

Data Validation Package

**November 2010
Water Sampling at the
Ambrosia Lake, New Mexico,
Disposal Site**

February 2011



**U.S. DEPARTMENT OF
ENERGY**

Legacy
Management

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Sampling Event Summary

Site: Ambrosia Lake, New Mexico, Disposal Site

Sampling Period: November 12, 2010

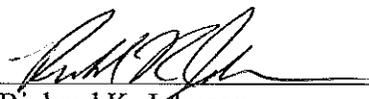
The *Long-Term Surveillance Plan for the Ambrosia Lake, New Mexico, Disposal Site* does not require groundwater monitoring because groundwater in the uppermost aquifer is of limited use, and supplemental standards have been applied to the aquifer. However, at the request of the New Mexico Environment Department, the U.S. Department of Energy conducts monitoring every three years at two locations, monitoring wells 0675 and 0678. 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). Water levels were measured at each sampled well. One duplicate sample was collected from location 0675.

Groundwater samples from the two wells were analyzed for the constituents listed in Table 1. Time-concentration graphs for well 0675, completed in alluvium, show an upward trend for selenium and downward trends for molybdenum and uranium. The water level in this well has dropped 1.44 feet since 2001. Graphs for well 0678, completed in the Tres Hermanos B Sandstone Unit of the Mancos Shale, show downward trends for nitrate + nitrite as nitrogen and selenium. The water level in well 0678 has dropped 1.67 feet since 2001.

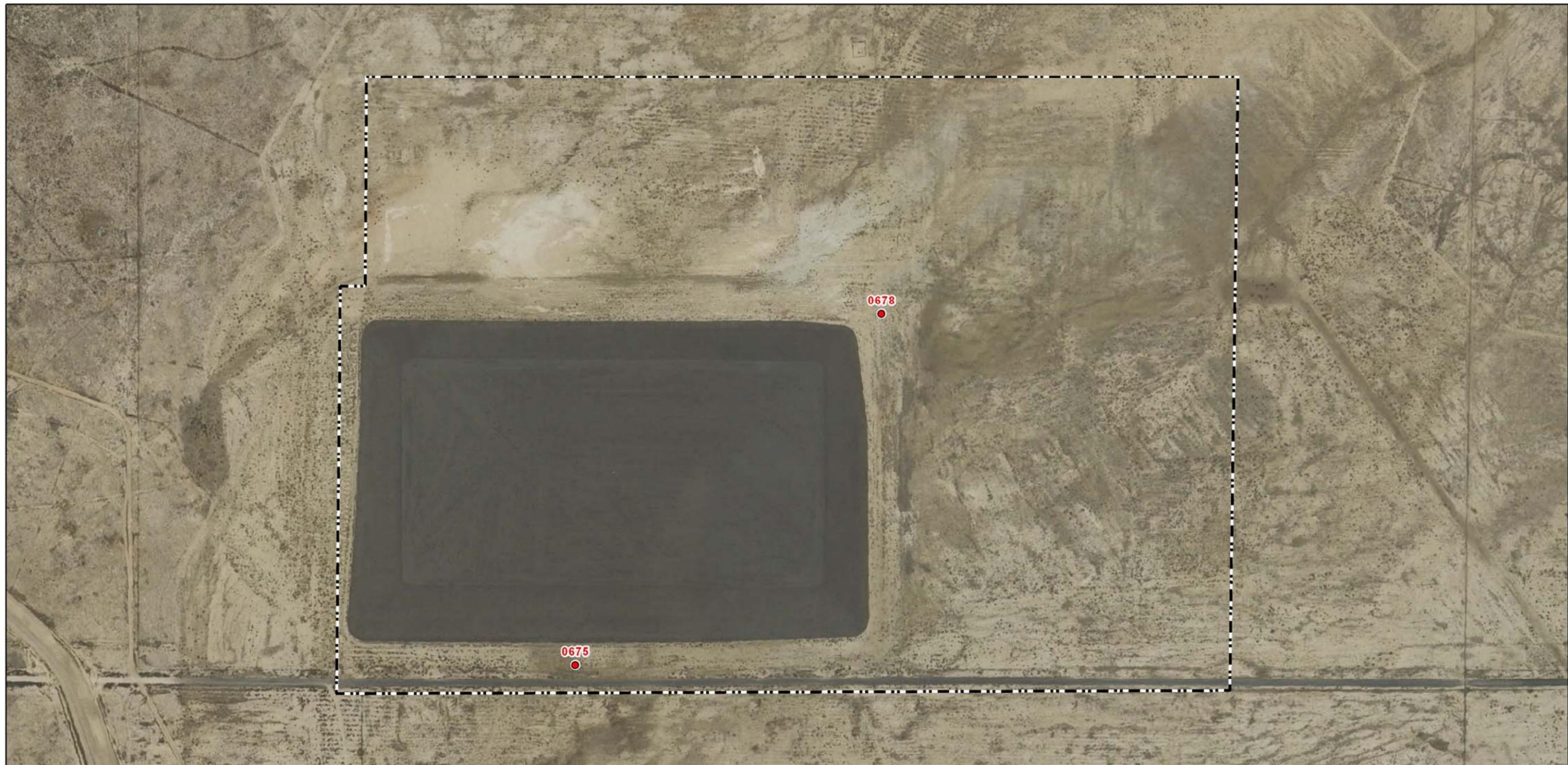
Table 1. 2010 Groundwater Monitoring Analytical Results at the Ambrosia Lake, New Mexico, Site

| Analyte | Unit of Measurement | 0675 Results | 0678 Results |
|---|---------------------|--------------|--------------|
| Arsenic | mg/L | 0.0472 | 0.0016 |
| Bicarbonate alkalinity (CaCO ₃) | mg/L | 102 | 760 |
| Calcium | mg/L | 451 | 405 |
| Carbonate alkalinity (CaCO ₃) | mg/L | ND | ND |
| Chloride | mg/L | 246 | 288 |
| Magnesium | mg/L | 213 | 496 |
| Molybdenum | mg/L | 0.0477 | 0.00526 |
| Nitrate + Nitrite as Nitrogen | mg/L | 21.8 | 300 |
| Potassium | mg/L | 5.5 | 29.4 |
| Selenium | mg/L | 1.25 | 0.0505 |
| Sodium | mg/L | 732 | 2800 |
| Sulfate | mg/L | 3310 | 7530 |
| Total Dissolved Solids | mg/L | 5240 | 14400 |
| Tritium | pCi/L | ND | ND |
| Uranium | pCi/L | 0.128 | 0.0565 |
| Uranium-234 | pCi/L | 44.4 | 81.8 |
| Uranium-235 | pCi/L | 1.94 | 1.22 |
| Uranium-238 | pCi/L | 33.3 | 19.1 |

