National Nuclear Security Administration
Sandia Site Office
P. O. Box 5400
Albuquerque, NM 87185

OCT 28 2011

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. John E. Kieling
Acting Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505

SUBJECT: Environmental Restoration Operations Consolidated Quarterly Report, October 2011

Dear Mr. Kieling:

On behalf of the Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation, DOE/NNSA is submitting the Environmental Restoration Operations Consolidated Quarterly Report, October 2011 that addresses all quarterly reporting (from April through June 2011) required under the *Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act Permit, the Compliance Order on Consent and the Chemical Waste Landfill (CWL) Closure Plan* for Sandia National Laboratories/New Mexico, Environmental Protection Agency EPA No. 5890110518.

Should you have any questions regarding this transmittal, please feel free to contact me at (505) 845-6036 or Joe Estrada of my staff at (505) 845-5326. For perchlorate or CWL groundwater-related items, please contact Carolyn Holloway of my staff at (505) 845-5326.

Sincerely,

Patty Wagner
Manager

Enclosure

cc w/enclosure:
William Moats, NMED-HWB (via Certified Mail)
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11-312-391833

CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

Document title: **Environmental Restoration Operations Consolidated Quarterly Report, October 2011**

Document author: **John Cochran, Department 06234**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Signature: _____ 10/24/11
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Ms. Patty Wagner, Manager
U.S. Department of Energy
National Nuclear Security Administration
Sandia Site Office
Owner and Co-Operator

Sandia National Laboratories

Sandia National Laboratories, New Mexico

Environmental Restoration Operations

A U.S. Department of Energy Environmental Cleanup Program

Consolidated Quarterly Report

April through June 2011

October 2011

United States Department of Energy
Sandia Site Office

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CONSOLIDATED QUARTERLY REPORT

October 2011

SANDIA NATIONAL LABORATORIES, NEW MEXICO (SNL/NM)

ENVIRONMENTAL RESTORATION OPERATIONS

U.S. DEPARTMENT OF ENERGY:	SANDIA SITE OFFICE
CONTRACTOR:	SANDIA CORPORATION
PROJECT MANAGER:	John Cochran

NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO THIS PERMIT: 36

SUSPECT WASTE: Radionuclides, metals, organic compounds, and explosives

REPORTING PERIOD: April through June 2011

OVERVIEW

This SNL/NM Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) addresses all quarterly reporting requirements pertaining to the Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act Permit, the Compliance Order on Consent, and the Chemical Waste Landfill Closure Plan. The 36 potential release sites that require corrective action under the Permit and Compliance Order on Consent consist of 27 Solid Waste Management Units, which include the Mixed Waste Landfill. The remaining potential release sites are nine Area of Concern sites, which include eight Drain and Septic System sites and the Tijeras Arroyo Groundwater Area of Concern. The Burn Site Groundwater and Technical Area V Groundwater areas of investigation are not included on the current HSWA Permit but have been added as Areas of Concern to the revised HSWA Permit that is pending approval by NMED at this time. This ER Quarterly Report presents activities and data in sections as follows:

SECTION I:	Environmental Restoration Operations Consolidated Quarterly Report
SECTION II:	Chemical Waste Landfill Quarterly Closure Progress Report
SECTION III:	Perchlorate Screening Quarterly Monitoring Report
SECTION IV:	Solid Waste Management Units 149 and 154 Quarterly Groundwater Monitoring Report

ABBREVIATIONS AND ACRONYMS

µg/L	microgram(s) per liter
AGMR	SNL/NM Annual Groundwater Monitoring Report
AOC	Area of Concern
BSG	Burn Site Groundwater
BW	background well
CAC	Corrective Action Complete
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
CME	Corrective Measures Evaluation
CMI	Corrective Measures Implementation
COA	Certificates of Analysis
CTF	Coyote Test Field
CWL	Chemical Waste Landfill
CY	Calendar Year
CYN	Canyons (Burn Site)
DO	dissolved oxygen
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration Operations
ET	evapotranspirative
FOP	Field Operating Procedure
FY11	Fiscal Year 2011
GEL	GEL Laboratories LLC
HWHF	Hazardous Waste Handling Facility
lb(s)	pound(s)
LE	Landfill Excavation
LTES	Long-Term Environmental Stewardship
LTMMP	Long-Term Monitoring and Maintenance Plan
LTS	Long-Term Stewardship
MCL	maximum contaminant level
MDL	method detection limit
mg/L	milligram(s) per liter
MW	monitoring well
MWL	Mixed Waste Landfill
ND	nondetect
NMED	New Mexico Environment Department
NOD	Notice of Disapproval

ORP	oxidation-reduction potential
PCC	Post-Closure Care
pCi/L	picocuries per liter
PPE	personal protective equipment
QC	quality control
RCRA	Resource Conservation and Recovery Act
Sandia	Sandia Corporation
SAP	Sampling and Analysis Plan
SC	specific conductance
SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit
TA	Technical Area
TAG	Tijeras Arroyo Groundwater
TSCA	Toxic Substances Control Act
VCM	Voluntary Corrective Measure
VOC	volatile organic compound

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SECTION I
ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED QUARTERLY REPORT

1.0 Introduction

This Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) provides the status of ongoing corrective actions being implemented by Sandia National Laboratories, New Mexico (SNL/NM) ER for the April through June 2011 quarterly reporting period. The following sections outline the status of regulatory closure activities and address Mixed Waste Landfill (MWL) activities, project management and site closure, site-wide hydrogeologic characterization, and ER/Long-Term Stewardship (LTS) activities.

2.0 Environmental Restoration Operations Work Completed

2.1 Mixed Waste Landfill Activities

- On April 1, 2011, the New Mexico Environment Department (NMED) approved a request to conduct supplemental watering and cover maintenance activities at the MWL in lieu of an approved Long-Term Monitoring and Maintenance Plan (LTMMP), (Bearzi April 2011 and Wagner March 2011). A supplemental watering event was performed from June 23 through June 30, 2011. A total of 56,000 gallons of water was applied during the morning hours to minimize evaporative loss across the 4.1-acre evapotranspirative (ET) cover (cover and side slopes). One large sprinkler was operated at 16 locations to simulate a 0.5-inch rainfall event across the cover (Figure 1).

    - Sprinkler locations were determined by measuring the distance (i.e., radius) of the sprinkler output and then spacing the locations across the cover area to ensure complete coverage.

    - Due to pressure loss in the sprinkler hose at the southern end of the ET cover, the 10 southern locations were more closely spaced than the 6 northern locations (50- versus 70-foot radius) and less water was applied per location (2,600 versus 5,000 gallons).

    - Planning for additional supplemental watering and a potential reseeding effort for specific locations of the ET cover were also performed during this reporting period.

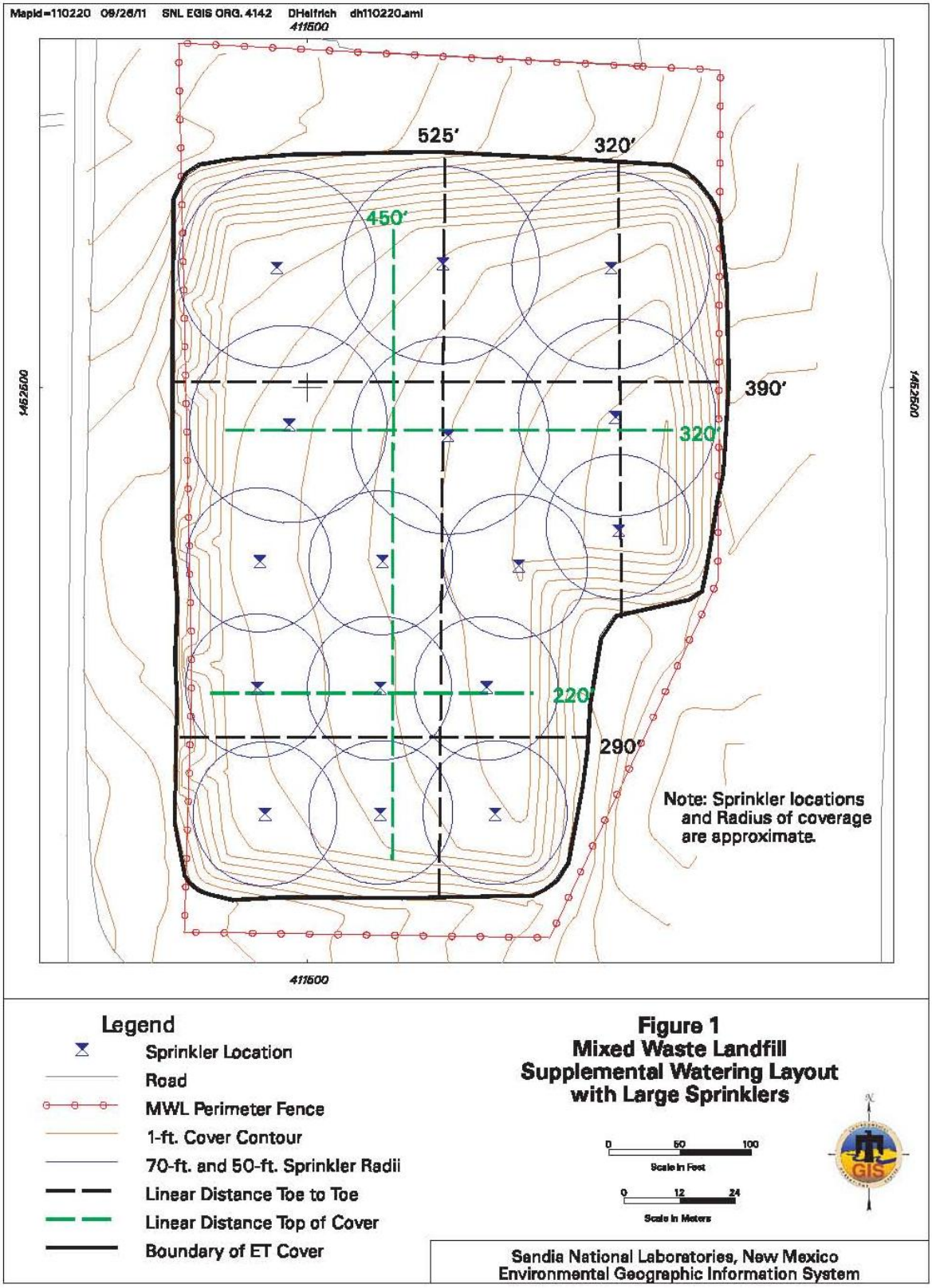

Figure 1
Mixed Waste Landfill
Supplemental Watering Layout
with Large Sprinklers

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

- On May 20, 2011, the U.S. Department of Energy (DOE) and Sandia Corporation (Sandia) received a Notice of Disapproval (NOD) from the NMED (May 2011) on the MWL Corrective Measures Implementation (CMI) Report (SNL/NM January 2010) that included eight comments. The DOE and Sandia are in the process of preparing responses to these comments that will be submitted to the NMED by August 19, 2011.

- On April 28, 2011, the NMED approved in an e-mail the DOE/Sandia request to install an access gate in the southern part of the perimeter fence (Moats April 2011). Instead of providing the revised ET cover as-built drawings depicting both the northern and southern access gates in the MWL LTMMP, as stated in the previous ER Quarterly Report (SNL/NM June 2011a), these revised drawings will be provided to the NMED as part of the MWL CMI Report NOD Response and incorporated into the revised CMI Report that will be submitted to the NMED by August 19, 2011.

- Groundwater monitoring activities for the MWL are discussed in Section I.2.3.4 of this ER Quarterly Report.

2.2 Project Management and Site Closure

Those ER sites currently undergoing regulatory and administrative closure activities are addressed in this section. Two permit modification requests are in progress with the NMED at this time that are summarized in Sections I.2.2.1 and I.2.2.2. In April 2010, DOE/Sandia received formal written communication from the NMED regarding its decisions on these sites (NMED April 2010). The decisions, presented in the NMED letter dated April 8, 2010, are summarized in Section I.2.2.3.

2.2.1 Permit Modification Request Submitted in March 2006

- Twenty-six sites were submitted to the NMED for the final determination of Corrective Action Complete (CAC) in March 2006 (Wagner March 2006). The sites included 19 Solid Waste Management Units (SWMUs) and 7 Areas of Concern (AOCs). The NMED issued the "Notice of Public Comment Period and Intent to Approve a Class 3 Permit Modification of the Resource Conservation and Recovery Act (RCRA) Permit for SNL/NM" for these 26 sites in December 2007 (NMED December 2007). The NMED public review and comment period ended in February 2008. The SWMUs and AOCs included in this permit modification request are listed as follows:

- SWMUs 4, 5, 46, 49, 52, 68, 91, 101, 116, 138, 140, 147, 149, 150, 154, 161, 196, 233, and 234

- AOCs 1090, 1094, 1095, 1114, 1115, 1116, and 1117

2.2.2 Permit Modification Request Submitted in January 2008

- Five sites were submitted for the final regulatory determination of CAC in a permit modification request in January 2008 (Wagner January 2008). This permit modification included all remaining SNL/NM ER sites with the exception of three active sites (SWMUs 83, 84, and 240), three groundwater investigation sites (Tijeras Arroyo Groundwater [TAG], Technical Area [TA]-V, Burn Site Groundwater [BSG]), and the MWL (SWMU 76). The final CMI Report for the MWL was submitted in January 2010 (SNL/NM January 2010) and is pending NMED approval. The MWL is addressed in Sections I.2.1 and I.2.3.4 of this ER Quarterly Report. The four SWMUs and one AOC included in the January 2008 permit modification request are listed as follows:

  - SWMUs 8, 28-2, 58, and 105
  - AOC 1101

2.2.3 Status of Permit Modification Requests Submitted in March 2006 and January 2008

- In April 2010, DOE/Sandia received a letter from the NMED entitled, "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001" (NMED April 2010). This letter included four main sections as follows: (1) "SWMUs Requiring Additional Corrective Action," (2) "SWMUs/AOCs to be Subject to Groundwater Monitoring Controls," (3) "SWMUs/AOCs to be Restricted to Industrial Land Use," and (4) "SWMUs/AOCs that do not Require Corrective Action." The NMED requirements stated in this letter are summarized as follows:

  - The section titled, "SWMUs Requiring Additional Corrective Action," specifies additional characterization requirements for SWMU 68 (Old Burn Site), SWMU 149 (Building 9930 Septic System), SWMU 154 (Building 9960 Septic System and Seepage Pits), and SWMUs 8/58 (Open Dump [Coyote Canyon Blast Area]/Coyote Canyon Blast Area). Activities associated with these requirements are summarized in Sections I.2.3 and IV of this ER Quarterly Report.

- The section titled, "SWMUs/AOCs to be Subject to Groundwater Monitoring Controls," specifies that annual groundwater monitoring is to be conducted at SWMUs 49 and 116. Groundwater monitoring results are summarized in Sections I.2.3.8 and I.2.3.9 of this ER Quarterly Report.

- The section titled, "SWMUs/AOCs to be Restricted to Industrial Land Use," indicates that the NMED intends to restrict the future land use of the following SWMUs/AOCs to industrial:

  1. SWMU 4 – Liquid Waste Disposal System Surface Impoundments
  2. SWMU 46 – Old Acid Waste Line Outfall
  3. SWMU 91 – Lead Firing Site
  4. SWMU 196 – Building 6597 Cistern (TA-V)
  5. SWMU 234 – Storm Drain System Outfall
  6. AOC 1090 – Building 6721 Septic System (TA-III)

- The section titled, "SWMUs/AOCs that do not Require Corrective Action," includes the following SWMUs/AOCs:

  1. SWMU 4 – Liquid Waste Disposal System Surface Impoundments
  2. SWMU 5 – Liquid Waste Disposal System Drainfield
  3. SWMU 28-2 – Mine Shaft
  4. SWMU 46 – Old Acid Waste Line Outfall
  5. SWMU 49 – Building 9820 Drains (Lurance Canyon)
  6. SWMU 91 – Lead Firing Site
  7. SWMU 101 – Building 9926/9926A Septic System and Seepage Pit (Coyote Test Field [CTF])
  8. SWMU 105 – Mercury Spill (Building 6536)
  9. SWMU 116 – Building 9990 Septic System (CTF)
  10. SWMU 138 – Building 6630 Septic Systems (TA-III)
  11. SWMU 140 – Building 9965 Septic System and Drywell (Thunder Range)
  12. SWMU 147 – Building 9925 Septic Systems (CTF)
  13. SWMU 150 – Building 9939/9939A Septic System and Drainfield (CTF)
  14. SWMU 161 – Building 6636 Septic System (TA-III)
  15. SWMU 196 – Building 6597 Cistern (TA-V)
  16. SWMU 233 – Storm Drain System Outfall
  17. SWMU 234 – Storm Drain System Outfall
  18. AOC 1090 – Building 6721 Septic System (TA-III)
  19. AOC 1094 – Live Fire Range East Septic System (Lurance Canyon)
  20. AOC 1095 – Building 9938 Seepage Pit (CTF)
  21. AOC 1101 – Building 885 Septic System
  22. AOC 1114 – Building 9978 Drywell (CTF)
  23. AOC 1115 – Former Offices Septic System (Solar Tower Complex)
  24. AOC 1116 – Building 9981A Seepage Pit (Solar Tower Complex)
  25. AOC 1117 – Building 9982 Drywell (Solar Tower Complex)

- SWMU 52 was not addressed in any of the sections of the April 2010 NMED letter as a "SWMU requiring additional corrective action." As stated in the letter, the NMED had previously requested additional information before determining corrective action for SWMU 52 (Brandwein December 2009a and 2009b). SNL/NM ER staff members are currently preparing a summary report for SWMU 52.

2.3 Site-Wide Hydrogeologic Characterization

The following sections present site-wide hydrogeologic characterization activities conducted at three groundwater investigation sites (TA-V, BSG, and TAG), at the MWL and CWL, and at the seven SWMUs subject to groundwater monitoring controls as discussed in Section I.2.2.3 of this ER Quarterly Report.

2.3.1 Technical Area V Groundwater

- In June 2011, DOE/Sandia submitted to the NMED the "Summary Report for Technical Area-V Groundwater and Soil-Vapor Monitoring Well Installation" (SNL/NM June 2011b).

- Groundwater sampling at TA-V was conducted in April 2011. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report; other analytical results will be presented and discussed in the SNL/NM Calendar Year (CY) 2011 Annual Groundwater Monitoring Report (CY 2011 AGMR) (anticipated submittal to the NMED in summer 2012).

2.3.2 Burn Site Groundwater

- On April 28, 2011, NMED and Sandia staff held a meeting at the SNL/NM Burn Site to discuss the final remedy for nitrate- and perchlorate-impacted groundwater.

- Groundwater sampling for the BSG Investigation was conducted in May 2011. The perchlorate analytical results are discussed in Section III of this ER Quarterly Report; other analytical results will be presented and discussed in the CY 2011 AGMR (anticipated submittal to the NMED in summer 2012).

2.3.3 Tijeras Arroyo Groundwater

- Groundwater sampling for the TAG investigation was completed in May 2011. Analytical results will be discussed in the CY 2011 AGMR (anticipated submittal to the NMED in summer 2012).

2.3.4 Mixed Waste Landfill Groundwater

- Currently, MWL groundwater monitoring results are provided to the NMED in two regulatory submittals: the SNL/NM AGMR and the ER MWL annual groundwater monitoring reports. The two reports contain the same information at the same level of detail. The Compliance Order on Consent (NMED April 2004) does not require a separate ER MWL report; therefore, future MWL groundwater monitoring results (CY 2011 and beyond) will be submitted to the NMED only as part of the AGMR.

- Groundwater sampling for the MWL was completed in June 2011. All CY 2011 groundwater monitoring results will be presented in the CY 2011 AGMR (anticipated submittal to the NMED in summer 2012).

2.3.5 Chemical Waste Landfill Groundwater

- No CWL groundwater monitoring activities were performed during this reporting period. The next CWL groundwater sampling event is scheduled for July–August 2011. The data for this sampling event will be presented in the CY 2011 AGMR (anticipated submittal to the NMED in summer 2012) and in the first CWL Post-Closure Care (PCC) Annual Report (due to the NMED by March 31, 2012). A more detailed discussion of projected CWL groundwater monitoring activities is presented in Section II of this ER Quarterly Report.

2.3.6 SWMUs 8/58 Groundwater

- As a result of a site inspection with NMED staff at SWMUs 8 and 58 on April 12, 2011, alternative locations were selected for the two required wells, CCBA-MW1 and CCBA-MW2.

- On May 10, 2011, DOE/Sandia submitted “Solid Waste Management Units 8 and 58 Proposed Groundwater Monitoring Well Location Adjustment” to the NMED (Wagner May 2011).

- On June 2, 2011, DOE/Sandia received a letter from the NMED entitled "Approval: Solid Waste Management Units 8 and 58, Proposed Groundwater Monitoring Well Location Adjustment, May 10, 2011" (NMED June 2011).

- Planning activities for installation of three groundwater monitoring wells at SWMUs 8/58 were initiated during this reporting period.

2.3.7 SWMU 68 Groundwater

- Planning activities for installation of three groundwater monitoring wells at SWMU 68 were initiated during this reporting period.

2.3.8 SWMU 49 Groundwater

- No groundwater monitoring activities were performed at SWMU 49 during this reporting period.

2.3.9 SWMU 116 Groundwater

- No groundwater monitoring activities were performed at SWMU 116 during this reporting period.

2.3.10 SWMU 149 Groundwater

- Groundwater sampling for SWMU 149 was conducted in June 2011. Analytical results for this sampling event are presented in Section IV of this ER Quarterly Report. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report. Analytical results will also be discussed in the CY 2011 AGMR (anticipated submittal to the NMED in summer 2012).

2.3.11 SWMU 154 Groundwater

- Groundwater sampling for SWMU 154 was conducted in May 2011. Analytical results for this sampling event are presented in Section IV of this ER Quarterly Report. The results for the perchlorate analysis are discussed in Section III of this ER Quarterly Report. Analytical results will also be discussed in the CY 2011 AGMR (anticipated submittal to the NMED in summer 2012).

2.4 Environmental Restoration Operations Documents Submitted to the NMED Pending Regulatory Review and Approval

This section lists the ER documents that have been submitted to the NMED and are, as of this reporting period, still pending approval:

- The TA-V Groundwater Corrective Measures Evaluation (CME) Work Plan, submitted to the NMED on May 11, 2004 (SNL/NM April 2004).

- The BSG Interim Measures Work Plan, submitted to the NMED on May 26, 2005 (SNL/NM May 2005).

- The CME Report for the TAG Investigation, submitted to the NMED on September 1, 2005 (SNL/NM August 2005).

- The BSG CME Work Plan, submitted to the NMED on April 9, 2008 (SNL/NM March 2008a).

- The BSG Current Conceptual Model of Groundwater Flow and Contaminant Transport, submitted to the NMED on April 9, 2008 (SNL/NM March 2008b).

- The TA-V Geophysical Logs and Slug Test Results Report, submitted to the NMED on November 24, 2010 (SNL/NM November 2010).

- Summary Report for TA-V Groundwater and Soil-Vapor Monitoring Well Installation submitted to the NMED on June 30, 2011 (SNL/NM June 2011b).

3.0 Environmental Restoration Operations/Long-Term Stewardship Work Completed

3.1 Corrective Action Management Unit

Corrective Action Management Unit (CAMU) PCC operations consist of vadose zone monitoring, leachate removal, and post-closure inspections, as required in the PCC Permit. Activities for this reporting period (April through June 2011) include the following:

- Quarterly monitoring of the Vadose Zone Monitoring System was conducted in June 2011. The results will be presented in the 2011 CAMU Vadose Zone Monitoring System Annual Monitoring Results report (anticipated submittal to the NMED in September 2011).

- Composite leachate sampling for waste characterization was conducted on June 9, 2011.

- Weekly pumping of leachate from the leachate collection and removal system (Figure 2) was performed. Waste management associated with the leachate collection and removal system during this reporting period is outlined in Section I.3.1.1.

Figure 2
Corrective Action Management Unit
Leachate Collection and
Removal System

- Weekly inspections of the RCRA less-than-90-day accumulation area were conducted.

- On April 5, 2011, SNL/NM Facilities personnel removed tumbleweeds and other excess vegetation identified during the previous quarterly inspection (conducted in March 2011) from inside the site boundaries and along the perimeter fence (SNL/NM June 2011a). Four-wing saltbush and snakeweed plants were identified on the containment cover during the March 2011 inspection. Because these plants can develop extensive root systems that could damage the high-density polyethylene fabric that is part of the cover system, they were removed from the cover on April 19 and April 21, 2011.

- Quarterly inspection of the site for this quarter was performed on June 15 and June 27, 2011, and included the containment cell cover, storm water diversion structures, security fences, gates, signs, and benchmarks. During the June site inspection activities, 20 four-wing saltbush plants were identified growing on the containment cell cover and are scheduled to be removed in July 2011. As stated, the extensive root systems of these species can damage the containment cover.

3.1.1 CAMU Waste Management Activities

Waste management data for the CAMU are reported below for the reporting period of April through June 2011. It should be noted that because of the overlap in reporting periods with the previous ER Quarterly Report, starting volumes reported here will not match previous ending volumes (SNL/NM June 2011a).

- Waste stored on site on April 1, 2011:
  - 93 gallons of leachate
  - 2 pounds (lbs) personal protective equipment (PPE)

- Waste generated on site during the reporting period:
  - 111 gallons of leachate
  - 4 gallons of rinsate
  - 10 lbs PPE, paper wipes, plastic drum pump

- Waste removed from the site by Hazardous Waste Handling Facility (HWHF) personnel on April 7, 2011:
  - 102 gallons of leachate
  - 2 gallons of rinsate
  - 5 lbs PPE, paper wipes, plastic drum pump

- Waste removed from the site by HWHF personnel on June 28, 2011:
  - 79 gallons of leachate
  - 2 gallons of rinsate

- Waste removed from the site by HWHF personnel on June 29, 2011:
  - 5 lbs PPE, paper wipes, plastic drum pump

- Waste remaining on site at the end of this reporting period:
  - 23 gallons of leachate
  - 2 lbs PPE

3.1.2 CAMU Regulatory Activities

No regulatory activities for the CAMU occurred during this reporting period.

3.2 Long-Term Stewardship Documents Submitted to the NMED Pending Regulatory Review and Approval

No LTS documents submitted to the NMED are pending regulatory review and approval.

4.0 References

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SECTION II
CHEMICAL WASTE LANDFILL QUARTERLY CLOSURE PROGRESS REPORT

1.0 Introduction

This section of the Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) presents the Quarterly Closure Progress Report for the Sandia National Laboratories, New Mexico (SNL/NM) Chemical Waste Landfill (CWL). This progress report has been prepared pursuant to the "CWL Final Closure Plan and Postclosure Care Permit Application" (Closure Plan) (SNL/NM December 1992). This section addresses monitoring activities performed at the CWL during the reporting period of April through June 2011; however, no groundwater sampling events occurred at the CWL during this reporting period.

Closure of the CWL was approved by the New Mexico Environment Department (NMED) on June 2, 2011 (Kieling June 2011), and regulatory requirements for the CWL have transitioned from the Closure Plan to the CWL Post-Closure Care (PCC) Permit (NMED October 2009a). This section of the ER Quarterly Report presenting CWL Closure Status will no longer be required as explained in more detail in Section II.3.0 (Status of Closure). Future ER Quarterly Reports will not contain "Section II, Chemical Waste Landfill Quarterly Closure Progress Report." Monitoring activities conducted at the CWL under the PCC Permit will be summarized in Section I of subsequent ER Quarterly Reports and detailed in the CWL Annual PCC Reports.

2.0 Work Completed

All voluntary corrective measure (VCM) activities for the CWL have been completed. The CWL Landfill Excavation (LE) VCM Final Report was submitted to the NMED in April 2003 (SNL/NM April 2003) and approved by the NMED in December 2003 (Moats December 2003). The Site Operational Boundary Closure Addendum to the LE VCM Final Report was submitted to the NMED in August 2005 (SNL/NM August 2005) and approved by the NMED on October 25, 2005 (Bearzi October 2005). With the submittal of the Waste Management Addendum to the LE VCM Final Report as Appendix B in the CWL Quarterly Closure Progress Report on February 22, 2006 (SNL/NM February 2006), all LE VCM regulatory deliverables have been submitted. With the completion of the VCM activities, technical meetings were held on an as-needed basis. The public continues to be informed of significant events through the SNL/NM Environmental Programs public meeting process.

Installation of the evapotranspirative (ET) cover as an interim measure was requested in April 2004 (Wagner April 2004) and approved with conditions in September 2004 (Kieling September 2004). The ET cover was completed in September 2005 in accordance with the conditions of approval. All field activities have been completed at the CWL, including the installation of new groundwater monitoring wells CWL-BW5 (background well), CWL-MW9, CWL-MW10, and CWL-MW11 and decommissioning of wells CWL-BW4A, CWL-MW4, CWL-MW5U/L, and CWL-MW6U/L. The transition to long-term monitoring and maintenance requirements under the NMED-approved CWL PCC Permit (NMED October 2009a) commenced as of June 2, 2011, when NMED approval of final closure was formalized (Kieling June 2011).

