

# Data Validation Package

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**April 2009**

**Groundwater Sampling at the  
Falls City, Texas, Disposal Site**

**June 2009**



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

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# Sampling Event Summary

**Site:** Falls City, Texas, Disposal Site

**Sampling Period:** April 22, 2009

Ten groundwater samples were collected at the Falls City, Texas, Disposal Site to demonstrate that legacy contamination is not affecting downgradient groundwater quality, as specified in the *Long-Term Surveillance Plan for the U.S. Department of Energy Falls City Uranium Mill Tailings Disposal Site Falls City, Texas* (DOE 2006, Revision 3).

Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (DOE 2006, Revision 2). Duplicate samples were collected from locations 0858 and 0880. The duplicate sample results were acceptable.

The wells sampled included the cell performance monitor wells (0709, 0858, 0880, 0906 and 0921) and the groundwater compliance monitor wells (0862, 0886, 0891, 0924, and 0963).

Water levels were measured at each sampled well. Historically, wells 0908 and 0916 have not produced water and were confirmed as dry. These wells are completed above the saturated interval in the formation. Water levels in the remaining wells decreased since the 2008 sampling event. The water level has been trending lower at four wells (0709, 0858, 0880, 0921) adjacent to the cell since 1996.

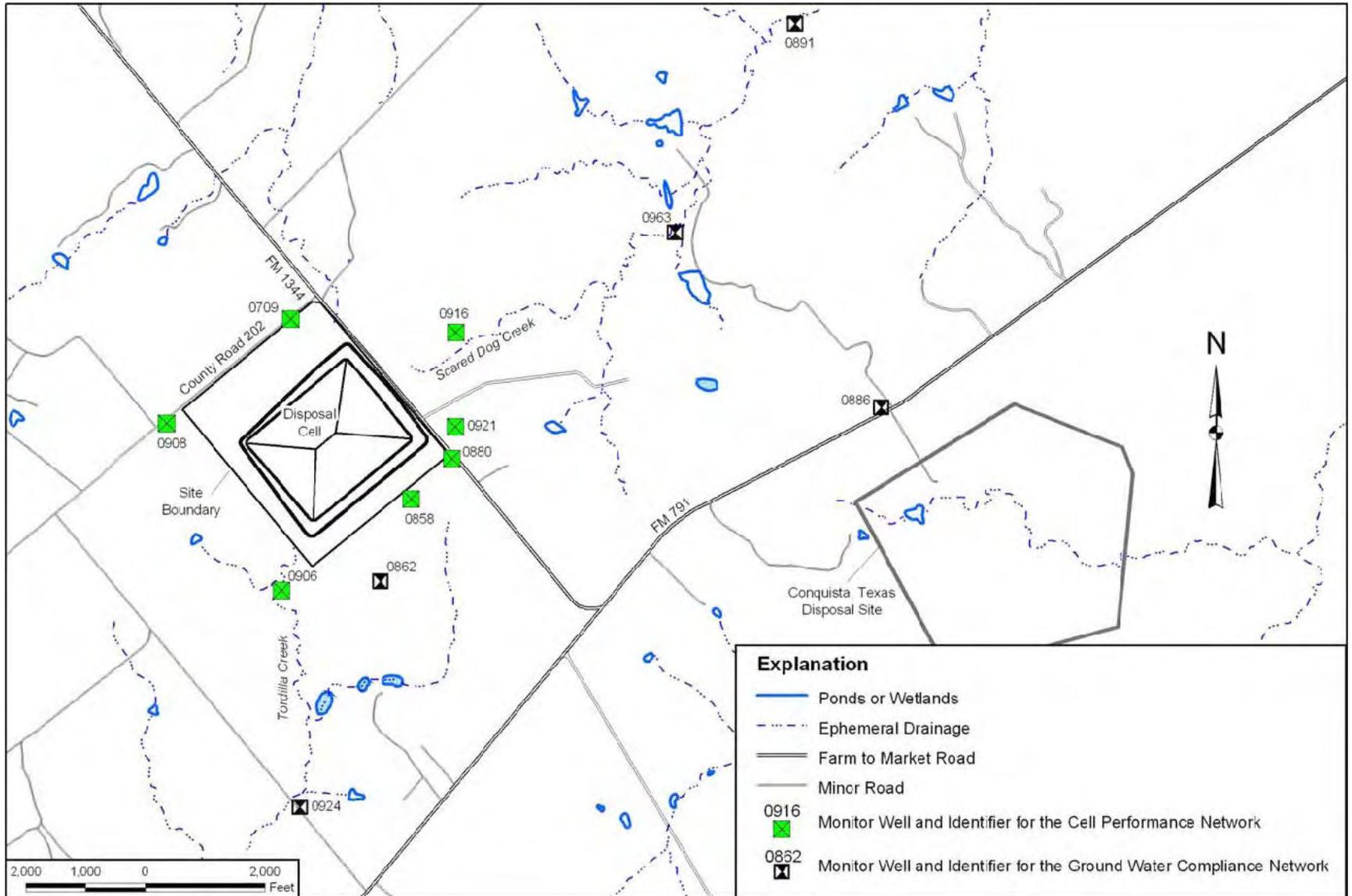
The time-concentration graphs included in this report show that the uranium concentration in well 0891 is anomalously high. The specific conductance measured in this well has been trending upward since 2005 indicating changing groundwater conditions. The concentration of uranium in well 0880 returned to a concentration greater than 6 mg/L after a historical low concentration was observed in 2008. No other significant changes in uranium concentration were noted.

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Michele Miller  
Site Lead, S.M. Stoller

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Date



Falls City, Texas, Monitor Well Location Map

# Data Assessment Summary

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## Water Sampling Field Activities Verification Checklist

|                                |                   |                                  |                |
|--------------------------------|-------------------|----------------------------------|----------------|
| <b>Project</b>                 | Falls City, Texas | <b>Date(s) of Water Sampling</b> | April 22, 2009 |
| <b>Date(s) of Verification</b> | May 14, 2009      | <b>Name of Verifier</b>          | Steve Donovan  |

|  | Response<br>(Yes, No, NA) | Comments  |
|--|---------------------------|---|
| 1. Is the SAP the primary document directing field procedures?<br><br>List other documents, SOPs, instructions.                                | Yes                       | Work Order Letter dated March 18, 2009.               |
| 2. Were the sampling locations specified in the planning documents sampled?  | No                        | Wells 0908 and 0916 were dry.                         |
| 3. Was a pre-trip calibration conducted as specified in the above-named documents?   | Yes                       | Pre-trip calibration was performed on April 17, 2009. |
| 4. Was an operational check of the field equipment conducted daily?<br><br>Did the operational checks meet criteria?                           | Yes<br><br>Yes            | Operational check was performed on April 22, 2009.    |
| 5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified? | Yes                       |   |
| 6. Was the category of the well documented?  | Yes                       |   |
| 7. Were the following conditions met when purging a Category I well:<br><br>Was one pump/tubing volume purged prior to sampling?               | Yes                       |   |
| Did the water level stabilize prior to sampling?   | No                        | Water level did not stabilize in well 0886.           |
| Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?  | Yes                       |   |
| Was the flow rate less than 500 mL/min?  | Yes                       |   |
| If a portable pump was used, was there a 4-hour delay between pump installation and sampling?  | NA                        |   |

## Water Sampling Field Activities Verification Checklist (continued)

|   | Response<br>(Yes, No, NA) | Comments   |
|---|---------------------------|--|
| 8. Were the following conditions met when purging a Category II well:   |                           |  |
| Was the flow rate less than 500 mL/min?   | Yes                       |  |
| Was one pump/tubing volume removed prior to sampling?   | Yes                       |  |
| 9. Were duplicates taken at a frequency of one per 20 samples?  | Yes                       | Duplicate samples were collected from wells 0858 and 0880. |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?                   | No                        | Equipment blanks were not required.                        |
| 11. Were trip blanks prepared and included with each shipment of VOC samples?   | NA                        |  |
| 12. Were QC samples assigned a fictitious site identification number?   | Yes                       | Locations IDs 2596 and 2743 were used for QC samples.      |
| Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDSC) report? | Yes                       |  |
| 13. Were samples collected in the containers specified?   | Yes                       |  |
| 14. Were samples filtered and preserved as specified?   | Yes                       | The sample from well 0886 was filtered.                    |
| 15. Were the number and types of samples collected as specified?  | Yes                       |  |
| 16. Were chain of custody records completed and was sample custody maintained?  | Yes                       |  |
| 17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDSC)?  | Yes                       |  |
| 18. Was all other pertinent information documented on the field data sheets?  | Yes                       |  |
| 19. Was the presence or absence of ice in the cooler documented at every sample location?   | NA                        | Sample cooling was not required.                           |
| 20. Were water levels measured at the locations specified in the planning documents?  | Yes                       |  |

## Laboratory Performance Assessment

### General Information

Report Number (RIN): 09032198  
Sample Event: April 22, 2009  
Site(s): Falls City, Texas  
Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
Work Order No.: 0904224  
Analysis: Metals  
Validator: Steve Donovan  
Review Date: May 14, 2009

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (DOE 2006, Revision 1). The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

Table 1. Analytes and Methods

| Analyte | Line Item Code | Prep Method  | Analytical Method |
|---------|----------------|--------------|-------------------|
| Uranium | LMM-02         | SW-846 3005A | SW-846 6020A      |

### Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 12 water samples on April 28, 2009, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all samples were listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the COC form, and the sample tickets had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

### Preservation and Holding Times

The sample shipments were received intact at ambient temperature which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses, all samples were analyzed within the applicable holding times.

### Data Qualifier Summary

None of the analytical results required qualification.

## Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

### *Method SW-846 6020A, Uranium*

Calibration was performed for uranium on May 4, 2009. The initial calibration was performed using seven calibration standards resulting in a calibration curve with a correlation coefficient value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in seven calibration checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit. All check results were within the acceptance range. The mass calibration and resolution were checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

### Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and initial and continuing calibration blank results were below the practical quantitation limits.

### Inductively Coupled Plasma Interference Check Sample (ICS) Analysis

Inductively coupled plasma interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

### Matrix Spike Analysis

Matrix spike and matrix spike duplicate samples are used to measure method performance in the sample matrix. The matrix spike and matrix spike duplicate data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spike recoveries met the recovery and precision criteria for all analytes evaluated.

### Laboratory Replicate Analysis

The relative percent difference values for the laboratory replicate sample results for all analytes were less than twenty percent, indicating acceptable laboratory precision.

### Laboratory Control Samples

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The laboratory control sample results were acceptable for all analysis.

### Metals Serial Dilution

Serial dilutions were performed during the metals analysis to monitor physical or chemical interferences that may exist in the sample matrix. Serial dilutions were prepared and analyzed for uranium. The acceptance criteria were met.

### Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for uranium.

### Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

### Electronic Data Deliverable (EDD) File

The EDD file arrived on May 13, 2009. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure that all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

RIN: 09032198 Lab Code: PAR Validator: Steve Donovan Validation Date: 5/14/2009

Project: Falls City Analysis Type:  Metals  General Chem  Rad  Organics

# of Samples: 12 Matrix: WATER Requested Analysis Completed: Yes

### Chain of Custody

Present: OK Signed: OK Dated: OK

### Sample

Integrity: OK Preservation: OK Temperature: OK

### Select Quality Parameters

- Holding Times
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

There were 2 duplicates evaluated.

**SAMPLE MANAGEMENT SYSTEM**  
**Metals Data Validation Worksheet**

RIN: 09032198      Lab Code: PAR      Date Due: 5/26/2009  
 Matrix: Water      Site Code: FCT      Date Completed: 5/12/2009

| Analyte | Date Analyzed | CALIBRATION |        |     |     |     |     | Method | LCS<br>%R | MS<br>%R | MSD<br>%R | Dup.<br>RPD | ICSAB<br>%R | Serial Dil.<br>%R | CRI<br>%R |
|---------|---------------|-------------|--------|-----|-----|-----|-----|--------|-----------|----------|-----------|-------------|-------------|-------------------|-----------|
|         |               | Int.        | R^2    | ICV | CCV | ICB | CCB |        |           |          |           |             |             |                   |           |
| URANIUM | 05/04/2009    | 0.0000      | 1.0000 | OK  | OK  | OK  | OK  | OK     | 102.0     | 116.0    | 108.0     | 2.0         | 108.0       | 5.0               | 79.0      |
| URANIUM | 05/04/2009    |             |        |     |     |     |     |        |           |          |           | 1.0         |             |                   |           |

## **Sampling Quality Control Assessment**

The following information summarizes and assesses quality control for this sampling event.

### Sampling Protocol

Sample results for all monitor wells met the Category I or II low-flow sampling criteria and were qualified with an “F” flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

The groundwater sample results for wells 0858 and 0862 were qualified with a “Q” flag in the database indicating the data are considered qualitative because the wells were sampled using Category II criteria.

The data from well 0886 were qualified with a “Q” flag in the database indicating the data are considered qualitative because the water level did not stabilize.

### Equipment Blank Assessment

Collection and analysis of an equipment blank was not performed because all samples were collected with dedicated bladder pumps.

### Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. Duplicate samples were collected from locations 0858 and 0880. The duplicate results were acceptable, meeting the Environmental Protection Agency recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the practical quantitation limit.

**SAMPLE MANAGEMENT SYSTEM**  
**Validation Report: Field Duplicates**

RIN: 09032198    Lab Code: PAR    Project: Falls City    Validation Date: 5/14/2009

Duplicate: 2596

Sample: 0880

| Analyte | Sample |      |       | Duplicate |      |       | RPD  | RER | Units |
|---------|--------|------|-------|-----------|------|-------|------|-----|-------|
|         | Result | Flag | Error | Result    | Flag | Error |      |     |       |
| URANIUM | 6800   |      |       | 7300      |      |       | 7.09 |     | UG/L  |

Duplicate: 2743

Sample: 0858

| Analyte | Sample |      |       | Duplicate |      |       | RPD | RER | Units |
|---------|--------|------|-------|-----------|------|-------|-----|-----|-------|
|         | Result | Flag | Error | Result    | Flag | Error |     |     |       |
| URANIUM | 65     |      |       | 65        |      |       | 0   |     | UG/L  |

### Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donivan 6-24-2008  
Steve Donivan Date

Data Validation Lead: Steve Donivan 6-24-2008  
Steve Donivan Date

**Attachment 1**  
**Assessment of Anomalous Data**

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# Potential Outliers Report

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## Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

The uranium concentration in well 0891 is anomalously high and is listed on the Anomalous Data Review Checksheet for further review. There were no errors identified with this result.

The data from five field measurements were identified as potentially anomalous. Further review of these data does not indicate any errors and the following are noted concerning these data. Most of the oxidation reduction potential values are below the historical minimum. The specific conductance measured in well 0891 has been trending upward since 2005. Dissolved oxygen has not been measured in these wells since 1996. The data from this sampling event are acceptable as qualified.

**Data Validation Outliers Report - No Field Parameters**

Laboratory: PARAGON (Fort Collins, CO)

RIN: 09032198

Comparison: All Historical Data

Report Date: 6/16/2009

| Site Code | Location Code | Sample Date | Analyte | Result | Current Qualifiers |      | Historical Maximum Qualifiers |     | Historical Minimum Qualifiers |        | Number of Data Points |      | Normally Distributed | Statistical Outlier |     |
|-----------|---------------|-------------|---------|--------|--------------------|------|-------------------------------|-----|-------------------------------|--------|-----------------------|------|----------------------|---------------------|-----|
|           |               |             |         |        | Lab                | Data | Result                        | Lab | Data                          | Result | Lab                   | Data |                      |                     | N   |
| FCT03     | 0891          | 04/22/2009  | Uranium | 1.7    |                    | F    | 0.45                          |     | F                             | 0.013  |                       | 19   | 0                    | Yes (log)           | Yes |
| FCT03     | 0963          | 04/22/2009  | Uranium | 0.08   |                    | F    | 0.367                         |     |                               | 0.083  | F                     | 27   | 0                    | No                  | No  |

**Data Validation Outliers Report - Field Parameters Only**

Laboratory: Field Measurements

RIN: 09032198

Comparison: All Historical Data

Report Date: 6/16/2009

| Site Code | Location Code | Sample Date | Analyte                       | Result | Current Qualifiers |      | Historical Maximum Qualifiers |     | Historical Minimum Qualifiers |        | Number of Data Points |      | Normally Distributed | Statistical Outlier |     |
|-----------|---------------|-------------|-------------------------------|--------|--------------------|------|-------------------------------|-----|-------------------------------|--------|-----------------------|------|----------------------|---------------------|-----|
|           |               |             |                               |        | Lab                | Data | Result                        | Lab | Data                          | Result | Lab                   | Data |                      |                     | N   |
| FCT03     | 0709          | 04/22/2009  | Oxidation Reduction Potential | -28.5  |                    | F    | 498.2                         |     |                               | 57     |                       | 25   | 0                    | Yes (log)           | Yes |
| FCT03     | 0858          | 04/22/2009  | Oxidation Reduction Potential | -13    |                    | FQ   | 449                           |     |                               | 3      | FQ                    | 26   | 0                    | No                  | No  |
| FCT03     | 0862          | 04/22/2009  | Oxidation Reduction Potential | -124   |                    | FQ   | 435                           | F   |                               | -110   | FQ                    | 19   | 0                    | No                  | No  |
| FCT03     | 0886          | 04/22/2009  | Temperature                   | 26.87  |                    | FQ   | 26.4                          | F   |                               | 23.44  | FQ                    | 15   | 0                    | No                  | No  |
| FCT03     | 0891          | 04/22/2009  | Oxidation Reduction Potential | -107   |                    | F    | 390                           |     |                               | 34     | F                     | 15   | 0                    | Yes (log)           | Yes |
| FCT03     | 0891          | 04/22/2009  | Specific Conductance          | 23160  |                    | F    | 13251                         | F   |                               | 6623   | F                     | 15   | 0                    | Yes                 | Yes |
| FCT03     | 0921          | 04/22/2009  | Dissolved Oxygen              | 4.26   |                    | F    | 2.1                           | F   |                               | 0.06   |                       | 6    | 0                    | Yes (log)           | No  |
| FCT03     | 0921          | 04/22/2009  | Oxidation Reduction Potential | -52.3  |                    | F    | 466.2                         |     |                               | 41     | L                     | 32   | 0                    | Yes (log)           | No  |
| FCT03     | 0924          | 04/22/2009  | Dissolved Oxygen              | 3.29   |                    | F    | 0.6                           | U   |                               | 0      |                       | 6    | 1                    | Yes                 | Yes |
| FCT03     | 0924          | 04/22/2009  | Oxidation Reduction Potential | -154.2 |                    | F    | 444.7                         |     |                               | -136   |                       | 23   | 0                    | Yes                 | No  |

**Data Validation Outliers Report - Field Parameters Only**

Laboratory: Field Measurements

RIN: 09032198

Comparison: All Historical Data

Report Date: 6/16/2009

| Site Code | Location Code | Sample Date | Analyte              | Result | Current Qualifiers |      | Historical Maximum Qualifiers |     |      | Historical Minimum Qualifiers |      |      | Number of Data Points |                | Normally Distributed | Statistical Outlier |     |
|-----------|---------------|-------------|----------------------|--------|--------------------|------|-------------------------------|-----|------|-------------------------------|------|------|-----------------------|----------------|----------------------|---------------------|-----|
|           |               |             |                      |        | Lab                | Data | Result                        | Lab | Data | Result                        | Lab  | Data | N                     | N Below Detect |                      |                     |     |
| FCT03     | 0963          | 04/22/2009  | Dissolved Oxygen     | 4.15   |                    | F    | 0.1                           |     |      |                               | 0    |      |                       | 5              | 2                    | Yes (log)           | Yes |
| FCT03     | 0963          | 04/22/2009  | Specific Conductance | 8209   |                    | F    | 8062                          |     | FQ   |                               | 696  |      | F                     | 26             | 0                    | No                  | No  |
| FCT03     | 0963          | 04/22/2009  | Turbidity            | 3.7    |                    | F    | 55                            |     |      |                               | 5.21 |      | F                     | 18             | 0                    | No                  | No  |

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

**LAB QUALIFIERS:**

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

**DATA QUALIFIERS:**

- F Low flow sampling method used.
- L Less than 3 bore volumes purged prior to sampling.
- U Parameter analyzed for but was not detected.
- G Possible grout contamination, pH > 9.
- Q Qualitative result due to sampling technique.
- X Location is undefined.
- J Estimated value.
- R Unusable result.

