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ACT 2 8 21011

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,

Wagner Pattv

Manager

Enclosure

cc w/enclosure: William Moats, NMED-HWB (via Certified Mail) Laurie King, EPA, Region 6 (via Certified Mail) Thomas Skibitski, NMED-OB, MS-1396 Carolyn Daniel, SNL/NM, MS-0718 SNL ES&H Records Center, SNL/NM, MS-0718 Zimmerman Library, UNM cc w/o enclosure: Robert Fleming, HQ/GTN, NA-173 Joanna Serra, HQ/FORS, NA-173 Amy Blumberg, SNL/NM, MS-0141 S. Andrew Orrell, SNL/NM, MS-0711 David Miller, SNL/NM, MS-0718 John Cochran, SNL/NM, MS-0719 Kimberly Davis, SSO/MO, MS-0184 Richard Sena, SSO/MO, MS-0184 Shirley Mondy, SSO/MO, MS-0184 Daniel Pellegrino, SSO/ESH, MS-0184 Michael McFadden, SSO/FP, MS-0184 Joe Estrada, SSO/FP, MS-0184 Carolyn Holloway, SSO/ESH, MS-0184 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:

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S. Andrew Orrell, Director Nuclear Energy & Fuel Cycle Programs Center 6200 Sandia National Laboratories/New Mexico Albuquerque, New Mexico 87185 Operator

and

Signature: 6) (6)

Ms. Patty Wagner, Manager U.S. Department of Energy National Nuclear Security Administration Sandia Site Office Owner and Co-Operator



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: CONTRACTOR: PROJECT MANAGER: SANDIA SITE OFFICE SANDIA CORPORATION 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:

<u>SECTION I</u> :	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
ТА	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

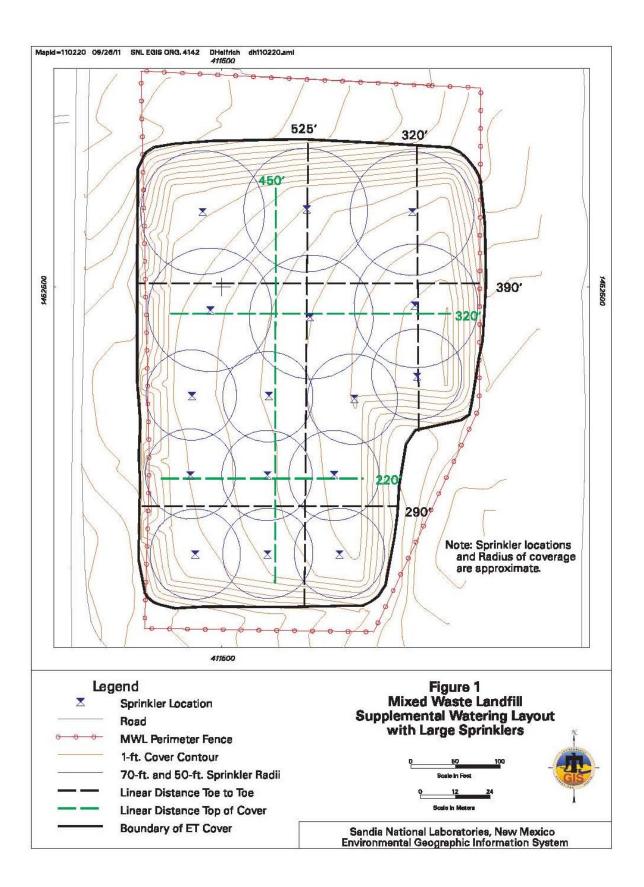
1.0 Introduction

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.



- 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
- o 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:
 - o SWMUs 8, 28-2, 58, and 105
 - o 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
 - 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:
 - o 102 gallons of leachate
 - o 2 gallons of rinsate
 - 5 lbs PPE, paper wipes, plastic drum pump
- Waste removed from the site by HWHF personnel on June 28, 2011:
 - o 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:
 - o 23 gallons of leachate
 - o 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**

Bearzi, J.P. (New Mexico Environment Department), April 2011. Letter to P. Wagner (U.S. Department of Energy) and S. Orrell (Sandia Corporation), "Request to Conduct Supplemental Watering and Cover Maintenance Activities, Mixed Waste Landfill, Sandia National Laboratories, EPA ID #NM5890110518, HWB-SNL-MISC," Hazardous Waste Bureau, New Mexico Environment Department, Santa Fe, New Mexico.

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New Mexico Environment Department (NMED), April 2004. "Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order," New Mexico Environment Department, April 24, 2004.

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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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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).

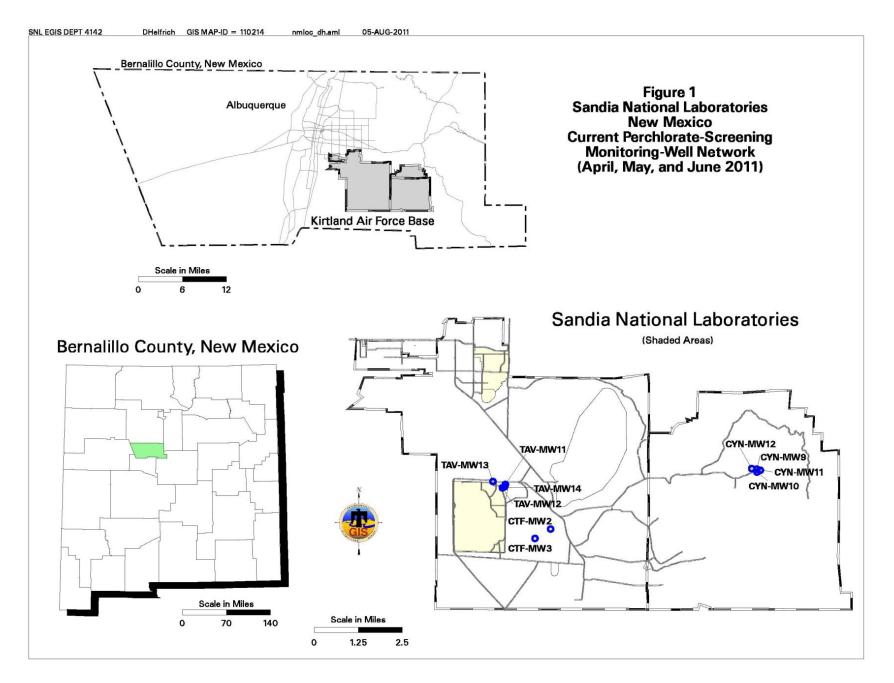


Table 1 Current Perchlorate-Screening Monitoring Well Network Second Quarter, CY 2011 (April, May, and June 2011)

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

^aIncludes this sampling event.

^bPer 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.

 $\begin{array}{ll} \mu g/L & = \mbox{Microgram}(s) \mbox{ per liter}. \\ \mbox{CTF} & = \mbox{Coyote Test Field}. \\ \mbox{CY} & = \mbox{Calendar Year}. \end{array}$

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 BSG	= Analysis request/chain of custody.= 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 $4 \mu g/L$ 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 $4 \mu g/L$ 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 $4 \mu g/L$, DOE/Sandia will evaluate the nature and extent of perchlorate contamination, based on a screening level/MDL of $4 \mu g/L$, 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 [♭] (µg/L)	PQL ^c (µg/L)	MCL ^d (µg/L)	Laboratory Qualifier ^e	Validation Qualifier ^f	Analytical Method ^g	Comments
	08-Mar-11	613448	090237-020	ND	4.0	12	NE	U		EPA 314.0	
CTF-MW2	00-10181-11	013440	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	
	09-Mar-11	613450	090243-020	ND	4.0	12	NE	U		EPA 314.0	
CTF-MW3	09-10181-11	013430	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	
	28-Sep-10	613285	089672-020	ND	4.0	12	NE	U		EPA 314.0	
	26-Sep-10	013265	089673-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
CYN-MW9	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	
	27-Sep-10	613283	089668-020	ND	4.0	12	NE	U		EPA 314.0	
	00 No. 40	040005	089773-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW10	02-Nov-10	613325	089774-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	09-Feb-11	613411	089994-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	10-May-11	613559	090610-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	29-Sep-10	613286	089675-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	01-Nov-10	613323	089765-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
CYN-MW11			089990-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	08-Feb-11	613410	089991-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	04-May-11	613556	090600-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	23-Sep-10	613282	089665-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	28-Oct-10	613322	089762-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW12	10-Feb-11	613412	089997-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
			090606-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	05-May-11	613558	090607-020	ND	4.0	12	NE	Ŭ		EPA 314.0	Duplicate sample
	06-Jan-11	613384	089917-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
TAV-MW11	18-Apr-11	613524	090435-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	19-Jan-11	613392	089935-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
TAV-MW12			090442-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	20-Apr-11	613527	090443-020	ND	4.0	12	NE	Ŭ		EPA 314.0	Duplicate sample
		1	089921-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
TAV-MW13	10-Jan-11	613386	089922-020	ND	4.0	12	NE	Ŭ		EPA 314.0	Duplicate sample
	06-Apr-11	613516	090417-020	ND	4.0	12	NE	Ŭ		EPA 314.0	
	20-Jan-11	613393	089938-020	ND	4.0	12	NE	U		EPA 314.0	
TAV-MW14											
	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 theCurrent 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.

^aResult

Values in **bold** exceed the screening level/MDL

ND = Not detected (at MDL).

 μ g/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.

°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.

dMCL

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.

^eLaboratory Qualifier

U = Analyte is absent or below the method detection limit.

^fValidation Qualifier

If cell is blank, then all quality control samples meet acceptance criteria with respect to submitted samples and no qualifier was assigned.

^gAnalytical 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)	рН	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

^aField measurements obtained immediately before the groundwater sample was collected.

- °C = Degrees Celsius.
- % Sat = Percent saturation.
- $\begin{array}{ll} \mu mhos/cm & = Micromhos \ per \ centimeter. \\ CTF & = Coyote \ Test \ Field. \\ CY & = Calendar \ Year. \end{array}$
- 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.

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Appendix A

Analytical Laboratory Certificates of Analysis for the Perchlorate Data

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

Certificate of Analysis

Report Date: June 14, 2011

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Parameter	Qual	ifier	Result	DL	, RL	Units	DF	Analyst Date	Time	Batch	Method
Ion Chroma	atography										
EPA 314.0	Perchlorate by IC "	As Re	ceived"								
Perchlorate		U	ND	0.004	0.012	mg/L	1	MAR1 06/02/11	2050	1107935	i
The follow	ing Analytical Met	nods w	vere performed	l:							
Method I		i <u>ption</u> 14.0 DC				Ana	alyst Co	mments			

			SMO Use							AR/COC	613579	6
	Date Samples Shipped 2-2 Camerwayali No 222		Color C. V. V.		Project/ SMO Au	Project/Task No.98026 SMO Authorization:	Project/Task No. 98026.01.14 SMO Authorization:			Waste Characterization -Send preliminary/copy report to:	port to:	
	Lab Destination:	• •	JEL		3	2				Released by COC No.:		
	SMO Contact/Phone:		Pam Puissant/505-844-3185	-844-318	2 2 2 2 2 2		UCC ANTINE EXIER	~		Validation Required		
	Seria report to SMO.		CUIDING TRUICE & /200-0-04-0-198		198				Τ	Diff 0.5andia National Labs (Accounts Payable)		
			Reference LOV(available at SMO)	ce LOV	(availa	ible at S	(ON)			P.O. Box 5800 MS 0154 Albuqueraue, NM 87185-0154	-	279398
ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Type Con	Container pe Volume	reserv- ative	Collection Sample Method Type	Sample Type		sthod	Lab Sample
	361	AN	060311\0937	GW	υ	3x40ml	HCL	υ	SA	TCL VOC (SW846-		ŝ
	361	A	060311\0938	GW	٩.	500 ml	HNO3	U	SA	TAL Metals (SW846-6020/7470)	7470)	0.32
CTF-MW3	361	AN	060311\0939	FGW	٩	500 ml	HNO3	U	SA	TAL Metals (SW846-6020/7470)	7470)	89 9
CTF-MW3	361	٩N	060311\0940	GW	٩	125 mł	4C	ს	SA	Anions (SW846-9056)		8
CTF-MW3	361	Ą	060311\0941	GW	٩	125 ml	H2SO4	U	SA	NPN (353.2)		\$ 8
CTF-MW3	361	NA	060311\0942	GW	٩	250 ml	4C	ე	SA	Perchlorate (314.0)		8
CTF-MW3	361	AA	060311\0943	о М	٩	500 ml	4C	U	SA	Alkaiinity (SM2320B)		N
CTF-TB2	AN	Ą	060311\0937	MID	U	3x40mt	HCL	U	ТВ	VOC (SW846-8260B)		88
-	Š		Sample Tracking		Smo Use		ial ir	ions/QC F	Requiren		Abnormal	
Cijent	posal by		Date Entered(mm/dd/yy	(include)			ED0	Yes	<u>_</u>		Conditions on	
7 Day 115 Day		30 Day	DV:				Level D Package		Lives	9N)	Receipt	
	–[Nogotiated TAT	ed TAT	OC MID			"Send report to:					
	Signature	Ē	Company/Organization/Phone/Celiular	anization/	Phone/Ci	Ī	Tim Jackson/ORG 4142/MS.0729/ 284-2547	86.4142/N	IS.0729/	284-2547		
				102/0101	0601-		a percriorate dem Alt-doite de later	uad naraa			9	Lao Use
			Wester (1412)844 401207020-01	0000000	101/0-		Andmirty as (<u>oral preal ponate and carbonate</u> Andone on Britty COM		<u>ile and c</u>	arponate		
							FGW (filtered in field with .45 micron filter)	field with A	45 micror	n filter)		
							*Please list as separate report	eparafe r	sport.			
Salvo	Org. 414 Date 6	2Date 6	L/ Time	22	4.Reling	4.Relinquished by			Org.	Date	Time	
7	Org.#13 9	Date 2.	me	212	4. Received by	ived by			Org.	Date	Time	
as a	0rg 4/1399	Date	g	100	5.Reling	5.Relinquished by			Org.	Date	Time	
Sew Carl	013/2e2	Bate	- 1	0725	5. Received by	ived by			Org.	Date	Time	
	Org.	Date	Time		6.Reling	6.Relinquished by			Og.	Date	Time	
	Org.	Date	Time		6. Received by	ived by			Org.	Date	Time	

