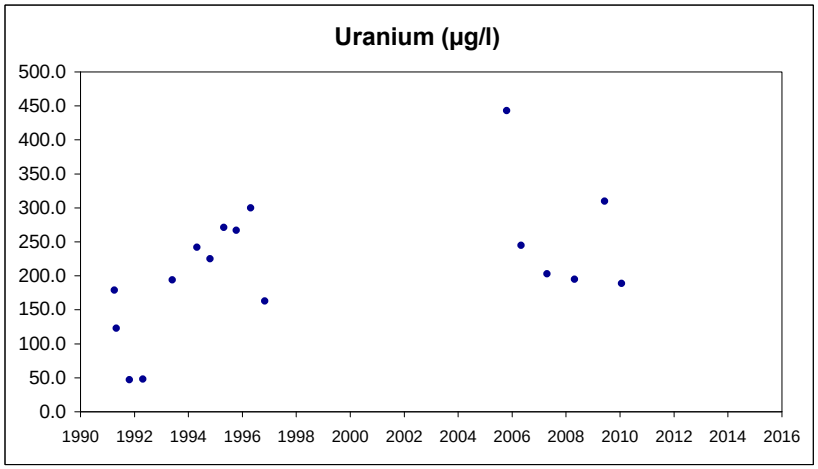

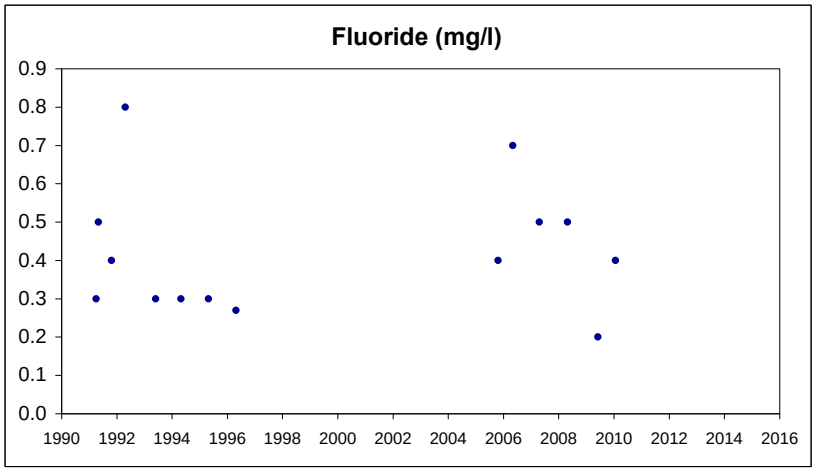

MW087

(Plugged on 02Feb2012)

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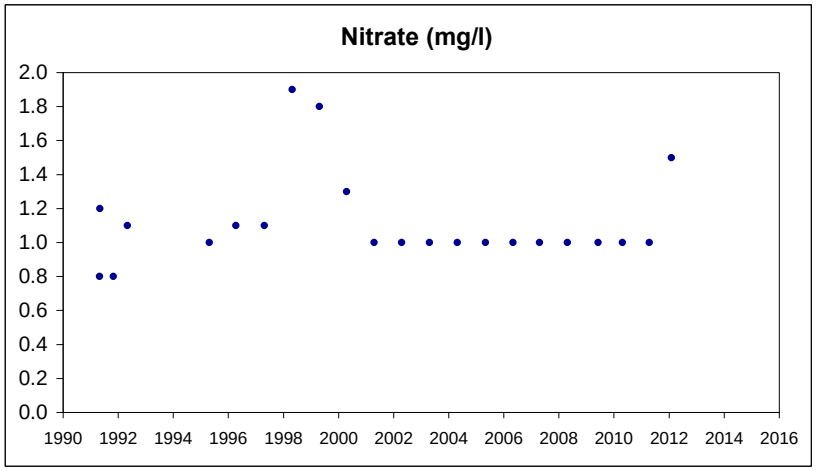

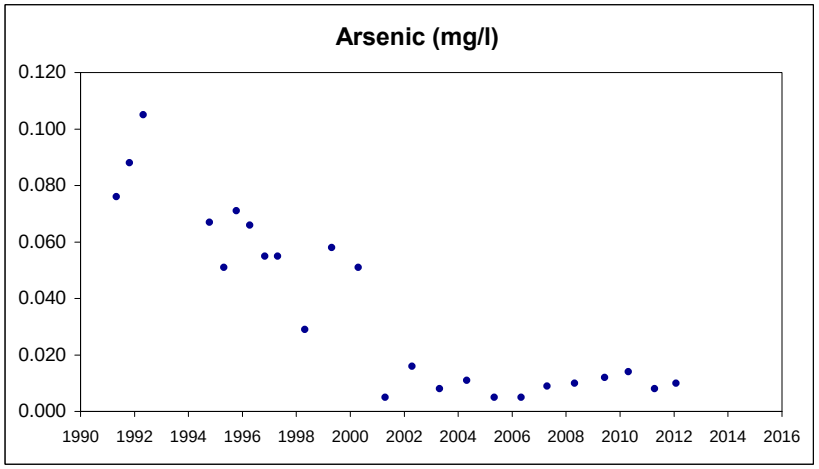

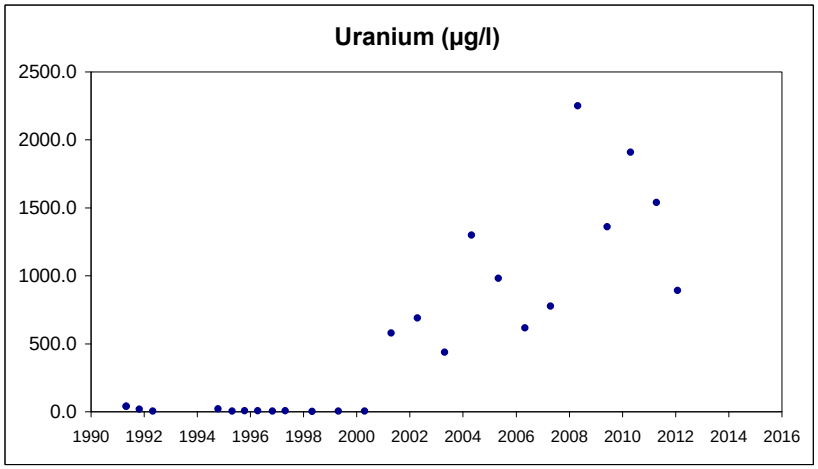

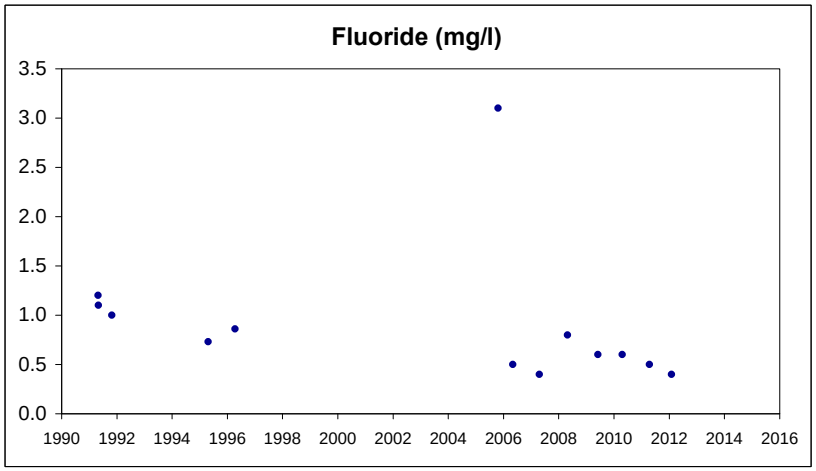

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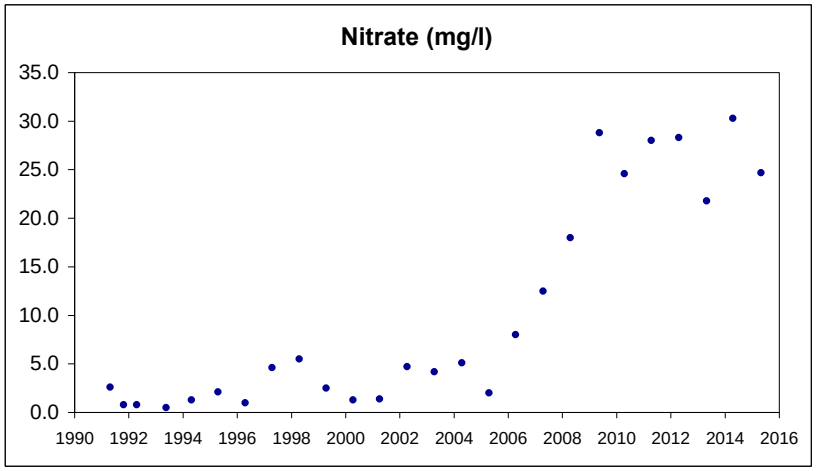

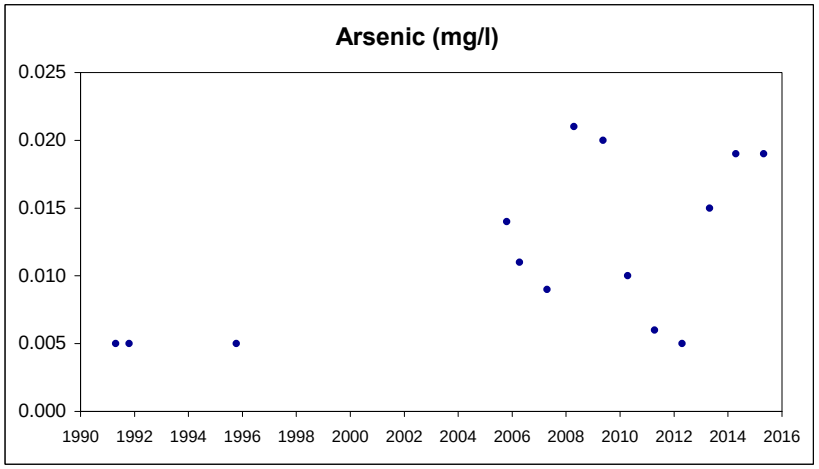

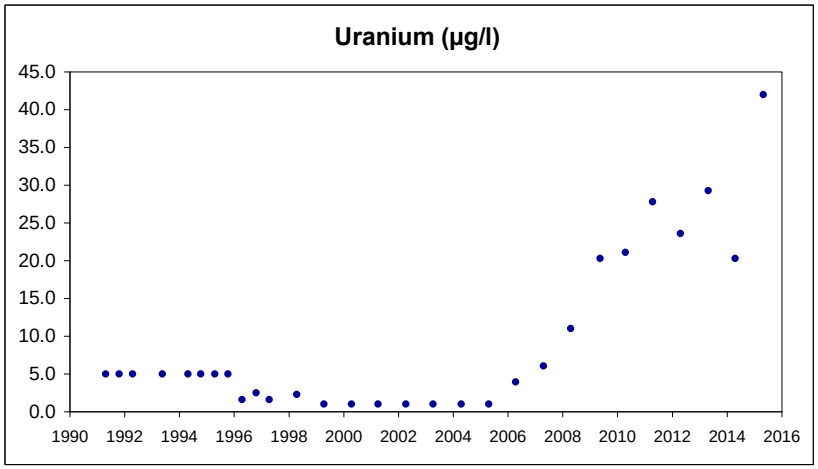

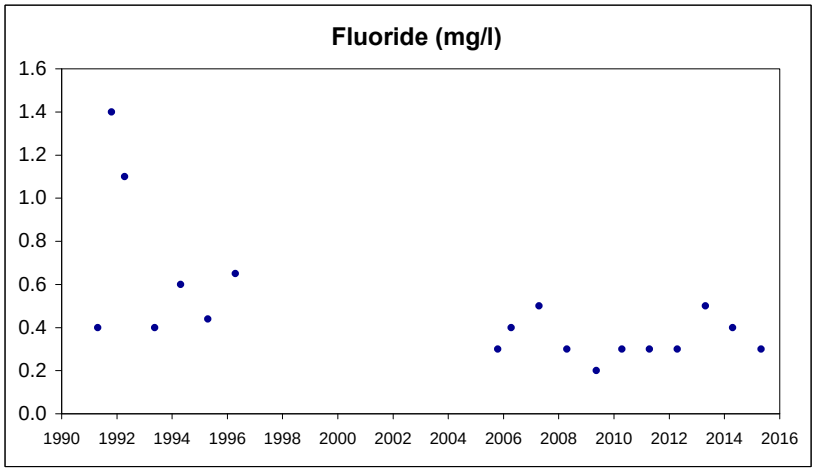

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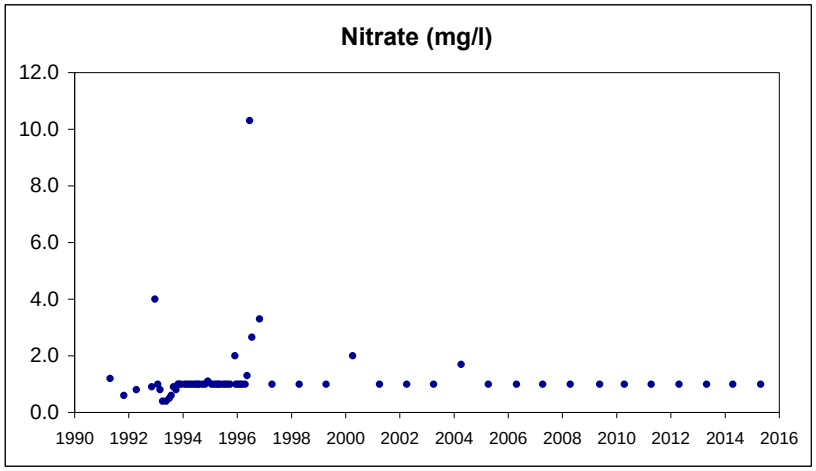

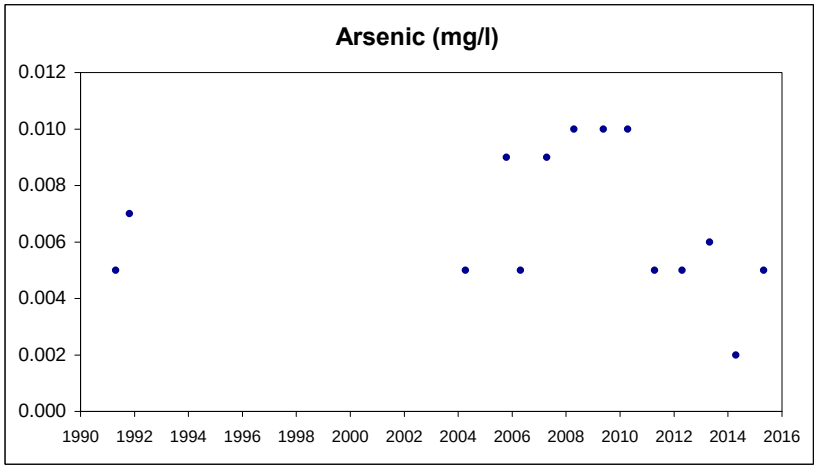

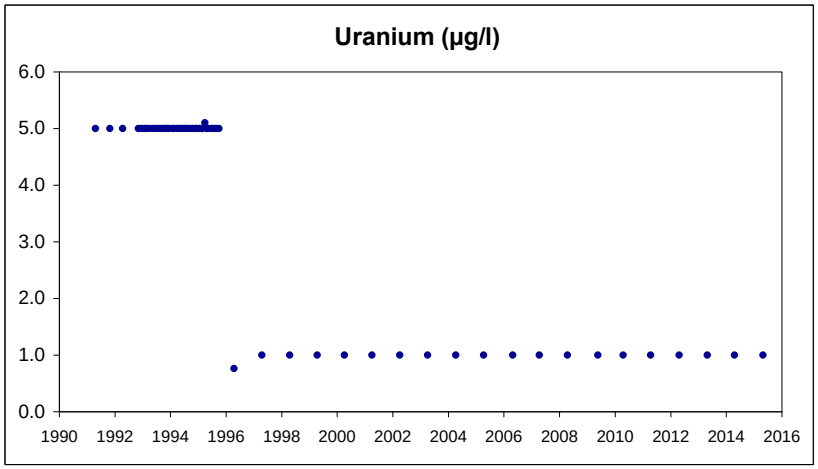

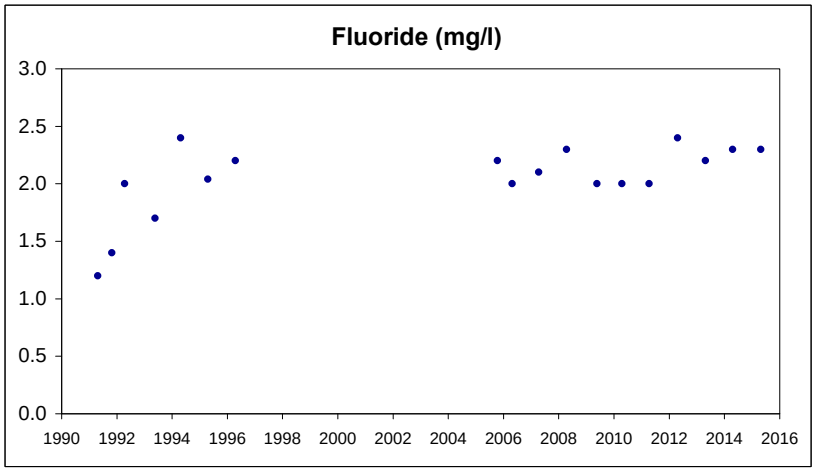

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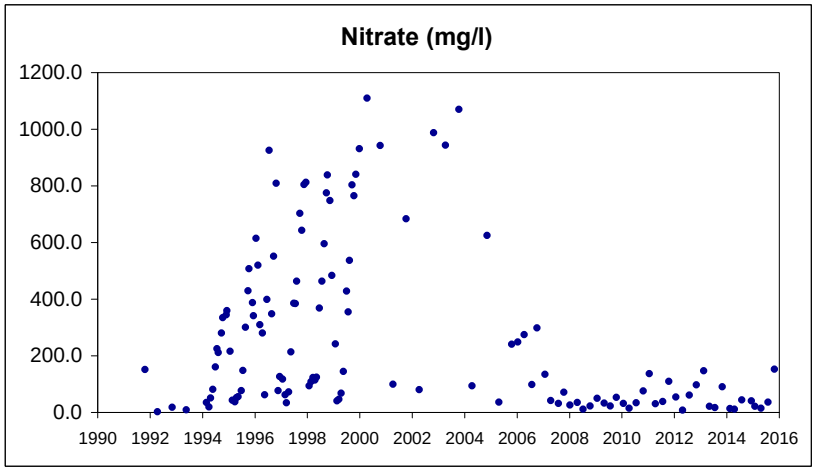

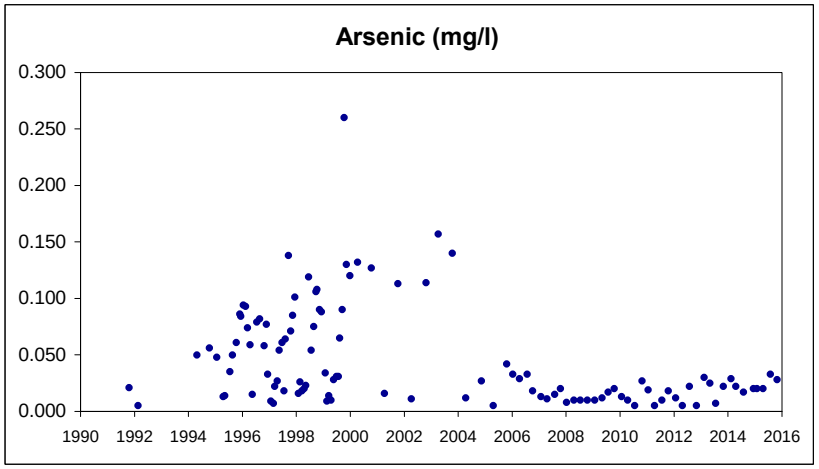

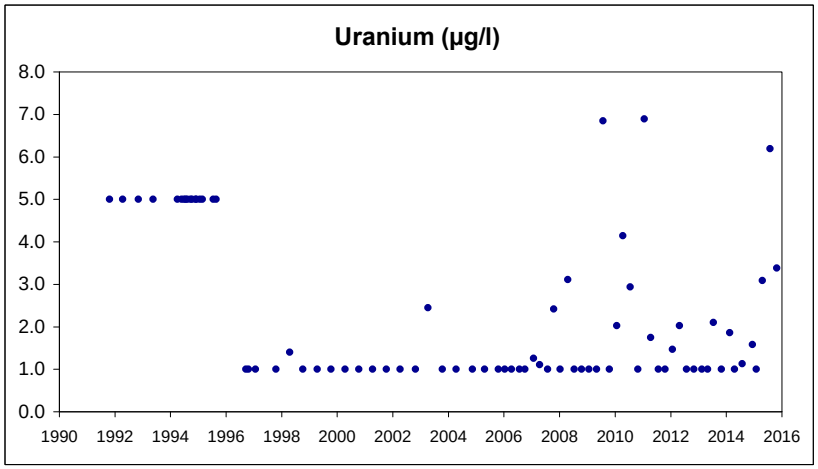

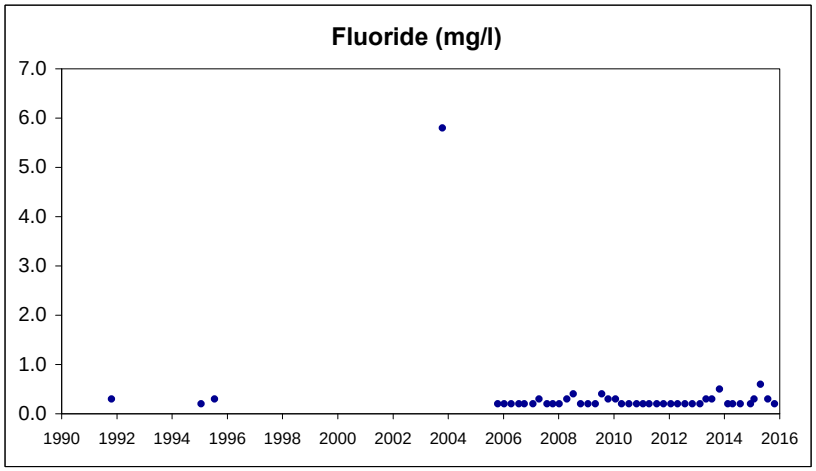

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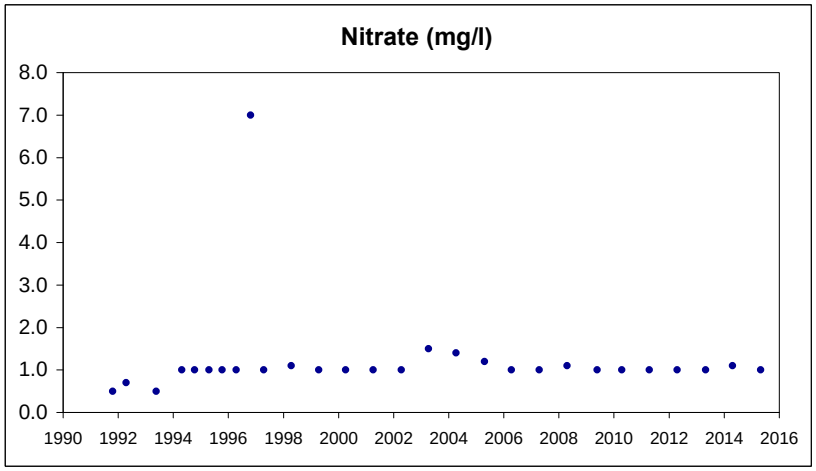

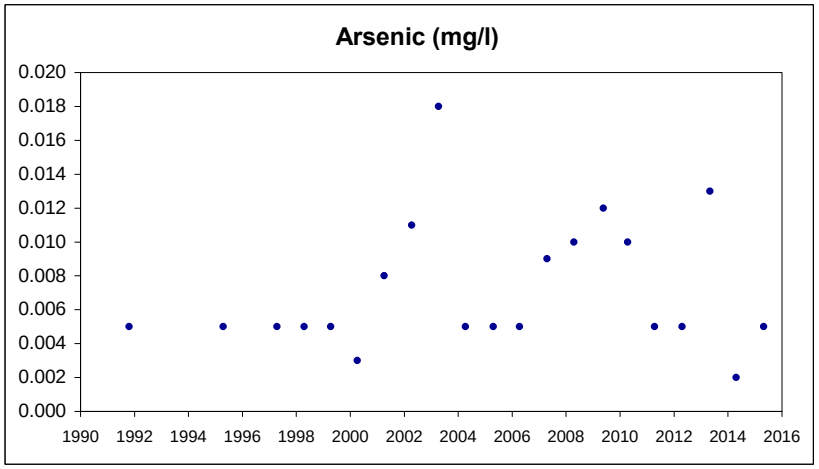

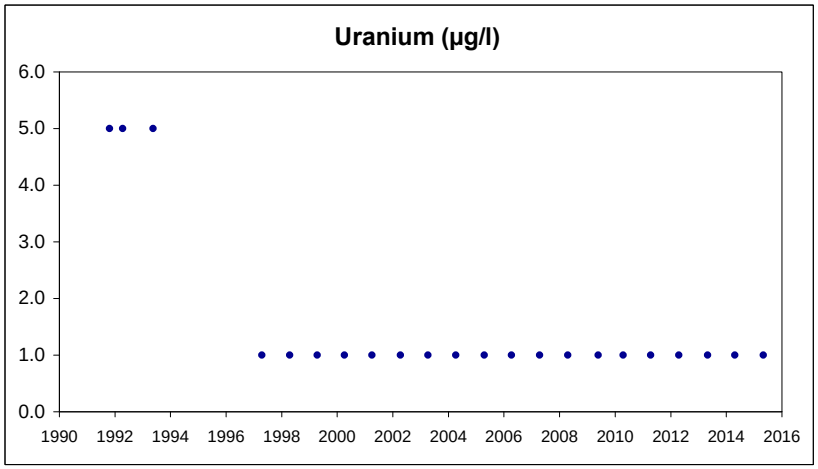

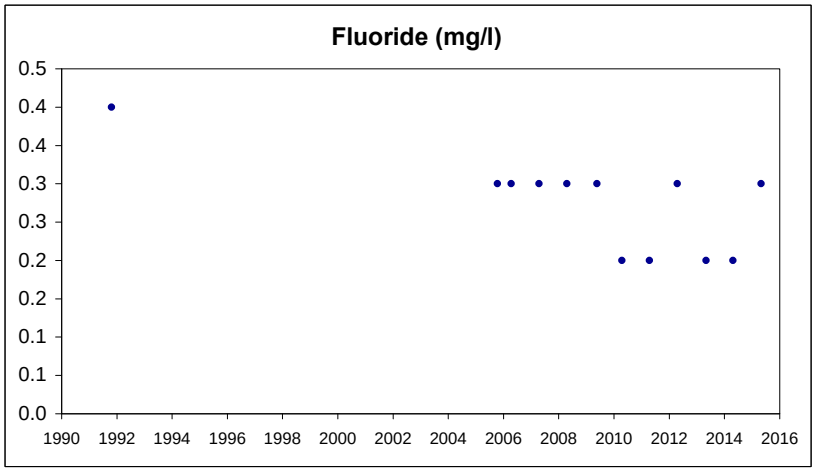

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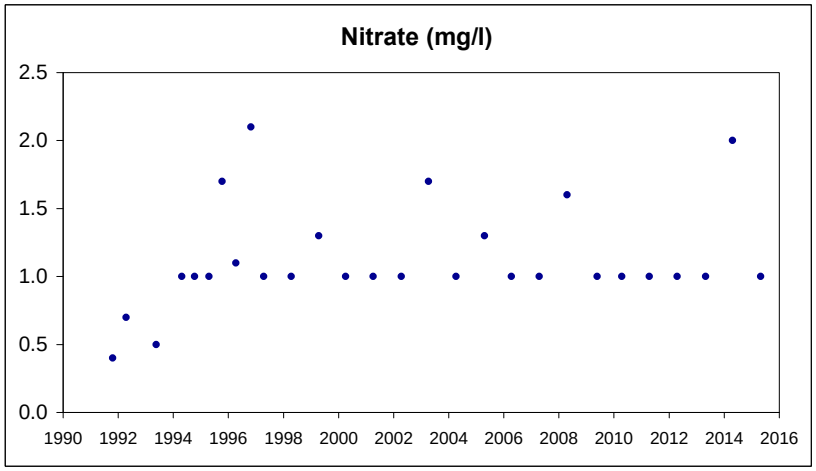