Key: mg/L = milligrams per liter; pCi/L = picocuries per liter; ND = not detected


Richard K. Johnson
Site Lead, S.M. Stoller Corporation

2/9/11
Date



Legend

- Well to be Sampled
- - - Site Boundary

N



U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AM01-07LM00060

Planned Sampling Map
Ambrosia Lake, NM, Disposal Site
November 2010

DATE PREPARED
January 3, 2011

FILENAME
S0709800

M:\LTS\1111000116\000\S07098\0709800-11x17.mxd smithw 1/3/2011 11:04:13 AM

Ambrosia Lake, New Mexico, Disposal Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

| | | | |
|--------------------------------|--------------------------|----------------------------------|--------------------------|
| Project | <u>Ambrosia Lake, NM</u> | Date(s) of Water Sampling | <u>November 12, 2010</u> |
| Date(s) of Verification | <u>January 20, 2011</u> | Name of Verifier | <u>Gretchen Baer</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 October 14, 2010.</u> |
| 2. Were the sampling locations specified in the planning documents sampled? | <u>Yes</u> | |
| 3. Was a pre-trip calibration conducted as specified in the above-named documents? | <u>Yes</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> | <u>DO readings were not recorded at 0678: Interferences in the water appeared to have caused incorrect readings by the DO probe.</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? | NA | |
| Was one pump/tubing volume removed prior to sampling? | NA | |
| 9. Were duplicates taken at a frequency of one per 20 samples? | Yes | A duplicate sample was collected at location 0675. |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | NA | |
| 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 | |
| Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report? | Yes | |
| 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): 10113425
 Sample Event: November 12, 2010
 Site(s): Ambrosia Lake, New Mexico
 Laboratory: GEL Laboratories, Charleston, South Carolina
 Work Order No.: 267058
 Analysis: Metals, Radiochemistry, and Wet Chemistry
 Validator: Gretchen Baer
 Review Date: January 20, 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 2.

Table 2. Analytes and Methods

| Analyte | Line Item Code | Prep Method | Analytical Method |
|--|----------------|--|--|
| Alkalinity, Bicarbonate | WCH-A-003 | EPA 310.1/SMEWW 2320B | EPA 310.1/SMEWW 2320B |
| Alkalinity, Carbonate | WCH-A-004 | EPA 310.1/SMEWW 2320B | EPA 310.1/SMEWW 2320B |
| Chloride | MIS-A-039 | EPA 300.0 | EPA 300.0 |
| Calcium, Magnesium, Potassium, Sodium | LMM-01 | SW-846 3005 | SW-846 6010B |
| Arsenic, Molybdenum, Selenium, Uranium | LMM-02 | SW-846 3005 | SW-846 6020 |
| Nitrate + Nitrite as N | WCH-A-022 | EPA 353.2 | EPA 353.2 |
| Sulfate | MIS-A-044 | EPA 300.0 | EPA 300.0 |
| Total Dissolved Solids | WCH-A-033 | SMEWW 2540C | SMEWW 2540C |
| Tritium | LSC-A-001 | EPA 906.0 Mod GL-RAD-A-002 R18 | EPA 906.0 Mod GL-RAD-A-002 R18 |
| Uranium Isotopes | ASP-A-024 | HASL-300, U-02-RC Mod, GL-RAD-A-011 R20 | HASL-300, U-02-RC Mod, GL-RAD-A-011 R20 |

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to the sections below for an explanation of the data qualifiers applied.

Table 3. Data Qualifier Summary

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---------------|----------------|------------|------|----------------------|
| All | All | Molybdenum | J | Matrix spike failure |
| All | All | Uranium | J | Matrix spike failure |
| 267058-001 | 0675 | Arsenic | J | Matrix spike failure |
| 267058-003 | 0675 Dup, 2073 | Arsenic | J | Matrix spike failure |

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received 3 water samples on November 16, 2010, accompanied by a Chain of Custody form. The air bill numbers were listed in the receiving documentation. The Chain of Custody form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody form was complete with no errors or omissions with the exception that the filtration status was not included. The filtration status was documented in the field notes.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 2 °C, 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.

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 EPA 300.0

Calibrations for chloride and sulfate were performed using seven calibration standards on November 5, 2010. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were 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 four verification checks. All calibration checks met the acceptance criteria.

Methods EPA 310.1/ SMEWW 2320B and SMEWW 2540C

There are no initial or continuing calibration requirements associated with the alkalinity or total dissolved solids methods.

Method EPA 353.2

Calibrations for nitrate + nitrite as N were performed using five calibration standards on November 17, 2010. 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. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in two verification checks. All calibration check results were within the acceptance criteria.

Method SW-846 6010B

Calibrations for calcium, magnesium, potassium, and sodium were performed on December 9, 2010, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the calibration curve intercepts were less than 3 times the 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 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 6020

Calibrations were performed for arsenic, molybdenum, selenium, and uranium on December 13, 2010, using two calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the calibration curve intercepts were less than 3 times the 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 11 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 PQL and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Radiochemical Analysis

Radiochemical results are qualified with a “U” flag (not detected) when the result is greater than the minimum detectable concentration (MDC) but less than the Decision Level Concentration, estimated as 3 times the one-sigma total propagated uncertainty. Results above the Decision Level Concentration and the MDC are qualified with a “J” flag (estimated) when the result is less than the Determination Limit (3 times the MDC).

Uranium Isotopes

Alpha spectrometry calibrations and instrument backgrounds were performed within a month prior to sample analysis. Calibration standards were counted to obtain a minimum of 10,000 counts per peak. Daily instrument checks performed on December 6, 2010, met the acceptance criteria. The tracer recoveries met the acceptance criteria of 30 to 110 percent for all samples. The full width at half maximum was reviewed to evaluate the spectral resolution. All internal standard full width at half maximum values were below 100 kiloelectron volts, demonstrating acceptable resolution. All internal standard peaks were within 50 kiloelectron

volts of the expected position. The regions of interest for analyte peaks were reviewed. No manual integrations were performed and all regions of interest were satisfactory. Uranium-234 results were corrected for tracer impurity.

Tritium

The tritium quench calibration curve was generated on August 12, 2010, for quench indicator values ranging from 119 to 355. Daily instrument checks performed on December 9, 2010, met the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Methods without sample preparation do not require the analysis of a method blank. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis.

Metals and Wet Chemistry

All method blank and calibration blank results associated with the samples were below the PQLs with the following exceptions. Some blank results for molybdenum and uranium were above the PQL. The samples associated with these blanks had concentrations greater than 10 times the blank. Some other metals blanks exceeded the MDL but all associated sample results were greater than 5 times the blank concentrations. For potassium, some calibration blanks were negative and the absolute values were greater than the MDL but less than the PQL. All potassium results were greater than 5 times the MDL, so no results are qualified.