CONTRACT LABORATORY

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Report Date: June 20, 2011

	Company : Address : Contact: Project:	Sandia National La MS-0756, Org. 06' 1515 Eubank SE Albuquerque, New Ms. Pamela M. Pu Level C, Groundw	765, Bldg. 823/Rm. 4276 Mexico 87123 issant							
	Client Sample ID:	090672-020			Project	::	SNLSGWat	er		
	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, R	ecv.:				
Parameter	Quali	ifier Result	DL	RL	Units	DF	Analyst Dat	e Tin	ne Batch	Method
Ion Chrom	atography									
	Perchlorate by IC "	As Received"								
Perchlorate		U ND	0.004	0.012	mg/L	1	MAR1 06/16/1	1 1643	1110331	t
The follow	ving Analytical Meth	nods were performed	:							
Method	Descr EPA 31	iption 14.0 DOE-AL			Anal	yst Co	mments			

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY SWOULS / 613560 613560	Calle Samples Shipped 57 //// Project/Task No. 98026.01.06 Contract Samples Shipped 57 / 2014 SMO Authorization: Contract - Send preliminary/copy report to: Lab Contact: Edie Keriu803-556-8171 Contract # PO 691436 Contact	Lab Destination: GEL SMO contact/Phone: Pam Puissant/505-844-3185 5 6° / 10° 17.0° 0120 mC	Send Report to SMO: Lorraine Herrera/505-844-3199 Bill To:Sandia National Labs (Accounts Payable)	P.O. Box 5800 MS of 54 Reference LOV(available at SMO) Alburnemia NM R7185-0154 2.7793	Pump ER Site Date/Time(hr) Sample Container Preserv- Cotlection Sample Parameter & Method Depth (ft) No. Collected Matrix Type Volume ative Method Type Requested	195 NA 051111/1004 GW G 3x40 ml HCL G SA TCL VOC (SW846	195 NA 0511111(1005 GW AG 4x1L 4C G SA SVOC (SW846-8270)	195 NA 051111/1008 GW AG 4x1 L 4C G SA TPH Diesel (SW846-8015AB) SVOC	195 NA 051111/1007 GW AG 3x40 ml 4C G SA TPH Gasoline (SW846-8015A/B) VOC 0.05		195 NA 051111/1011 GW P 250 ml 4C G SA Perchlorate (314.0)	195 NA 051111/1012 GW AG 4x1 L 4C G SA High Explosives (SWB46-B321A)	NA NA 05111111004 DIW G 3x40 ml HCL G TB TCL VOC (SW846-8260B)	NA NA 051111/1007 DIW AG 3x40 ml 4C G TB TPH Gasoline (SW846-8015A/B) VOC C <thc< th=""> <thc< th=""> <thc< th=""></thc<></thc<></thc<>	4A NA 051111\0943 DIW G 3x40 ml HCL G FB TCL VOC (SW846-8260B	Sample Tracking Shot See Special instructions/QC Requirements		Nogotiated TAT QC(n)18 Send report to:	abre, Init, Company/Organization/Phone/Cellular			L L Droigert 3rd Oursetor W	Last well for CYN - Project 3rd Quarter.	*	(Time 11.09 4. Relinquished by	Last well for CYN - Project 3rd Quarter. Last well for CYN - Project 3rd Quarter. Time 1/09 4 Relinquished by Time 1/09 4. Received by	HH2 Date 5-11-11 Time 11.00 A. Relinquished by HH2 Date 5-11-11 Time 11.00 4. Relinquished by HH2 Date 5-11-11 Time 12.20 5. Relinquished by	Last well for CYN - Project 3rd Quarter. Please list as separate report. Time A Relinquished by Org 4. Received by Org 6. Received by Org 0.03 Date Time 2. Bod S. Reinquished by 0.03 Org Date Time 2. Bod S. Reinquished by 0.03 Org Date Time 2. Received by
NALYSIS		· · ·			1	┝╶┥				-		_		_		T	ĥ	1 ŝ	trit, C		Meaton				2 Date 5-//-) (2 Date 5-11-11	2 Date 5-11-1	2 Date 5-11-11 2 Date 5-11-11 2 Date 5-11-1
A	A Contact State		Send Report	-1-	╂╼╌──		195	195	195	195	195	195	¥	¥	¥	tef. No.	ğΝ	X	Signature	HHUS MAR	and and				H/h Bio	HH-60	11, 60	019.414
~	6234/0718 50 HzJ Mike Skefty COCHEAN Burn Sile GWC	ER/1333/DAT ER 058	CF# 235-11	Tech Area Room	ER Sample ID or Sample Location Detail	CYN-MW9	CYN-MW9	CYN-MWD	CYN-MW9	CYN-MW9	CYN-MW9	CYN-MW9	CYN-TB9	CYN-TB10	ľ	- 1	Client to Client			uos					and the	and the	and the	and the
Internal Lab	Mail Stop: k Menager		er No.	Building	NeFraction		1 090613-002	1 090613-005	A 090613-006	r 090613-018	1 090613-020	P 090613-024	¥ 090614-001	¥ 090615-001	16-001	RMMA	Turnaround Time	Return Samples By:			Membore				1.Relinquished by	1. Received by	1. Received by 2. Received by	1. Recinquished by 1. Received by 2. Received by 2. Received by

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				Certificate	UI AIIA	17213		Report Da	ate: Ji	une 7, 2	2011
	Company : Address : Contact: Project:	MS 151 Alb Ms.	dia National Labor -0756, Org. 06765 5 Eubank SE uquerque, New Mo Pamela M. Puissa el C, Groundwater	, Bldg. 823/Rm. 42 exico 87123 nt	76			-			
	Client Sample ID:	090	613-020			Projec	et:	SNLSGWater			
	Sample ID:	277	938006			Client	ID:	SNLS003			
	Matrix:	AQ	UEOUS								
	Collect Date:	11-1	MAY-11 10:11								
	Receive Date:	12-1	MAY-11			Client	Desc.:	CYN-MW9			
	Collector:	Clie	nt			Vol. F	lecv.:				
Parameter	Quali	fier	Result	DL	RL	Units	DF	Analyst Date	Time	Batch	Method
Ion Chrom	atography										
EPA 314.0	Perchlorate by IC "	As Re	ceived"								
Perchlorate		U	ND	0.004	0.012	mg/L	1	MAR1 05/18/11	2113 I	100014	I.
The follow	ving Analytical Meth	ods v	vere performed:								
Method I	Descri EPA 31					Ana	lyst Co	omments			

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65					a	174011			8	002	600	Š					C200	× S							ŝ				Time	Time	Time	Time	Time	lime	
Page_1 of 1613559		aport to:			counts Payable)			Method			EA/RV SVOC		004 (avein			5-8321A)	B)	3015A/B) VOC		Abnormal	Conditions on	Recept													
	Wate Characterization	-Send preliminary/copy report to:	Reteased by COC No.:	 Vatidation Required 	Bili To:Sandla National Labs (Accounts Payable)	P.O. Box 5800 MS 0154	Albuquerque, NM 87185-0154	Parameter & Me Requested	TCI VOC /SMBA6_8260B	CL TO (SMBA6-8270)			TPH Gasoline (Sword-out)2001 VOO	NPN (355.2)	Perchlorate (314.0)	High Explosives (SW846-8321A)	TCL VOC (SW846-8260B)	TPH Gasoline (SW846-8015A/B) VOC		ments		 No 		Tim Jackson/Org.4142/MS 0756/505-284-2547	if Perchlorate detected perform verification				Date	Date	Date	Date	Date	Date	
4			þ	<u>í</u>	Bill	[_	Sample	1		1	1			SA	<u>¥</u> S	18	TB TP		Require		, C		MS 0756/	perform '	6850M		e report.	Ē	og.	БО	Org.	Org.	Org.	
λQC		1	Can's	COM	ı			Collection Sample		╉╸	┼	╍╆╼	┼	┽	ن	υ	с U	U		ctions/QC	(es	age Nge	ğ	Org.4142/	detected	g SW846-		s separati							
CONTRACT LABORATORY	1	N .	•	Clarge or			I	4	╈			- - 2	4C	H2SO4	40	40	HCL	4C		Special Instructions/QC Requirements	√es	0	*Send report to:	Jackson/	erchiorate	analysis using SW846-6850M		*Please list as separate report.							
CONTRACT LABORATORY JEST AND CHAIN OF CL		Project/Task No. 98026.01.06 SMO Authorization:	91436	Pag			(OM)		+			-	┿	-+-	_	_		Ē		STR	EDO		es.		Π	ana		ă T			A	5 0	Aq pa	 	
		VTask No.	Contract #: PO 691436	5 (92			ble at S	Container			+		3x40 ml	125 ml	250 ml	3 4X1 L	3x40 mi	3x40 mi	┼╼		3			e/Cellular					A Relinnuished by	4 Received by	5 Delinmished hv	5 Received by	6 Relinguished by	6. Received by	
		Project	Contra	-1.	<u>_</u> 8	20	/(availa	l l l					8		2	N AG	N N	DIW AG	┨─		2		25	tion/Phon	39-7367	60-7090			AA		4	T.	Τ	6	-
ONTR EST /			8171	1010 100	844-3100 05 844 24	2-1-0-00		Samp	Matrix		GW	<u>≷</u>	8	No.	GW	GW	5 DIW	┼─	╀		5 5 5		OC MIS	Orosoiza	4 4013/2	4-4013/2			2 NY						
c REQUI	, Use	影響が	Edie Kent/803-556-8171		Pam Puissant/505-644-3103		Referet	Date/Time(hr) Sample Container	Collacted	05101110945	05101110947	011\0951	0110949	011\0953	051011/0954	051011\0955	051011\0945	05101100949			In Tracking			Company/Omanization/Phone/Cellular	Weston/4142/844-4013/239-7367	Weston/4 142/844-4013/250-7090			+	÷	÷	_		Time	1
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		6234/0718 6234/0718	e GWC	3/DAT		5-11	ea	CD Semula ID OF	Sample Location Detail	MW10	UN10	CYN-MW10	CYN-MW10	CYN-MW10	CVN_MM/10				-TB8		Yes 1	Return to Client	7 Day		Nama	William J Gibson	Robert Lynch		200	111	4 Class	1. 2 1	- Law	-	
	4	6234/0718	Bum Site GWC	ERV1333/DAT	ER 056	CF# 236-11	Tech Area	Roon		CYN-MW10	CYN-MW10	C <u>X</u> N-1						CVN-1B/	CYN-TB8		þ		Ime	By:		iii			Ĥ	N ZN		1/2-1A	M.	Ý.	
		Aall Stop:	me:	er Code:	ef. No.:	der No.	5		Samole NoFraction	030610-001	090610-002	090610-005	nane 10-006	00610-018			090610-024	090611-001	090612-001			Sample Disposal	Turnaround Time	Return Samples By:		e e	Jers			1.Relinquished by	1. Received by	2.Relinquished b	2. Received by	3.Relinquished by	3. Received by
internai Lab		Dept. No./Mall Stop	Project/Task Manager: Project Name:	Record Center Code:	Logbook Ref. No.:	Service Order No.	Location	Building	Samole h	9050	9060								060		RMMA	Sample	Turna	Return	[Sample	Team Members			1.Relin	1. Rec	2.Relin	2. Rec	3.Relir	3. Rec