**STATISTICAL TESTS:**

The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test  
 Outliers are identified using Dixon's Test when there are 25 or fewer data points.  
 Outliers are identified using Rosner's Test when there are 26 or more data points.  
 See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

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# **Anomalous Data Review Checksheet**

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## **Attachment 2**

# **Data Presentation**

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## **Groundwater Quality Data**

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**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0709 WELL

| Parameter                     | Units    | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L     | 04/22/2009  | N001      | 12.65 - 32.65        | 3.38   |     | F               | #  |                 |             |
| Oxidation Reduction Potential | mV       | 04/22/2009  | N001      | 12.65 - 32.65        | -28.5  |     | F               | #  |                 |             |
| pH                            | s.u.     | 04/22/2009  | N001      | 12.65 - 32.65        | 6.17   |     | F               | #  |                 |             |
| Specific Conductance          | umhos/cm | 04/22/2009  | N001      | 12.65 - 32.65        | 8998   |     | F               | #  |                 |             |
| Temperature                   | C        | 04/22/2009  | N001      | 12.65 - 32.65        | 24.88  |     | F               | #  |                 |             |
| Turbidity                     | NTU      | 04/22/2009  | N001      | 12.65 - 32.65        | 0.85   |     | F               | #  |                 |             |
| Uranium                       | mg/L     | 04/22/2009  | N001      | 12.65 - 32.65        | 0.58   |     | F               | #  | 0.000045        |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0858 WELL

| Parameter                     | Units     | Sample Date | Sample ID | Depth Range (Ft BLS) |         | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|-----------|-------------|-----------|----------------------|---------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L      | 04/22/2009  | N001      | 39.42                | - 49.42 | 2.65   |     | FQ              | #  |                 |             |
| Oxidation Reduction Potential | mV        | 04/22/2009  | N001      | 39.42                | - 49.42 | -13    |     | FQ              | #  |                 |             |
| pH                            | s.u.      | 04/22/2009  | N001      | 39.42                | - 49.42 | 6.05   |     | FQ              | #  |                 |             |
| Specific Conductance          | umhos /cm | 04/22/2009  | N001      | 39.42                | - 49.42 | 11205  |     | FQ              | #  |                 |             |
| Temperature                   | C         | 04/22/2009  | N001      | 39.42                | - 49.42 | 23.48  |     | FQ              | #  |                 |             |
| Turbidity                     | NTU       | 04/22/2009  | N001      | 39.42                | - 49.42 | 3.36   |     | FQ              | #  |                 |             |
| Uranium                       | mg/L      | 04/22/2009  | N001      | 39.42                | - 49.42 | 0.065  |     | FQ              | #  | 0.0000045       |             |
| Uranium                       | mg/L      | 04/22/2009  | N002      | 39.42                | - 49.42 | 0.065  |     | FQ              | #  | 0.0000045       |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0862 WELL

| Parameter                     | Units    | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L     | 04/22/2009  | N001      | 117.77 - 127.77      | 2.23   |     | FQ              | #  |                 |             |
| Oxidation Reduction Potential | mV       | 04/22/2009  | N001      | 117.77 - 127.77      | -124   |     | FQ              | #  |                 |             |
| pH                            | s.u.     | 04/22/2009  | N001      | 117.77 - 127.77      | 6.88   |     | FQ              | #  |                 |             |
| Specific Conductance          | umhos/cm | 04/22/2009  | N001      | 117.77 - 127.77      | 4379   |     | FQ              | #  |                 |             |
| Temperature                   | C        | 04/22/2009  | N001      | 117.77 - 127.77      | 23.97  |     | FQ              | #  |                 |             |
| Turbidity                     | NTU      | 04/22/2009  | N001      | 117.77 - 127.77      | 0.86   |     | FQ              | #  |                 |             |
| Uranium                       | mg/L     | 04/22/2009  | N001      | 117.77 - 127.77      | 0.0019 |     | FQ              | #  | 0.0000045       |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0880 WELL

| Parameter                     | Units    | Sample Date | Sample ID | Depth Range (Ft BLS) |        | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|-----------|----------------------|--------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L     | 04/22/2009  | N001      | 32.3                 | - 42.3 | 2.45   |     | F               | #  |                 |             |
| Oxidation Reduction Potential | mV       | 04/22/2009  | N001      | 32.3                 | - 42.3 | 177.3  |     | F               | #  |                 |             |
| pH                            | s.u.     | 04/22/2009  | N001      | 32.3                 | - 42.3 | 4.19   |     | F               | #  |                 |             |
| Specific Conductance          | umhos/cm | 04/22/2009  | N001      | 32.3                 | - 42.3 | 18104  |     | F               | #  |                 |             |
| Temperature                   | C        | 04/22/2009  | N001      | 32.3                 | - 42.3 | 24.36  |     | F               | #  |                 |             |
| Turbidity                     | NTU      | 04/22/2009  | N001      | 32.3                 | - 42.3 | 6.18   |     | F               | #  |                 |             |
| Uranium                       | mg/L     | 04/22/2009  | 0002      | 32.3                 | - 42.3 | 7.3    |     | F               | #  | 0.00045         |             |
| Uranium                       | mg/L     | 04/22/2009  | N001      | 32.3                 | - 42.3 | 6.8    |     | F               | #  | 0.00045         |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0886 WELL

| Parameter                     | Units     | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|-----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L      | 04/22/2009  | N001      | 19.17 - 49.17        | 2.87   |     | FQ              | #  |                 |             |
| Oxidation Reduction Potential | mV        | 04/22/2009  | N001      | 19.17 - 49.17        | 8.8    |     | FQ              | #  |                 |             |
| pH                            | s.u.      | 04/22/2009  | N001      | 19.17 - 49.17        | 5.75   |     | FQ              | #  |                 |             |
| Specific Conductance          | umhos /cm | 04/22/2009  | N001      | 19.17 - 49.17        | 3285   |     | FQ              | #  |                 |             |
| Temperature                   | C         | 04/22/2009  | N001      | 19.17 - 49.17        | 26.87  |     | FQ              | #  |                 |             |
| Turbidity                     | NTU       | 04/22/2009  | N001      | 19.17 - 49.17        | 43.1   |     | FQ              | #  |                 |             |
| Uranium                       | mg/L      | 04/22/2009  | 0001      | 19.17 - 49.17        | 0.0093 |     | FQ              | #  | 0.0000045       |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0891 WELL

| Parameter                     | Units    | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L     | 04/22/2009  | N001      | 10.74 - 20.74        | 3.58   |     | F               | #  |                 |             |
| Oxidation Reduction Potential | mV       | 04/22/2009  | N001      | 10.74 - 20.74        | -107   |     | F               | #  |                 |             |
| pH                            | s.u.     | 04/22/2009  | N001      | 10.74 - 20.74        | 6.16   |     | F               | #  |                 |             |
| Specific Conductance          | umhos/cm | 04/22/2009  | N001      | 10.74 - 20.74        | 23160  |     | F               | #  |                 |             |
| Temperature                   | C        | 04/22/2009  | N001      | 10.74 - 20.74        | 23.95  |     | F               | #  |                 |             |
| Turbidity                     | NTU      | 04/22/2009  | N001      | 10.74 - 20.74        | 7.41   |     | F               | #  |                 |             |
| Uranium                       | mg/L     | 04/22/2009  | N001      | 10.74 - 20.74        | 1.7    |     | F               | #  | 0.00022         |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0906 WELL

| Parameter                     | Units     | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|-----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L      | 04/22/2009  | N001      | 12.49 - 27.49        | 2.66   |     | F               | #  |                 |             |
| Oxidation Reduction Potential | mV        | 04/22/2009  | N001      | 12.49 - 27.49        | 35     |     | F               | #  |                 |             |
| pH                            | s.u.      | 04/22/2009  | N001      | 12.49 - 27.49        | 5.56   |     | F               | #  |                 |             |
| Specific Conductance          | umhos /cm | 04/22/2009  | N001      | 12.49 - 27.49        | 11214  |     | F               | #  |                 |             |
| Temperature                   | C         | 04/22/2009  | N001      | 12.49 - 27.49        | 23.24  |     | F               | #  |                 |             |
| Turbidity                     | NTU       | 04/22/2009  | N001      | 12.49 - 27.49        | 3.27   |     | F               | #  |                 |             |
| Uranium                       | mg/L      | 04/22/2009  | N001      | 12.49 - 27.49        | 0.08   |     | F               | #  | 0.0000045       |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0921 WELL