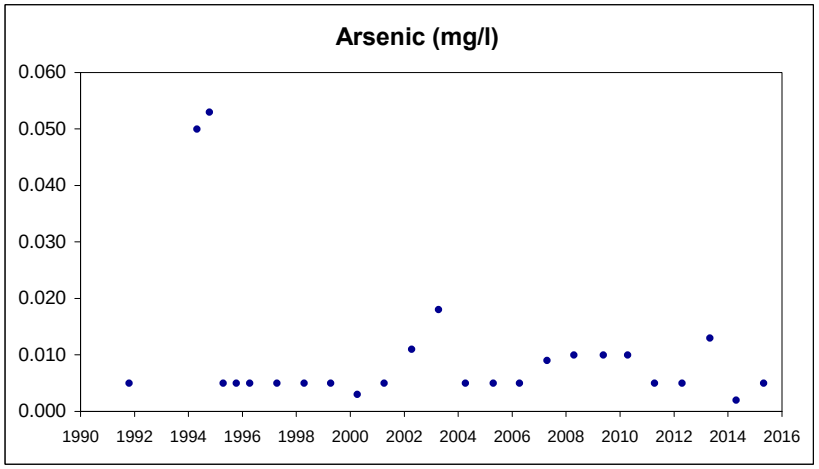

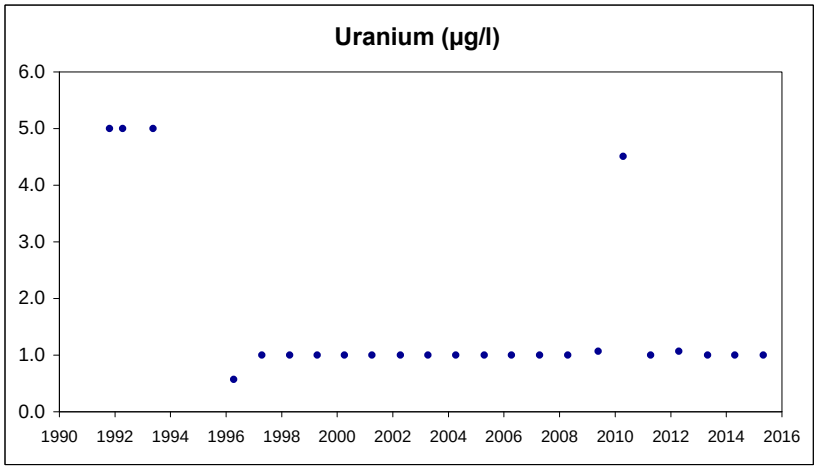

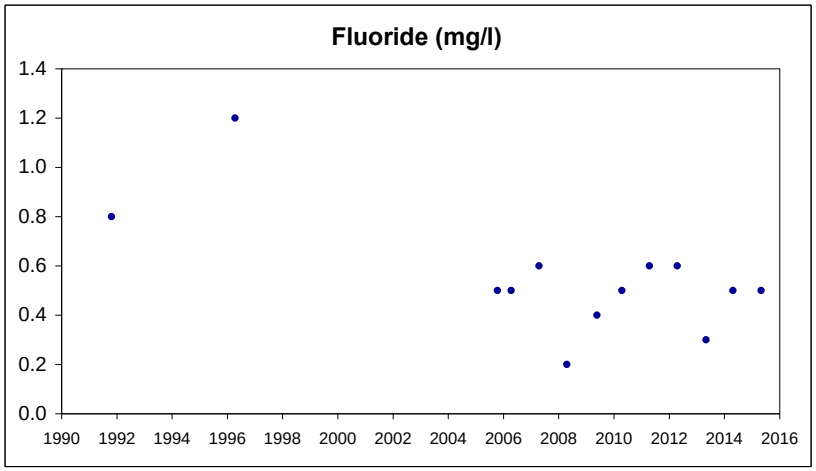

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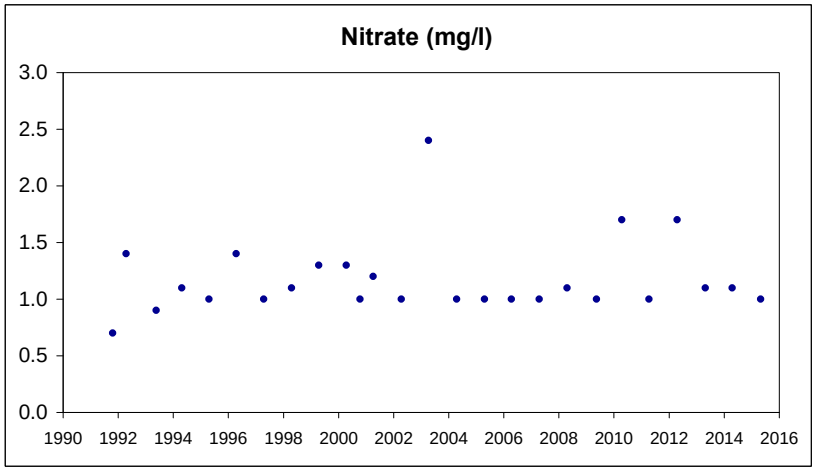

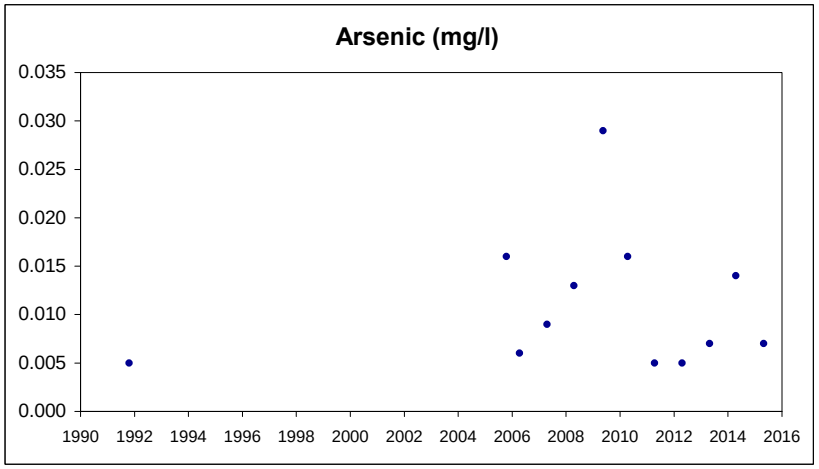

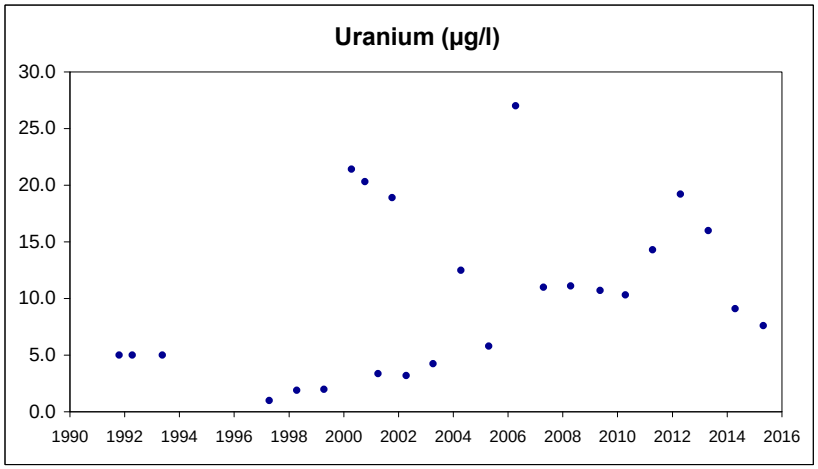

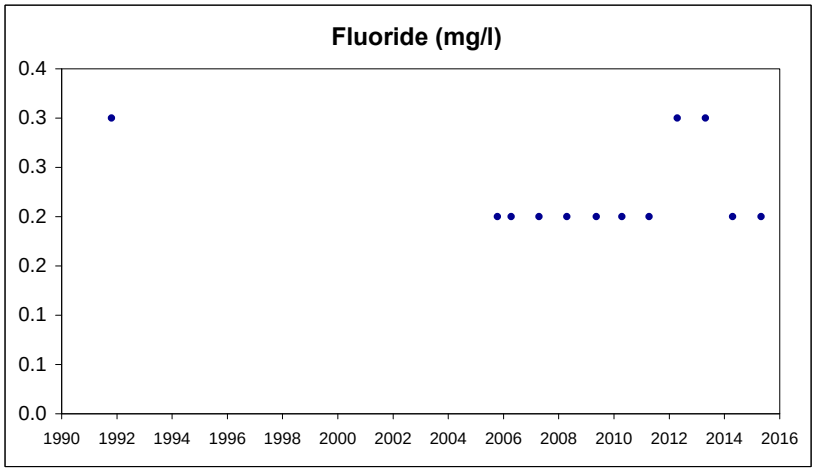

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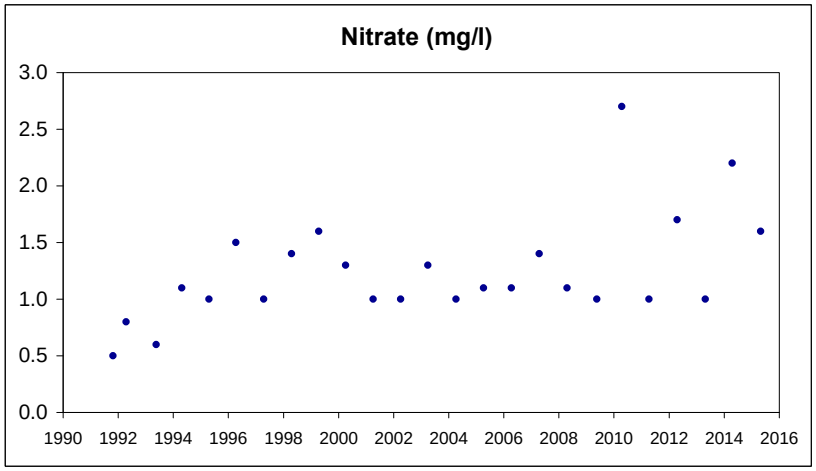

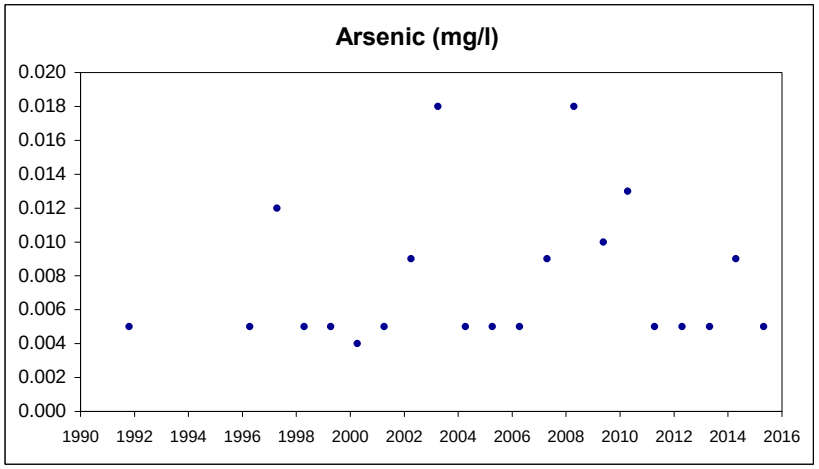

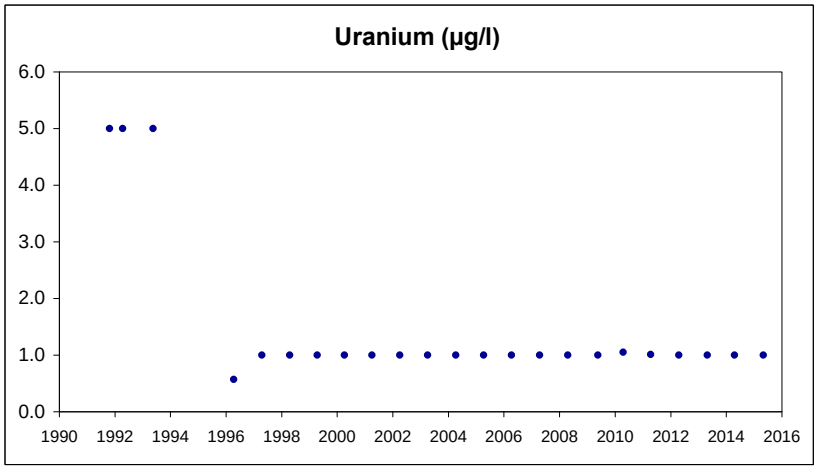

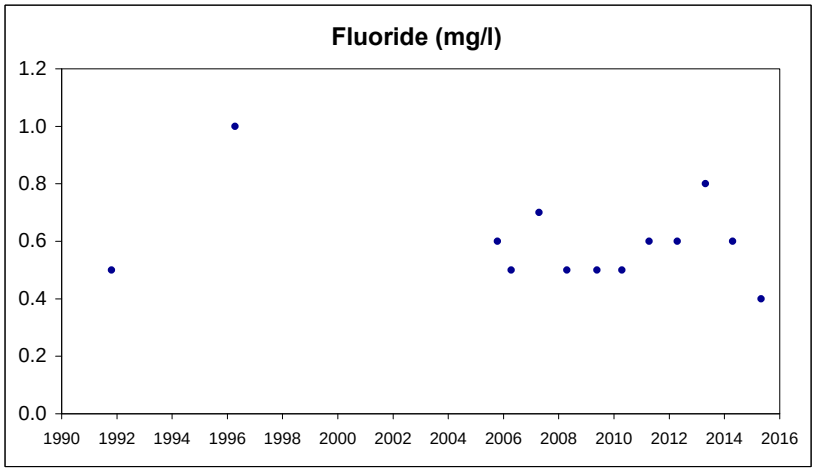

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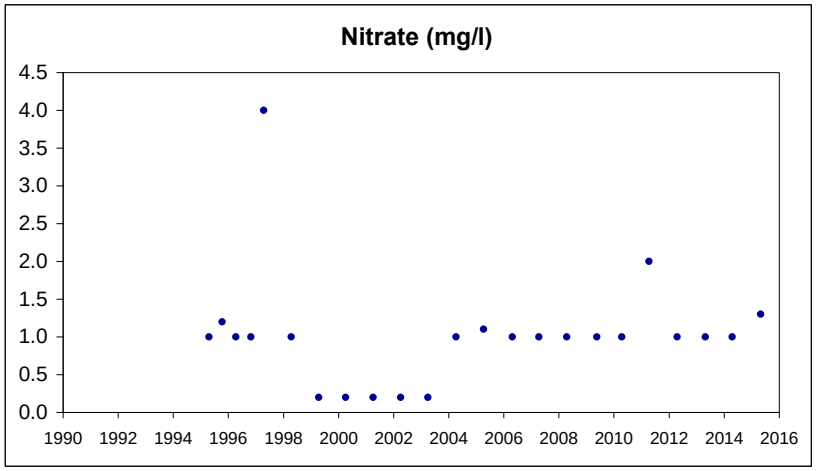

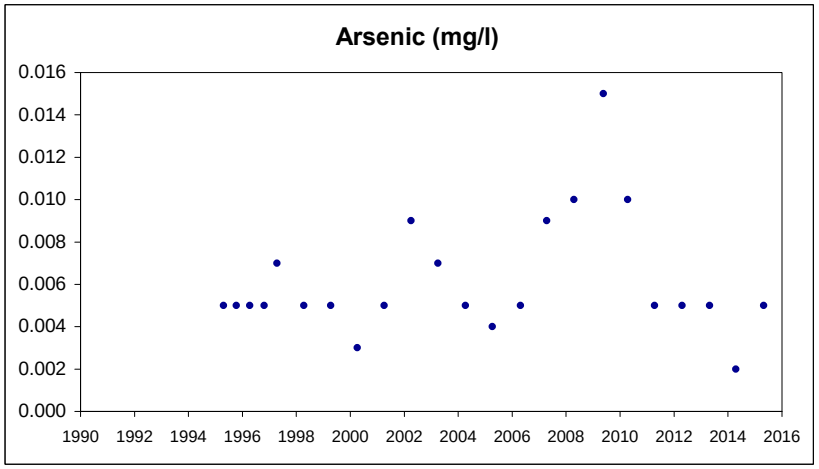

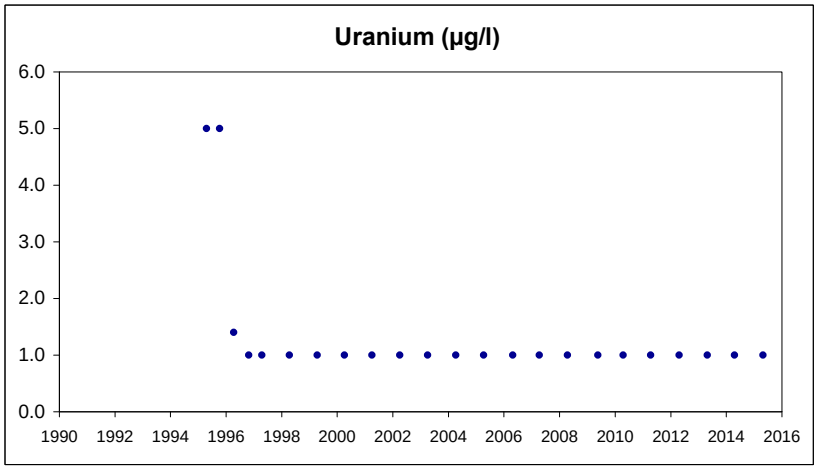

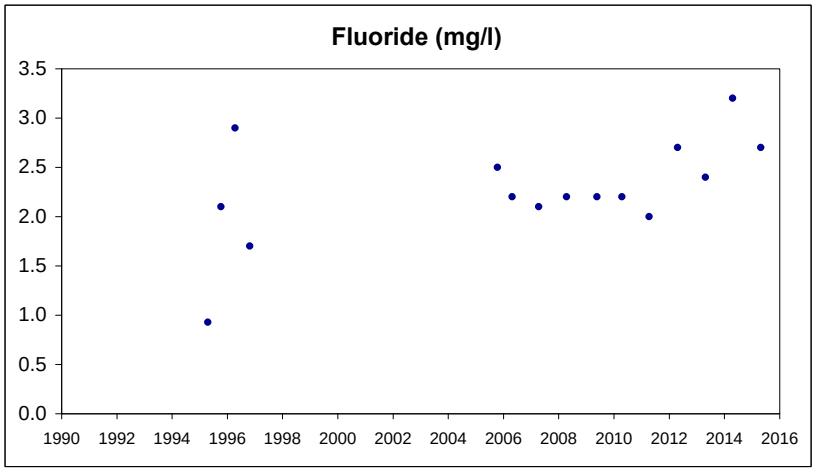

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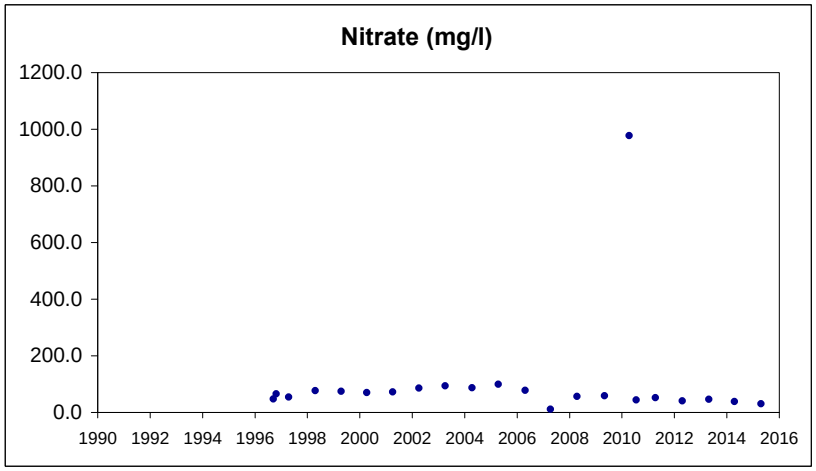

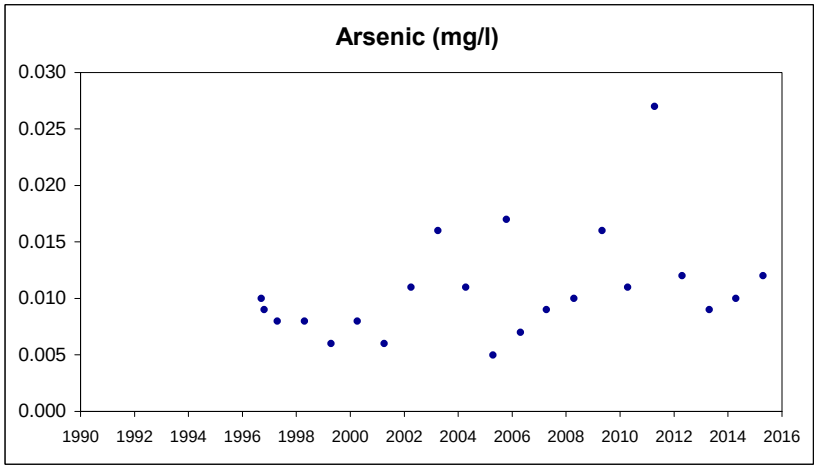

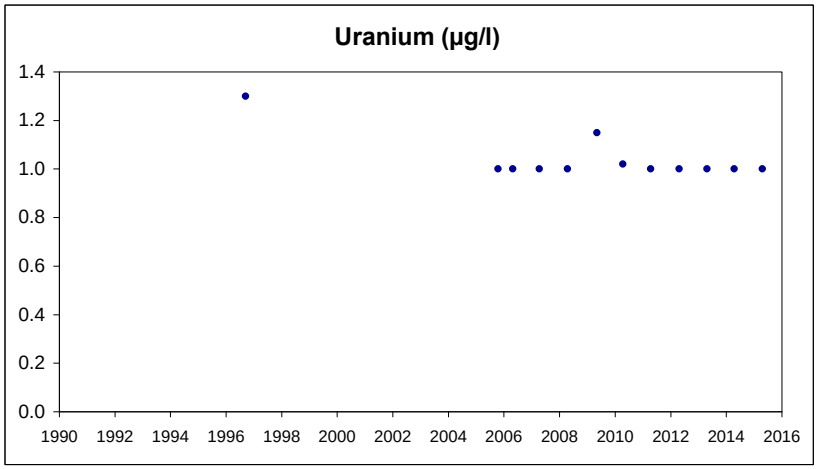

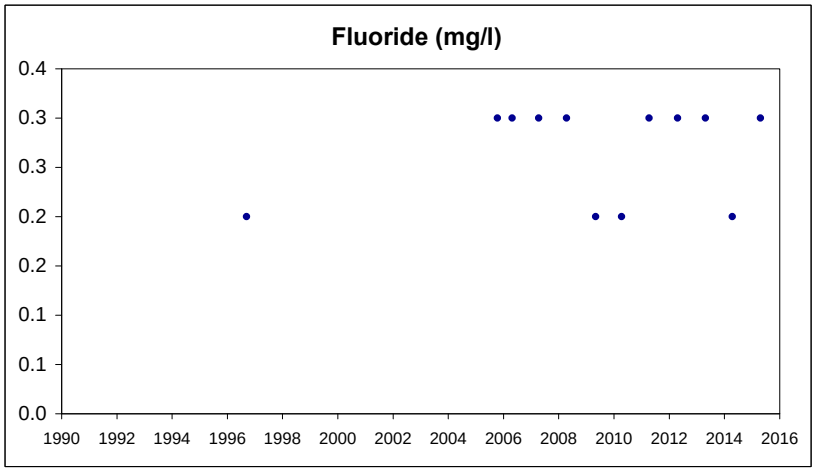

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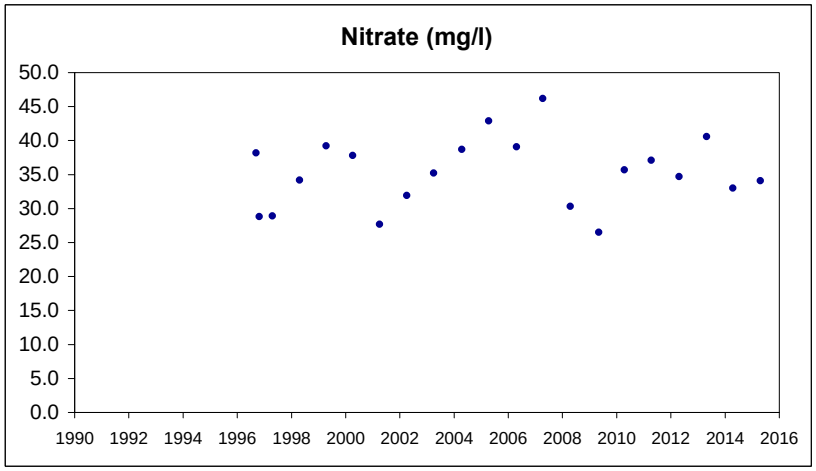