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Report Date: June 9, 2011 Company : Sandia National Laboratories MS-0756, Org. 06765, Bldg. 823/Rm. 4276 Address : 1515 Eubank SE Albuquerque, New Mexico 87123 Contact: Ms. Pamela M. Puissant Level C, Groundwater Monitoring Project: Client Sample ID: 090610-020 Project: SNLSGWater Client ID: SNLS003 Sample ID: 277861006 Matrix: AQUEOUS 10-MAY-11 09:54 Collect Date: Client Desc.: CYN-MW10 Receive Date: 11-MAY-11 Vol. Recv.: Collector: Client Qualifier RL DF Analyst Date Time Batch Method Result DLUnits Parameter lon Chromatography EPA 314.0 Perchlorate by IC "As Received" 0.012 1 MAR1 05/18/11 2054 1100014 1 ND 0.004 mg/L Perchlorate U The following Analytical Methods were performed: Description Analyst Comments Method _... .__ EPA 314.0 DOE-AL 1

Page <u>1 of 1</u>	AR/COC 613556	Waste Characterization -Send preliminary/copy report to:	Reteased by COC No.:	Bill To:Sandia National Labs (Accounts Payable)	P.O. Box 5800 MS 0154 2774/70	thod	Requested ID	TCL VOC (SW846-8260B)	SVOC (SW846-8270)	TPH Diesel (SW846-8015A/B) SVOC	TPH Gasoline (SW846-8015A/B) VOC		Perchlorate (314.0)	High Explosives (SW846-8321A)	TCL VOC (SW846-8260B)	TPH Gasoline (SW846-8015A/B) VOC		ments Abliotenal	Conditions on	Vo Recept		1	N FEICIDIOTAID GENERGIG, PEITORN VARNICATION analysis using SW846-6860M				Date Time		Date	Date Time	Date Time
≿		,)	r			- 	d Type	Å	SA	Αŝ	SA	ΥS	SA	SA	TB	£		Special Instructions/QC Requirements	°N N	6 0		142/MS 07	146-6850M		*Please list as senarate renort.	go	Org.	Org.	Dg.	Bo	Org.
STOE		15	ORM	1			Method	U	υ	Ċ	0 	ი 	0	0	<u>ს</u>	0		structions	≺es	ackage	ort to:	ion/Org.4	rate detec sind SW8.	9	it as sena	-					1
JF CU		36 36	SUP BOTH ORNAR			0	ative	Ę	4	40	40	H2SO4	4	40	HCL	40		Special Int		Levei D Package	*Send report to:	Tim Jacks	anaivais using SW846-6850M		 *Please lis						
CONTRACT LABORATORY EQUEST AND CHAIN OF CUSTODY		Project/Task No. 98026.01.06 SMO Authorization: Carl 5 Contract #: PO 691436	SUP		a at SMC	Container	Volume	3x40 ml	4x1 L	4x1 L	3x40 ml	125 ml	250 ml	4x1 L	3x40 ml	3x40 ml									T	4. Relinquished by	ved by	5.Relinquished by	ved by	6.Relinquished by	ved by
ACT L ND C		Project/ SMO Aut Contract		1.0	idelleve	S	-T T	U	AG	ĄĢ	AG	٩	٩	AG	U	Ŷ		Smo Use				Phone/Ce	000	710		4.Reling	4. Received by	5.Relind	5. Received by	6.Relind	Received by
ST A			14-3185	-844-3199		Sample	Matrix	ß	ş	β	ş	ş	Ŋ	ş	Mia	Div			Į,		OC Ints	anization	13/250-7(30/228-0		2011	10	1 8	30		
CC ANALYSIS REQUE		Kent	GEL Pam Puissant/505-844-3185	Lorraine Herrera/505-844-3199	Reference OV/svaljahja at S W O	Date/Time(hr)	Collected	050411/1013	050411/1015	050411/1017	050411/1018	050411/1019	050411/1020	050411/1022	050411/1013	050411/1018		Sample Tracking	Date Entered(ami/dd/5y)	Editing by	d TAT	Company/Organization/Phone/Cellular	Weston/4142/844-4013/250-7090	Weston/4142/844-5130/228-0710		14 [[/ Time	1 4/11 Time 11	1411 I Time 13	-5-11 Time 07	Time	Time
IAL YS	ns shi	s Shippet	• •	•		ER Site	ý.	¥	¥	ΝA	AN	¥	MA	Ą	¥	¥	-				Negotiated TAT	Т			T	Date S	Date	Date 5	Date	Date	Date
AN	Cochran ms shall	Date Samules Shiofe Currer/Waybil No Lab Contact: E	Lab Destination: SMO Contact/Phone:	Send Report to SMO:	, ,		Depth (ft)	253	253	253	253	253	253	253	NA	A		Ň	ő	15 Day (🗹 30 Day		Signatum	N SUL	12 S.		2414:00	2 X / MUDOWS	GMOON HIYZ	13 BQ	ġ	ощ.
) vipr	6234/0718 Milte Skeilty Bum Site GWC	ER/1333/DAT ER 058	4	Tech Area 519111	ER Sample ID or	Sample Location Detail	CYN-MW11	CYN-MW11	CVN-MW11	CYN-MW11	CYN-MW11	CYN-MW11	CVN-MW11	CYN-TB1	CYN-TB2		TYes JNo Ref. No.	to Client				Protect Lynch	Affred Santillarres		KWX South	N. G. J. SM	The Kan Cont	NVi Unlin		
internal Lab	Batch No. N	Dept. No./Mail Slop: 6 ProjectTask Manager:	ie o N	•	Π	Ī	Sample NoFraction	030600-001	090600-002	090600-005	000000000	090600-018	090600-020	090600-024	030601-001	90602-001		RMMA	Sample Disposal	Turnaround Time	Return Samples By:			ers		1.Relinquished by	1. Received by	2. Retinquished by	2. Received by 🗠 🥌	3.Ralinquished by	3. Received hv

Page 5 of 320

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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 Ms. Pamela M. Puissant Contact: 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.: Qualifier Result DF Analyst Date Time Batch Method Parameter DL RL Units Ion Chromatography EPA 314.0 Perchlorate by IC "As Received" 0.012 I MAR1 05/18/11 1859 1100014 Perchlorate U ND 0.004 mg/L 1 The following Analytical Methods were performed: -----Description Analyst Comments

Method EPA 314.0 DOE-AL 1

	58						Lab Sample ID	6/6	020	2	222	023	02%	Q Q	250	027	00 01 01														
Page 1 ef 2	613558	an r report to:		Accounts Payable)		5-0154	& Method stad)B)		15A/B) SVOC	8015A/B) VOC			6-8321A)	<u>(8)</u>		15A/B) SVOC	Abnormal	Conditions on	Recept							Time	Time	Time	Time	Time
	ARICOC	Waste Characterization -Send preliminary/copy report to:	Released by COC No.	Bill To:Sandia National Labs (Accounts Payable)	P.O. Box 5800 MS 0154	Albuquerque, NM 87185-0154	Parameter & Method Requested	TCL VOC (SW846-8260B)	SVOC (SW846-8270)	TPH Diesel (SW846-8015A/B) SVOC	TPH Gasoline (SW846-8015A/B) VOC	NPN (353.2)	Perchlorate (314.0)	High Explosives (SW846-8321A)	TCL VOC (SW846-8260B)	SVOC (SW846-8270)	TPH Diesei (SW846-8015A/B) SVOC	rements		No No		Tim Jackson/Org. 4142/MS 0755/505-284-2547	lf Perchierate detected, perferm verification analysis using SWBAA second			Date	Date	Date	Date	Date	Date
~			<u> </u>	1			Sample Type	SA	SA	¥\$	SA	SA	SA	SA	B	В	В	C Requi	Å	5		<u>2MAS 075</u>	id, periem e. eo entil		te renort	Org.	Org.	org.	Б. Б	Ë	ġ.
			20%				Collection Sample Method Type	ŋ	U	G	U	U	U	ს	U	υ	G	ructions/C		kage	1 10: 1	<u>n/Org. 414</u>	te detecte an Swedd		at tonars						
FORY F CUS		601.00 601.00	26 012			_	Preserv- ative	HCL	4C	40	40	H2SO4	40	4	HCL	4	4C	Special instructions/QC Requirements	EDD	Level D Package	*Send report to:	Im Jackson	lf Perchlerate detected, perfer analysis vision SMette.cesou		*Djasta jitt at tanarsta ranort						
CONTRACT LABORATORY EQUEST AND CHAIN OF CUSTODY		Project/Task No.98026.01.06 SMO Authorization:	SEE ROTTE ORDER			Reference LOV(available at SMO	Container e Volume	3x40 ml	4x1 L	4x1 L	3x40 ml	125 ml	250 ml	4x1 L	3x40 ml	4x1 L	4x1 L								Ī	4. Relinquished by	red by	5.Reiinquished by	red by	6.Relinquished by	led by
		Project/T SMO Aut Contract	2			avallabl	Type C		ЪG	ЭĊ УС	AG	٩	٩	AG	U	ЪG	AG	Smo Use				Phone/Ce	200	8 문		4. Reling	4. Received by	5.Relind	5. Received by	6.Reling	6. Received by
ST A		171	44-3185	-844-319			Sampie Matrix	МÖ	о М	ŇÖ	NO NO	NO NO	Š	м В	ð	Š	GW		5		OC hits	anization/	13/239-7.	30/228-0		14	14	ola	Ĩ		
	SMO Use	Date Samples Shippet よう	GEL Pam Putssant/505-844-3185	Lorraine Herrera/505-844-3199		Referenc	Date/Time(hr) Collected	05/05/11 0947	05/05/11 0949	05/05/11 0952	05/05/11 0953	05/05/11 0954	05/05/11 0955	05/05/11 0958	05/05/11 0947	05/05/11 0949	05/05/11 0952	Sample Tracking	Date Entered (stm/dd5y)	Embred by	<u>d TAT</u>	Company/Organization/Phone/Cellular	Weston/4142/844-4013/239-7367 Misston/4142/844-4013/239-7367	Weston/4142/844-5130/228-0710		S// Time //.	5-// Time //	2-11 Time / 1	. 1	Time	Time
ANALYSIS R	:		•••	•	[ER Site No.	AN	NA	ΫŅ	AN	AN	A	AN	NA	¥	AN	1 1			Negotiated TAT	ŧ			•	DateS	Date Sr S-/	Date 2-2-2 Date	Date S	Date	Date
AN	Coltan	Date Sample Carrier Wayb Lab Contact	Lab Destination: sub Contact/Phone:	Send Report to SMO:		1	Pump Depth (ft)	273	273	273	273	273	273	273	273	273	273	No.	Disposal by lab	5	_[Signature		11.65.44		CN/HONO	Org//39		Dig Ce L	Org.	, Buo
	, may	6234/0718 /m5 Mile Stelly 5/4/1/1 Bum Site GWC		CF# 235-11		Room	ER Sample ID or Sample Location Detail	CYN-MW12	CYN-MW12	CYN-MW12	CYN-MW12	CYN-MW12	CYN-MW12	CYN-MW12	CYN-MW12	CYN+MW12	CYN-MW12	TYes JNo Ref. No.	to Client	e 17 Day 15 Day			William J Gibson	Tes		the week	madare	1 2 Hours	Chlin 1 Section		
Internai Lab	Batch No.	Mail Stop: : Manager: :me:			Ь	Bulding	Sample NoFraction		1 090606-002	A 090606-005	00000000	090606-018 0	090606-020	f 090606-024	090607-001 1	090607-002	030607-005]	Sample Disposal	Turnaround Time	Return Samples By:		Sample	ers		1.Relinquished by	1. Received by	2.Relinquished by	2. Received by (3.Relinquished by	3. Received by