| Parameter                     | Units    | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L     | 04/22/2009  | N001      | 44.55 - 54.55        | 4.26   |     | F               | #  |                 |             |
| Oxidation Reduction Potential | mV       | 04/22/2009  | N001      | 44.55 - 54.55        | -52.3  |     | F               | #  |                 |             |
| pH                            | s.u.     | 04/22/2009  | N001      | 44.55 - 54.55        | 6.05   |     | F               | #  |                 |             |
| Specific Conductance          | umhos/cm | 04/22/2009  | N001      | 44.55 - 54.55        | 10553  |     | F               | #  |                 |             |
| Temperature                   | C        | 04/22/2009  | N001      | 44.55 - 54.55        | 25.15  |     | F               | #  |                 |             |
| Turbidity                     | NTU      | 04/22/2009  | N001      | 44.55 - 54.55        | 0.74   |     | F               | #  |                 |             |
| Uranium                       | mg/L     | 04/22/2009  | N001      | 44.55 - 54.55        | 1.2    |     | F               | #  | 0.00022         |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0924 WELL

| Parameter                     | Units     | Sample Date | Sample ID | Depth Range (Ft BLS) |        | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|-----------|-------------|-----------|----------------------|--------|--------|-----|-----------------|----|-----------------|-------------|
| Dissolved Oxygen              | mg/L      | 04/22/2009  | N001      | 19.7                 | - 29.7 | 3.29   |     | F               | #  |                 |             |
| Oxidation Reduction Potential | mV        | 04/22/2009  | N001      | 19.7                 | - 29.7 | -154.2 |     | F               | #  |                 |             |
| pH                            | s.u.      | 04/22/2009  | N001      | 19.7                 | - 29.7 | 6.25   |     | F               | #  |                 |             |
| Specific Conductance          | umhos /cm | 04/22/2009  | N001      | 19.7                 | - 29.7 | 11454  |     | F               | #  |                 |             |
| Temperature                   | C         | 04/22/2009  | N001      | 19.7                 | - 29.7 | 25.62  |     | F               | #  |                 |             |
| Turbidity                     | NTU       | 04/22/2009  | N001      | 19.7                 | - 29.7 | 1.29   |     | F               | #  |                 |             |
| Uranium                       | mg/L      | 04/22/2009  | N001      | 19.7                 | - 29.7 | 0.56   |     | F               | #  | 0.000045        |             |

**Groundwater Quality Data by Location (USEE100) FOR SITE FCT03, Falls City Disposal Site**

REPORT DATE: 6/16/2009

Location: 0963 WELL

| Parameter                     | Units    | Sample     |      | Depth Range |   |       | Result | Qualifiers |      |    | Detection Limit | Uncertainty |
|-------------------------------|----------|------------|------|-------------|---|-------|--------|------------|------|----|-----------------|-------------|
|                               |          | Date       | ID   | (Ft BLS)    |   |       |        | Lab        | Data | QA |                 |             |
| Dissolved Oxygen              | mg/L     | 04/22/2009 | N001 | 4.38        | - | 14.38 | 4.15   |            | F    | #  |                 |             |
| Oxidation Reduction Potential | mV       | 04/22/2009 | N001 | 4.38        | - | 14.38 | 272.9  |            | F    | #  |                 |             |
| pH                            | s.u.     | 04/22/2009 | N001 | 4.38        | - | 14.38 | 3.4    |            | F    | #  |                 |             |
| Specific Conductance          | umhos/cm | 04/22/2009 | N001 | 4.38        | - | 14.38 | 8209   |            | F    | #  |                 |             |
| Temperature                   | C        | 04/22/2009 | N001 | 4.38        | - | 14.38 | 23.98  |            | F    | #  |                 |             |
| Turbidity                     | NTU      | 04/22/2009 | N001 | 4.38        | - | 14.38 | 3.7    |            | F    | #  |                 |             |
| Uranium                       | mg/L     | 04/22/2009 | N001 | 4.38        | - | 14.38 | 0.08   |            | F    | #  | 0.0000045       |             |

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

- F Low flow sampling method used.
- G Possible grout contamination, pH > 9.
- J Estimated value.
- L Less than 3 bore volumes purged prior to sampling.
- Q Qualitative result due to sampling technique.
- R Unusable result.
- U Parameter analyzed for but was not detected.
- X Location is undefined.

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

## **Static Water Level Data**

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**STATIC WATER LEVELS (USEE700) FOR SITE FCT03, Falls City Disposal Site**  
**REPORT DATE: 6/16/2009**

| Location Code | Flow Code | Top of Casing Elevation (Ft) | Measurement Date | Measurement Time | Depth From Top of Casing (Ft) | Water Elevation (Ft) | Water Level Flag |
|---------------|-----------|------------------------------|------------------|------------------|-------------------------------|----------------------|------------------|
| 0709          | D         | 451.58                       | 04/22/2009       | 16:45:13         | 31.65                         | 419.93               |                  |
| 0858          | O         | 441.03                       | 04/22/2009       | 09:10:57         | 27.95                         | 413.08               |                  |
| 0862          | O         | 428.67                       | 04/22/2009       | 08:45:46         | 67.47                         | 361.2                |                  |
| 0880          | O         | 446.84                       | 04/22/2009       | 09:45:04         | 27.65                         | 419.19               |                  |
| 0886          | D         | 403.52                       | 04/22/2009       | 11:50:07         | 34.89                         | 368.63               |                  |
| 0891          | D         | 349.63                       | 04/22/2009       | 18:20:49         | 15.2                          | 334.43               |                  |
| 0906          | D         | 420.17                       | 04/22/2009       | 08:05:42         | 12.69                         | 407.48               |                  |
| 0921          | D         | 435.75                       | 04/22/2009       | 17:25:36         | 30.43                         | 405.32               |                  |
| 0924          | D         | 396.44                       | 04/22/2009       | 15:40:14         | 17.54                         | 378.9                |                  |
| 0963          | D         | 373.23                       | 04/22/2009       | 12:45:14         | 11.6                          | 361.63               |                  |

FLOW CODES: B BACKGROUND      C CROSS GRADIENT      D DOWN GRADIENT      F OFF SITE  
                   N UNKNOWN            O ON SITE                    U UPGRADIENT