Radiochemistry

The method blank results were less than the Decision Level Concentration.

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

ICP 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 (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 spikes met the recovery and precision criteria for all analytes evaluated with the following exceptions. The arsenic, molybdenum, and uranium MS recoveries were above the acceptance range. The affected results that were above the detection limit are qualified with a "J" flag (estimated). At 123 percent, the MS recovery of sulfate exceeded the laboratory's acceptance criteria, but was within the ± 25 percent requirement for methods for which no digestion is employed.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for non-radiochemical 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. The relative error ratio for radiochemical replicate results (calculated using the one-sigma total propagated uncertainty) was less than three, indicating acceptable precision.

Laboratory Control Sample

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. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the PQL for method 6010 or greater than 100 times the PQL for method 6020. All evaluated serial dilution data were acceptable.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis for several analytes to reduce interferences. The required detection limits were met for all analytes with the following exceptions. The arsenic and selenium detection limits were 1.6 and 1 micrograms per liter ($\mu\text{g/L}$), respectively, which are above the Line Item Code required detection limits of 0.1 $\mu\text{g/L}$. All radiochemical MDCs were calculated using the equation specified in *Quality Systems for Analytical Services*. All reported MDCs were less than the required MDCs.

Completeness

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

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. All peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on December 15, 2010. 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.

SAMPLE MANAGEMENT SYSTEM
General Data Validation Report

RIN: 10113425 Lab Code: GEN Validator: Gretchen Baer Validation Date: 1/19/2011

Project: Ambrosia Lake Disposal Site Analysis Type: Metals General Chem Rad Organics

of Samples: 3 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.

There are 6 detection limit failures.

There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Non-Compliance Report: Detection Limits

RIN: 10113425 Lab Code: GEN

Project: Ambrosia Lake Disposal Site

Validation Date: 1/19/2011

| Ticket | Location | Lab Sample ID | Method Code | Lab Method | Analyte Name | Result | Qualifier | Reported Detection Limit | Required Detection Limit | Units |
|---------|----------|---------------|-------------|---------------|--------------|--------|-----------|--------------------------|--------------------------|-------|
| IMX 466 | 0675 | 267058001 | LMM-02 | EPA 3005/6020 | Selenium | 1250 | | 1 | 0.1 | µg/L |
| IMX 466 | 0675 | 267058001 | LMM-02 | EPA 3005/6020 | Arsenic | 47.2 | N | 1.6 | 0.1 | µg/L |
| IMX 469 | 0678 | 267058002 | LMM-02 | EPA 3005/6020 | Arsenic | 1.60 | UN | 1.6 | 0.1 | µg/L |
| IMX 469 | 0678 | 267058002 | LMM-02 | EPA 3005/6020 | Selenium | 50.5 | | 1 | 0.1 | µg/L |
| IMX 470 | 2073 | 267058003 | LMM-02 | EPA 3005/6020 | Selenium | 1290 | | 1 | 0.1 | µg/L |
| IMX 470 | 2073 | 267058003 | LMM-02 | EPA 3005/6020 | Arsenic | 47 | N | 1.6 | 0.1 | µg/L |

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 10113425Lab Code: GENDate Due: 12/14/2010Matrix: WaterSite Code: AMB01Date Completed: 12/14/2010

| Analyte | 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 | | | | | | | | |
| 1Calcium | 12/09/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 106.0 | | | 1.0 | 100.0 | 1.0 | 109.0 |
| 1Magnesium | 12/09/2010 | 0.0000 | 0.9999 | OK | OK | OK | OK | OK | 108.0 | | | 1.0 | 100.0 | 2.0 | 106.0 |
| 1Potassium | 12/09/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 102.0 | 88.3 | | 4.0 | 114.0 | | 106.0 |
| 1Sodium | 12/09/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 102.0 | | | 1.0 | 108.0 | 4.0 | 108.0 |
| Arsenic | 12/13/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 107.0 | 172.0 | | 12.0 | 102.0 | | 114.0 |
| Molybdenum | 12/13/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 107.0 | 130.0 | | 3.0 | 96.0 | 0.5 | 117.0 |
| Selenium | 12/13/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 101.0 | | | 0.0 | 107.0 | 2.4 | 111.0 |
| Uranium | 12/13/2010 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 110.0 | 139.0 | | 2.0 | 100.0 | 2.0 | 106.0 |

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 10113425 **Lab Code:** GEN **Date Due:** 12/14/2010
Matrix: Water **Site Code:** AMB01 **Date Completed:** 12/14/2010

| Analyte | Date Analyzed | CALIBRATION | | | | | | Method Blank | LCS %R | MS %R | MSD %R | DUP RPD | Serial Dil. %R |
|----------------------------|---------------|-------------|--------|-----|-----|-----|-----|-----------------|-----------|----------|-----------|------------|-------------------|
| | | Int. | R^2 | ICV | CCV | ICB | CCB | | | | | | |
| ALKALINITY, Total as CaCO3 | 11/22/2010 | | | | | | | OK | 100.00 | | | | |
| Chloride | 11/05/2010 | 0.111 | 0.9986 | OK | | OK | | | | | | | |
| Chloride | 11/17/2010 | | | | OK | | OK | OK | 96.30 | | | | |
| Chloride | 11/18/2010 | | | | | | | | | 104.0 | | 0 | |
| Chloride | 11/18/2010 | | | | | | | | | 105.0 | | 1.00 | |
| NO2+NO3 as N | 11/17/2010 | 0.001 | 0.9999 | OK | OK | OK | OK | OK | 101.00 | 92.4 | | 1.00 | |
| Sulfate | 11/05/2010 | 0.286 | 0.9996 | OK | | OK | | | | | | | |
| Sulfate | 11/17/2010 | | | | OK | | OK | OK | 99.00 | | | | |
| Sulfate | 11/18/2010 | | | | | | | | | 123.0 | | 2.00 | |
| Sulfate | 11/19/2010 | | | | | | | | | 104.0 | | 1.00 | |
| Total Dissolved Solids | 11/17/2010 | | | | | | | OK | 98.30 | | | 2.00 | |