Page 8 of 320

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

Page 2 of 2 613558

0000010		Lab use	Lab Sample In	000	0000	2	2	033	2										
		Ľ	Lab			20	8	N									 		
-SOONE			Parameter & Method Regnested	TPH Gasoline (SW846-8015A/B) VOC	NPN (353.2)	Perchlorate (314.0)	High Explosives (SW846-8321A)	TCL VOC (SW846-8260B)	TPH Gasoline (SW846-8015A/B) VOC										
6			n Sample Tvpe	.	Ы	ρα	В	8	TB		[
98026.01.06	ļ		Collection Sample Method Type	σ	σ	U	U	ი	ს										
		MO)	Preserv- ative	4C	H2S04	4C	4C	HCL	4C										
Project/Task No.:		ole at S	Container Type Volume	AG 3x40 ml	125 ml	250 ml	4X1 L	3x40 ml	3x40 ml				ĺ						
d		vailat	Tvpe 1	₽ ₽	٩	۵.	AG	сл U	AG	 			 						
		OV (a	Sample Matrix	ß	в	ß	ş	MID	DIW										
Mike Skelly		Reference LOV (available at SMO)	Date/Time (hr) Collected	12	05/05/11 0954	05/05/11 0955	05/05/11 0958	05/05/11 0947	05/05/11 0953										I AB USE
nger:	2		ER Site No.	۲.	NA	AN	¥	AN	NA										
Project/Task Manger:			Pump Depth (ft)		273	273	273	AN	AA										
Burn Site GWC		Room	ER Sample ID or Sample I ocation detail		CYN-MW12	CYN-MW12	CYN-MW12	CYN-TB5	CYN-TB6										Abnormal Conditions on Receipt Recipient Initials
Project Name:	ы Б		Sample No- Fraction	1 090607-006	1 090607-018	a 090607-020	090607-024	1 090608-001	♦ 090609-001										Abnormal Conditions o Recipient Initials

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

Certificate of Analysis

Report Date: May 31, 2011

	Company : Address : Contact: Project:	MS- 1515 Albu Ms.	0756, Org. (Eubank SE querque, N Pamela M. 1	ew Mexico 87	7123	76					
	Client Sample ID:	0906	606-020				Projec	st:	SNLSGWater		
	Sample ID:	2774	70024				Client	tID:	SNLS003		
	Matrix:	AQU	JEOUS								
	Collect Date:	05-N	AY-11 09:	55							
	Receive Date:	06-N	1AY-11				Client	Desc.:	CYN-MW12		
	Collector:	Clie	nt				Vol. I	Recv.:			
Parameter	Quali	fier	Result		DL	RL	Units	DF	Analyst Date	Time Batch	Method
Ion Chroma	atography										
EPA 314.0	Perchlorate by IC ".	As Re	ceived"								
Perchlorate		U	ND		0.004	0.012	mg/L	1	MAR1 05/18/11	2016 1100014	I
The follow	ing Analytical Meth	ods w	ere perform	ed:							
Method	Descr	<u> </u>					Ana	lyst Co	mments		
i	EPA 31	4.0 DC	E-AL								

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Certificate of Analysis

Report Date: May 31, 2011

	Company : Address : Contact: Project:	MS- 151: Albi Ms.	dia National Labo 0756, Org. 06763 5 Eubank SE uquerque, New M Pamela M. Puiss el C, Groundwate	5, Bldg. 823/Rm. 42 lexico 87123 ant	276						
	Client Sample ID:	0900	507-020			Projec	:t:	SNLSGWater			
	Sample ID:	2774	470031			Client	ID:	SNLS003			
	Matrix:	AQ	JEOUS								
	Collect Date:	05-1	MAY-11 09:55								
	Receive Date:	06-N	MAY-11			Client	Desc.:	CYN-MW12			
	Collector:	Clie	nt			Vol. F	Recv.:				
Parameter	Qual	fier	Result	DL	RL	Units	DF	Analyst Date	Time	Batch	Method
Ion Chroma	atography										
EPA 314.0	Perchlorate by IC ".	As Re									
Perchlorate		U	ND	0.004	0.012	mg/L	1	MAR1 05/18/11	2035 11	00014	1
The follow	ring Analytical Meth	ods w	vere performed:								
Method	Descr EPA 31	<u> </u>				Ana	lyst Co	mments	<u>-</u>		

ad TAT 30 linits 30 linits Company/Organization/Phone/Celtular Weston/4133/844.4013/250-7090 Weston/4133/844.4013/250-7090 Weston/4133/844.4013/250-7090 Weston/4133/844.4013/230-7367 Weston/4133/844.4013/230-7367 Meston/4133/844.4013/230-7367 Meston/4133/844.4013/24013/24014 Meston/413/4711/47 Meston/414/471
Weston/4133/844-5130/228-0710 Weston/4133/844-4013/239-7367 Whether the transformation of transformation of the transformation of transformation of the transformation of transformatio oo transformation of transformation of transforma

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

Page 2 of 2 613524

AR/COC-

Real and Manual	TA V CWM	Project/Task Manger	anger	Mike Skelly		P	Project/Task No.:		98026.01.10	Π		
tion	Tech Area			Reference LOV (available at SMO)	OV (av	ailab	le at SI	MO)				Lab use
Building	Room	ľ	ť		Comple	Ċ	Container	Drecary-	Preserv- I Collection Sample	Samole	Parameter & Method	Lab Sample
Sample No-	ER Sample ID or	Denth (ft) Site No.	Site No.	Collected	Matrix Type Volume	rype /		ative	Method	Type	Requested	Q
DODA 25_076	TAV-MW11	531	¥	041811/1012	GW	AG	250 ml	4C	IJ	SA	Tritium (906.0)	200
	TAV-TB11	A N	¥	041811/1000	DIW	0	3x40 ml	ΗCΓ	U	81	TCL VOC (SW846-8260)	2
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Abnormal Condit Recipient Intilats	Abnormal Conditions on Receipt Recipient Intras			LABUSE	m							

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Certificate of Analysis

Report Date: May 19, 2011

	Company : Address : Contact: Project:	MS- 1515 Albu Ms.	5 Eubank SE 1querque, Nev Pamela M. P	5765, Bldg. 823/Rm w Mexico 87123	n. 427(6						
	Client Sample ID:	0904	435-020				Projec	ct:	SNLSGWater			
	Sample 1D:	2762	276006				Client	t ID:	SNLS003			
	Matrix:	AQI	JEOUS									
	Collect Date:	18-A	APR-11 10:07									
	Receive Date:	19-A	APR-11				Client	Desc.:	TAV-MW11			
	Collector:	Clie	nt				Vol. 1	Recv.:				
Parameter	Quali	fier	Result	D	L	RL	Units	DF	Analyst Date	Tim	e Batch	Method
Ion Chroma	atography											
EPA 314.0	Perchlorate by IC "A	As Re	ceived"									
Perchlorate		U	ND	0.004		0.012	mg/L	1	MARI 05/05/11	1615	1095219	1
The follow	ving Analytical Meth	lods w	ere performe	d:								
Method	Descr	ption					Ana	lyst Co	mments			
1	EPA 31	4.0 DC	E-AL									

Internal Lab		·	ANAL	ANALYSIS REQU	EST /	AND	CHAIN	REQUEST AND CHAIN OF CUSTODY	STOD	~		Page 1 of 2	
Balch No. NWT				SMO Ude							AR/COC	613527	27
Dept. No./Mail Stop: Project/Task Manager:	6234/0718 Mike Skettv	Date Samples Shipped Camer/Maybill No	Jais Ship Abili Na			Project/ SMO Au	Project/Task No. <u>98026.01.10</u> SMO Authorization:	026.01.10	シン		Waste Characterization -Send Preliminary/copy report to:	and to:	
Project Name:	TA-V GWM	Lab Contact:	#	Edle Kent/803-556-8171		Contract	Contract #: 691436	691436	5	eno			İ
Record Center Code:	ER/1306/DAT	Lab Destination:	ation:	GEL			Jun)	A nTT 15 DAMMA	0 Duran		Released by COC No.:		
Logbook Ref. No.: Senice Order No	NA CEO# 240-11	SMO Contact/Phone: Sand Report to SMO:	UPhone: to SMO:	Pam Puissant/505-844-3185 I orraine Herrera /505-844-3189	4-3185 844-310	đ		2 .	1.00		Validation Reguired	Value Danahiat	
Cation	Tach Area		5									unus r'ayaolej	
Ruilding	Rom	T		Referen	ce LOV	'(avail:	Reference LOV(available at SMO)	(OM			Alhumine NM 87185-0154	3	
	ER Sample ID or		ER Site	Date/Ti	Sample	8	Container	Preserv-	Collection Sample	Sample	Parameter & Method		Lab Sample
Sample NoFraction	Sample Location Detail	etail Depl h (f t)	9 2		Matrix	l ₂	Volume	ative	Method	Type	Requested		
090442-001	TAV-MW12	529	¥	04/20/11 1017	GW	ი	3x40 ml	HCL	9	SA	TCL VOC (SW846-8260)		025
090442-004	TAV-WW12	529	AN	04/20/11 1018	GW	AG	500 ml	H2SO4	G	SA	TOC (SW846-9060)		
090442-010	TAV-MW12	529	₹	04/20/11 1019	GW	٩	500 ml	HNO3	U	SA	TAL Metals+Ur (SW848-6020)		007
090442-016	TAV-MW12	529	AN	04/20/11 1020	GW	٩	125 ml	4C	G	SA	Anions (SW846-9056)		300
090442-017	TAV-MW12	529	¥	04/20/11 1021	FGW	٩	500 ml	HNO3	ს	SA	Total Fe and Mn (SW846-6020)		202
090442-018	TAV-MW12	529	AA	04/20/11 1022	GW	Р	250 mi	H2SO4	9	SA	NPN (353.2)		010
090442-020	TAV-MW12	529	₹	04/20/11 1023	ß	٩	250 ml	4C	G	SA	Perchlorate (314.0)		050
090442-022	TAV-MW12	529	¥	04/20/11 1025	ß	٩	500 mi	40	J	SA	Alkalinity (SM2320B)		03/
090442-023	TAV-MW12	529	¥	04/20/11 1027	GW	٦	1 L	NaOH-Zn	o	SA	Sulfide (SW846-9034)		TE ()
090442-033	TAV-MW12	529	₹	04/20/11 1029	ß	٩	ן ר ק	HN03	U	SA	Gamma Spec (short list)(901-0)		033
090442-034	TAV-MW12	529	¥	04/20/11 1031	GW	٦	11	HNO3	ß	SA	Gross Alpha/Beta (900.0)		130
RMMA	Ves JNo	Ref. No.		Semple Tracking		Smo Lise		alla	tions/QC F	Requireme		Abnormal	
Sample Disposal Turnaround Timo	Return to Client	L Disposal by lab	/ lab	Date Entered (mm/dd <u>)y)</u>	Å.				Ves [No	بر م		Conditions	5
Return Samples By:	1		Negotia	Negotiated TAT	OC Inits			*Send report to:				Í.	
	Name	Signature	Init	ny/Orga	Nzation/P	hone/Ce		<u>Tim Jackson/ORG. 4142/MS.0729/ 284-2547</u>	RG. 4142/	NS.0729/2	<u>84-2547</u>		
Sample								Alkalinity (total, bicarbonate, carbonate)	bicarbonate	carbonate			Lab Use
Team	Alfred Santillanes	RUNN	ð	Weston/4133/844-5130/228-0710	80/228-07	<u>e</u>		Anions (Br,CI,FI,SO4)	(, SO4)				
Members	Wilkiam J. Gibson	WillielBu	812. V	Weston/4133/844-4013/239-7367	3/239-73	29		FGW (Filtered in field w/40 micron filter)	n field w/40	I micron filt	ier)		
								If Perchlorate (<u>letected ve</u>	orify w/ and	If Perchlorate detected verify w/ analysis SW846-6850M		
Į	11 20							*Please list as separate report	separate n	sport.			
1. Relinquished by	141115346	LYW BIO 200	2 Dale	121	0	4.Reling	5			Org.	Date	Time	
1. Received by	CN KLD	5240 Ong 414	Z Date 4	10	ø	4. Received by	ved by			org.	Date	Time	
2.Relinquished by	2 LA R lin	914 Org. 414 2. Date	Z Date	1/20/1/ Time	\mathbf{T}	5.Reling	5.Relinguished by			Og.	Date	Time	
2. Received by	11/ Mr.	013 6EL	LDate	4 2 / I Time	0000	5. Received by	ved by			Org.	Oate	Time	
3.Relinquished by		Org.	Date	Time		6.Relino	6.Relinguished by		-	ě	Date	Timo	
o Deschind hu					Ī					-iRi-	רמום	2111	