3.0 Status of Closure

The CWL Toxic Substances Control Act (TSCA) Final Report was submitted to the U.S. Environmental Protection Agency (EPA) and NMED on November 2, 2006 (SNL/NM November 2006). This final TSCA report documents the completion of all closure activities specified in the "Risk-Based Approval Request, 40 CFR [Code of Federal Regulations] 761.61(c) Risk-Based Method for Management of PCB [Polychlorinated Biphenyl] Materials" (SNL/NM October 2001), approved by the EPA in June 2002 (Cooke June 2002).

Negotiations related to the PCC Permit, Corrective Measures Study Report, and Final Remedy and Closure Plan Amendment were completed on October 15, 2009, and documented in the settlement agreement and Final Order In the Matter of Application for a Post-Closure Care Hazardous Waste Permit for the Chemical Waste Landfill, Sandia National Laboratories No. NM5890110518 (Final Order) (NMED October 2009a), which also included the final PCC Permit. The NMED issued the "Notice of Approval, Final Remedy and Closure Plan Amendment, Chemical Waste Landfill" on October 16, 2009 (NMED October 2009b). The NMED approval, dated October 16, 2009, included the final versions of two revisions to the Closure Plan that were part of the Closure Plan Amendment as Changed: Chapter 12 and Appendix G, Revision 4, Section 1.0.

The Final Resource Conservation and Recovery Act (RCRA) Closure Report documenting closure in accordance with all CWL Closure Plan requirements was submitted to the NMED on September 27, 2010 (SNL/NM September 2010). The required 40 CFR 265.116 (survey plat) and 40 CFR 265.119 (notation on property deed) notices were submitted to the Bernalillo County Zoning Commission and County Clerk, respectively, as well as the NMED, in early September 2010 in accordance with the Closure Plan. These notices were also included as an appendix in the Final RCRA Closure Report (SNL/NM September 2010), which documents the backfilling of the former CWL, installation of the at-grade

ET cover, ET cover revegetation activities performed in 2009, installation of the four new groundwater monitoring wells performed in 2010, and the final end-state conditions and cumulative risk assessment.

All required closure actions have now been completed in accordance with the CWL Closure Plan and the 2008 through 2009 negotiations that covered the CWL Closure Plan Amendment As Changed (revisions to Chapter 12 and to Appendix G [NMED October 2009b]), the CWL PCC Permit (NMED October 2009a), and the CWL Corrective Measures Study Report (SNL/NM December 2004) and Final Remedy. The new groundwater monitoring well network, installed in 2010 (CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11) in accordance with the Closure Plan Amendment as Changed (Appendix G revision), was sampled for the first time in November and December 2010. The results for this semiannual monitoring event are presented in the March 2011 ER Quarterly Report (SNL/NM March 2011).

The NMED conducted a site visit and closure inspection on April 21, 2011, and approved the CWL Final RCRA Closure Report on June 2, 2011 (Kieling June 2011). In accordance with the NMED approval dated June 2, 2011, the CWL Closure Plan (SNL/NM December 1992 and subsequent revisions) is no longer effective, and the CWL is now regulated under the CWL PCC Permit (NMED October 2009a). Quarterly reporting under the CWL Closure Plan is no longer required. As stipulated in the CWL PCC Permit, all CWL reporting will be provided annually, and an annual report that presents the monitoring and maintenance results and documentation for the previous calendar year will be submitted to the NMED by March 31 of each year.

4.0 Groundwater and Soil-Gas Monitoring

No groundwater monitoring or soil-gas sampling activities were performed at the CWL during this reporting period. Soil-gas sampling is not required under the Closure Plan but is a requirement under the CWL PCC Permit (NMED October 2009a) that became effective during this reporting period. Section II.6.0 presents additional information regarding the timing of the first groundwater and soil-gas monitoring events that will be performed under the PCC Permit.

5.0 Evapotranspirative Cover Maintenance

No ET cover maintenance was performed during this reporting period. All future maintenance activities will be documented in the CWL PCC Annual Reports.

6.0 Projected Activities for the Upcoming Quarter

The transition to monitoring and maintenance activities required by the CWL PCC Permit began in June 2011 and will continue during the next reporting period. On June 3, 2011, the implementation of the CWL PCC Permit was discussed with NMED, including what Permit activities would be completed from June through December 2011 and reported to the NMED in the first CWL Annual PCC Report due to be submitted by March 31, 2012. The U.S. Department of Energy (DOE) and Sandia Corporation (Sandia) notified the NMED that one semiannual groundwater monitoring event (July–August) and two site/cover inspections (August–September and November–December) would be conducted during this first six-month period under the PCC Permit, and that the first soil-gas monitoring event would be conducted early in Calendar Year 2012. The NMED concurred with this approach and requested that DOE/Sandia summarize the phone discussion in an e-mail. The e-mail was provided to the NMED on June 8, 2011 (Cochran June 2011).

Groundwater monitoring previously scheduled for early June 2011 under the Closure Plan, Appendix G requirements was delayed until the end of July 2011. This delay allowed time for the sampling crew to complete Permit-required training and to switch groundwater purging/sampling pumps to the new pumps and configuration required by the PCC Permit, Attachment 2, to facilitate pumping rates as low as reasonably achievable.

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Appendix B. Data Validation Sample Findings Summary Sheets for the Perchlorate Data

SECTION III
PERCHLORATE SCREENING QUARTERLY MONITORING REPORT

1.0 Introduction

Section IV.B of the Compliance Order on Consent (the Order) between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia) for Sandia National Laboratories, New Mexico (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells at SNL/NM be sampled for perchlorate (NMED April 2004). This report summarizes the perchlorate screening monitoring completed during the Second Quarter of Calendar Year (CY) 2011 (April, May, and June 2011) in response to the requirements of the Order. The outline of this report is based on the required elements of a "Periodic Monitoring Report" described in Section X.D. of the Order (NMED April 2004).

In November 2005, DOE/Sandia submitted a letter report on the status of perchlorate screening in groundwater at SNL/NM monitoring wells (SNL/NM November 2005). The purpose of the letter report was to summarize previous correspondence and sampling results and to outline proposed future work to comply with NMED requirements for perchlorate screening in groundwater. As specified in the letter report, quarterly reports will be submitted for wells active in the perchlorate-screening monitoring well network.

Based on the NMED response (NMED January 2006), DOE/Sandia will submit each quarterly report within 90 days following the quarter that the data represent. In November 2008, DOE/Sandia received approval from the NMED to proceed to semiannual reporting (NMED November 2008); however, upon further consideration, the NMED once more required quarterly reporting (NMED April 2009). This did not alter the previously negotiated frequency for CYN-MW6, an existing Burn Site Groundwater (BSG) study area monitoring well that has been under the sampling and reporting requirements of the Order since the well was installed and which will remain at a semiannual frequency for sampling and reporting.

This report is the twenty-second to be submitted since the November 2005 letter report; the previous reports were submitted for Fourth Quarter of CY 2005 through the First Quarter of CY 2011 (SNL/NM February 2006, June 2006, September 2006, December 2006, March 2007, June 2007, September 2007, December 2007, March 2008, June 2008, September 2008, December 2008, June 2009, September 2009, December 2009, March 2010, June 2010a, September 2010, December 2010, March 2011a, and June 2011).

Groundwater at BSG monitoring wells CYN-MW9, CYN-MW10, CYN-MW11, and CYN-MW12 has been sampled four times; Coyote Test Field (CTF) wells CTF-MW2 and CTF-MW3 have been sampled two times; and Technical Area (TA)-V wells TAV-MW11, TAV-MW12, TAV-MW13, and TAV-MW14 have been sampled two times (Figure 1). The Order requires that new wells be sampled for perchlorate for a minimum of four quarters (NMED April 2004). Reporting will continue as long as groundwater monitoring wells remain active in the perchlorate-screening monitoring well network unless negotiated otherwise with the NMED.

2.0 Scope of Activities

This report provides perchlorate screening results for the Second Quarter of CY 2011 (April, May, and June 2011) for the wells currently active in the perchlorate-screening program as shown in Figure 1 and listed in Table 1. In accordance with the requirements of Table XI-1 of the Order, a well with four consecutive quarters of nondetects (NDs) for perchlorate at the screening level/method detection limit (MDL) of 4 micrograms per liter (μg/L) is removed from the requirement of continued monitoring for perchlorate. Data for numerous wells identified in the Order have satisfied this requirement; therefore, these wells have been removed from the perchlorate-screening program. The perchlorate results for these wells have been provided in previous reports and are not discussed in this current report. Wells discussed in previous perchlorate-screening reports include the following: CYN-MW1D, CYN-MW5 (recently reinstated), CYN-MW7, CYN-MW8, LWDS-MW1, MRN-2, MRN-3D, MWL-BW1, MWL-BW2, MWL-MW1, MWL-MW7, MWL-MW8, MWL-MW9, NWTA3-MW2, SWTA3-MW4, TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27.

SNL/NM personnel performed groundwater sampling at 10 wells on the dates listed in Table 1. Several of the wells were installed after the Order was finalized and were therefore required to be sampled for perchlorate as "new" wells; the other wells were sampled to meet other regulatory requirements (discussed in Section III.3.0). Groundwater sampling activities were conducted in accordance with procedures outlined in the following investigation-specific sampling and analysis plans (SAPs) entitled:

- "TA-V Groundwater Monitoring, Mini-SAP for Third Quarter, Fiscal Year 2011 [FY11]" (SNL/NM March 2011b)

- "BSG Monitoring, Mini-SAP for Third Quarter, FY11" (SNL/NM April 2011).

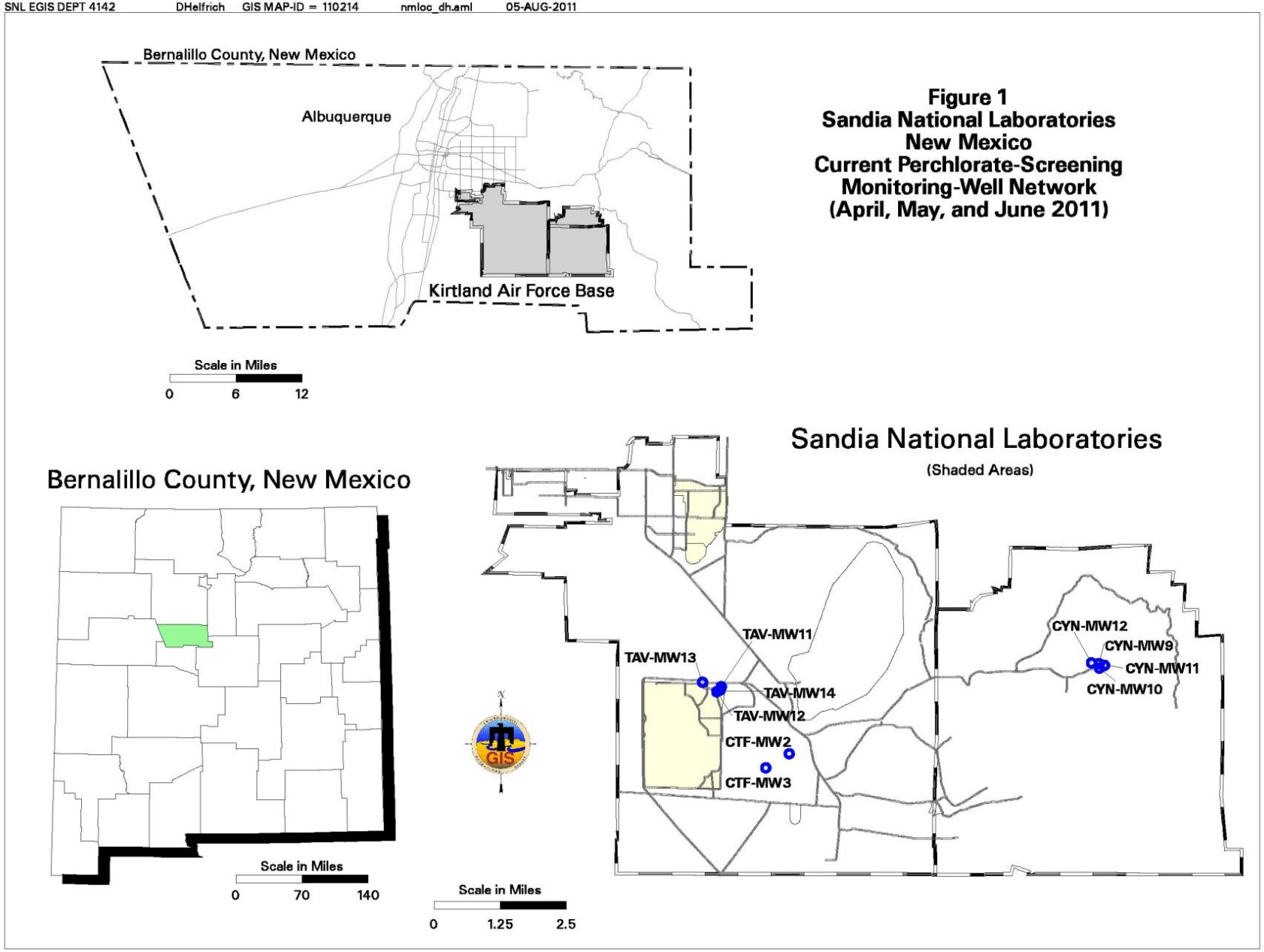
SNL EGIS DEPT 4142 DHelfrich GIS MAP-ID = 110214 nmloc_dh.aml 05-AUG-2011
Bernalillo County, New Mexico
Albuquerque
Kirtland Air Force Base
Scale in Miles
0 6 12
Figure 1
Sandia National Laboratories
New Mexico
Current Perchlorate-Screening
Monitoring-Well Network
(April, May, and June 2011)
Bernalillo County, New Mexico
Scale in Miles
0 70 140
Sandia National Laboratories
(Shaded Areas)
TAV-MW11
TAV-MW13
TAV-MW14
TAV-MW12
CTF-MW2
CTF-MW3
CYN-MW12
CYN-MW9
CYN-MW11
CYN-MW10
Scale in Miles
0 1.25 2.5

Table 1
Current Perchlorate-Screening Monitoring Well Network
Second Quarter, CY 2011
(April, May, and June 2011)

Well	Date Sampled	Number of Consecutive Sampling Events[a]	Remaining Number of Sampling Events[b]	Sampling Equipment
CTF-MW2	31-May-11	2	6	Bennett™ Pump
CTF-MW3	03-Jun-11	2	6	Bennett™ Pump
CYN-MW9	11-May-11	4	0	Bennett™ Pump
CYN-MW10	10-May-11	4	0	Bennett™ Pump
CYN-MW11	04-May-11	4	0	Bennett™ Pump
CYN-MW12	05-May-11	4	0	Bennett™ Pump
TAV-MW11	18-Apr-11	2	2	Bennett™ Pump
TAV-MW12	20-Apr-11	2	2	Bennett™ Pump
TAV-MW13	06-Apr-11	2	2	Bennett™ Pump
TAV-MW14	21-Apr-11	2	2	Bennett™ Pump

Notes

[a]Includes this sampling event.
[b]Per the requirements of Table XI-1 of the Order (NMED April 2004), a well will be removed from the perchlorate-screening monitoring well network after four quarters unless perchlorate is detected above the screening level/MDL of 4 μg/L. If perchlorate is detected above the screening level/MDL in a specific well, monitoring will continue at that well at a frequency negotiated with the NMED.

μg/L = Microgram(s) per liter.
CTF = Coyote Test Field.
CY = Calendar Year.
CYN = Canyons (Burn Site).
MDL = Method detection limit.
MW = Monitoring well.
NMED = New Mexico Environment Department.
TAV = Technical Area V.

- "SWMU [Solid Waste Management Unit] 149 Groundwater Monitoring, Mini-SAP for Third Quarter, FY11" (SNL/NM May 2011a).

- "SWMU 154 Groundwater Monitoring, Mini-SAP for Third Quarter, FY11" (SNL/NM May 2011b).

As described in the Mini-SAPs, groundwater sampling was performed in accordance with current SNL/NM Environmental Management, Long-Term Environmental Stewardship (LTES) Project Field Operating Procedures (FOPs). A portable Bennett™ groundwater sampling system was used to collect the groundwater samples. The sampling pump and tubing bundle were decontaminated prior to installation into monitoring wells in accordance with procedures described in FOP 05-03, "LTES Groundwater Sampling Equipment Decontamination," Revision 2 (SNL/NM August 2007a). All wells were purged a minimum of one saturated screen volume before sampling in accordance with FOP 05-01,

"LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements," Revision 2 (SNL/NM August 2007b).

Field water-quality measurements for turbidity, pH, temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the well prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with a YSI™ Model 620 water quality meter. Turbidity was measured with a HACH™ Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when the following parameters are achieved:

- Turbidity measurements are within 10 percent, or less than 5 nephelometric turbidity units
- pH is within 0.1 units
- Temperature is within 1.0 degree Celsius
- SC is within 5 percent

Field Measurement Logs documenting details of well purging and water quality measurements have been submitted to the SNL/NM Customer Funded Records Center.

The groundwater samples were submitted to GEL Laboratories LLC (GEL) for chemical analysis of perchlorate using U.S. Environmental Protection Agency Method 314.0 (EPA November 1999). The sample identification, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table 2. The analytical report from GEL, including certificates of analyses (COA) (Appendix A), analytical methods, MDLs, practical quantitation limits, dates of analyses, results of quality control (QC) analyses, and data validation findings (Appendix B) have been submitted to the SNL/NM Customer Funded Records Center.

Table 2
Sample Details for Second Quarter, CY 2011 Perchlorate Sampling

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation
CTF-MW2	090670-020	613578	SWMU 154
CTF-MW3	090672-020	613579	SWMU 149
CYN-MW9	090613-020	613560	BSG
CYN-MW10	090610-020	613559	BSG
CYN-MW11	090600-020	613556	BSG
CYN-MW12	090606-020 090607-020	613558	BSG
TAV-MW11	090435-020	613524	TA-V
TAV-MW12	090442-020 090443-020	613527	TA-V
TAV-MW13	090417-020	613516	TA-V
TAV-MW14	090445-020	613528	TA-V

Notes

AR/COC = Analysis request/chain of custody.
BSG = Burn Site Groundwater.
CTF = Coyote Test Field.
CY = Calendar Year.
CYN = Canyons (Burn Site).
MW = Monitoring Well.
SWMU = Solid Waste Management Unit.
TAV = Technical Area V.

3.0 Regulatory Criteria

In a given monitoring well, four consecutive ND results using the screening level/MDL of 4 μg/L are considered by the NMED to be evidence of the absence of perchlorate, such that additional monitoring for perchlorate in that well is not required. If perchlorate is detected using the screening level/MDL of 4 μg/L in a specific well, then monitoring will continue at that well at a frequency negotiated with the NMED. The Order (NMED April 2004) also requires that for detections equal to or greater than 4 μg/L, DOE/Sandia will evaluate the nature and extent of perchlorate contamination, based on a screening level/MDL of 4 μg/L, and incorporate the results of this evaluation into a Corrective Measures Evaluation (CME). Section VII.C of the Order clarifies that the CME process will be initiated where there is a documented release to the environment and where corrective measures are necessary to protect human health or the environment.

In April 2009, DOE/Sandia received a letter from the NMED requiring DOE/Sandia to characterize the nature and extent of the perchlorate contamination in soil and groundwater in the BSG study area (NMED April 2009). A characterization work plan was prepared and submitted to the NMED (SNL/NM November 2009), approved by the NMED (February

2010), and implemented in July 2010. In the April 2009 letter, the NMED had also requested that DOE/Sandia monitor perchlorate concentrations for a minimum of four quarters at several Tijeras Arroyo Groundwater and TA-V monitoring wells (NMED April 2009); all these wells have been sampled for four consecutive monitoring events with no perchlorate detections and have since been removed from the perchlorate sampling list.

During the First Quarter of CY 2011 four monitoring wells were added to the perchlorate monitoring network based on the NMED letter of April 8, 2010, entitled, "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008) Sandia National Laboratories EPA ID #NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001" (NMED April 2010). The NMED letter required work plans and groundwater monitoring at the following SWMUs:

- SWMU 49—Annual sampling of existing monitoring well CYN-MW5. This well had been sampled four times from May 2004 through February 2005. Based on four consecutive ND results, CYN-MW5 was removed from the perchlorate monitoring network (SNL/NM November 2005).

- SWMU 116—Annual sampling of existing monitoring well CTF-MW1.

- SWMU 149—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW3 for a minimum of eight quarters.

- SWMU 154—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW2 for a minimum of eight quarters.

To fulfill the requirements of the April 2010 NMED letter, DOE/Sandia submitted a SAP for CTF-MW2 and CTF-MW3 (SNL/NM June 2010b) that was subsequently approved (with modifications) by the NMED (December 2010).

4.0 Monitoring Results

Table 3 summarizes current and historical perchlorate results for wells currently in the perchlorate-screening monitoring network. The analytical laboratory COA for the Second Quarter of CY 2011 perchlorate data is included as Appendix A. Consistent with historical analytical results, no perchlorate was detected above the screening level in any samples from the 10 groundwater monitoring wells.

Table 3
Summary of Perchlorate Screening Analytical Results for the Current Monitoring Well Network as of Second Quarter, CY 2011

Well ID	Sample Date	AR/COC No.	Sample No.	Perchlorate Result[a] (µg/L)	MDL[b] (µg/L)	PQL[c] (µg/L)	MCL[d] (µg/L)	Laboratory Qualifier[e]	Validation Qualifier[f]	Analytical Method[g]	Comments
CTF-MW2	08-Mar-11	613448	090237-020	ND	4.0	12	NE	U		EPA 314.0	
			090238-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	31-May-11	613578	090670-020	ND	4.0	12	NE	U		EPA 314.0	
CTF-MW3	09-Mar-11	613450	090243-020	ND	4.0	12	NE	U		EPA 314.0	
			090244-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	03-Jun-11	613579	090672-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW9	28-Sep-10	613285	089672-020	ND	4.0	12	NE	U		EPA 314.0	
			089673-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	27-Oct-10	613321	089759-020	ND	4.0	12	NE	U		EPA 314.0	
	15-Feb-11	613414	090006-020	ND	4.0	12	NE	U		EPA 314.0	
	11-May-11	613560	090613-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW10	27-Sep-10	613283	089668-020	ND	4.0	12	NE	U		EPA 314.0	
	02-Nov-10	613325	089773-020	ND	4.0	12	NE	U		EPA 314.0	
			089774-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	09-Feb-11	613411	089994-020	ND	4.0	12	NE	U		EPA 314.0	
	10-May-11	613559	090610-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW11	29-Sep-10	613286	089675-020	ND	4.0	12	NE	U		EPA 314.0	
	01-Nov-10	613323	089765-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Feb-11	613410	089990-020	ND	4.0	12	NE	U		EPA 314.0	
			089991-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	04-May-11	613556	090600-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW12	23-Sep-10	613282	089665-020	ND	4.0	12	NE	U		EPA 314.0	
	28-Oct-10	613322	089762-020	ND	4.0	12	NE	U		EPA 314.0	
	10-Feb-11	613412	089997-020	ND	4.0	12	NE	U		EPA 314.0	
	05-May-11	613558	090606-020	ND	4.0	12	NE	U		EPA 314.0	
			090607-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
TAV-MW11	06-Jan-11	613384	089917-020	ND	4.0	12	NE	U		EPA 314.0	
	18-Apr-11	613524	090435-020	ND	4.0	12	NE	U		EPA 314.0	
TAV-MW12	19-Jan-11	613392	089935-020	ND	4.0	12	NE	U		EPA 314.0	
	20-Apr-11	613527	090442-020	ND	4.0	12	NE	U		EPA 314.0	
			090443-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
TAV-MW13	10-Jan-11	613386	089921-020	ND	4.0	12	NE	U		EPA 314.0	
			089922-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	06-Apr-11	613516	090417-020	ND	4.0	12	NE	U		EPA 314.0	
TAV-MW14	20-Jan-11	613393	089938-020	ND	4.0	12	NE	U		EPA 314.0	
	21-Apr-11	613528	090445-020	ND	4.0	12	NE	U		EPA 314.0	

Table 3 (Concluded)
Summary of Perchlorate Screening Analytical Results for the Current Monitoring-Well Network, as of Second Quarter CY 2011

Notes

AR/COC = Analysis Request and Chain of Custody.
CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
CY = Calendar Year.
CYN = Canyons (Burn Site).
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MW = Monitoring well.
TAV = Technical Area V.

[a]**Result**
Values in **bold** exceed the screening level/MDL
ND = Not detected (at MDL).
µg/L = Micrograms per liter.

[b]**MDL**
Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

[c]**PQL**
Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by the indicated method under routine laboratory operating conditions.

[d]**MCL**
Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11, Subpart B) and subsequent amendments or Title 20, Chapter 7, Part 1 of the New Mexico Administrative Code, incorporating 40 CFR 141.
NE = Not established.

[e]**Laboratory Qualifier**
U = Analyte is absent or below the method detection limit.

[f]**Validation Qualifier**
If cell is blank, then all quality control samples meet acceptance criteria with respect to submitted samples and no qualifier was assigned.

[g]**Analytical Method**
EPA 314.0: U.S. Environmental Protection Agency, November 1999, "Perchlorate in Drinking Water Using Ion Chromatography," EPA 815/R-00-014 (EPA November 1999).

Table 4 summarizes field water quality measurements collected immediately before the groundwater samples were collected. Field water quality measurements include turbidity, pH, temperature, SC, ORP, and DO.

The analytical data were reviewed and validated in accordance with Administrative Operating Procedure 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 2 (SNL/NM July 2007). No problems were identified with the analytical data that resulted in qualification of the data as unusable. The data are acceptable, and reported QC measures are adequate. The data validation sample findings summary sheets for the perchlorate data are included as Appendix B.

No variances or nonconformances were identified in field activities or field conditions that deviated from requirements in the groundwater monitoring Mini-SAPs (SNL/NM March 2011b, April 2011, May 2011a, and May 2011b) during the Second Quarter of CY 2011 sampling activities.

5.0 Summary and Conclusions

Based on the analytical data presented in Table 3 and in previous reports, the following statements can be made:

- No perchlorate was detected in the environmental samples from groundwater monitoring wells CTF-MW2, CTF-MW3, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, TAV-MW11, TAV-MW12, TAV-MW13, or TAV-MW14 at the screening level/MDL of 4 μg/L.

- No perchlorate has been detected during four consecutive quarterly sampling events at CYN-MW9, CYN-MW10, CYN-MW11, or CYN-MW12, so these wells will be removed from the perchlorate screening well network.

- Since June 2004 (the start of sampling required by the Order), perchlorate has been detected above the screening level/MDL (4 μg/L) in samples from only one of the wells (CYN-MW6) in the perchlorate-screening monitoring well network.

DOE/Sandia will continue annual monitoring for perchlorate in CTF-MW1 and CYN-MW5, semiannual monitoring in CYN-MW6, and quarterly monitoring of perchlorate in CTF-MW2, CTF-MW3, TAV-MW11, TAV-MW12, TAV-MW13, and TAV-MW14.

Table 4
Perchlorate Screening Groundwater Monitoring
Field Water Quality Measurements[a], Second Quarter, CY 2011

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (μmhos/cm)	Oxidation-Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
CTF-MW2	31-May-11	19.51	3404	71.2	5.89	1.16	1.8	0.17
CTF-MW3	03-Jun-11	21.49	1587	414.2	6.86	0.33	78.6	6.95
CYN-MW9	11-May-11	14.31	1050	419.9	7.01	2.44	56.4	5.75
CYN-MW10	10-May-11	17.23	853	412.9	7.35	0.22	71.8	6.88
CYN-MW11	04-May-11	18.83	958	316.1	7.28	0.28	5.5	0.57
CYN-MW12	05-May-11	18.07	1011	395.0	7.06	0.54	9.1	0.85
TAV-MW11	18-Apr-11	21.35	531	393.4	7.50	0.75	75.9	6.72
TAV-MW12	20-Apr-11	21.57	568	379.8	7.41	1.25	64.8	5.70
TAV-MW13	06-Apr-11	20.18	502	369.5	7.41	0.87	34.7	3.11
TAV-MW14	21-Apr-11	19.85	624	382.3	7.41	2.22	74.7	6.80

Notes

[a]Field measurements obtained immediately before the groundwater sample was collected.
°C = Degrees Celsius.
% Sat = Percent saturation.
μmhos/cm = Micromhos per centimeter.
CTF = Coyote Test Field.
CY = Calendar Year.
CYN = Canyons (Burn Site).
ID = Identification.
mg/L = Milligrams per liter.
mV = Millivolt(s).
MW = Monitoring well.
NTU = Nephelometric turbidity unit.
pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).
TAV = Technical Area V.