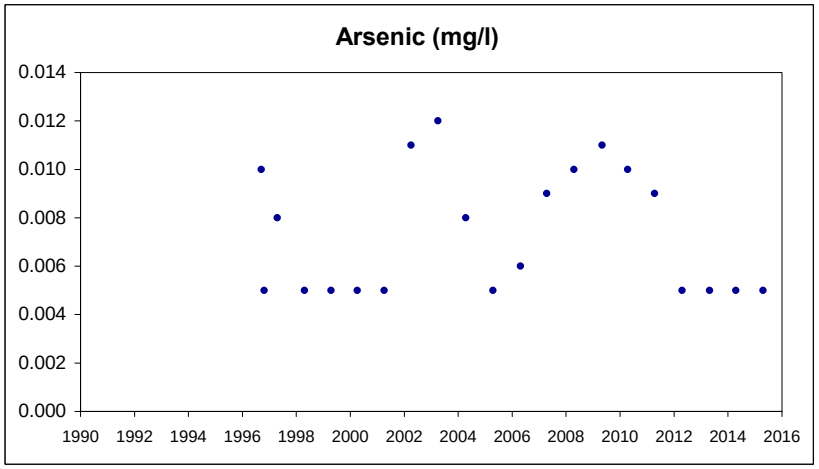

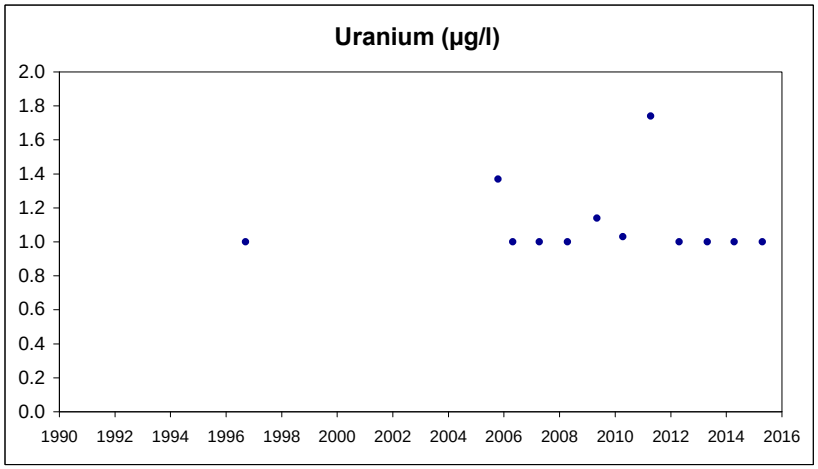

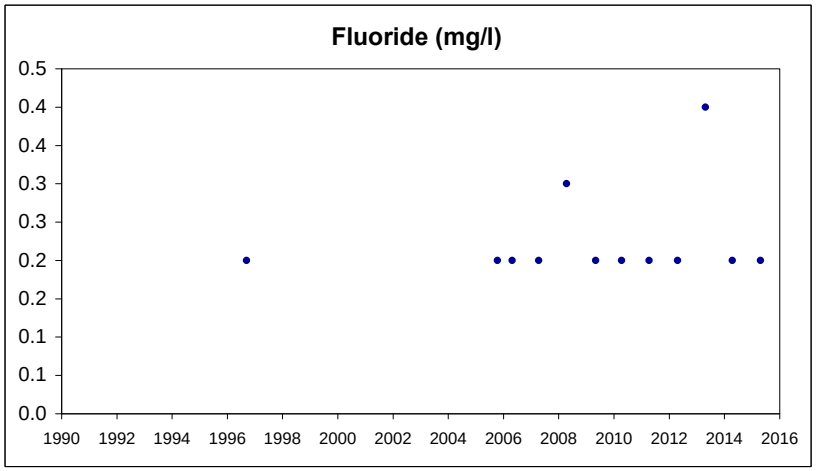

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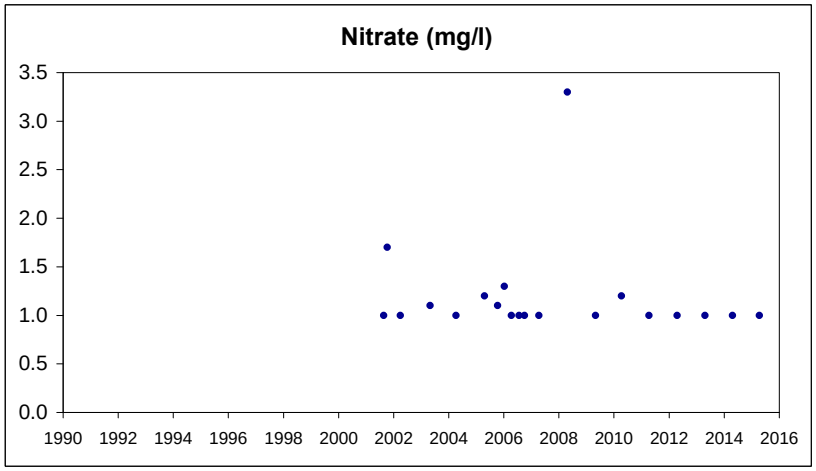

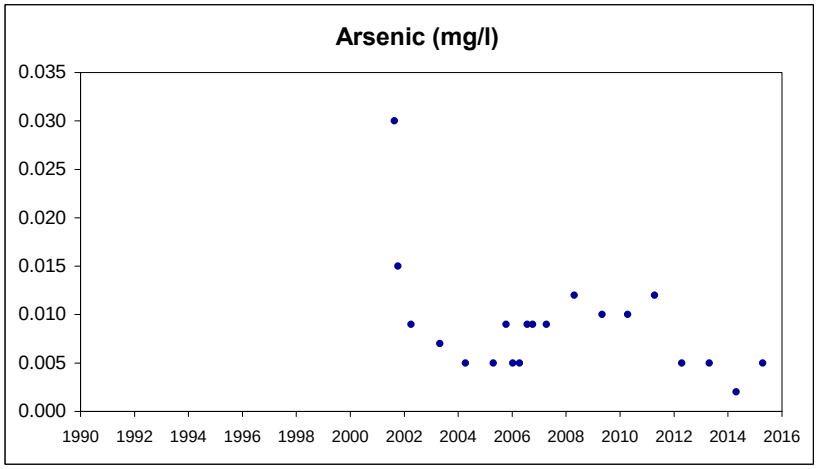

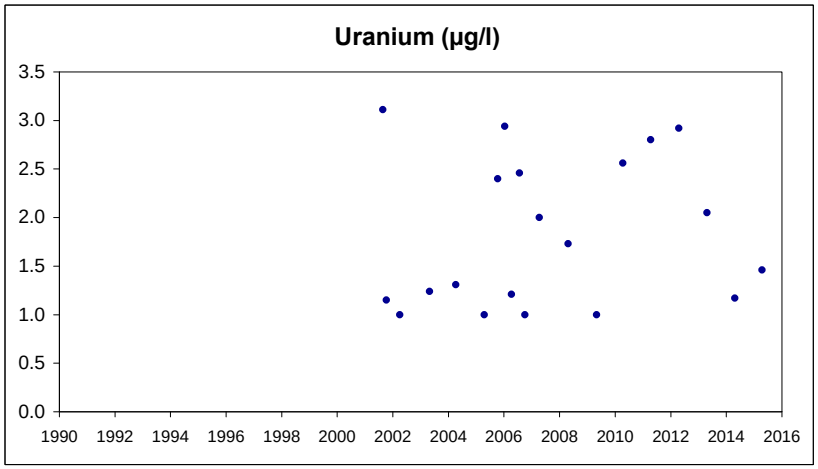

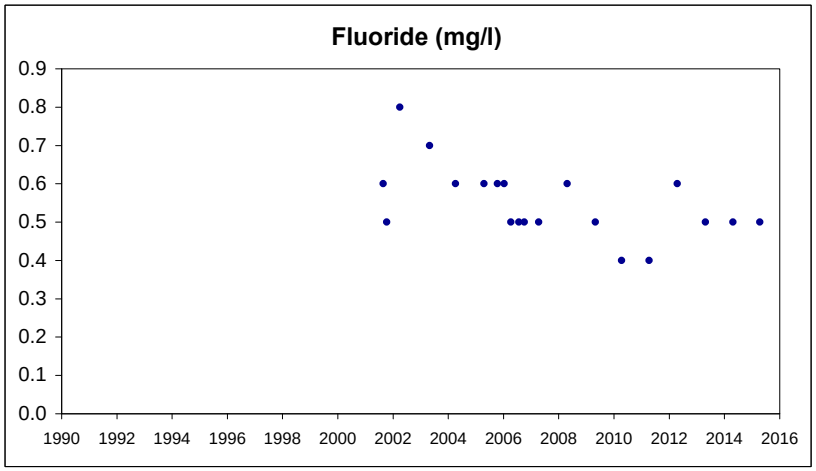

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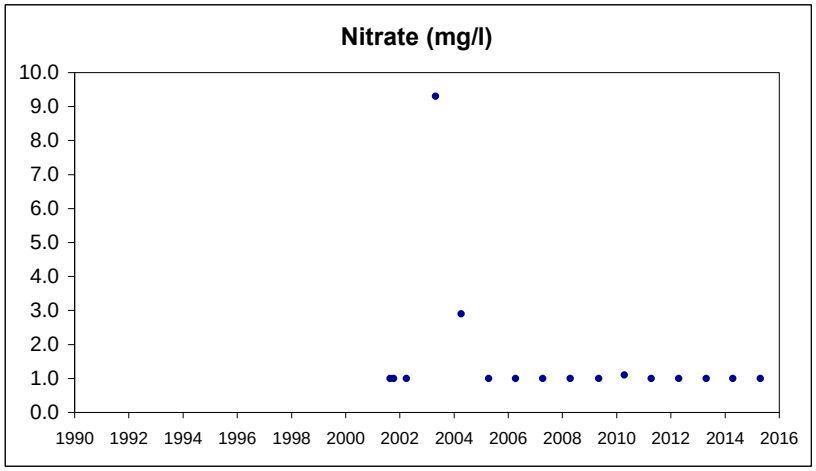

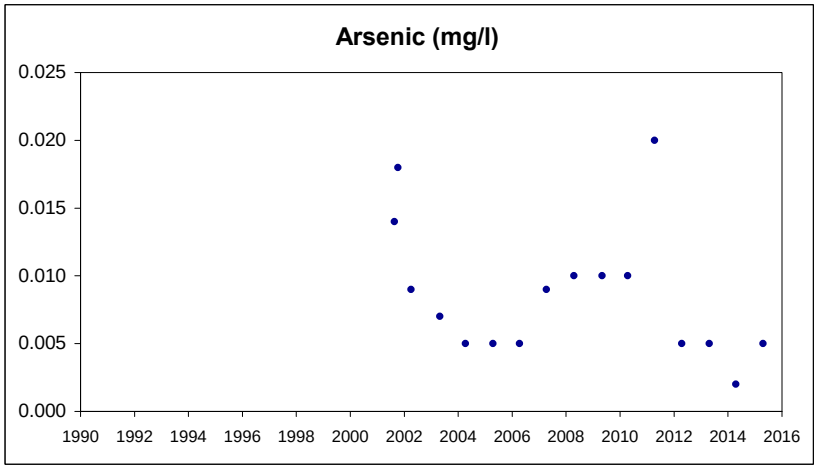

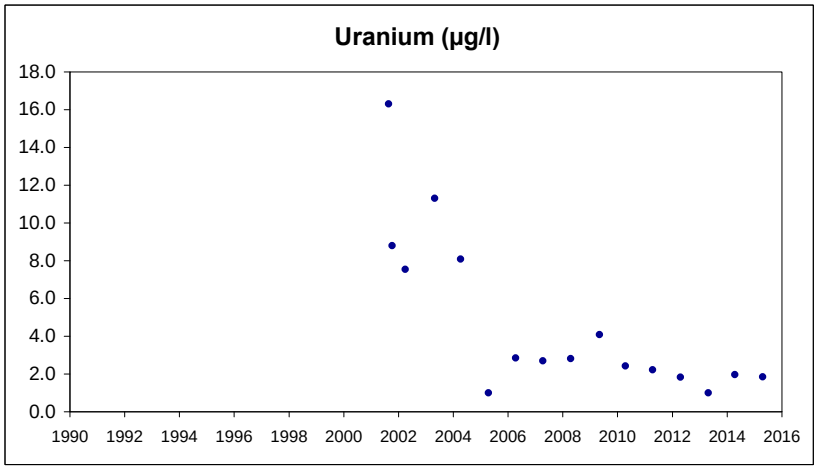

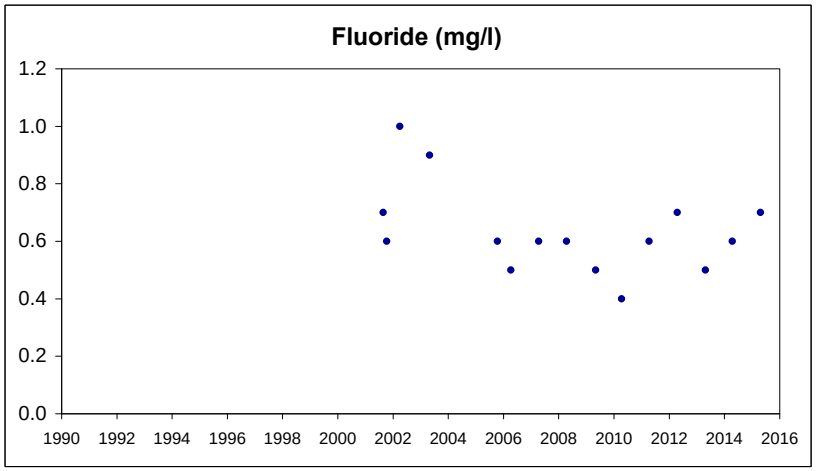

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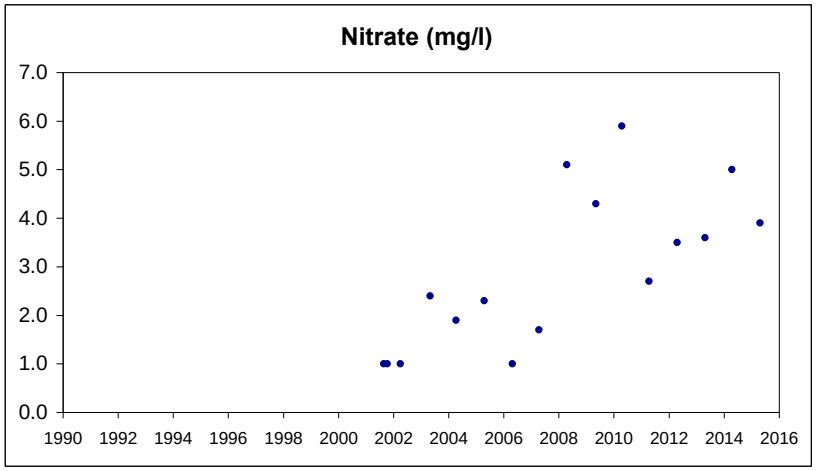

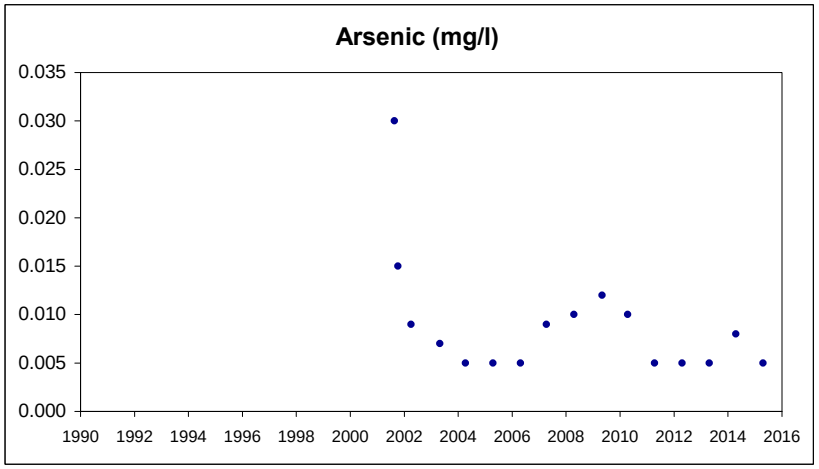

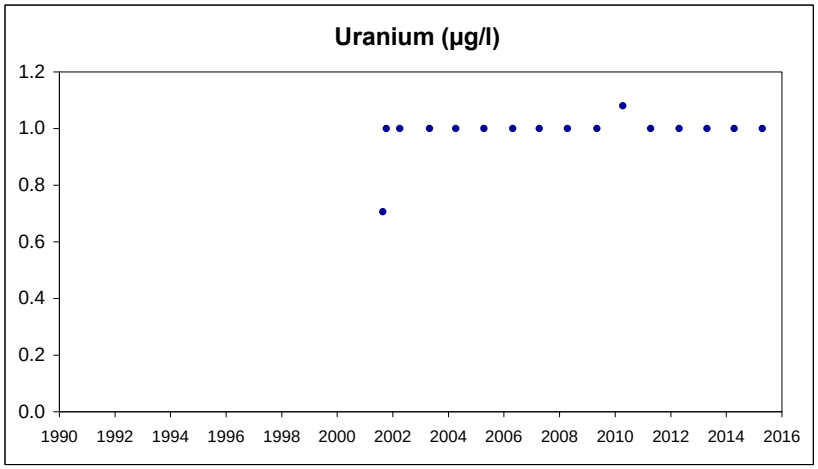

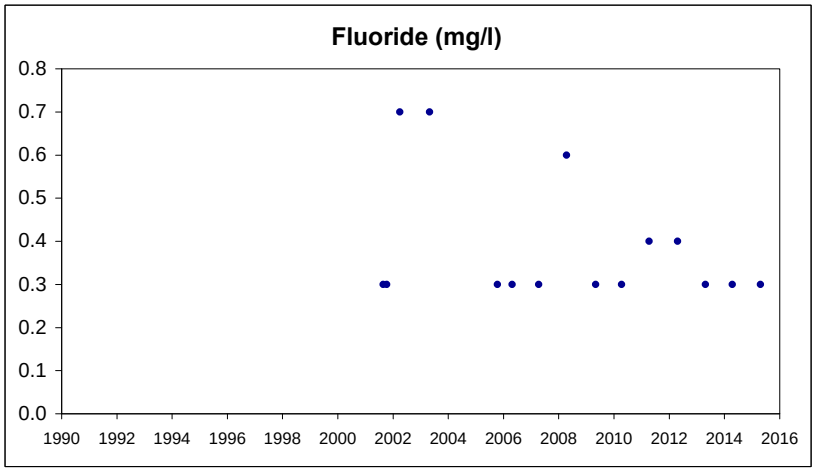

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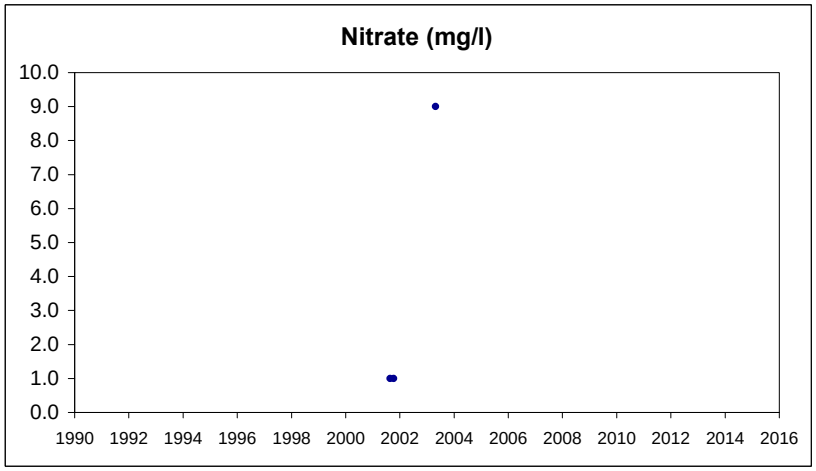

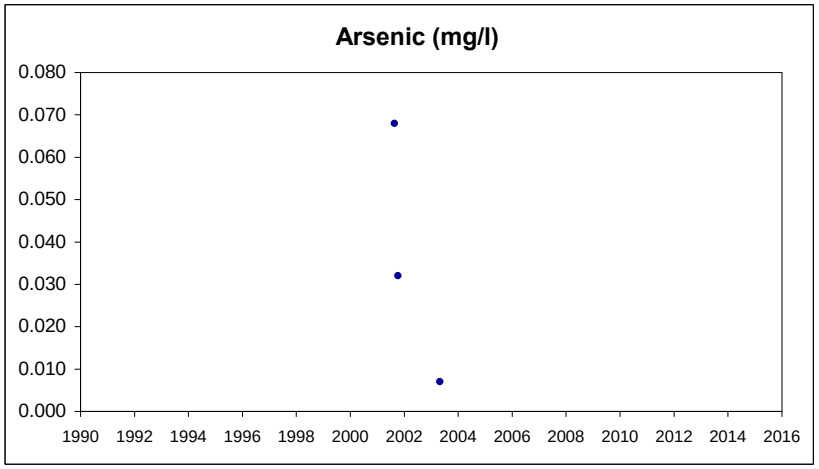

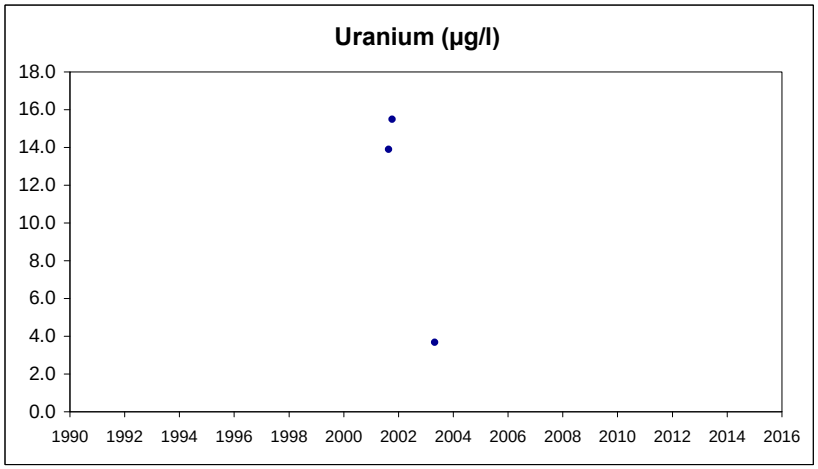

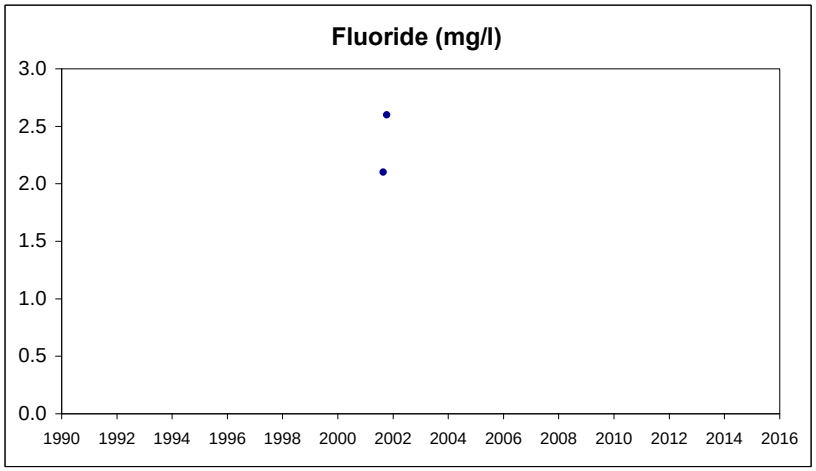

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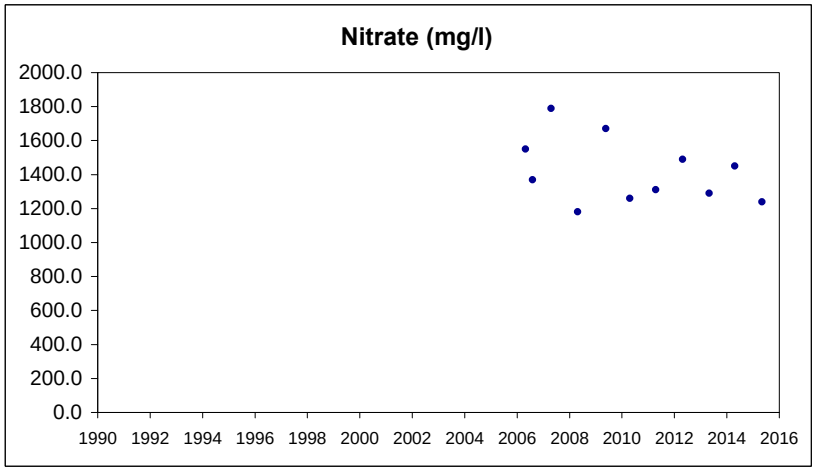

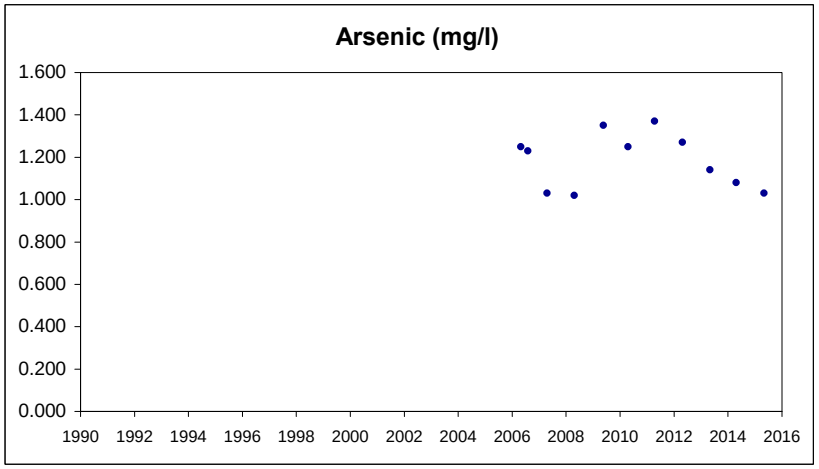

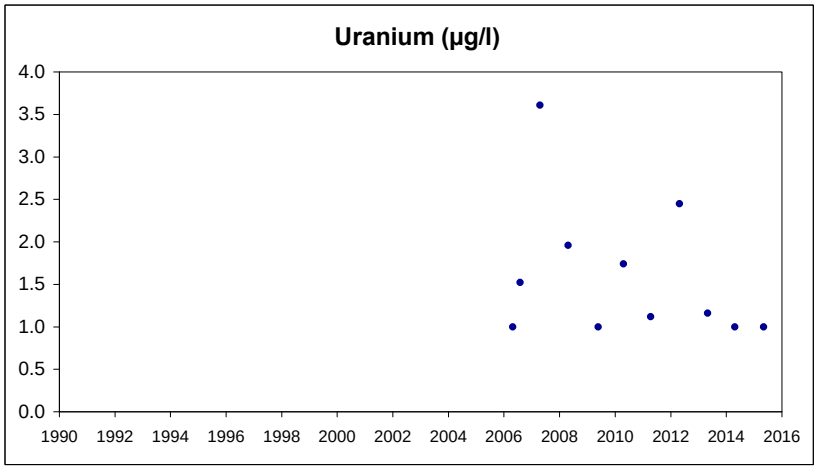

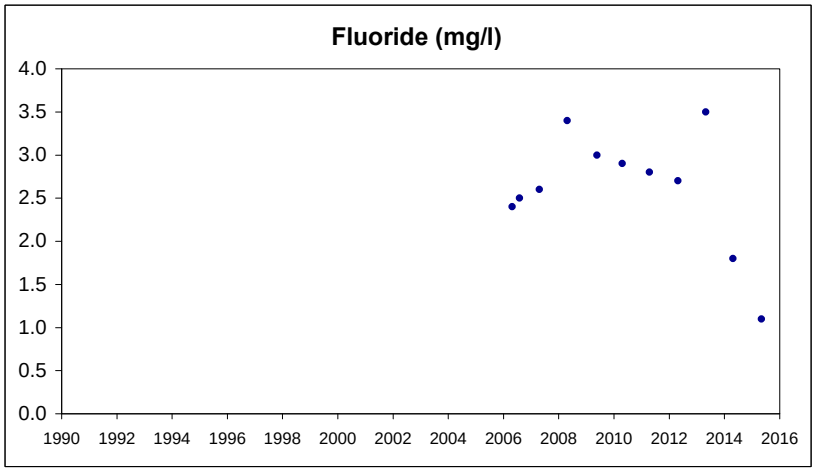

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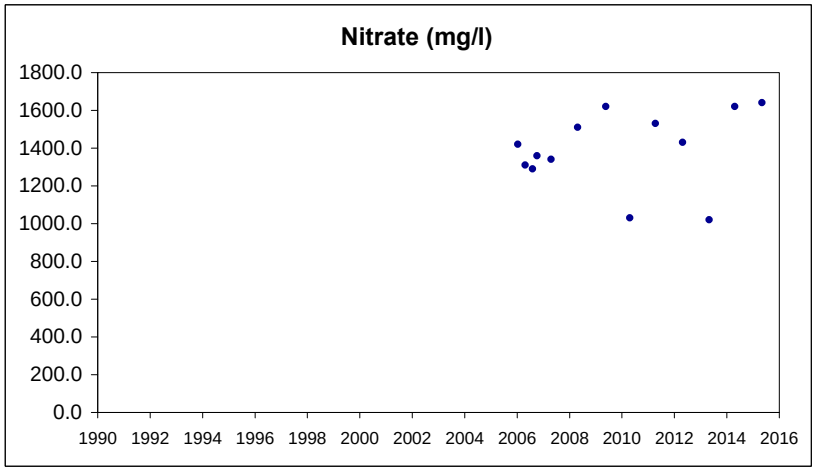

