

Data Validation Package

April 2011
Groundwater Sampling at the
Falls City, Texas, Disposal Site

June 2011



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Falls City, Texas, Disposal Site

Sampling Period: April 6, 2011

Ten groundwater samples were collected at the Falls City, Texas, Disposal Site as specified in the March 2008 *Long-Term Surveillance Plan for the U.S. Department of Energy Falls City Uranium Mill Tailings Disposal Site Falls City, Texas*.

Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites (LMS/PLN/S04351, continually updated)*.

The wells sampled included the cell performance monitoring wells (0709, 0858, 0880, 0906, and 0921) and the groundwater monitoring wells (0862, 0886, 0891, 0924, and 0963). A duplicate sample was collected from location 0891.

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. The water level has been trending lower at four wells (0709, 0858, 0880, and 0921) adjacent to the cell since 1996.

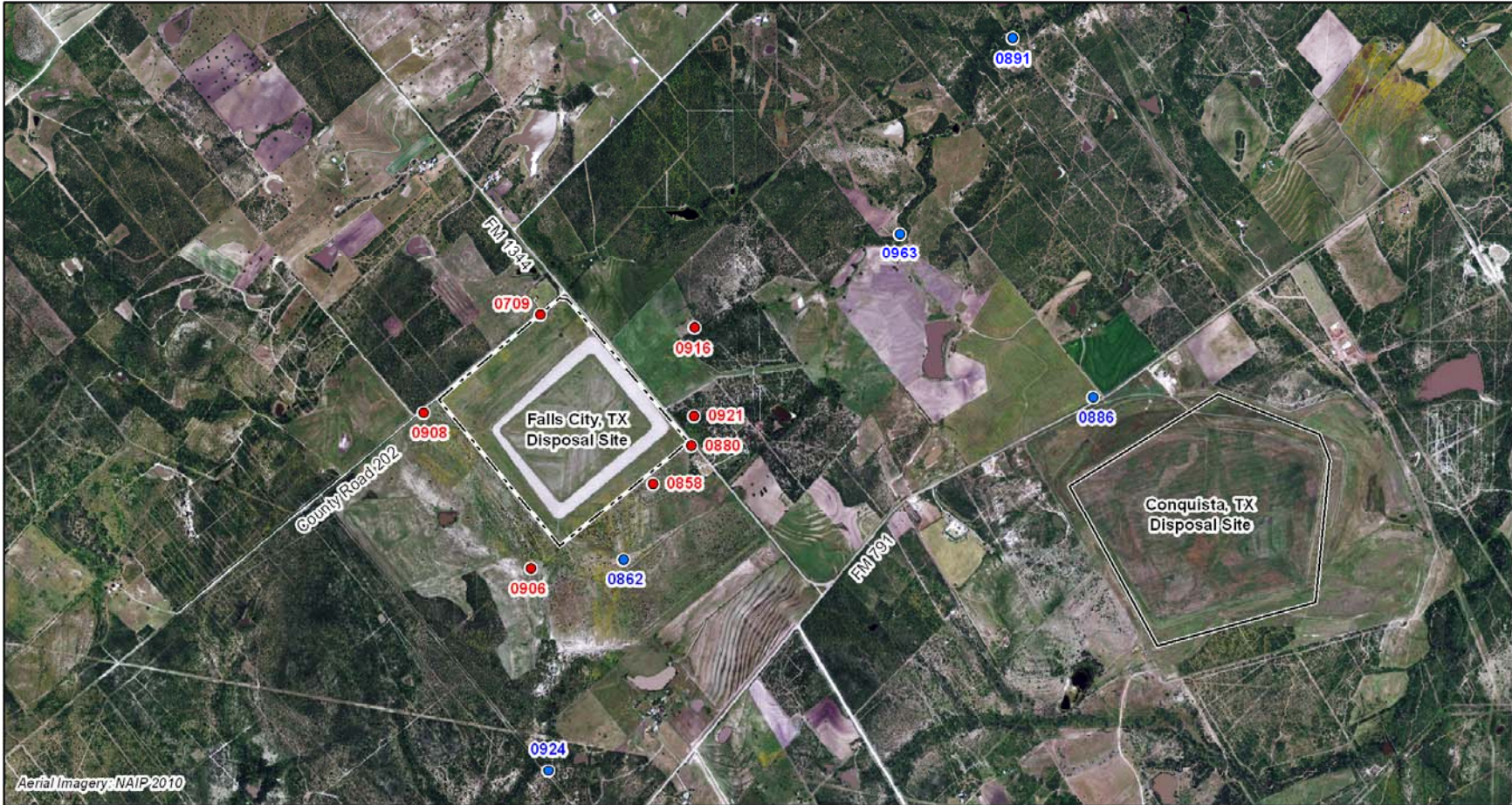
The time-concentration graphs included in this report show that analyte concentrations have increased significantly in well 0891 since 2006. The historical high concentration of uranium in this well of 2.9 milligrams per liter was obtained this sampling event. No other significant uranium concentration changes were observed in the other wells sampled.



Michele L. Miller
Project Manager, SM Stoller Corporation - Contractor
for Department of Energy Office of Legacy Management
2011.09.20 09:09:06 -04'00'

Michele Miller
Site Lead, S.M. Stoller Corporation

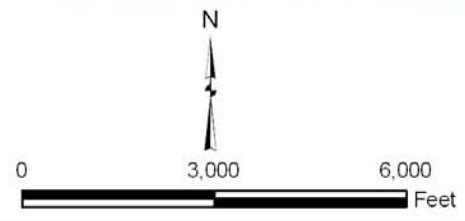
Date



Aerial Imagery: NAIP 2010

Legend

- 0906 Cell Performance Network Monitoring Well and Identifier
- 0924 Groundwater Compliance Network Monitoring Well and Identifier



U.S. DEPARTMENT OF ENERGY
 GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
 Under DOE Contract
 No. DE-AM01-07-LM00050

**Monitoring Well Locations
 Falls City, TX, Disposal Site**

DATE PREPARED:
June 14, 2011

FILENAME:
S0789700

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Falls City, Texas, Monitoring Well Location Map

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

| | | | |
|--------------------------------|--------------------------|----------------------------------|----------------------|
| Project | <u>Falls City, Texas</u> | Date(s) of Water Sampling | <u>April 6, 2011</u> |
| Date(s) of Verification | <u>May 13, 2011</u> | Name of Verifier | <u>Steve Donovan</u> |

| | Response (Yes, No, NA) | Comments |
|---|---|---|
| 1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions. | <u>Yes</u> | <u>Work Order Letter dated March 10, 2011.</u> |
| 2. Were the sampling locations specified in the planning documents sampled? | <u>Yes</u> | <u>Locations 0908 and 0916 were dry.</u> |
| 3. Was a pre-trip calibration conducted as specified in the above-named documents? | <u>Yes</u> | <u>Pre-trip calibration was performed on April 1, 2011.</u> |
| 4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria? | <u>Yes</u> <u>Yes</u> | |
| 5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified? | <u>Yes</u> | |
| 6. Was the category of the well documented? | <u>Yes</u> | |
| 7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4-hour delay between pump installation and sampling? | <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>NA</u> | |

Water Sampling Field Activities Verification Checklist (continued)

| | Response (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 | A duplicate sample was collected from well 0891. |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | NA | Dedicated equipment was used at all locations. |
| 11. Were trip blanks prepared and included with each shipment of VOC samples? | NA | |
| 12. Were QC samples assigned a fictitious site identification number? Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report? | Yes | |
| Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report? | Yes | Location ID 2913 was used for the duplicate sample. |
| 13. Were samples collected in the containers specified? | Yes | |
| 14. Were samples filtered and preserved as specified? | Yes | |
| 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 (FDCS)? | 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? | Yes | |
| 20. Were water levels measured at the locations specified in the planning documents? | Yes | |

Laboratory Performance Assessment

General Information

Report Number (RIN): 11033683
Sample Event: April 6, 2011
Site(s): Falls City, Texas
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1104132
Analysis: Metals and Wet Chemistry
Validator: Steve Donovan
Review Date: May 13, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), "Standard Practice for Validation of Laboratory Data." 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 |
|---------------------------|----------------|--------------|-------------------|
| Ammonia as N | WCH-A-005 | EPA 350.1 | EPA 350.1 |
| Chloride | MIS-A-039 | SW-846 9056 | SW-846 9056 |
| Metals: Ca, Fe, K, Mg, Na | LMM-01 | SW-846 3005A | SW-846 6010B |
| Nitrite + Nitrate as N | WCH-A-022 | EPA 353.2 | EPA 353.2 |
| Sulfate | MIS-A-044 | SW-846 9056 | SW-846 9056 |
| Uranium | LMM-02 | SW-846 3005A | SW-846 6020A |

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 11 water samples on April 13, 2011, accompanied by a Chain of Custody form. The Chain of Custody form was checked to confirm that the sample was listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents had no errors or omissions with the following exception. There was no relinquishment signature on the form. Copies of the air waybill labels were included with the receiving documentation.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 1.1 °C, which complies with requirements. The samples were received in the correct container types and had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

Data Qualifier Summary

Analytical results were qualified as listed in Table 2. Refer to the sections below for an explanation of the data qualifiers applied.

Table 2. Data Qualifier Summary

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---------------|----------------|------------|------|--------------------------------|
| 1104132-3 | 0862 | Potassium | J | Serial dilution failure |
| 1104132-6 | 0891 | Potassium | J | Serial dilution failure |
| 1104132-6 | 0891 | Iron | J | Poor field duplicate precision |
| 1104132-11 | 0891 Duplicate | Potassium | J | Serial dilution failure |
| 1104132-11 | 0891 Duplicate | Iron | J | Poor field duplicate precision |

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. All calibration and laboratory spike standards were prepared from independent sources.

Method MCAWW 350.1

Calibration was performed for ammonia as N on April 18, 2011, using six calibration standards. The calibration curve correlation coefficient value was greater than 0.995 and the absolute value of the intercept was less than 3 times the method detection limit (MDL). Initial and continuing calibration verification checks were made at the required frequency resulting in five verification checks. All calibration checks met the acceptance criteria.

Method MCAWW 353.2

Calibration was performed for nitrate + nitrite as N on April 15, 2011, using seven calibration standards. The calibration curve correlation coefficient value was greater than 0.995 and the absolute value of the intercept was less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in five verification checks. All calibration checks met the acceptance criteria.

Method SW-846 6010B

Calibrations for calcium, iron, magnesium, potassium, and sodium were performed on April 15 and 21, 2011. The initial calibrations were performed using eight calibration standards resulting in calibration curves with correlation coefficient values greater than 0.995. The absolute value of the curve intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 19 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit (PQL) and all results were within the acceptance range.

Method SW-846 6020A, Uranium

Calibration was performed for uranium on April 15, 2011. The initial calibration was performed using four 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 MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in eight verification 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 PQL. All check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method SW-846 9056

Calibrations were performed for chloride and sulfate on March 24, 2011, using five calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 11 verification checks. All calibration checks met the acceptance criteria.

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 PQLs.

Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples A and AB were analyzed at the required frequency to verify the interelement and background correction factors for all inductively coupled plasma instruments. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD 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

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. The replicate results met these criteria demonstrating 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 samples 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 all metals. The acceptance criteria were met for all analytes with the exception of potassium. The sample potassium results are qualified with a “J” flag as estimated values.

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 both analytes.

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 April 29, 2011. 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 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.

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with (be equal to) the total cations when expressed in milliequivalents per liter. Table 3 shows the total anion and cation results for locations 0862 and 0891 as well as the charge balance, which is a relative percent difference calculation. Typically, a charge balance difference of 10 percent is considered acceptable. The charge balance value was below 10 percent at all locations indicating acceptable performance.

Table 3. Cation/Anion Balance

| Location | Cations (meq/L) | Anions (meq/L) | Charge Balance (%) |
|-----------------|------------------------|-----------------------|---------------------------|
| 0862 | 46.51 | 50.22 | 3.83 |
| 0891 | 295.71 | 329.48 | 5.40 |

meq/L = milliequivalents per liter

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 11033683 Lab Code: PAR Validator: Steve Donovan Validation Date: 5/13/2011
Project: Falls City Analysis Type: Metals General Chem Rad Organics
of Samples: 11 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 was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM
Metals Data Validation Worksheet

RIN: 11033683 Lab Code: PAR Date Due: 5/11/2011
 Matrix: Water Site Code: FCT Date Completed: 5/3/2011

| Analyte | Method Type | Date Analyzed | CALIBRATION | | | | | | | Method Blank | LCS %R | MS %R | MSD %R | Dup. RPD | ICSAB %R | Serial Dil. %R | CRI %R |
|-----------|-------------|---------------|-------------|--------|-----|-----|-----|-----|----|--------------|--------|-------|--------|----------|----------|----------------|--------|
| | | | Int. | R^2 | ICV | CCV | ICB | CCB | | | | | | | | | |
| Calcium | ICP/ES | 04/15/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 102.0 | | | 4.0 | 105.0 | 5.0 | 106.0 | |
| Calcium | ICP/ES | 04/21/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 100.0 | | | 2.0 | 102.0 | | 100.0 | |
| Iron | ICP/ES | 04/15/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 97.0 | | | | 108.0 | | 103.0 | |
| Iron | ICP/ES | 04/21/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 88.0 | 83.0 | 85.0 | 2.0 | 109.0 | | 90.0 | |
| Magnesium | ICP/ES | 04/15/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 100.0 | | | 3.0 | 104.0 | 8.0 | 103.0 | |
| Magnesium | ICP/ES | 04/21/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 97.0 | 86.0 | 87.0 | 1.0 | 106.0 | | 101.0 | |
| Potassium | ICP/ES | 04/15/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 99.0 | | | 2.0 | | 18.0 | 77.0 | |
| Potassium | ICP/ES | 04/21/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 93.0 | 111.0 | 109.0 | 1.0 | | | 75.0 | |
| Sodium | ICP/ES | 04/15/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 99.0 | | | 3.0 | | | 81.0 | |
| Sodium | ICP/ES | 04/21/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 95.0 | | | 1.0 | | 9.0 | 79.0 | |
| Uranium | ICP/MS | 04/15/2011 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 108.0 | 112.0 | 105.0 | 4.0 | 100.0 | 5.0 | 100.0 | |
| Uranium | ICP/MS | 04/15/2011 | | | | | | | | | | | 2.0 | | | 110.0 | |

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 11033683 Lab Code: PAR Date Due: 5/11/2011
 Matrix: Water Site Code: FCT Date Completed: 5/3/2011

| Analyte | Date Analyzed | CALIBRATION | | | | | | Method Blank | LCS %R | MS %R | MSD %R | DUP RPD | Serial Dil. %R |
|----------------------|---------------|-------------|--------|-----|-----|-----|-----|-----------------|-----------|----------|-----------|------------|-------------------|
| | | Int. | R^2 | ICV | CCV | ICB | CCB | | | | | | |
| AMMONIA AS N | 04/18/2011 | 0.000 | 1.0000 | OK | OK | OK | OK | OK | 101.00 | 80.0 | 82.0 | 3.00 | |
| CHLORIDE | 04/14/2011 | 0.000 | 1.0000 | OK | OK | OK | OK | OK | 100.00 | | | | |
| CHLORIDE | 04/15/2011 | | | OK | OK | OK | OK | | | 90.0 | 88.0 | 0 | |
| Nitrate+Nitrite as N | 04/15/2011 | 0.000 | 0.9996 | OK | OK | OK | OK | OK | 103.00 | 106.0 | 107.0 | 1.00 | |
| SULFATE | 04/14/2011 | 0.000 | 1.0000 | OK | OK | OK | OK | OK | 97.00 | | | | |
| SULFATE | 04/15/2011 | | | OK | OK | OK | OK | | | 104.0 | 104.0 | 0 | |

Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring 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, 0862, and 0886 were qualified with a “Q” flag in the database indicating the data are considered qualitative because the wells were sampled using Category II criteria. Well 0886 had a turbidity value greater than ten NTUs. The sample from this well was filtered.

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. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location 0891. The duplicate results met these criteria, demonstrating acceptable overall precision for all analytes with the exception of iron. The iron results for the sample and duplicate are qualified with a “J” flag as estimated values.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

Page 1 of 1

RIN: 11033683 Lab Code: PAR Project: Falls City Validation Date: 5/13/2011

Duplicate: 2913

Sample: 0891

| Analyte | Sample | | | | Duplicate | | | | RPD | RER | Units |
|----------------------|---------|------|-------|----------|-----------|------|-------|----------|-------|-----|-------|
| | Result | Flag | Error | Dilution | Result | Flag | Error | Dilution | | | |
| AMMONIA AS N | 0.1 | U | | 1 | 0.1 | U | | 1 | | | MG/L |
| Calcium | 2500000 | | | 10 | 2500000 | | | 10 | 0 | | UG/L |
| CHLORIDE | 10000 | | | 1000 | 10000 | | | 1000 | 0 | | MG/L |
| Iron | 240 | | | 1 | 330 | | | 1 | 31.58 | | UG/L |
| Magnesium | 240000 | | | 1 | 240000 | | | 1 | 0 | | UG/L |
| Nitrate+Nitrite as N | 0.1 | | | 1 | 0.1 | | | 1 | 0 | | MG/L |
| Potassium | 130000 | | | 1 | 130000 | | | 1 | 0 | | UG/L |
| Sodium | 3400000 | | | 100 | 3400000 | | | 100 | 0 | | UG/L |
| SULFATE | 1900 | | | 500 | 1900 | | | 500 | 0 | | MG/L |
| Uranium | 2900 | | | 200 | 2800 | | | 200 | 3.51 | | 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* 2011.06.15
07:00:40 -06'00'
Steve Donivan Date

Data Validation Lead: *Steve Donivan* 2011.06.15
07:01:04 -06'00'
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.

There were no potential outliers identified, and the data for this event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 11033683

Report Date: 5/26/2011

| Site Code | Location Code | Sample ID | Sample Date | Analyte | Current | | Historical Maximum | | | Historical Minimum | | | Number of Data Points | | Statistical Outlier |
|-----------|---------------|-----------|-------------|-----------|---------|------------------------|--------------------|------------------------|--------|------------------------|----|----------------|-----------------------|--|---------------------|
| | | | | | Result | Qualifiers Lab Data | Result | Qualifiers Lab Data | Result | Qualifiers Lab Data | N | N Below Detect | | | |
| FCT03 | 0891 | N001 | 04/06/2011 | Potassium | 130 | FJ | 110 | FJ | 45.2 | F | 20 | 0 | No | | |
| FCT03 | 0891 | N001 | 04/06/2011 | Sodium | 3400 | F | 2800 | F | 730 | F | 20 | 0 | No | | |
| FCT03 | 0891 | N001 | 04/06/2011 | Uranium | 2.9 | F | 2.1 | F | 0.013 | | 22 | 0 | No | | |
| FCT03 | 0906 | N001 | 04/06/2011 | Uranium | 0.00032 | F | 0.395 | F | 0.07 | | 41 | 0 | No | | |
| FCT03 | 0921 | N001 | 04/06/2011 | Uranium | 1.4 | F | 1.2 | F | 0.043 | | 52 | 0 | No | | |
| FCT03 | 0963 | N001 | 04/06/2011 | Uranium | 0.076 | F | 0.367 | | 0.08 | F | 29 | 0 | No | | |

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.

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: 5/26/2011

Location: 0709 WELL

| Parameter | Units | Sample | | Depth Range (Ft BLS) | Result | Lab | Qualifiers | | Detection Limit | Uncertainty |
|-------------------------------|----------|------------|------|-------------------------|--------|-----|------------|----|--------------------|-------------|
| | | Date | ID | | | | Data | QA | | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 12.65 - 32.65 | 5.13 | | F | # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 12.65 - 32.65 | 154.9 | | F | # | | |
| pH | s.u. | 04/06/2011 | N001 | 12.65 - 32.65 | 6.19 | | F | # | | |
| Specific Conductance | umhos/cm | 04/06/2011 | N001 | 12.65 - 32.65 | 8923 | | F | # | | |
| Temperature | C | 04/06/2011 | N001 | 12.65 - 32.65 | 25.55 | | F | # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 12.65 - 32.65 | 0.59 | | F | # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 12.65 - 32.65 | 0.51 | | F | # | 0.00015 | |

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

REPORT DATE: 5/26/2011

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 | 04/06/2011 | N001 | 39.42 - 49.42 | 0.95 | | FQ | # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 39.42 - 49.42 | 334.5 | | FQ | # | | |
| pH | s.u. | 04/06/2011 | N001 | 39.42 - 49.42 | 6.03 | | FQ | # | | |
| Specific Conductance | umhos/cm | 04/06/2011 | N001 | 39.42 - 49.42 | 10936 | | FQ | # | | |
| Temperature | C | 04/06/2011 | N001 | 39.42 - 49.42 | 24.82 | | FQ | # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 39.42 - 49.42 | 0.68 | | FQ | # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 39.42 - 49.42 | 0.066 | | FQ | # | 0.00015 | |

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

REPORT DATE: 5/26/2011

Location: 0862 WELL

| Parameter | Units | Sample Date | ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Alkalinity, Total (As CaCO3) | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 297 | | FQ | # | | |
| Ammonia Total as N | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 0.1 | U | FQ | # | 0.1 | |
| Calcium | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 400 | | FQ | # | 0.012 | |
| Chloride | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 610 | | FQ | # | 10 | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 0.74 | | FQ | # | | |
| Iron | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 0.0049 | U | FQ | # | 0.0049 | |
| Magnesium | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 22 | | FQ | # | 0.013 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 0.16 | | FQ | # | 0.01 | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 117.77 - 127.77 | -13.2 | | FQ | # | | |
| pH | s.u. | 04/06/2011 | N001 | 117.77 - 127.77 | 6.86 | | FQ | # | | |
| Potassium | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 66 | E | FQJ | # | 0.11 | |
| Sodium | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 530 | | FQ | # | 0.033 | |
| Specific Conductance | umhos/cm | 04/06/2011 | N001 | 117.77 - 127.77 | 4376 | | FQ | # | | |
| Sulfate | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 1300 | | FQ | # | 25 | |
| Temperature | C | 04/06/2011 | N001 | 117.77 - 127.77 | 25.39 | | FQ | # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 117.77 - 127.77 | 1.02 | | FQ | # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 117.77 - 127.77 | 0.0018 | | FQ | # | 0.000029 | |