6.0 References

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Appendix A

Analytical Laboratory Certificates of Analysis for the Perchlorate Data

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613578

Dept. No./Mail Stop:	6234\MS 0718	Date Samples Shipped:	5-31-11	Project/Task No.98026.01.15	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	127661	SMO Authorization:	
Project Name:	SWMU-154	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	☐ Released by COC No.:
Record Center Code:	NA	Lab Destination:	GEL	SOO BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To:Sandia National Labs (Accounts Payable) 2790971
Service Order No.	CF 251-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		P.O. Box 5800 MS 0154 2790691 #01
Location	Tech Araa				Albuquerque, NM 87185-0154
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090670-001	CTF-MW2	127	NA	053111\0954	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090670-002	CTF-MW2	127	NA	053111\0955	GW	AG	4x1L	4C	G	SA	TCL SVOC (SW846-8270C)	002
090670-009	CTF-MW2	127	NA	053111\0957	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	003
090670-010	CTF-MW2	127	NA	053111\0958	FGW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	004
090670-016	CTF-MW2	127	NA	053111\1000	GW	P	125ml	4C	G	SA	Anions (SW846-9056)	005
090670-018	CTF-MW2	127	NA	053111\1001	GW	P	125ml	H2SO4	G	SA	NPN (353.2)	006
090670-020	CTF-MW2	127	NA	053111\1002	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	007
090670-022	CTF-MW2	127	NA	053111\1003	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	008
090670-024	CTF-MW2	127	NA	053111\1004	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	009
090670-033	CTF-MW2	127	NA	053111\1006	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	010
090670-034	CTF-MW2	127	NA	053111\1007	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☑ 15 Day ☑ 30 Day

Return Samples By: MS 6-3-11 ☐ Negotiated TAT

Sample Tracking — Smo Use

Date Entered(mm/dd/yy)

Entered by

QC Inits

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to: Tin Jackson/org 4142/MS 0729/284-2547

Water has high buffering capacity,check pH, add Presv. as needed

If Perchlorate detected perform verification analysis (SW846-6850M)

Alkalinity as totel bicarbonate and carbonate

Major Anions as Br,Fl,Cl,SO4

FGW (filtered in field with .45 micron filter)

*Please list as separate report

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	William Gibson		WG	Weston/4142/844-4013/239-7367

1.Relinquished by		Org.	4142	Date	5/31/11	Time	1135	4.Relinquished by	Org.	Date	Time
1. Received by	S'MO	Org.	4142	Date	5/31/11	Time	1135	4. Received by	Org.	Dete	Time
2.Relinquished by		Org.	4142	Date	5/31/11	Time	1238	5.Relinquished by	Org.	Date	Time
2. Received by	SMO	Org.	CAL	Date	6-1-11	Time	0815	5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

OFF-SITE LABORATORY

Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613578

Project Name:	SWMU-154	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.15
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No- Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090670-035	CTF-MW2	127	NA	053111\1008	GW	P	1 Liter	HNO3	G	SA	Isotopic Ur (ASTM D3972-09M)	012
090671-001	CTF-TB1	NA	NA	053111\0954	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	013

Abnormal Conditions on Receipt — LAB USE

Recipient Initials MK

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 14, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090670-020	Project:	SNLSGWater
Sample ID:	279097007	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	31-MAY-11 10:02		
Receive Date:	01-JUN-11	Client Desc.:	CTF-MW2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	06/02/11	2050	1107935	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. | SMO Use | AR/COC 613579

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	6-6-11	Project/Task No.98026.01.14	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	12 7877	SMO Authorization: BB	
Project Name:	SWMU-149	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.: ☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		
Service Order No.	CF 250-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 279398
Location	Tech Area	Reference LOV(available at SMO)			
Building	Room				

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090672-001	CTF-MW3	361	NA	060311\0937	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090672-009	CTF-MW3	361	NA	060311\0938	GW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	002
090672-010	CTF-MW3	361	NA	060311\0939	FGW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	003
090672-016	CTF-MW3	361	NA	060311\0940	GW	P	125 ml	4C	G	SA	Anions (SW846-9056)	004
090672-018	CTF-MW3	361	NA	060311\0941	GW	P	125 ml	H2SO4	G	SA	NPN (353.2)	005
090672-020	CTF-MW3	361	NA	060311\0942	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	006
090672-022	CTF-MW3	361	NA	060311\0943	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	007
090673-001	CTF-TB2	NA	NA	060311\0937	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	008

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☑ 15 Day ☐ 30 Day ☐ Negotiated TAT

Return Samples By: QC info

Sample Tracking Smo Use

Date Entered(mm/dd/yy):

Entered by:

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/ORG.4142/MS.0729/ 284-2547

If perchlorate detected perform verification analysis(SW846-6850M)

Alkalinity as total bicarbonate and carbonate

Anions as Br,Fl,Cl,SO4

FGW (filtered in field with .45 micron filter)

*Please list as separate report.

Abnormal Conditions on Receipt Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes			Weston/4142/844-5130/228-0710
	William Gibson			Weston/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 6/6/11	Time 1022	4.Relinquished by		Org.	Date	Time
1. Received by		Org. 4139	Date 6-6-11	Time 1012	4. Received by		Org.	Date	Time
2.Relinquished by		Org. 4139	Date 6-6-11	Time 1100	5.Relinquished by		Org.	Date	Time
2. Received by		Org. GEL	Date 6-7-11	Time 0725	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 20, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090672-020	Project:	SNLSGWater
Sample ID:	279398006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	03-JUN-11 09:42		
Receive Date:	07-JUN-11	Client Desc.:	CTF-MW3
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	06/16/11	1643	1110331	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab — Page 1 of 1

Batch No. N/A — SMO Use — AR/COC 613560

Dept. No./Mail Stop:	6234/0718 / JOHN COCHRAN	Date Samples Shipped:	5/11/11	Project/Task No.98026.01.06	☐ Waste Characterization
Project/Task Manager:	~~Mike Skelly~~	Carrier/Waybill No:	12 1997	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	Burn Site GWC	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SOS BOTTLE ORDER	☐ Released by COC No.:_____
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CF# 235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 277938

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090613-001	CYN-MW9	195	NA	051111\1004	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090613-002	CYN-MW9	195	NA	051111\1005	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	002
090613-005	CYN-MW9	195	NA	051111\1008	GW	AG	4x1 L	4C	G	SA	TPH Diesel (SW846-8015A/B) SVOC	003
090613-006	CYN-MW9	195	NA	051111\1007	GW	AG	3x40 ml	4C	G	SA	TPH Gasoline (SW846-8015A/B) VOC	004
090613-018	CYN-MW9	195	NA	051111\1010	GW	P	125 ml	H2SO4	G	SA	NPN (353.2)	005
090613-020	CYN-MW9	195	NA	051111\1011	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	006
090613-024	CYN-MW9	195	NA	051111\1012	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A)	007
090614-001	CYN-TB9	NA	NA	051111\1004	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	008
090615-001	CYN-TB10	NA	NA	051111\1007	DIW	AG	3x40 ml	4C	G	TB	TPH Gasoline (SW846-8015A/B) VOC	009
090616-001	CYN-FB1	NA	NA	051111\0943	DIW	G	3x40 ml	HCL	G	FB	TCL VOC (SW846-8260B)	010

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking — Sms Use
Date Entered(mm/dd/yy)
Entered by:
QC inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/Org.4142/MS 0756/505-284-2547
If Perchlorate detected,perform verification analysis ustng SW846-6850M
Last well for CYN - Project 3rd Quarter.
*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William J Gibson			Weston/4142/844-4013/239-7367
	Robert Lynch			Weaton/4142/844-4013/250-7090

1.Relinquished by		Org.4142	Date 5-11-11	Time 1109	4.Relinquished by		Org.	Date	Time
1. Received by		Org.4142	Date 5-11-11	Time 1109	4. Received by		Org.	Date	Time
2.Relinquished by		Org.4142	Date 5-11-11	Time 1200	5.Relinquished by		Org.	Date	Time
2. Received by		Org. Gel	Date 5-12-11	Time 0745	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

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Certificate of Analysis

Report Date: June 7, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090613-020	Project:	SNLSGWater
Sample ID:	277938006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	11-MAY-11 10:11		
Receive Date:	12-MAY-11	Client Desc.:	CYN-MW9
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/18/11	2113	1100014	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

AR/COC **613559**

Internal Lab

Batch No. N/A John Cochran SMO Use

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	5/10/11
Project/Task Manager:	~~Mike Skelly~~ MS 5/12/11	Carrier/Waybill No.:	126930
Project Name:	Burn Site GWC	Lab Contact:	Edie Kent/803-556-8171
Record Center Code:	ER/1333/DAT	Leb Destination:	GEL
Logbook Ref. No.:	ER 056	SMO Contact/Phone:	Pam Puissant/505-844-3185
Service Order No.	CF# 235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199
Location	Tech Area		
Building	Room		

Project/Task No.98026.01.06
SMO Authorization: SMO
Contract #: PO 691436
SUBCONTRACT ORDER

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:_____
☑ Validation Required

Bill To:Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154
277861

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090610-001	CYN-MW10	170	NA	051011\0945	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090610-002	CYN-MW10	170	NA	051011\0947	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	002
090610-005	CYN-MW10	170	NA	051011\0951	GW	AG	4x1 L	4C	G	SA	TPH Diesel (SW846-8015A/B) SVOC	003
090610-006	CYN-MW10	170	NA	051011\0949	GW	AG	3x40 ml	4C	G	SA	TPH Gasoline (SW846-8015A/B) VOC	004
090610-018	CYN-MW10	170	NA	051011\0953	GW	P	125 ml	H2SO4	G	SA	NPN (353.2)	005
090610-020	CYN-MW10	170	NA	051011\0954	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	006
090610-024	CYN-MW10	170	NA	051011\0955	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A)	007
090611-001	CYN-TB7	NA	NA	051011\0945	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	008
090612-001	CYN-TB8	NA	NA	051011\0949	DIW	AG	3x40 ml	4C	G	TB	TPH Gasoline (SW846-8015A/B) VOC	009

RMMA ☐ Yes ☑ No Ref. No.
Sample Disposal ☐ Return to Client ☑ Disposal by lab
Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Sample Tracking — SMO Use
Date Entered(mm/dd/yy)
Entered by
QC Inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/Org.4142/MS 0756/505-284-2547
If Perchlorate detected,perform verification analysis using SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt
Lab Use

Return Samples By:

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cellular
	William J Gibson			Weston/4142/844-4013/239-7367
	Robert Lynch			Weston/4142/844-4013/250-7090

1.Relinquished by		Org. 4142	Date 5/10/11	Time 1048	4.Relinquished by		Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 5/10/11	Time 1048	4. Received by		Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 5/10/11	Time 1150	5.Relinquished by		Org.	Date	Time
2. Received by		Org. GEL	Date 5-11-11	Time 0725	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

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Certificate of Analysis

Report Date: June 9, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090610-020	Project:	SNLSGWater
Sample ID:	277861006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	10-MAY-11 09:54		
Receive Date:	11-MAY-11	Client Desc.:	CYN-MW10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/18/11	2054	1100014	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab — Page 1 of 1

Batch No. N/A — John Cochran ms 5/9/11 SMO Use

AR/COC 613556

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	5/11/11	Project/Task No.98026.01.06	☐ Waste Characterization
Project/Task Manager:	~~Mike Skelly~~	Carrier/Waybill No:	1261434	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	Burn Site GWC	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CF# 235-11-~~44~~ MS	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area 5/9/11				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 277470

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090600-001	CYN-MW11	253	NA	050411\1013	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090600-002	CYN-MW11	253	NA	050411\1015	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	002
090600-005	CYN-MW11	253	NA	050411\1017	GW	AG	4x1 L	4C	G	SA	TPH Diesel (SW846-8015A/B) SVOC	003
090600-006	CYN-MW11	253	NA	050411\1018	GW	AG	3x40 ml	4C	G	SA	TPH Gasoline (SW846-8015A/B) VOC	004
090600-018	CYN-MW11	253	NA	050411\1019	GW	P	125 ml	H2SO4	G	SA	NPN (353.2)	005
090600-020	CYN-MW11	253	NA	050411\1020	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	006
090600-024	CYN-MW11	253	NA	050411\1022	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A)	007
090601-001	CYN-TB1	NA	NA	050411\1013	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	008
090602-001	CYN-TB2	NA	NA	050411\1018	DIW	AG	3x40 ml	4C	G	TB	TPH Gasoline (SW846-8015A/B) VOC	009

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC Inits:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/Org.4142/MS 0756/505-284-2547
If Perchlorate detected,perform verification analysis using SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	William J Gibson		WJG	Weston/4142/844-4013/239-7367
	Robert Lynch		RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes		AS	Weston/4142/844-5130/228-0710

1.Relinquished by		Org.4142	Date 5/4/11	Time 1107	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org.4142	Date 5/4/11	Time 1107	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org.4142	Date 5/4/11	Time 1218	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 5-5-11	Time 0730	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: May 31, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090600-020	Project:	SNLSGWater
Sample ID:	277470006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	04-MAY-11 10:20		
Receive Date:	05-MAY-11	Client Desc.:	CYN-MW11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/18/11	1859	1100014	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. John Cochran SMO Use

AR/COC 613558

Dept. No./Mail Stop:	6234/0718 ms	Date Samples Shipped:	5-5-11	Project/Task No.98026.01.06	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	~~Mike Skelly~~ 5/9/11	Carrier/Waybill No:	126734	SMO Authorization:	
Project Name:	Burn Site GWC	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.: ☑ Validation Required
Logbook Ref. No.:	ER 058	SMO Contact/Phone:	Pam Puissant/505-844-3185		
Service Order No.	CF# 235-11	Send Report to SMO:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090606-001	CYN-MW12	273	NA	05/05/11 0947	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260B)	019
090606-002	CYN-MW12	273	NA	05/05/11 0949	GW	AG	4x1 L	4C	G	SA	SVOC (SW846-8270)	020
090606-005	CYN-MW12	273	NA	05/05/11 0952	GW	AG	4x1 L	4C	G	SA	TPH Diesel (SW846-8015A/B) SVOC	021
090606-006	CYN-MW12	273	NA	05/05/11 0953	GW	AG	3x40 ml	4C	G	SA	TPH Gasoline (SW846-8015A/B) VOC	022
090606-018	CYN-MW12	273	NA	05/05/11 0954	GW	P	125 ml	H2SO4	G	SA	NPN (353.2)	023
090606-020	CYN-MW12	273	NA	05/05/11 0955	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	024
090606-024	CYN-MW12	273	NA	05/05/11 0958	GW	AG	4x1 L	4C	G	SA	High Explosives (SW846-8321A)	025
090607-001	CYN-MW12	273	NA	05/05/11 0947	GW	G	3x40 ml	HCL	G	DU	TCL VOC (SW846-8260B)	026
090607-002	CYN-MW12	273	NA	05/05/11 0949	GW	AG	4x1 L	4C	G	DU	SVOC (SW846-8270)	027
090607-005	CYN-MW12	273	NA	05/05/11 0952	GW	AG	4x1 L	4C	G	DU	TPH Diesel (SW846-8015A/B) SVOC	028

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by	
Return Samples By:	☐ Negotiated TAT	QC Inits.	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/Org.4142/MS 0755/505-284-2547
If Perchlerate detected, perform verification analysis using SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	William J Gibson			Weston/4142/844-4013/239-7367
	Robert Lynch			Weston/4142/844-4013/250-7090
	Alfred Santillanes		ASX	Weston/4142/844-5130/228-0710

1.Relinquished by		Org 4142	Date 5/5/11	Time 11:14	4.Relinquished by	Org.	Date / Time
1. Received by		Org 4139	Date 5-5-11	Time 11:14	4. Received by	Org.	Date / Time
2.Relinquished by		Org 4139	Date 5-5-11	Time 1:02	5.Relinquished by	Org.	Date / Time
2. Received by		Org. BEL	Date 5-6-11	Time 0740	5. Received by	Org.	Date / Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date / Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date / Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613558

Project Name:	Burn Site GWC	Project/Task Manger:	Mike Skelly	Project/Task No.:	98026.01.06
Location	Tech Area				
Building	Room	Reference LOV (available at SMO)			

Sample No- Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090607-006	CYN-MW12	273	NA	05/05/11 0953	GW	AG	3x40 ml	4C	G	DU	TPH Gasoline (SW846-8015A/B) VOC	029
090607-018	CYN-MW12	273	NA	05/05/11 0954	GW	P	125 ml	H2SO4	G	DU	NPN (353.2)	030
090607-020	CYN-MW12	273	NA	05/05/11 0955	GW	P	250 ml	4C	G	DU	Perchlorate (314.0)	031
090607-024	CYN-MW12	273	NA	05/05/11 0958	GW	AG	4x1 L	4C	G	DU	High Explosives (SW846-8321A)	032
090608-001	CYN-TB5	NA	NA	05/05/11 0947	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	033
090609-001	CYN-TB6	NA	NA	05/05/11 0953	DIW	AG	3x40 ml	4C	G	TB	TPH Gasoline (SW846-8015A/B) VOC	034

Abnormal Conditions on Receipt LAB USE

Recipient Initials AK

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 31, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090606-020	Project:	SNLSGWater
Sample ID:	277470024	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	05-MAY-11 09:55		
Receive Date:	06-MAY-11	Client Desc.:	CYN-MW12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/18/11	2016	1100014	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 31, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090607-020	Project:	SNLSGWater
Sample ID:	277470031	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	05-MAY-11 09:55		
Receive Date:	06-MAY-11	Client Desc.:	CYN-MW12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/18/11	2035	1100014	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NP

SMO Use

AR/COC 613524

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	4/18/11	Project/Task No. 98026.01.10	☐ Waste Characterization
Project/Task Manager:	Mike Skelly	Carrier/Waybill No.	1Z 5 97 2	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 276276

500 BOTTLES ORDER

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090435-001	TAV-MW11	531	NA	041811\1000	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	001
090435-004	TAV-MW11	531	NA	041811\1001	GW	AG	500 ml	H2SO4	G	SA	TOC (SW846-9060)	002
090435-010	TAV-MW11	531	NA	041811\1002	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur (SW846-6020)	003
090435-016	TAV-MW11	531	NA	041811\1003	GW	P	125 ml	4C	G	SA	Anions (SW846-9056)	004
090435-017	TAV-MW11	531	NA	041811\1005	FGW	P	500 ml	HNO3	G	SA	Total Fe and Mn (SW846-6020)	276285 001
090435-018	TAV-MW11	531	NA	041811\1006	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	005
090435-020	TAV-MW11	531	NA	041811\1007	GW	P	500 ml	4C	G	SA	Perchlorate (314.0)	006
090435-022	TAV-MW11	531	NA	041811\1008	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	007
090435-023	TAV-MW11	531	NA	041811\1009	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	008
090435-033	TAV-MW11	531	NA	041811\1010	GW	P	1 L	HNO3	G	SA	Gamma Spec (short list)(901-0)	009
090435-034	TAV-MW11	531	NA	041811\1011	GW	P	1 L	HNO3	G	SA	Gross Alpha/Beta (900.0)	010

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC Inits

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jackson/ORG. 4142/MS.0729/ 284-2547
Alkalinity (total,bicarbonate,carbonate)
Anions (Br,Cl,Fl,SO4)
FGW (Filtered in field w/40 micron filter)
If Perchlorate detected verify w/ analysis SW846-6850M
*Please list as separate report.

Abnormal Conditions on Receipt
Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	Robert Lynch		RL	Weston/4133/844-4013/250-7090
	Alfred Santillanes		AS	Weston/4133/844-5130/228-0710
	William J. Gibson		WJG	Weston/4133/844-4013/239-7367

1.Relinquished by		Org. 4133	Date 4/18/11	Time 1044	4.Relinquished by		Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 4/18/11	Time 1044	4. Received by		Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 4/18/11	Time 1205	5.Relinquished by		Org.	Date	Time
2. Received by		Org. GEL	Date 4/19/11	Time 0745	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613524

Project Name:	TA-V GWM	Project/Task Manger:	Mike Skelly	Project/Task No.:	98026.01.10
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090435-036	TAV-MW11	531	NA	041811\1012	GW	AG	250 ml	4C	G	SA	Tritium (906.0)	01
090436-001	TAV-TB11	NA	NA	041811\1000	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	02

Abnormal Conditions on Receipt

Recipient Initials

LAB USE

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 19, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090435-020	Project:	SNLSGWater
Sample ID:	276276006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	18-APR-11 10:07		
Receive Date:	19-APR-11	Client Desc.:	TAV-MW11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/05/11	1615	1095219	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NA

SMO Use

AR/COC **613527**

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	4/20/11	Project/Task No. 98026.01.10	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Mike Skelly	Carrier/Waybill No	1218157	SMO Authorization:	
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL	500 BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090442-001	TAV-MW12	529	NA	04/20/11 1017	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	025
090442-004	TAV-MW12	529	NA	04/20/11 1018	GW	AG	500 ml	H2SO4	G	SA	TOC (SW846-9060)	026
090442-010	TAV-MW12	529	NA	04/20/11 1019	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur (SW846-6020)	027
090442-016	TAV-MW12	529	NA	04/20/11 1020	GW	P	125 ml	4C	G	SA	Anions (SW846-9056)	028
090442-017	TAV-MW12	529	NA	04/20/11 1021	FGW	P	500 ml	HNO3	G	SA	Total Fe and Mn (SW846-6020)	276 285
090442-018	TAV-MW12	529	NA	04/20/11 1022	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	029
090442-020	TAV-MW12	529	NA	04/20/11 1023	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	030
090442-022	TAV-MW12	529	NA	04/20/11 1025	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	031
090442-023	TAV-MW12	529	NA	04/20/11 1027	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	032
090442-033	TAV-MW12	529	NA	04/20/11 1029	GW	P	1 L	HNO3	G	SA	Gamma Spec (short list)(901-0)	033
090442-034	TAV-MW12	529	NA	04/20/11 1031	GW	P	1 L	HNO3	G	SA	Gross Alpha/Beta (900.0)	034

RMMA	☐ Yes ☑ No Ref. No.	**Sample Tracking**	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	
Return Samples By:	☐ Negotiated TAT	CC nils.	

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

Alkalinity (total,bicarbonate,carbonate)

Anions (Br,Cl,Fl,SO4)

FGW (Filtered in field w/40 micron filter)

If Perchlorate *detected* verify w/ analysis SW846-6850M

**Please list as separate report.*

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members				
	Alfred Santillanes			Weston/4133/844-5130/228-0710
	William J. Gibson			Weston/4133/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 4/20/11	Time 1118	4.Relinquished by		Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 4/20/11	Time 1118	4. Received by		Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 4/20/11	Time 1215	5.Relinquished by		Org.	Date	Time
2. Received by		Org. GEL	Date 4/21/11	Time 0900	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613527

Project Name:	TA-V GWM	Project/Task Manger:	Mike Skelly	Project/Task No.:	98028.01.10
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090442-036	TAV-MW12	529	NA	04/20/11 1032	GW	AG	250 ml	4C	G	SA	Tritium (906.0)	035
090443-001	TAV-MW12	529	NA	04/20/11 1017	GW	G	3x40 ml	HCL	G	DU	TCL VOC (SW846-8260)	036
090443-004	TAV-MW12	529	NA	04/20/11 1018	GW	AG	500 ml	H2SD4	G	DU	TDC (SW846-9060)	037
090443-010	TAV-MW12	529	NA	04/20/11 1019	GW	P	500 ml	HND3	G	DU	TAL Metals+Ur (SW846-6020)	038
090443-016	TAV-MW12	529	NA	04/20/11 1020	GW	P	125 ml	4C	G	DU	Anions (SW846-9056)	039
090443-017	TAV-MW12	529	NA	04/20/11 1021	FGW	P	500 ml	HNO3	G	DU	Total Fe and Mn (SW846-6020)	276253 276254
090443-018	TAV-MW12	529	NA	04/20/11 1022	GW	P	250 ml	H2SO4	G	DU	NPN (353.2)	040
090443-020	TAV-MW12	529	NA	04/20/11 1023	GW	P	250 ml	4C	G	DU	Perchlorate (314.0)	041
090443-022	TAV-MW12	529	NA	04/20/11 1025	GW	P	500 ml	4C	G	DU	Alkalinity (SM2320B)	042
090443-023	TAV-MW12	529	NA	04/20/11 1027	GW	P	1 L	NaOH-Zn	G	DU	Sulfide (SW846-9034)	043
090443-033	TAV-MW12	529	NA	04/20/11 1029	GW	P	1 L	HND3	G	DU	Gamma Spec (short list)(901-0)	044
090443-034	TAV-MW12	529	NA	04/20/11 1031	GW	P	1 L	HND3	G	DU	Gross Alpha/Beta (900.0)	045
090443-036	TAV-MW12	529	NA	04/20/11 1032	GW	AG	250 ml	4C	G	DU	Tritium (906.0)	046
090444-001	TAV-TB14	NA	NA	04/20/11 1017	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	047

Abnormal Conditions on Receipt

LAB USE

Recipient Initials VL

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 19, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090442-020	Project:	SNLSGWater
Sample ID:	276276030	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	20-APR-11 10:23		
Receive Date:	21-APR-11	Client Desc.:	TAV-MW12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/05/11	1731	1095219	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 19, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090443-020	Project:	SNLSGWater
Sample ID:	276276041	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	20-APR-11 10:23		
Receive Date:	21-APR-11	Client Desc.:	TAV-MW12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MARI	05/05/11	1751	1095219	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC **613516**

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	4/6/11	Project/Task No:	98026.01.10
Project/Task Manager:	Mike Skelly	Carrier/Waybill No:	125588	SMO Authorization:	
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #:	691436
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL		
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		
Location	Tech Area				
Building	Room				

SEE 90TH ORDER

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:

☑ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154 275567

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090417-001	TAV-MW13	547	NA	04/06/11 0956	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	001
090417-004	TAV-MW13	547	NA	04/06/11 0957	GW	AG	500 ml	H2SO4	G	SA	TOC (SW846-9060)	002
090417-010	TAV-MW13	547	NA	04/06/11 0958	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur (SW846-6020)	003
090417-016	TAV-MW13	547	NA	04/06/11 0959	GW	P	125 ml	4C	G	SA	Anions (SW846-9056)	004
090417-017	TAV-MW13	547	NA	04/06/11 1000	FGW	P	500 ml	HNO3	G	SA	Total Fe and Mn (SW846-6020)	275568 001
090417-018	TAV-MW13	547	NA	04/06/11 1001	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	005
090417-020	TAV-MW13	547	NA	04/06/11 1002	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	006
090417-022	TAV-MW13	547	NA	04/06/11 1003	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	007
090417-023	TAV-MW13	547	NA	04/06/11 1005	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	008
090417-033	TAV-MW13	547	NA	04/06/11 1006	GW	P	1 L	HNO3	G	SA	Gamma Spec (short list)(901-0)	009
090417-034	TAV-MW13	547	NA	04/06/11 1008	GW	P	1 L	HNO3	G	SA	Gross Alpha/Beta (900.0)	010

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

Sample Tracking — Smo Use
Date Entered(mm/dd/yy)
Entered by
QC Info

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:
Tim Jacksen/ORG. 4142/MS.0729/ 284-2547
Alkalinity (total,bicarbonate,carbonate)
Anions (Br,Cl,Fl,SO4)
FGW (Filtered in field w/40 micron filter)
If Perchlorate detected verify w/ analysis SW846-6850M
*Please list as separate report.