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 10113425 **Lab Code:** GEN **Date Due:** 12/14/2010
Matrix: Water **Site Code:** AMB01 **Date Completed:** 12/14/2010

| Sample | Analyte | Date Analyzed | Result | Flag | Tracer %R | LCS %R | MS %R | Duplicate |
|--------|-----------------|---------------|---------|------|-----------|--------|-------|-----------|
| 0675 | Tritium | 12/09/2010 | | | | | | 0.11 |
| Blank | Tritium | 12/09/2010 | 41.8000 | U | | | | |
| LCS | Tritium | 12/09/2010 | | | | 92.90 | | |
| 0675 | Tritium | 12/09/2010 | | | | | 101.0 | |
| 0675 | Uranium-233+234 | 12/06/2010 | | | 100.0 | | | |
| 0678 | Uranium-233+234 | 12/06/2010 | | | 94.0 | | | |
| 2073 | Uranium-233+234 | 12/06/2010 | | | 83.0 | | | |
| 0675 | Uranium-233+234 | 12/06/2010 | | | 98.0 | | | 0.13 |
| 0675 | Uranium-233+234 | 12/06/2010 | | | 98.0 | | | |
| Blank | Uranium-233+234 | 12/06/2010 | -0.0678 | U | 98.0 | | | |
| 0675 | Uranium-233+234 | 12/06/2010 | | | | | | 0.11 |
| Blank | Uranium-235 | 12/06/2010 | 0.0423 | U | 98.0 | | | |
| 0675 | Uranium-235/236 | 12/06/2010 | | | | | | |
| 0675 | Uranium-238 | 12/06/2010 | | | | | | 0.48 |
| LCS | Uranium-238 | 12/06/2010 | | | | 106.00 | | |
| 0675 | Uranium-238 | 12/06/2010 | | | | | 109.0 | |
| Blank | Uranium-238 | 12/06/2010 | 0.0513 | U | 98.0 | | | |

Sampling Quality Control Assessment

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

Sampling Protocol

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

Equipment Blank Assessment

No equipment blanks were taken. All samples were collected using dedicated equipment that did not require equipment blanks.

Field Duplicate Analysis

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 0675 (field duplicate ID 2073). The non-radiochemical duplicate results met the criteria, demonstrating acceptable overall precision. The relative error ratio for radiochemical duplicate results (calculated using the one-sigma total propagated uncertainty) was less than three, indicating acceptable precision.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

Page 1 of 1

RIN: 10113425 Lab Code: GEN Project: Ambrosia Lake Disposal Site Validation Date: 1/19/2011

Duplicate: 2073

Sample: 0675

| Analyte | Sample | | | | Duplicate | | | | RPD | RER | Units |
|--------------------------------|--------|------|-------|----------|-----------|------|-------|----------|-------|-----|-------|
| | Result | Flag | Error | Dilution | Result | Flag | Error | Dilution | | | |
| Arsenic | 47.2 | N | | 1.00 | 47 | N | | 1.00 | 0.42 | | ug/L |
| Bicarbonate alkalinity (CaCO3) | 102 | | | 1.00 | 104 | | | 1.00 | 1.94 | | mg/L |
| Calcium | 451000 | | | 1.00 | 447000 | | | 1.00 | 0.89 | | ug/L |
| Carbonate alkalinity (CaCO3) | 0.725 | U | | 1.00 | 0.725 | U | | 1.00 | | | mg/L |
| Chloride | 246 | | | 100.00 | 247 | | | 100.00 | 0.41 | | mg/L |
| Magnesium | 213000 | | | 1.00 | 215000 | | | 1.00 | 0.93 | | ug/L |
| Molybdenum | 47.7 | N | | 1.00 | 41.8 | N | | 1.00 | 13.18 | | ug/L |
| NO2+NO3 as N | 21.8 | | | 50.00 | 22.8 | | | 50.00 | 4.48 | | mg/L |
| Potassium | 5500 | | | 10.00 | 5890 | | | 10.00 | 6.85 | | ug/L |
| Selenium | 1250 | | | 10.00 | 1290 | | | 10.00 | 3.15 | | ug/L |
| Sodium | 732000 | | | 10.00 | 717000 | | | 10.00 | 2.07 | | ug/L |
| Sulfate | 3310 | | | 100.00 | 3110 | | | 100.00 | 6.23 | | mg/L |
| Total Dissolved Solids | 5240 | | | 1.00 | 5250 | | | 1.00 | 0.19 | | mg/L |
| Tritium | 86.5 | U | 193 | 1.00 | 20.8 | U | 190 | 1.00 | | 0.5 | pCi/L |
| Uranium | 128 | N | | 1.00 | 140 | N | | 1.00 | 8.96 | | ug/L |
| Uranium-233+234 | 44.4 | | 6.37 | 1.00 | 50.4 | | 7.31 | 1.00 | 12.66 | 1.2 | pCi/L |
| Uranium-235/236 | 1.94 | | 0.495 | 1.00 | 2.07 | | 0.538 | 1.00 | 6.48 | 0.3 | pCi/L |
| Uranium-238 | 33.3 | | 4.84 | 1.00 | 39.2 | | 5.75 | 1.00 | 16.28 | 1.5 | pCi/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 Donovan 2-9-2011
Steve Donovan Date

Data Validation Lead: Gretchen Baer 2/9/11
Gretchen Baer 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.

Results for magnesium, selenium, sodium, and total dissolved solids at 0675 were identified as potentially anomalous. Magnesium, sodium, and total dissolved solids have not been tested at 0675 since 1996. Because the gap between the November 2011 data and the previous data is 15 years for these analytes, points slightly outside historical ranges do not necessarily indicate errors in the data. The selenium results for location 0675 had a concentration slightly higher than previously observed. Recent results for selenium indicate possible upward trending at this location. The results from this sampling event are acceptable as qualified.

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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 AMB01, Ambrosia Lake Disposal Site

REPORT DATE: 1/20/2011

Location: 0675 WELL

| Parameter | Units | Sample | | Depth Range (Ft BLS) | Result | Lab | Qualifiers | | Detection Limit | Uncertainty |
|------------------------------------|-------|------------|------|-------------------------|--------|-----|------------|----|--------------------|-------------|
| | | Date | ID | | | | Data | QA | | |
| Alkalinity, Bicarbonate (As CaCO3) | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 102 | | F | # | 0.725 | |
| Alkalinity, Bicarbonate (As CaCO3) | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 104 | | F | # | 0.725 | |
| Alkalinity, Carbonate (As CaCO3) | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 0.725 | U | F | # | 0.725 | |
| Alkalinity, Carbonate (As CaCO3) | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 0.725 | U | F | # | 0.725 | |
| Arsenic | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 0.0472 | N | FJ | # | 0.0016 | |
| Arsenic | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 0.047 | N | FJ | # | 0.0016 | |
| Calcium | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 451 | | F | # | 0.05 | |
| Calcium | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 447 | | F | # | 0.05 | |
| Chloride | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 246 | | F | # | 6.6 | |
| Chloride | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 247 | | F | # | 6.6 | |
| Dissolved Oxygen | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 2.18 | | F | # | | |
| Magnesium | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 213 | | F | # | 0.085 | |
| Magnesium | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 215 | | F | # | 0.085 | |
| Molybdenum | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 0.0477 | N | FJ | # | 0.000167 | |
| Molybdenum | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 0.0418 | N | FJ | # | 0.000167 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 21.8 | | F | # | 0.5 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 22.8 | | F | # | 0.5 | |