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

REPORT DATE: 5/26/2011

Location: 0880 WELL

| Parameter | Units | Sample | | Depth Range | | Result | Qualifiers | | Detection Limit | Uncertainty |
|-------------------------------|----------|------------|------|-------------|--------|--------|------------|-----|-----------------|-------------|
| | | Date | ID | (Ft BLS) | Lab | | Data | QA | | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 32.3 | - 42.3 | 1.67 | | F # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 32.3 | - 42.3 | 144.5 | | F # | | |
| pH | s.u. | 04/06/2011 | N001 | 32.3 | - 42.3 | 4.38 | | F # | | |
| Specific Conductance | umhos/cm | 04/06/2011 | N001 | 32.3 | - 42.3 | 19596 | | F # | | |
| Temperature | C | 04/06/2011 | N001 | 32.3 | - 42.3 | 22.67 | | F # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 32.3 | - 42.3 | 8.93 | | F # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 32.3 | - 42.3 | 6.7 | | F # | 0.0029 | |

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

REPORT DATE: 5/26/2011

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 | 04/06/2011 | N001 | 19.17 - 49.17 | 2.16 | | FQ | # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 19.17 - 49.17 | 94.3 | | FQ | # | | |
| pH | s.u. | 04/06/2011 | N001 | 19.17 - 49.17 | 5.85 | | FQ | # | | |
| Specific Conductance | umhos /cm | 04/06/2011 | N001 | 19.17 - 49.17 | 3261 | | FQ | # | | |
| Temperature | C | 04/06/2011 | N001 | 19.17 - 49.17 | 22.72 | | FQ | # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 19.17 - 49.17 | 296 | | FQ | # | | |
| Uranium | mg/L | 04/06/2011 | 0001 | 19.17 - 49.17 | 0.0059 | | FQ | # | 0.000029 | |

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

REPORT DATE: 5/26/2011

Location: 0891 WELL

| Parameter | Units | Sample Date | ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|-------|-------------|------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Alkalinity, Total (As CaCO3) | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 392 | | F | # | | |
| Ammonia Total as N | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 0.1 | U | F | # | 0.1 | |
| Ammonia Total as N | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 0.1 | U | F | # | 0.1 | |
| Calcium | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 2500 | | F | # | 0.12 | |
| Calcium | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 2500 | | F | # | 0.12 | |
| Chloride | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 10000 | | F | # | 200 | |
| Chloride | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 10000 | | F | # | 200 | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 0.86 | | F | # | | |
| Iron | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 0.24 | | FJ | # | 0.0049 | |
| Iron | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 0.33 | | FJ | # | 0.0049 | |
| Magnesium | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 240 | | F | # | 0.013 | |
| Magnesium | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 240 | | F | # | 0.013 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 0.1 | | F | # | 0.01 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 0.1 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 10.74 - 20.74 | 144.8 | | F | # | | |
| pH | s.u. | 04/06/2011 | N001 | 10.74 - 20.74 | 6.31 | | F | # | | |
| Potassium | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 130 | | FJ | # | 0.11 | |

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

REPORT DATE: 5/26/2011

Location: 0891 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|----------------------|-----------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Potassium | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 130 | | FJ | # | 0.11 | |
| Sodium | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 3400 | | F | # | 0.66 | |
| Sodium | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 3400 | | F | # | 0.66 | |
| Specific Conductance | umhos /cm | 04/06/2011 | N001 | 10.74 - 20.74 | 29012 | | F | # | | |
| Sulfate | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 1900 | | F | # | 250 | |
| Sulfate | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 1900 | | F | # | 250 | |
| Temperature | C | 04/06/2011 | N001 | 10.74 - 20.74 | 23.16 | | F | # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 10.74 - 20.74 | 1.61 | | F | # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 10.74 - 20.74 | 2.9 | | F | # | 0.00058 | |
| Uranium | mg/L | 04/06/2011 | N002 | 10.74 - 20.74 | 2.8 | | F | # | 0.00058 | |

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

REPORT DATE: 5/26/2011

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 | 04/06/2011 | N001 | 12.49 - 27.49 | 1.33 | | F | # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 12.49 - 27.49 | 258.9 | | F | # | | |
| pH | s.u. | 04/06/2011 | N001 | 12.49 - 27.49 | 5.61 | | F | # | | |
| Specific Conductance | umhos /cm | 04/06/2011 | N001 | 12.49 - 27.49 | 11149 | | F | # | | |
| Temperature | C | 04/06/2011 | N001 | 12.49 - 27.49 | 25.9 | | F | # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 12.49 - 27.49 | 1.33 | | F | # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 12.49 - 27.49 | 0.00032 | | F | # | 0.000029 | |

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

REPORT DATE: 5/26/2011

Location: 0921 WELL

| Parameter | Units | Sample | | Depth Range (Ft BLS) | Result | Qualifiers | | Detection Limit | Uncertainty |
|-------------------------------|----------|------------|------|-------------------------|--------|------------|---------|--------------------|-------------|
| | | Date | ID | | | Lab | Data QA | | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 44.55 - 54.55 | 1.86 | | F # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 44.55 - 54.55 | 190.7 | | F # | | |
| pH | s.u. | 04/06/2011 | N001 | 44.55 - 54.55 | 6.07 | | F # | | |
| Specific Conductance | umhos/cm | 04/06/2011 | N001 | 44.55 - 54.55 | 11001 | | F # | | |
| Temperature | C | 04/06/2011 | N001 | 44.55 - 54.55 | 25.63 | | F # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 44.55 - 54.55 | 1.62 | | F # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 44.55 - 54.55 | 1.4 | | F # | 0.00015 | |

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

REPORT DATE: 5/26/2011

Location: 0924 WELL

| Parameter | Units | Sample | | Depth Range (Ft BLS) | Result | Qualifiers | | Detection Limit | Uncertainty |
|-------------------------------|----------|------------|------|-------------------------|--------|------------|---------|--------------------|-------------|
| | | Date | ID | | | Lab | Data QA | | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 19.7 - 29.7 | 1.09 | | F # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 19.7 - 29.7 | 12.4 | | F # | | |
| pH | s.u. | 04/06/2011 | N001 | 19.7 - 29.7 | 6.35 | | F # | | |
| Specific Conductance | umhos/cm | 04/06/2011 | N001 | 19.7 - 29.7 | 11292 | | F # | | |
| Temperature | C | 04/06/2011 | N001 | 19.7 - 29.7 | 25.16 | | F # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 19.7 - 29.7 | 0.94 | | F # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 19.7 - 29.7 | 0.54 | | F # | 0.000029 | |

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

REPORT DATE: 5/26/2011

Location: 0963 WELL

| Parameter | Units | Sample Date | ID | Depth Range (Ft BLS) | | Result | Qualifiers | | Detection Limit | Uncertainty |
|-------------------------------|-----------|-------------|------|----------------------|---------|--------|------------|---------|-----------------|-------------|
| | | | | | | | Lab | Data QA | | |
| Dissolved Oxygen | mg/L | 04/06/2011 | N001 | 4.38 | - 14.38 | 0.85 | | F # | | |
| Oxidation Reduction Potential | mV | 04/06/2011 | N001 | 4.38 | - 14.38 | 328.7 | | F # | | |
| pH | s.u. | 04/06/2011 | N001 | 4.38 | - 14.38 | 3.46 | | F # | | |
| Specific Conductance | umhos /cm | 04/06/2011 | N001 | 4.38 | - 14.38 | 8404 | | F # | | |
| Temperature | C | 04/06/2011 | N001 | 4.38 | - 14.38 | 21.91 | | F # | | |
| Turbidity | NTU | 04/06/2011 | N001 | 4.38 | - 14.38 | 6.38 | | F # | | |
| Uranium | mg/L | 04/06/2011 | N001 | 4.38 | - 14.38 | 0.076 | | F # | 0.000029 | |

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.

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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Static Water Level Data