Abnormal Conditions on Receipt
Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4133/844-4013/250-7090
	Alfred Santillanes		AS	Weston/4133/844-5130/228-0710
	William J. Gibson		WJG	Weston/4133/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 4/6/11	Time 1030	4.Relinquished by		Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 4/6/11	Time 1030	4. Received by		Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 4/6/11	Time 1200	5.Relinquished by		Org.	Date	Time
2. Received by		Org. GEL	Date 4-7-11	Time 0735	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

OFF-SITE LABORATORY

Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613516

Project Name:	TA-V GWM	Project/Task Manger:	Mike Skelly		Project/Task No.:	98026.01.10					
Location	Tech Area										
Building	Room	Reference LOV (available at SMO)									
Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090417-036	TAV-MW13	547	NA	04/06/11 1009	GW	AG	250 ml	4C	G	SA	Tritium (906.0)	01
090418-001	TAV-TB3	NA	NA	04/06/11 0956	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	02

Abnormal Conditions on Receipt LAB USE

Recipient Initials MK

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 5, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090417-020	Project:	SNLSGWater
Sample ID:	275567006	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	06-APR-11 10:02		
Receive Date:	07-APR-11	Client Desc.:	TAV-MW13
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	04/15/11	2314	1091090	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC **613528**

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	4/21/11	Project/Task No. 98026.01.10	☐ Waste Characterization
Project/Task Manager:	Mike Skelly	Carrier/Waybill No:	1Z 6197	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	TA-V GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code:	ER/1306/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CFO# 240-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154 276276

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090445-001	TAV-MW14	535	NA	042111\0941	GW	G	3x40 ml	HCL	G	SA	TCL VOC (SW846-8260)	048
090445-004	TAV-MW14	535	NA	042111\0942	GW	AG	500 ml	H2SO4	G	SA	TOC (SW846-9060)	049
090445-010	TAV-MW14	535	NA	042111\0943	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur (SW846-6020)	050
090445-016	TAV-MW14	535	NA	042111\0944	GW	P	125 ml	4C	G	SA	Anions (SW846-9056)	051
090445-017	TAV-MW14	535	NA	042111\0945	FGW	P	500 ml	HNO3	G	SA	Total Fe and Mn (SW846-6020)	276253 005
090445-018	TAV-MW14	535	NA	042111\0946	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	052
090445-020	TAV-MW14	535	NA	042111\0947	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	053
090445-022	TAV-MW14	535	NA	042111\0948	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	054
090445-023	TAV-MW14	535	NA	042111\0950	GW	P	1 L	NaOH-Zn	G	SA	Sulfide (SW846-9034)	055
090445-033	TAV-MW14	535	NA	042111\0951	GW	P	1 L	HNO3	G	SA	Gamma Spec (short list)(901-0)	056
090445-034	TAV-MW14	535	NA	042111\0953	GW	P	1 L	HNO3	G	SA	Gross Alpha/Beta (900.0)	057

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	SMO Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy):	
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	
Return Samples By:	☐ Negotiated TAT	QC Inits:	

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Alfred Santillanes			Weston/4133/844-5130/228-0710
	William J. Gibson			Weston/4133/844-4013/239-7367

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report te:

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

Alkalinity (total,bicarbonate,carbonate)

Anions (Br,Cl,Fl,SO4)

FGW (Filtered in field w/40 micron filter)

If Perchlorate detected verify w/ analysis SW846-6850M

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

1.Relinquished by		Org. 4137	Date 4/21/11	Time 1030	4.Relinquished by		Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 4/21/11	Time 1030	4. Received by		Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 4/21/11	Time 1200	5.Relinquished by		Org.	Date	Time
2. Received by		Org. GEL	Date 4/22/11	Time 0730	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613528

Project Name:	TA-V GWM	Project/Task Manger:	Mike Skelly	Project/Task No.:	98026.01.10
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090445-036	TAV-MW14	535	NA	042111\0954	GW	AG	250 ml	4C	G	SA	Tritium (906.0)	058
090446-001	TAV-TB15	NA	NA	042111\0941	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260)	059
090447-001	TAV-FB3	NA	NA	042111\0914	DIW	G	3x40 ml	HCL	G	FB	TCL VOC (SW846-8260)	060

Abnormal Conditions on Receipt

Recipient Initials LD

LAB USE

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 19, 2011

Company :	Sandia National Laboratories
Address :	MS-0756, Org. 06765, Bldg. 823/Rm. 4276 1515 Eubank SE Albuquerque, New Mexico 87123
Contact:	Ms. Pamela M. Puissant
Project:	Level C, Groundwater Monitoring

Client Sample ID:	090445-020	Project:	SNLSGWater
Sample ID:	276276053	Client ID:	SNLS003
Matrix:	AQUEOUS		
Collect Date:	21-APR-11 09:47		
Receive Date:	22-APR-11	Client Desc.:	TAV-MW14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	05/05/11	1810	1095219	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

Appendix B

Data Validation Sample Findings Summary Sheets for the Perchlorate Data

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), and SM 2320B (alkalinity). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as follows.

Alkalinity:
Total alkalinity was detected in the MB at a concentration ≥ the PQL. However, blanks are not applicable for alkalinity and are not assessed for data validation. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Nitrate/Nitrite:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Nitrate/Nitrite:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Anions by Ion Chromatography:
Sample -005 was diluted 5X for bromide and was diluted 100X for chloride and sulfate due to high concentration or matrix interference.

Nitrate/Nitrite:
Sample -006 was diluted 5X due to matrix interference.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date:** 07/06/11

Sample Findings Summary

AR/COC: 613578

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	090670-034/CTF-MW2	ALPHA (12587-46-1)	J, FR7
EPA 901.1			
	090670-033/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
	090670-033/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
	090670-033/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	090670-033/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
SW846 3005/6020 DOE-AL			
	090670-009/CTF-MW2	Cadmium (7440-43-9)	J+, CK2
	090670-009/CTF-MW2	Manganese (7439-96-5)	J, MS1
	090670-009/CTF-MW2	Zinc (7440-66-6)	J+, CK2
	090670-010/CTF-MW2	Manganese (7439-96-5)	J, MS1
	090670-010/CTF-MW2	Zinc (7440-66-6)	J+, CK2
SW846 3535/8321A Modified			
	090670-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, I4
SW846 8270C			
	090670-002/CTF-MW2	1,3-Dichlorobenzene (541-73-1)	UJ, MS3
	090670-002/CTF-MW2	1,4-Dichlorobenzene (106-46-7)	UJ, MS3
	090670-002/CTF-MW2	Hexachlorobutadiene (87-68-3)	UJ, MS3
	090670-002/CTF-MW2	Hexachlorocyclopentadiene (77-47-4)	UJ, C3,MS3
	090670-002/CTF-MW2	Hexachloroethane (67-72-1)	UJ, MS3

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

DATE: July 6, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: SWMU-149 GWM
AR/COC(s): 613579
SDG: 279398
Laboratory: GEL
Project/Task No: 98026.01.14

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate), EPA 353.2 (nitrate/nitrite), EPA 9056 (anions), and SM 2320B (total alkalinity). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

All Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

All Analyses: All MS (PS) QC acceptance criteria were met.

Replicates

All Analyses: All replicate QC acceptance criteria were met.

Detection Limits/Dilutions

Anions Analysis: All detection limits were properly reported. Sample 279398-004 was diluted 20X for chloride and sulfate due to high concentrations of the target analytes. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Nitrate/nitrite Analysis: All detection limits were properly reported. Sample -005 was diluted 10X for nitrate/nitrite due to high concentration of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No EBs, FBs, or FDs were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert Date: 07/07/11

Sample Findings Summary

AR/COC: 613579

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	090672-009/CTF-MW3	Copper (7440-50-8)	J+, CK2
	090672-009/CTF-MW3	Nickel (7440-02-0)	J+, CK2
	090672-009/CTF-MW3	Zinc (7440-66-6)	J+, CK2
	090672-010/CTF-MW3	Antimony (7440-36-0)	0.0064U, B3
	090672-010/CTF-MW3	Copper (7440-50-8)	J+, CK2
	090672-010/CTF-MW3	Nickel (7440-02-0)	J+, CK2
	090672-010/CTF-MW3	Zinc (7440-66-6)	J+, CK2
SW846 7470A			
	090672-009/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090672-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
SW846 8260B DOE-AL			
	090672-001/CTF-MW3	1,1,1-Trichloroethane (71-55-6)	UJ, H1
	090672-001/CTF-MW3	1,1,2,2-Tetrachloroethane (79-34-5)	UJ, H1
	090672-001/CTF-MW3	1,1,2-Trichloroethane (79-00-5)	UJ, H1
	090672-001/CTF-MW3	1,1-Dichloroethane (75-34-3)	UJ, H1
	090672-001/CTF-MW3	1,1-Dichloroethylene (75-35-4)	UJ, H1
	090672-001/CTF-MW3	1,2-Dichloroethane (107-06-2)	UJ, H1
	090672-001/CTF-MW3	1,2-Dichloropropane (78-87-5)	UJ, H1
	090672-001/CTF-MW3	2-Butanone (78-93-3)	UJ, H1
	090672-001/CTF-MW3	2-Hexanone (591-78-6)	UJ, H1
	090672-001/CTF-MW3	4-Methyl-2-pentanone (108-10-1)	UJ, H1
	090672-001/CTF-MW3	Acetone (67-64-1)	UJ, H1
	090672-001/CTF-MW3	Benzene (71-43-2)	UJ, H1
	090672-001/CTF-MW3	Bromodichloromethane (75-27-4)	UJ, H1
	090672-001/CTF-MW3	Bromoform (75-25-2)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090672-001/CTF-MW3	Bromomethane (74-83-9)	UJ, H1
	090672-001/CTF-MW3	Carbon disulfide (75-15-0)	UJ, H1
	090672-001/CTF-MW3	Carbon tetrachloride (56-23-5)	UJ, H1
	090672-001/CTF-MW3	Chlorobenzene (108-90-7)	UJ, H1
	090672-001/CTF-MW3	Chloroethane (75-00-3)	UJ, H1
	090672-001/CTF-MW3	Chloroform (67-66-3)	J, H1
	090672-001/CTF-MW3	Chloromethane (74-87-3)	UJ, H1
	090672-001/CTF-MW3	cis-1,2-Dichloroethylene (156-59-2)	UJ, H1
	090672-001/CTF-MW3	cis-1,3-Dichloropropylene (10061-01-5)	UJ, H1
	090672-001/CTF-MW3	Dibromochloromethane (124-48-1)	UJ, H1
	090672-001/CTF-MW3	Ethylbenzene (100-41-4)	UJ, H1
	090672-001/CTF-MW3	Methylene chloride (75-09-2)	UJ, H1
	090672-001/CTF-MW3	Styrene (100-42-5)	UJ, H1
	090672-001/CTF-MW3	Tetrachloroethylene (127-18-4)	UJ, H1
	090672-001/CTF-MW3	Toluene (108-88-3)	UJ, H1
	090672-001/CTF-MW3	trans-1,2-Dichloroethylene (156-60-5)	UJ, H1
	090672-001/CTF-MW3	trans-1,3-Dichloropropylene (10061-02-6)	UJ, H1
	090672-001/CTF-MW3	Trichloroethylene (79-01-6)	UJ, H1
	090672-001/CTF-MW3	Vinyl acetate (108-05-4)	UJ, H1
	090672-001/CTF-MW3	Vinyl chloride (75-01-4)	UJ, H1
	090672-001/CTF-MW3	Xylenes (total) (1330-20-7)	UJ, H1
	090673-001/CTF-TB2	1,1,1-Trichloroethane (71-55-6)	UJ, H1
	090673-001/CTF-TB2	1,1,2,2-Tetrachloroethane (79-34-5)	UJ, H1
	090673-001/CTF-TB2	1,1,2-Trichloroethane (79-00-5)	UJ, H1
	090673-001/CTF-TB2	1,1-Dichloroethane (75-34-3)	UJ, H1
	090673-001/CTF-TB2	1,1-Dichloroethylene (75-35-4)	UJ, H1
	090673-001/CTF-TB2	1,2-Dichloroethane (107-06-2)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090673-001/CTF-TB2	1,2-Dichloropropane (78-87-5)	UJ, H1
	090673-001/CTF-TB2	2-Butanone (78-93-3)	UJ, H1
	090673-001/CTF-TB2	2-Hexanone (591-78-6)	UJ, H1
	090673-001/CTF-TB2	4-Methyl-2-pentanone (108-10-1)	UJ, H1
	090673-001/CTF-TB2	Acetone (67-64-1)	UJ, H1
	090673-001/CTF-TB2	Benzene (71-43-2)	UJ, H1
	090673-001/CTF-TB2	Bromodichloromethane (75-27-4)	UJ, H1
	090673-001/CTF-TB2	Bromoform (75-25-2)	UJ, H1
	090673-001/CTF-TB2	Bromomethane (74-83-9)	UJ, H1
	090673-001/CTF-TB2	Carbon disulfide (75-15-0)	UJ, H1
	090673-001/CTF-TB2	Carbon tetrachloride (56-23-5)	UJ, H1
	090673-001/CTF-TB2	Chlorobenzene (108-90-7)	UJ, H1
	090673-001/CTF-TB2	Chloroethane (75-00-3)	UJ, H1
	090673-001/CTF-TB2	Chloroform (67-66-3)	UJ, H1
	090673-001/CTF-TB2	Chloromethane (74-87-3)	UJ, H1
	090673-001/CTF-TB2	cis-1,2-Dichloroethylene (156-59-2)	UJ, H1
	090673-001/CTF-TB2	cis-1,3-Dichloropropylene (10061-01-5)	UJ, H1
	090673-001/CTF-TB2	Dibromochloromethane (124-48-1)	UJ, H1
	090673-001/CTF-TB2	Ethylbenzene (100-41-4)	UJ, H1
	090673-001/CTF-TB2	Methylene chloride (75-09-2)	UJ, H1
	090673-001/CTF-TB2	Styrene (100-42-5)	UJ, H1
	090673-001/CTF-TB2	Tetrachloroethylene (127-18-4)	UJ, H1
	090673-001/CTF-TB2	Toluene (108-88-3)	UJ, H1
	090673-001/CTF-TB2	trans-1,2-Dichloroethylene (156-60-5)	UJ, H1
	090673-001/CTF-TB2	trans-1,3-Dichloropropylene (10061-02-6)	UJ, H1
	090673-001/CTF-TB2	Trichloroethylene (79-01-6)	UJ, H1
	090673-001/CTF-TB2	Vinyl acetate (108-05-4)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090673-001/CTF-TB2	Vinyl chloride (75-01-4)	UJ, H1
	090673-001/CTF-TB2	Xylenes (total) (1330-20-7)	UJ, H1

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 18, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Burn Site GW Characterization
AR/COC: 613560
SDG: 277938
Laboratory: GEL
Project/Task: 98026.01.06
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction) and EPA 314.0 (perchlorate). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Perchlorate and Nitrate/Nitrite:
It should be noted that the MS analyses were performed on SNL samples from other SDGs. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Perchlorate and Nitrate/Nitrite:
It should be noted that the replicate analyses were performed on SNL samples from other SDGs. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Sample 277938-005 was diluted 50X due to high concentration for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date**: 07/19/11

Sample Findings Summary

AR/COC: 613560

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modified			
	090613-024/CYN-MW9	HMX (2691-41-0)	UJ, MS5
	090613-024/CYN-MW9	m-Nitrotoluene (99-08-1)	UJ, I4
	090613-024/CYN-MW9	p-Nitrotoluene (99-99-0)	UJ, I4
5W846 8015A/B SVOC			
	090613-005/CYN-MW9	Diesel Range Organics (DRO)	UJ, L3

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 15, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Burn Site GW Characterization
AR/COC: 613559
SDG: 277861
Laboratory: GEL
Project/Task: 98026.01.06
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction) and EPA 314.0 (perchlorate). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Perchlorate:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Perchlorate:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Samples 277861-005 was diluted 50X due to high concentration for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date:** 07/19/11

Sample Findings Summary

AR/COC: 613559

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modified			
	090610-024/CYN-MW10	HMX (2691-41-0)	UJ, MS5
	090610-024/CYN-MW10	m-Nitrotoluene (99-08-1)	UJ, I4
	090610-024/CYN-MW10	p-Nitrotoluene (99-99-0)	UJ, I4
SW846 8015A/B SVOC			
	090610-005/CYN-MW10	Diesel Range Organics (DRO)	UJ, L3

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 14, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: Burn Site GW Characterization
AR/COC: 613556, 613557, and 613558
SDG: 277470
Laboratory: GEL
Project/Task: 98026.01.06
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

Four samples were prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction) and EPA 314.0 (perchlorate). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
Samples 277470-005, -023, and -030 were diluted 10X due to high concentration for this analysis.
Sample -014 was diluted 10X due to matrix interference.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

An EB and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date**: 07/18/11

Sample Findings Summary

AR/COC: 613556, 613557, 613558

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modified			
	090600-024/CYN-MW11	HMX (2691-41-0)	UJ, MS5
	090600-024/CYN-MW11	m-Nitrotoluene (99-08-1)	UJ, I4
	090603-024/CYN-EB1	HMX (2691-41-0)	UJ, MS5
	090603-024/CYN-EB1	m-Nitrotoluene (99-08-1)	UJ, I4
	090606-024/CYN-MW12	HMX (2691-41-0)	UJ, MS5
	090606-024/CYN-MW12	m-Nitrotoluene (99-08-1)	UJ, I4
	090607-024/CYN-MW12	HMX (2691-41-0)	UJ, MS5
	090607-024/CYN-MW12	m-Nitrotoluene (99-08-1)	UJ, I4

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
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www.aqainc.net

Memorandum

Date: May 26, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: TAV GW Characterization
AR/COC: 613524, 613526, 613527, and 613528
SDG: 276276
Laboratory: GEL
Project/Task: 98026.01.10
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

Five samples were prepared and analyzed with accepted procedures using methods EPA 9060 (total organic carbon), EPA 9056 (anions by ion chromatography), EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 314.0 (perchlorate), SM 2320B (alkalinity), and EPA 9034 (total sulfide). Problems were identified with the data package that results in the qualification of data.

1. Total Organic Carbon (TOC):
   In the EB, sample 276276-014, associated with samples -026 and -037, TOC average was detected at a concentration > the MDL but ≤ the PQL. The associated TOC quadruplicate and average results were detects <5X the EB concentration and will be **qualified "2.3U,B2"** at 5X the value of the EB (mg/L).

2. Nitrate/Nitrite:
   In the MB, nitrate/nitrite was detected at negative concentration with absolute value > the MDL but ≤ the PQL. The nitrate/nitrite result for sample -017 was an ND and will be **qualified "UJ,B5."** The other associated sample results were detects >5X the MDL and will not be qualified.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as noted above in the summary section and as follows.

Anions:
In the EB, sample -016, associated with samples -028 and -039, chloride was detected at a concentration > the PQL. The associated sample results were detects >5X the EB concentration and will not be qualified.

Alkalinity:
In the MB and the EB, bicarbonate alkalinity was detected at concentrations > the PQL. However, blanks are not applicable for alkalinity and are not assessed for data validation. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria

Anions and Nitrate/Nitrite:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Sulfides:
It should be noted that the MS analysis associated with sample -008 (Batch # 1094198) was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Anions and Nitrate/Nitrite:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Sulfides:
It should be noted that the replicate analysis associated with sample -008 (Batch # 1094198) was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Nitrate/Nitrite:
All samples were diluted 10X due to high concentrations or matrix interference.

Anions:
Samples -004, -028, -039, and -051 were diluted 5X for chloride and sulfate due to high concentrations for this analysis.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

EBs and field duplicate pairs were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result. It should be noted that the EBs on AR/COC# 613526 are associated with the samples on AR/COC# 613527.

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613524, 613526, 613527, 613528

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 353.2			
	090440-018/TAV-EB2	Nitrogen, Nitrate/Nitrite (N/A)	UJ, B5
EPA 900.0/SW846 9310			
	090440-034/TAV-EB2	ALPHA (12587-46-1)	BD, FR3
	090440-034/TAV-EB2	BETA (12587-47-2)	BD, FR3
	090443-034/TAV-MW12	BETA (12587-47-2)	J, FR7
EPA 901.1			
	090435-033/TAV-MW11	Americium-241 (14596-10-2)	BD, FR3
	090435-033/TAV-MW11	Cesium-137 (10045-97-3)	BD, FR3
	090435-033/TAV-MW11	Cobalt-60 (10198-40-0)	BD, FR3
	090435-033/TAV-MW11	Potassium-40 (13966-00-2)	BD, FR3
	090440-033/TAV-EB2	Americium-241 (14596-10-2)	BD, FR3
	090440-033/TAV-EB2	Cesium-137 (10045-97-3)	BD, FR3
	090440-033/TAV-EB2	Cobalt-60 (10198-40-0)	BD, FR3
	090440-033/TAV-EB2	Potassium-40 (13966-00-2)	BD, FR3
	090442-033/TAV-MW12	Americium-241 (14596-10-2)	BD, FR3
	090442-033/TAV-MW12	Cesium-137 (10045-97-3)	BD, FR3
	090442-033/TAV-MW12	Cobalt-60 (10198-40-0)	BD, Z2
	090442-033/TAV-MW12	Potassium-40 (13966-00-2)	BD, FR3
	090443-033/TAV-MW12	Americium-241 (14596-10-2)	BD, FR3
	090443-033/TAV-MW12	Cesium-137 (10045-97-3)	BD, FR3
	090443-033/TAV-MW12	Cobalt-60 (10198-40-0)	BD, Z2
	090443-033/TAV-MW12	Potassium-40 (13966-00-2)	BD, FR3
	090445-033/TAV-MW14	Americium-241 (14596-10-2)	BD, FR3
	090445-033/TAV-MW14	Cesium-137 (10045-97-3)	BD, FR3
	090445-033/TAV-MW14	Cobalt-60 (10198-40-0)	BD, FR3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090445-033/TAV-MW14	Potassium-40 (13966-00-2)	BD, FR3
EPA 906.0 Modified			
	090435-036/TAV-MW11	Tritium (10028-17-8)	BD, FR3
	090440-036/TAV-EB2	Tritium (10028-17-8)	BD, FR3
	090442-036/TAV-MW12	Tritium (10028-17-8)	BD, FR3
	090443-036/TAV-MW12	Tritium (10028-17-8)	BD, FR3
	090445-036/TAV-MW14	Tritium (10028-17-8)	BD, FR3
SW846 3005/6020 DOE-AL			
	090435-010/TAV-MW11	Magnesium (7439-95-4)	J, D1
	090440-010/TAV-EB2	Magnesium (7439-95-4)	UJ, D1
	090442-010/TAV-MW12	Arsenic (7440-38-2)	0.0099U, B2
	090442-010/TAV-MW12	Copper (7440-50-8)	0.0023U, B2
	090442-010/TAV-MW12	Magnesium (7439-95-4)	J, D1
	090443-010/TAV-MW12	Copper (7440-50-8)	0.0023U, B2
	090443-010/TAV-MW12	Magnesium (7439-95-4)	J, D1
	090445-010/TAV-MW14	Magnesium (7439-95-4)	J, D1
SW846 9060			
	090442-004/TAV-MW12	Total Organic Carbon #1 (N/A)	2.3U, B2
	090442-004/TAV-MW12	Total Organic Carbon #2 (N/A)	2.3U, B2
	090442-004/TAV-MW12	Total Organic Carbon #3 (N/A)	2.3U, B2
	090442-004/TAV-MW12	Total Organic Carbon #4 (N/A)	2.3U, B2
	090442-004/TAV-MW12	Total Organic Carbon Average (N/A)	2.3U, B2
	090443-004/TAV-MW12	Total Organic Carbon #1 (N/A)	2.3U, B2
	090443-004/TAV-MW12	Total Organic Carbon #2 (N/A)	2.3U, B2
	090443-004/TAV-MW12	Total Organic Carbon #3 (N/A)	2.3U, B2
	090443-004/TAV-MW12	Total Organic Carbon #4 (N/A)	2.3U, B2
	090443-004/TAV-MW12	Total Organic Carbon Average (N/A)	2.3U, B2

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
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Memorandum

DATE: May 16, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: TA-V GWM
AR/COC(s): 613516
SDG: 275567
Laboratory: GEL
Project/Task No: 98026.01.10

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate), EPA 353.2 (nitrate/nitrite), EPA 9034 (total sulfide), EPA 9056 (anions), EPA 9060 (total organic carbon), and SM 2320B (total alkalinity). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

Nitrate/nitrite Analysis: In the method blank (MB), nitrate/nitrite was detected at concentration > the method detection limit (MDL) but ≤ the practical quantitation limit (PQL). The associated sample result was a detect >5X the MB and will not be qualified.

Alkalinity Analysis: In the MB, bicarbonate alkalinity was detected at concentration > the MDL but ≤ the PQL. The associated sample result was a detect >5X the MB and will not be qualified.

All Other Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

All Other Analyses: All MS (PS) QC acceptance criteria were met. It should be noted that the MS (PS) analyses for the anions, nitrate/nitrite, and total sulfide analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Replicates

All Other Analyses: All replicate QC acceptance criteria were met. It should be noted that the replicate analyses for the anions, nitrate/nitrite, and total sulfide analyses were performed on SNL samples of similar matrix from other SDGs. No sample data will be qualified as a result.

Detection Limits/Dilutions

Anions Analysis: All detection limits were properly reported. Sample 275567-004 was diluted 10X for sulfate due to high concentration of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Nitrate/nitrite Analysis: All detection limits were properly reported. Sample -005 was diluted 10X for nitrate/nitrite due to high concentration of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No equipment blanks (EBs), field blanks (FBs), or field duplicates (FDs) were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert Date: 05/17/11

Sample Findings Summary

AR/COC: 613516

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	090417-034/TAV-MW13	ALPHA (12587-46-1)	J, FR7
	090417-034/TAV-MW13	BETA (12587-47-2)	J, FR7
EPA 901.1			
	090417-033/TAV-MW13	Americium-241 (14596-10-2)	BD, FR3
	090417-033/TAV-MW13	Cesium-137 (10045-97-3)	BD, Z2
	090417-033/TAV-MW13	Cobalt-60 (10198-40-0)	BD, FR3
	090417-033/TAV-MW13	Potassium-40 (13966-00-2)	R, Z1
EPA 906.0 Modified			
	090417-036/TAV-MW13	Tritium (10028-17-8)	BD, FR3
SW846 3005/6020 DOE-AL			
	090417-010/TAV-MW13	Aluminum (7429-90-5)	0.10U, B
	090417-010/TAV-MW13	Nickel (7440-02-0)	NJ-, B4
SW846 7470A			
	090417-010/TAV-MW13	Mercury (7439-97-6)	UJ, B4

All other analyses met QC acceptance criteria; no further data should be qualified.

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APPENDICES

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SECTION IV
SOLID WASTE MANAGEMENT UNITS 149 AND 154 QUARTERLY MONITORING REPORT

1.0 Introduction

This report summarizes the second of eight quarterly sampling events for Coyote Test Field (CTF) monitoring well CTF-MW3, located near Solid Waste Management Unit (SWMU) 149 (Building 9930 Septic System), and monitoring well CTF-MW2, located near SWMU 154 (Building 9960 Septic System and Seepage Pits). This supplemental groundwater monitoring at the two SWMUs is designed to address the requirements of Section VII.D.6 of the Compliance Order on Consent (the Order) (NMED April 2004) and the letter dated April 8, 2010, from the New Mexico Environment Department (NMED) Hazardous Waste Bureau (NMED April 2010). The analytical results discussed in this section correspond to the reporting period of April through June 2011. Monitoring wells CTF-MW3 and CTF-MW2 were sampled on June 3 and May 31, 2011, respectively.

Monitoring wells CTF-MW3 and CTF-MW2 were installed in August 2001. Prior to this sampling event, CTF-MW3 and CTF-MW2 had been sampled 13 and 14 times, respectively, for a variety of constituents. Monitoring well CTF-MW3 is located approximately 290 feet to the west and downgradient of SWMU 149. Monitoring well CTF-MW2 is located approximately 260 feet to the southwest and downgradient of SWMU 154. Both wells are screened in Precambrian bedrock.

The May and June 2011 groundwater samples were collected in accordance with the NMED-approved Sampling and Analysis Plan for the two sites (SNL/NM June 2010). The samples from CTF-MW3 were analyzed for all required constituents, consisting of volatile organic compounds (VOCs), metals (including selenium), general chemistry parameters, perchlorate, and nitrate plus nitrite. The samples from CTF-MW2 were analyzed for all required constituents, consisting of VOCs, semivolatile organic compounds, general chemistry parameters, high explosive compounds, perchlorate, metals (including uranium), nitrate plus nitrite, and radionuclides for gross alpha/beta activity and gamma spectroscopy.

Analytical results for the May and June 2011 groundwater samples were compared with the U.S. Environmental Protection Agency maximum contaminant levels (MCLs) for drinking water. No analytical results for the CTF-MW3 groundwater samples exceed the corresponding MCLs. Except for arsenic and gross alpha activity, none of the analytical results for the CTF-MW2 groundwater samples exceed the MCLs. Arsenic was detected above the MCL of 0.010 milligrams per liter (mg/L) in CTF-MW2 groundwater

samples at concentrations of 0.0496 mg/L in the unfiltered sample and 0.0528 mg/L in the filtered sample. These values are comparable to historical values. Results for gross alpha activity in the sample from CTF-MW2 exceed historical values. The corrected gross alpha activity reported exceeds the MCL of 15 picocuries per liter (pCi/L) at 23.38 pCi/L in the environmental sample. The result for the gross alpha activity reanalysis reported is below the MCL. The elevated arsenic concentration and gross alpha activity in the groundwater samples can most likely be attributed to background because monitoring well CTF-MW2 is screened in a fault-gouge zone in the Precambrian granite.

Field quality control samples included only a trip blank sample. The corresponding data validation results are presented in Appendix A.

The U.S. Department of Energy and Sandia Corporation will continue to conduct quarterly sampling of groundwater monitoring wells CTF-MW3 and CTF-MW2.

2.0 Groundwater Monitoring

Quarterly groundwater monitoring activities were performed at SWMUs 149 and 154 in May and June 2011; the analytical results are presented in Appendix A. This sampling event represents the second of eight supplemental quarterly events for the two monitoring wells (CTF-MW3 and CTF-MW2).

3.0 Projected Activities for the Upcoming Quarter

The third of the eight supplemental quarterly sampling events will be conducted during the upcoming quarter (July to September 2011).