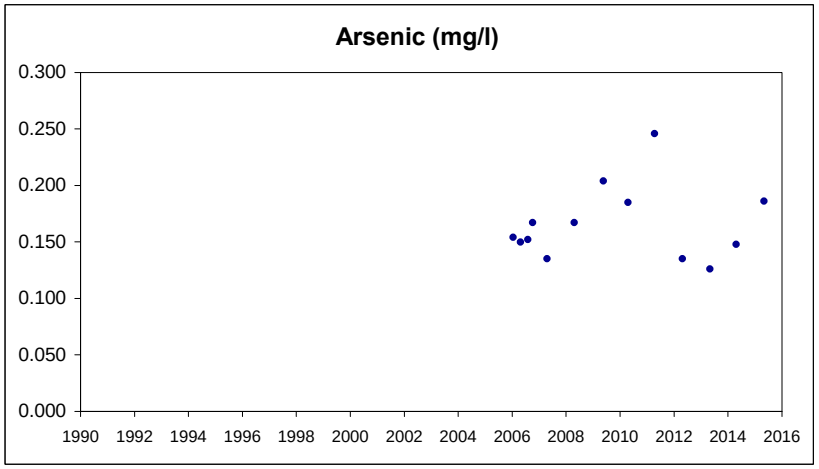

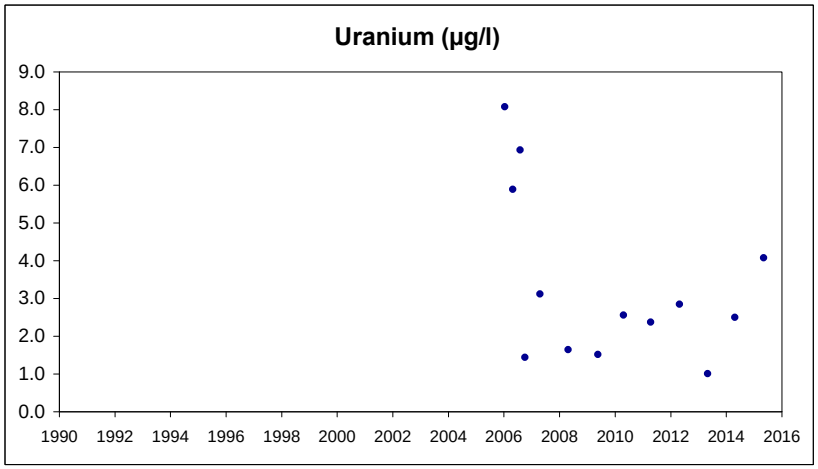

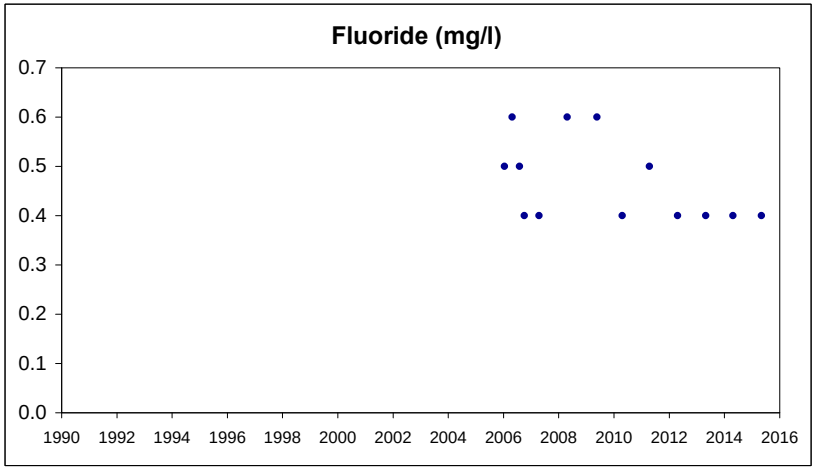

MW123A

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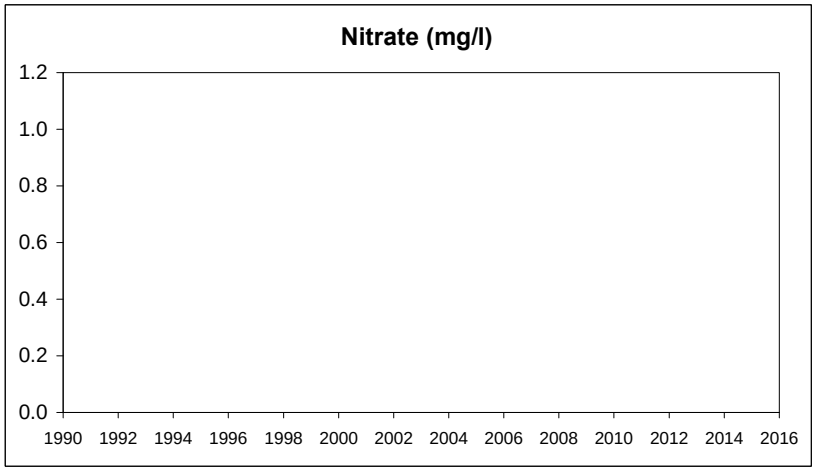

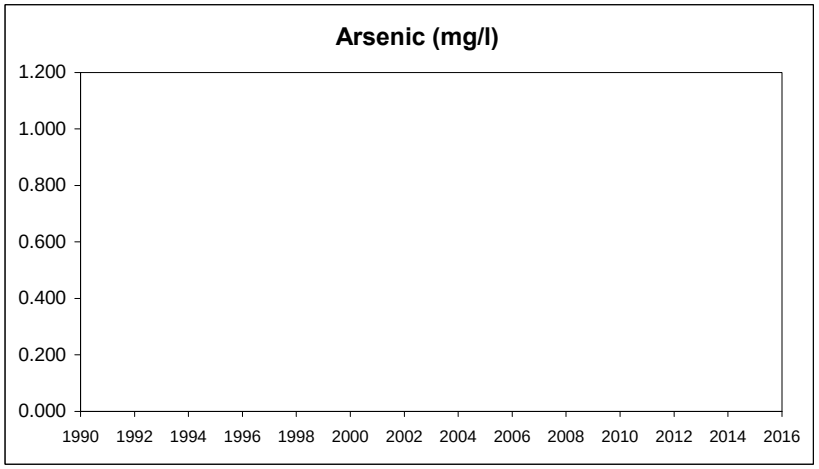

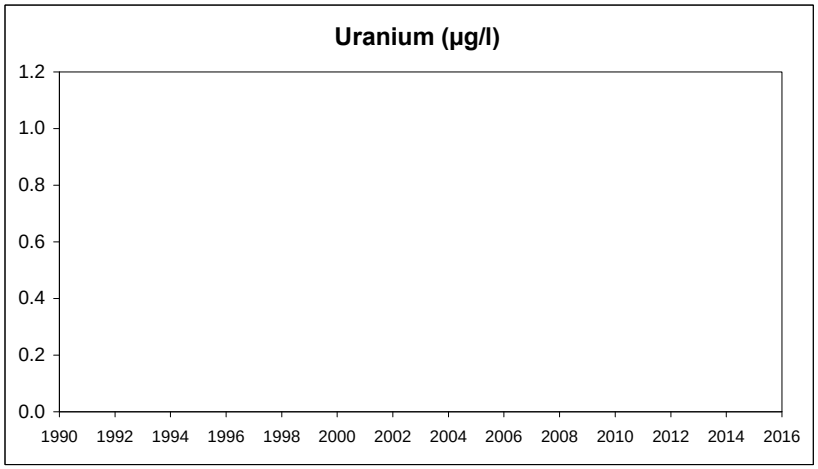

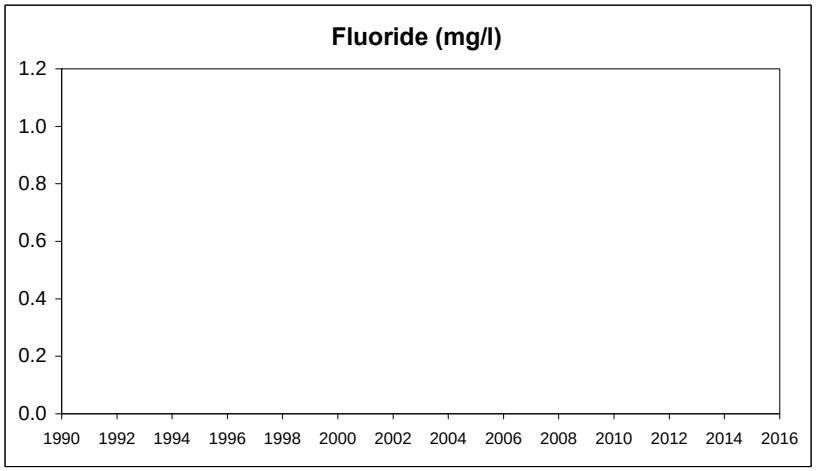

MW124A

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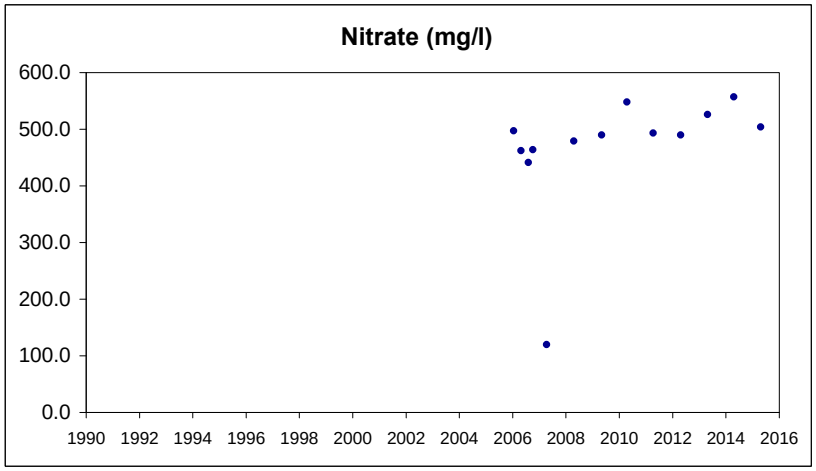

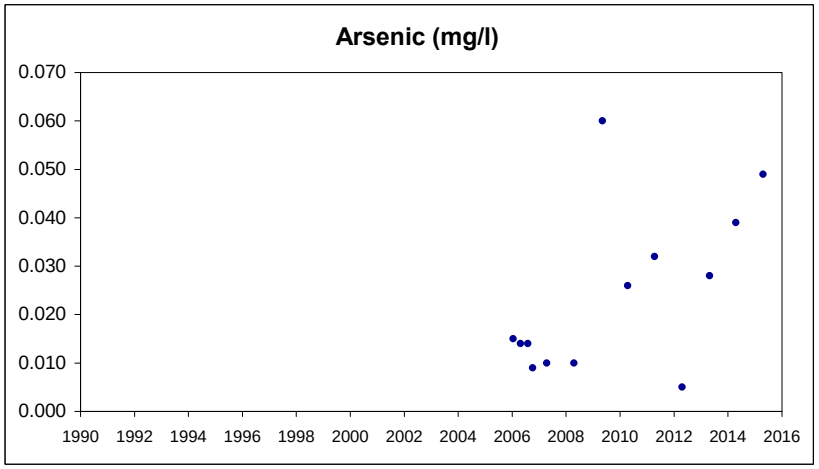

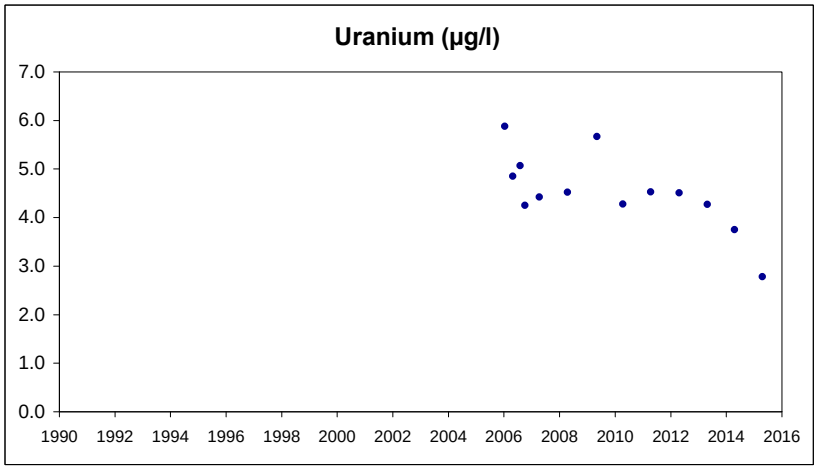

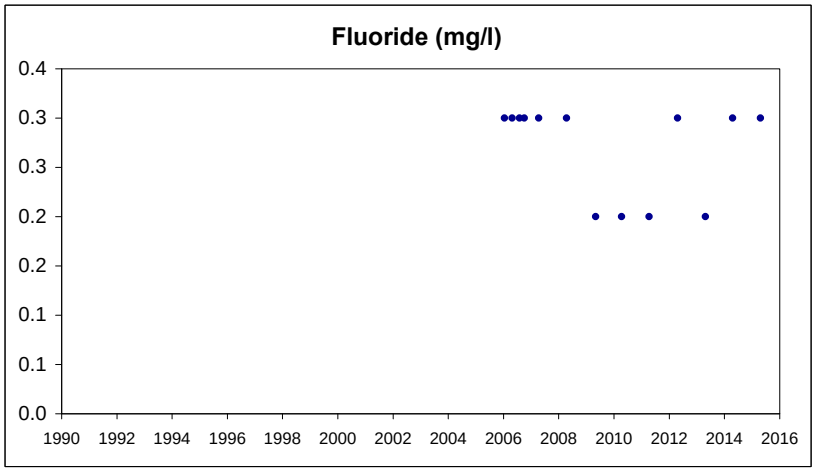

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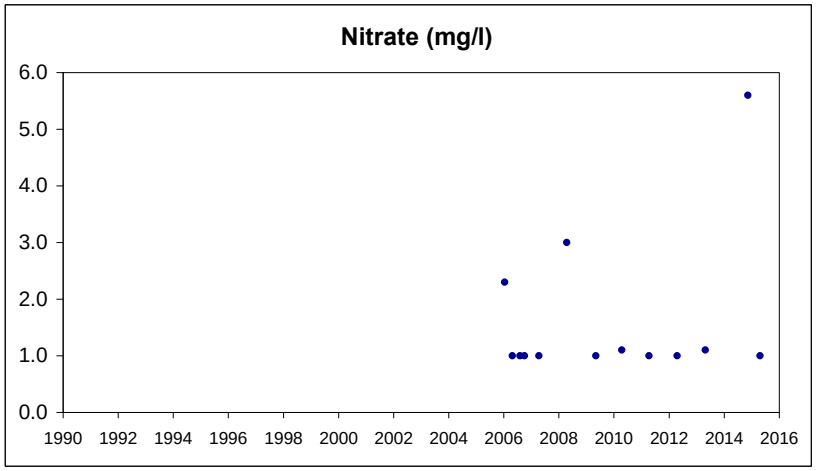

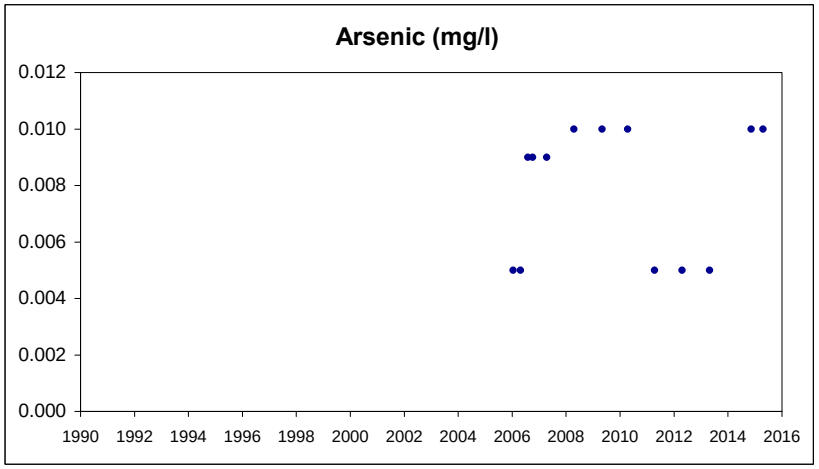

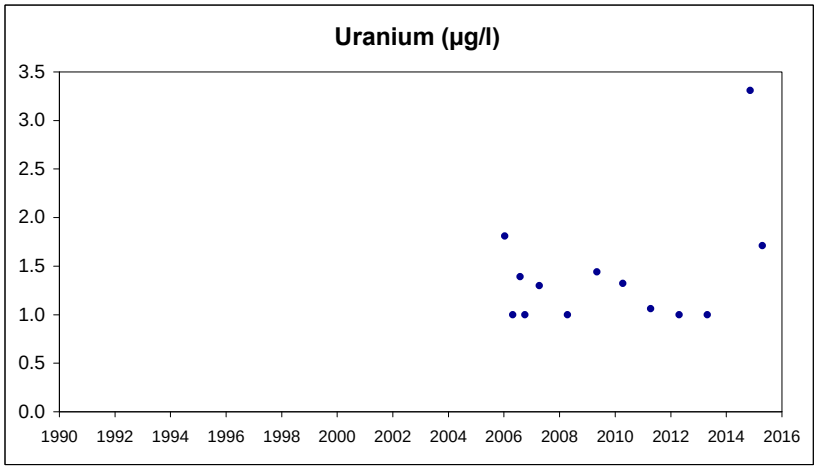

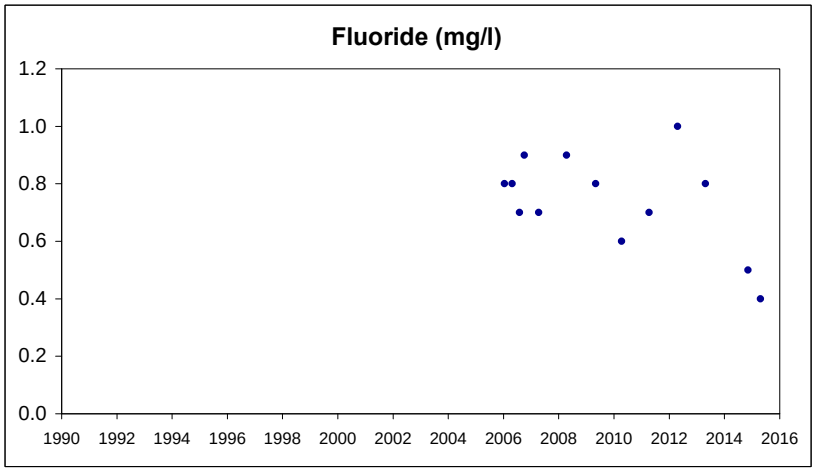

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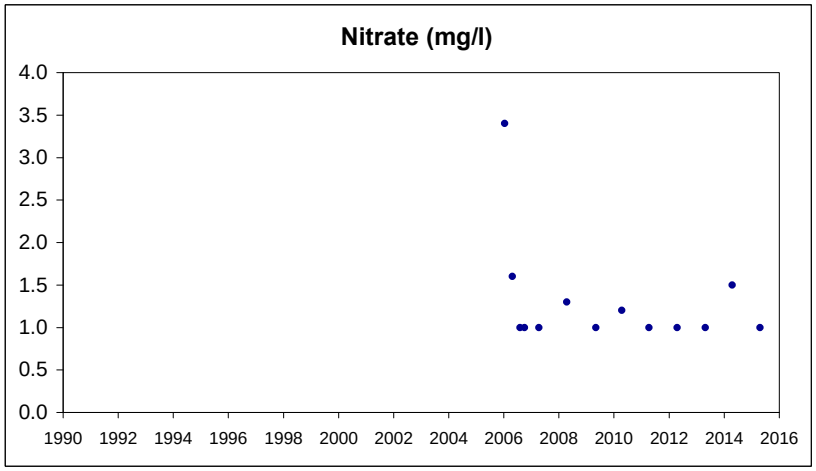

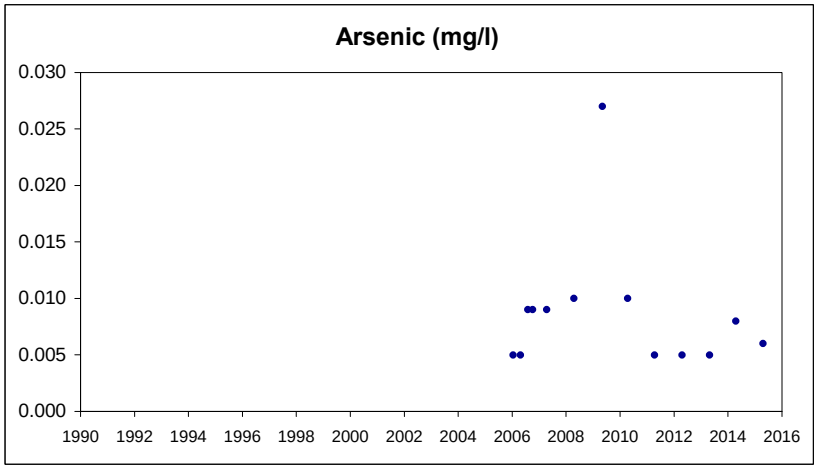

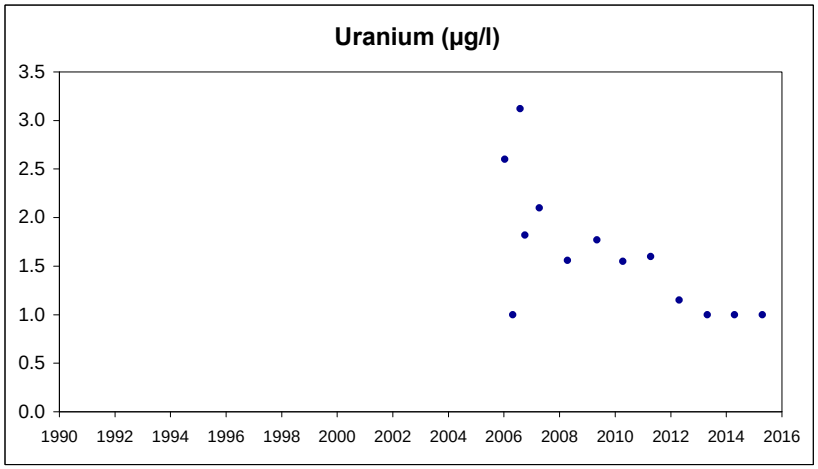

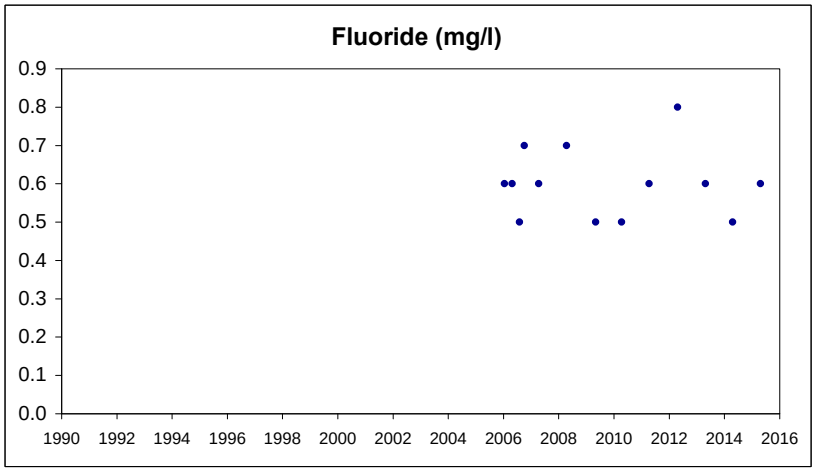

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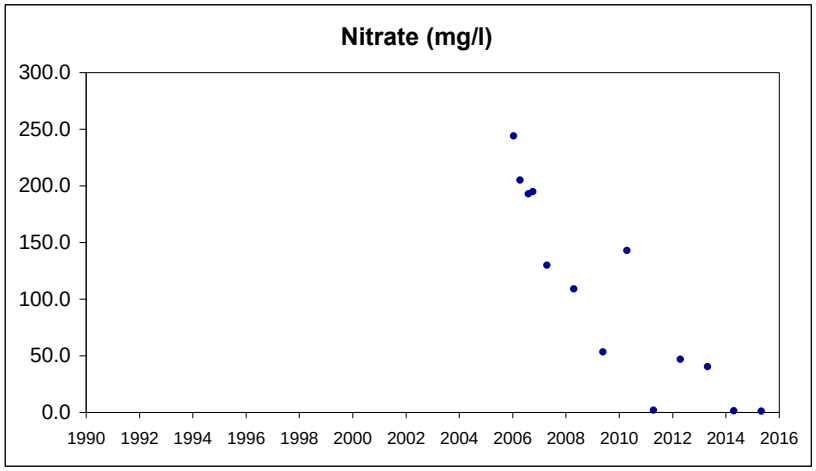

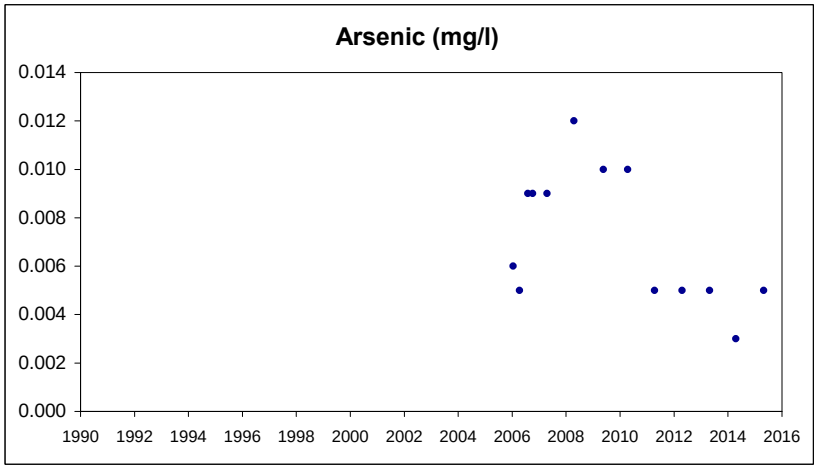

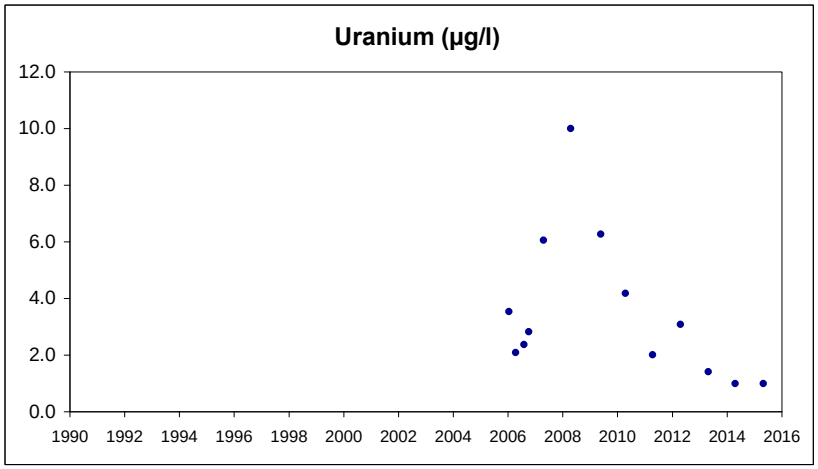

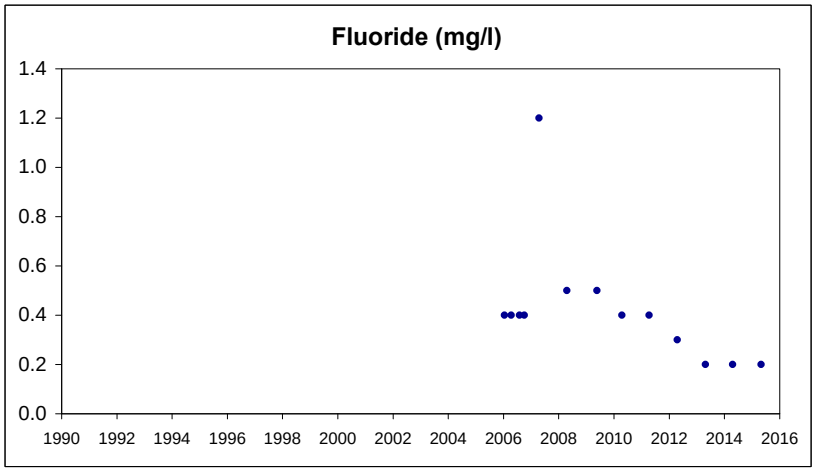

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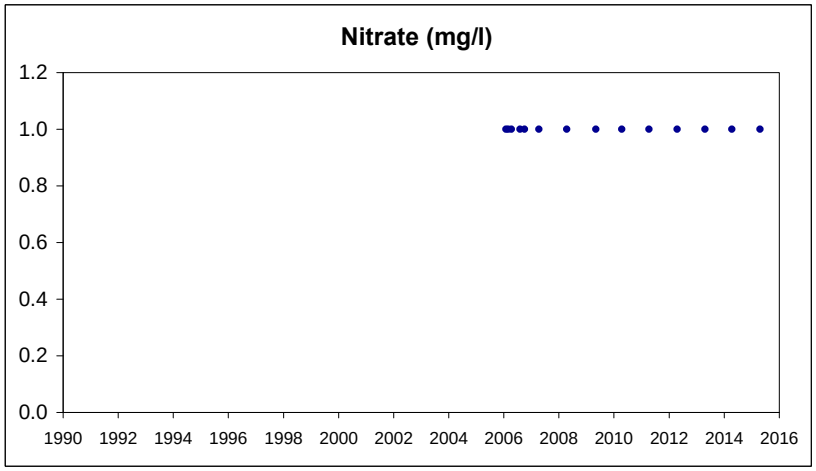