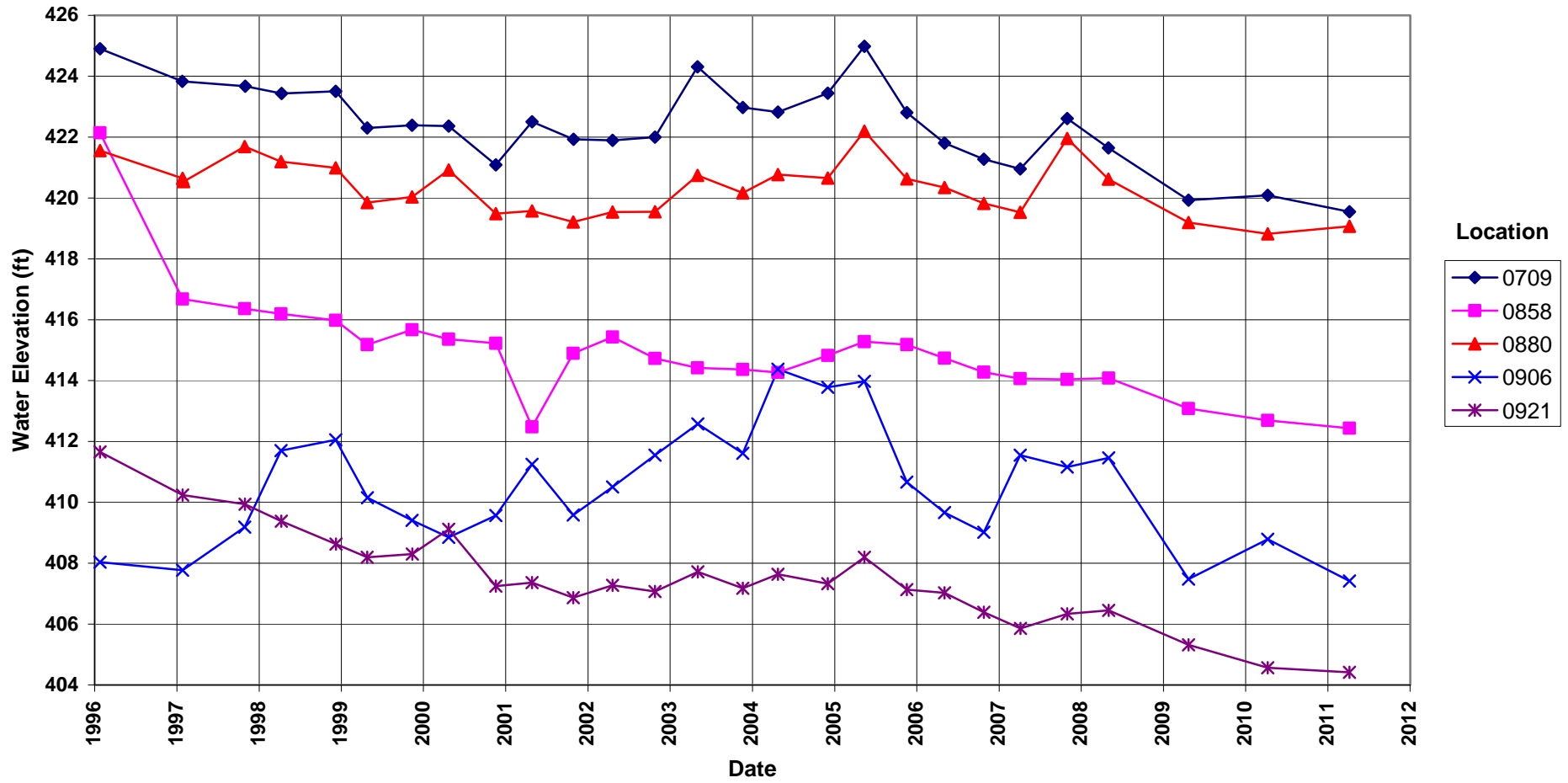
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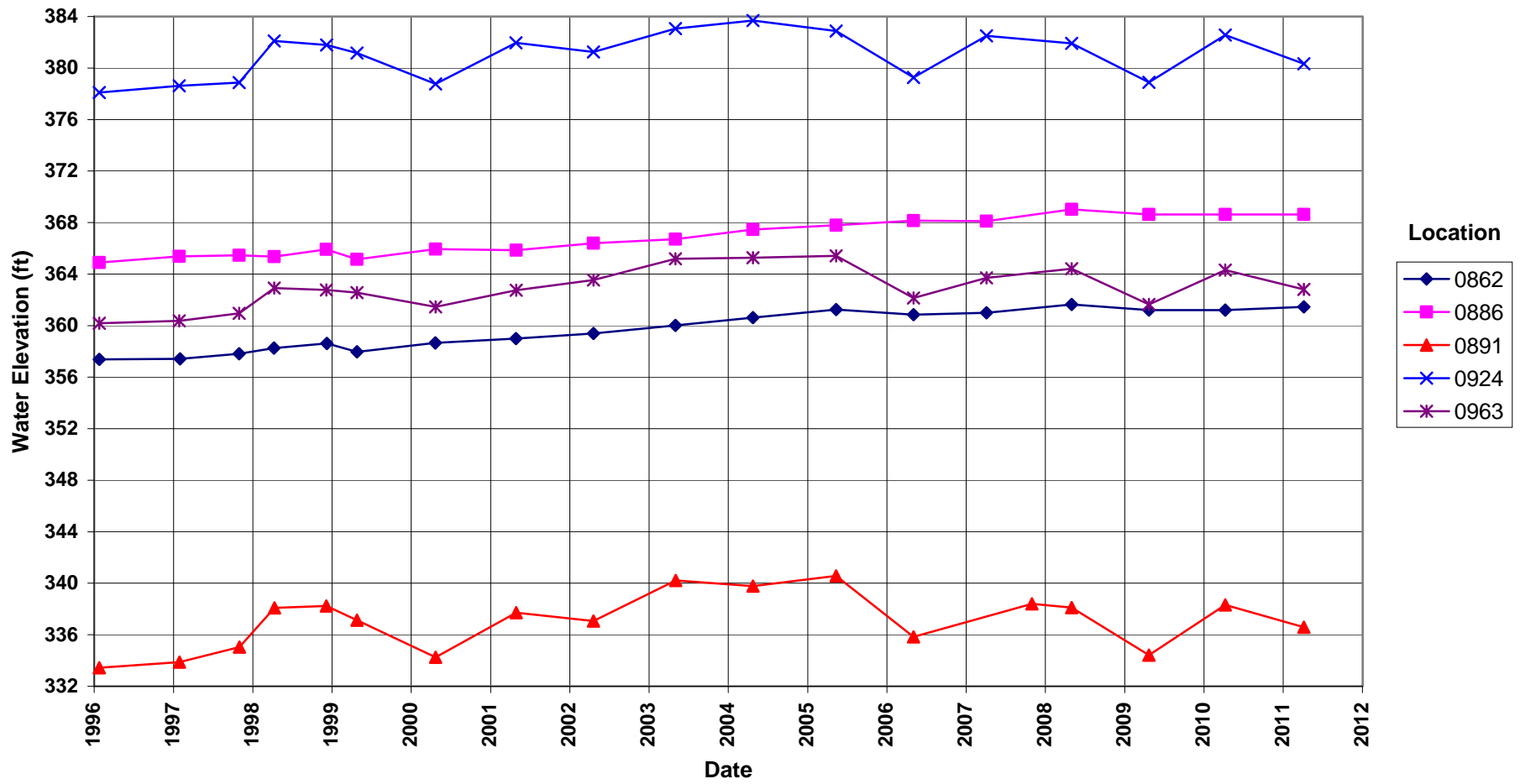
Hydrographs

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Falls City Disposal Site Cell Performance Monitoring Wells Hydrograph



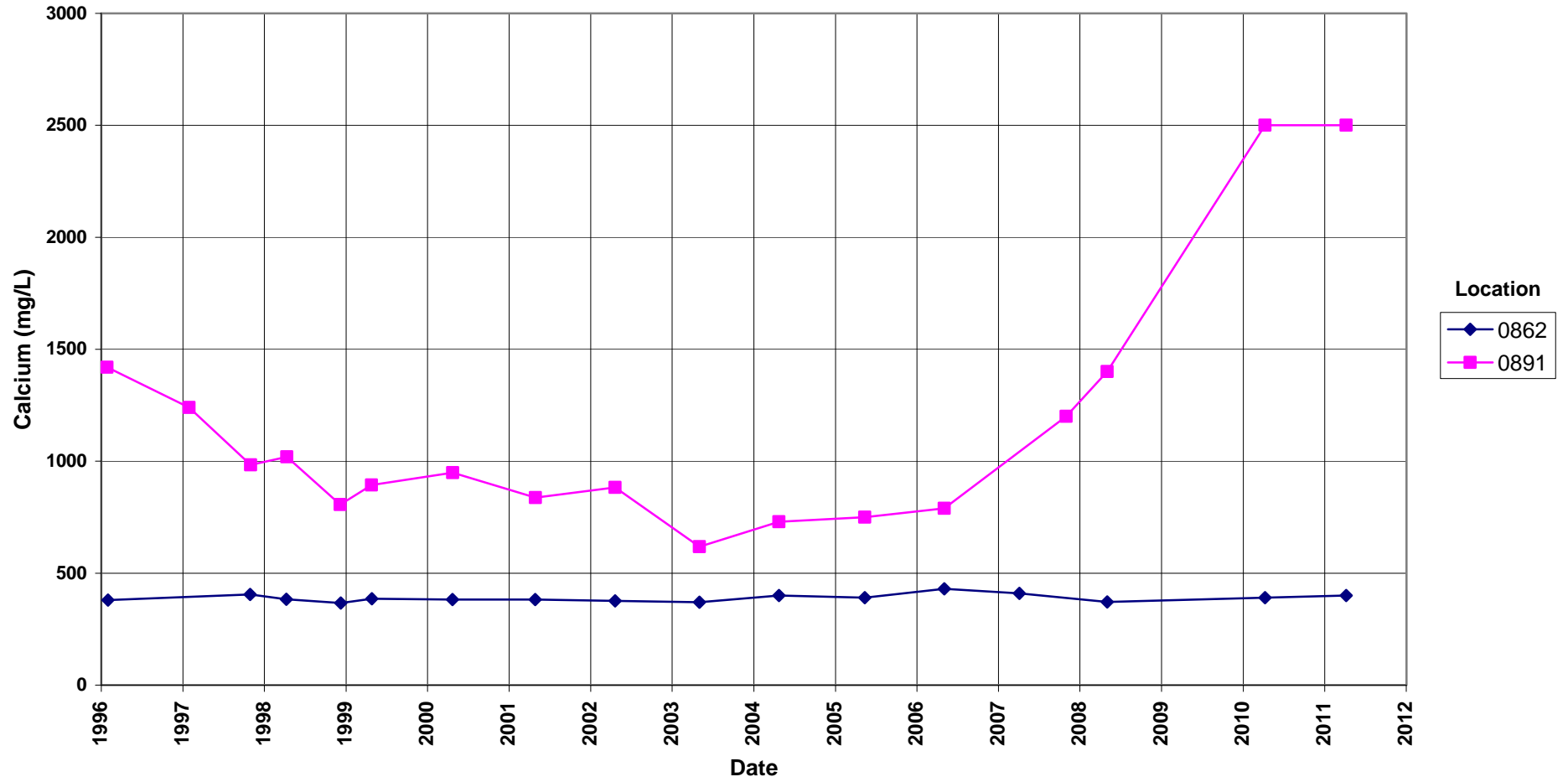
Falls City Disposal Site Groundwater Compliance Monitoring Wells Hydrograph