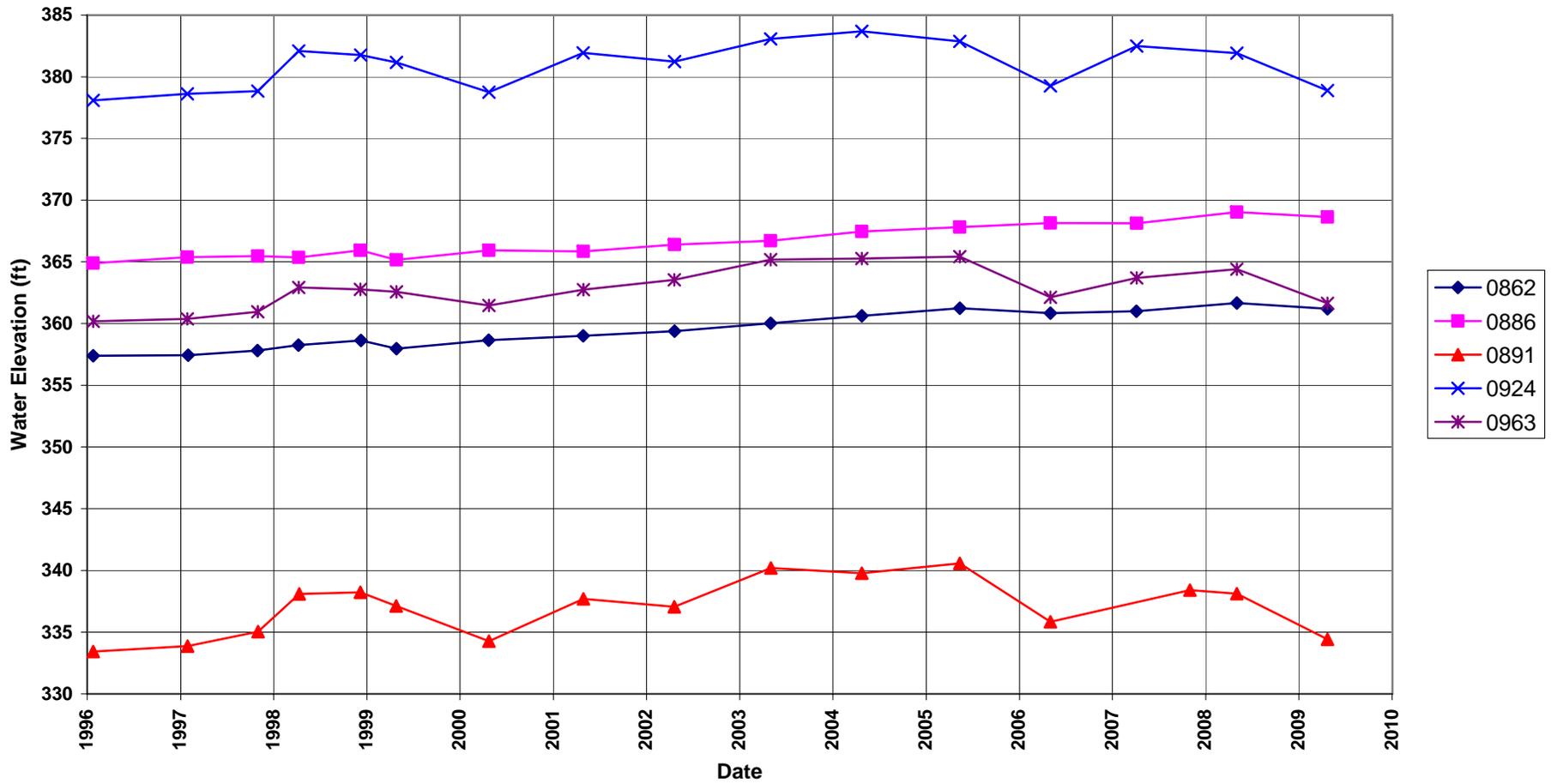
WATER LEVEL FLAGS: D Dry      F FLOWING

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# Hydrographs

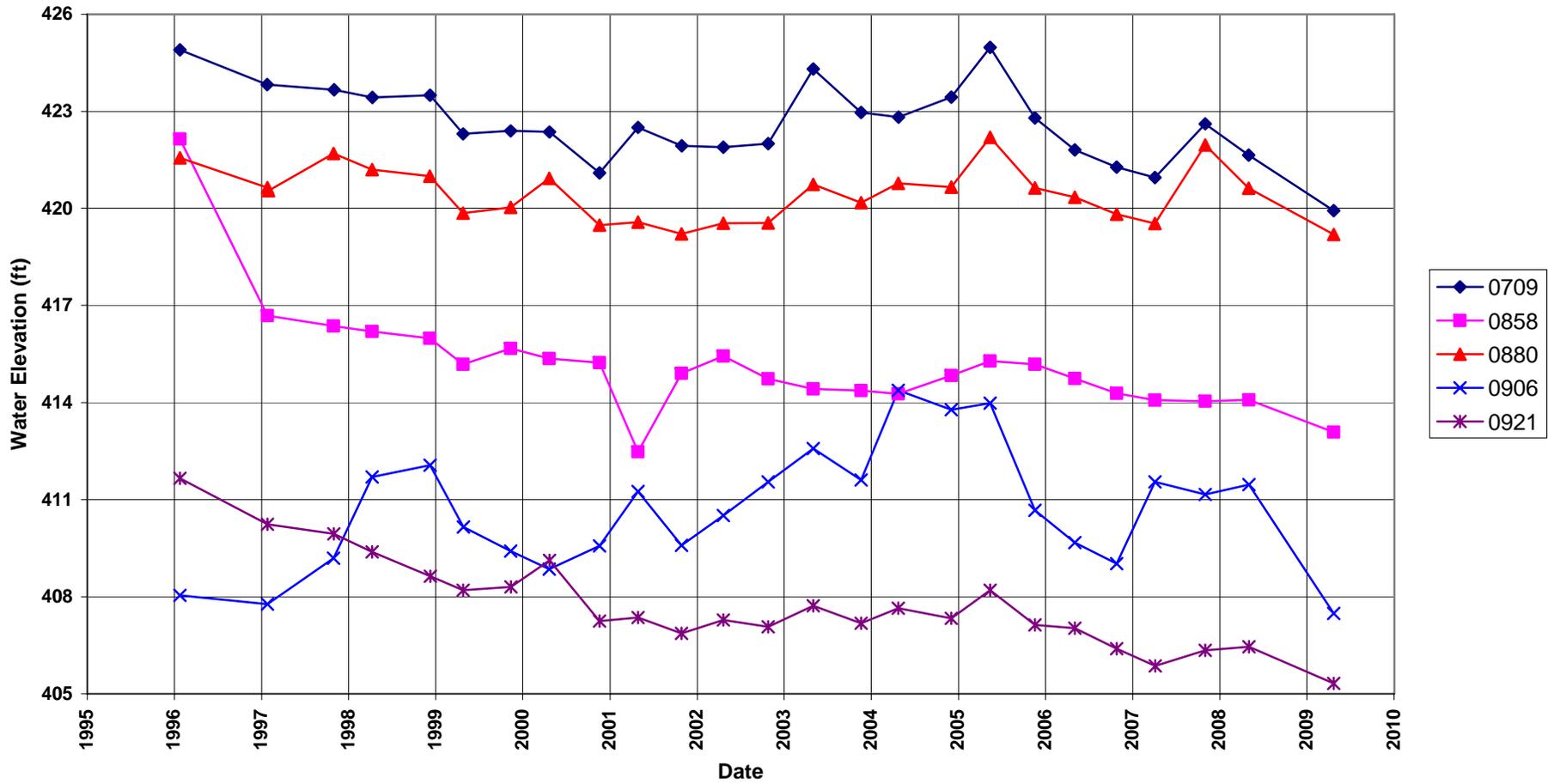
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**Falls City Disposal Site  
Hydrograph**  
Groundwater Compliance Monitoring Wells



## Falls City Disposal Site Hydrograph

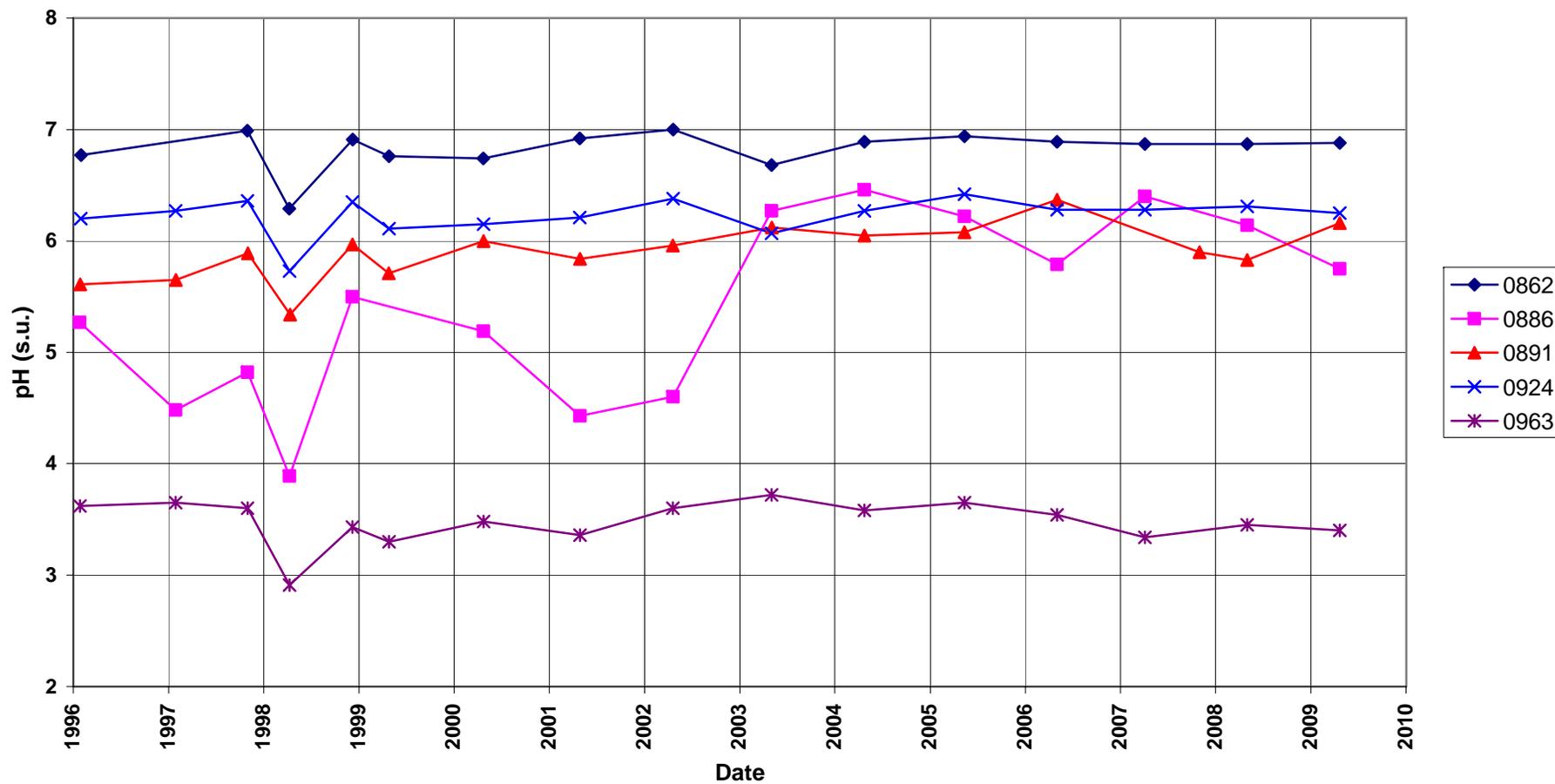
Disposal Cell Performance Monitoring Wells