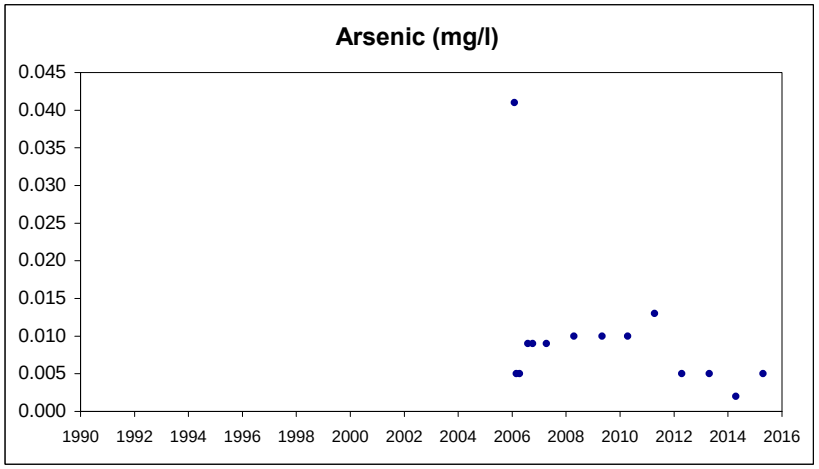

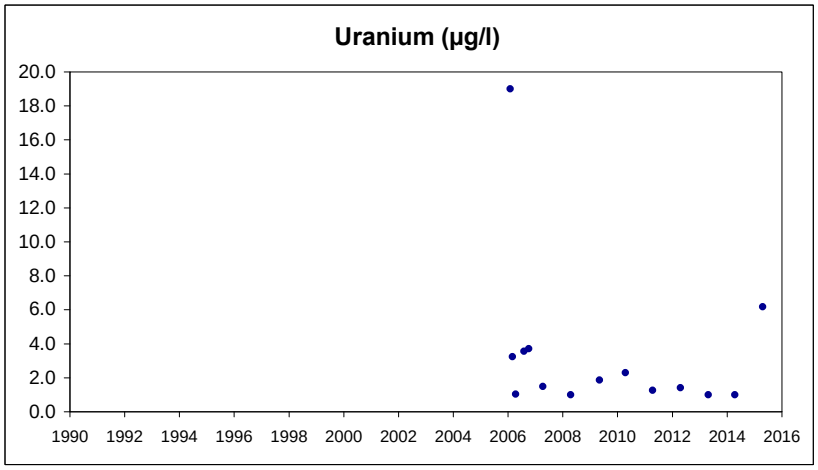

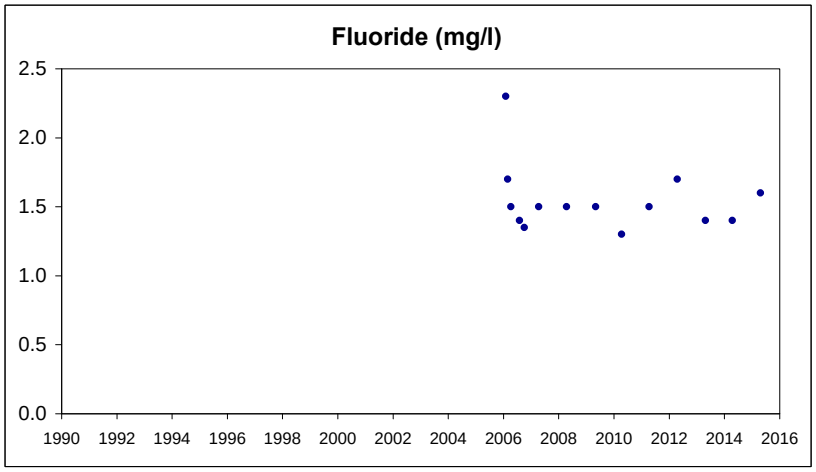

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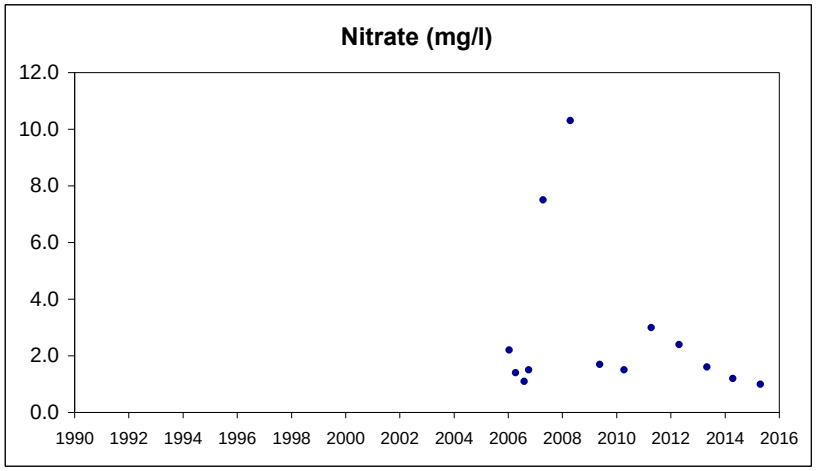

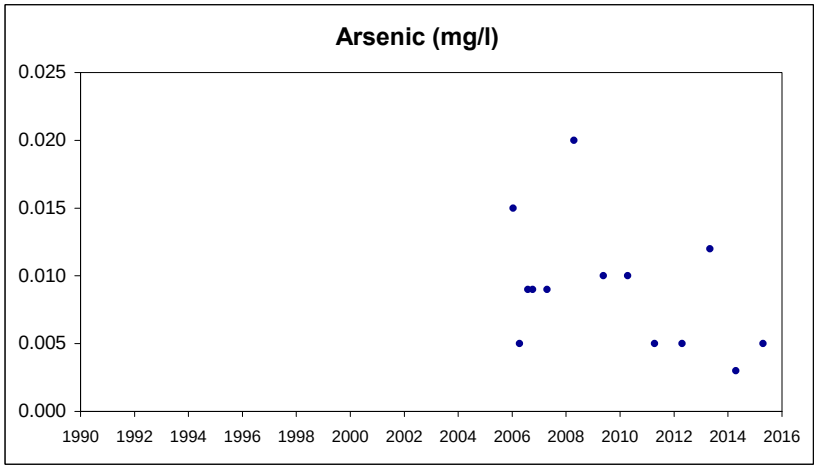

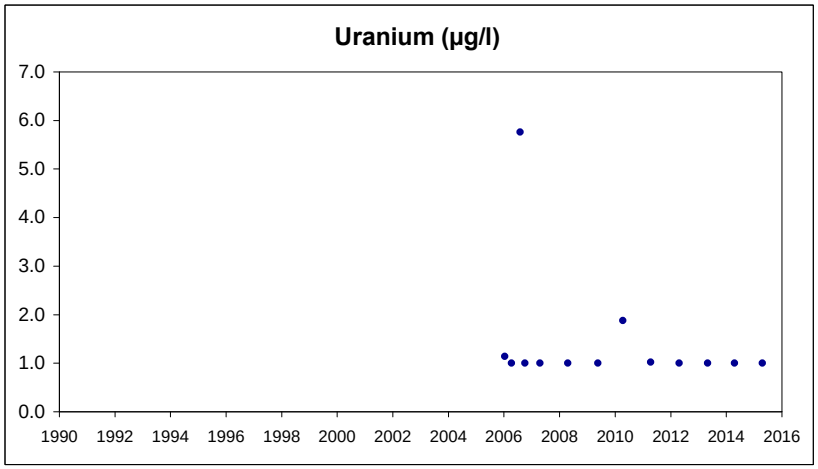

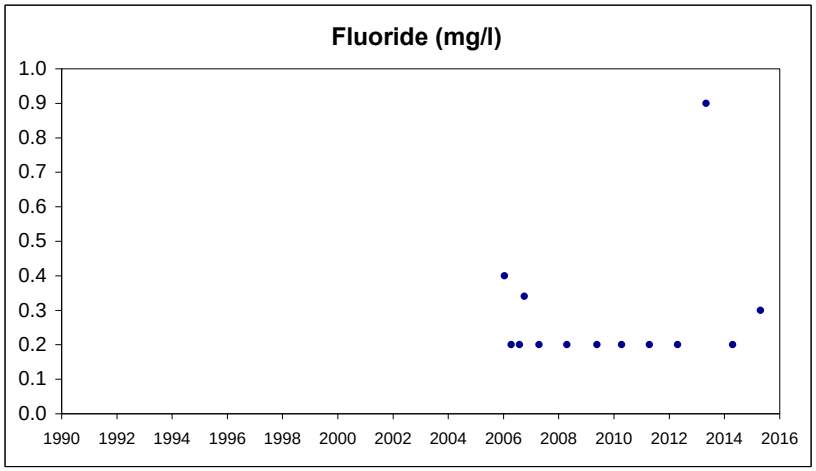

STA04

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Sequoyah Fuels Corporation

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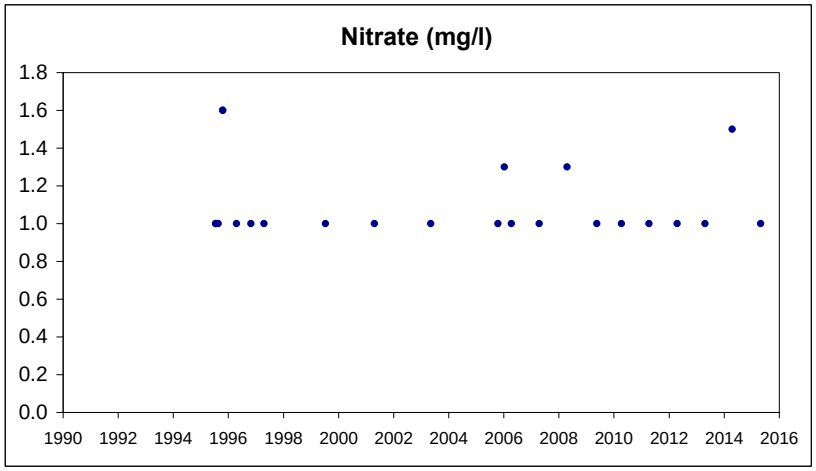

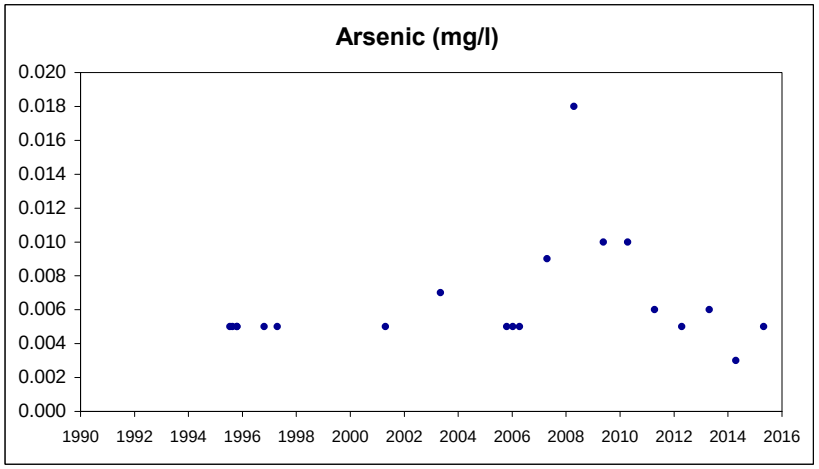

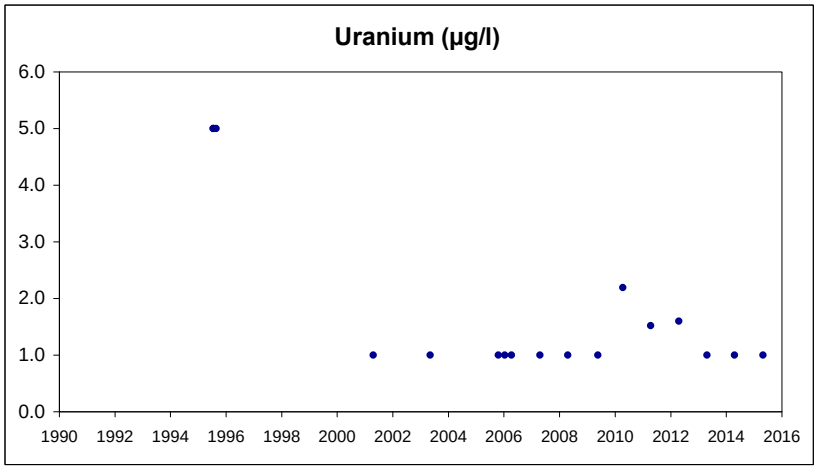

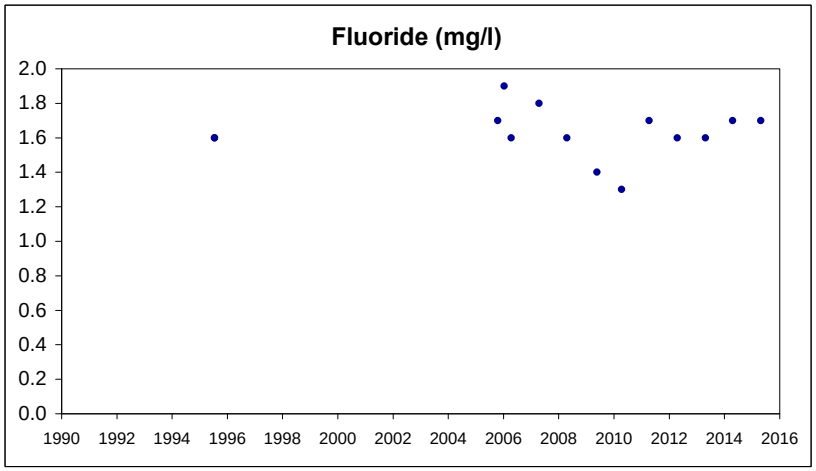

Appendix C

Time Series Graphs for Groundwater Recovery Systems

2223

(Ditch West Pond 2 Recovery System)

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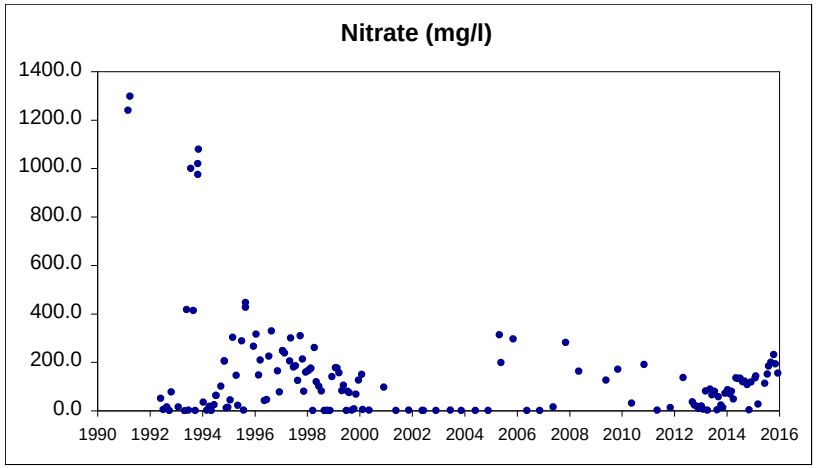

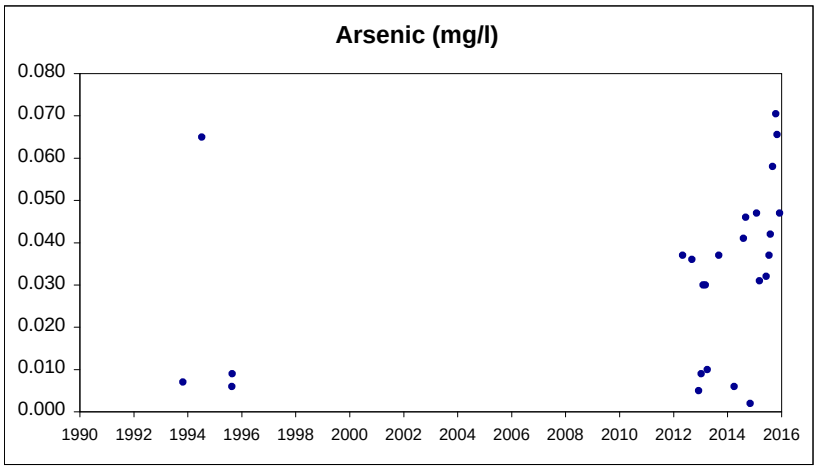

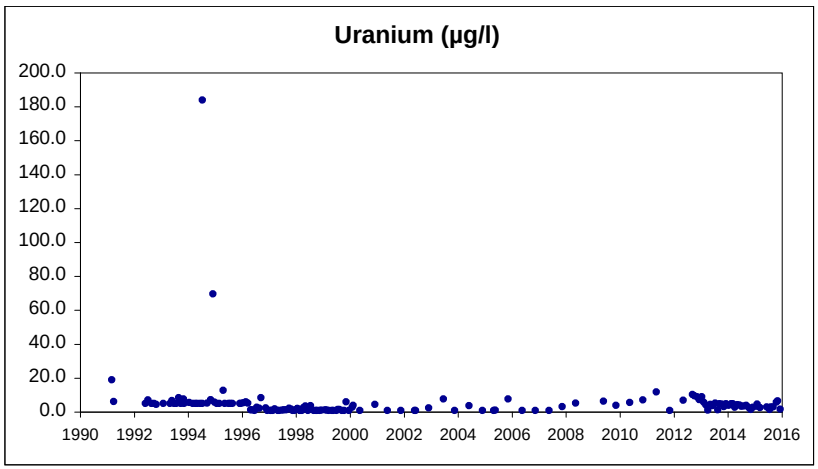

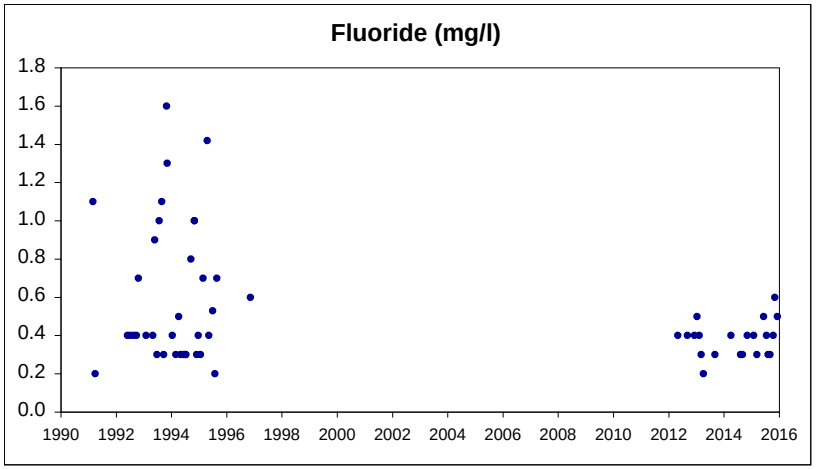

2224A

(005 Collection Trench West of Emergency Basin)

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Sequoyah Fuels Corporation

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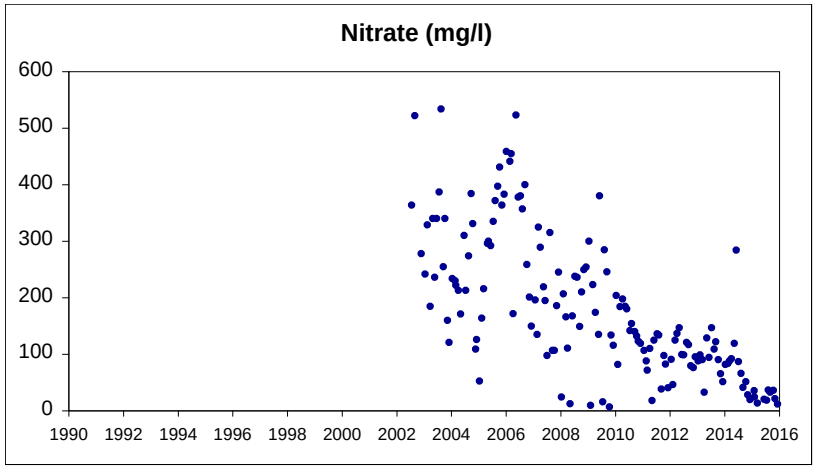

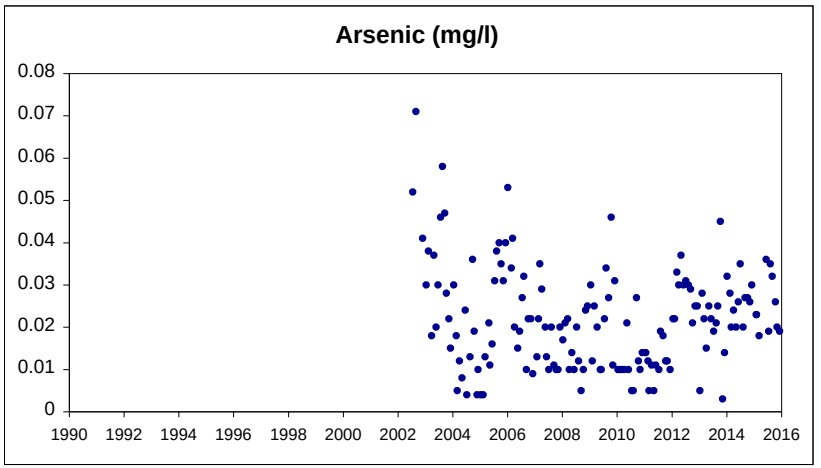

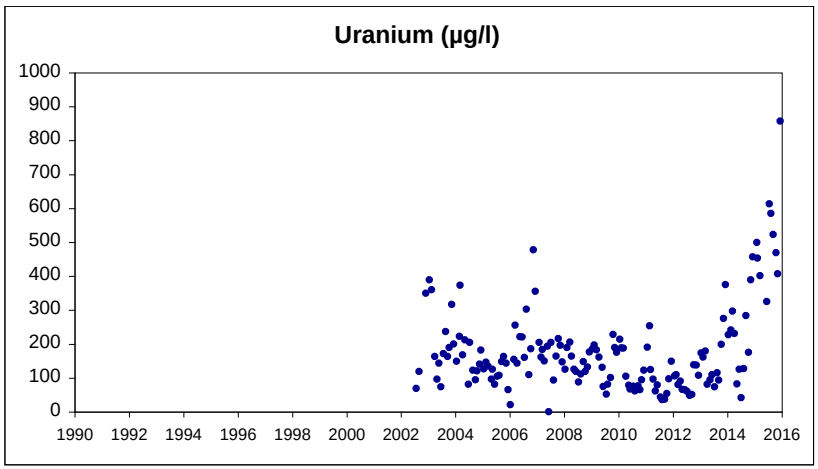

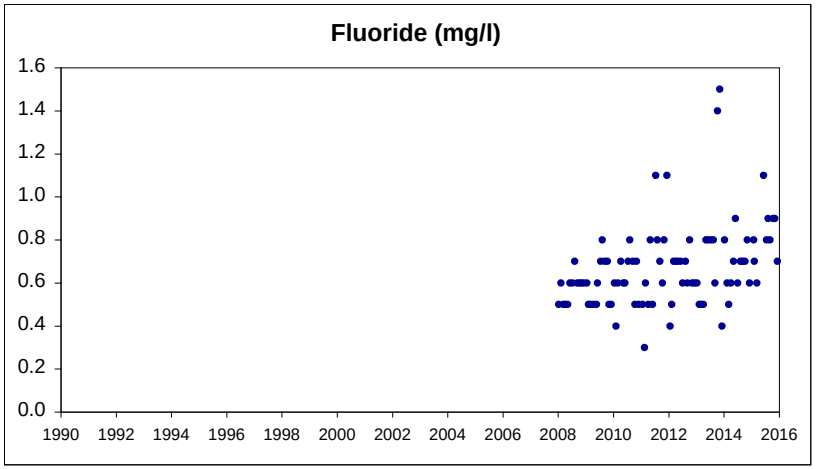

2224B

(005 Monitor Trench West of Emergency Basin)

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Sequoyah Fuels Corporation

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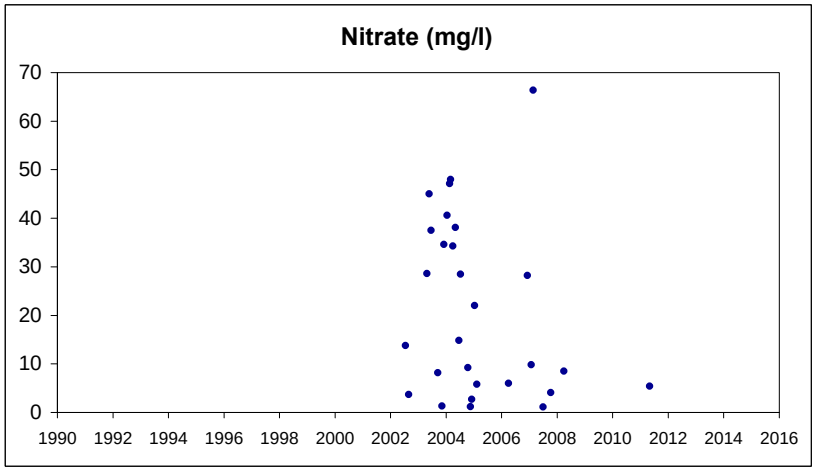