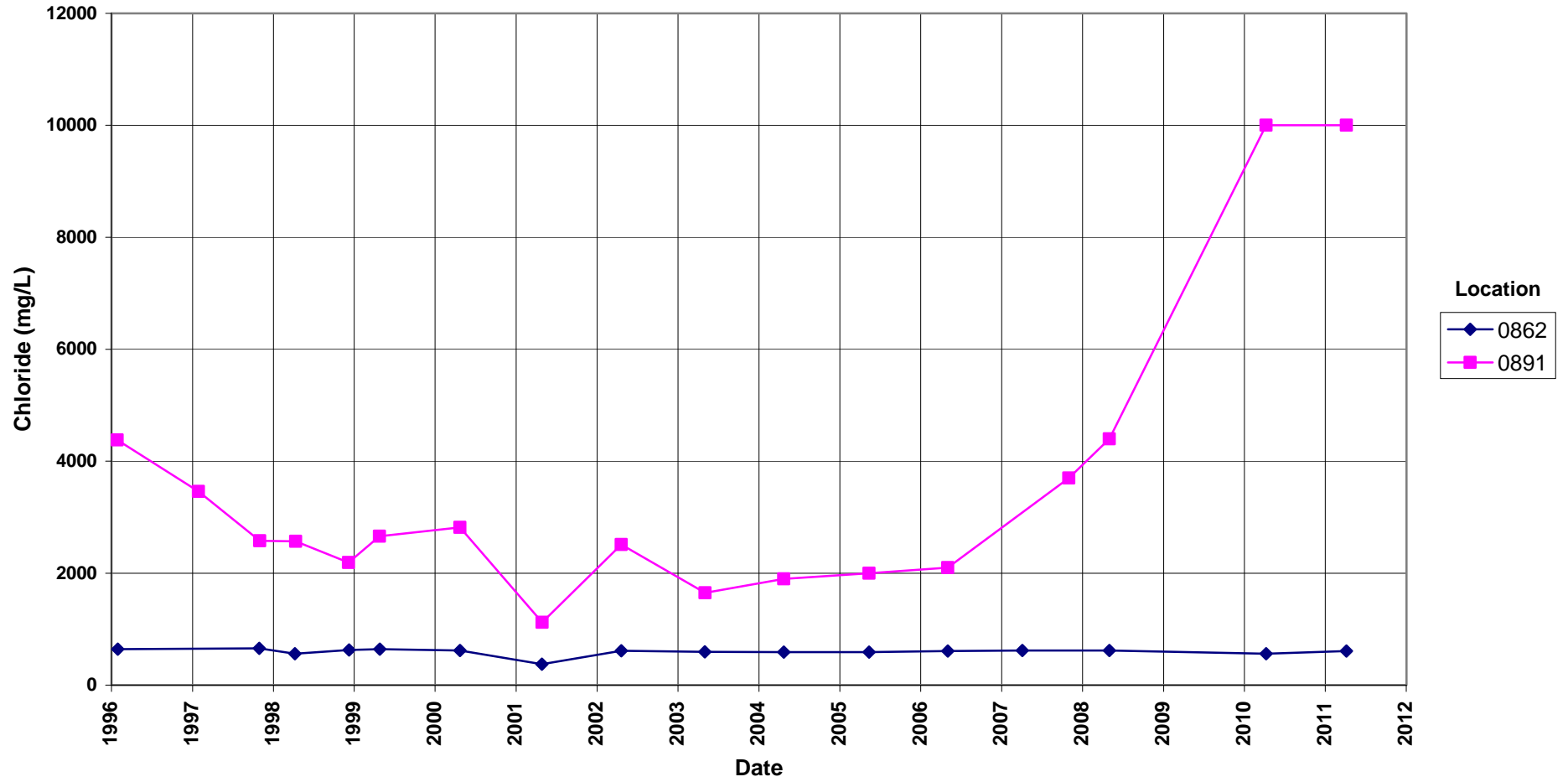
Time-Concentration Graphs

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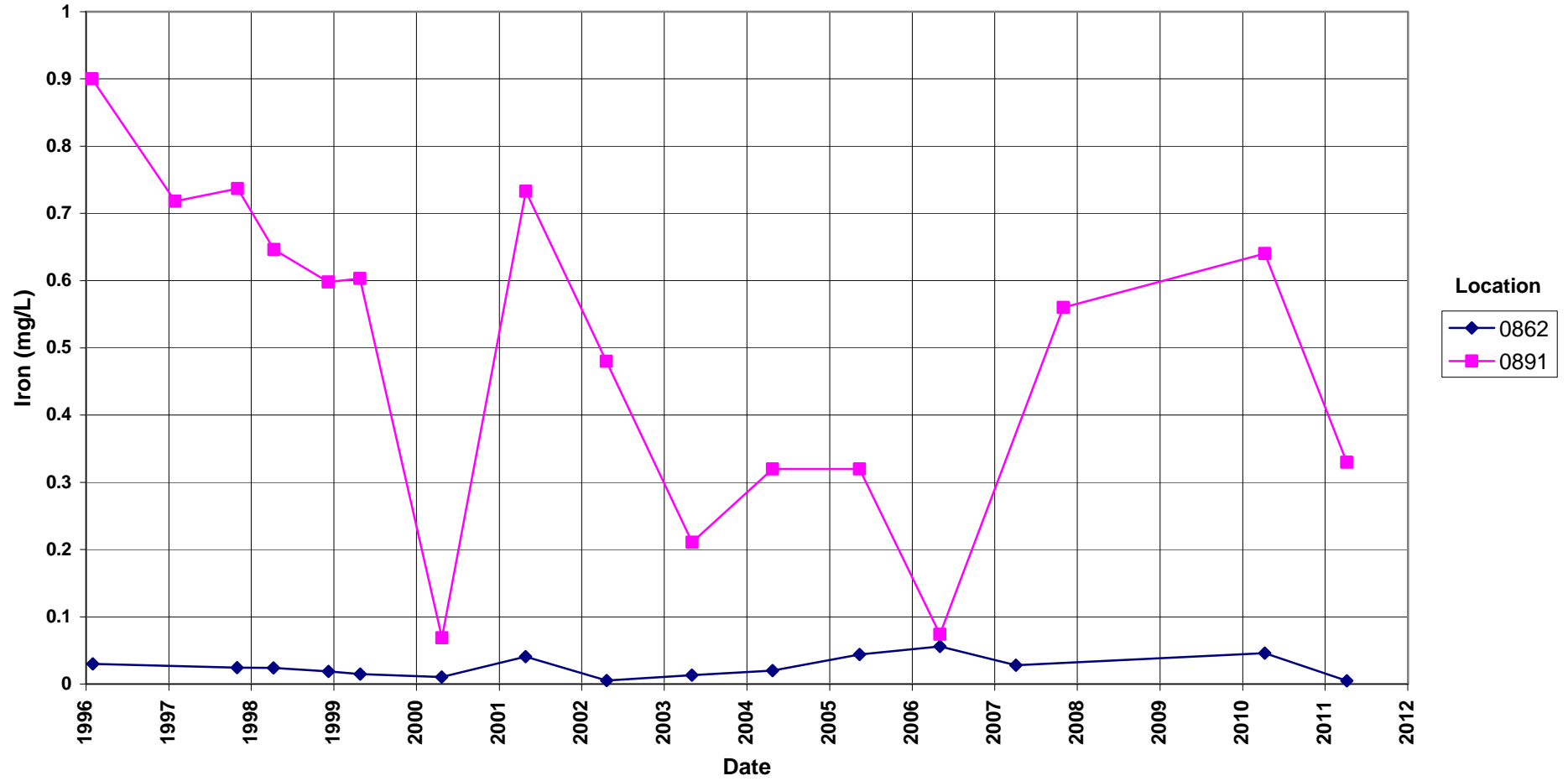
Falls City Disposal Site Calcium Concentration



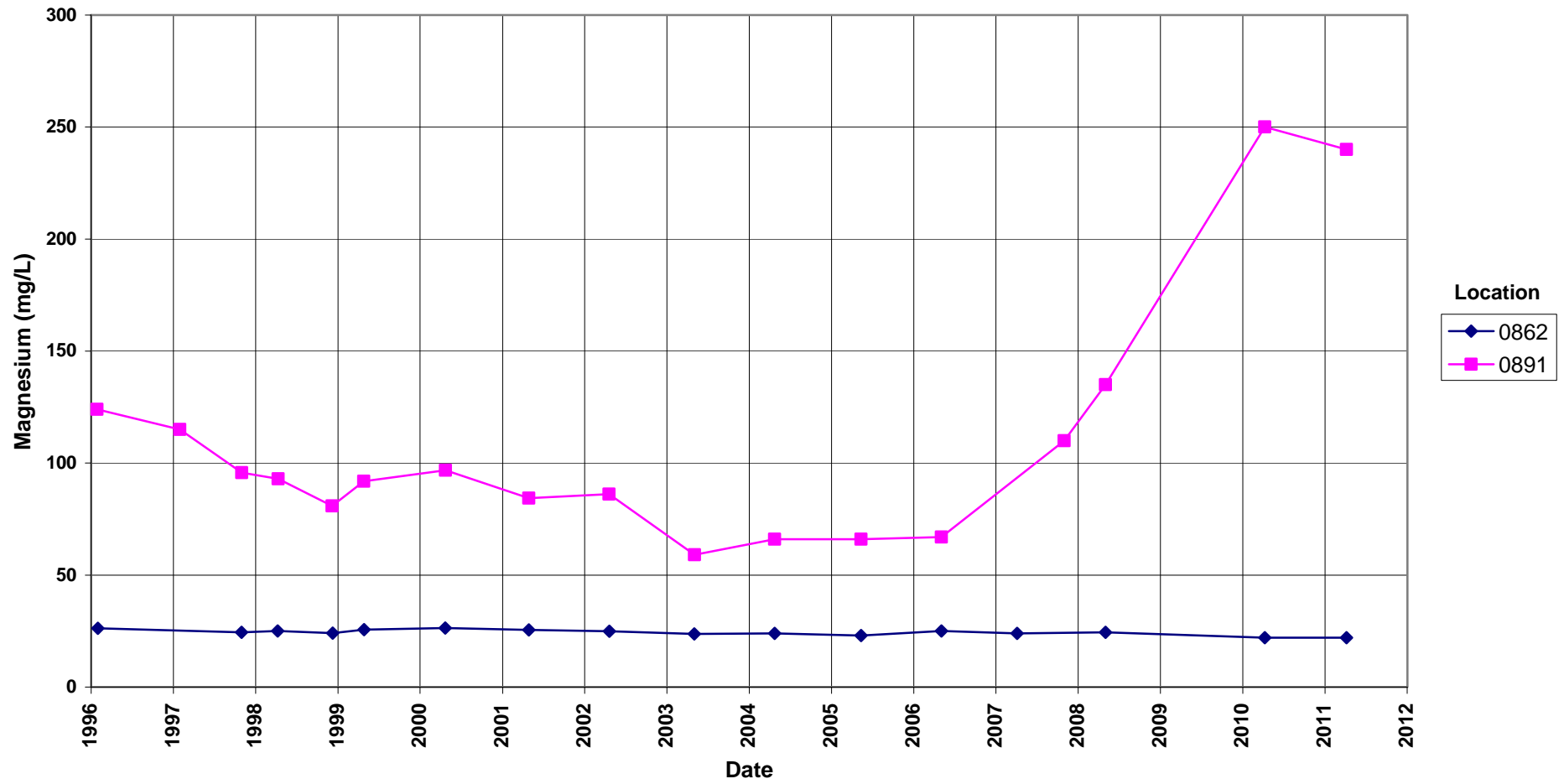
Falls City Disposal Site Chloride Concentration