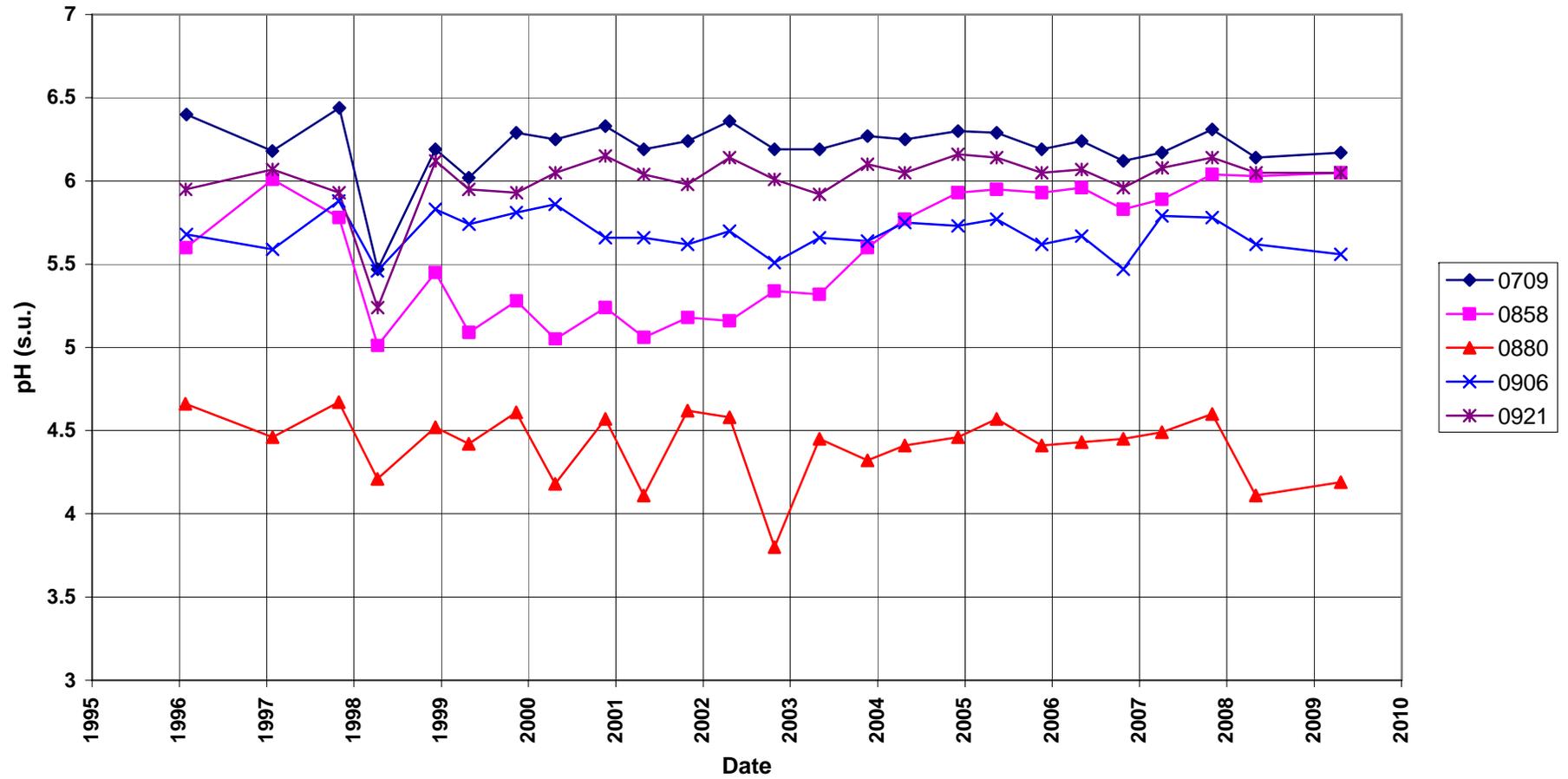
# **Time-Concentration Graphs**

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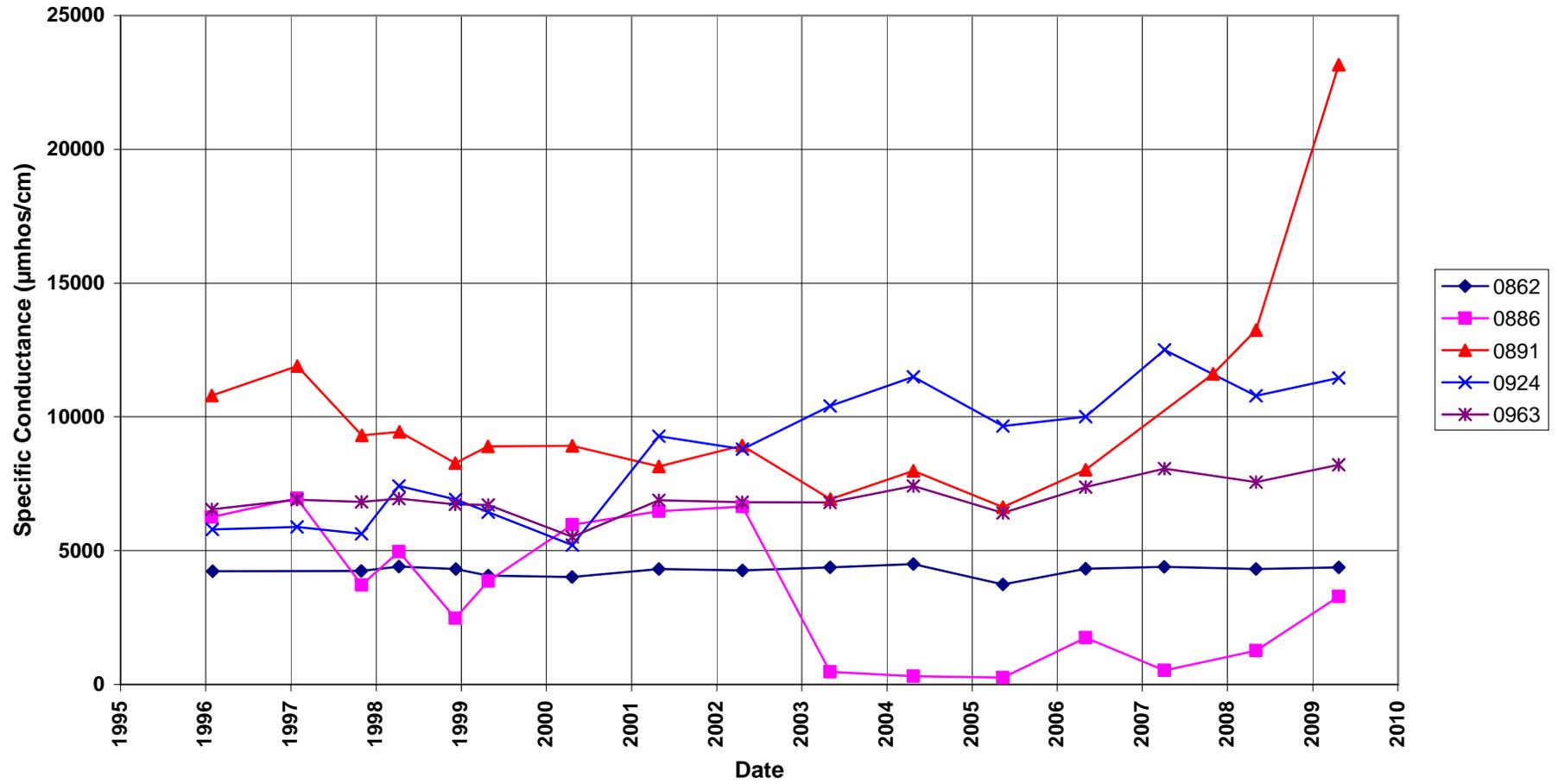
Falls City Disposal Site  
Measured pH  
Groundwater Compliance Monitoring Wells



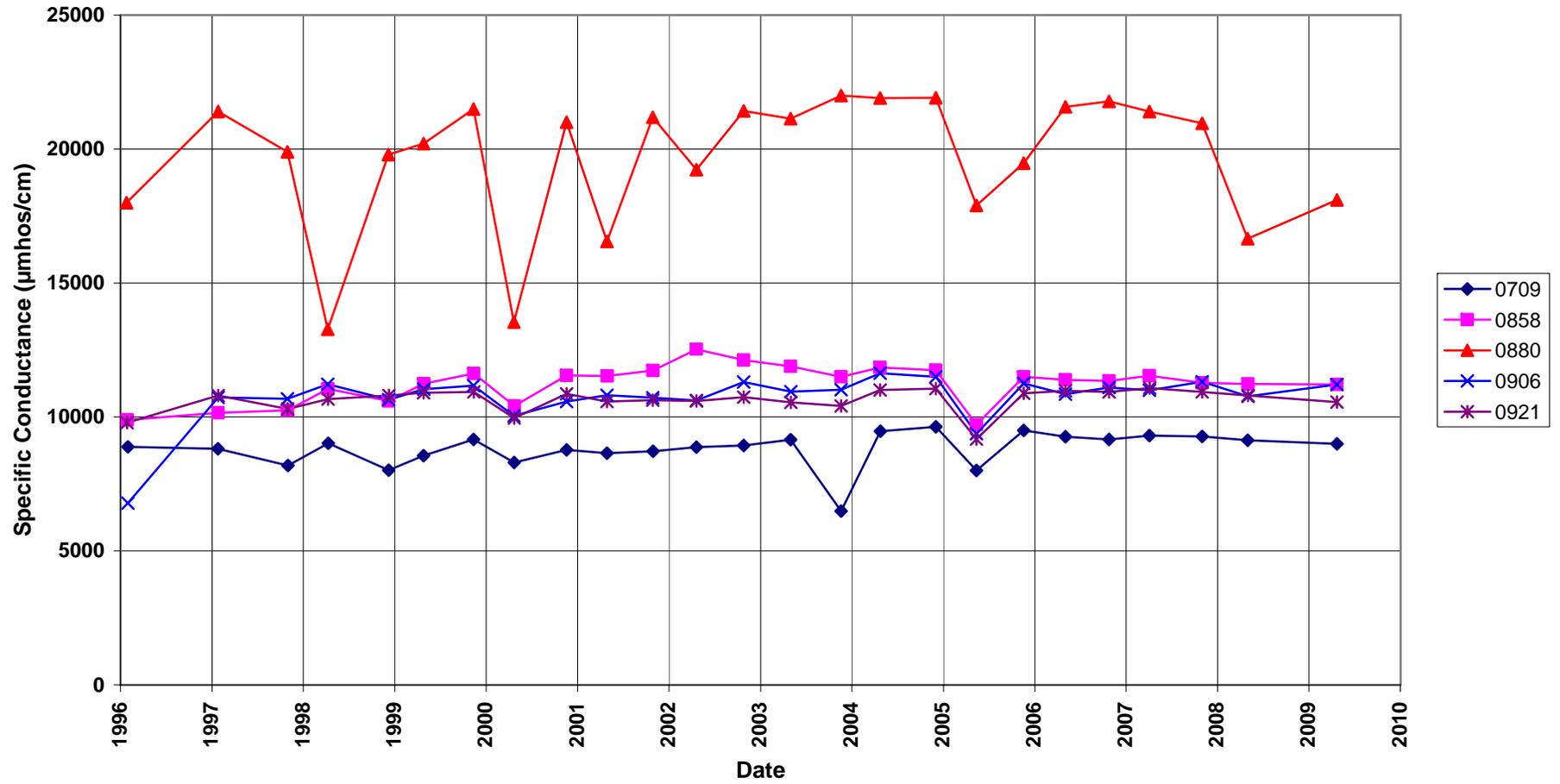
Falls City Disposal Site  
Measured pH  
Disposal Cell Performance Monitoring Wells