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

Page 2 of 2

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ש נהנ							ĺ					AR/COC-	613527
	Project Name:		Project/Task Manger	anger:	Mike Skely	1	1	Project/Task No.		98028.01.10			
] I ecn Area Room			Reference LOV (available at SMO)	-0V (a	vaila	ble at S	(OM)				
-	Sample No-	ER Sample ID or	Dump	ER	Date/Time (hr)	Sample	ပြီ	Container	Ż	Collection Sample	Samole	Parameter & Method	Lab use
ł	Fraction	Sample Location detail	Ð	ŝ		Matrix	Type	Matrix Type Volume	ative	Method	Type		
-	090442-036	TAV-MW12	529	AN	04/20/11 1032	δ	AG	250 ml	4C	ю	SA	Tritium (906.0)	0
-	090443-001	TAV-MW12	529	Ą	04/20/11 1017	ß	υ	3x40 ml	ΗCΓ	U	Ы	TCL VOC (SW846-8260)	0 m 0
1	090443-004	TAV-MW12	529	٩N	04/20/11 1018	ß	BG	500 mt	H2SD4	υ	В	TDC (SW846-9060)	× eo
-	090443-010	TAV-MW12	529	AN	04/20/11 1019	ş	٩	500 ml	HND3	υ	DO	TAL Metals+Ur (SW846-6020)	52
	090443-016	TAV-MW12	529	AN	04/20/11 1020	δ	٩	125 ml	4C	υ	DU	Anions (SW846-9056)	0 0 0
~	090443-017	TAV-MW12	529	¥	04/20/11 1021	FGW	٩	500 mJ	HN03	υ	DU	Total Fe and Mn (SW846-6020)	17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4	090443-018	TAV-MW12	529	Ą	04/20/11 1022	ß	٩	250 ml	H2SO4	υ	DO	NPN (353.2)	Ş
	090443-020	TAV-MW12	529	٩V	04/20/11 1023	δ	٩	250 ml	4 C	υ	DO	Perchlorate (314.0)	/×0
•	090443-022	TAV-MW12	529	AN	04/20/11 1025	ß	٩	500 ml	4C	υ	DU	Alkalinity (SM2320B)	042
	090443-023	TAV-MW12	529	AN	04/20/11 1027	ŝ	۵.		NaOH-Zn	9	DU	Sulfide (SW846-9034)	2
~	090443-033	TAV-MW12	529	٩	04/20/11 1029	ş	۵	ــــ	HND3	υ	В	Gamma Spec (short list)(901-0)	0%
	090443-034	TAV-MW12	529	AN	04/20/11 1031	Š	۵.		HND3	υ	DU	Gross Alpha/Beta (900.0)	966
-	090443-036	TAV-MW12	529	NA	04/20/11 1032	δ	BG	250 ml	Ą	σ	D	Tritium (906.0)	0%5
~	090444-001	TAV-TB14	AN	AN	04/20/11 1017	Ma	υ	3x40 ml	ΗCΓ	υ	TB	TCL VOC (SW846-8260)	20
	Abromet Condito Recipient initials	Abnormal Conditions on Receipt Recipient Initials <u>JC</u>			LABUSE								

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

Certificate of Analysis

Report Date: May 19, 2011

	Company : Address : Contact: Project:	MS-0 1515 Albuq Ms. P	a National Laborato 756, Org. 06765, Bl Eubank SE Juerque, New Mexic amela M. Puissant C, Groundwater Me	dg. 823/Rm. 42 :0 87123	76						
	Client Sample ID:	09044	2-020			Projec	 t:	SNLSGWater			
	Sample ID:	27627	6030			Client	ID:	SNLS003			
	Matrix:	AQUI	EOUS								
	Collect Date:	20-AF	PR-11 10:23								
	Receive Date:	21-AF	PR-11			Client	Desc.:	TAV-MW12			
	Collector:	Client	:			Vol. R	ecv.:				
Parameter	Qual	ifier	Result	DL	RL	Units	DF	Analyst Date	Time	Batch	Method
Ion Chroma	atography						`				
	Perchlorate by IC ".	As Rece	vived"								
Perchloratc	·	U	ND	0.004	0.012	mg/L	ť	MARI 05/05/11	1731	1095219	ĩ
The follow	ing Analytical Metl	nods we	re performed:								
Method	Descr EPA 3	iption 14.0 DOE	-AL			Ana	lyst Co	mments	·_ ·		

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 19, 2011

	Company : Address : Contact: Project:	MS-07 1515 H Albuq Ms. Pa	Eubank SE uerque, New amela M. Pui	65, Bldg. 823/Rm. Mexico 87123	4276							
	Client Sample ID:	09044	3-020			Projec	:t:	SNLSGWa	ter			
	Sample ID:	27627	6041			Client	ID:	SNLS003				
	Matrix:	AQUE										
	Collect Date:	20-AP	R-11 10:23									
	Receive Date:	21-AP	R-11					TAV-MW	12			
	Collector:	Client				Vol. I	Recv.:					
Parameter Ion Chrom	Qual	fier	Result	DL	, RL	Units	DF	Analyst Da	ate	Time	Batch	Method
	Perchlorate by IC "	As Rece	ived"									
Perchlorate	Teremorate by IC	U	ND	0.004	0.012	mg/L	1	MARI 05/05	/11	1751	1095219	1
The follov <u>Method</u> 1	ving Analytical Meth Descr EPA 3					Ana	ilyst Co	mments				·

Page 2 of 2 613516 Lab Sample Lab use 0 ₽ 2 --AR/COC--Parameter & Method Requested TB TCL VOC (SW846-8260) SA Tritium (906.0) Collection Sample Type Method 98026.01.10 C c Date/Time (hr) Sample Container Preserv-Collected Matrix Type Volume ative ЧСГ 4 Reference LOV (available at SMO) Project/Task No.: -----04/06/11 1009 GW AG 250 ml G 3x40 ml 04/06/11 0956 DIW LAB USE Project/Task Manger: Mike Skefty Pump ER Depth (ft) Site No. A ¥ 뜺 547 ₹ ER Sample ID or Sample Location detail TAV-MW13 TAV-TB3 Abnormal Conditions on Receipt Tech Area Recipient Initials MK TA-V GWM Room 090417-036 Location 090418-001 Sample No-Fraction Project Name: Building

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

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GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 5, 2011

	Company : Address : Contact: Project:	MS- 151: Albi Ms.	dia National Labor 0756, Org. 06765 5 Eubank SE 1querque, New Ma Pamela M. Puissa el C, Groundwater	, Bldg. 823/Rm. 42 exico 87123 nt	76							
	Client Sample ID:	0904	417-020			Projec	st:	SNLSG	Water			
	Sample ID:	275	567006			Client	ID:	SNLS0	03			
	Matrix:	AQI	JEOUS									
	Collect Date:	06-A	APR-11 10:02									
	Receive Date:	07- <i>A</i>	APR-11			Client	Desc.:	TAV-M	IW13			
	Collector:	Clie	nt			Vol. F	lecv.:					
Parameter Ion Chrom			Result	DL	RL	Units	DF	Analyst	Date	Time	Batch 1	Method
	Perchlorate by IC "A					/ *		14001.04		2214 10	01000	
Perchlorate		U	ND	0.004	0.012	mg/L	I	MAR1 04	15/11	2314 10	91090	I
The follow	ving Analytical Meth	ods w	ere performed:									
<u>Method</u> i	Descrite	<u> </u>			<u>A</u> ı	nalyst Comm	ents					

4

Internal Lab			ANA	ANALYSIS REQUEST AND CHAIN OF CUSTODY						-		Page 1 of 2	
Batch No. N/											AR/COC	613528	28
Dept. No./Mail Stop: Projec/Task Manager Project Name:	6234/0718 Mike Skelly TA-V GWM	Clanter Sample Clamer Wayt Lab Contact:	Date Samples Shipped Camer Waybil No Lab Contact: Edi	A (24 / W E (256- 6 Kenv803-556-		Project/T SMO Au Contract	Project/Task No. <u>98026.01,10</u> SMO Authorization: 691436 Contract #: 691436	226.01.10 2014.36 5914.36	10	UM.	Waste Characterization -Send preliminary/copy report to:	eport to:	
See	ER/1306/DAT	Lab Destination:	nation:	GEL			21914	۱ d			Released by COC No.:		
Logbook Ref. No.: Service Order No.	NA CFO# 240-11	SMO Contact/Phone: Send Report to SMO	act/Phone: ht to SMO:	Pam Puissant/505-844-3185 Lorraine Herrera /505-844-3199	44-3185 5-844-319	•		100 000000	NARYS	\$	Validation Required	counte Devehie)	
Γ	Tech Area									i		oouns rayanic)	
	Room	T		Referei	Ice LOV	(avalla	Reference LOV(avallable at SMO)	(OM			Albuquerque, NM 87185-0154	-	276271
	ER Sample ID or		ш Ш	ŏ	Sample	ð	Container	Preserv-	Collection Sample	Sample	Parameter & Method		Lab Sample
Sample NoFraction	Sample Location Letan	5	4_	Collected	Matrix	<u> </u>	volume	evile	Method	lype	Requested		
090445-001	TAV-MW14	232	¥ 	04211110941	3 O		3x40 ml	HCL	υ	SA	TCL VOC (SW846-8260)		840
090445-004	TAV-MW14	235	₹	042111\0942	ß	Ŷ	500 ml	H2SO4	U	SA	TOC (SW846-9060)		0%0
090445-010	TAV-MW14	535	¥	042111\0943	ß	٩	500 ml	HN03	ს	SA	TAL Metals+Ur (SW846-6020)		020
090445-016	TAV-MW14	535	Ą	042111\0944	GW	۵.	125 ml	4C	G	SA	Anions (SW846-9056)		65
090445-017	TAV-MW14	535	A	04211110945	FGW	٦	500 ml	HNO3	e	SA	Totai Fe and Mn (SW846-6020)		8 32 74
090445-018	TAV-MW14	535	¥	04211110946	GW	d	250 ml	H2SO4	G	SA	NPN (353.2)		R S S
090445-020	TAV-MW14	535	¥	042111\0947	GW	٦	250 ml	4C	6	SA	Perchlorate (314.0)		m So
090445-022	TAV-MW14	535	Ą	042111\0948	В	۵.	500 ml	40	ს	SA	Alkalinity (SM2320B)		059
090445-023	TAV-MW14	535	AA	042111\0950	GW	۵.	1-	NaOH-Zn	9	SA	Sulfide (SW846-9034)		0 0 0
090445-033	TAV-MW14	535	¥	042111\0951	ß	٩	٦ ٦	HNO3	ე	SA	Gamma Spec (short list)(901-0)		0 0 0
090445-034		535	A	042111\0953	GW	Ч	11.	HNO3	9	SA	Gross Alpha/Beta (900.0)		×20
RMMA	Ves J No	Ref. No.		Sample Tricking		Seno Lise		al Instruc	tions/QCF	Requireme		Abnormai	
Sample Disposai Turnaround Time	Return to Client	1 15 Cav 2 30	18D 30 Dav	Date Entered (nando)	S.			EDD U Y	≺es ⊡ Yes ⊡	; ع		Conditions on	c
Return Samples By:	4	יו	51	Negotiated TAT	OC Inits.			*Sand report te:					
	Name	Signature	init I	Company/Organization/Phone/Cellular	nization/P	hone/Cel		Tim Jackson/ORG. 4142/MS.0729/ 284-2547	RG. 4142/	MS.0729/2	184-2547		
Sample								Alkalinity (total bicarbonate carbonate)	oicarbonate	carbonate	(С Ш	Lab Use
Team	Alfred Santilianes			Weston/4133/844-5130/228-0710	30/228-07	위		Anians (Br,Cl,Fl,SO4)	I,SO4)				
Members	William J. Gibson	Uithue Work	zonati	Weston/4133/844-4013/239-7367	13/239-73	26	Ī	FGW (Filtered in field w/40 micron filter)	n fieid w/40) micron filt	ier)		
				-				IT Perchiorate detected verify v *Piease list as senarate renort	senarate n	<u>Nrhy wi an</u> Anort	II Perchlorate detected verify w/ analysis SW846-6850M *Please list as secarate renort		
1.Relinquished by	the contact	Gið	V/ EFDate 4	/2///Time		4.Reling	4.Relinquished by			Ora.	Date	Time	
1. Received by	a le fur is		(17 Date 1	121	030	4. Received by	ved by			Org.	Date	Time	
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3. Received by		Go	Date	Ime		6. Received by	ved by			og.	Date	Time	٦