4.0 References

New Mexico Environment Department (NMED), April 2004. "Compliance Order on Consent, Pursuant to the New Mexico Hazardous Waste Act, § 74-4-10," New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), April 2010. Letter to K. Davis (U.S. Department of Energy) and M. Walck (Sandia Corporation), "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

NMED, see New Mexico Environment Department.

Sandia National Laboratories/New Mexico (SNL/NM), June 2010. "Sampling and Analysis Plans for Monitoring Wells CTF-MW2 and CTF-MW3," in U.S. Department of Energy/Sandia Corporation Response to the New Mexico Environment Department letter entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008),* Sandia National Laboratories, Albuquerque, New Mexico, April 8, 2010.

SNL/NM, see Sandia National Laboratories, New Mexico.

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Appendix A

SWMUs 149 and 154 Quarterly Groundwater Monitoring Assessment Report, April – June 2011

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ATTACHMENTS

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SECTION IV, APPENDIX A
SWMUs 149 AND 154 QUARTERLY GROUNDWATER MONITORING ASSESSMENT REPORT, APRIL – JUNE 2011

1.0 Introduction

This Quarterly Groundwater Monitoring Assessment Report has been prepared pursuant to the "U.S. Department of Energy (DOE)/Sandia Corporation (Sandia) Response to the New Mexico Environment Department (NMED) letter of April 8, 2010, entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories EPA ID# NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001"* (SNL/NM June 2010). The activities associated with the groundwater monitoring task are summarized as follows.

On May 31 and June 3, 2011, the Second Quarter groundwater sampling event for Calendar Year (CY) 2011 was performed at Solid Waste Management Units (SWMUs) 149 and 154 at Sandia National Laboratories, New Mexico (SNL/NM) (Figures A-1 and A-2). This quarterly groundwater monitoring event corresponds to the time period from April 2011 through June 2011. Quarterly groundwater monitoring at SWMUs 149 and 154 is designed to address the requirements of Section VII.D.6 of the Compliance Order on Consent (the Order) (NMED April 2004) and the letter dated April 8, 2010, from the NMED (April 2010).

This groundwater sampling event was conducted in accordance with procedures outlined in the "Sampling and Analysis Plan (SAP) for Collection and Analysis of Additional Groundwater Samples Collected from Monitoring Well CTF-MW3, Located near SNL/NM SWMU 149" (Attachment 1, SNL/NM June 2010) and the "SAP for Collection and Analysis of Additional Groundwater Samples Collected from Monitoring Well CTF-MW2, Located near SNL/NM SWMU 154" (Attachment 2, SNL/NM June 2010). These SAPs were approved by the NMED in December 2010 (NMED December 2010).

This report describes groundwater sampling activities and presents analytical results for the second of eight quarterly groundwater assessment monitoring periods. In May and June 2011, environmental groundwater samples were collected from Coyote Test Field (CTF) monitoring well CTF-MW3, located near SWMU 149 (Figure A-1), and CTF-MW2, located near SWMU 154 (Figure A-2), in accordance with the NMED-approved SAP for each site (Attachments 1 and 2, SNL/NM June 2010). Both wells were installed in August 2001. The samples from CTF-MW3 were analyzed for the required

constituents, consisting of general chemistry parameters, volatile organic compounds (VOCs), perchlorate, metals (including selenium), and nitrate plus nitrite (NPN). The samples from CTF-MW2 were analyzed for the required constituents, consisting of general chemistry parameters, VOCs, semivolatile organic compounds (SVOCs), high explosive (HE) compounds, perchlorate, metals (including barium), NPN, gross alpha/beta activity, and gamma spectroscopy.

The following sections provide descriptions of the field methods used and discussions of the analytical and quality control (QC) sampling results.

2.0 Field Methods and Measurements

The quarterly groundwater sampling field measurements were collected in accordance with the DOE/Sandia Response to the NMED letter of April 8, 2010 (SNL/NM June 2010). Groundwater monitoring at SWMUs 149 and 154 was performed according to the SAPs submitted as Attachments 1 and 2 to the DOE/Sandia Response (SNL/NM June 2010) and updated SNL/NM administrative operating procedures (AOPs) and field operating procedures (FOPs) (SNL/NM July 2007, August 2007a and 2007b).

2.1 Equipment Decontamination

A portable Bennett™ groundwater sampling system was used to collect the groundwater samples from both wells. The Bennett™ sampling pump and tubing bundle were decontaminated prior to installation into monitoring wells according to procedures described in SNL/NM FOP 05-03, "Long-Term Environmental Stewardship (LTES) Groundwater Sampling Equipment Decontamination" (SNL/NM August 2007a). Table A-2 presents the details for groundwater samples collected from CTF-MW3 and CTF-MW2 during Second Quarter, CY 2011.

2.2 Well Evacuation

In accordance with procedures described in SNL/NM FOP 05-01, "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM August 2007b), all wells were purged a minimum of one saturated casing volume (the volume of one length of the saturated screen plus the borehole annulus around the saturated screen interval) and monitored for stability of water quality parameters, if applicable.

Field water-quality measurements for turbidity, pH, temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the wells prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with a YSI™ Model 620 water quality meter. Turbidity was measured with a HACH™ Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when the following parameters have been achieved:

- Turbidity measurements are within 10 percent, or less than 5 nephelometric turbidity units
- pH is within 0.1 units
- Temperature is within 1.0 degree Celsius
- SC is within 5 percent as micromhos per centimeter

Table A-3 summarizes temperature, pH, SC, and turbidity measurements, which are discussed in Section 3.0 of this appendix. Field Measurement Logs (Attachment 1) documenting details of well purging and water quality measurements have been submitted to the SNL/NM Customer Funded Records Center.

2.3 Groundwater Sample Collection

All groundwater samples were collected directly from the sample discharge tube into laboratory-prepared sample containers. Chemical preservatives for samples intended for chemical analyses were added to the sample containers at the laboratory prior to shipment to SNL/NM. The groundwater samples were submitted to GEL Laboratories LLC (GEL) for chemical analysis using methods outlined in Table A-1. Table A-1 also lists the sample containers and preservative requirements. Section 3.0 of this appendix summarizes the analytical results.

The sample identification number, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table A-2. Chain-of-custody forms and supporting documentation are included in Attachment 2.

3.0 Analytical Results

Groundwater samples were submitted to GEL for chemical and radiological analyses. Samples were analyzed in accordance with applicable U.S. Environmental Protection Agency (EPA) analytical methods. Groundwater sampling results are compared with established EPA maximum contaminant levels (MCLs) for drinking water supplies. Analytical results for samples collected from CTF-MW3 and CTF-MW2 are shown in tabulated form in Tables A-4 through A-16. Analytical reports, including certificates of analyses, analytical methods, method detection limits (MDLs), minimum detectable activity (MDA), critical level, practical quantitation limits, dates of analyses, results of QC analyses, and data validation findings are filed in the SNL/NM Customer Funded Records Center.

The analytical data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 2 (SNL/NM July 2007). No problems were identified with the analytical data that resulted in qualification of the data as unusable. The data are acceptable, and reported QC measures are adequate. The data validation sample findings summary sheets are included as Attachment 3.

3.1 Field Water Quality Measurements

SWMU 149, CTF-MW3. Table A-3 summarizes field water quality measurements (turbidity, pH, temperature, SC, ORP, and DO) collected prior to sampling at CTF-MW3.

SWMU 154, CTF-MW2. Table A-3 summarizes field water quality measurements (turbidity, pH, temperature, SC, ORP, and DO) collected prior to sampling at CTF-MW2.

3.2 Volatile Organic Compounds

SWMU 149, CTF-MW3. No VOCs were detected at concentrations exceeding established MCLs in any CTF-MW3 groundwater samples. Chloroform was detected at 0.670 micrograms per liter (µg/L), but no MCL is established for this compound. Table A-4 summarizes detected VOCs in environmental groundwater samples from CTF-MW3, and Table A-5 lists the associated MDLs for VOCs analyzed.

SWMU 154, CTF-MW2. No VOCs were detected at concentrations exceeding established MCLs in any CTF-MW2 groundwater samples. The VOC carbon disulfide was detected at 1.90 µg/L, but no MCL is established for this compound. Table A-4

summarizes detected VOCs in environmental groundwater samples from CTF-MW2, and Table A-6 summarizes the associated MDLs for VOCs analyzed.

3.3 Semivolatile Organic Compounds

SWMU 149, CTF-MW3. Analysis of SVOCs is not required for CTF-MW3.

SWMU 154, CTF-MW2. No SVOCs were detected at concentrations exceeding established MCLs in any CTF-MW2 groundwater samples. No SVOCs were reported above laboratory MDLs. Table A-6 summarizes the associated MDLs for SVOCs analyzed.

3.4 High Explosive Compounds

SWMU 149, CTF-MW3. Analysis of HE compounds is not required for CTF-MW3.

SWMU 154, CTF-MW2. No HE compounds were detected at concentrations exceeding established MCLs in any CTF-MW2 groundwater samples. The HE compound RDX [hexahydro-trinitro-triazine] was detected in the CTF-MW2 groundwater sample at a concentration of 0.124 µg/L. Table A-4 summarizes detected HE compounds in environmental groundwater samples, and Table A-7 summarizes the MDLs for associated HE compounds analyzed.

3.5 Nitrate Plus Nitrite

SWMU 149, CTF-MW3. Table A-8 summarizes NPN results for CTF-MW3. NPN concentrations were compared with the nitrate MCL of 10 milligrams per liter (mg/L). NPN was reported at a concentration of 5.51 mg/L.

SWMU 154, CTF-MW2. Table A-8 summarizes NPN results for CTF-MW2. No detections of NPN above the laboratory MDL (0.050 mg/L) were reported for CTF-MW2 groundwater samples.

3.6 Anions and Alkalinity

SWMU 149, CTF-MW3. Table A-9 summarizes alkalinity and major anion (bromide, chloride, fluoride, and sulfate) results. No parameters were detected above established MCLs.

SWMU 154, CTF-MW2. Table A-9 summarizes alkalinity and major anion (bromide, chloride, fluoride, and sulfate) results. No parameters were detected above established MCLs.

3.7 Perchlorate

SWMU 149, CTF-MW3. No perchlorate detections above the screening level/MDL of 0.004 mg/L were reported in CTF-MW3 groundwater samples. Table A-10 presents perchlorate results.

SWMU 154, CTF-MW2. No perchlorate detections above the screening level/MDL of 0.004 mg/L were reported in CTF-MW2 groundwater samples. Table A-10 presents perchlorate results.

Perchlorate results for Second Quarter of CY 2011 are discussed in more detail in Section III ("Perchlorate Screening Quarterly Monitoring Report") of the Consolidated Quarterly Report for April through June 2011.

3.8 Metals

Metal analyses include two sets of analyses and results for filtered and unfiltered groundwater samples. Groundwater samples obtained for total metal analyses are collected without filtering, and dissolved metal samples are collected by filtering the sample prior to analysis. Target Analyte List (TAL) metals plus uranium in both unfiltered and filtered fractions were analyzed in all samples.

SWMU 149, CTF-MW3. No metals were detected above established MCLs in any groundwater samples. Total metal results for both unfiltered and filtered samples from CTF-MW3 are summarized in Tables A-11 and A-12, respectively.

SWMU 154, CTF-MW2. No metals were detected above established MCLs in any CTF-MW2 groundwater samples, except for arsenic. Arsenic concentrations exceed the MCL of 0.010 mg/L with total arsenic reported at 0.0496 mg/L, and dissolved arsenic at 0.0528 mg/L. Unfiltered and filtered total metal results for CTF-MW2 groundwater samples are summarized in Tables A-13 and A-14, respectively.

3.9 Gamma Spectroscopy and Radioisotopic Analyses

SWMU 149, CTF-MW3. Gamma spectroscopy analysis is not required for CTF-MW3.

SWMU 154, CTF-MW2. CTF-MW2 groundwater samples were screened for gamma-emitting radionuclides and gross alpha/beta activity. Additional samples for isotopic uranium were collected to support evaluation of gross alpha activity results. The results for gamma spectroscopy, gross alpha, gross beta, and isotopic uranium are presented in Table A-15. Gamma spectroscopy results for short-list radionuclides are less than the associated MDAs, except for potassium-40. The potassium-40 activity reported is 91.4 ± 48.6 picocuries per liter (pCi/L).

Radioisotopic analyses included gross alpha/beta activity and isotopic uranium analyses. Gross alpha activity is measured as a screening tool and, according to Title 40, Code of Federal Regulations, Parts 9, 141, and 142, Table I-4, does not include uranium, which is measured independently. Therefore, gross alpha activity measurements were corrected by subtracting out the uranium activity. The corrected gross alpha activity reported exceeds the MCL of 15 pCi/L at 23.38 pCi/L in the CTF-MW2 groundwater sample. Although this activity is comparable to historical values, SNL/NM personnel requested a reanalysis. The result for the corrected gross alpha reanalysis reported is below the MCL at 1.18 pCi/L. Gross beta activity results do not exceed established MCLs. The isotopic uranium results reported are as follows: uranium-233/234 at 58.5 ± 8.38 pCi/L; uranium-235/236 at 0.690 ± 0.172 pCi/L; and uranium-238 at 8.93 ± 1.35 pCi/L. In this region, groundwater contacts bedrock, which contains material high in naturally occurring uranium.

3.10 Sample Results Exceeding Maximum Contaminant Levels

Table A-16 lists the results for all constituents that were detected at concentrations exceeding the EPA MCLs during all quarterly sampling events. The only constituents exceeding MCLs in samples collected during this quarter are arsenic and gross alpha activity, which were detected in the CTF-MW2 groundwater samples. Figure A-3 shows the concentrations of arsenic and groundwater elevations over time for CTF-MW2.

4.0 Quality Control Samples

Field and laboratory QC samples were prepared to determine the accuracy of the methods used and to detect inadvertent sample contamination that may have occurred during the sampling and analysis process. The following sections discuss each sample type.

4.1 Field Quality Control Samples

Field QC samples included a trip blank (TB) sample only. In accordance with the approved SAP, QC samples for environmental duplicate, equipment blank, and field blank samples were not required during this sampling event. The TB sample was submitted for analysis along with the groundwater samples in accordance with QC procedures specified in the SAP (Attachments 1 and 2, SNL/NM June 2010).

Trip Blank Samples

TB samples are submitted whenever samples are collected for VOC analyses to assess whether contamination of the samples has occurred during shipment and storage. TB samples consist of laboratory reagent-grade water with hydrochloric acid preservative contained in 40-milliliter volatile organic analysis vials prepared by the analytical laboratory, which accompany the empty sample containers supplied by the laboratory. The TBs were brought to the field and accompanied each sample shipment. A total of two TBs were submitted with the samples collected during the April through June 2011 sampling event. No VOCs were detected above associated laboratory MDLs.

4.2 Laboratory Quality Control Samples

Internal laboratory QC samples, including method blanks and duplicate laboratory control samples, were analyzed concurrently with all groundwater samples. All chemical data were reviewed and validated in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 2 (SNL/NM July 2007).

No significant data quality problems were noted during the data validation process for CTF-MW3 samples. Due to laboratory error, the VOC analysis was performed outside holding time limits. Because the analysis was performed within two times the method-specific holding time requirement, all VOC results were qualified during data validation as estimated values.

No significant data quality problems were noted during the data validation process for CTF-MW2 samples. The data validation reports are provided in Attachment 3 and filed in the SNL/NM Customer Funded Records Center.

4.3 Variances and Nonconformances

No variances or nonconformances from the requirements in the SWMU 149 Groundwater Monitoring SAP or project-specific issues were identified during the April through June 2011 sampling activities at CTF-MW3.

Variances, nonconformances, or project-specific issues that deviated from the requirements in the SWMU 154 Groundwater Monitoring SAP during the April through June 2011 sampling activities at CTF-MW2 are identified as follows:

- GEL revised its process for vanadium analysis. Due to inconsistencies exhibited by instrumentation, GEL has decided to analyze vanadium using SW846 6010 for all sample matrices.

- SNL/NM personnel requested that GEL rerun the gross alpha activity analysis. The result for the reanalysis did correlate with the initial data and both results are reported in Table A-15.

5.0 Summary

In May and June 2011, samples were collected from monitoring wells CTF-MW3, located near SWMU 149, and CTF-MW2, located near SWMU 154. Sampling results were compared with EPA MCL guidelines for drinking water.

Analytical parameters for CTF-MW3 samples included VOCs, NPN, major anions, alkalinity, TAL total metals, and perchlorate. No parameters were detected above established MCLs. All groundwater monitoring data for CTF-MW3 are comparable to historical values.

Analytical parameters for CTF-MW2 included VOCs, SVOCs, HE, NPN, major anions, alkalinity, TAL total metals plus uranium, perchlorate, gamma spectroscopy, gross alpha/beta activity, and isotopic uranium. No parameters were detected above established MCLs, except for arsenic and gross alpha activity.

Arsenic concentrations exceed the MCL of 0.010 mg/L in CTF-MW2 groundwater samples at 0.0496 mg/L in the unfiltered sample and 0.0528 mg/L in the filtered sample. These values are comparable to historical values.

The result for gross alpha activity in the sample from CTF-MW2 exceeds historical values. The corrected gross alpha activity reported exceeds the MCL of 15 pCi/L at 23.38 pCi/L in the environmental groundwater sample. The result for the gross alpha activity reanalysis reported is below the MCL.

DOE/Sandia will continue quarterly groundwater monitoring of CTF-MW3 and CTF-MW2, paying particular attention to arsenic concentrations and gross alpha activity in CTF-MW2 groundwater samples.

6.0 References

New Mexico Environment Department (NMED), April 2004. "Compliance Order on Consent, Pursuant to the New Mexico Hazardous Waste Act, § 74-4-10," New Mexico Environment Department, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), April 2010. "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001." New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), December 2010. "Approval with Modifications, Response to April 8, 2010 Letter, Groundwater Monitoring Plan for SWMUs 149 and 154," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico.

NMED, see New Mexico Environment Department.

Sandia National Laboratories, New Mexico (SNL/NM), July 2007. "Data Validation Procedure for Chemical and Radiochemical Data," Administrative Operating Procedure 00-03, Revision 2, Sample Management Office, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), August 2007a. "Long-Term Environmental Stewardship (LTES) Groundwater Sampling Equipment Decontamination," Field Operating Procedure 05-03, Revision 02, Long-Term Environmental Stewardship, Environmental Management Department, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), August 2007b. "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements," Field Operating Procedure 05-01, Revision 02, Long-Term Environmental Stewardship, Environmental Management Department, Sandia National Laboratories, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), June 2010. "U.S. Department of Energy/Sandia Corporation Response to the New Mexico Environment Department letter entitled, *Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008) Sandia National Laboratories EPA ID# NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001*," Sandia National Laboratories, Albuquerque, New Mexico, April 8, 2010.

SNL/NM, see Sandia National Laboratories/New Mexico.

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Figures

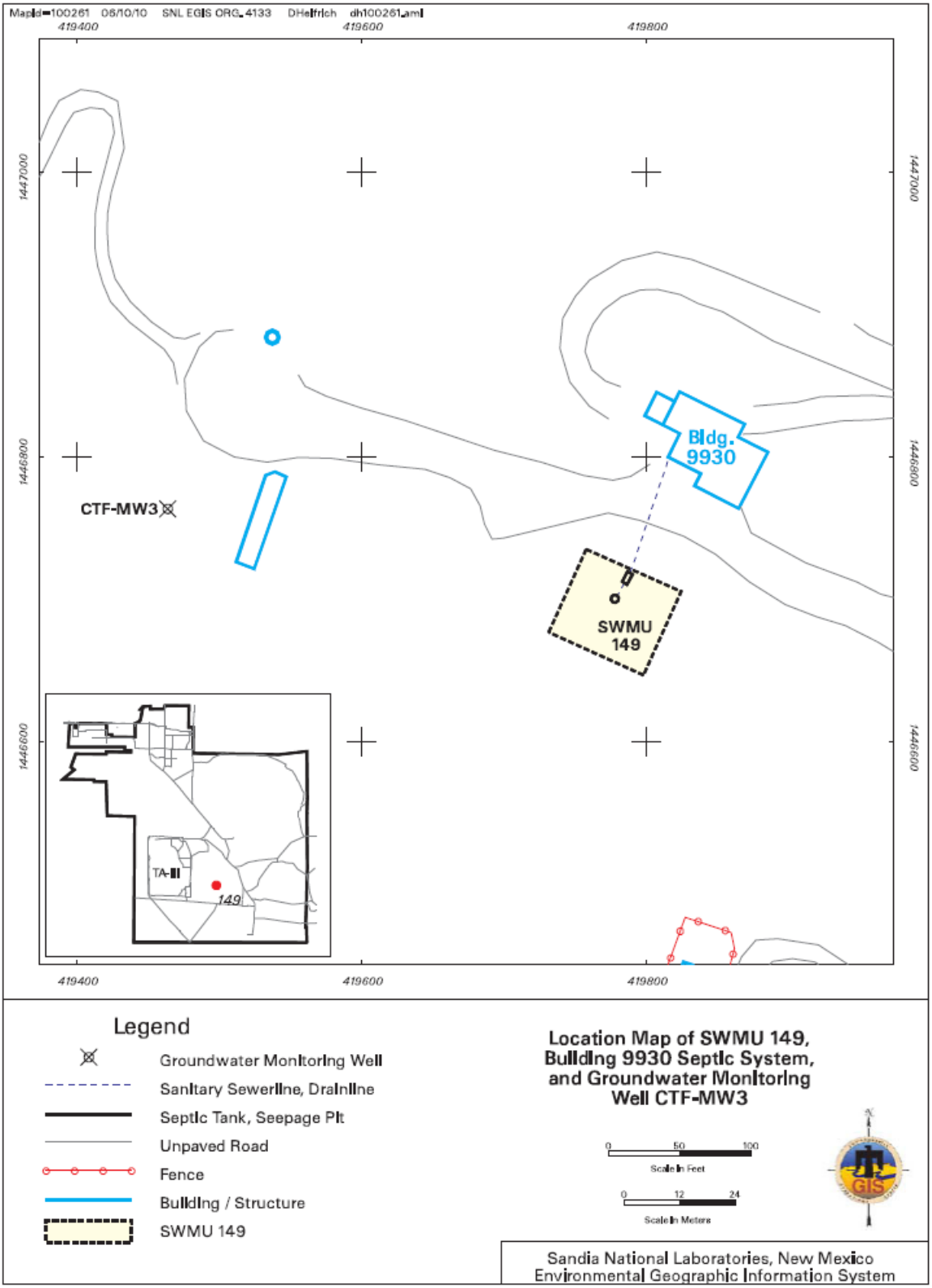

Figure A-1

Location of Monitoring Well CTF-MW3 near SWMU 149

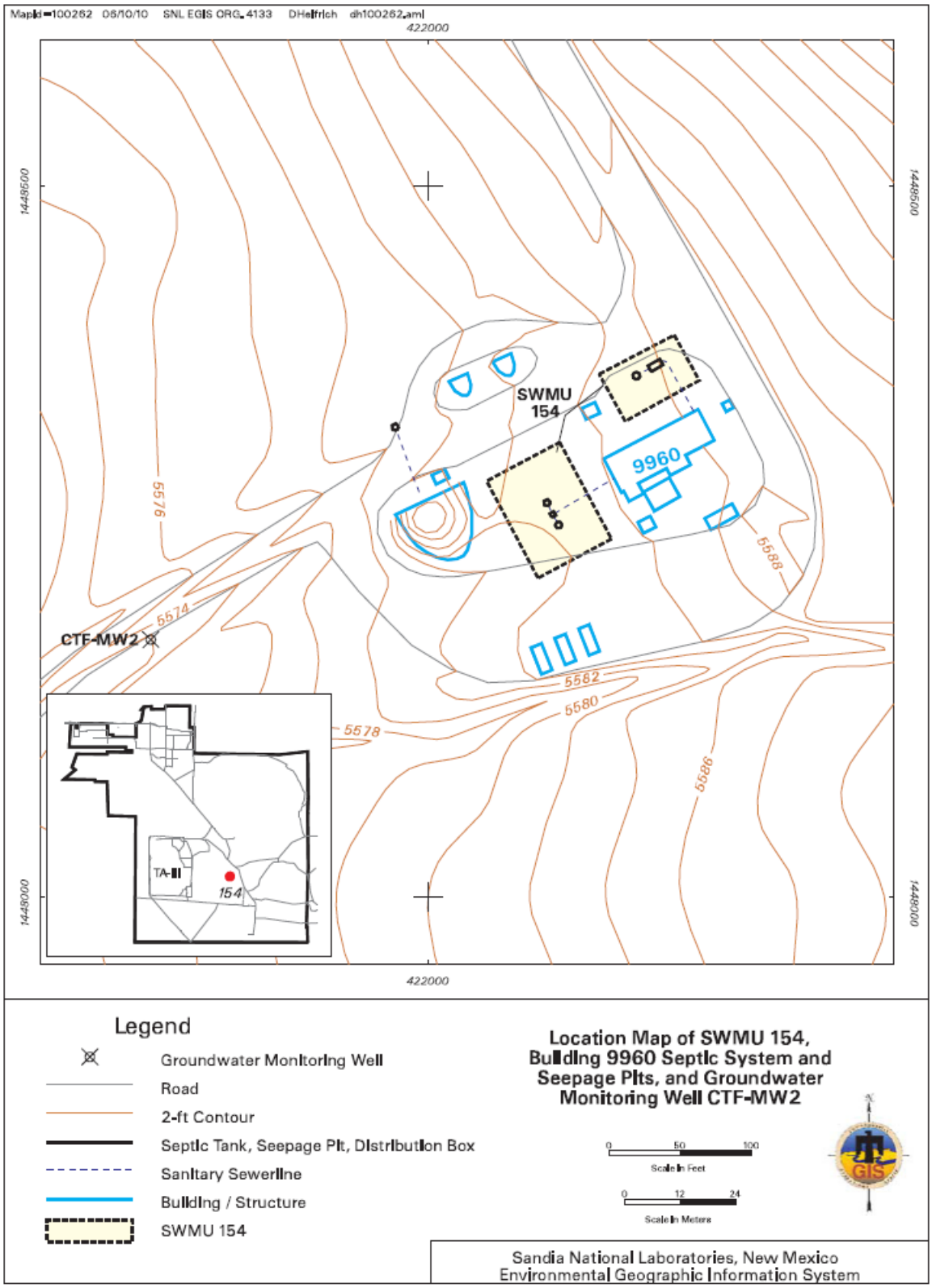

Figure A-2

Location of Monitoring Well CTF-MW2 near SWMU 154

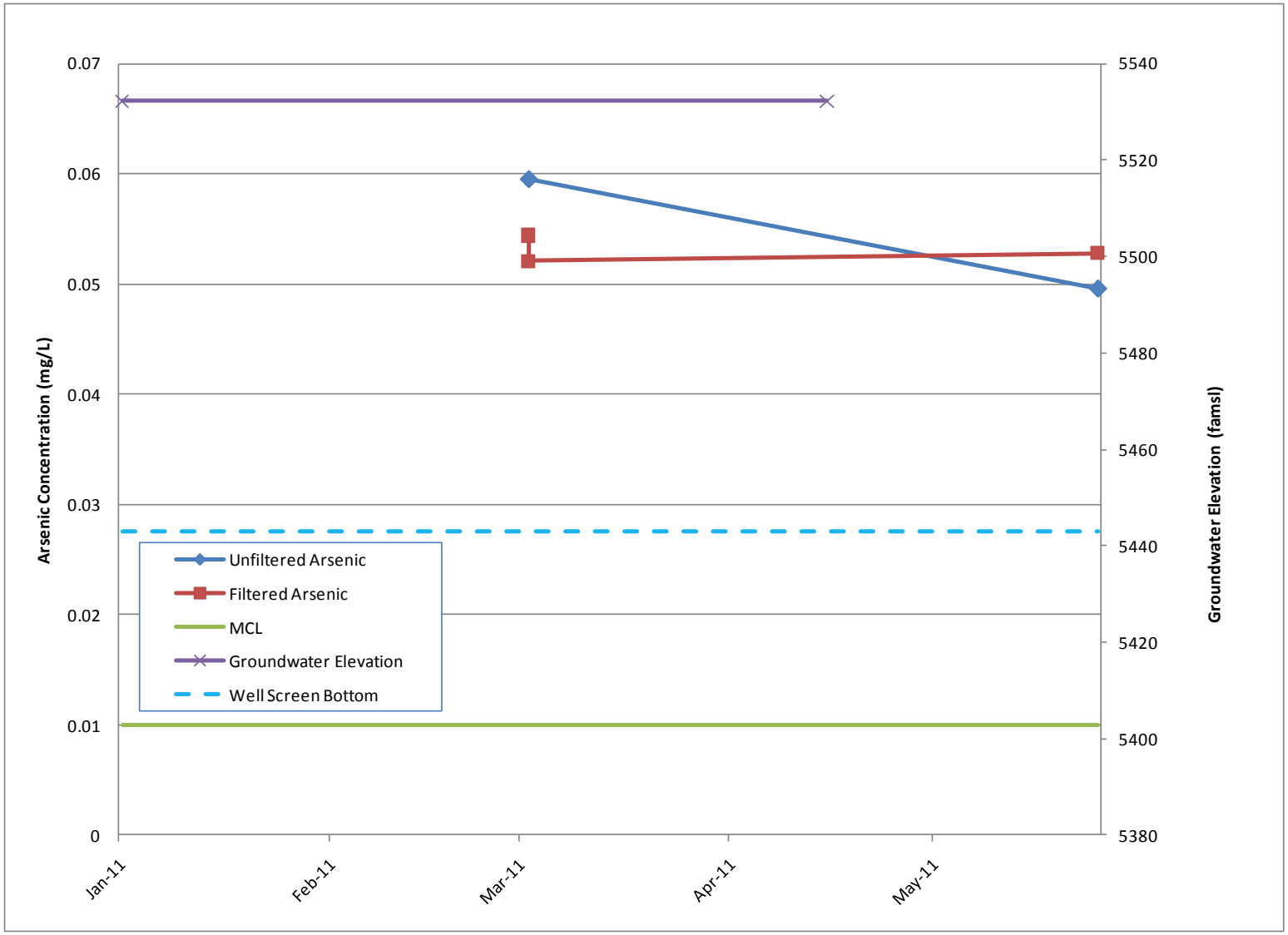

Figure A-3

Groundwater Elevations and Arsenic Concentrations Over Time in CTF-MW2

Tables

Table A-1

Laboratory Analytical Methods, Container Types, and Preservatives used for SWMU 149 and 154 Groundwater Samples

Analysis	EPA Method[a]	Volume and Container Type/Preservation
Volatile Organic Compounds	8260B	3 x 40-mL glass, HCL, 4°C
Semivolatile Organic Compounds	8270C	3 x 1-L amber glass, 4°C
High Explosives	8321A	4 x 1-L amber glass, 4°C
Metals[b]	6020/7470	1 x 500-mL polyethylene, HNO_3, 4°C
Perchlorate	314.0	1 x 250-mL polyethylene, 4°C
Major Anions and Cations[c]	6020/7470/9056	1 x 500-mL polyethylene, 4°C
Alkalinity as Total, Carbonate, and Bicarbonate	SM 2320B	1 x 500-mL polyethylene, 4°C
Nitrate plus Nitrite	353.2	1 x 250-mL polyethylene, H_2SO_4, 4°C
Gross Alpha/Beta Activity	900.0	1 x 1-L polyethylene, HNO_3, 4°C
Gamma Spectroscopy[d]	901.0	1 x 1-L polyethylene, HNO_3, 4°C

Notes

[a]U.S. Environmental Protection Agency, 1986 (and updates), "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*," SW-846, 3rd ed., U.S. Environmental Protection Agency, Washington, D.C.
U.S. Environmental Protection Agency, 1999, "*Perchlorate in Drinking Water Using Ion Chromatography*," EPA 815/R-00-014, U.S. Environmental Protection Agency, Washington, D.C.
Clesceri, L.S., A.E. Greenburg, and A.D. Eaton, 1998. *Standard Methods for the Examination of Water and Wastewater,* 20th ed., Standard Method 2320B, Published jointly by American Public Health Association, American Water Works Association, and Water Environment Federation, Washington, D.C.
U.S. Environmental Protection Agency, 1980, "*Prescribed Procedures for Measurement of Radioactivity in Drinking Water,"* EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio
[b]Metals = filtered and unfiltered samples, Target Analyte List (TAL) metals including barium, calcium, magnesium, potassium, and sodium, plus uranium.
[c]Major anions include bromide, chloride, fluoride, and sulfate.
[d]Gamma spectroscopy = Americium-241, Cesium-137, Cobalt-60, and Potassium-40.
°C = Degrees Celsius.
EPA = U.S. Environmental Protection Agency.
H_2SO_4 = Sulfuric Acid.
HCL = Hydrochloric acid.
HNO_3 = Nitric acid.
L = Liter.
mL = Milliliter(s).
SM = Standard Method.
SWMU = Solid Waste Management Unit.