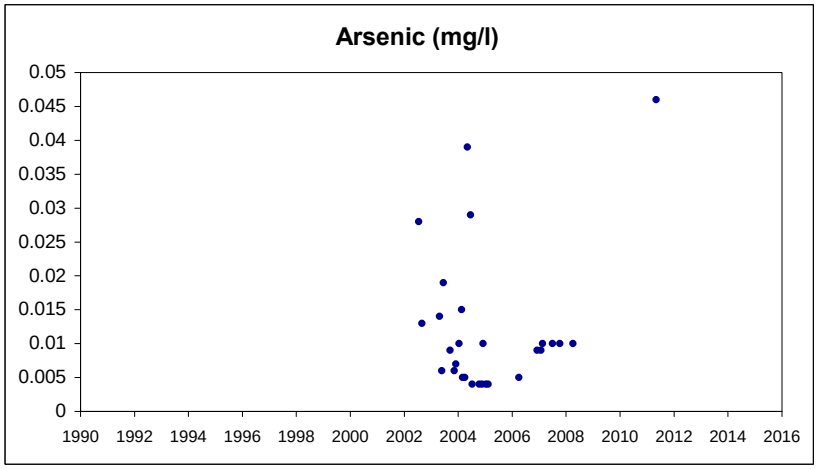

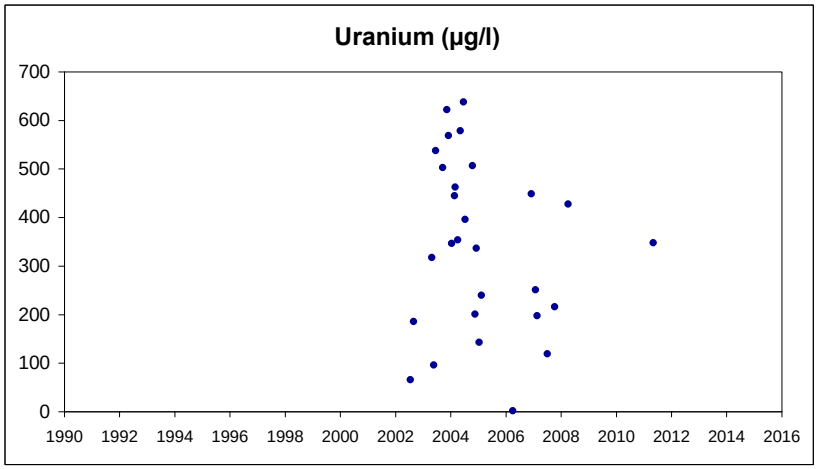

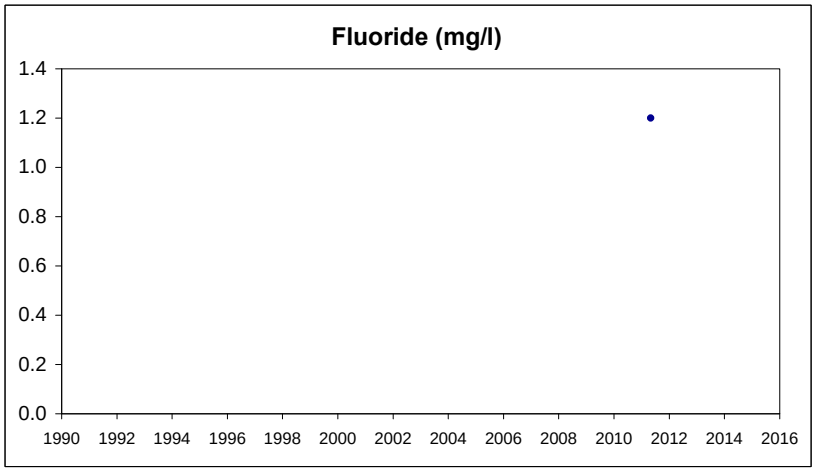

2225

(Catchment Trench No. 3)

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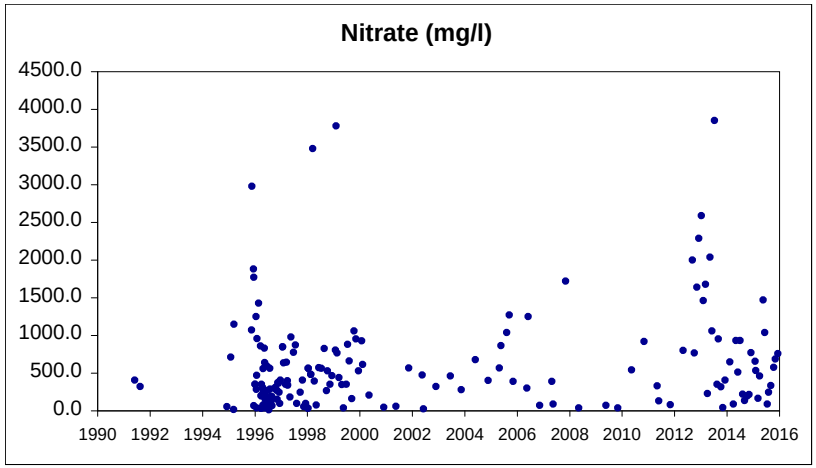

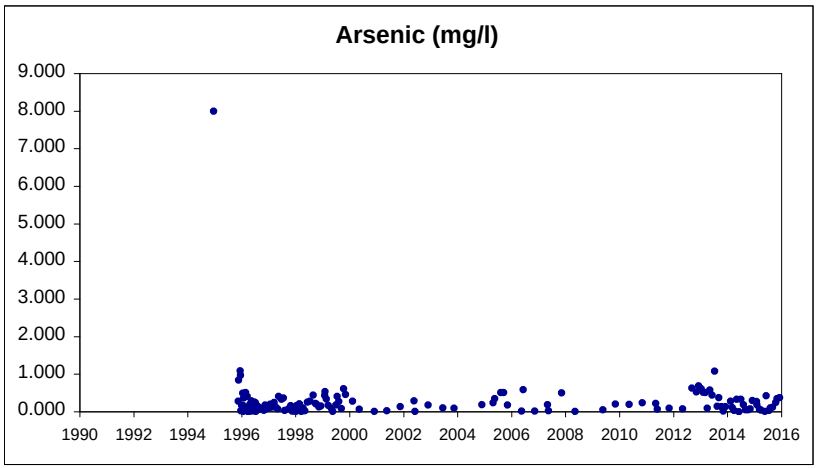

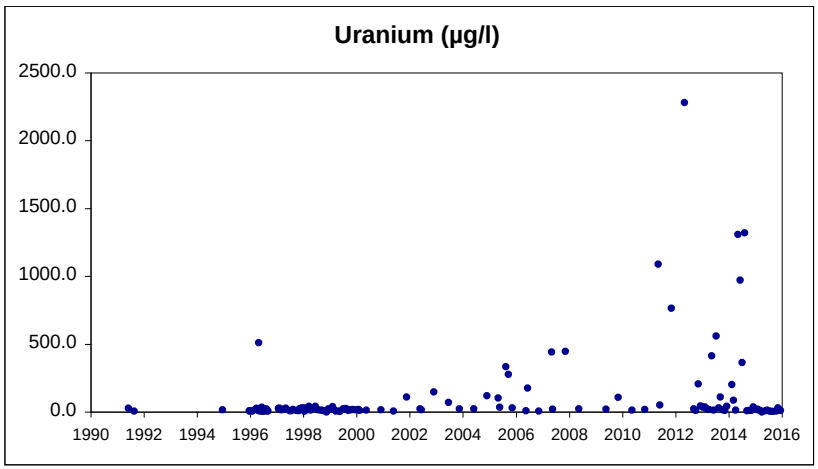

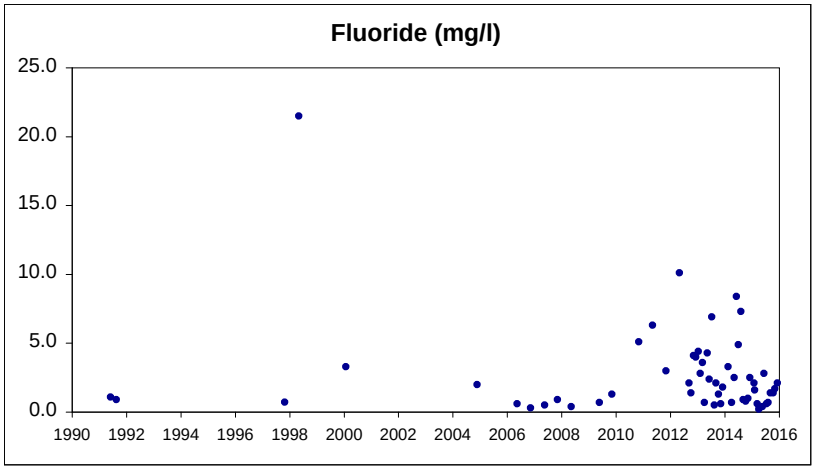

2241

(005 Drainage ~ 25' East of COE Boundary Fence)

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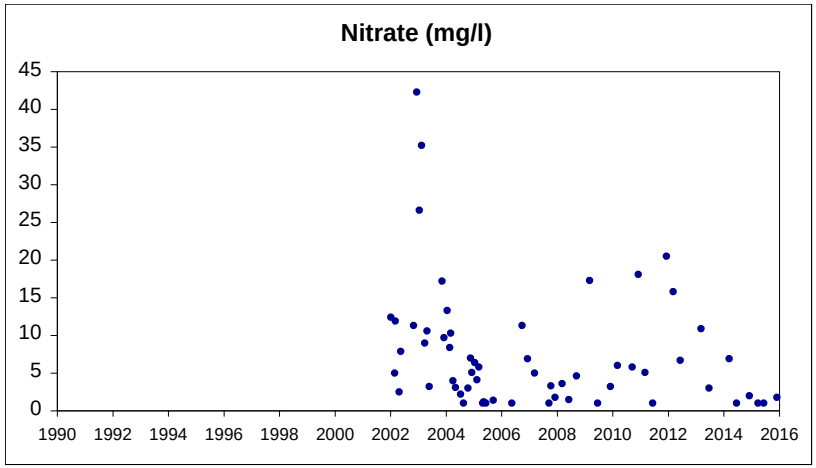

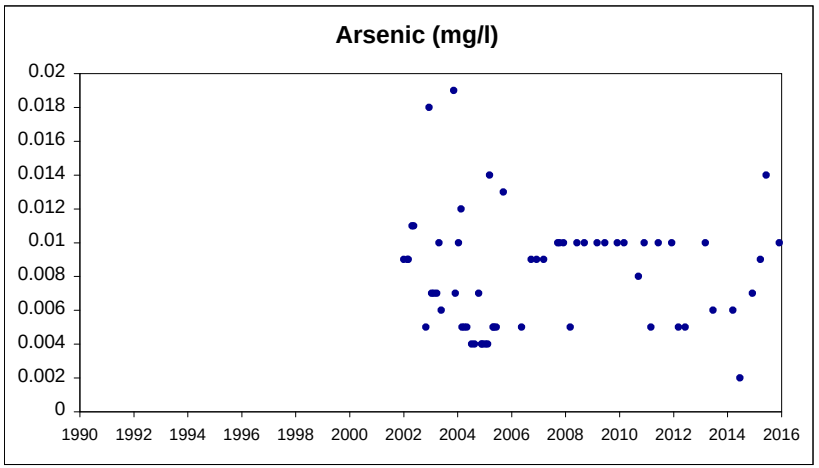

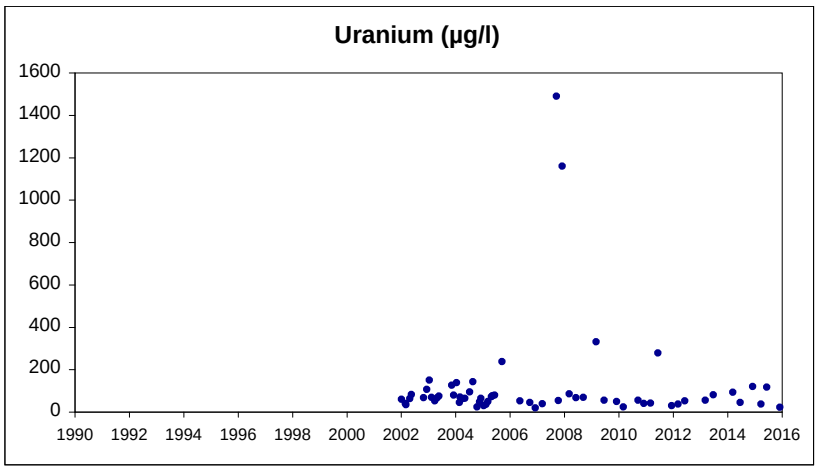

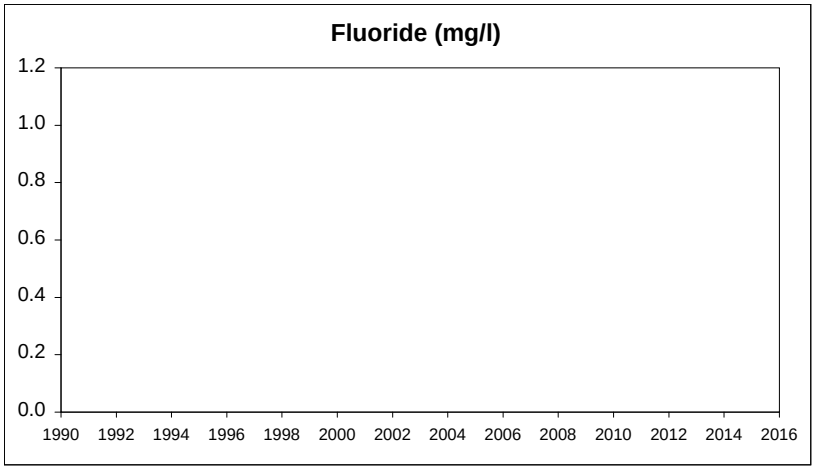

2242

(005 Drainage - Pool Near MW100B)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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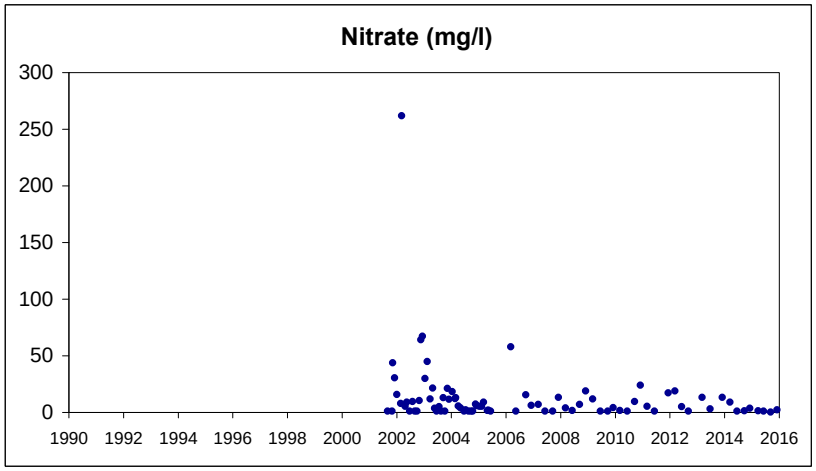

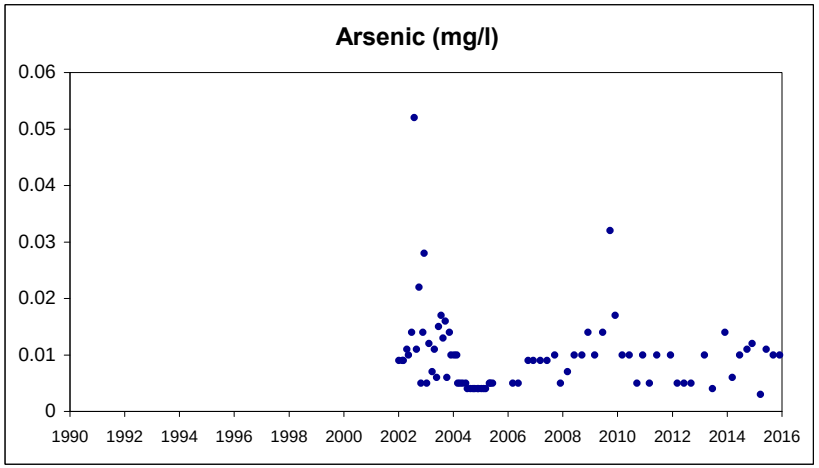

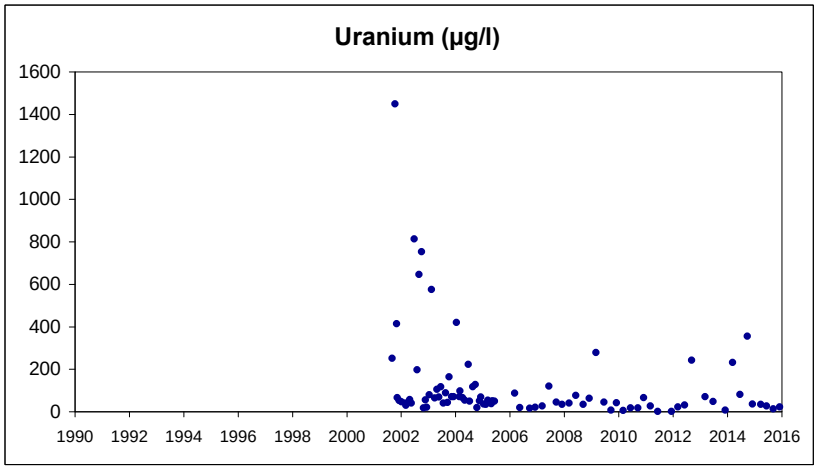

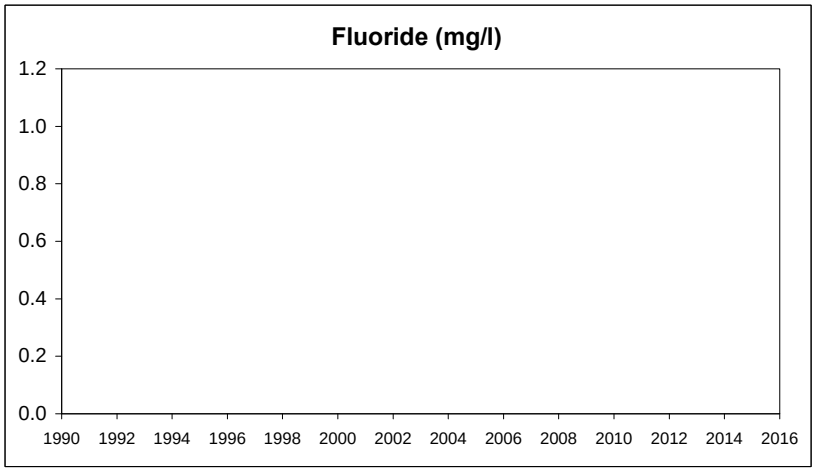

2243

(007 Drainage North of Calcium Fluoride Holding Basin)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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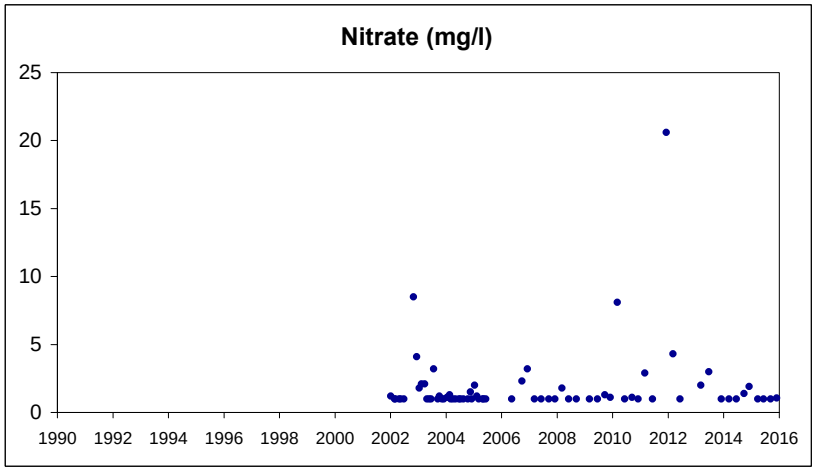

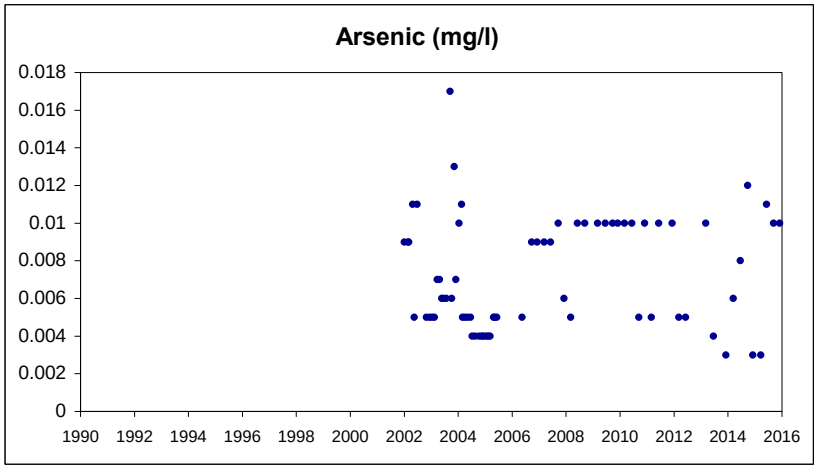

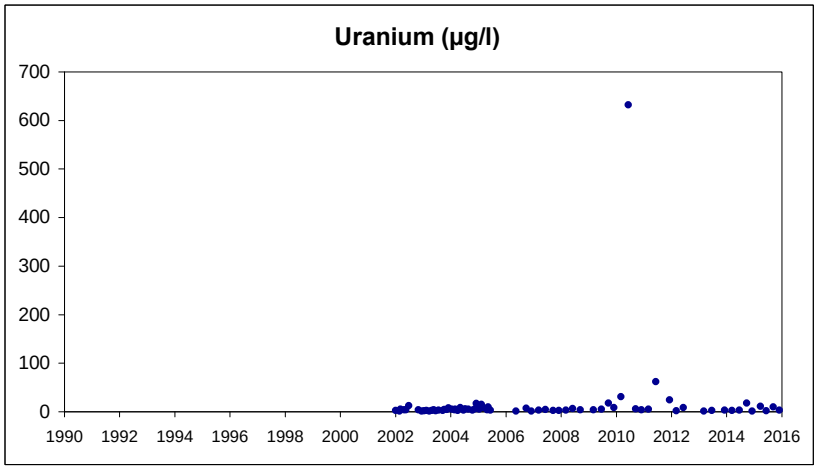

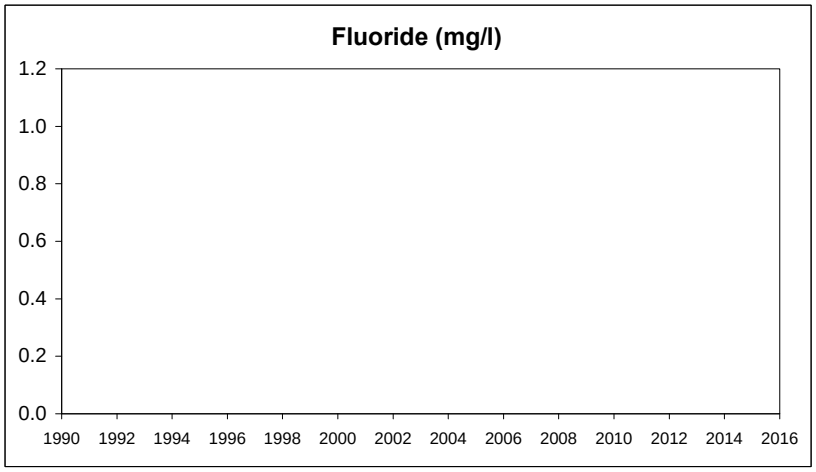

2244

(004 Drainage ~ 20' East of COE Boundary Fence)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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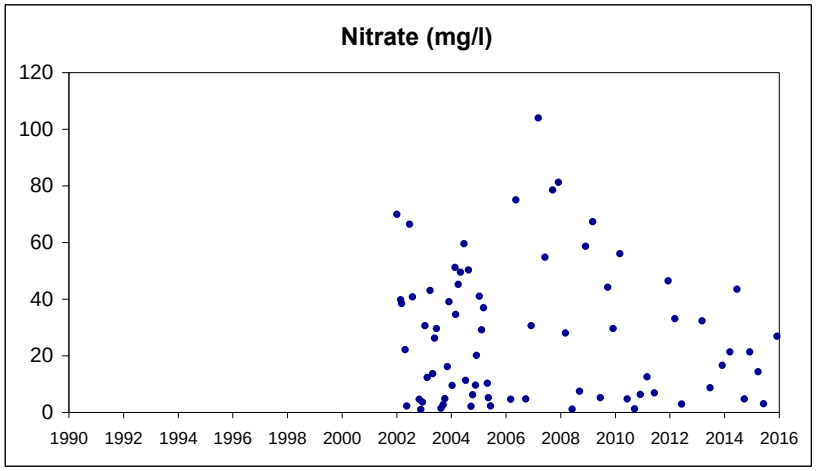