Page 15 of 1003

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

613528 Lab Sample ID Page 2 of 2 Lab use 050 050 060 Parameter & Method AR/COC-Requested TB | TCL VOC (SW846-8260) TCL VOC (SW846-8260) Tritium (906.0) Collection Sample SA Type Ð Method 98026.01.10 U ര Q Preservative HOL 4 HCL Reference LOV (available at SMO) Project/Task No.: Date/Time (hr) Sample Container Collected Matrix Type Volume 3x40 ml AG 250 ml 3x40 ml σ c ₹ S ₹ MO 042111/0954 042111\0914 042111\0941 LAB USE Mike Skelly Site No. Æ ₹ ٨A ٩Z Project/Task Manger: Depth (ft) Pump 535 ٨N ¥۷ Sample Location detail ER Sample ID or TAV-MW14 **TAV-TB15** TAV-FB3 brormal Conditions on Receipt Tech Area TA-V GWM Room Reciplent Initials Bullding Sample No-090445-036 090446-001 Location 090447-001 Fraction roject Name: • -

Page 16 of 1003

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: May 19, 2011

	Company : Address : Contact: Project:	MS-0756, Or 1515 Eubank Albuquerque Ms. Pamela I	, New Mexico 87123	m. 4276								
	Client Sample ID:	090445-020				Project:		SNLSG	Water			
	Sample ID:	276276053				Client I	D;	SNLS0	03			
	Matrix:	AQUEOUS										
	Collect Date:	21-APR-110	9:47									
	Receive Date:	22-APR-11				Client I)esc.:	TAV-M	[W14			
	Collector:	Client				Vol. Re	cv.:					
Parameter	Qual	ifier Result		DL	RL	Units	DF	Analyst	Date	Time	e Batch	Method
Ion Chroma	atography											
	Perchlorate by IC ".	As Received"										
Perchlorate	_	U ND	0.00	4	0.012	mg/L	1	MARI 0	5/05/11	1810	1095219	1
The follow	ing Analytical Meth	nods were perfe	ormed:									
Method	Descr EPA 31	iption 14.0 DOE-AL				Analy	vst Co	mments				

Appendix B

Data Validation Sample Findings Summary Sheets for the Perchlorate Data



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

<u>Blanks</u>

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

Alkalinity:

Total alkalinity was detected in the MB at a concentration \geq 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 $\leq 5X$. 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

Page 1 of 1

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
5W846 3535/8321A Modifie	d		
	090670-024/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
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.



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

<u>Blanks</u>

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

<u>Anions Analysis</u>: 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 $\leq 5X$. No sample data will be qualified as a result.

<u>Nitrate/nitrite Analysis</u>: 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 $\leq 5X$. 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



AR/COC: 613579

Page 1 of 4

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, H 1
	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, H 1
	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)	U J, H1
	090673-001/CTF-TB2	Carbon disulfide (75-15-0)	UJ, H 1
	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- 6 6-3)	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)	U J, 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)	U J, H1

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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.



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.

<u>Blanks</u>

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.

<u>Perchlorate and Nitrate/Nitrite</u>: 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.

<u>Perchlorate and Nitrate/Nitrite</u>: 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.

<u>Nitrate/Nitrite</u>: 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 $\leq 5X$. 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



AR/COC: 613560

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modifie	d		
	090613-024/CYN-MW9	HMX (2691-41-0)	UJ, MS5
	090613-024/CYN-MW9	m-Nitrotoluene (99-08-1)	UJ, 14
	090613-024/CYN-MW9	p-Nitrotoluene (99-99-0)	UJ, 14
5W846 8015A/B SVOC			
	090613-00 5/ CYN-MW9	Diesel Range Organics (DRO)	UJ, L3

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



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

<u>Blanks</u>

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.

<u>Perchlorate</u>: 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.

<u>Perchlorate</u>: 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.

<u>Nitrate/Nitrite</u>: 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 $\leq 5X$. 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



AR/COC: 613559

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Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modifie	d		
	090610-024/CYN-MW10	HMX (2691-41-0)	UJ, MS5
	090610-024/CYN-MW10	m-Nitrotoluene (99-08-1)	UJ, 14
	090610-024/CYN-MW10	p-Nitrotoluene (99-99-0)	UJ, 14
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.



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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.

1

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.

<u>Blanks</u>

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 $\leq 5X$. No sample data will be qualified as a result.

Other OC

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

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Analytical Method	Sample (D	Analyte Name (CAS#)	Qualifier, RC
SW846 3535/8321A Modifie	d		
	090600-024/CYN-MW11	HMX (2691-41-0)	UJ, MS5
	090600-024/CYN-MW11	m-Nitrotoluene (99-08-1)	UJ, 14
	090603-024/CYN-EB1	HMX (2691-41-0)	UJ, MS5
	090603-024/CYN-EB1	m-Nitrotoluene (99-08-1)	UJ, 14
	090606-024/CYN-MW12	HMX (2691-41-0)	UJ, MS5
	090606-024/CYN-MW12	m-Nitrotoluene (99-08-1)	UJ, 14
	090607-024/CYN-MW12	HMX (2691-41-0)	UJ, MS5
	090607-024/CYN-MW12	m-Nitrotoluene (99-08-1)	UJ, 14

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



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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 \leq 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 \leq 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.

1

Holding Times and Preservation

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

<u>Calibration</u>

All initial and continuing calibration QC acceptance criteria were met.

<u>Blanks</u>

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 $\leq 5X$. 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

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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.



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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.

<u>Blanks</u>

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

1

<u>Alkalinity Analysis</u>: In the MB, bicarbonate alkalinity was detected at concentration > the MDL but \leq 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)

<u>All Other Analyses</u>: 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

<u>All Other Analyses</u>: 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

<u>Anions Analysis</u>: 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 $\leq 5X$. No sample data will be qualified as a result.

<u>Nitrate/nitrite Analysis</u>: 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 $\leq 5X$. No sample data will be qualified as a result.

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

Other QC

<u>All Analyses</u>: 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

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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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SOLID WASTE MANAGEMENT UNITS 149 AND 154 QUARTERLY MONITORING

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

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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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A-11	Summary of Unfiltered Total Metal Results, Solid Waste Management Unit 149 Groundwater Monitoring, Quarterly Assessment, April 2011 – June 2011
A-12	Summary of Filtered Total Metal Results, Solid Waste Management Unit 149 Groundwater Monitoring, Quarterly Assessment, April 2011 – June 2011
A-13	Summary of Unfiltered Total Metal Results, Solid Waste Management Unit 154 Groundwater Monitoring, Quarterly Assessment, April 2011 – June 2011
A-14	Summary of Filtered Total Metal Results, Solid Waste Management Unit 154 Groundwater Monitoring, Quarterly Assessment, April 2011 – June 2011
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
A-16	Summary of Constituents Detected Above Established MCLs, Solid Waste Management Units 149 and 154, Groundwater Monitoring as of Second Quarter, CY 2011

ATTACHMENTS

- Attachment 1. Field Measurement Logs and Documentation
- Attachment 2. Analysis Request/Chain-of-Custody Forms
- Attachment 3. Data Validation Reports for Groundwater Analytical Results, April 2011 – June 2011

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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 YSITM Model 620 water quality meter. Turbidity was measured with a HACHTM 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 (μ g/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 μ g/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 gammaemitting 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 \pm 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 \pm 8.38 pCi/L; uranium-235/236 at 0.690 \pm 0.172 pCi/L; and uranium-238 at 8.93 \pm 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

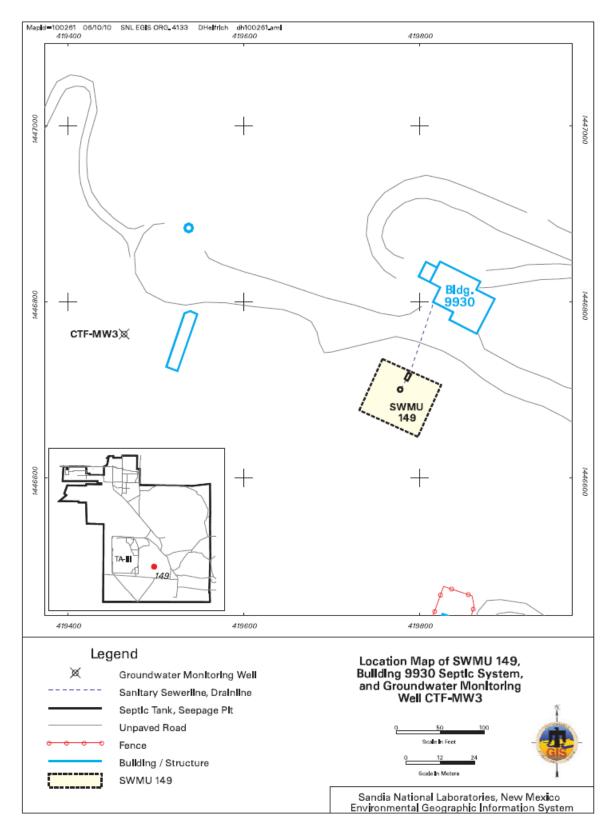


Figure A-1 Location of Monitoring Well CTF-MW3 near SWMU 149

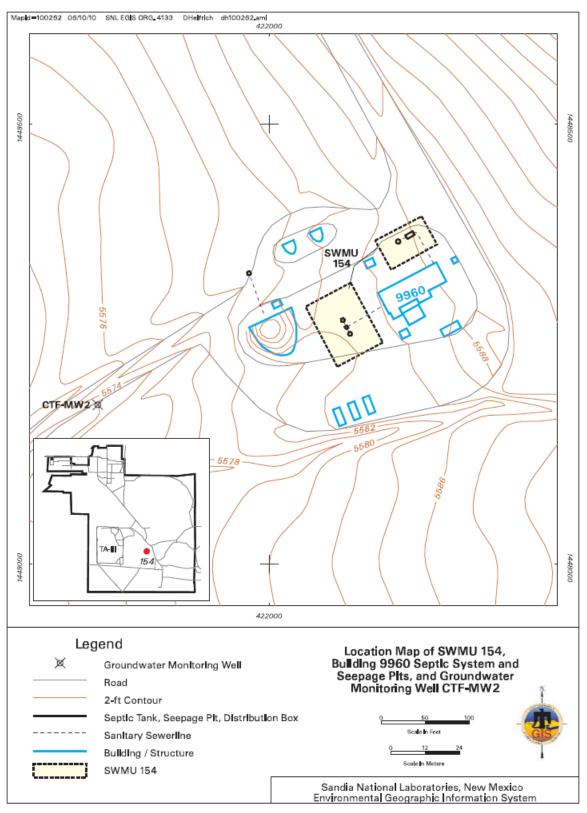


Figure A-2

Location of Monitoring Well CTF-MW2 near SWMU 154

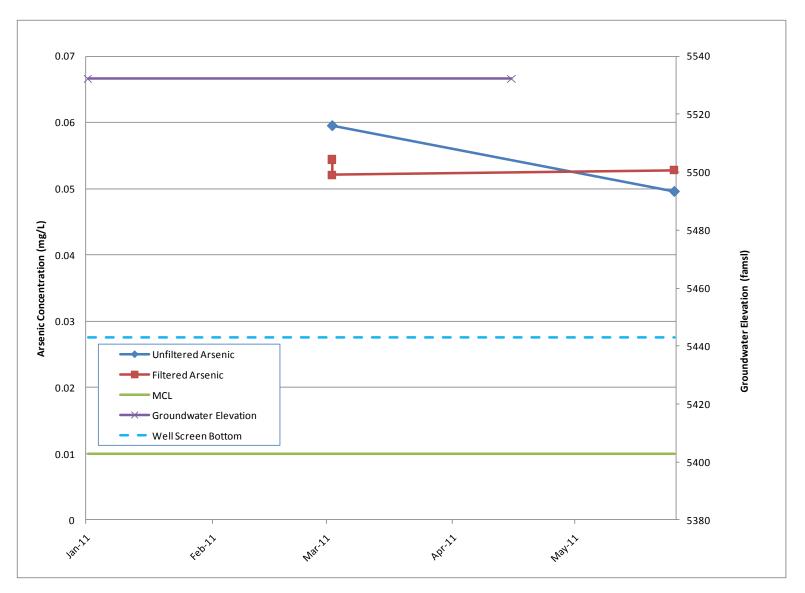


Figure A-3

Groundwater Elevations and Arsenic Concentrations Over Time in CTF-MW2

Tables

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 ₂ SO 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

^aU.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

^bMetals = filtered and unfiltered samples, Target Analyte List (TAL) metals including barium, calcium, magnesium, potassium, and sodium, plus uranium.

^cMajor anions include bromide, chloride, fluoride, and sulfate.

^dGamma 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.
- HNO₃ = Nitric acid.
- L = Liter.
- mL = Milliliter(s).
- SM = Standard Method.
- SWMU = Solid Waste Management Unit.

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.

MW= Monitoring wear.SWMU= Solid Waste Management Unit.

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)	рН	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

^aField measurements collected prior to sampling.