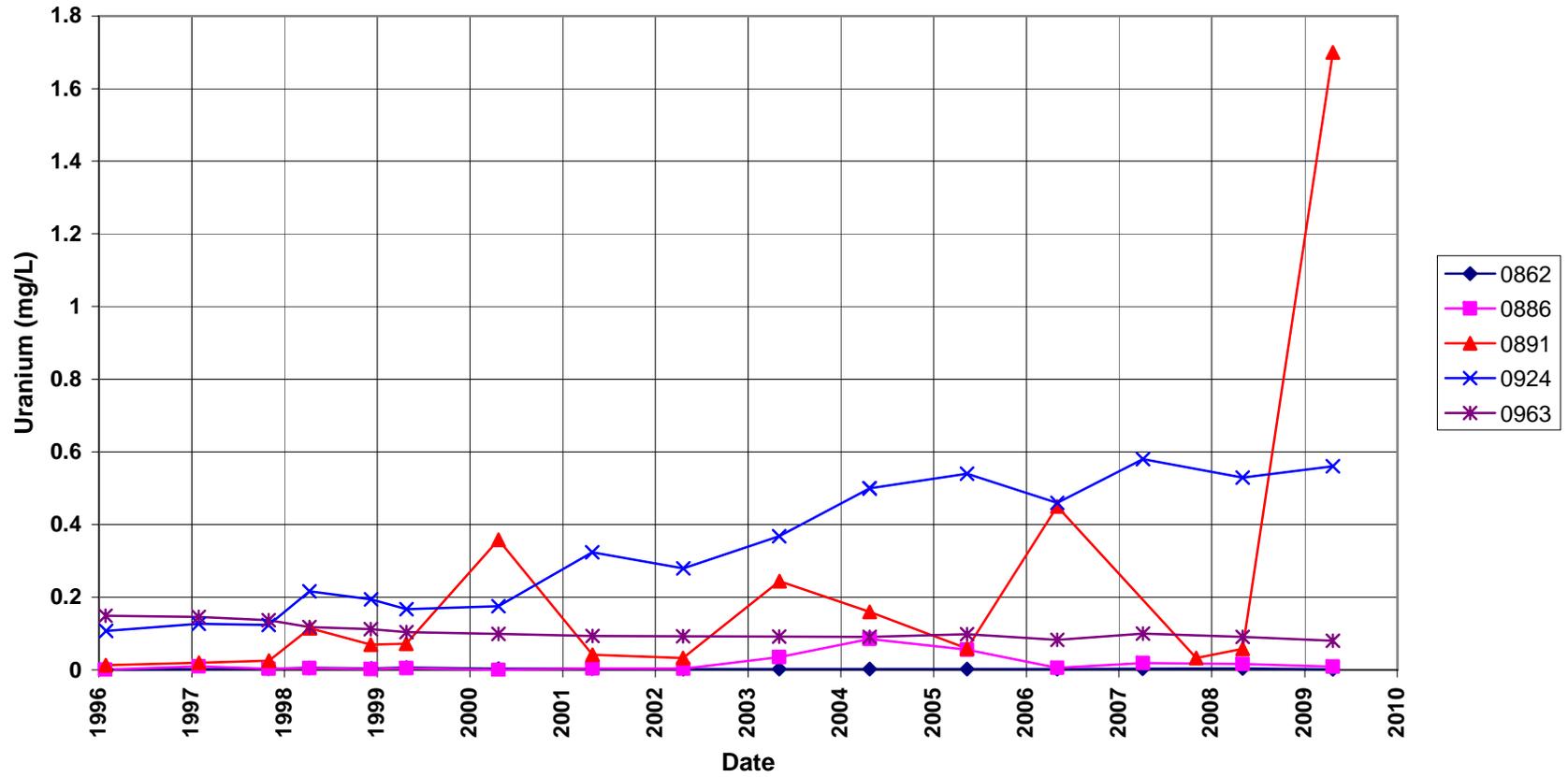
Falls City Disposal Site  
Specific Conductance  
Groundwater Compliance Monitoring Wells



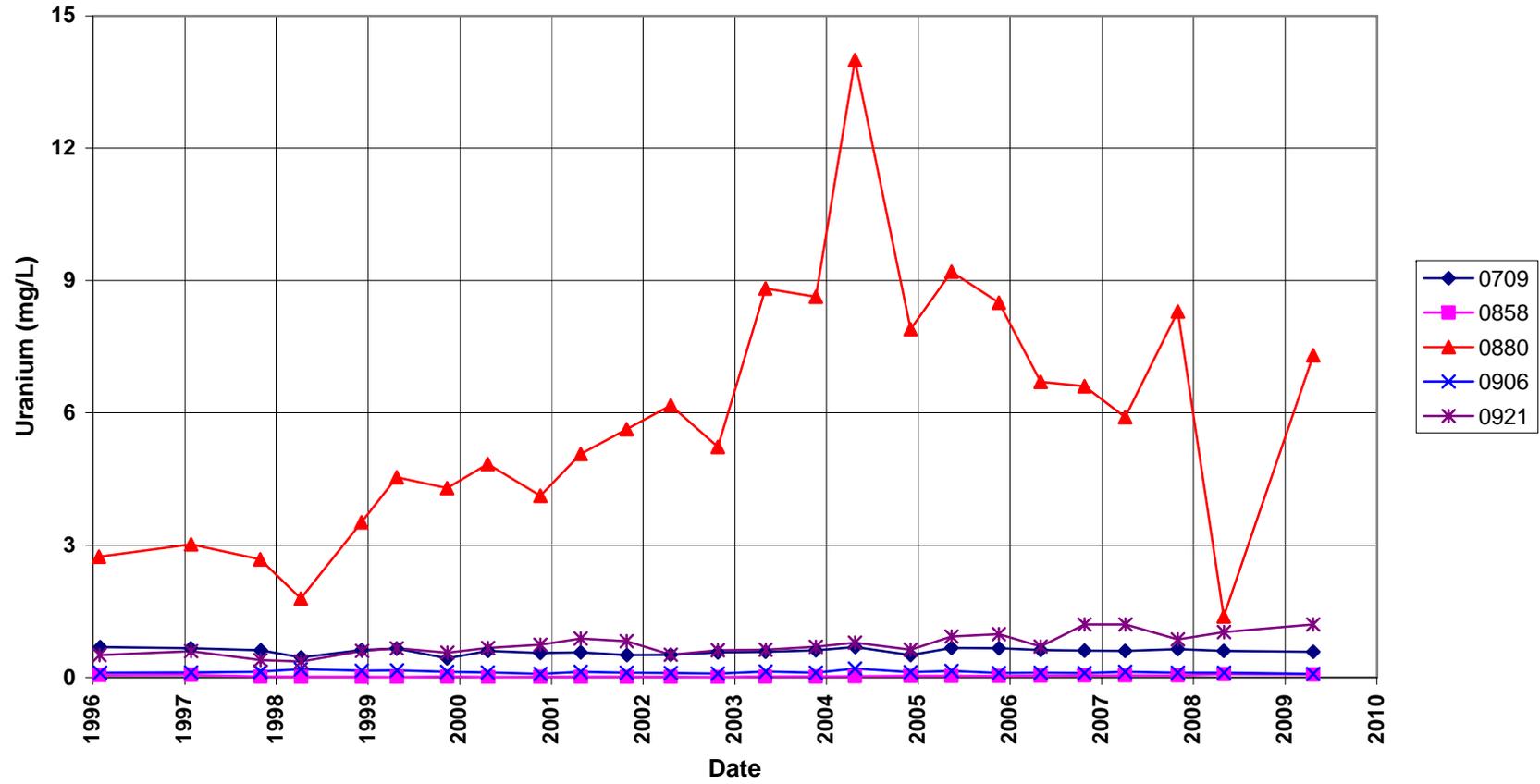
Falls City Disposal Site  
Specific Conductance  
Disposal Cell Performance Monitoring Wells



Falls City Disposal Site  
Uranium Concentration  
Groundwater Compliance Monitoring Wells



Falls City Disposal Site  
Uranium Concentration  
Disposal Cell Performance Monitoring Wells



**Attachment 3**  
**Sampling and Analysis Work Order**

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Task Order LM00-501  
Control Number 09-0621

March 18, 2009

U.S. Department of Energy  
Office of Legacy Management  
ATTN: Jalena Dayvault  
Site Manager  
2597 B ¾ Road  
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller  
April 2009 Environmental Sampling at Falls City, Texas

REFERENCE: Task Order LM00-501-02-105-402, Falls City, TX, Disposal Site

Dear Ms. Dayvault:

The purpose of this letter is to inform you of the upcoming sampling at Falls City, Texas. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring at Falls City, Texas. Water quality data will be collected from monitor wells at this site as part of the routine environmental sampling currently scheduled to begin the week of April 7, 2009.