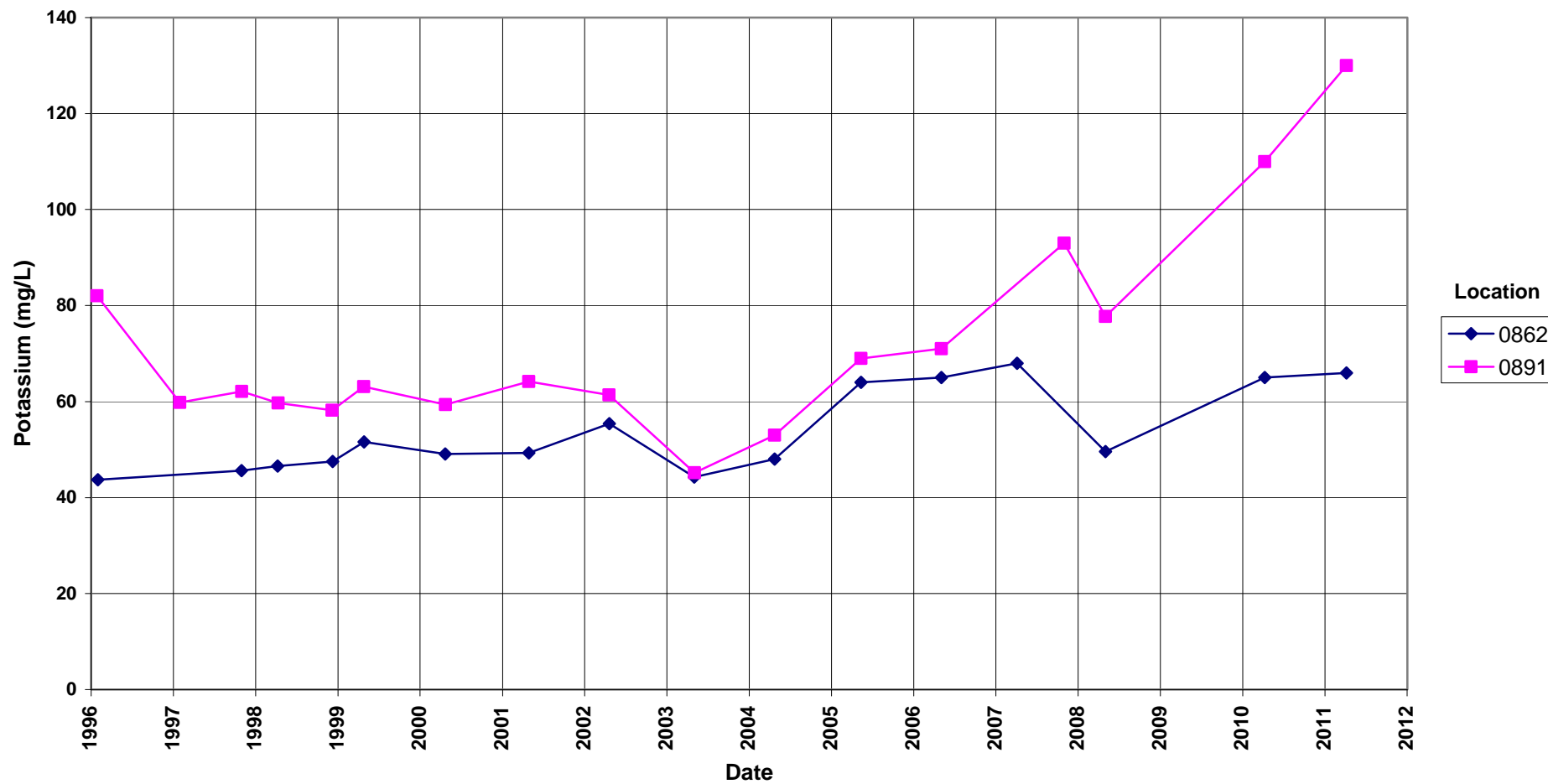
Falls City Disposal Site Iron Concentration



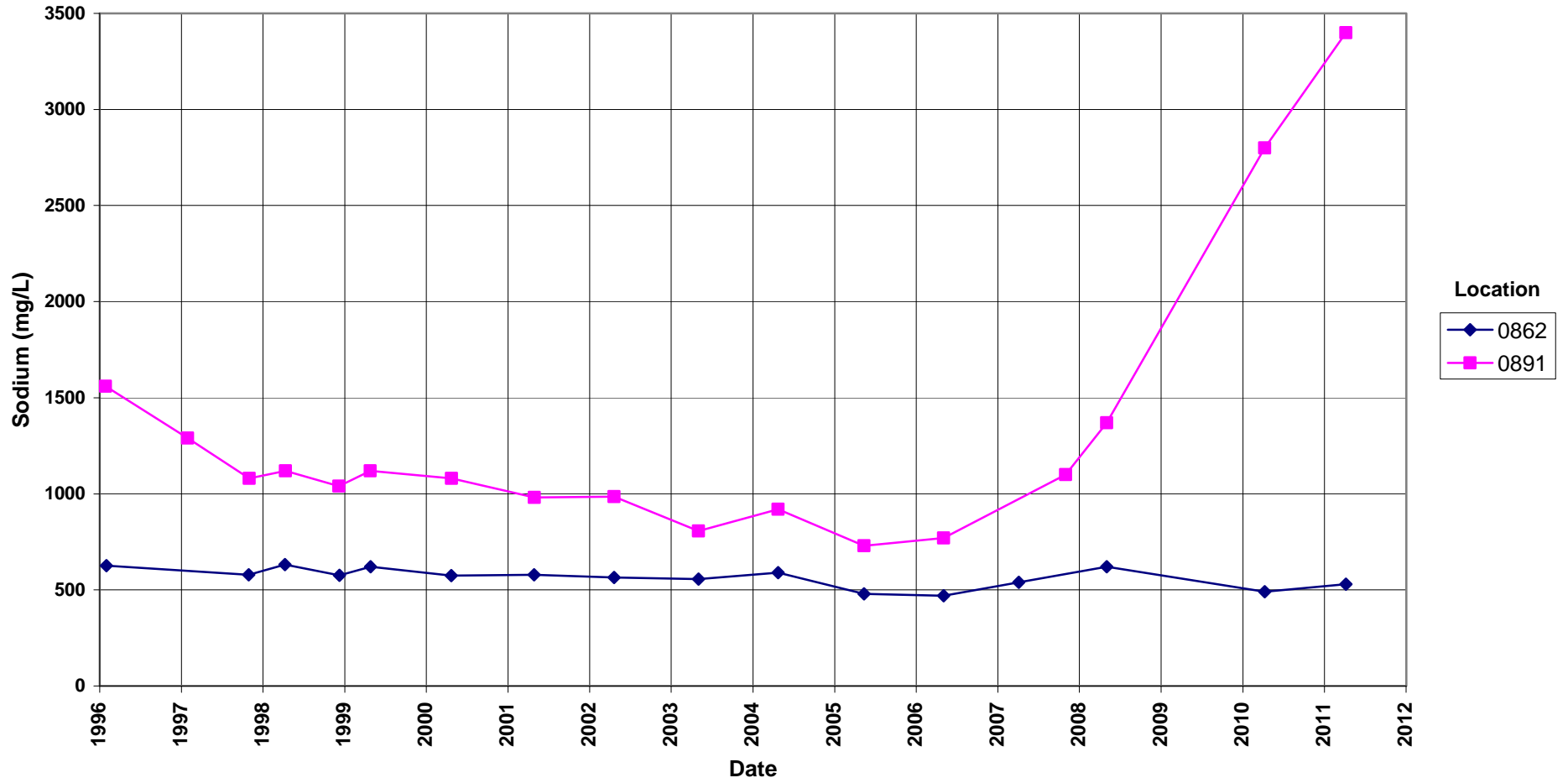
Falls City Disposal Site Magnesium Concentration



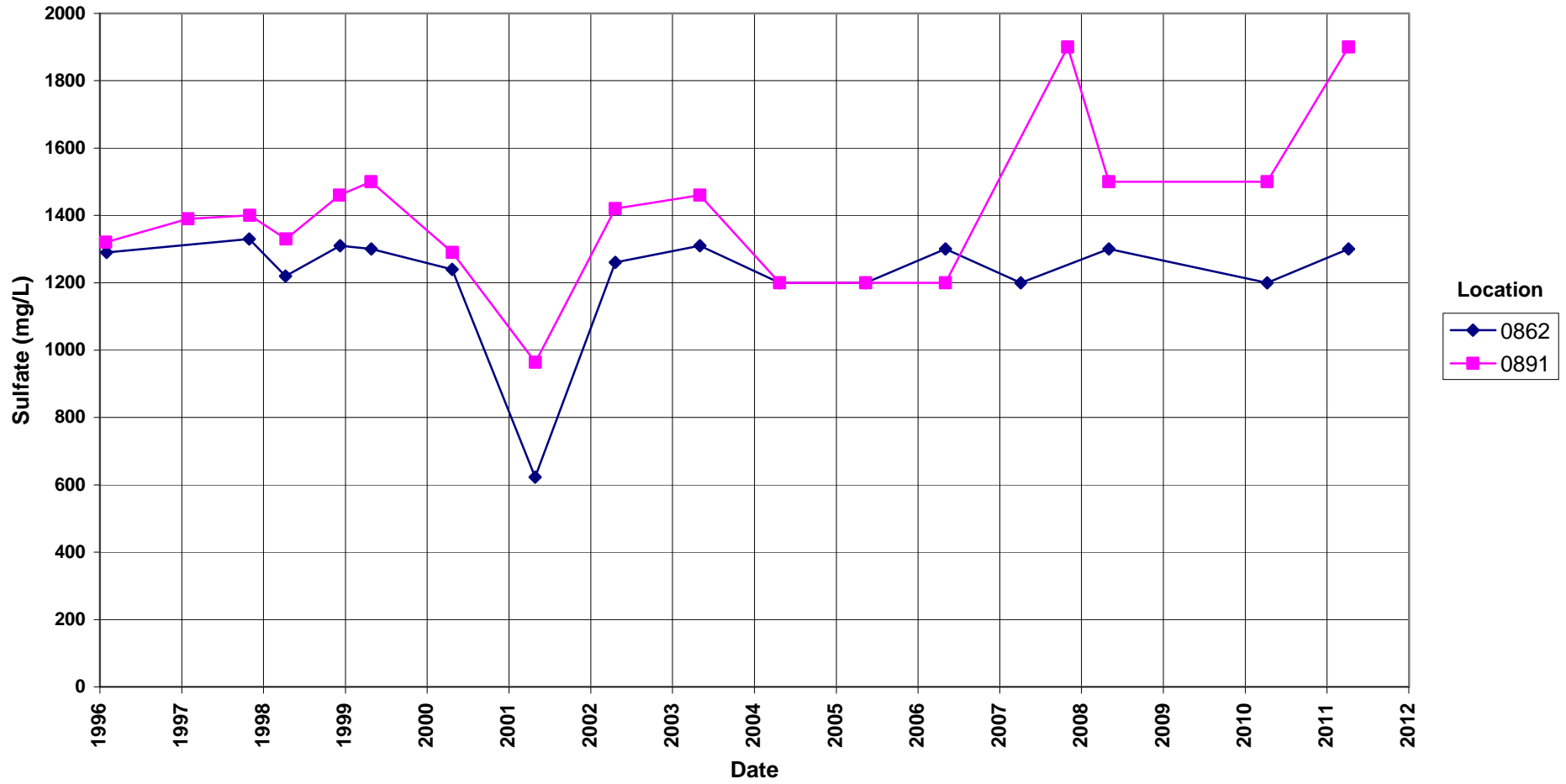
Falls City Disposal Site Potassium Concentration