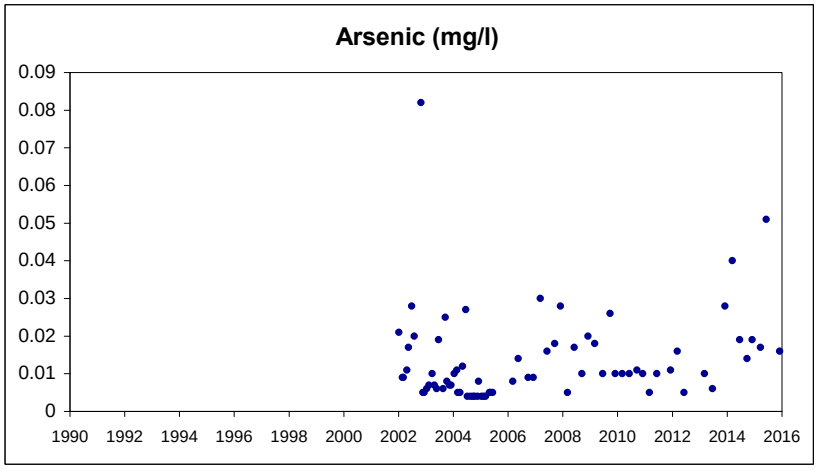

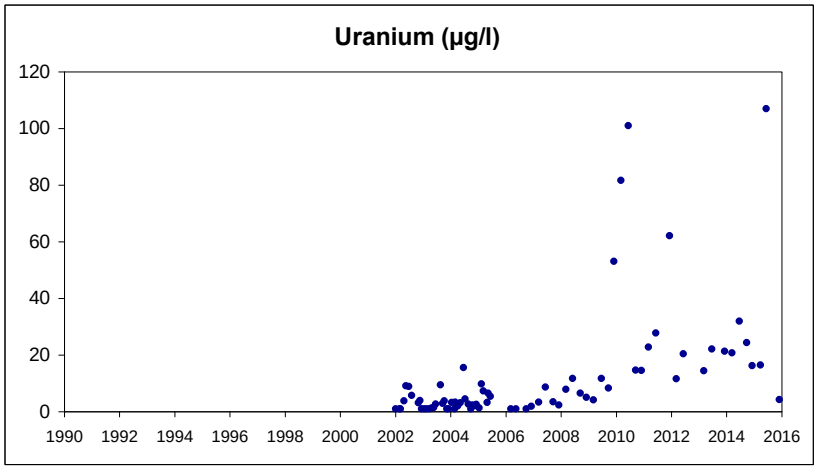

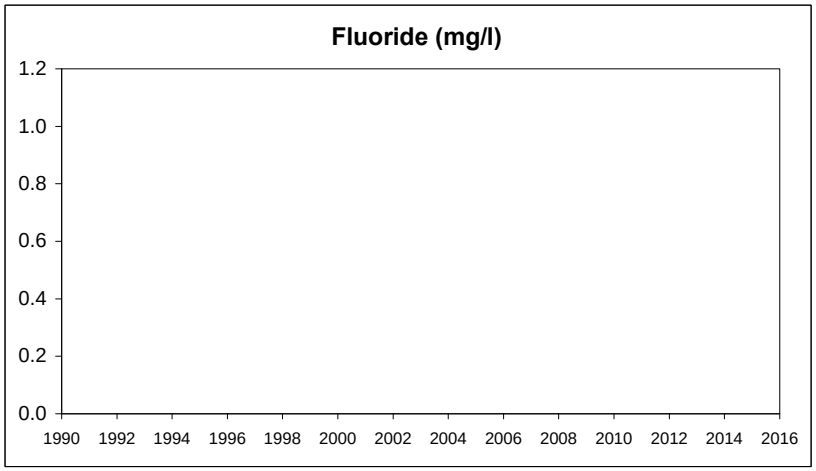

2245

(Seep North of Port Road Bridge)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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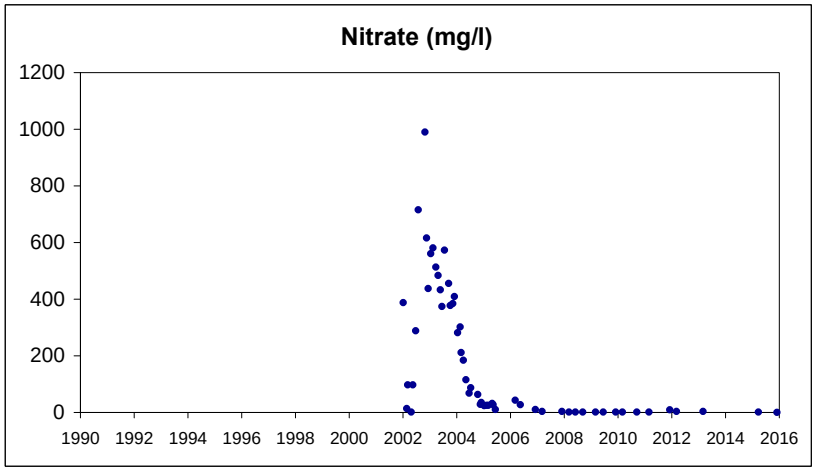
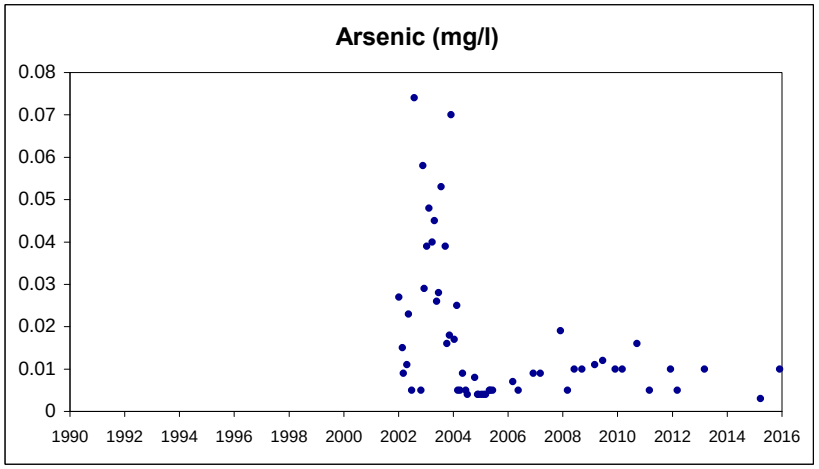
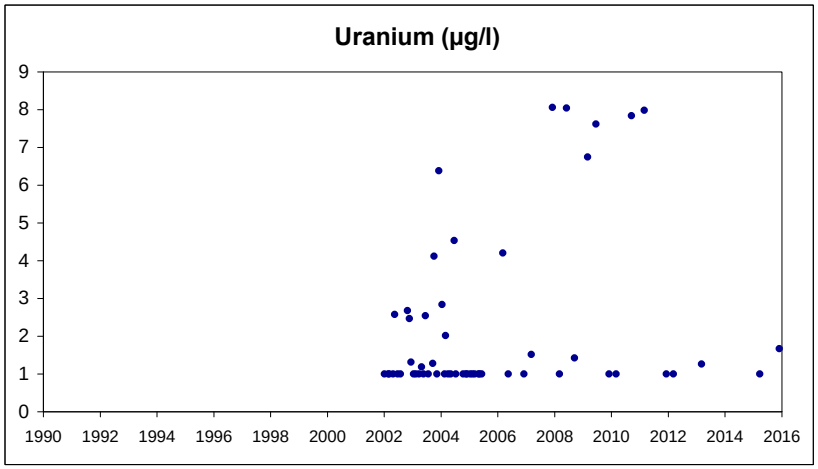
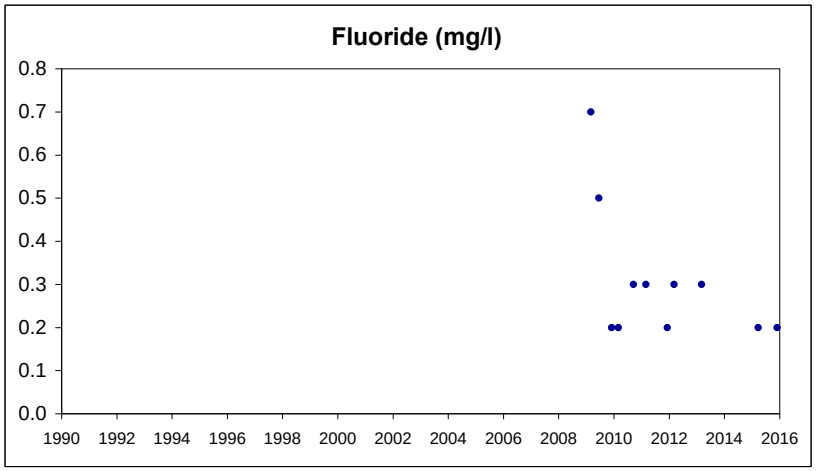






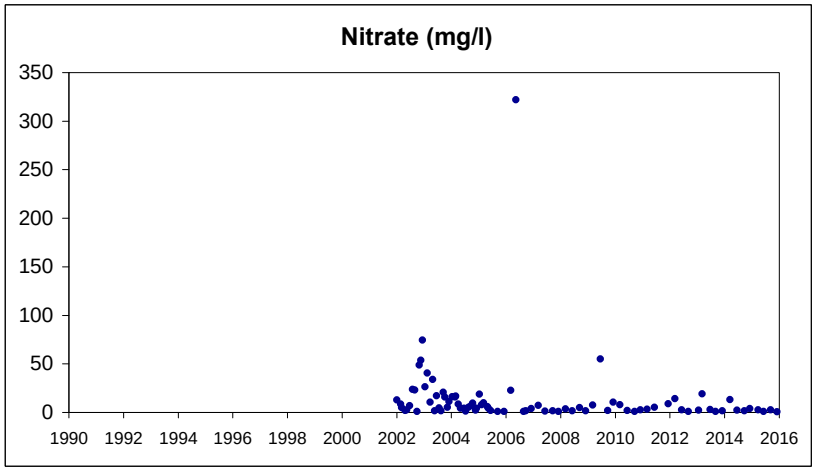


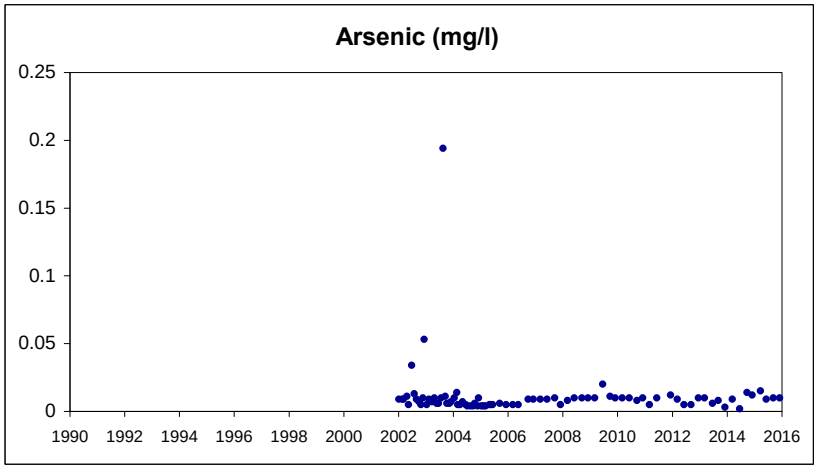
2246

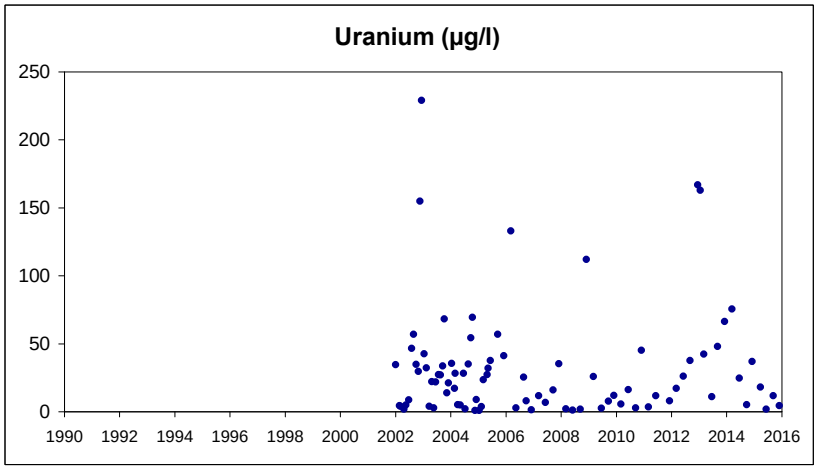
(001 Drainage North of Port Road Bridge)

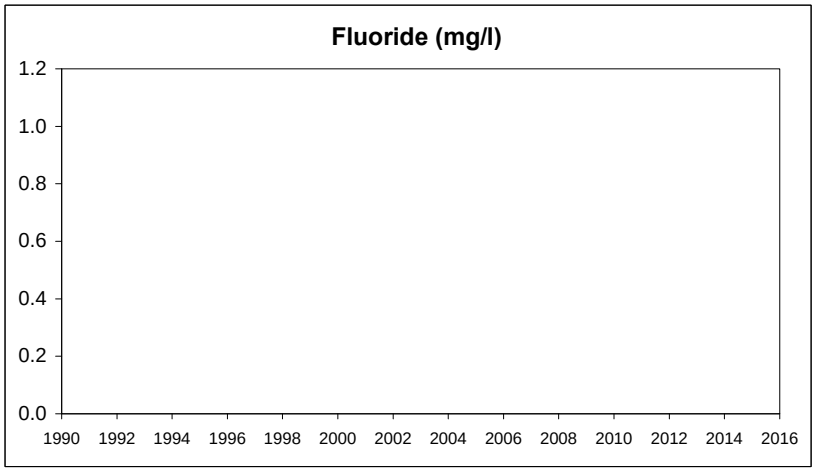
Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

2015 Annual Report









2247

(MW095A Recovery Trench)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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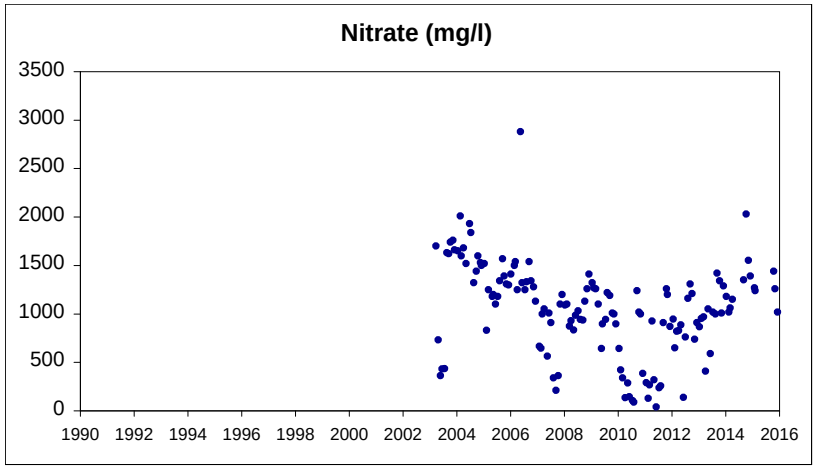
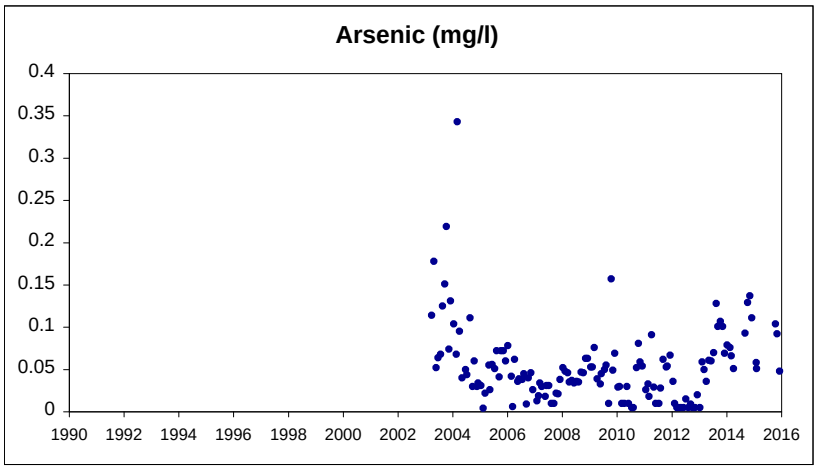
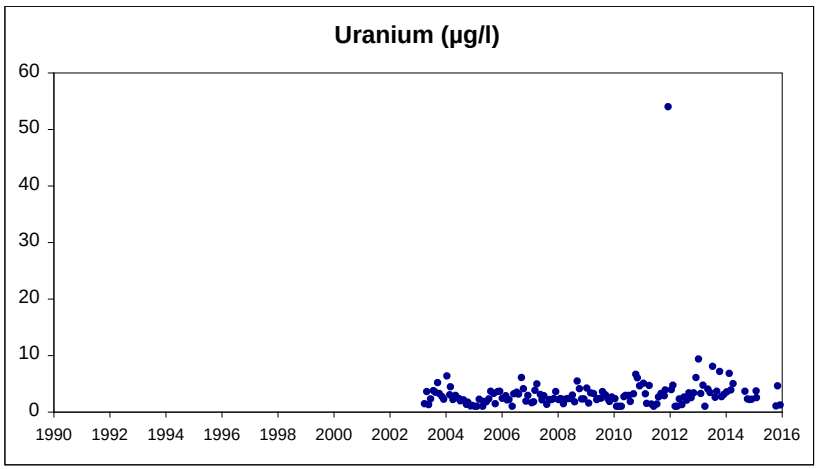
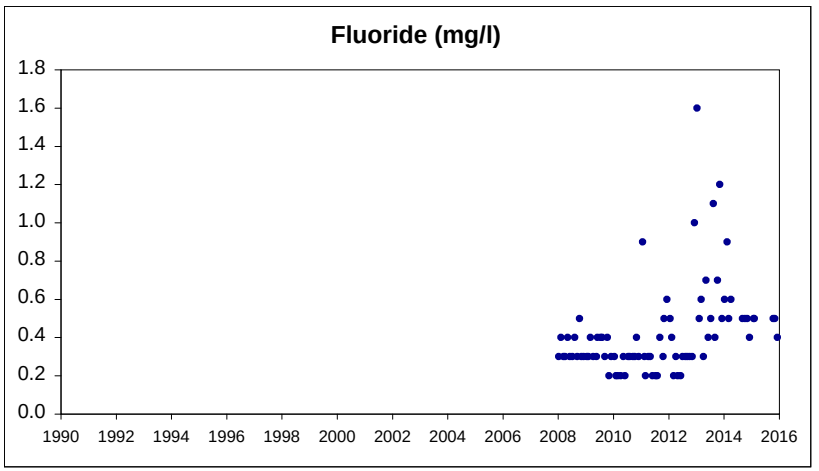






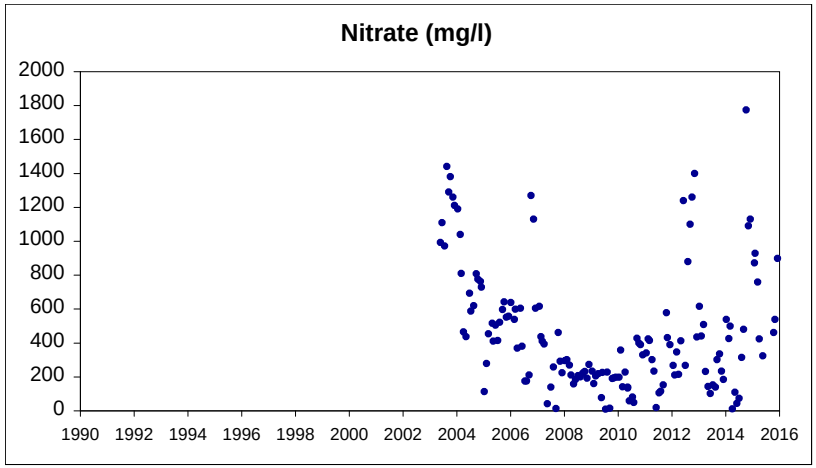


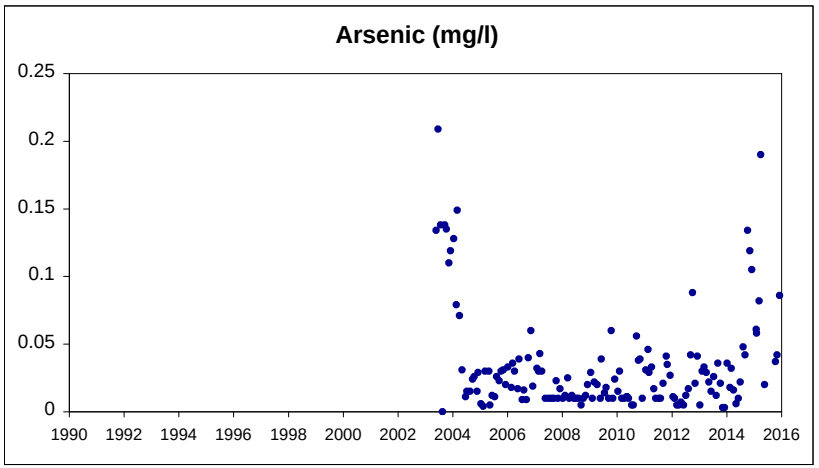
2247A

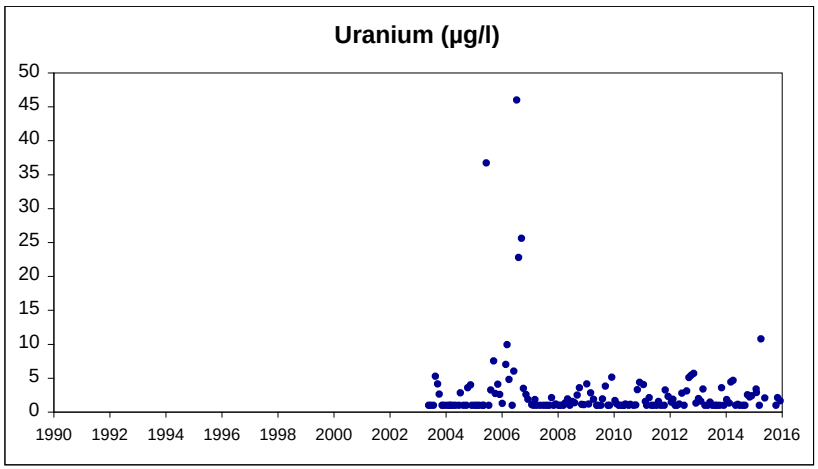
(MW095A Recovery Pit)

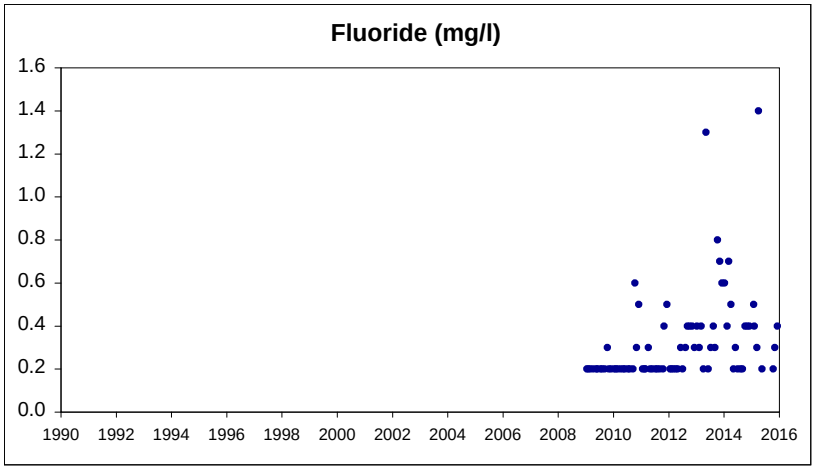
Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

2015 Annual Report









2248

(MW010 Collection Trench)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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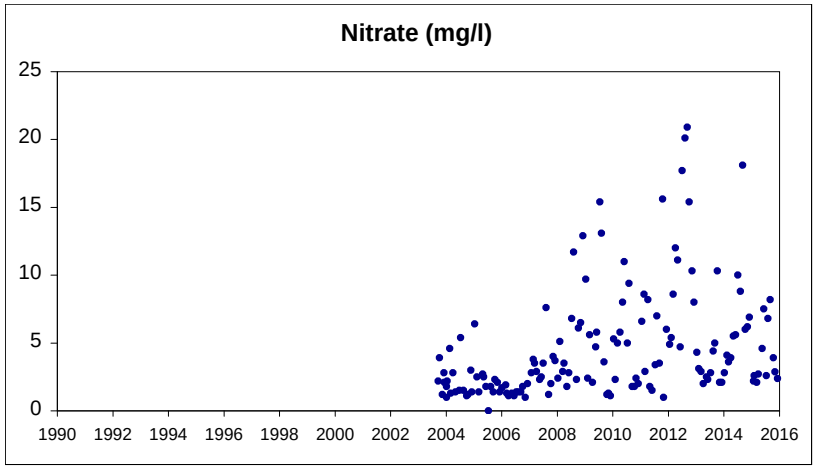

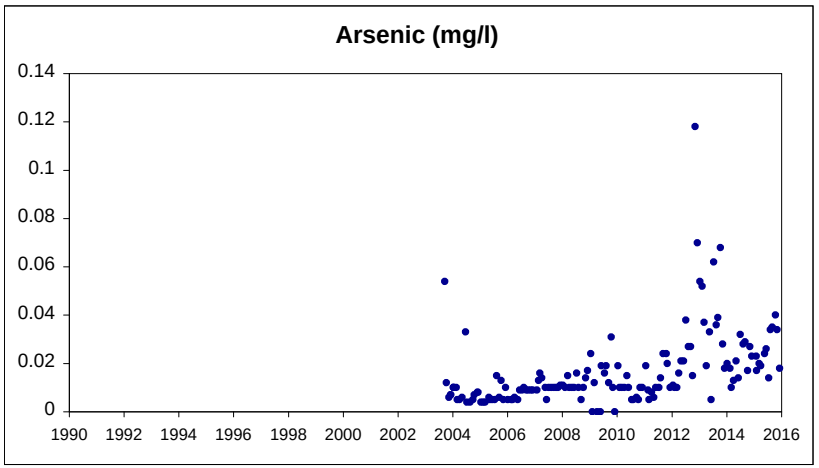

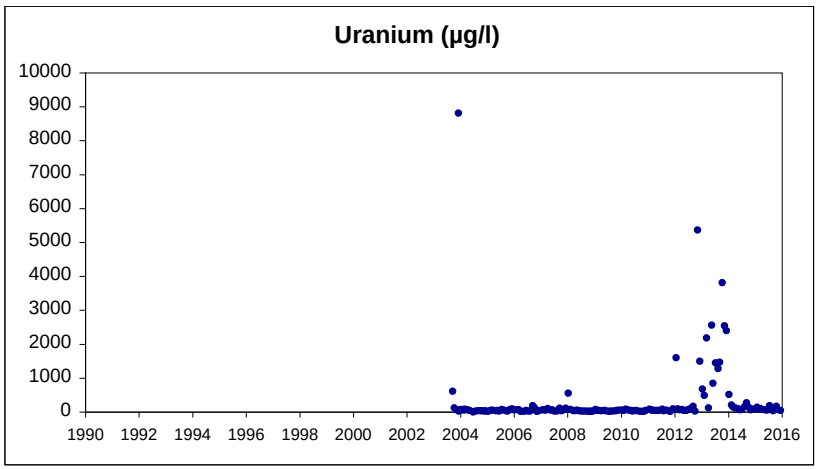

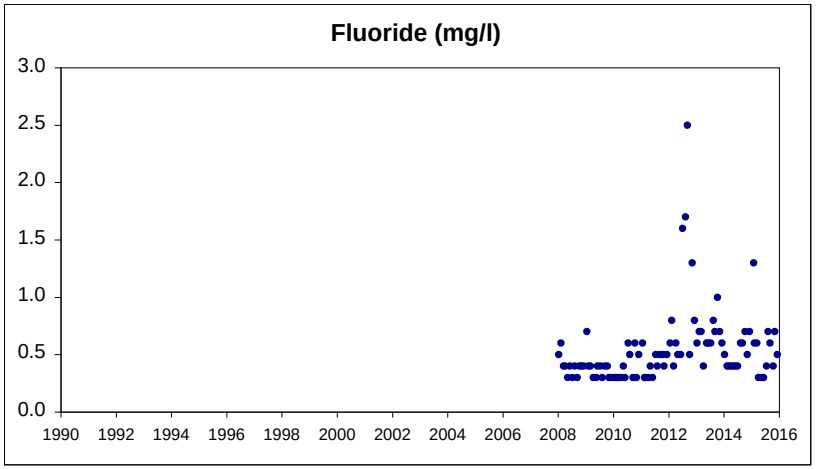

FD-B

(French Drain B - Concrete Manhole Near SX Vault)

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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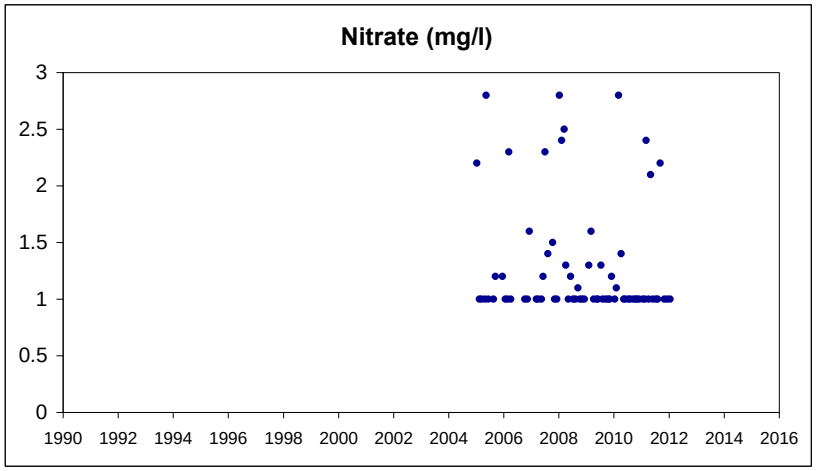