The following list shows the monitor wells (with associated zone of completion) scheduled to be sampled during this event.

**Monitor Wells\***

|           |        |        |        |        |        |        |
|-----------|--------|--------|--------|--------|--------|--------|
| 709 Cq/Ct | 862 DI | 886 De | 906 Cq | 916 Cq | 924 Cq | 963 Cq |
| 858 Cq    | 880 De | 891 DI | 908 Cq | 921 Cq |        |        |

\*NOTE: Cq = Conquista Clay – Whitsett Formation; Ct = Claystone; De = DeWeesville Sand – Whitsett Formation

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

If you have any questions, please call me at (412) 818-7015.

Sincerely,



Digitally signed by Michele L. Miller  
DN: cn=Michele L. Miller, o=us, ou=department of energy,  
public key (rsa)  
Date: 2009.03.19 10:54:14 -0400

Michele Miller  
Project Manager

Jalena Dayvault  
Control Number 09-0621  
Page 2

MM/lcg/lb

Enclosures (3)

cc: (electronic)  
Cheri Bahrke, Stoller  
Steve Donovan, Stoller  
Bev Gallagher, Stoller  
Lauren Goodknight, Stoller  
EDD Delivery  
rc-grand.junction

### Constituent Sampling Breakdown

| Site                               | Falls City  |                  | Required<br>Detection<br>Limit (mg/L) | Analytical Method | Line Item<br>Code |
|------------------------------------|-------------|------------------|---------------------------------------|-------------------|-------------------|
| Analyte                            | Groundwater | Surface<br>Water |                                       |                   |                   |
| Approx. No. Samples/yr             | 12          | 0                |                                       |                   |                   |
| <i>Field Measurements</i>          |             |                  |                                       |                   |                   |
| Alkalinity                         |             |                  |                                       |                   |                   |
| Dissolved Oxygen                   | X           |                  |                                       |                   |                   |
| Redox Potential                    | X           |                  |                                       |                   |                   |
| pH                                 | X           |                  |                                       |                   |                   |
| Specific Conductance               | X           |                  |                                       |                   |                   |
| Turbidity                          | X           |                  |                                       |                   |                   |
| Temperature                        | X           |                  |                                       |                   |                   |
| <i>Laboratory Measurements</i>     |             |                  |                                       |                   |                   |
| Aluminum                           |             |                  |                                       |                   |                   |
| Ammonia as N (NH3-N)               |             |                  |                                       |                   |                   |
| Calcium                            |             |                  |                                       |                   |                   |
| Chloride                           |             |                  |                                       |                   |                   |
| Chromium                           |             |                  |                                       |                   |                   |
| Gross Alpha                        |             |                  |                                       |                   |                   |
| Gross Beta                         |             |                  |                                       |                   |                   |
| Iron                               |             |                  |                                       |                   |                   |
| Lead                               |             |                  |                                       |                   |                   |
| Magnesium                          |             |                  |                                       |                   |                   |
| Manganese                          |             |                  |                                       |                   |                   |
| Molybdenum                         |             |                  |                                       |                   |                   |
| Nickel                             |             |                  |                                       |                   |                   |
| Nickel-63                          |             |                  |                                       |                   |                   |
| Nitrate + Nitrite as N (NO3+NO2)-N |             |                  |                                       |                   |                   |
| Potassium                          |             |                  |                                       |                   |                   |
| Radium-226                         |             |                  |                                       |                   |                   |
| Radium-228                         |             |                  |                                       |                   |                   |
| Selenium                           |             |                  |                                       |                   |                   |
| Silica                             |             |                  |                                       |                   |                   |
| Sodium                             |             |                  |                                       |                   |                   |
| Strontium                          |             |                  |                                       |                   |                   |
| Sulfate                            |             |                  |                                       |                   |                   |
| Sulfide                            |             |                  |                                       |                   |                   |
| Total Dissolved Solids             |             |                  |                                       |                   |                   |
| Total Organic Carbon               |             |                  |                                       |                   |                   |
| Uranium                            | X           |                  | 0.0001                                | SW-846 6020       | LMM-02            |
| Vanadium                           |             |                  |                                       |                   |                   |
| Zinc                               |             |                  |                                       |                   |                   |
| <b>Total No. of Analytes</b>       | 1           | 0                |                                       |                   |                   |

Note: All analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

**Sampling Frequencies for Locations at  
Falls City, Texas**

| Location ID          | Quarterly | Semiannually | Annually | Biennially | Not Sampled | Notes                                  |
|----------------------|-----------|--------------|----------|------------|-------------|--|
| <b>Monitor Wells</b> |           |              |          |            |             |  |
| 709                  |           |              | X        |            |             |  |
| 858                  |           |              | X        |            |             |  |
| 862                  |           |              | X        |            |             |  |
| 880                  |           |              | X        |            |             | Ken B. wants a duplicate of this well. |
| 886                  |           |              | X        |            |             |  |
| 891                  |           |              | X        |            |             | Download data logger                   |
| 906                  |           |              | X        |            |             | Download data logger                   |
| 908                  |           |              | X        |            |             |  |
| 916                  |           |              | X        |            |             |  |
| 921                  |           |              | X        |            |             |  |
| 924                  |           |              | X        |            |             | Download data logger                   |
| 963                  |           |              | X        |            |             | Download data logger                   |

Annual sampling conducted in April  
Based on LTSP dated March 2008

# **Attachment 4**

## **Trip Report**

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## Memorandum

Control Number N/A

DATE: April 28, 2009  
 TO: Michele Miller  
 FROM: Kent Moe  
 SUBJECT: Sampling Trip Report

**Site:** Falls City, Texas

**Dates of Sampling Event:** April 20-24, 2009

**Team Members:** Joe Trevino and Kent Moe.

**Number of Locations Sampled:** 10 monitor wells, and 2 duplicate samples, for a total of 12 samples. No equipment blanks were required.

**Locations Not Sampled/Reason:** Monitor wells 0908 and 0916 were dry.

### Location Specific Information:

| Ticket Number | Location | Sample Date | Description                     |
|---------------|----------|-------------|---------------------------------|
| HEU 957       | 0709     | 4/22/2009   | Cat I                           |
| HEU 958       | 0858     | 4/22/2009   | Cat II                          |
| HEU 967       | 0862     | 4/22/2009   | Cat II                          |
| HEU 959       | 0880     | 4/22/2009   | Cat I                           |
| HEU 960       | 0886     | 4/22/2009   | Cat I                           |
| HEU 965       | 0891     | 4/22/2009   | Cat I                           |
| HEU 961       | 0906     | 4/22/2009   | Cat I                           |
| -             | 0908     | -           | Well Dry                        |
| -             | 0916     | -           | Well Dry                        |
| HEU 962       | 0921     | 4/22/2009   | Cat I                           |
| HEU 963       | 0924     | 4/22/2009   | Cat I                           |
| HEU 964       | 0963     | 4/22/2009   | Cat I ( May need Cat II status) |

**Quality Control Sample Cross Reference:** The following are the false identifications assigned to the quality control sample:

| False ID | True ID | Sample Type | Associated Matrix | Ticket Number |
|----------|---------|-------------|-------------------|---------------|
| 2596     | 0880    | Duplicate   | Groundwater       | HEU 966       |
| 2743     | 0858    | Duplicate   | Groundwater       | HEU 970       |

**Field Variance:** Turbidity did not stabilize or drop below 10 NTU's at well 0886; the sample was filtered. Also, well 0886 may need Category II status because the water level would not stabilize. Duplicate on well 0880 was also filtered.

**Requisition Numbers Assigned:** All samples were assigned to RIN 09032198.

**Sample Shipment:** Samples were shipped to ALS Paragon in Fort Collins, CO, from Grand Junction on April 27, 2009.

**Water Level Measurements:** Water level measurements were collected at all sampled wells. Water level data are provided in the table below. These data represent depth to water (ft btoc) measurements:

| Well | Date      | Depth to water (ft.) |
|------|-----------|----------------------|
| 0709 | 4/22/2009 | 31.65                |
| 0858 | 4/22/2009 | 27.95                |
| 0862 | 4/22/2009 | 67.47                |
| 0880 | 4/22/2009 | 27.65                |
| 0886 | 4/22/2009 | 34.89                |
| 0891 | 4/22/2009 | 15.20                |
| 0906 | 4/22/2009 | 12.69                |
| 0908 | 4/22/2009 | Dry                  |
| 0916 | 4/22/2009 | Dry                  |
| 0921 | 4/22/2009 | 30.43                |
| 0924 | 4/22/2009 | 17.54                |
| 0963 | 4/22/2009 | 11.60                |

**Well Inspection Summary:** Well inspections were conducted at all sampled wells; all wells were in good condition.

**Equipment:** The ten wells sampled were equipped with dedicated submersible pumps. Each well was sampled using low-flow techniques.

**Institutional Controls:** All gates accessed during the sampling event were appropriately closed and locked.

**Fences, Gates, Locks:** OK

**Signs:** OK

**Trespassing/Site Disturbances:** None observed.

#### Site Issues

**Disposal Cell/Drainage Structure Integrity:** Looked OK

**Vegetation/Noxious Weed Concerns:** N/A

**Maintenance Requirements:** None

**Corrective Action Taken:** None.

(KLM/lcg)

cc: (electronic)

Jalena Dayvault, DOE

Cheri Bahrke, Stoller

Steve Donivan, Stoller

EDD Delivery

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