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

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 SWMU 149	Analyte	Result (μg/L)	MDL (μg/L)	PQL (μg/L)	MCL (µg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Sample No.	Analytical Method ^c
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

- μ g/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.

^aLaboratory 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.

^bValidation 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.

^cAnalytical 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.

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

Solid Waste Management Unit 149 Groundwater Monitoring

Quarterly Assessment, April 2011 - June 2011

Analyta	MDL					
Analyte	(μ g/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

- μ g/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-6Method Detection Limits for Volatile and Semivolatile Organic CompoundsSolid Waste Management Unit 154 Groundwater MonitoringQuarterly 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

^aU.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.

 $\mu g/L$ = 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.

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

 μ g/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.

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	Nitrate plus nitrite as N	5.51	0.100	0.500	10.0			090672-018	EPA 353.2
03-Jun-11	Nillale plus fillite as N	5.51	0.100	0.500	10.0			090072-018	EFA 355.2
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.

^aLaboratory Qualifier

U = Analyte is absent or below the method detection limit.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical 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.

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	В		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	В		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 ResultsSolid Waste Management Units 149 and 154 Groundwater MonitoringQuarterly Assessment, April 2011 – June 2011

Notes (continued)

^aLaboratory Qualifier

B = The analyte was detected in the blank above the effective MDL.

U = Analyte is absent or below the method detection limit.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical 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.

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	ND	0.004	0.012	NE			090672-020	EPA 314.0		
03-Jun-11	ND	0.004	0.012		0		090072-020	EFA 314.0		
SWMU 154										
CTF-MW2	ND	0.004	0.012	NE			090670-020	EPA 314.0		
31-May-11	UND	0.004	0.012	INE	0		090070-020	EFA 314.0		

Notes

- CFR = Code of Federal Regulations.
- CTF = Coyote Test Field.
- EPA = U.Ś. 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.

^aLaboratory Qualifier

U = Analyte is absent or below the method detection limit.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical Method

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

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.Ś. 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.

^aLaboratory 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.

^bValidation 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.

^cAnalytical 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.

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.Ś. 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.

^aLaboratory 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.

^bValidation 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.

^cAnalytical 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.

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.Ś. 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.

^aLaboratory 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.

^bValidation 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.

^cAnalytical 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.

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.Ś. 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.

^aLaboratory 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.

^bValidation 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.

^cAnalytical 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.

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

Solid Waste Management Unit 154 Groundwater Monitoring

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

Quarterly Assessment, April 2011 – June 2011

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.

^aActivities 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).

^bThe 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)

^cLaboratory Qualifier

U = Analyte is absent or below the MDA.

^dValidation 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.

^eAnalytical 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.

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.

^aLaboratory Qualifier

J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical 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: <u>5/31/11</u> Time: <u>2790</u>
Activities: <u>Ground Water monitoring/ sampling /</u> (Anyone has the right to cease field activities for sa	Vapor well sampling fety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp: °F Wind Speed: MPH	Humidity:% Wind Chill°F
Chemicals Used: <u>Acids in sample containers, stand</u> Other:	ard solutions. Hach ACCU-VAC ampoules
Safety I	opics 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).
U Wear chemical safety goggles.	□ Avoid spilling purge / decon water.

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

Kobert Lync Printed Name

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Attendees Sign Signature

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Printed Name

Printed Name

Printed Name

Signature

Signature

Printed Name

Signature

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

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		· · ·	Į.			<u></u>		
SNL/NM Project Name: SWA	AU		SNL/NM Project No.: 146422.10.11.01					
Calibrations done by: 72	24		Date: 05/31/11					
Make & Model: YSI 6920-V Sonde (S/N: 99J0 YSI 650 MDS (S/N): _08H100		H, ORP, and tem	perature probes:		99 - 99 - 99 - 99 - 99 - 99 - 99 - 99			
		oH C	alibration		****			
pH Calibrated to (std): 7.00		F	pH sloped to (s	tđ): 10.00				
Reference value:	4	.00	7	/.00	1	0.00		
	Value	Temp	Value	Temp	Value	Temp		
L. 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			1					
		SC G	alibration			· · · · · · · · · · · · · · · · · · ·		
Reference Value: 1278			Standard Lot N	lo.: 1710737				
	Value	Temp	Expiration Date	: 12/12				
1. Time: 064(1	1282	20.8						
2. Time: 1124	1286	21.3]					
3. Time:								
4. Time:		[5 10 8 (0 K) (2	9434493				
		ORP C	alibration					
Reference Value: 200.0			Standard Lot N	o. 03K0868				
<u></u>	Value	Temp	Expiration Date	: 12/12				
1. Time: 06 40	201.1	20.8						
2. Time: 1(23	200.8	21.3						
3. Time:								
4. Time:								
	.1	DO Ci	libration					
	010/ als anthre	tion @ 5200 ft		Atmospheric	Pressure in Hg	· · · · ·		
Calibration Value:	0170 811 581012							
		-	20	.46				
1. Time: 0638	81.8	-	24	.46	· · · · · · · · · · · · · · · · · · ·			
Calibration Value: 1. Time: 0638 2. Time: 1/2/ 3. Time:		-	24 24	.46 . 48				

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: S	WMU		Project No.: 146422.10.11.01				
Calibration done by:	24		Date: 05/31/11				
		IMETER					
Make & Model: HACH 2	100Q		Serial No.	10050C002897			
Reference Value	10		20	100	800		
Standard Lot No.							
^{1. Time} 0754	9.72	2	०.५	103	80		
2. Time 1010	9.62	20	». l	103	BOY		
3. Time							
4. Time							
Comments:							
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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Na	me: SWN	<i>I</i> U		·····	[P	roject N	0.:		
Well I.D.:	CTF-M	N2				Date: 05/			
Well Cond	lition:					Veather (Condition:		
Method: I	Portable p	ump	<u>×</u>		Dedica	ated pum	p	Pump	depth: <u>127</u>
			I	PURGE	MEAS	UREM	ENTS		
Depth to Water (ft)	Time 24 hr	Vol (Lga)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
43.77	08/7		STA	Rt					
47.32	0845	10	17.57	3731	128.1	5.82	1.47	3.0	0.26
47.54	0855		17.94	3299	99.5	5.83	1.01	3.0	0.19
47.66	0905	20	18.18		79.5	5.84	0.82	2.0	0.19
47.77	0915	25	18.32	3388	80.7	587	1.20	1.9	0.18
47.86	0925		18-43	3400	720	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
	0943	37	19.02	-	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		SAM	plin	à				
				<i>I</i>	2				
			·						
							-		~4.80 gals. purged from tubing 0826
									from tubing
									0826

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		

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LTES Groundwater Monitoring Waste Generation Log

	Decontamination Log Form	æ	
Project Name: <u>SWMU+154</u>	Monitoring Well ID <u># CTF-MW2</u>	TF-MW2	Date: 5/31/11
The following equipment was decon	ttaminated at completion of	The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03	05-03
Pump and Tubing Bundle ID #: Pump 2		Water Level Indicator 1D#: <u>56161</u>	
Personnel Performing Decontamination:		Personnel Performing Decontamination:	
Print Name: Robert Lynch	QL Initial:	Print Name : Robert Lynch	LL Initial:
Print Name: William Gibson	WA Initial:	Print Name William Gibson	WPP Initial:
	Condition of Equipment	pment	
Pump: Good	Tubing Bundle: Good	Water Level Ir	Water Level Indicator: <u>Good</u>
	List of Decontamination Materials		
Distilled or Deionized (circle one)	Je one)	HNO3	33
	.	Grade: <u>Reagent</u>	
Source: Culligan		UN #: 2031	
Lot Number: 05- 04 -11		Manufacture: <u>Fisher</u>	
CTF-MW2 filtered/sampled for Arsenic, CoC 613599	C 613599	Lot Number: 002735	

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CTF-MW-3	Date: <u>6/03/11</u> Time: <u>077 J</u>
Activities: <u>Ground Water monitoring/ samplin</u> (Anyone has the right to cease field activities for	g /Vapor well sampling w safety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp:°F Wind Speed:MPH	
Chemicals Used: <u>Acids in sample containers, str</u> Other:	indard solutions, Hach ACCU-VAC ampoules
Safe	ty 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

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Attendees Signa Sig Signature

Printed Name

Signature

Printed Name

Signature

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM	Project Name: SW	MU		SNL/NM Project No.: 146422.10.11.01					
Calibratio	ns done by: Z	Ŀ		Date: 06/03	/11				
	(ode): V Sonde (S/N: 993) 1DS (S/N): _081110(pH, ORP, and tem	pensiure probes;			an alianan dara di kata di kata da di kata di k		
			pHC	albration			*****		
pH Calibr	ated to (std): 7.00		******	pH sloped to (std): 10.00		••••••••••••••••••••••••••••••••••••••		
Reference value: 4,00			1999 (1997) (199	7.00	1	0.00			
		Value	Temp	Value	Temp	Value	Temp		
I. Time:	0647	4:03	214				21-4		
2. Time:	1052	4.0	219	7.02	21.9				
3. Time.				-	<u> </u>				
4. Time,	ot.no. 954115	1							
a an	date: 12/12								
expiration for	12212					L			
			SEC	alibration					
Reference	Value: 1278			Standard Lot 1	Vo.: 1710737				
Value Temp				Expiration Da	e; 12/12	****	/#************************************		
I. Time:	0649	1284	211						
2. Lime	1054	1285	21.9						
3. Time									
4. Time.				and the second second					
			ORP	alibration					
Reference	Value: 200.0	liki kinalisi kina jerepina je na na na na je povezna n		Standard Lot?	io. 63K0868	;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	4999,996 - 1975 - 1 ⁹⁷ - 1979 - 19		
(u	******	Vatue	Temp	Expiration Date: 12/12					
1. Time;	0648	2011	21.4						
2. Time:	1053	201.0	21.9						
3. Tane:									
4. Time:	<u></u>								
			DOC	alibration					
Celibration	· Value:	\$1% oir satur	ation @ 5200 II.		Atmospheric Pressure in Hg				
1. Time.	0646	81.3	*******	1	2 4.35				
2. Time:	1051	81.6			24.39				
3. Time:						50000000000000000000000000000000000000	an a suite suite a suite a suite anna anna anna anna anna anna anna an		
4. Time:	e veren Killen om en					hannad ha ann an an an ann an an an an an an an			
***********************					***	*****			

SNLANM Project Name: SWMU Project No.: 146422.10.11.01 Calibration done by: PL Date: 06/03/11 TURBIDIMETER Make & Model: HACH 2100Q Serial No. 10050C002897 Reference Value 10 20 100 800 Standard Lot No. i. Time 9.67 0754 805 102 201 2. Time 9.59 0946 803 20.2 102 3. Time 4. Time Comments:

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

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Project Na	me: SWA	4U		******	F	roject N	0.3		
Well I.D.: CTF-MW3						Date: 06/03/11			
Well Cond	ition:				<u> </u> }	Veather (Condition:		
Method: Portable pump Dec					Dedica	cated pump Pump depth: 361			
			1	VURGE	MEAS	UREM	ENTS		
Depth to Water (ft)	Time 24 hr	Vol. (LG)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
306.63	0800	-	STA	12-7-					n an
313.37	6992	5	20.26	1567	411.)	6.76	165	97.5	8.75
316.71	0833	10	2057	1570	44.5	6-83	2.32	\$3.4	7.44
319.49	0844	15		1569	412.4	6-85	0.64	72-3	<u>6.45</u>
321.70	0856	20	20.94	**************************************	<u>4.12.7</u>	la de la constante de la const	0.57	18.9	7.01
323.48		25	21.16	1578		······································	0.53	\$7.4	7.35
324-10		27		1577		<pre>c</pre>	0.62	74.3	7.00
324.83		29		1580				13.0	6.45
9.25.43		31	21.33		and the second		0.37	81.0	7.18
325.84		33		1587			tauna antina	78.7	6.97
325.94		35	21.49	1587	414.2	6.86	0.33	78.6	6.95
	0937		<u></u>	<u>mp/ir</u>	s	./			
					<u>V</u>				
		Ana 1988 (
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	SWMU-149	SWMD-149	SWMU-149	
Project Name				
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 (parge 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:	δίου δαγουληγιο τηματική ματαγρατική το 2000 ματαγραφό το δημοτικό το δημοτικό το δημοτικό το δημοτικό το δημοτ δίου δαγουληγιο τηματική από τηματική το 2000 ματαγραφό το δημοτικό το δημοτικό το δημοτικό το δημοτικό το δημοτ	a tody 2 merenne en	Decon after CTF-MW3 purge. CoC 613579	