Groundwater Quality Data by Location (USEE100) FOR SITE AMB01, Ambrosia Lake Disposal Site

REPORT DATE: 1/20/2011

Location: 0675 WELL

| Parameter | Units | Sample Date | ID | Depth Range (Ft BLS) | | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-------------------------------|----------|-------------|------|----------------------|---------|--------|-----|-----------------|----|-----------------|-------------|
| Oxidation Reduction Potential | mV | 11/12/2010 | N001 | 21.81 | - 31.81 | 74.5 | | F | # | | |
| pH | s.u. | 11/12/2010 | N001 | 21.81 | - 31.81 | 7.11 | | F | # | | |
| Potassium | mg/L | 11/12/2010 | N001 | 21.81 | - 31.81 | 5.5 | | F | # | 0.5 | |
| Potassium | mg/L | 11/12/2010 | N002 | 21.81 | - 31.81 | 5.89 | | F | # | 0.5 | |
| Selenium | mg/L | 11/12/2010 | N001 | 21.81 | - 31.81 | 1.25 | | F | # | 0.01 | |
| Selenium | mg/L | 11/12/2010 | N002 | 21.81 | - 31.81 | 1.29 | | F | # | 0.01 | |
| Sodium | mg/L | 11/12/2010 | N001 | 21.81 | - 31.81 | 732 | | F | # | 1 | |
| Sodium | mg/L | 11/12/2010 | N002 | 21.81 | - 31.81 | 717 | | F | # | 1 | |
| Specific Conductance | umhos/cm | 11/12/2010 | N001 | 21.81 | - 31.81 | 6327 | | F | # | | |
| Sulfate | mg/L | 11/12/2010 | N001 | 21.81 | - 31.81 | 3310 | | F | # | 10 | |
| Sulfate | mg/L | 11/12/2010 | N002 | 21.81 | - 31.81 | 3110 | | F | # | 10 | |
| Temperature | C | 11/12/2010 | N001 | 21.81 | - 31.81 | 8.73 | | F | # | | |
| Total Dissolved Solids | mg/L | 11/12/2010 | N001 | 21.81 | - 31.81 | 5240 | | F | # | 2.38 | |
| Total Dissolved Solids | mg/L | 11/12/2010 | N002 | 21.81 | - 31.81 | 5250 | | F | # | 2.38 | |
| Tritium | pCi/L | 11/12/2010 | N001 | 21.81 | - 31.81 | 330 | U | F | # | 330 | 193 |
| Tritium | pCi/L | 11/12/2010 | N002 | 21.81 | - 31.81 | 333 | U | F | # | 333 | 190 |
| Turbidity | NTU | 11/12/2010 | N001 | 21.81 | - 31.81 | 3.8 | | F | # | | |

Groundwater Quality Data by Location (USEE100) FOR SITE AMB01, Ambrosia Lake Disposal Site

REPORT DATE: 1/20/2011

Location: 0675 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-----------------|-------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Uranium | mg/L | 11/12/2010 | N001 | 21.81 - 31.81 | 0.128 | N | FJ | # | 0.00005 | |
| Uranium | mg/L | 11/12/2010 | N002 | 21.81 - 31.81 | 0.14 | N | FJ | # | 0.00005 | |
| Uranium-234 | pCi/L | 11/12/2010 | N001 | 21.81 - 31.81 | 44.4 | | F | # | 0.14 | 6.37 |
| Uranium-234 | pCi/L | 11/12/2010 | N002 | 21.81 - 31.81 | 50.4 | | F | # | 0.201 | 7.31 |
| Uranium-235/236 | pCi/L | 11/12/2010 | N001 | 21.81 - 31.81 | 1.94 | | F | # | 0.173 | 0.495 |
| Uranium-235/236 | pCi/L | 11/12/2010 | N002 | 21.81 - 31.81 | 2.07 | | F | # | 0.0776 | 0.538 |
| Uranium-238 | pCi/L | 11/12/2010 | N001 | 21.81 - 31.81 | 33.3 | | F | # | 0.175 | 4.84 |
| Uranium-238 | pCi/L | 11/12/2010 | N002 | 21.81 - 31.81 | 39.2 | | F | # | 0.0628 | 5.75 |

Groundwater Quality Data by Location (USEE100) FOR SITE AMB01, Ambrosia Lake Disposal Site

REPORT DATE: 1/20/2011

Location: 0678 WELL

| Parameter | Units | Sample Date | ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|------------------------------------|----------|-------------|------|----------------------|---------|-----|-----------------|----|-----------------|-------------|
| Alkalinity, Bicarbonate (As CaCO3) | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 760 | | F | # | 0.725 | |
| Alkalinity, Carbonate (As CaCO3) | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 0.725 | U | F | # | 0.725 | |
| Arsenic | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 0.0016 | UN | F | # | 0.0016 | |
| Calcium | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 405 | | F | # | 0.05 | |
| Chloride | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 288 | | F | # | 6.6 | |
| Magnesium | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 496 | | F | # | 0.85 | |
| Molybdenum | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 0.00526 | N | FJ | # | 0.000167 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 300 | | F | # | 2.5 | |
| Oxidation Reduction Potential | mV | 11/12/2010 | N001 | 237.15 - 257.15 | -50.9 | | F | # | | |
| pH | s.u. | 11/12/2010 | N001 | 237.15 - 257.15 | 7.2 | | F | # | | |
| Potassium | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 29.4 | | F | # | 0.5 | |
| Selenium | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 0.0505 | | F | # | 0.005 | |
| Sodium | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 2800 | | F | # | 1 | |
| Specific Conductance | umhos/cm | 11/12/2010 | N001 | 237.15 - 257.15 | 17013 | | F | # | | |
| Sulfate | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 7530 | | F | # | 50 | |
| Temperature | C | 11/12/2010 | N001 | 237.15 - 257.15 | 11.63 | | F | # | | |
| Total Dissolved Solids | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 14400 | | F | # | 4.76 | |
| Tritium | pCi/L | 11/12/2010 | N001 | 237.15 - 257.15 | 333 | U | F | # | 333 | 193 |

Groundwater Quality Data by Location (USEE100) FOR SITE AMB01, Ambrosia Lake Disposal Site