Table A-2

Sample Details for Second Quarter, CY 2011 Groundwater Sampling

Solid Waste Management Units 149 and 154 Groundwater Monitoring Quarterly Assessment

April 2011 – June 2011

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation
CTF-MW3	090672	613579	SWMU 149
CTF-MW2	090670	613578	SWMU 154

Notes

AR/COC = Analysis request/chain of custody.
CTF = Coyote Test Field.
CY = Calendar Year.
MW = Monitoring well.
SWMU = Solid Waste Management Unit.

Table A-3

Summary of Field Water Quality Measurements[a]

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (μmhos/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
SWMU 149								
CTF-MW3	03-Jun-11	21.49	1587	414.2	6.86	0.33	78.6	6.95
SWMU 154								
CTF-MW2	31-May-11	19.51	3404	71.2	5.89	1.16	1.8	0.17

Notes

[a]Field measurements collected prior to sampling.

°C = Degrees Celsius.
% Sat = Present saturation.
μmhos/cm = Micromhos per centimeter.
CTF = Coyote Test Field.
ID = Identification.
mg/L = Milligrams per liter.
mV = Millivolts.
MW = Monitoring well.
NTU = Nephelometric turbidity units.
pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).
SWMU = Solid Waste Management Unit.

Table A-4

Summary of Detected Volatile Organic, Semivolatile Organic, and High Explosive Compounds

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (μg/L)	MDL (μg/L)	PQL (μg/L)	MCL (μg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149									
CTF-MW3 03-Jun-11	Chloroform	0.670	0.250	1.00	NE	H, J	J	090672-001	SW846-8260B
SWMU 154									
CTF-MW2	Carbon disulfide	1.60	1.25	5.00	NE	J		090670-001	SW846-8260B
31-May-11	RDX	0.124	0.104	0.325	NE	J		090238-024	SW846-8321A

Notes

μg/L = Micrograms per liter.
CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
MW = Monitoring well.
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
RDX = Hexahydro-trinitro-triazine.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
H = Analytical holding time was exceeded.
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J = The associated value is an estimated quantity.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.

Table A-5

Method Detection Limits for Volatile Organic Compounds (EPA Method SW846-8260)

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Analyte	MDL (µg/L)
1,1,1-Trichloroethane	0.325
1,1,2,2-Tetrachloroethane	0.250
1,1,2-Trichloroethane	0.250
1,1-Dichloroethane	0.300
1,1-Dichloroethene	0.300
1,2-Dichloroethane	0.250
1,2-Dichloropropane	0.250
2-Butanone	1.25
2-Hexanone	1.25
4-methyl-, 2-Pentanone	1.25
Acetone	3.50
Benzene	0.300
Bromodichloromethane	0.250
Bromoform	0.250
Bromomethane	0.300
Carbon disulfide	1.25
Carbon tetrachloride	0.300
Chlorobenzene	0.250
Chloroethane	0.300
Chloroform	0.250
Chloromethane	0.300
Dibromochloromethane	0.300
Ethylbenzene	0.250
Methylene chloride	3.00
Styrene	0.250
Tetrachloroethene	0.300
Toluene	0.250
Trichloroethene	0.250
Vinyl acetate	1.50
Vinyl chloride	0.500
Xylene	0.300
cis-1,2-Dichloroethene	0.300
cis-1,3-Dichloropropene	0.250
trans-1,2-Dichloroethene	0.300
trans-1,3-Dichloropropene	0.250

Notes

µg/L = Micrograms per liter.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.

Table A-6
Method Detection Limits for Volatile and Semivolatile Organic Compounds
Solid Waste Management Unit 154 Groundwater Monitoring
Quarterly Assessment, April 2011 – June 2011

Analyte	MDL (µg/L)	Analytical Method[a]	Analyte	MDL (µg/L)	Analytical Method[a]	Analyte	MDL (µg/L)	Analytical Method[a]
1,1,1-Trichloroethane	0.325	8260B	1,2,4-Trichlorobenzene	2.00	8270C	Di-n-butyl phthalate	2.00	8270C
1,1,2,2-Tetrachloroethane	0.250	8260B	1,2-Dichlorobenzene	2.00	8270C	Di-n-octyl phthalate	3.00	8270C
1,1,2-Trichloroethane	0.250	8260B	1,3-Dichlorobenzene	2.00	8270C	Dibenz[a,h]anthracene	0.200	8270C
1,1-Dichloroethane	0.300	8260B	1,4-Dichlorobenzene	2.00	8270C	Dibenzofuran	2.00	8270C
1,1-Dichloroethene	0.300	8260B	2,4,5-Trichlorophenol	2.00	8270C	Diethylphthalate	2.00	8270C
1,2-Dichloroethane	0.250	8260B	2,4,6-Trichlorophenol	2.00	8270C	Dimethylphthalate	2.00	8270C
1,2-Dichloropropane	0.250	8260B	2,4-Dichlorophenol	2.00	8270C	Dinitro-o-cresol	3.00	8270C
2-Butanone	1.25	8260B	2,4-Dimethylphenol	2.00	8270C	Diphenyl amine	3.00	8270C
2-Hexanone	1.25	8260B	2,4-Dinitrophenol	5.00	8270C	Fluoranthene	0.200	8270C
4-methyl-, 2-Pentanone	1.25	8260B	2,4-Dinitrotoluene	2.00	8270C	Fluorene	0.200	8270C
Acetone	3.50	8260B	2,6-Dinitrotoluene	2.00	8270C	Hexachlorobenzene	2.00	8270C
Benzene	0.300	8260B	2-Chloronaphthalene	0.300	8270C	Hexachlorobutadiene	2.00	8270C
Bromodichloromethane	0.250	8260B	2-Chlorophenol	2.00	8270C	Hexachlorocyclopentadiene	3.00	8270C
Bromoform	0.250	8260B	2-Methylnaphthalene	0.300	8270C	Hexachloroethane	2.00	8270C
Bromomethane	0.300	8260B	2-Nitroaniline	2.00	8270C	Indeno(1,2,3-c,d)pyrene	0.200	8270C
Carbon disulfide	1.25	8260B	2-Nitrophenol	2.00	8270C	Isophorone	3.00	8270C
Carbon tetrachloride	0.300	8260B	3,3'-Dichlorobenzidine	2.00	8270C	Naphthalene	0.300	8270C
Chlorobenzene	0.250	8260B	3-Nitroaniline	2.00	8270C	Nitro-benzene	3.00	8270C
Chloroethane	0.300	8260B	4-Bromophenyl phenyl ether	2.00	8270C	Pentachlorophenol	2.00	8270C
Chloroform	0.250	8260B	4-Chloro-3-methylphenol	2.00	8270C	Phenanthrene	0.200	8270C
Chloromethane	0.300	8260B	4-Chlorobenzenamine	2.00	8270C	Phenol	1.00	8270C
Dibromochloromethane	0.300	8260B	4-Chlorophenyl phenyl ether	2.00	8270C	Pyrene	0.300	8270C
Ethylbenzene	0.250	8260B	4-Nitroaniline	3.00	8270C	bis(2-Chloroethoxy)methane	3.00	8270C
Methylene chloride	3.00	8260B	4-Nitrophenol	2.00	8270C	bis(2-Chloroethyl)ether	2.00	8270C
Styrene	0.250	8260B	Acenaphthene	0.310	8270C	bis(2-Ethylhexyl)phthalate	2.00	8270C
Tetrachloroethene	0.300	8260B	Acenaphthylene	0.200	8270C	bis-Chloroisopropyl ether	2.00	8270C
Toluene	0.250	8260B	Anthracene	0.200	8270C	m,p-Cresol	3.00	8270C
Trichloroethene	0.250	8260B	Benzo(a)anthracene	0.200	8270C	n-Nitrosodipropylamine	2.00	8270C
Vinyl acetate	1.50	8260B	Benzo(a)pyrene	0.200	8270C	o-Cresol	2.00	8270C
Vinyl chloride	0.500	8260B	Benzo(b)fluoranthene	0.200	8270C			
Xylene	0.300	8260B	Benzo(ghi)perylene	0.200	8270C			
cis-1,2-Dichloroethene	0.300	8260B	Benzo(k)fluoranthene	0.200	8270C			
cis-1,3-Dichloropropene	0.250	8260B	Butylbenzyl phthalate	2.00	8270C			
trans-1,2-Dichloroethene	0.300	8260B	Carbazole	0.200	8270C			
trans-1,3-Dichloropropene	0.250	8260B	Chrysene	0.200	8270C			

Notes

[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.
µg/L = Micrograms per liter.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

Table A-7

Method Detection Limits for High Explosive Compounds (EPA Method SW846-8321A)

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Analyte	MDL (μg/L)
1,3,5-Trinitrobenzene	0.104
1,3-Dinitrobenzene	0.104
2,4,6-Trinitrotoluene	0.104
2,4-Dinitrotoluene	0.104
2,6-Dinitrotoluene	0.104
2-Amino-4,6-dinitrotoluene	0.104
2-Nitrotoluene	0.104
3-Nitrotoluene	0.104
4-Amino-2,6-dinitrotoluene	0.104
4-Nitrotoluene	0.104
HMX	0.104
Nitro-benzene	0.104
Pentaerythritol tetranitrate	0.130
RDX	0.104
Tetryl	0.130

Notes

μg/L = Micrograms per liter.
EPA = U.S. Environmental Protection Agency.
HMX = Tetrahexamine tetranitramine.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
RDX = Hexahydro-trinitro-triazine.

Table A-8

Summary of Nitrate plus Nitrite Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149									
CTF-MW3 03-Jun-11	Nitrate plus nitrite as N	5.51	0.100	0.500	10.0			090672-018	EPA 353.2
SWMU 154									
CTF-MW2 31-May-11	Nitrate plus nitrite as N	ND	0.050	0.250	10.0	U		090670-018	EPA 353.2

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.
N = Nitrogen.
ND = Not detected (at MDL).
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.

Table A-9

Summary of Anion and Alkalinity Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149									
CTF-MW3	Bicarbonate Alkalinity	328	0.725	1.00	NE	B		090672-022	SM2320B
03-Jun-11	Carbonate Alkalinity	ND	0.725	1.00	NE	U		090672-022	SM2320B
	Bromide	1.22	0.066	0.200	NE			090672-016	SW846 9056
	Chloride	124	1.32	4.00	NE			090672-016	SW846 9056
	Fluoride	2.37	0.033	0.100	4.0			090672-016	SW846 9056
	Sulfate	521	2.00	8.00	NE			090672-016	SW846 9056
SWMU 154									
CTF-MW2	Bicarbonate Alkalinity	1590	0.725	1.00	NE	B		090670-022	SM2320B
31-May-11	Carbonate Alkalinity	ND	0.725	1.00	NE	U		090670-022	SM2320B
	Bromide	1.82	0.330	1.00	NE			090670-016	SW846 9056
	Chloride	404	6.60	20.0	NE			090670-016	SW846 9056
	Fluoride	2.08	0.033	0.100	4.0			090670-016	SW846 9056
	Sulfate	162	10.0	40.0	NE			090670-016	SW846 9056

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.
ND = Not detected (at MDL).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

Table A-9 (Concluded)

Summary of Anion and Alkalinity Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Notes (continued)

[a]Laboratory Qualifier
B = The analyte was detected in the blank above the effective MDL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and wastes." EPA 600-4-79-020.
U.S. Environmental Protection Agency, Washington, D.C.; or Clesceri, Greenburg, and Eaton, 1998, *Standard Methods for the Examination of Water and Wastewater*, 20th ed., Method 2320B.

Table A-10

Summary of Perchlorate Results

Solid Waste Management Units 149 and 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Perchlorate Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 149								
CTF-MW3 03-Jun-11	ND	0.004	0.012	NE	U		090672-020	EPA 314.0
SWMU 154								
CTF-MW2 31-May-11	ND	0.004	0.012	NE	U		090670-020	EPA 314.0

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.
ND = Not detected (at MDL).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1999 (and updates), *"Perchlorate in Drinking Water Using Ion Chromatography,"* EPA 815/R-00-014.

Table A-11

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW3	Aluminum	ND	0.015	0.050	NE	U		090672-009	SW846 6020
03-Jun-11	Antimony	ND	0.001	0.003	0.006	U		090672-009	SW846 6020
	Arsenic	ND	0.0017	0.005	0.010	U		090672-009	SW846 6020
	Barium	0.0291	0.0006	0.002	2.00			090672-009	SW846 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		090672-009	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090672-009	SW846 6020
	Calcium	202	0.600	2.00	NE			090672-009	SW846 6020
	Chromium	ND	0.002	0.010	0.100	U		090672-009	SW846 6020
	Cobalt	0.000227	0.0001	0.001	NE	J		090672-009	SW846 6020
	Copper	0.00169	0.00035	0.001	NE		J+	090672-009	SW846 6020
	Iron	0.310	0.033	0.100	NE			090672-009	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090672-009	SW846 6020
	Magnesium	49.5	0.010	0.030	NE			090672-009	SW846 6020
	Manganese	ND	0.001	0.005	NE	U		090672-009	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U	UJ	090672-009	SW846 7470
	Nickel	0.00612	0.0005	0.002	NE		J+	090672-009	SW846 6020
	Potassium	11.0	0.080	0.300	NE			090672-009	SW846 6020
	Selenium	0.0255	0.0015	0.005	0.050			090672-009	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090672-009	SW846 6020
	Sodium	177	0.800	2.50	NE			090672-009	SW846 6020
	Thallium	ND	0.00045	0.002	0.002	U		090672-009	SW846 6020
	Vanadium	ND	0.001	0.005	NE	U		090672-009	SW846 6020
	Zinc	0.00383	0.0035	0.010	NE	J	J+	090672-009	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.

Table A-11 (Concluded)

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Notes (continued)

ND = Not detected (at MDL).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[a]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J+ = The associated value is an estimated quantity with a suspected positive bias.
UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-12

Summary of Filtered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW3	Aluminum	0.0282	0.015	0.050	NE	J		090672-010	SW846 6020
03-Jun-11	Antimony	0.00138	0.001	0.003	0.006	J	U	090672-010	SW846 6020
	Arsenic	ND	0.0017	0.005	0.010	U		090672-010	SW846 6020
	Barium	0.0283	0.0006	0.002	2.00			090672-010	SW846 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		090672-010	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090672-010	SW846 6020
	Calcium	193	0.600	2.00	NE			090672-010	SW846 6020
	Chromium	ND	0.002	0.010	0.100	U		090672-010	SW846 6020
	Cobalt	0.000245	0.0001	0.001	NE	J		090672-010	SW846 6020
	Copper	0.00184	0.00035	0.001	NE		J+	090672-010	SW846 6020
	Iron	0.389	0.033	0.100	NE			090672-010	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090672-010	SW846 6020
	Magnesium	41.4	0.010	0.030	NE			090672-010	SW846 6020
	Manganese	ND	0.001	0.005	NE	U		090672-010	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U	UJ	090672-010	SW846 7470
	Nickel	0.00618	0.0005	0.002	NE		J+	090672-010	SW846 6020
	Potassium	10.2	0.080	0.300	NE			090672-010	SW846 6020
	Selenium	0.0251	0.0015	0.005	0.050			090672-010	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090672-010	SW846 6020
	Sodium	181	0.800	2.50	NE			090672-010	SW846 6020
	Thallium	ND	0.00045	0.002	0.002	U		090672-010	SW846 6020
	Vanadium	ND	0.001	0.005	NE	U		090672-010	SW846 6020
	Zinc	0.00408	0.0035	0.010	NE	J	J+	090672-010	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.
mg/L = Milligrams per liter.
MW = Monitoring well.

Table A-12 (Concluded)

Summary of Filtered Total Metal Results

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Notes (continued)

ND = Not detected (at MDL).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[a]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J+ = The associated value is an estimated quantity with a suspected positive bias.
U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-13

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW2	Aluminum	0.0807	0.075	0.250	NE	J		090670-009	SW846 6020
31-May-11	Antimony	ND	0.001	0.003	0.006	U		090670-009	SW846 6020
	Arsenic	**0.0496**	0.0017	0.005	0.010			090670-009	SW846 6020
	Barium	0.0702	0.0006	0.002	2.00			090670-009	SW846 6020
	Beryllium	0.00231	0.0002	0.0005	0.004			090670-009	SW846 6020
	Cadmium	0.000119	0.00011	0.001	0.005	J	J+	090670-009	SW846 6020
	Calcium	392	0.600	2.00	NE			090670-009	SW846 6020
	Chromium	ND	0.010	0.050	0.100	U		090670-009	SW846 6020
	Cobalt	0.00869	0.0005	0.005	NE			090670-009	SW846 6020
	Copper	ND	0.00175	0.005	NE	U		090670-009	SW846 6020
	Iron	2.51	0.165	0.500	NE			090670-009	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090670-009	SW846 6020
	Magnesium	84.9	0.050	0.150	NE			090670-009	SW846 6020
	Manganese	2.99	0.005	0.025	NE		J	090670-009	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U		090670-009	SW846 7470
	Nickel	0.0253	0.0025	0.010	NE			090670-009	SW846 6020
	Potassium	50.9	0.400	1.50	NE			090670-009	SW846 6020
	Selenium	ND	0.0015	0.005	0.050	U		090670-009	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090670-009	SW846 6020
	Sodium	488	0.800	2.50	NE			090670-009	SW846 6020
	Thallium	0.00146	0.00045	0.002	0.002	J		090670-009	SW846 6020
	Uranium	0.0274	0.000335	0.001	0.03			090670-009	SW846 6020
	Vanadium	ND	0.001	0.005	NE	U		090670-009	SW846 6020
	Zinc	0.0106	0.0035	0.010	NE		J+	090670-009	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.

Table A-13 (Concluded)

Summary of Unfiltered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Notes (continued)

ND = Not detected (at MDL).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J = The associated value is an estimate and may be inaccurate or imprecise.
J+ = The associated value is an estimated quantity with a suspected positive bias.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-14

Summary of Filtered Total Metal Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
CTF-MW2	Aluminum	0.111	0.075	0.250	NE	J		090670-010	SW846 6020
31-May-11	Antimony	ND	0.001	0.003	0.006	U		090670-010	SW846 6020
	Arsenic	**0.0528**	0.0017	0.005	0.010			090670-010	SW846 6020
	Barium	0.0696	0.0006	0.002	2.00			090670-010	SW846 6020
	Beryllium	0.00232	0.0002	0.0005	0.004			090670-010	SW846 6020
	Cadmium	ND	0.00011	0.001	0.005	U		090670-010	SW846 6020
	Calcium	395	0.600	2.00	NE			090670-010	SW846 6020
	Chromium	ND	0.010	0.050	0.100	U		090670-010	SW846 6020
	Cobalt	0.00886	0.0005	0.005	NE			090670-010	SW846 6020
	Copper	ND	0.00175	0.005	NE	U		090670-010	SW846 6020
	Iron	2.68	0.165	0.500	NE			090670-010	SW846 6020
	Lead	ND	0.0005	0.002	NE	U		090670-010	SW846 6020
	Magnesium	81.8	0.050	0.150	NE			090670-010	SW846 6020
	Manganese	2.99	0.005	0.025	NE		J	090670-010	SW846 6020
	Mercury	ND	0.000066	0.0002	0.002	U		090670-010	SW846 7470
	Nickel	0.0258	0.0025	0.010	NE			090670-010	SW846 6020
	Potassium	51.3	0.400	1.50	NE			090670-010	SW846 6020
	Selenium	ND	0.0015	0.005	0.050	U		090670-010	SW846 6020
	Silver	ND	0.0002	0.001	NE	U		090670-010	SW846 6020
	Sodium	478	1.60	5.00	NE			090670-010	SW846 6020
	Thallium	0.00137	0.00045	0.002	0.002	J		090670-010	SW846 6020
	Uranium	0.0271	0.000335	0.001	0.03			090670-010	SW846 6020
	Vanadium	ND	0.001	0.005	NE	U		090670-010	SW846 6020
	Zinc	0.00978	0.0035	0.010	NE	J	J+	090670-010	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.

Table A-14 (Concluded)
Summary of Filtered Total Metal Results
Solid Waste Management Unit 154 Groundwater Monitoring
Quarterly Assessment, April 2011 – June 2011

Notes (continued)

ND = Not detected (at MDL).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

[a]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
U = Analyte is absent or below the method detection limit.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
J = The associated numerical value is an estimated quantity.
J+ = The associated value is an estimated quantity with a suspected positive bias.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.

Table A-15

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Well ID	Analyte	Activity[a] (pCi/L)	MDA (pCi/L)	Critical Level[b] (pCi/L)	MCL (pCi/L)	Laboratory Qualifier[c]	Validation Qualifier[d]	Sample No.	Analytical Method[e]
CTF-MW2	Americium-241	11.5 ± 22.4	31.7	15.9	NE	U	BD	090670-033	EPA 901.1
31-May-11	Cesium-137	-0.418 ± 2.15	3.55	1.77	NE	U	BD	090670-033	EPA 901.1
	Cobalt-60	-1.08 ± 2.26	3.62	1.81	NE	U	BD	090670-033	EPA 901.1
	Potassium-40	91.4 ± 48.6	33.7	16.8	NE		J	090670-033	EPA 901.1
	Gross Alpha Activity	**23.38**	NA	NA	15	NA	None	090670-034	EPA 900.0
	Gross Alpha (reanalysis)	1.18	NA	NA	15	NA	None	090670-R34	EPA 900.0
	Gross Beta Activity	54.0 ± 12.6	11.3	5.44	4 mrem/yr	NA	None	090670-R34	EPA 900.0
	Uranium-233/234	58.5 ± 8.38	0.159	0.0714	NE			090670-034	HASL-300
	Uranium-235/236	0.690 ± 0.172	0.122	0.0508	NE			090670-035	HASL-300
	Uranium-238	8.93 ± 1.35	0.083	0.0332	NE			090670-035	HASL-300

Notes

Values in **bold** exceed the established MCL.
CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
HASL = Health and Safety Laboratory.
ID = Identification.
MCL = Maximum contaminant level. The following are the MCLs for gross alpha particles and beta particles in community water systems:
15 pCi/L = Gross alpha particle activity, excluding total uranium (40 CFR Parts 9, 141, and 142, Table I-4)
4 mrem/yr = any combination of beta and/or gamma emitting radionuclides (as dose rate).
MDA = The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
mrem/yr = Millirem per year.
MW = Monitoring well.
NA = Not applicable for gross alpha activities. The MDA or critical level could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.
NE = Not established.
pCi/L = Picocuries per liter.

[a]Activities of zero or less are considered to be not detected. Gross alpha activity measurements were corrected by subtracting out the total uranium activity (40 CFR Parts 9, 141, and 142, Table I-4).

[b]The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions. The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.

Table A-15 (Concluded)

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results

Solid Waste Management Unit 154 Groundwater Monitoring

Quarterly Assessment, April 2011 – June 2011

Notes (continued)

[c]Laboratory Qualifier
U = Analyte is absent or below the MDA.

[d]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.
BD = Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J = The associated numerical value is an estimated quantity.

[e]Analytical Method
U.S. Environmental Protection Agency, 1980, "*Prescribed Procedures for Measurement of Radioactivity in Drinking Water,"* EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio
U.S. Department of Energy, Environmental Measurements Laboratory, 1990, *"EML Procedures Manual,"* 27th ed., Vol. 1, Rev. 1992, HASL-300.

Table A-16

Summary of Constituents Detected Above Established MCLs

Solid Waste Management Units 149 and 154

Groundwater Monitoring as of Second Quarter, CY 2011

Well ID	Date	Analyte	Result	MCL	Laboratory Qualifier[a]	Validation Qualifier[b]	Sample No.	Analytical Method[c]
SWMU 154								
CTF-MW2	08-Mar-11	Arsenic—Filtered	0.0544 mg/L	0.010 mg/L			090237-010	SW846 6020
CTF-MW2 (Duplicate)	08-Mar-11	Arsenic—Filtered	0.0521 mg/L	0.010 mg/L			090238-010	SW846 6020
CTF-MW2	31-May-11	Arsenic—Filtered	0.0528 mg/L	0.010 mg/L			090670-010	SW846 6020
CTF-MW2	08-Mar-11	Arsenic—Unfiltered	0.0595 mg/L	0.010 mg/L			090237-009	SW846 6020
CTF-MW2	31-May-11	Arsenic—Unfiltered	0.0496 mg/L	0.010 mg/L			090670-009	SW846 6020
CTF-MW2	31-May-11	Gross Alpha Activity	23.38 pCi/L	15 pCi/L			090670-010	EPA 900.0
CTF-MW2	08-Mar-11	Thallium—Unfiltered	0.00249 mg/L	0.002 mg/L	J		090237-009	SW846 6020

Notes

CFR = Code of Federal Regulations.
CTF = Coyote Test Field.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 CFR 141.11, Subpart B), National Primary Drinking Water Standards, EPA, May 2009.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix specific.
mg/L = Milligrams per liter.
MW = Monitoring well.
pCi/L = Picocuries per liter.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
SWMU = Solid Waste Management Unit.