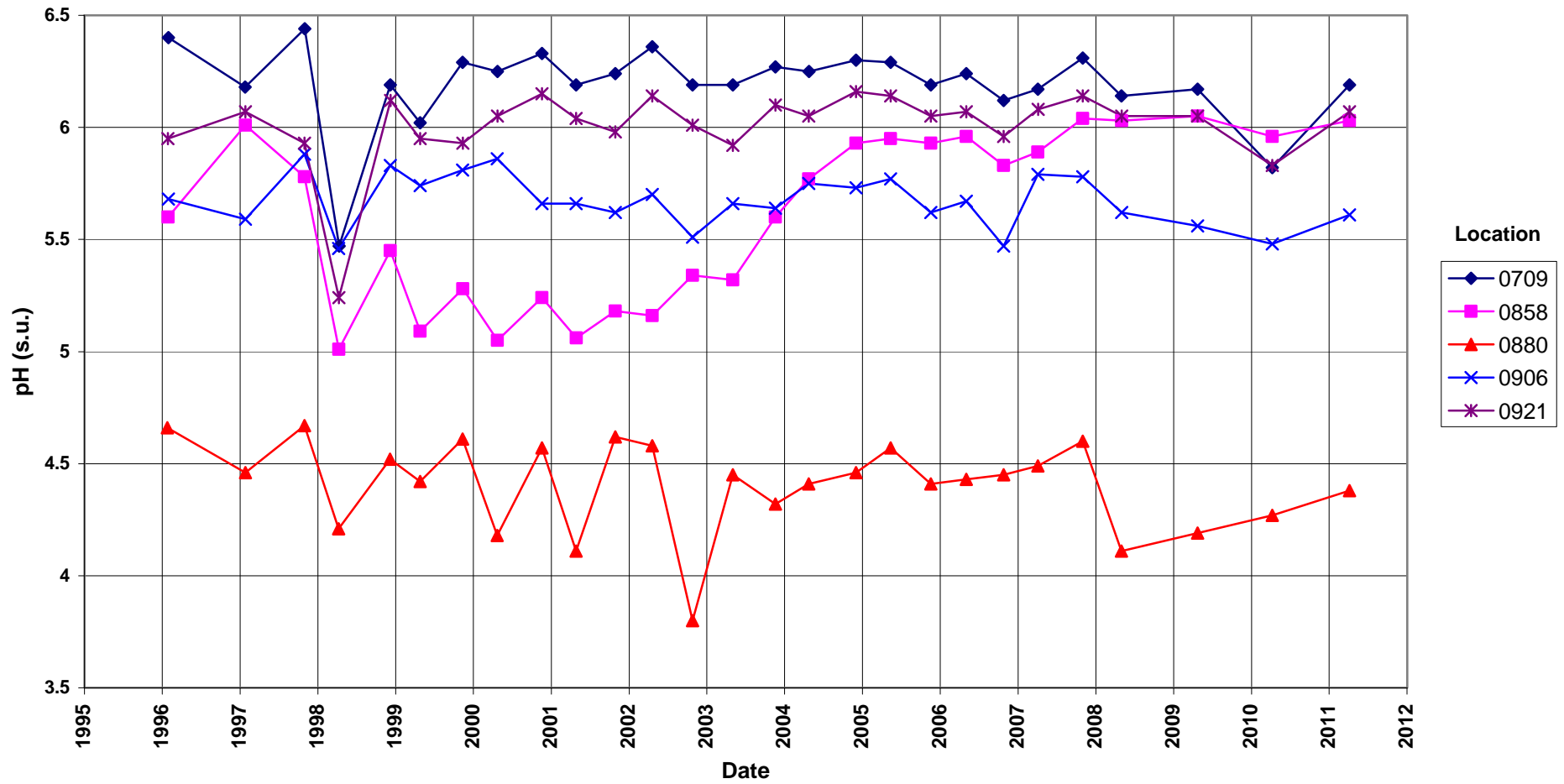
Falls City Disposal Site Sodium Concentration



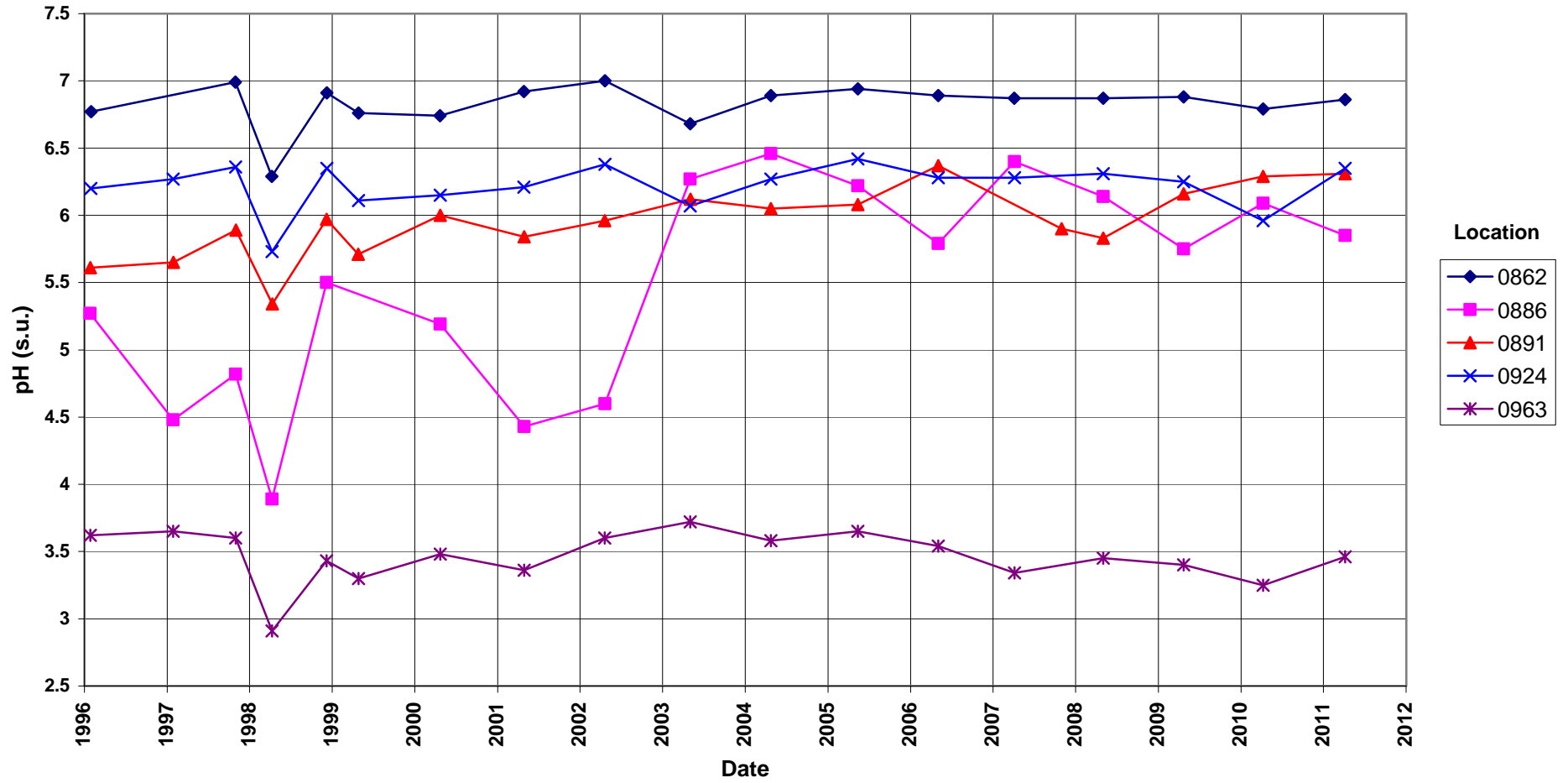
Falls City Disposal Site Sulfate Concentration



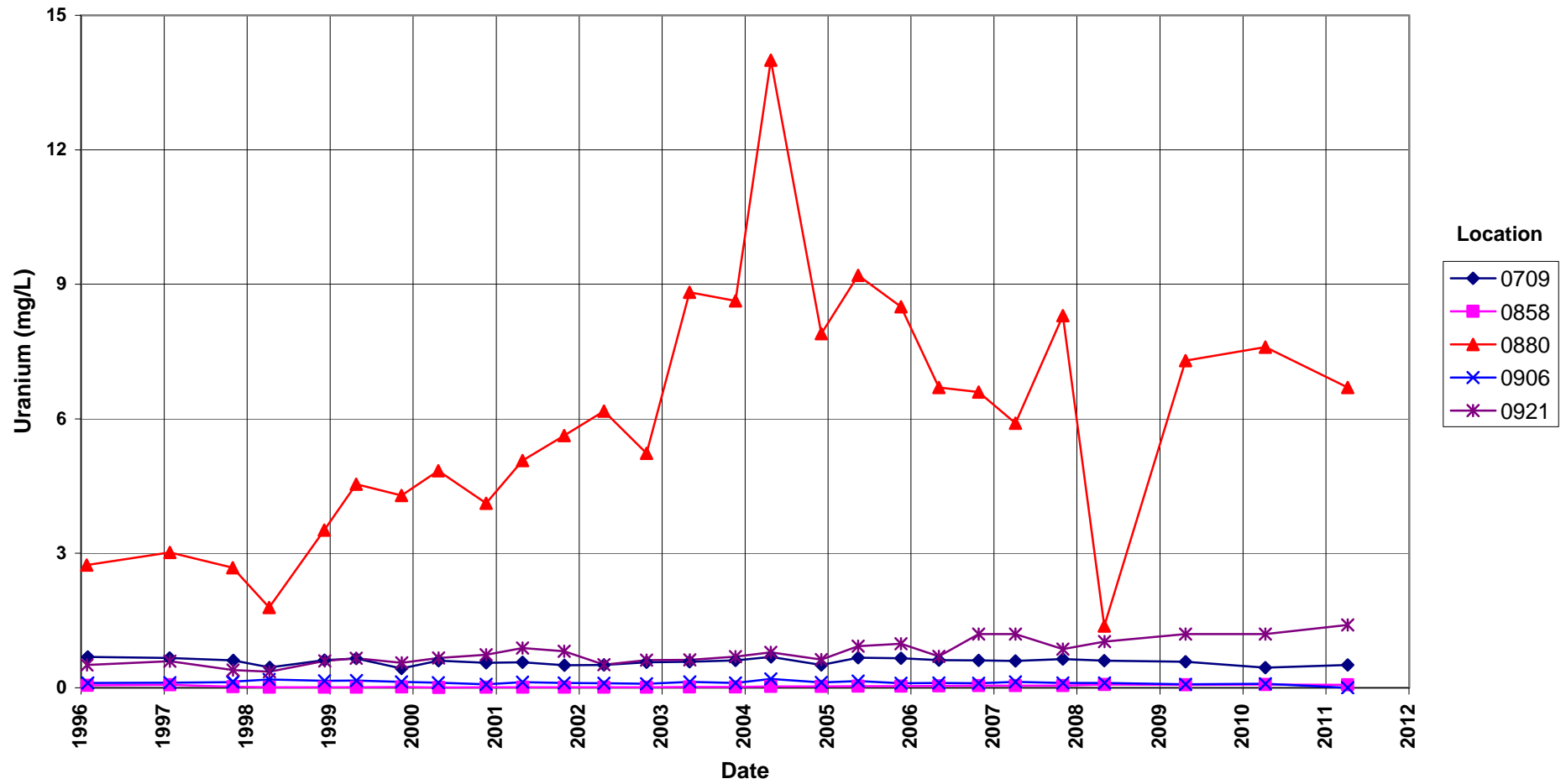
Falls City Disposal Site Cell Performance Monitoring Wells pH Value