REPORT DATE: 1/20/2011

Location: 0678 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Lab | Qualifiers Data | QA | Detection Limit | Uncertainty |
|-----------------|-------|-------------|-----------|----------------------|--------|-----|-----------------|----|-----------------|-------------|
| Turbidity | NTU | 11/12/2010 | N001 | 237.15 - 257.15 | 1.46 | | F | # | | |
| Uranium | mg/L | 11/12/2010 | N001 | 237.15 - 257.15 | 0.0565 | N | FJ | # | 0.00005 | |
| Uranium-234 | pCi/L | 11/12/2010 | N001 | 237.15 - 257.15 | 81.8 | | F | # | 0.055 | 11.5 |
| Uranium-235/236 | pCi/L | 11/12/2010 | N001 | 237.15 - 257.15 | 1.22 | | F | # | 0.068 | 0.368 |
| Uranium-238 | pCi/L | 11/12/2010 | N001 | 237.15 - 257.15 | 19.1 | | F | # | 0.14 | 2.88 |

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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STATIC WATER LEVELS (USEE700) FOR SITE AMB01, Ambrosia Lake Disposal Site
REPORT DATE: 1/20/2011

| 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 |
|---------------|-----------|------------------------------|------------------|------------------|-------------------------------|----------------------|------------------|
| 0675 | D | 6966.65 | 11/12/2010 | 08:59:53 | 19.92 | 6946.73 | |
| 0678 | C | 6987.94 | 11/12/2010 | 13:50:23 | 226.08 | 6761.86 | |

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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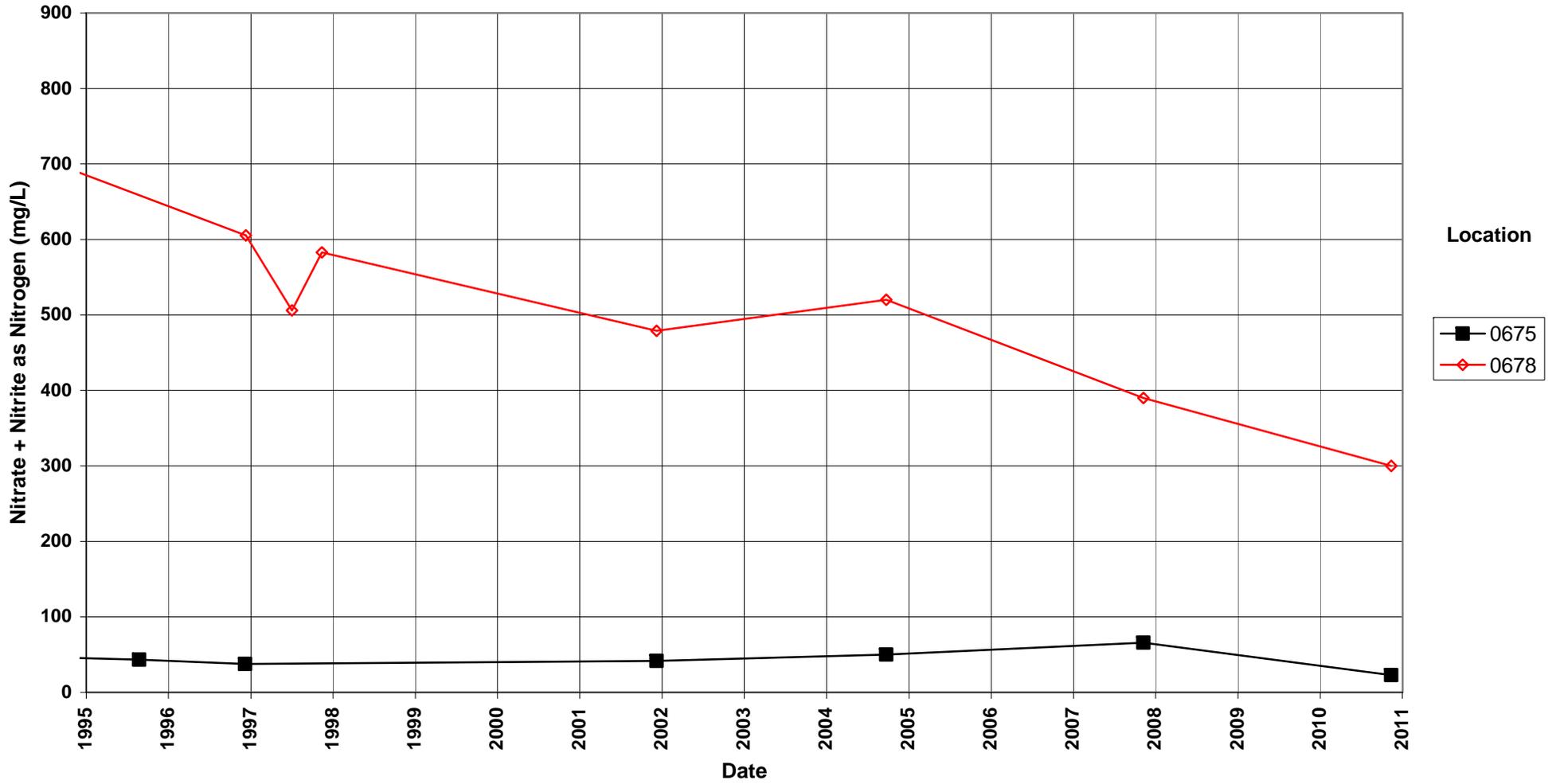
Time-Concentration Graphs