[a]Laboratory Qualifier
J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.

[b]Validation Qualifier
If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

[c]Analytical Method
U.S. Environmental Protection Agency, 1986 (and updates), *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"* SW-846, 3rd ed.
U.S. Environmental Protection Agency, 1984, *"Methods for Chemical Analysis of Water and wastes."* EPA 600-4-79-020.
U.S. Environmental Protection Agency, 1980, "*Prescribed Procedures for Measurement of Radioactivity in Drinking Water,"* EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio

Attachment 1
Field Measurement Logs and Documentation

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: **CTF-MW-2** Date: 5/31/11 Time: 0740

Activities: Ground Water monitoring/ sampling /Vapor well sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill _____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampoules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.	☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.	☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.	☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.	☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.	☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
William Gibson	William Gibson

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: SWMU	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RL	Date: 05/31/11

Make & Model:

YSI 6920-V Sonde (S/N: 99J0064) with DO, Ec, pH, ORP, and temperature probes: _____

YSI 650 MDS (S/N): _08H100440_____

pH Calibration

pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0639	4.02	20.8	7.01	20.8	10.00	20.8
2. Time: 1122	4.03	21.3	7.02	21.3	10.01	21.3
3. Time:						
4. Time:						
Standard lot no.:054115						
Expiration date: 12/12						

SC Calibration

Reference Value: 1278			Standard Lot No.: 1710737
	Value	Temp	Expiration Date: 12/12
1. Time: 0641	1282	20.8	
2. Time: 1124	1286	21.3	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 200.0			Standard Lot No. 03K0868
	Value	Temp	Expiration Date: 12/12
1. Time: 0640	201.1	20.8	
2. Time: 1123	200.8	21.3	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0638	81.8	24.46
2. Time: 1121	81.7	24.48
3. Time:		
4. Time:		

SNL/NM Project Name: SWMU	Project No.: 146422.10.11.01
Calibration done by: RC	Date: 05/31/11

TURBIDIMETER

Make & Model: HACH 2100Q	Serial No. 10050C002897

Reference Value	10	20	100	800
Standard Lot No.				
1. Time 0754	9.72	20.4	103	801
2. Time 1010	9.62	20.1	103	804
3. Time				
4. Time				

Comments:

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: SWMU	Project No.:
Well I.D.: CTF-MW2	Date: 05/31/11
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 127'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
43.77	0817	/	START						
47.32	0845	10	17.57	3231	128.1	5.82	1.47	3.0	0.28
47.54	0855	15	17.94	3299	99.5	5.83	1.01	2.0	0.19
47.66	0905	20	18.18	3345	79.5	5.84	0.89	2.0	0.19
47.77	0915	25	18.32	3388	80.7	5.87	1.20	1.9	0.18
47.86	0925	30	18.43	3400	79.0	5.87	1.15	2.5	0.23
47.26	0938	35	18.76	3406	70.8	5.88	1.14	2.0	0.18
47.18	0943	37	19.02	3408	70.1	5.89	1.17	1.9	0.17
46.91	0948	39	19.33	3405	70.1	5.89	1.13	1.9	0.17
46.84	0953	41	19.51	3404	71.2	5.89	1.16	1.8	0.17
	0954	/	sampling						
									~4.00 gals. purged
									from tubing
									0826

LTES Groundwater Monitoring Waste Generation Log

Waste Generator : William Gibson **Phone:** 239-7367 **Project Leader:** Don Schofield

Project Name	SWMU 154	SWMU 154	SWMU 154
Container ID # (site-date-sequence)	CTF-MW2-053111-01	CTF-MW2-053111-02	CTF-053111
Initial Label Type (Hazardous or Non-Regulated)	Non- Regulated	Non- Regulated	Non- Regulated
Waste Matrix (purge water, decon water, HACH Accu-Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	55 CHPD	55 CHPD	55 CHPD
Volume of Waste	24 gal.	21 gal.	30 gal.
Total Container Weight	200 lbs.	190 lbs.	300 lbs.
COC#: Sample#-Fraction	CoC#: 613578,613599 Sample#:090670, 090713	CoC#: 613578,613599 Sample#:090670, 090713	CoC#: 613578,613599 Sample#:090670, 090713
Accumulation Date	Start:05\31\11 Full:05\31\11	Start:05\31\11 Full:05\31\11	Start:05\31\11 Full:05\31\11
Date Waste Moved to Accumulation Area	05\31\11	05\31\11	05\31\11
Accumulation Area Name	9925	9925	9925
Comments:			Decon after CTF-MW2 purge. CoC 613578, 613599

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: SWMU-154	Monitoring Well ID # CTF-MW2	Date: 5/31/11

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: Pump 2	Water Level Indicator ID#: 56161
Personnel Performing Decontamination: Print Name: Robert Lynch RL Initial: Print Name: William Gibson WJG Initial:	Personnel Performing Decontamination: Print Name : Robert Lynch RL Initial: Print Name William Gibson WJG Initial:

Condition of Equipment

Pump: Good Tubing Bundle: Good Water Level Indicator: Good

List of Decontamination Materials

Distilled or **Deionized** (circle one) **Source: Culligan** **Lot Number: 05- 04 -11** **CTF-MW2 filtered/sampled for Arsenic, CoC 613599**	**HNO_3** **Grade: Reagent** **UN #: 2031** **Manufacture: Fisher** **Lot Number: 002735**

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CTF-MW-3 Date: 6/03/11 Time: 0730

Activities: Ground Water monitoring/ sampling /Vapor well sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____% Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampoules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.	☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.	☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.	☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.	☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.	☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
ALFRED SANTILLANES	Alfred Santillanes
William Gibson	William J Gibson

Printed Name / Signature

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: SWMU	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RL	Date: 06/03/11

Make & Model:

YSI 6920-V Sonde (S/N: 99J0064) with DO, Ec, pH, ORP, and temperature probes: _____

YSI 650 MDS (S/N): 08H100440

pH Calibration

pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0647	4.03	21.4	7.00	21.4	10.02	21.4
2. Time: 1052	4.01	21.9	7.02	21.9	10.03	21.9
3. Time:						
4. Time:						
Standard lot no. 054115						
Expiration date: 12/12						

SC Calibration

Reference Value: 1278			Standard Lot No.: 1710737
	Value	Temp	Expiration Date: 12/12
1. Time: 0649	1284	21.4	
2. Time: 1054	1285	21.9	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 200.0			Standard Lot No. 63K0868
	Value	Temp	Expiration Date: 12/12
1. Time: 0648	201.1	21.4	
2. Time: 1053	201.0	21.9	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0646	81.3	24.35
2. Time: 1051	81.6	24.39
3. Time:		
4. Time:		

SNL/NM Project Name: SWMU	Project No.: 146422.10.11.01
Calibration done by: RL	Date: 06/03/11

TURBIDIMETER

Make & Model: HACH 2100Q	Serial No. 10050C002897

Reference Value	10	20	100	800
Standard Lot No.				
1. Time 0754	9.67	20.1	102	805
2. Time 0946	9.59	20.2	102	803
3. Time				
4. Time				

Comments:

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: SWMU	Project No.:
Well I.D.: CTF-MW3	Date: 06/03/11
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 361'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
306.63	0800	/	START						
313.37	0922	5	20.26	1567	411.1	6.76	1.65	97.5	8.76
316.71	0833	10	20.57	1570	414.5	6.83	2.32	83.4	7.44
319.49	0844	15	20.77	1569	412.4	6.85	0.64	72.8	6.45
321.70	0856	20	20.94	1571	412.7	6.85	0.57	78.9	7.01
323.48	0908	25	21.16	1578	413.9	6.86	0.53	83.4	7.35
324.10	0913	27	21.23	1577	413.3	6.86	0.62	79.3	7.00
324.83	0919	29	21.28	1580	413.7	6.86	0.36	73.0	6.45
325.43	0924	31	21.33	1584	414.2	6.85	0.37	81.0	7.18
325.86	0930	33	21.45	1587	414.1	6.86	0.30	78.7	6.97
325.94	0936	35	21.49	1587	414.2	6.86	0.33	78.6	6.95
	0937	/	Sampling						
									~4.00 gals purged
									from tubing
									0811

LTES Groundwater Monitoring Waste Generation Log

Waste Generator : William Gibson **Phone:** 239-7367 **Project Leader:** Don Schofield

Project Name	SWMU-149	SWMU-149	SWMU-149
Container ID # (site-date-sequence)	CTF-MW3-060311-01	CTF-MW3-060311-02	CTF-060311
Initial Label Type (Hazardous or Non-Regulated)	Non- Regulated	Non- Regulated	Non- Regulated
Waste Matrix (purge water, decon water, HACH Accu-Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	55 CHPD	55 CHPD	55 CHPD
Volume of Waste	19 gal.	20 gal.	30 gal.
Total Container Weight	170 lbs.	180 lbs.	300 lbs.
COC#: Sample#-Fraction	CoC#: 613579 Sample#:090672	CoC#: 613579 Sample#:090672	CoC#: 613579 Sample#:090672
Accumulation Date	Start:06\03\11 Full:06\03\11	Start:06\03\11 Full:06\03\11	Start:06\03\11 Full:06\03\11
Date Waste Moved to Accumulation Area	06\03\11	06\03\11	06\03\11
Accumulation Area Name	9925	9925	9925
Comments:			Decon after CTF-MW3 purge. CoC 613579

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: SWMU-149	Monitoring Well ID # CTF-MW3	Date: 6/03/11

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: Pump 2	Water Level Indicator ID#: 56161
Personnel Performing Decontamination: Print Name: Robert Lynch Initial: RL Print Name: Alfred Santillanes Initial:	Personnel Performing Decontamination: Print Name : Robert Lynch Initial: RL Print Name Alfred Santillanes Initial:

Condition of Equipment

Pump: Good Tubing Bundle: Good Water Level Indicator: Good

List of Decontamination Materials

Distilled or **Deionized** (circle one) **Source: Culligan** **Lot Number: 05- 04 -11**	**HNO_3** **Grade: Reagent** **UN #: 2031** **Manufacture: Fisher** **Lot Number: 002735**

Attachment 2
Analysis Request/Chain-of-Custody Forms

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613578

Dept. No./Mail Stop:	6234\MS 0718	Date Samples Shipped:	5-31-11	Project/Task No.98026.01.15	☐ Waste Characterization
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.		SMO Authorization:	-Send preliminary/copy report to:
Project Name:	SWMU-154	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL	SST BOTTLE ORDER	☐ Released by COC No.:_____
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		☑ Validation Required
Service Order No.	CF 251-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room				Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090670-001	CTF-MW2	127	NA	053111\0954	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	
090670-002	CTF-MW2	127	NA	053111\0955	GW	AG	4x1L	4C	G	SA	TCL SVOC (SW846-8270C)	
090670-009	CTF-MW2	127	NA	053111\0957	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	
090670-010	CTF-MW2	127	NA	053111\0958	FGW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	
090670-016	CTF-MW2	127	NA	053111\1000	GW	P	125ml	4C	G	SA	Anions (SW846-9056)	
090670-018	CTF-MW2	127	NA	053111\1001	GW	P	125ml	H2SO4	G	SA	NPN (353.2)	
090670-020	CTF-MW2	127	NA	053111\1002	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	
090670-022	CTF-MW2	127	NA	053111\1003	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	
090670-024	CTF-MW2	127	NA	053111\1004	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	
090670-033	CTF-MW2	127	NA	053111\1006	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	
090670-034	CTF-MW2	127	NA	053111\1007	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☑ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking — Smo Use

Date Entered(mm/dd/yy):

Entered by:

QC inits:

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to: Tin Jackson/org 4142/MS 0729/284-2547

Water has high buffering capacity,check pH, add Presv. as needed

If Perchlorate detected perform verification analysis (SW846-6850M)

Alkalinity as total bicarbonate and carbonate

Major Anions as Br,F,Cl,SO4

FGW (filtered in field with .45 micron filter)

*Please list as separate report

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4142/844-4013/250-7090
	William Gibson	William Gibson	WG	Weston/4142/844-4013/239-7367

1.Relinquished by	Robert Lynch	Org.	4142	Date	5/31/11	Time	1135	4.Relinquished by	Org.	Date	Time
1. Received by	Pam Puissant SMO	Org.	4142	Date	5/31/11	Time	1135	4. Received by	Org.	Date	Time
2.Relinquished by		Org.		Date		Time		5.Relinquished by	Org.	Date	Time
2. Received by		Org.		Date		Time		5. Received by	Org.	Date	Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613578

Project Name:	SWMU-154	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.15
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090670-035	CTF-MW2	127	NA	053111\1008	GW	P	1 Liter	HNO3	G	SA	Isotopic Ur (ASTM D3972-09M)	012
090671-001	CTF-TB1	NA	NA	053111\0954	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	013

Abnormal Conditions on Receipt — LAB USE

Recipient Initials MK

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A | SMO Use) | **AR/COC** 613599

Dept. No./Mail Stop:	6234/ MS 0718	Date Samples Shipped:	5/31/11	Project/Task No. 98026.01.15	☑ Waste Characterization
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.		SMO Authorization: Sept. 6 Gibson SMO	-Send preliminary/copy report to:
Project Name:	SWMU 154	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL	5 08 Bottles ORDon	☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		~~☑ Validation Required~~ WJG
Service Order No.	CF 251-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5600 MS 0154
Building	Room				Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090713-009	CTF-MW2	NA	NA	053111\0933	FGW	P	500 ml	HNO3	G	SA	Arsenic (SW846-6020)	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day ☐ Negotiated TAT

Return Samples By:

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by QC Inits.

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/ORG.4133/MS 0729/ 284-2547

Water has high buffering capacity, check pH, add pres.

FGW (filtered in field with Arsenic filter)

Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4142/844-4013/250-7090
	William Gibson	William Gibson	WJG	Weston/4142/844-4013/239-7367

1.Relinquished by	Robert Lynch	Org.	4142	Date	5/31/11	Time	1135	4.Relinquished by	Org. Date Time
1. Received by	Sept. 6 Gibson	Org.	4142	Date	5/31/11	Time	1135	4. Received by	Org. Date Time
2.Relinquished by		Org.		Date		Time		5.Relinquished by	Org. Date Time
2. Received by		Org.		Date		Time		5. Received by	Org. Date Time
3.Relinquished by		Org.		Date		Time		6.Relinquished by	Org. Date Time
3. Received by		Org.		Date		Time		6. Received by	Org. Date Time

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. | SMO Use | AR/COC 613579

Dept. No./Mail Stop:	6234/MS 0718	Date Samples Shipped:	6-6-11	Project/Task No.98026.01.14	☐ Waste Characterization
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	127817	SMO Authorization: LB3	-Send preliminary/copy report to:
Project Name:	SWMU-149	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	
Record Center Code:	NA	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Pulssant/505-844-3185	SEE BOTTLE ORDER	☑ Validation Required
Service Order No.	CF 250-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 279398
Location	Tech Area				
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090672-001	CTF-MW3	361	NA	060311\0937	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090672-009	CTF-MW3	361	NA	060311\0938	GW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	002
090672-010	CTF-MW3	361	NA	060311\0939	FGW	P	500 ml	HNO3	G	SA	TAL Metals (SW846-6020/7470)	003
090672-016	CTF-MW3	361	NA	060311\0940	GW	P	125 ml	4C	G	SA	Anions (SW846-9056)	004
090672-018	CTF-MW3	361	NA	060311\0941	GW	P	125 ml	H2SO4	G	SA	NPN (353.2)	005
090672-020	CTF-MW3	361	NA	060311\0942	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	006
090672-022	CTF-MW3	361	NA	060311\0943	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	007
090673-001	CTF-TB2	NA	NA	060311\0937	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	008

RMMA	☐ Yes ☑ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	☐ 7 Day ☑ 15 Day ☐ 30 Day	Entered by:	
Return Samples By:	☐ Negotiated TAT	QC initls	

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to:

Tim Jackson/ORG.4142/MS.0729/ 284-2547

If perchlorate detected perform verification analysis(SW846-6850M)

Alkalinity as total bicarbonate and carbonate

Anions as Br,Fl,Cl,SO4

FGW (filtered in field with .45 micron filter)

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4142/844-4013/250-7090
	Alfred Santillanes	Alfred Santillanes	AS	Weston/4142/844-5130/228-0710
	William Gibson	William Gibson	WG	Weston/4142/844-4013/239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 6/6/11	Time 1032	4.Relinquished by		Org.	Date	Time
1. Received by		Org. 4139	Date 6-6-11	Time 1032	4. Received by		Org.	Date	Time
2.Relinquished by		Org. 4139	Date 6-6-11	Time 1100	5.Relinquished by		Org.	Date	Time
2. Received by	Mike Bowlan	Org. GEL	Date 6-7-11	Time 0725	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

Attachment 3
Data Validation Reports for
Groundwater Analytical Results
April 2011 – June 2011

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction), EPA 9056 (Anions by Ion Chromatography), EPA 314.0 (perchlorate), and SM 2320B (alkalinity). Data were reported for all required analytes. No problems were identified with the data package that results in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks except as follows.

Alkalinity:
Total alkalinity was detected in the MB at a concentration ≥ the PQL. However, blanks are not applicable for alkalinity and are not assessed for data validation. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Nitrate/Nitrite:
It should be noted that the MS analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Nitrate/Nitrite:
It should be noted that the replicate analysis was performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

Anions by Ion Chromatography:
Sample -005 was diluted 5X for bromide and was diluted 100X for chloride and sulfate due to high concentration or matrix interference.

Nitrate/Nitrite:
Sample -006 was diluted 5X due to matrix interference.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the sample that were ≤5X. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date**: 07/06/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: LC/MS/MS Organic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: High Explosives (HE)

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with accepted procedures using method EPA 8321A Mod. (HE by LCMSMS). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. The ICAL RF for p-nitrotoluene was <0.05 but ≥0.01. The associated sample result was an ND and will be **qualified "UJ,I4."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The sample was extracted and analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the summary section.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria except as follows.

The MSD %R for m-dinitrobenzene was > the UAL. The associated sample result was an ND and will not be qualified.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. According to laboratory procedure, all sample and QC extracts were diluted 2X with HPLC grade water.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date:** 07/06/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

Two samples were prepared and analyzed with approved procedures using methods EPA 6010B (ICP metals), EPA 6020 (ICP-MS metals), and EPA 7470A (CVAA mercury). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   The MS had a Mn concentration >4X the analyte spike concentration and the MS %R did not meet QC acceptance criteria. The associated sample results were detects and will be **qualified "J,MS1"** due to lack of matrix-specific accuracy data.

   The Ca concentration for samples 279097-003 and -004 were > the ICS A Ca concentration and the ICS A results for Cd and Zn were > the MDL. The Cd result for sample -004 was an ND and will not be qualified. All other associated sample results were detects <50X the ICS A result and will be **qualified "J+,CK2."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

ICP-MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria except as noted above in the summary section and as follows.

ICP-MS metals:
It should be noted that the MS had Ca, Mg, K and Na concentrations >4X the analyte spike concentrations and the MS %Rs did not meet QC acceptance criteria. However, according to AOP criteria, Ca, Mg, K and Na are not required MS analytes. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted except as follows.

ICP-MS metals:
Samples -003 and -004 were diluted 5X, 10X, or 20X for Ca, Mg, and Na due to over-range concentrations and were diluted 5X for Al, Cr, Co, Cu, Fe, Mn, Ni, K, and U due to instrument QC failures.

All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

ICP Interference Check Sample (ICS A and AB)

All ICS A and AB met QC acceptance criteria except as noted above in the summary section..

ICP Serial Dilution

The serial dilution analyses met all QC acceptance criteria.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date:** 07/06/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: Radiochemical Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with approved procedures using method EPA 901.1 (gamma spec – short list), EPA 900.0 (gross alpha/beta), and HASL 300, U-02-RC Mod (Alpha Spec U). Problems were identified with the data package that result in the qualification of data.

1. Gamma Spec:
   All associated gamma spec results that were either < the associated 2-sigma TPU or < the associated MDA will be **qualified "BD,FR3."**

   For sample 279097-010, the K-40 result was <3X the associated MDA and will be **qualified "J,FR7."**

2. Gross Alpha/Beta:
   For sample -011, the gross alpha result was <3X the associated MDA and will be **qualified "J,FR7."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times. It should be noted that samples -010, -011, and -012 were received with a pH >2. However, SNL was notified and directed the laboratory to properly preserve the samples to a pH <2. No sample data will be qualified as a result.

Quantification

All quantification criteria were met except as noted above in the summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the MB at concentrations > the MDA and 2-sigma TPU.

Gamma Spec:
It should be noted that the K-40 result in the MB was rejected by the laboratory. No sample data will be qualified as a result.

Tracer/Carrier Recovery

All tracer/carrier recoveries met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gross Alpha/Beta:
Since a replicate and MSD were performed for gross alpha/beta analysis, two measures of precision were available. The MS/MSD pair was used to evaluate gross alpha/beta precision.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All required detection limits were met. No dilutions were required.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date**: 07/06/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 28, 2011

To: File

From: Kevin Lambert

Subject: Radiochemical Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578 (reanalysis)
SDG: 281628
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with approved procedures using method EPA 900.0 (gross alpha). It should be noted that the original sample was previously submitted in SDG# 279097 and the client requested a relog of the sample for gross alpha analysis. Problems were identified with the data package that result in the qualification of data.

1. Gross Alpha:
   For sample 281628-001, the gross alpha result was <3X the associated MDA and will be **qualified "J,FR7."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was analyzed within the prescribed holding times and properly preserved.

Quantification

All quantification criteria were met except as noted above in the summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the MB at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Not Applicable.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gross Alpha:
Since a replicate and MSD were performed for gross alpha analysis, two measures of precision were available. The MS/MSD pair was used to evaluate gross alpha/beta precision.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All required detection limits were met. No dilutions were required.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 07/28/11

Sample Findings Summary

AR/COC: 613578

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	090670-034/CTF-MW2	ALPHA (12587-46-1)	J, FR7
EPA 901.1			
	090670-033/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
	090670-033/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
	090670-033/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	090670-033/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
SW846 3005/6020 DOE-AL			
	090670-009/CTF-MW2	Cadmium (7440-43-9)	J+, CK2
	090670-009/CTF-MW2	Manganese (7439-96-5)	J, MS1
	090670-009/CTF-MW2	Zinc (7440-66-6)	J+, CK2
	090670-010/CTF-MW2	Manganese (7439-96-5)	J, MS1
	090670-010/CTF-MW2	Zinc (7440-66-6)	J+, CK2
SW846 3535/8321A Modified			
	090670-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, I4
SW846 8270C			
	090670-002/CTF-MW2	1,3-Dichlorobenzene (541-73-1)	UJ, MS3
	090670-002/CTF-MW2	1,4-Dichlorobenzene (106-46-7)	UJ, MS3
	090670-002/CTF-MW2	Hexachlorobutadiene (87-68-3)	UJ, MS3
	090670-002/CTF-MW2	Hexachlorocyclopentadiene (77-47-4)	UJ, C3,MS3
	090670-002/CTF-MW2	Hexachloroethane (67-72-1)	UJ, MS3

All other analyses met QC acceptance criteria; no further data should be qualified.

Sample Findings Summary

AR/COC: 613578

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	090670-R34/CTF-MW2	ALPHA (12587-46-1)	J, FR7

All other analyses met QC acceptance criteria; no further data should be qualified.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: SVOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with accepted procedures using method EPA 8270C (SVOCs). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. The calibration verification %D for hexachlorocyclopentadiene was >40% but ≤60% with negative bias. The associated sample result was an ND and will be **qualified "UJ,C3."**

2. The MS and/or MSD %Rs for 1,3-dichlorobenzene; 1,4-dichlorobenzene; hexachlorobutadiene; hexachlorocyclopentadiene; and hexachloroethane were < the LALs but ≥10%. All associated sample results were non-detects and will be **qualified "UJ,MS3."**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The sample was extracted and analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the summary section and as follows.

The calibration verification %Ds for 2,4-dinitrophenol; carbazole; and p-nitroaniline were >20% but ≤40% with negative bias. All associated sample results were NDs, and no other calibration infractions occurred for these analytes. Therefore, the associated sample results will not be qualified.

The calibration verification %D for bis(2-chloroisopropyl)ether was >20% with a positive bias. The associated sample result was an ND and will not be qualified for the calibration infraction.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria except as noted above in the summary section.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria except as follows.

The LCS %R for hexachlorocyclopentadiene was < the LAL but ≥10%. The associated sample result was an ND. Up to four LCS recovery infractions are allowed since 64 LCS analytes were reported. Therefore, the associated sample results will not be qualified.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date**: 07/06/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: July 5, 2011

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: SWMU 154 GWM
AR/COC: 613578
SDG: 279097
Laboratory: GEL
Project/Task: 98026.01.15
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

Two samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

A TB was submitted on the AR/COC(s).