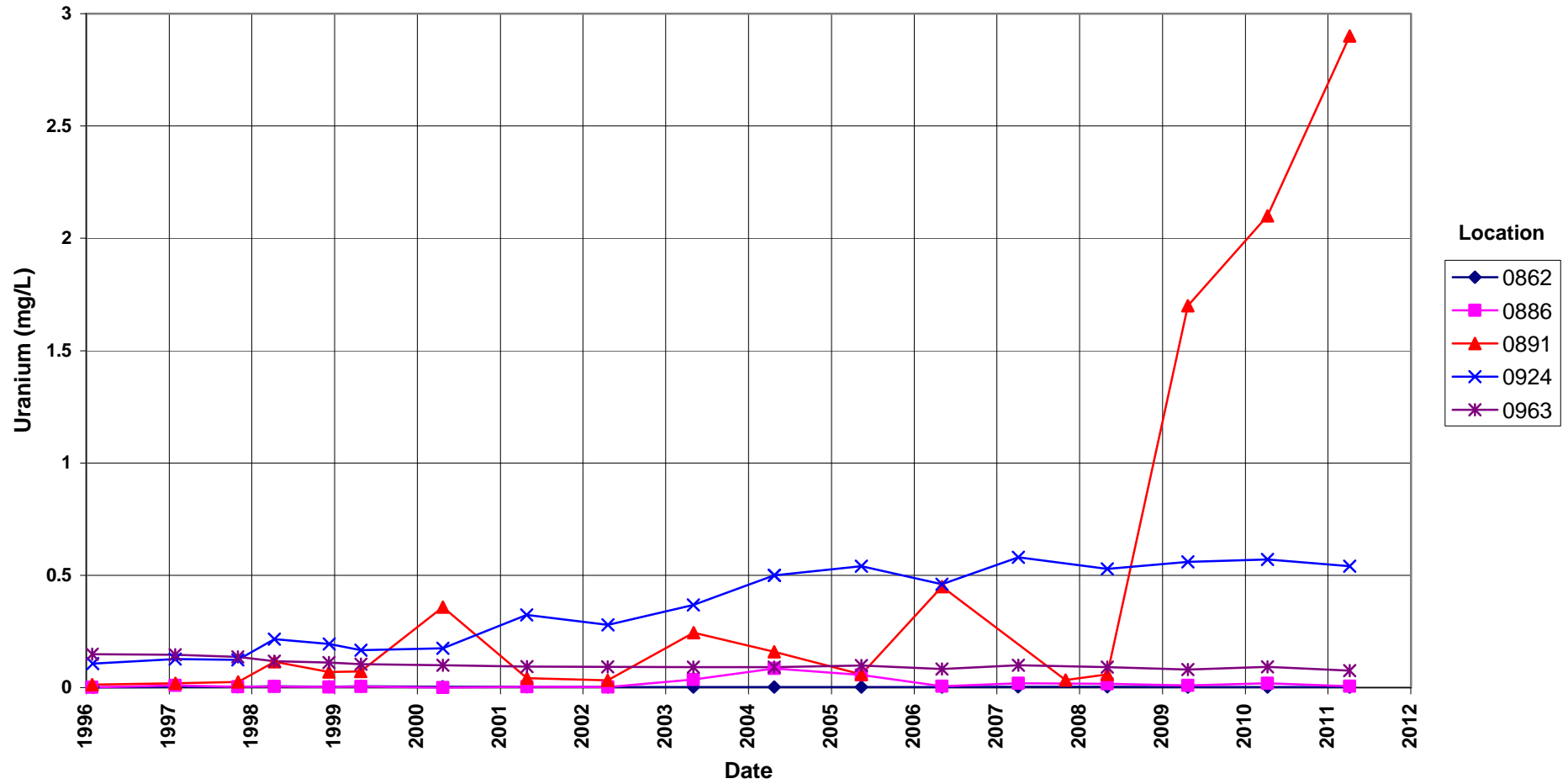
Falls City Disposal Site
Groundwater Compliance Monitoring Wells
pH Value



Falls City Disposal Site Cell Performance Monitoring Wells Uranium Concentration



Falls City Disposal Site Groundwater Compliance Monitoring Wells Uranium Concentration



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Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM00-501
Control Number 11-0421

March 10, 2011

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporations (Stoller)
April 2011 Environmental Sampling at the Falls City, Texas, Disposal Site

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

Dear Ms. Dayvault:

The purpose of this letter is to inform you of the upcoming sampling at Falls City, TX. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Falls City disposal site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of April 4, 2011.

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

Monitoring Wells*

| | | | | | | |
|-----------|--------|--------|--------|--------|--------|--------|
| 709 Cq/Ct | 862 D1 | 886 De | 906 Cq | 916 Cq | 924 Cq | 963 Cq |
| 858 Cq | 880 De | 891 D1 | 908 Cq | 921 Cq | | |

*NOTE: Cq = Conquista Clay Whitsett Formation; Ct = Claystone; De = DeWeesville Sand Whitsett Formation; D1 = Dilworth Sand Whitsett Formation

As requested and approved, the samplers will collect a split sample at well 886 for Conquista.

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.

Please call me at (412) 818-7015 if you have any questions.

Sincerely,

2011.03.10
09:08:12 -05'00'

Michele Miller
Project Manager

The S.M. Stoller Corporation 2597 B $\frac{3}{4}$ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

Jalena Dayvault
Control Number 11-0421
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
File: FCT 410.02(A)

The S.M. Stoller Corporation 2597 B $\frac{3}{4}$ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

Sampling Frequencies for Locations at Falls City, Texas

| Location ID | Quarterly | Semiannually | Annually | Biennially | Not Sampled | Notes |
|-------------------------|-----------|--------------|----------|------------|-------------|--|
| Monitoring Wells | | | | | | |
| 709 | | | X | | | |
| 858 | | | X | | | |
| 862 | | | X | | | |
| 880 | | | X | | | |
| 886 | | | X | | | |
| 891 | | | X | | | Download data logger; collect duplicate from this well |
| 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

Constituent Sampling Breakdown

| Site | Falls City | | Required Detection Limit (mg/L) | Analytical Method | Line Item Code |
|--|------------------|------------------|--|----------------------|-------------------|
| Analyte | Groundwater | Surface Water | | | |
| Approx. No. Samples/yr | 12 | 0 | | | |
| <i>Field Measurements</i> | | | | | |
| Alkalinity | 862 and 891 only | | | | |
| Dissolved Oxygen | X | | | | |
| Redox Potential | X | | | | |
| pH | X | | | | |
| Specific Conductance | X | | | | |
| Turbidity | X | | | | |
| Temperature | X | | | | |
| <i>Laboratory Measurements</i> | | | | | |
| Aluminum | | | | | |
| Ammonia as N (NH ₃ -N) | 862 and 891 only | | 0.1 | EPA 350.1 | WCH-A-005 |
| Calcium | 862 and 891 only | | 5 | SW-846 6010 | LMM-01 |
| Chloride | 862 and 891 only | | 0.5 | SW-846 9056 | WCH-A-039 |
| Chromium | | | | | |
| Gross Alpha | | | | | |
| Gross Beta | | | | | |
| Iron | 862 and 891 only | | 0.05 | SW-846 6020 | LMM-02 |
| Lead | | | | | |
| Magnesium | 862 and 891 only | | 5 | SW-846 6010 | LMM-01 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Nickel-63 | | | | | |
| Nitrate + Nitrite as N (NO ₃ +NO ₂)-N | 862 and 891 only | | 0.05 | EPA 353.1 | WCH-A-022 |
| Potassium | 862 and 891 only | | 1 | SW-846 6010 | LMM-01 |
| Radium-226 | | | | | |
| Radium-228 | | | | | |
| Selenium | | | | | |
| Silica | | | | | |
| Sodium | 862 and 891 only | | 1 | SW-846 6010 | LMM-01 |
| Strontium | | | | | |
| Sulfate | 862 and 891 only | | 0.5 | SW-846 9056 | MIS-A-044 |
| Sulfide | | | | | |
| Total Dissolved Solids | | | | | |
| Total Organic Carbon | | | | | |
| Uranium | X | | 0.0001 | SW-846 6020 | LMM-02 |
| Vanadium | | | | | |
| Zinc | | | | | |
| Total No. of Analytes | 10 | 0 | | | |

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

Attachment 4 Trip Report

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Memorandum

Control Number N/A

DATE: April 13, 2011
 TO: Michele Miller
 FROM: Jeff Walters
 SUBJECT: Sampling Trip Report

Site: Falls City, Texas

Dates of Sampling Event: April 4 through April 8, 2011

Team Members: Joe Trevino and Jeff Walters

Number of Locations Sampled: 10 monitoring wells and 1 duplicate sample, for a total of 11 samples. No equipment blanks were required.

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

Location Specific Information: All wells were sampled for U. Wells 0862 and 0891 had additional samples collected for Ca, Fe, Mg, Na, K, (NO₃+NO₂)-N, NH₃-N, Cl, and SO₄. These two wells also had field alkalinity readings collected and recorded in the FDCS.

| Ticket Number | Location | Sample Date | Description |
|---------------|----------|-------------|-------------------------------------|
| JEU 438 | 0709 | 4/6/11 | CAT I |
| JEU 439 | 0858 | 4/6/11 | CAT II |
| JEU 440 | 0862 | 4/6/11 | CAT II |
| JEU 441 | 0880 | 4/6/11 | CAT I |
| JEU 442 | 0886 | 4/6/11 | CAT II, Split samples with Tetrtech |
| JEU 443 | 0891 | 4/6/11 | CAT I, Duplicated |
| JEU 444 | 0906 | 4/6/11 | CAT I |
| JEU 445 | 0921 | 4/6/11 | CAT I |
| JEU 446 | 0924 | 4/6/11 | CAT I |
| JEU 447 | 0963 | 4/6/11 | CAT I |
| JEU 449 | 0908 | 4/6/11 | Well was Dry |
| JEU 450 | 0916 | 4/6/11 | Well was Dry |

Quality Control Sample Cross Reference: The following is the false identification assigned to the quality control sample:

| False ID | True ID | Sample Type | Associated Matrix | Ticket Number |
|----------|---------|-------------|-------------------|---------------|
| 2913 | 0891 | Duplicate | Groundwater | JEU 448 |

Field Variance: Turbidity criteria were not met for well 0886. Turbidity did not stabilize or drop under 10 NTUs. This sample was filtered.

Requisition Numbers Assigned: All samples were assigned to RIN 11033683.

Sample Shipment: Samples were shipped overnight FedEx from Grand Junction, Colorado, to ALS Lab in Ft Collins, Colorado, on April 12, 2011.

Water Level Measurements: Water levels measurements were collected in all sampled wells. See the FDACS for those measurements.

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: All OK.

Signs: No issues observed.

Trespassing/Site Disturbances: Some hog damage around the wells was observed but no problems were noted with the wells.

Site Issues

Disposal Cell/Drainage Structure Integrity: Looked OK.

Vegetation/Noxious Weed Concerns: N/A

Maintenance Requirements: The road to well 0921 is almost gone. Vegetation is reclaiming that area.

Corrective Action Taken: Cut back some bushes around various wells.

(JW/lcg)

cc: (electronic)
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EDD Delivery