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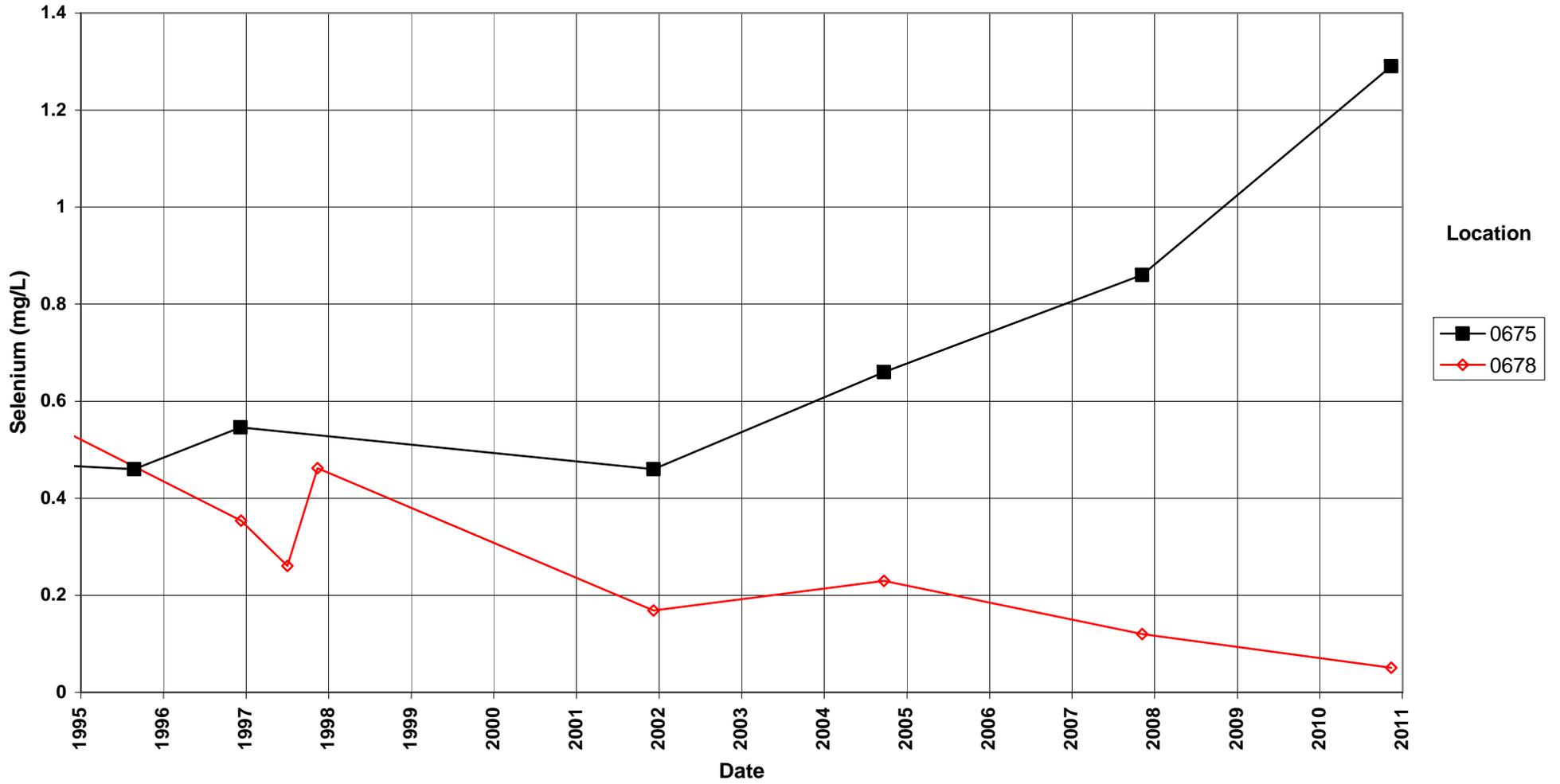
Ambrosia Lake Disposal Site Molybdenum Concentration



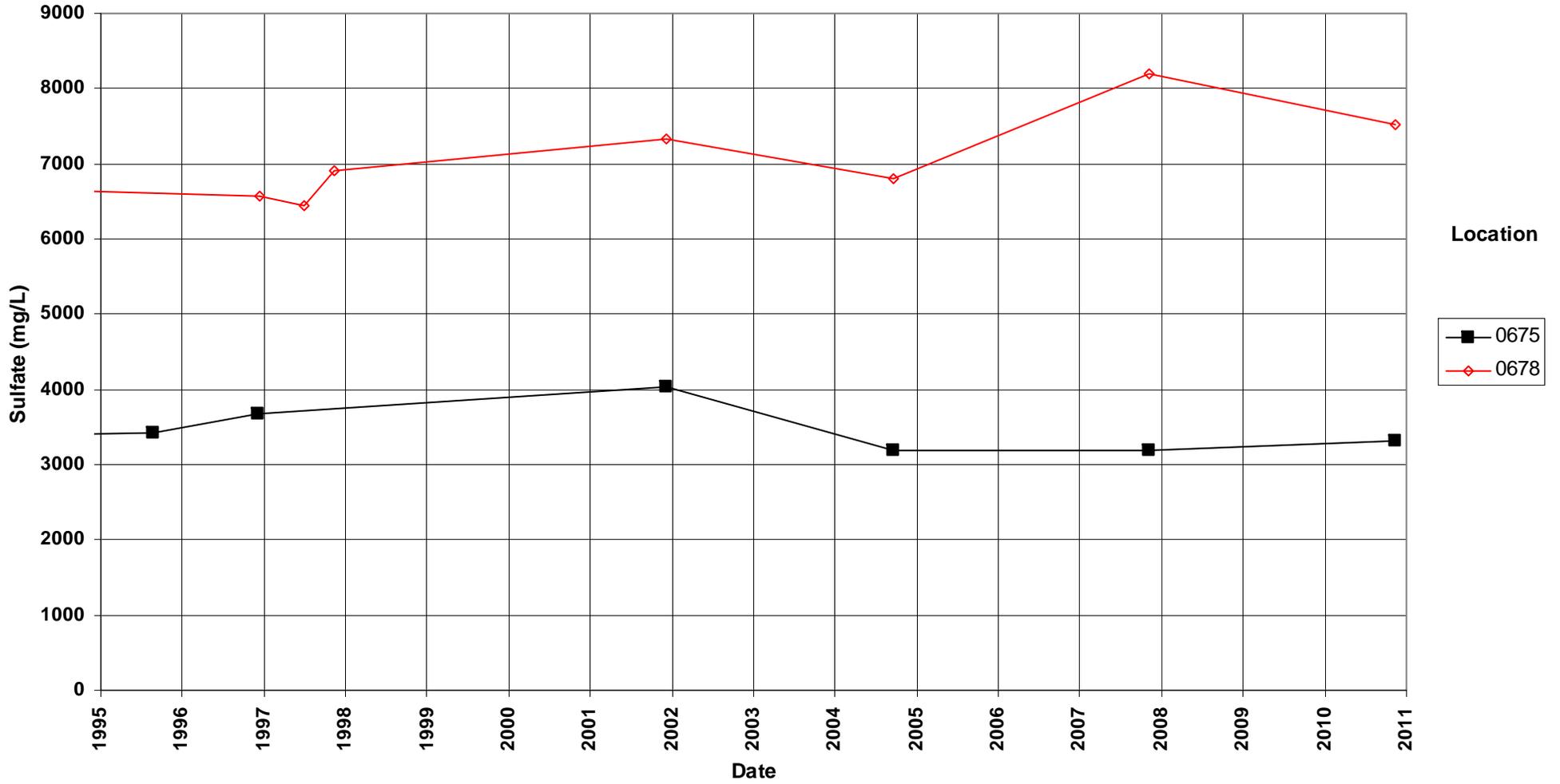
Ambrosia Lake Disposal Site Nitrate + Nitrite as Nitrogen Concentration



Ambrosia Lake Disposal Site Selenium Concentration



Ambrosia Lake Disposal Site Sulfate Concentration



Ambrosia Lake Disposal Site 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 11-0041

October 14, 2010

U.S. Department of Energy
Office of Legacy Management
ATTN: Dr. April Gil
Site Manager
2597 B ¼ Rd.
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
November 2010 Environmental Sampling at Ambrosia Lake, New Mexico

REFERENCE: Task Order LM-501-02-101-402, Ambrosia Lake, NM, Disposal Site

Dear Dr. Gil:

The purpose of this letter is to inform you of the upcoming sampling at Ambrosia Lake, New Mexico. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring at the Ambrosia Lake disposal site. Water quality data will be collected from monitoring wells at this site as part of the environmental sampling currently scheduled to begin the week of November 8, 2010.