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent **Date**: 07/06/11

Data Validation Summary Worksheet

AR/COC #: 613578 Site/Project: SNL SWMU 154 Validation Date: 07.05.11

SDG #: 279097 Laboratory: GEL Validator: Kevin A. Lambert

Matrix: aqueous # of Samples: 13 CVR present: NO Analysis Type: X Organic X Metals

AR/COC(s) present: yes Sample Container Integrity: OK X Rad X Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
All						
Reported						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres. (1)	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
090670-033	279097-010	G. Spec	pH > 2	05.31.11				
↓ -034	↓ -011	GA/B	↓	↓				
↓ -035	↓ -012	AlphaSpec U	↓	↓				

Comments: (1) Samples were acidified by LAB per client instructions to bring pH ≤ 2; No Sample data will be qualified as a result

Revised 7/2007

Validated By: Kevin A Lambert

VOC Organic Worksheet (GC/MS)

AR/COC #: 613578 SDG #: 279097 Matrix: aqueous

Laboratory Sample IDs: 279097-001, -013

Method/Batch #s: EPA 8260B (VOC)/1110267 Tuning (pass/fail): Pass TICs Required? (yes/no) No

Analyte (outliers)	Calibration Int.	RF	RSD/ R^2	CCV %D (ICV)	Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	TB -013			
All Analytes	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓			

Surrogate Recovery Outliers

Sample ID						
	Met Criteria					

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
	Met Criteria											

Comments: QC: -001

SVOC Organic Worksheet (GC/MS)

AR/COC #: 613578 SDG #: 279097 Matrix: aqueous

Laboratory Sample IDs: 279097-002

Method/Batch #s: EPA8270C(SVOC)/1109175 Tuning (pass/fail): Pass TICs Required? (yes/no) NO

Analyte (outliers)	Calibration Int.	Calibration RF	Calibration RSD/R^2	Calibration ICV CCV %D	Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/MSD RPD			
1,3-Dichlorobenzene	✓	✓	✓	✓	✓	NA	✓	✓	34(35)	✓			
1,4-Dichlorobenzene	↓	↓	↓	↓	↓	↓	↓	✓	36(38)	✓			
Hexachlorobutadiene	↓	↓	↓	↓	↓	↓	↓	✓	37(38)	✓			
Hexachlorocyclopentadiene	↓	↓	↓	-49	↓	↓	15(34)	27(31)	25	✓			
Hexachloroethane	↓	↓	↓	✓	↓	↓	✓	38(40)	30	✓			
2,4-Dinitrophenol	↓	↓	↓	-30	↓	↓	↓	✓	✓	✓			
Carbazole	↓	↓	↓	-36	↓	↓	↓	↓	↓	↓			
bis(2-Chloroisopropyl)ether	↓	↓	↓	25	↓	↓	↓	↓	↓	↓			
p-Nitroaniline	✓	✓	✓	-25	✓	✓	✓	✓	✓	✓			

Surrogate Recovery Outliers

Sample ID						
	Met Criteria					

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
	Met Criteria											

Comments: QC: -002
DL: 1X

Revised 7/2007

High Explosives Worksheet (LC/MS/MS)

AR/COC #: 613578 SDG #: 279097 Matrix: aqueous

Laboratory Sample IDs 279097-009

Method/Batch #s: EPA 8321A Mod (HE by LCMSMS)/1108016

Analyte (Outliers)	Initial Calibration			Continuing Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/MSD RPD	CRI			
	Int.	RF	COD RSD/R²	ICV	CCV	ICB	CCB										
m-Dinitrobenzene	NA	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	115/114	✓	✓			
p-Nitrotoluene	NA	0.04	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓			

Surrogate Recovery Outliers

Sample ID					
	Met Criteria				

Internal Standard Outliers

Sample ID	Area	RT	Sample ID	Area	RT	Sample ID	Area	RT
	Met Criteria							

Comments: QC: -009

DL: std 2X

Inorganic Metals Worksheet

AR/COC #: 613578 SDG #: 279097 Matrix: aqueous

Laboratory Sample IDs: 279097-003,-004

Method/Batch #s: EPA 6010B (ICP)/1108108 ; EPA 6020 (ICP-MS)/1108111 ; EPA 7470A (CVAA)/1107948

ICPMS Mass Cal (pass/fail) Pass ICPMS Resolution (pass/fail) Pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R				
	Int.	R^2	ICV	CCV	ICB	CCB													
Cd	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	0.532	✓				
Zn	↓	↓	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓	↓	6.23	↓				
Mn										420 N/A				✓					
K										305 N/A				↓					
Ca										300 N/A									
Na										50 N/A									
Mg	↓	↓	↓	↓	↓	↓	↓	↓	↓	245 N/A	↓	↓	↓	↓	↓				

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
	Met Criteria			Met Criteria			

Comments: QC: -003 N/A - sample [c] > 4X spike [c]

DL: 1X, 5X, 10X, 20X

General Chemistry Worksheet

AR/COC #: 613578 SDG #: 279097 Matrix: aqueous

Laboratory Sample IDs: 279097-005, -006, -007, -008

Method/Batch #s: EPA 9056 (ANIONS) / 1107821

Method/Batch #s: EPA 353.2 (NO_3/NO_2) / 1108260

Method/Batch #s: EPA 314.0 (ClO_4) / 1107935

Method/Batch #s: EPA 2320B (Alk) / 1108434

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	MSD %R	MS/ MSD RPD	Lab Rep. RPD	Partial/ Total RPD		
	Int.	R^2	ICV	CCV	ICB	CCB										
All Analytes	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	✓	NA		

Comments: QC: -005, -007, -008

NO_3/NO_2, another SNL SDG

DL: 1X, 5X, 100X

Radiochemistry Worksheet

AR/COC #: 613578 SDG #: 279097 Matrix: aqueous

Laboratory Sample IDs: 279097-010, -011, -012

Method/Batch#s: EPA 901.1 (G. Spec) / 1109033

Method/Batch#s: EPA 900.0 (GA/B) / 1108839

Method/Batch#s: HASL 300, U-02-RC Mod (AlphaSpec) / 1108630

Analyte (outliers)	Control Freq.	Control Eval.	Method Blank	5X Blank or 5X MDC	LCS %R	MS %R	MSD %R	MS/ MSD RER	Lab Rep. RER				
All Analytes	NA	NA	✓	NA	✓	✓	NA	NA	✓				

Tracer/Carrier Recovery Outliers

Sample ID	Tracer/Carrier	%R	Sample ID	Tracer/Carrier	%R	Sample ID	Tracer/Carrier	%R
Met								
	Criteria							

Comments: QC: -010, -011, -012

DL: 1X

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613578

Dept. No./Mail Stop:	6234\MS 0718	Date Samples Shipped:	5-31-11	Project/Task No.98026.01.15	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.	127641	SMO Authorization:	
Project Name:	SWMU-154	Lab Contact:	Edie Kent/803-556-8171	Contract # PO 691436	☐ Released by COC No.:
Record Center Code:	NA	Lab Destination:	GEL	SEE BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	NA	SMO Contact/Phone:	Pam Puissant/505-844-3185		Bill To:Sandia National Labs (Accounts Payable) 2790971
Service Order No.	CF 251-11	Send Report to SMO:	Lorraine Herrera /505-844-3199		P.O. Box 5800 MS 0154 2790691 #01
Location	Tech Area				Albuquerque, NM 87185-0154
Building	Room				

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090670-001	CTF-MW2	127	NA	053111\0954	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090670-002	CTF-MW2	127	NA	053111\0955	GW	AG	4x1L	4C	G	SA	TCL SVOC (SW846-8270C)	002
090670-009	CTF-MW2	127	NA	053111\0957	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	003
090670-010	CTF-MW2	127	NA	053111\0958	FGW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	004
090670-016	CTF-MW2	127	NA	053111\1000	GW	P	125ml	4C	G	SA	Anions (SW846-9056)	005
090670-018	CTF-MW2	127	NA	053111\1001	GW	P	125ml	H2SO4	G	SA	NPN (353.2)	006
090670-020	CTF-MW2	127	NA	053111\1002	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	007
090670-022	CTF-MW2	127	NA	053111\1003	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	008
090670-024	CTF-MW2	127	NA	053111\1004	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	009
090670-033	CTF-MW2	127	NA	053111\1006	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	010
090670-034	CTF-MW2	127	NA	053111\1007	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/Beta (900.0)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☑ 15 Day ☑ 30 Day

Return Samples By: MS 6-3-11 ☐ Negotiated TAT

Sample Tracking — Smo Use

Date Entered(mm/dd/yy)

Entered by

QC Initls

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

*Send report to: Tin Jackson/org 4142/MS 0729/284-2547

Water has high buffering capacity,check pH, add Presv. as needed

If Perchlorate detected perform verification analysis (SW846-6850M)

Alkalinity as total bicarbonate and carbonate

Major Anions as Br,Fl,Cl,SO4

FGW (filtered in field with .45 micron filter)

*Please list as separate report

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4142/844-4013/250-7090
	William Gibson	William Gibson	WG	Weston/4142/844-4013/239-7367

1.Relinquished by	Robert Lynch	Org. 4142	Date 5/31/11	Time 1135	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 5/31/11	Time 1135	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 5/31/11	Time 1235	5.Relinquished by	Org.	Date	Time
2. Received by		Org. QAL	Date 6-1-11	Time 0815	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

OFF-SITE LABORATORY
Analysis Request And Chain Of Custody (Continuation)

AR/COC- 613578

Project Name:	SWMU-154	Project/Task Manger:	Alicia Aragon	Project/Task No.:	98026.01.15
Location	Tech Area				
Building	Room				

Reference LOV (available at SMO)

Sample No-Fraction	ER Sample ID or Sample Location detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab use Lab Sample ID
090670-035	CTF-MW2	127	NA	053111\1008	GW	P	1 Liter	HNO3	G	SA	Isotopic Ur (ASTM D3972-09M)	012
090671-001	CTF-TB1	NA	NA	053111\0954	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260B)	013

Abnormal Conditions on Receipt

LAB USE

Recipient Initials MF

Data Validation Summary Worksheet

AR/COC #: 613578 (Gross Alpha Reanalysis) Site/Project: SNL SWMU 154 Validation Date: 07.28.11

SDG #: 281628 Laboratory: GEL Validator: Kevin A. Lambert

Matrix: aqueous # of Samples: 1 CVR present: YES Analysis Type: ☐ Organic ☐ Metals

AR/COC(s) present: Yes Sample Container Integrity: OK ☒ Rad ☐ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
All						
Repeated						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
Met								
Criteria								

Comments:

Revised 7/2007

Validated By: Kevin A. Lambert

Radiochemistry Worksheet

AR/COC #: 613578 (Gross Alpha Reanalysis) SDG #: 281628 Matrix: aqueous

Laboratory Sample IDs: 281628-001

Method/Batch#s: EPA 900.0 (G. Alpha) / 1125323

Method/Batch#s:

Method/Batch#s:

Analyte (outliers)	Control Freq.	Control Eval.	Method Blank	5X Blank or 5X MDC	LCS %R	MS %R	MSD %R	MS/ MSD RER	Lab Rep. RER				
G. Alpha	NA	NA	✓	NA	✓	✓	NA	✓	✓				

Tracer/Carrier Recovery Outliers

Sample ID	Tracer/Carrier	%R	Sample ID	Tracer/Carrier	%R	Sample ID	Tracer/Carrier	%R
Not								
	Applicable							

Comments: QC: -001

DL: 1X

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613578

Dept. No./Mail Stop:	6234\MS 0718	Date Samples Shipped: 5-31-11	Project/Task No.98026.01.15	☐ Waste Characterization -Send preliminary/copy report to:	
Project/Task Manager:	Alicia Aragon	Carrier/Waybill No.: 1Z 7E6	SMO Authorization:		
Project Name:	SWMU-154	Lab Contact: Edie Kent/803-556-8171	Contract # PO 881436		
Record Center Code:	NA	Lab Destination: GEL	SEE BOTTLE ORDER	☐ Released by COC No.:	
Logbook Ref. No.:	NA	SMO Contact/Phone: Pam Puissant/505-844-3185		☑ Validation Required	
Service Order No.	CF 251-11	Send Report to SMO: Lorraine Herrera /505-844-3199		Bill To:Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	2790971. 2790969.1 #3 #01

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
090670-001	CTF-MW2	127	NA	053111\0954	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	001
090670-002	CTF-MW2	127	NA	053111\0955	GW	AG	4x1L	4C	G	SA	TCL SVOC (SW846-8270C)	002
090670-009	CTF-MW2	127	NA	053111\0957	GW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	003
090670-010	CTF-MW2	127	NA	053111\0958	FGW	P	500 ml	HNO3	G	SA	TAL Metals+Ur(SW846-6020/7470)	004
090670-016	CTF-MW2	127	NA	053111\1000	GW	P	125ml	4C	G	SA	Anions (SW846-9056)	005
090670-018	CTF-MW2	127	NA	053111\1001	GW	P	125ml	H2SO4	G	SA	NPN (353.2)	006
090670-020	CTF-MW2	127	NA	053111\1002	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	007
090670-022	CTF-MW2	127	NA	053111\1003	GW	P	500 ml	4C	G	SA	Alkalinity (SM2320B)	008
090670-024	CTF-MW2	127	NA	053111\1004	GW	AG	4x1L	4C	G	SA	High Explosive (SW846-8321A) Mod.	009
090670-033	CTF-MW2	127	NA	053111\1006	GW	P	1 Liter	HNO3	G	SA	Gamma Spec (short list)(901.0)	010
090670-034	CTF-MW2	127	NA	053111\1007	GW	P	1 Liter	HNO3	G	SA	Gross Alpha/~~Beta~~(900.0) 281628-001	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☑ 15 Day ☑ 30 Day

Return Samples By: MS 6-3-11 ☐ Negotiated TAT

Sample Tracking — SMO Use
Date Entered(mm/dd/yy):
Entered by:
QC Info:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to: Tin Jackson/org 4142/MS 0729/284-2547
Water has high buffering capacity,check pH, add Presv. as needed
If Perchlorate detected perform verification analysis (SW846-6850M)
Alkalinity as total bicarbonate and carbonate
Major Anions as Br,Fl,Cl,SO4
FGW (filtered in field with .45 micron filter)
*Please list as separate report

Abnormal Conditions on Receipt — Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4142/844-4013/250-7080
	William Gibson		WJG	Weston/4142/844-4013/239-7387

1.Relinquished by		Org. 4142	Date 5/31/11	Time 1135	4.Relinquished by		Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 5/31/11	Time 1135	4. Received by		Org.	Date	Time
2.Relinquished by		Org. 4142	Date 5/31/11	Time 1735	5.Relinquished by		Org.	Date	Time
2. Received by		Org. CAL	Date 6-1-11	Time 0815	5. Received by		Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

DATE: July 6, 2011

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: SWMU-149 GWM
AR/COC(s): 613579
SDG: 279398
Laboratory: GEL
Project/Task No: 98026.01.14

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate), EPA 353.2 (nitrate/nitrite), EPA 9056 (anions), and SM 2320B (total alkalinity). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Blanks

All Analyses: No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike (MS)

All Analyses: All MS (PS) QC acceptance criteria were met.

Replicates

All Analyses: All replicate QC acceptance criteria were met.

Detection Limits/Dilutions

Anions Analysis: All detection limits were properly reported. Sample 279398-004 was diluted 20X for chloride and sulfate due to high concentrations of the target analytes. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

Nitrate/nitrite Analysis: All detection limits were properly reported. Sample -005 was diluted 10X for nitrate/nitrite due to high concentration of the target analyte. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

Other QC

All Analyses: No EBs, FBs, or FDs were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert Date: 07/07/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

DATE: July 5, 2011

TO: File

FROM: David Schwent

SUBJECT: Organic GC/MS Data Review and Validation - SNL
Site: SWMU-149 GWM
AR/COC(s): 613579
SDG: 279398
Laboratory: GEL
Project/Task No: 98026.01.14

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 8260B (VOCs). Problems were identified with the data package that result in the qualification of data.

Holding Times: Due to lab oversight, the VOC analysis of samples 279398-001 and -008 were performed beyond the method specified HT, but within 2X the HT. The associated chloroform result of sample -001 was a detect and will be qualified "J,H1." All other associated sample results were NDs and will be qualified "UJ,H1."

Data are acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved, except as noted above in the summary section.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met, except the following. The ICV and/or CCV %Ds of acetone; trans-1,2-dichloroethylene; and 4-methyl-2-pentanone were >20% but ≤40% with negative bias. All associated sample results were NDs and no other calibration QC acceptance criteria were exceeded. Therefore, no sample data will be qualified as a result. The CCV %D of vinyl acetate was >20% with positive bias. All associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

All IS QC acceptance criteria were met.

Surrogates

All surrogate QC acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD (PS/PSD) QC acceptance criteria were met.

Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not requested.

Detection Limits/Dilutions

All detection limits were reported correctly. No samples required dilution.

Other QC

No FBs, EBs, or FDs were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert Date: 07/07/11

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

DATE: July 5, 2011

TO: File

FROM: David Schwent

SUBJECT: Organic GC/MS Data Review and Validation - SNL
Site: SWMU-149 GWM
AR/COC(s): 613579
SDG: 279398
Laboratory: GEL
Project/Task No: 98026.01.14

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

All samples were prepared and analyzed with approved procedures using method EPA 8260B (VOCs). Problems were identified with the data package that result in the qualification of data.

Holding Times: Due to lab oversight, the VOC analysis of samples 279398-001 and -008 were performed beyond the method specified HT, but within 2X the HT. The associated chloroform result of sample -001 was a detect and will be qualified "J,H1." All other associated sample results were NDs and will be qualified "UJ,H1."

Data are acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved, except as noted above in the summary section.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met, except the following. The ICV and/or CCV %Ds of acetone; trans-1,2-dichloroethylene; and 4-methyl-2-pentanone were >20% but ≤40% with negative bias. All associated sample results were NDs and no other calibration QC acceptance criteria were exceeded. Therefore, no sample data will be qualified as a result. The CCV %D of vinyl acetate was >20% with positive bias. All associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

All IS QC acceptance criteria were met.

Surrogates

All surrogate QC acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD (PS/PSD) QC acceptance criteria were met.

Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not requested.

Detection Limits/Dilutions

All detection limits were reported correctly. No samples required dilution.

Other QC

No FBs, EBs, or FDs were submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert Date: 07/07/11

ANALYTICAL QUALITY ASSOCIATES, INC.

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Memorandum

DATE: July 5, 2011

TO: File

FROM: David Schwent

SUBJECT: Inorganic Data Review and Validation - SNL
Site: SWMU-149 GWM
AR/COC(s): 613579
SDG: 279398
Laboratory: GEL
Project/Task No: 98026.01.14

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 6010B (ICP), EPA 6020 (ICP-MS), and EPA 7470A (CVAA). Problems were identified with the data package that result in the qualification of data.

ICP-MS Analysis:

ICS A: For samples 279398-002 and -003, the sample Ca concentrations were > the associated ICS A concentration and the ICS A results for Cu, Ni, and Zn were > the MDL. All associated sample results were detects <50X the ICS A result will be qualified "J+,CK2."

Blanks: Sb was detected in the CCB at a concentration > the MDL but ≤ the RL. The associated result of sample -003 was a detect <5X the CCB concentration and will be qualified "0.0064U,B3" at 5X the CCB value (mg/L). The associated result of sample -002 was an ND and will not be qualified.

CVAA Analysis:

Blanks: Hg was detected in the CCB at a negative concentration with an absolute value > the MDL but ≤ the RL. All associated sample results were NDs and will be qualified "UJ,B4."

Data are acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

ICP-MS Analyses: All ICP-MS IS QC acceptance criteria were met.

Calibration

All Analyses: All initial and continuing calibration QC acceptance criteria were met.

Reporting Limit Verification

ICP/ICP-MS Analyses: All CRI recoveries met QC acceptance criteria.

CVAA Analysis: All CRA recoveries met QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the blanks.

ICP-MS/CVAA Analyses: No target analytes were detected in the blanks, except as noted above in the summary section.

ICP-MS Internal Standards

ICP-MS Analysis: All ICP-MS IS QC acceptance criteria were met.

Matrix Spike (MS)

ICP-MS Analysis: All MS QC acceptance criteria were met, except the following. In the MS analysis, the concentrations of Ca, Mg, and Na were >4X the analyte spike concentrations and the MS %Rs for these analytes were outside QC acceptance limits. However, according to AOP 00-03 Rev 3 criteria, these analytes are not required for the MS analysis. No sample data will be qualified as a result.

All Other Analyses: All MS QC acceptance criteria were met.

Laboratory Replicate

All Analyses: All replicate QC acceptance criteria were met.

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Detection Limits/Dilutions

ICP-MS Analysis: All detection limits were properly reported. All samples were diluted 10X for Ca and Na due to over-range concentrations of the target analytes. All associated batch QC samples were diluted

at dilution factors that resulted in relative dilution factors to the samples that were ≤5X. No sample data will be qualified as a result.

All Other Analyses: All detection limits were properly reported. No samples required dilution.

ICP Interference Check Sample (ICS A and AB)

ICP Analysis: All ICS A and AB QC acceptance criteria were met.

ICP-MS Analysis: All ICS A/AB QC acceptance criteria were met, except as noted above in the summary section and the following. For samples -002 and -003, the sample Ca concentrations were > the associated ICS A concentration and the ICS A results for Cd, Cr, and Mn were > the MDL. All associated sample results were NDs and will not be qualified.

ICP Serial Dilution

ICP/ICP-MS Analyses: The serial dilution analyses met all QC acceptance criteria.

Other QC

All Analyses: No EBs, FBs, or FDs were submitted on the AR/COC(s).

No other specific issues that affect data quality were identified.

Reviewed by: Kevin A. Lambert Date: 07/07/11

Sample Findings Summary

AR/COC: 613579

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	090672-009/CTF-MW3	Copper (7440-50-8)	J+, CK2
	090672-009/CTF-MW3	Nickel (7440-02-0)	J+, CK2
	090672-009/CTF-MW3	Zinc (7440-66-6)	J+, CK2
	090672-010/CTF-MW3	Antimony (7440-36-0)	0.0064U, B3
	090672-010/CTF-MW3	Copper (7440-50-8)	J+, CK2
	090672-010/CTF-MW3	Nickel (7440-02-0)	J+, CK2
	090672-010/CTF-MW3	Zinc (7440-66-6)	J+, CK2
SW846 7470A			
	090672-009/CTF-MW3	Mercury (7439-97-6)	UJ, B4
	090672-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
SW846 8260B DOE-AL			
	090672-001/CTF-MW3	1,1,1-Trichloroethane (71-55-6)	UJ, H1
	090672-001/CTF-MW3	1,1,2,2-Tetrachloroethane (79-34-5)	UJ, H1
	090672-001/CTF-MW3	1,1,2-Trichloroethane (79-00-5)	UJ, H1
	090672-001/CTF-MW3	1,1-Dichloroethane (75-34-3)	UJ, H1
	090672-001/CTF-MW3	1,1-Dichloroethylene (75-35-4)	UJ, H1
	090672-001/CTF-MW3	1,2-Dichloroethane (107-06-2)	UJ, H1
	090672-001/CTF-MW3	1,2-Dichloropropane (78-87-5)	UJ, H1
	090672-001/CTF-MW3	2-Butanone (78-93-3)	UJ, H1
	090672-001/CTF-MW3	2-Hexanone (591-78-6)	UJ, H1
	090672-001/CTF-MW3	4-Methyl-2-pentanone (108-10-1)	UJ, H1
	090672-001/CTF-MW3	Acetone (67-64-1)	UJ, H1
	090672-001/CTF-MW3	Benzene (71-43-2)	UJ, H1
	090672-001/CTF-MW3	Bromodichloromethane (75-27-4)	UJ, H1
	090672-001/CTF-MW3	Bromoform (75-25-2)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090672-001/CTF-MW3	Bromomethane (74-83-9)	UJ, H1
	090672-001/CTF-MW3	Carbon disulfide (75-15-0)	UJ, H1
	090672-001/CTF-MW3	Carbon tetrachloride (56-23-5)	UJ, H1
	090672-001/CTF-MW3	Chlorobenzene (108-90-7)	UJ, H1
	090672-001/CTF-MW3	Chloroethane (75-00-3)	UJ, H1
	090672-001/CTF-MW3	Chloroform (67-66-3)	J, H1
	090672-001/CTF-MW3	Chloromethane (74-87-3)	UJ, H1
	090672-001/CTF-MW3	cis-1,2-Dichloroethylene (156-59-2)	UJ, H1
	090672-001/CTF-MW3	cis-1,3-Dichloropropylene (10061-01-5)	UJ, H1
	090672-001/CTF-MW3	Dibromochloromethane (124-48-1)	UJ, H1
	090672-001/CTF-MW3	Ethylbenzene (100-41-4)	UJ, H1
	090672-001/CTF-MW3	Methylene chloride (75-09-2)	UJ, H1
	090672-001/CTF-MW3	Styrene (100-42-5)	UJ, H1
	090672-001/CTF-MW3	Tetrachloroethylene (127-18-4)	UJ, H1
	090672-001/CTF-MW3	Toluene (108-88-3)	UJ, H1
	090672-001/CTF-MW3	trans-1,2-Dichloroethylene (156-60-5)	UJ, H1
	090672-001/CTF-MW3	trans-1,3-Dichloropropylene (10061-02-6)	UJ, H1
	090672-001/CTF-MW3	Trichloroethylene (79-01-6)	UJ, H1
	090672-001/CTF-MW3	Vinyl acetate (108-05-4)	UJ, H1
	090672-001/CTF-MW3	Vinyl chloride (75-01-4)	UJ, H1
	090672-001/CTF-MW3	Xylenes (total) (1330-20-7)	UJ, H1
	090673-001/CTF-TB2	1,1,1-Trichloroethane (71-55-6)	UJ, H1
	090673-001/CTF-TB2	1,1,2,2-Tetrachloroethane (79-34-5)	UJ, H1
	090673-001/CTF-TB2	1,1,2-Trichloroethane (79-00-5)	UJ, H1
	090673-001/CTF-TB2	1,1-Dichloroethane (75-34-3)	UJ, H1
	090673-001/CTF-TB2	1,1-Dichloroethylene (75-35-4)	UJ, H1
	090673-001/CTF-TB2	1,2-Dichloroethane (107-06-2)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090673-001/CTF-TB2	1,2-Dichloropropane (78-87-5)	UJ, H1
	090673-001/CTF-TB2	2-Butanone (78-93-3)	UJ, H1
	090673-001/CTF-TB2	2-Hexanone (591-78-6)	UJ, H1
	090673-001/CTF-TB2	4-Methyl-2-pentanone (108-10-1)	UJ, H1
	090673-001/CTF-TB2	Acetone (67-64-1)	UJ, H1
	090673-001/CTF-TB2	Benzene (71-43-2)	UJ, H1
	090673-001/CTF-TB2	Bromodichloromethane (75-27-4)	UJ, H1
	090673-001/CTF-TB2	Bromoform (75-25-2)	UJ, H1
	090673-001/CTF-TB2	Bromomethane (74-83-9)	UJ, H1
	090673-001/CTF-TB2	Carbon disulfide (75-15-0)	UJ, H1
	090673-001/CTF-TB2	Carbon tetrachloride (56-23-5)	UJ, H1
	090673-001/CTF-TB2	Chlorobenzene (108-90-7)	UJ, H1
	090673-001/CTF-TB2	Chloroethane (75-00-3)	UJ, H1
	090673-001/CTF-TB2	Chloroform (67-66-3)	UJ, H1
	090673-001/CTF-TB2	Chloromethane (74-87-3)	UJ, H1
	090673-001/CTF-TB2	cis-1,2-Dichloroethylene (156-59-2)	UJ, H1
	090673-001/CTF-TB2	cis-1,3-Dichloropropylene (10061-01-5)	UJ, H1
	090673-001/CTF-TB2	Dibromochloromethane (124-48-1)	UJ, H1
	090673-001/CTF-TB2	Ethylbenzene (100-41-4)	UJ, H1
	090673-001/CTF-TB2	Methylene chloride (75-09-2)	UJ, H1
	090673-001/CTF-TB2	Styrene (100-42-5)	UJ, H1
	090673-001/CTF-TB2	Tetrachloroethylene (127-18-4)	UJ, H1
	090673-001/CTF-TB2	Toluene (108-88-3)	UJ, H1
	090673-001/CTF-TB2	trans-1,2-Dichloroethylene (156-60-5)	UJ, H1
	090673-001/CTF-TB2	trans-1,3-Dichloropropylene (10061-02-6)	UJ, H1
	090673-001/CTF-TB2	Trichloroethylene (79-01-6)	UJ, H1
	090673-001/CTF-TB2	Vinyl acetate (108-05-4)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	090673-001/CTF-TB2	Vinyl chloride (75-01-4)	UJ, H1
	090673-001/CTF-TB2	Xylenes (total) (1330-20-7)	UJ, H1

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 613579 Site/Project: SNL/SWMU-149 GWM Validation Date: 7-5-11

SDG #: 279398 Laboratory: GEL Validator: David Schwent

Matrix: Groundwater # of Samples: 8 CVR present: yes Analysis Type: ☑ Organic ☑ Metals

AR/COC(s) present: yes Sample Container Integrity: okay ☐ Rad ☑ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers *

Sample Number (Client)	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
090672-001	279398-001	EPA 8260B (VOCs)	✓	6-3-11	NA	6-21-11	yes	No
090673-001	-008	"	"	"	"	"	"	"

Comments: * Due to lab oversight, VOC analyses was performed outside HT but within 2x HT. (see e-mail, dated 6-21-11)

Revised 7/2007

Validated By: David Schwent

Organic Worksheet (GC/MS)

AR/COC #: 613579 SDG #: 279398 Matrix: Groundwater

Laboratory Sample IDs: 279398-001 and -008.

Method/Batch #s: EPA 8260B (VOCs)/1112180. Tuning (pass/fail): pass TICs Required? (yes/no) pass

Analyte (outliers)	Calibration Int.	Calibration RF	Calibration RSD/R^2	Calibration (ICV) CCV %D	Method Blank	5X (10X) Blank	LCS %R	(PS) MS %R	(PSD) MSD %R	MS/(PS) MSD (PSD) RPD	TB (-008)			
acetone	✓	✓	✓	(-24.8)	✓	NA	✓	✓	✓	✓	✓			
trans-1,2-dichloroethylene	NA			(-22)										
Vinyl acetate	✓			(27.6)										
4-methyl-2-pentanone	NA	✓	✓	-20.5	✓	✓	✓	✓	✓	✓	✓			

Surrogate Recovery Outliers

Sample ID						
No Outliers						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
No Outliers												

Comments: Samples run beyond HT, but within 2x HT. No dilutions.

Revised 7/2007

General Chemistry Worksheet

AR/COC #: 613579 SDG #: 279398 Matrix: Groundwater

Laboratory Sample IDs: 279398-006; -004; -005; -007.

Method/Batch #s: EPA 314.0 (Perch.)/1110331; M/09671; EPA 353.2 (NO_3/NO_2)/1110886; SM 2320B (alkalinity)/1110304

Method/Batch #s: EPA 9056 (anions)

Method/Batch #s:

Method/Batch #s:

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	(PS) MS %R	MSD %R	MS/MSD RPD	Lab Rep. RPD	Partial/Total RPD		
	Int.	R^2	ICV	CCV	ICB	CCB										
No Outliers	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	✓	NA		

Comments: Samples diluted for chloride, sulfate, and NO_3/NO_2 due to high concentrations.

Inorganic Metals Worksheet

AR/COC #: 613579 SDG #: 279398 Matrix: Groundwater

Laboratory Sample IDs: 279398-002 and -003.

Method/Batch #s: EPA 6010B (ICP)/1109620; EPA 6020 (ICP-MS)/1109618; EPA 7470A (CVAA)/1109797.

ICPMS Mass Cal (pass/fail) pass ICPMS Resolution (pass/fail) pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or [5X MDL]	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R				
	Int.	R^2	ICV	CCV	ICB	CCB µg/L		[5X MDL] µg/L						µg/L					
Hg	✓	✓	✓	✓	✓	-0.03	✓	[0.33]	✓	✓	✓	NA	NA	NA	✓				
Sb	↓	↓	↓	↓	↓	1.27	↓	6.4	↓	↓*	↓	✓	✓	✓	↓				
Ca	↓	↓	↓	↓	↓	✓	↓	NA	↓	0*	↓	↓	↓	NA	↓				
Mg	↓	↓	↓	↓	↓	↓	↓	↓	↓	-125*	↓	↓	↓	↓	↓				
Na	↓	↓	↓	↓	↓	↓	↓	↓	↓	-450*	↓	↓	↓	↓	↓				
Cd	↓	↓	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓	↓	0.649	↓				
Mn	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1.99	↓				
Zn	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6.65	↓				
Cr	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	4.33	↓				
Cu	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2.89	↓				
Ni	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	3.54	↓				

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
No Outliers				No Outliers			

Comments: * Fail 4X rule ([Sample] < 4X [Spike]). → Not required analytes for MS.
Ca and Na had over-range concs. and sample was diluted 10X.