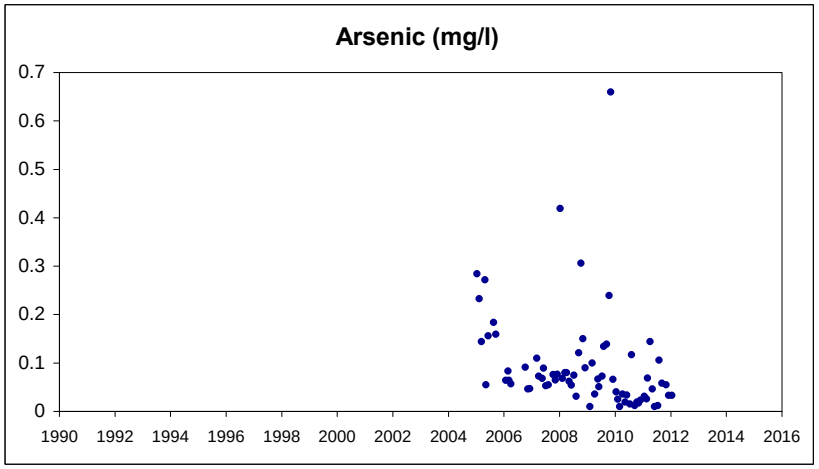

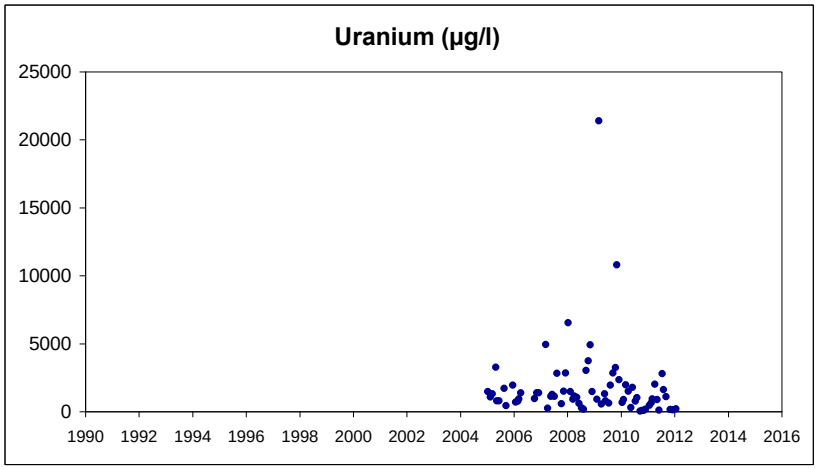

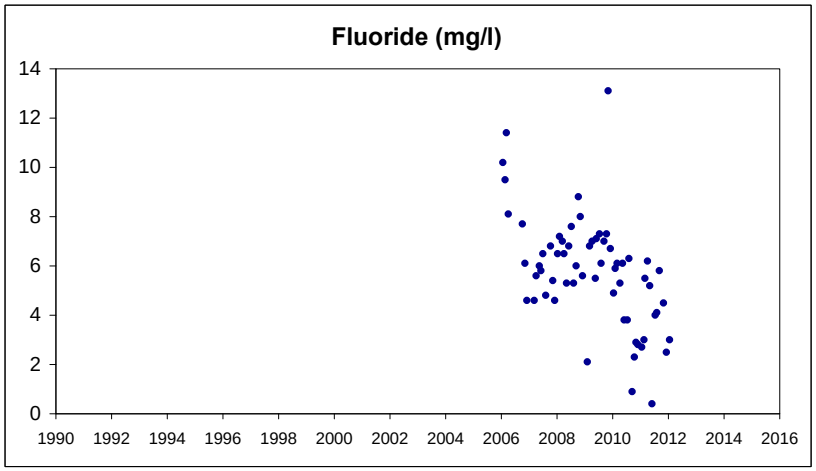

MWRW2

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Sequoyah Fuels Corporation

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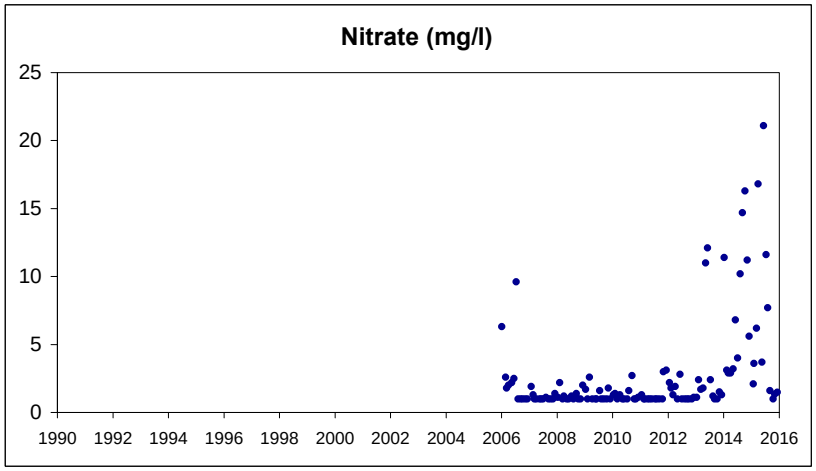

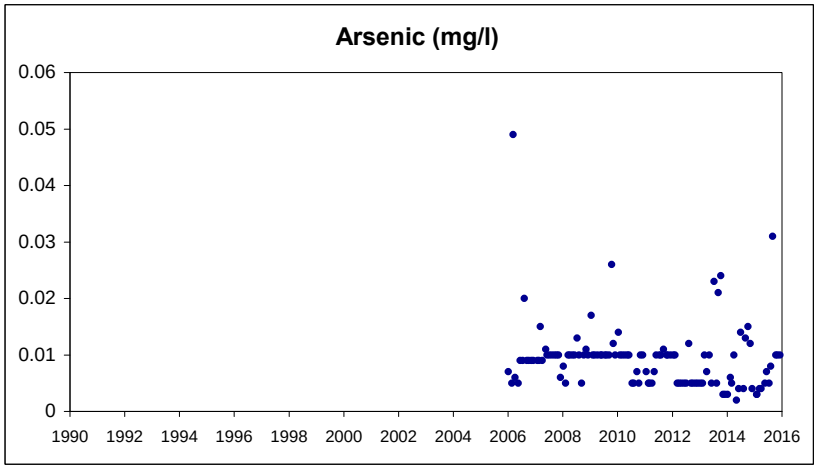

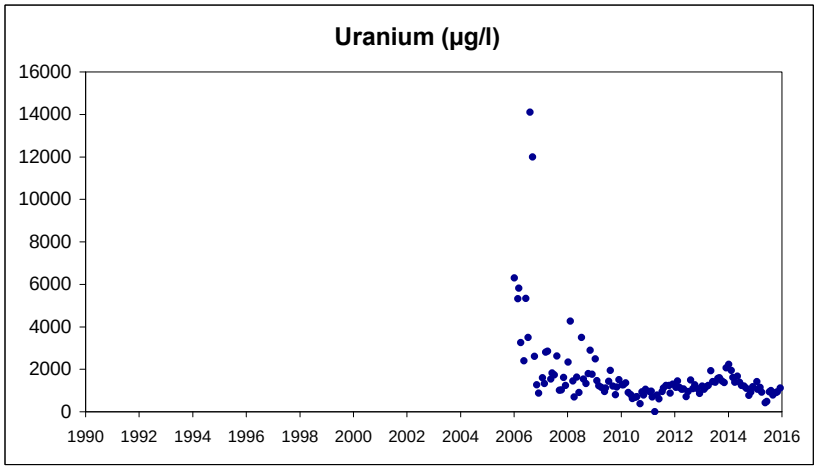

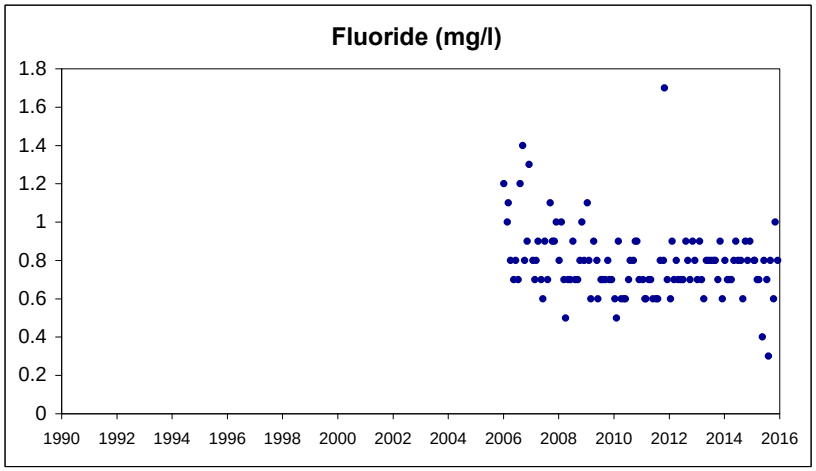

MWRW4

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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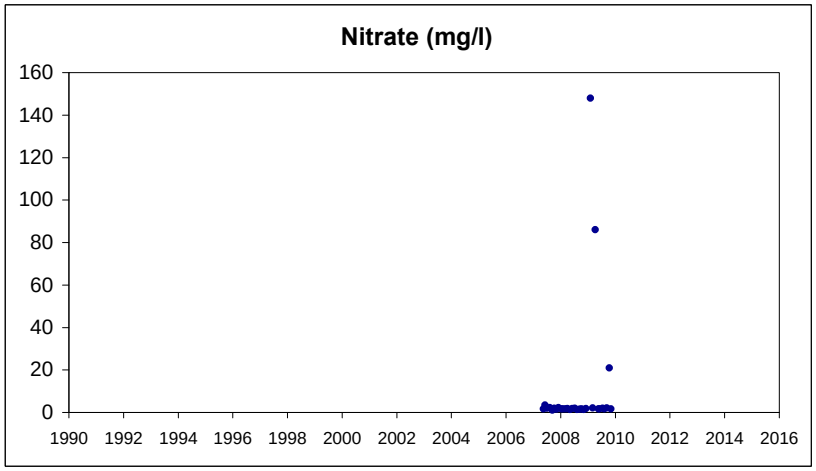

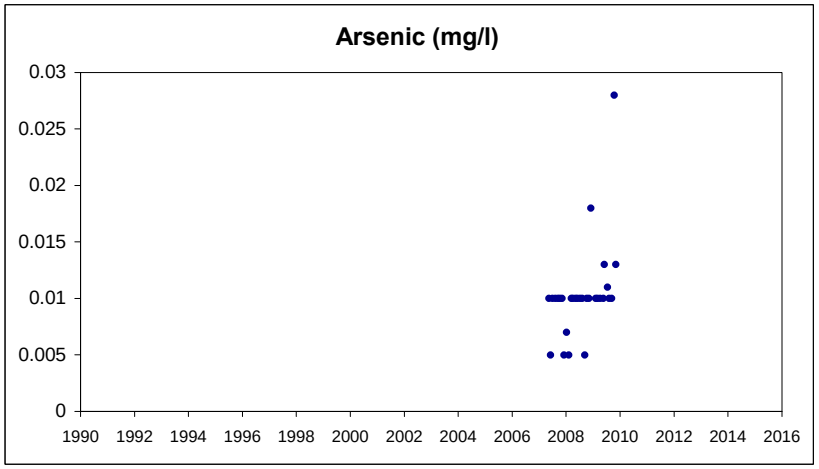

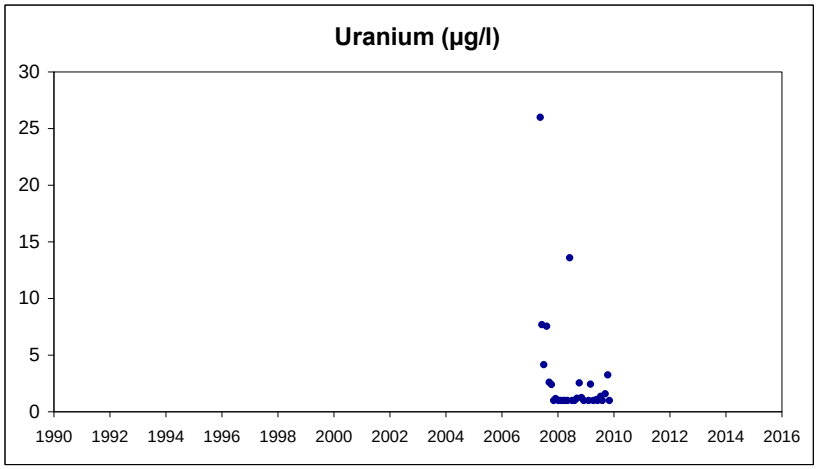

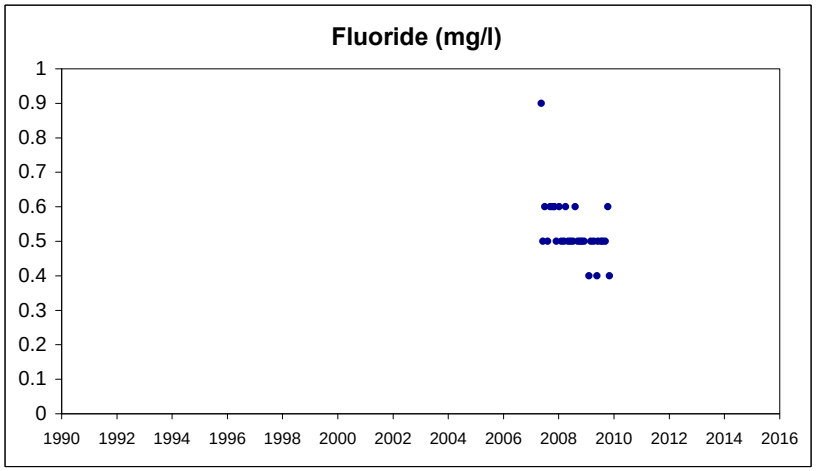

MWRW5

Groundwater Monitoring Well Evaluation
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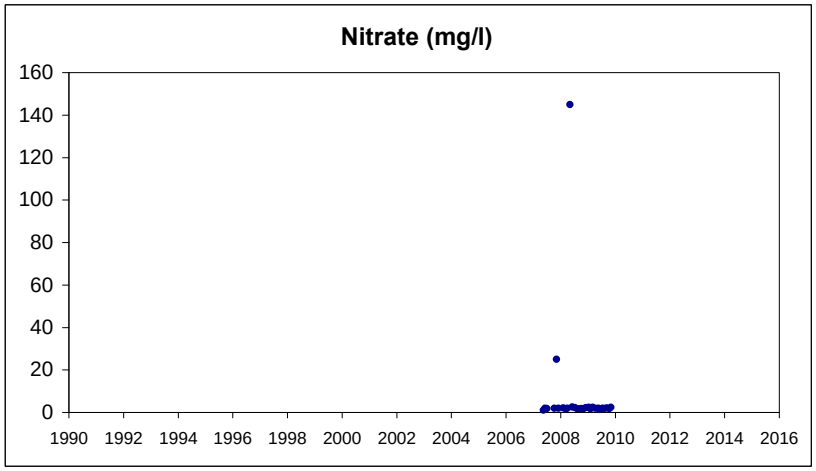

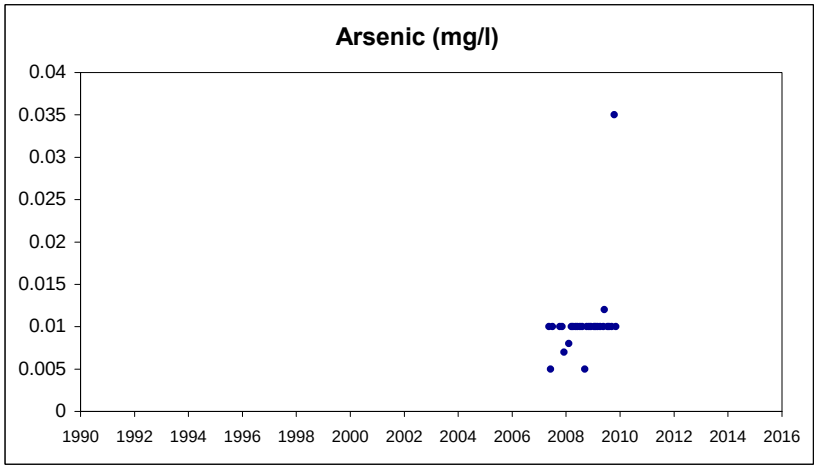

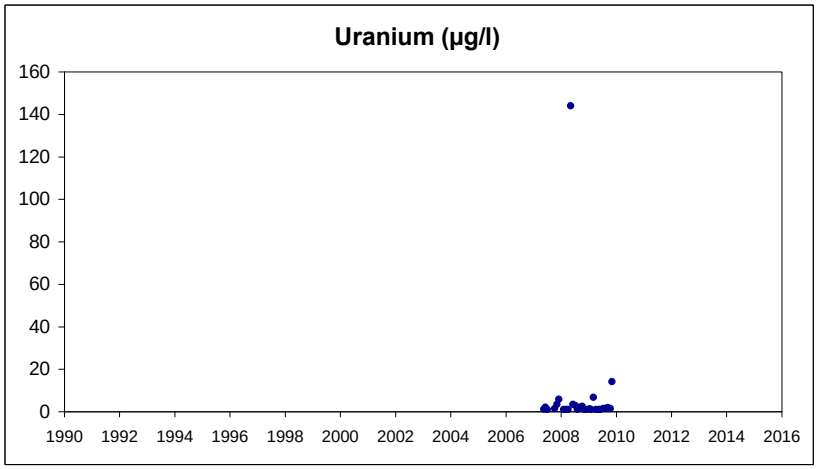

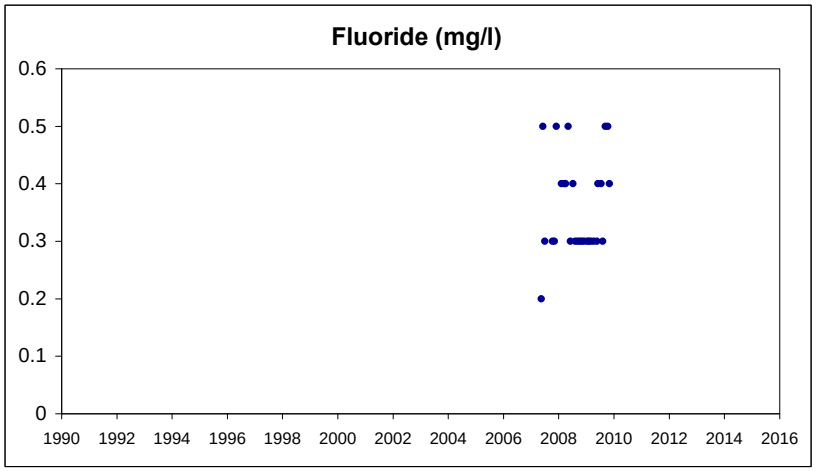

MWRW6

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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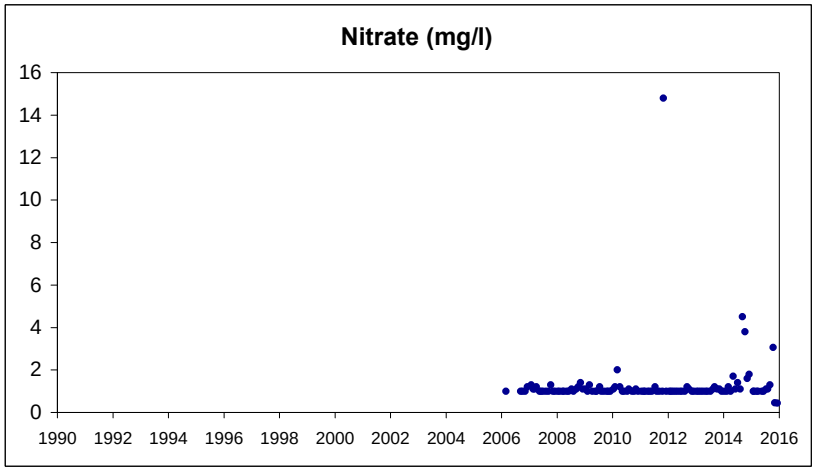

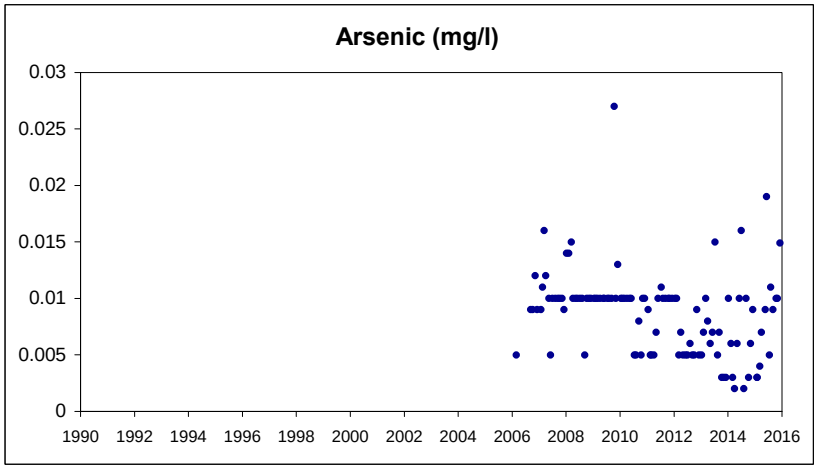

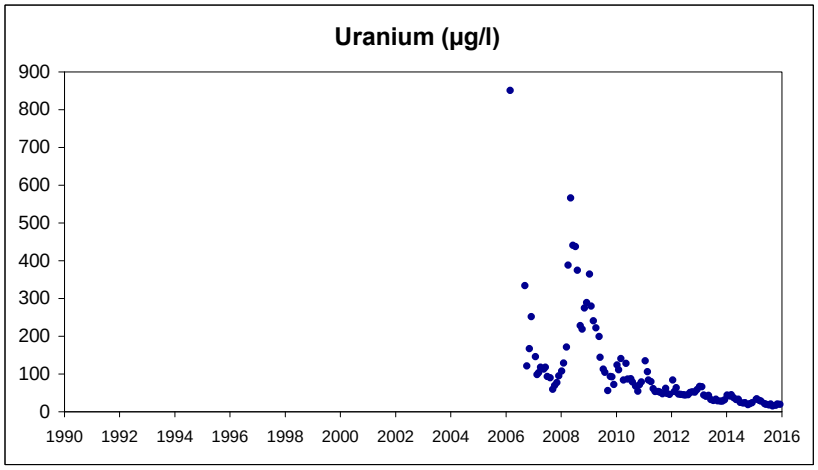

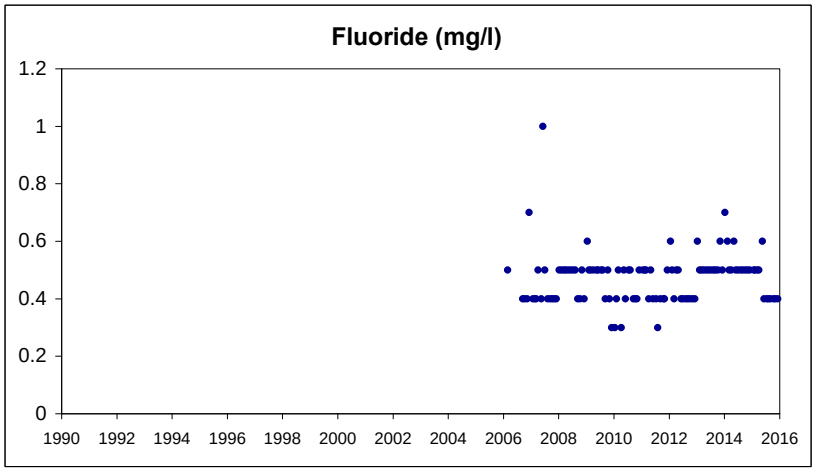

MWRW7

Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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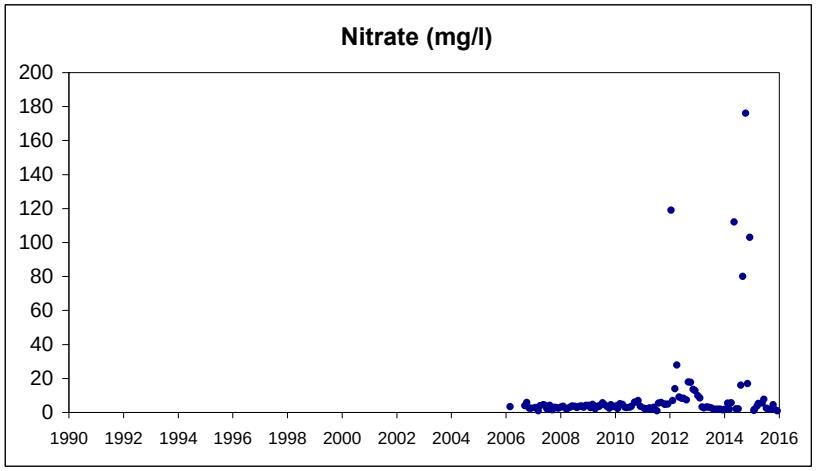

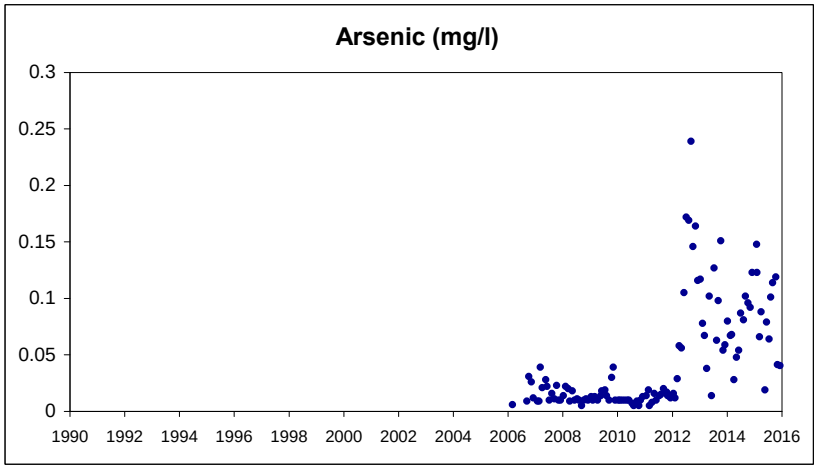

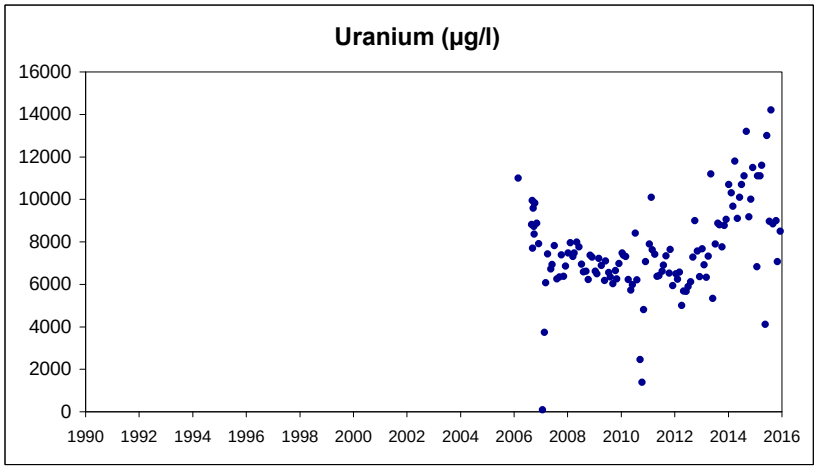

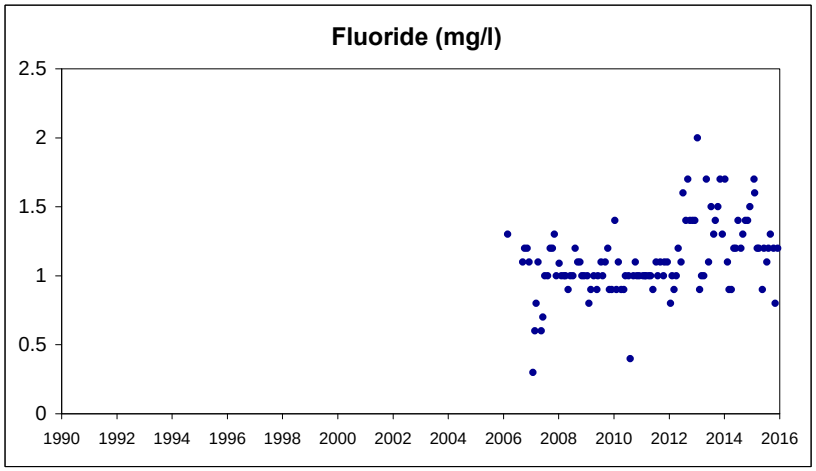

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Groundwater Monitoring Well Evaluation
Sequoyah Fuels Corporation

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