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

Monitoring Wells*
675 Km 678 Tb

*NOTE: Km = Mancos shale; Tb = Tres Hermanos-B sandstone

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 contact me at (970) 248-6022 if you have any questions or concerns.

Sincerely,

Richard K. Johnson
Site Lead

The S.M. Stoller Corporation 2597 B ¼ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

Dr. April Gil
Control Number 11-0041
Page 2

RKJ/lcg/lb

Enclosures (3)

cc: (electronic)
Cheri Bahrke, Stoller
Steve Donovan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Richard Johnson, Stoller
EDD Delivery
rc-grand.junction
File: AMB 410.02 (A)

Constituent Sampling Breakdown

| Site | Ambrosia Lake | | Required Detection Limit (mg/L) | Analytical Method | Line Item Code |
|---|---------------|---------------|---------------------------------------|----------------------|-------------------|
| | Groundwater | Surface Water | | | |
| Analyte | | | | | |
| Approx. No. Samples/yr | 2 | 0 | | | |
| Field Measurements | | | | | |
| Alkalinity | | | | | |
| Dissolved Oxygen | X | | | | |
| Redox Potential | X | | | | |
| pH | X | | | | |
| Specific Conductance | X | | | | |
| Turbidity | X | | | | |
| Temperature | X | | | | |
| Laboratory Measurements | | | | | |
| Aluminum | | | | | |
| Arsenic | X | | 0.0001 | SW-846 6020 | LMM-02 |
| Bicarbonate | X | | 10 | SM2320 B | WCH-A-003 |
| Calcium | X | | 5 | SW-846 6010 | LMM-01 |
| Carbonate | X | | 10 | SM2320 B | WCH-A-004 |
| Chloride | X | | 0.5 | SW-846 9056 | WCH-A-039 |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | X | | 5 | SW-846 6010 | LMM-01 |
| Manganese | | | | | |
| Molybdenum | X | | 0.003 | SW-846 6020 | LMM-02 |
| Nickel | | | | | |
| Nickel-63 | | | | | |
| Nitrate + Nitrite as N (NO ₃ +NO ₂)-N | X | | 0.05 | EPA 353.1 | WCH-A-022 |
| Potassium | X | | 1 | SW-846 6010 | LMM-01 |
| Radium-226 | | | | | |
| Radium-228 | | | | | |
| Selenium | X | | 0.0001 | SW-846 6020 | LMM-02 |
| Silica | | | | | |
| Sodium | X | | 1 | SW-846 6010 | LMM-01 |
| Strontium | | | | | |
| Sulfate | X | | 0.5 | SW-846 9056 | MIS-A-044 |
| Sulfide | | | | | |
| Total Dissolved Solids | X | | 10 | SM2540 C | WCH-A-033 |
| Total Organic Carbon | | | | | |
| Tritium | X | | 400 pCi/L | Liquid Scintillation | LSC-A-001 |
| Uranium | X | | 0.0001 | SW-846 6020 | LMM-02 |
| U-234, -238 | X | | 1 pCi/L | Alpha Spectrometry | ASP-A-024 |
| Vanadium | | | | | |
| Zinc | | | | | |
| Total No. of Analytes | 16 | 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.

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Attachment 4
Trip Report

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Memorandum

Control Number N/A

DATE: December 8, 2010
TO: Dick Johnson
FROM: Jeff Walters
SUBJECT: Trip Report

Site: Ambrosia Lake, New Mexico

Date of Sampling Event: November 12, 2010

Team Members: Kent Moe and Jeff Walters

Number of Locations Sampled: Two wells were sampled for Ca, K, Mg, Na, As, Mo, Se, U, CL, Alk-Carb, Alk-Bicarb, SO₄, TDS, (NO₃+NO₂)-N, tritium, U-234, and U-238. One duplicate sample was collected for QC purposes.

Locations Not Sampled/Reason: None.

Location Specific Information:

| TICKET NUMBER | SAMPLE DATE | LOCATION | DESCRIPTION |
|---------------|-------------|----------|-------------|
| IMX 466 | 11/12/10 | 0675 | CAT I |
| IMX 469 | 11/12/10 | 0678 | CAT I |

Field Variance: The pump in 0678 is set at ~245 feet below top of casing. The water level was only ~20 feet above the pump. This caused the well to purge and fill sample containers extremely slow. The flow rate averaged ~10-20 ml/m. Well below the 100ml/m required for the low flow procedure.

Quality Control Sample Cross Reference:

| FALSE ID | TRUE ID | SAMPLE TYPE | ASSOCIATED MATRIX | TICKET NUMBER |
|----------|---------|-------------|-------------------|---------------|
| 2073 | 0675 | Duplicate | Groundwater | IMX 470 |

Requisition Numbers Assigned: 10113425

Water Level Measurements: Water levels were collected in all sampled wells. See *Water Sampling Field Data* logs for measurements.

Dick Johnson
December 8, 2010
Page 2

Well Inspection Summary: Well inspections were conducted on both sampled wells. Both wells were in good condition.

Equipment: Monitoring well 0675 was sampled using a peristaltic pump and the low flow procedure. 0678 was sampled using a dedicated bladder pump and the low flow procedure. In the future, 0678 needs to be sampled using the MP10UH control box.

Sample Shipment: All samples were shipped via Fed-Ex to GEL Labs in Charleston, SC from Grand Junction on November 15, 2010.

Institutional Controls

Fences, Gates, Locks: All were ok

Signs: No problems observed

Trespassing/Site Disturbances: No problems observed

Site Issues

Disposal Cell/Drainage Structure Integrity: No problems observed

Vegetation/Noxious Weed Concerns: N/A

Maintenance Requirements: None

Corrective Action: None taken.

cc: (electronic)
Chris Clayton, DOE
Steve Donovan, Stoller
EDD Delivery