LTES Groundwater Monitoring Waste Generation Log

Project Name: <u>SWMU-149</u> The following equipment was decontamina Pump and Tubing Bundle ID #: <u>Pump 2</u>	Monitoring Well ID # CTF-MW3	F-MW3	Date: 6/03/11
The following equipment was decontamina Pump and Tubing Bundle ID #: Pump.2			
Pump and Tubing Bundle ID #: <u>Pump.2</u>	tted at completion of	The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03	5-03
		Water Level Indicator ID#: 56161	
Personnel Performing Decontamination:		Personnel Performing Decontamination:	
Print Name: Robert Lynch	ZL-Initial:	Print Name : Robert Lynch	R LInitial:
Print Name: Alfred Santillanes	Mc Initial:	Print Name Alfred Santillancs	Comitial:
Pump; Good	Condition of Equipment Tubing Bundle: Good	ment Water Level Indicator: Good	dicator: Good
List	List of Decontamination Materials	Materials	
Distilled or Delanized (circle one)		HNO	Section 2015 and a section 2015
(haven and a very a second	i	Grade: Reagent	``
Source: Culligan	<u></u>	TE07 # ND	
Lot Number: 05- 04-11	<u></u>	Manufacture: Fisher	
		Lot Number: <u>002735</u>	

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

Attachment 2 Analysis Request/Chain-of-Custody Forms

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Batch No. N/VL			-	SMO Use							AR/COC	613578	78
Dept. No./Mail Stop; Project/Task Manager; Project Name;	6234WS 0718 Alicia Aragon SWMU-154	Date Sample Carder/Wayb Lab Contact:	Date Samples Ship Carrier/Maybill No Lab Contact:	Date Samples Shipped (557) Canter/Maybull No Edie Kent/803-556-8171 Lab Contact: Edie Kent/803-556-8171		Project/ SMO Au Contract	Project/Task No. 98026 SMO Authorization: Contract # PO 691436	Project/Task No. 98026 01.15 SMO Authorization: 2016 2017 C	1 to	03	Waste Characterization -Send preliminary/copy report to:	on report to:	
Record Center Code: Logbook Ref. No.:	NA NA	Lab Destination: SMO Contact/Phon	Lab Destination: SMO Contact/Phone:	GEL Pam Puissant/505-844-3185	-844-3185		Sur	sor both error	nando	4	Contended by COC No.: Validation Required		
Service Order No. Location	CF 251-11 Trech Area	Send Rep	Send Report to SMO:	Lorraine Herrera /505-844-3199	505-844-3	199					Bill To:Sandla National Labs (Accounts Payable) P.O. Box 5800 MS 0154	Áccounts Payable) 54	
Building	Room				ce LOV	(availa	Reference LOV(available at SMO)	MO)			Albuquerque, NM 87185-0154	5-0154	
Sample NoFraction		or betail Depth (ft)	() ER Site	Date/ Col	Sample Matrix	Con Type	Volume	Preserv- ative	Collection Sample Method Type	Sample Type	Parametei Requ	Parameter & Method Requested	Lab Sample ID
030670-001	CTF-MV2	127	NA	053111/0954	GW		3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	0B).	
090670-002	CTF-MW2	127	NA	053111\0955	GW	AG	4x1L	40	O	SA	TCL SVOC (SW846-8270C)	270C)	
090670-009	CTF-MW2	127	NA	053111/0957	NO	۵	500 ml	HNO3	Ø	SA	TAL Metals+Ur(SW846-6020/7470)	6020/7470)	
090670-010	CTF-MW2	127	NA	053111\0958	FGW	ä	500 ml	HNO3	Ø	SA	TAL Metals+Ur(SW846-6020/7470)	-6020/7470)	
090670-016	CTF-MW2	127	AN	05311111000	ß	٩	125ml	4	ტ	ŞA	Anions (SW846-9056)		
090670-018	CTF-MW2	127	NA	053111/1001	GW	٥.	125ml	H2SO4	ග	SA	NPN (353.2)		
090670-020	CTF-MW2	127	NA	053111/1002	GW	٩	250 ml	40	U	SA	Perchlorate (314.0)		
090670-022	CTF-MW2	127	NA	053111/1003	GW	Ċ.	500 ml	4	0	SA	Alkalinity (SM2320B)	na ar e an an eireonn an t-annibitiút an acht e Vinnis é nat cuidíochthaithe airseacht e e e	
090670-024	CTF-MW2	127	NA	053111/1004	GW	AG	4X1L	40	Ø	SA	High Explosive (SW846-8321A) Mod.	3-8321A) Mod.	
090670-033	CTF-MW2	127	NA	053111/1006	ВW	a.	1 Liter	HNO3	ø	SA	Gamma Spec (short list)(901.0)	t)(901.0)	
090670-034	CTF-MW2	127	NA	053111/1007	GW	۵.	Liter	HN03	<u>ල</u>	SA	Gross Alpha/Beta (900.0)		
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n general en de fan	Name	Signature	, Init		anization/	Phone/C	T	Water has high I	uffering c	una pacity.	Water has high buffering capacity check pH, add Presv. as needed	seded	
Sample	Robert Lynch	Longrace	AL AL	- I	4013/250	-7090		If Perchlorate de	flocted pe	rform ve	If Perchlorate detected perform verification analysis (SW046-6850M)	6850W)	Lao Use
Team	Willem Gibson 🤞	Unter guld	Elm -	Weston/4142/844-4013/239-7367	4013/236	-7367		Alkalinity as total bloarbonate and carbonate	l blcarbor	iate and	carbonate		
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	Page 2 of 2 613578		-	Lab use	Lab Sample		02											
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OFF-SITE LABORATORY

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Page 5 of 648

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



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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 3 1

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.

1

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.

<u>Blanks</u>

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

Alkalinity:

Total alkalinity was detected in the MB at a concentration \geq 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 $\leq 5X$. 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



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.

<u>Blanks</u>

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



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.

1

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.

<u>Blanks</u>

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 $\leq 5X$. 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



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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.

<u>Blanks</u>

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



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.

<u>Blanks</u>

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



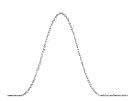


AR/COC: 613578

Page 1 of 1

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4/CTF-MW2	ALPHA (12587-46-1)	J, FR7
3/CTF-MW2	Americium-241 (14596-10-2)	BD, FR3
3/CTF-MW2	Cesium-137 (10045-97-3)	BD, FR3
3/CTF-MW2	Cobalt-60 (10198-40-0)	BD, FR3
3/CTF-MW2	Potassium-40 (13966-00-2)	J, FR7
9/CTF-MW2	Cadmium (7440-43-9)	J+, CK2
9/CTF-MW2	Manganese (7439-96-5)	J, MS1
9/CTF-MW2	Zinc (7440-66-6)	J+, CK2
D/CTF-MW2	Manganese (7439-96-5)	J, M S1
D/CTF-MW2	Zinc (7440-66-6)	J+, CK2
4/CTF-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
2/CTF-MW2	1,3-Dichlorobenzene (541-73-1)	UJ, MS3
2/CTF-MW2	1,4-Dichlorobenzene (106-46-7)	UJ, MS3
2/CTF-MW2	Hexachlorobutadiene (87-68-3)	UJ, MS3
		UJ, C3 ,MS3
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	D/CTF-MW2 4/CTF-MW2 2/CTF-MW2 2/CTF-MW2 2/CTF-MW2 2/CTF-MW2	D/CTF-MW2 Zinc (7440-66-6) 4/CTF-MW2 p-Nitrotoluene (99-99-0) 2/CTF-MW2 1,3-Dichlorobenzene (541-73-1) 2/CTF-MW2 1,4-Dichlorobenzene (106-46-7) 2/CTF-MW2 Hexachlorobutadiene (87-68-3)

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



Sample Findings Summary



AR/COC: 613578

Page 1 of 1

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.



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 \leq 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.

<u>Blanks</u>

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 $\geq 10\%$. 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.

<u>Other QC</u>

No other specific issues that affect data quality were identified.

Reviewed by: David Schwent

Date: 07/06/11



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.

1

<u>Blanks</u>

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
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5 VOC Organic Worksheet (GC/MS)

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High Explosives Worksheet (LC/MS/MS)

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Revised 7/2007

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CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY	SMO Use BR/COC 613578	Project/Task No. 98026.01.15 Waste Characterization Send preliminary/copy report to: Contract # PO 801436 Kontract. # PO 801436 Kontract.	Solr Boy LIF ORON	15-844-3185 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	/505-844-3199	Reference LOV(available at SMO) Albuquerque, NM 87185-0154	Sample Container Preserv- Collection Sample Parameter & Method	Collected Matrix Type Volume ative Method Type Requested ID	GW G 3x40ml HCL G SA TCL VOC (SW846-8260B)	GW AG 4x1L 4C G SA TCL SVOC (SW846-8270C)	53111\0957 GW P 500 ml HNO3 G SA TAL Metals+Ur(SW846-6020/7470) 003	53111\0958 FGW P 500 ml HNO3 G SA TAL Metals+Ur(SWB46-6020/7470) (071	53111/1000 GW P 125ml 4C G SA Anions (SW846-9056) 0005	53111\1001 GW P 125mi H2SO4 G SA NPN (353.2)	GW P 250 ml 4C G SA Perchlorate (314.0)	53111/1003 GW P 500 ml 4C G SA Alkalinity (SM2320B)	GW AG 4x1L 4C G SA High Explosive (SW846-8321A) Mod.	53111\1006 GW P 1 Liter HNO3 G SA Gamma Spec (short list)(901.0)	7 GW P 1 Liter HNO3 G SA Gross Alpha/Beta (900.0	ig sinciples Special Instructions/QC Requirements	midding EDD	0010114	pany/Organization/Phone/Cellular Water has high buffering capacity.check pH, add Presv. as needba		Weston/4142/844-4013/239-7367 Alkalinity as total bicarbonate and carbonate	Major Antons as br.ri.vi.o.04 CCWV (filtered in field with A5 mirron filter)	*Please list as separate report	// Trime // 3 5 4. Relinquished by	1135	Time / 2 3 4 5. Relinquished by	// Time D	Time S.Relinquished by Org. Date Time
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	Page 2 of 2 613578		Lab use	Lab Sample	D	<u>0</u> 2	<u>S</u> 2														
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090670-016	CTF-MW2	127	¥	063111/1000	МÐ	d	125ml	4	U	SA	Anions (SW846-9056)			
090670-018	CTF-MW2	127	¥	053111/1001	МÐ	đ	125ml	H2SO4	Ð	SА	NPN (363.2)			
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Page 5 of 906



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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

<u>All Analyses</u>: All samples were analyzed within the prescribed holding times and properly preserved.

1

Calibration

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

<u>Blanks</u>

<u>All Analyses</u>: 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

<u>Anions Analysis</u>: 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 $\leq 5X$. No sample data will be qualified as a result.

<u>Nitrate/nitrite Analysis</u>: 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 $\leq 5X$. 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



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.

<u>Holding Times</u>: 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 \leq 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.

<u>Blanks</u>

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



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.

<u>Holding Times</u>: 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 \leq 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.

<u>Blanks</u>

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



www.aqainc.net

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:

<u>ICS A</u>: 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."

<u>Blanks</u>: Sb was detected in the CCB at a concentration > the MDL but \leq 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:

<u>Blanks</u>: Hg was detected in the CCB at a negative concentration with an absolute value > the MDL but \leq 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

<u>All Analyses</u>: 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.

<u>Blanks</u>

ICP Analysis: No target analytes were detected in the blanks.

<u>ICP-MS/CVAA Analyses</u>: 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)

<u>ICP-MS Analysis</u>: 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)

<u>All Analyses</u>: All LCS QC acceptance criteria were met.

Detection Limits/Dilutions

<u>ICP-MS Analysis</u>: 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 $\leq 5X$. 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.

<u>ICP-MS Analysis</u>: 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

<u>All Analyses</u>: 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





AR/COC: 613579

Page 1 of 4

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
s.	090672-010/CTF-MW3	Mercury (7439-97-6)	UJ, B4
SW846 8260B DOE-AL			
A	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)	UI, H1
	090672-001/CTF-MW3	1,1,2-Trichloroethane (79-00-5)	UJ, H1
	090672-001/CTF-MW3	1,1-Dichloroethane (75-34-3)	Ŵ, 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)	UI, HI
	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
		Bromoform (75-25-2)	UJ, H1

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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)	ŪJ, 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)	UI, 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
r n	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)	W, 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)	ŲĴ, 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)	- W, H1
	090673-001/CTF-TB2	Benzene (71-43-2)	UJ, H1
	090673-001/CTF-TB2	Bromodichloromethane (75-27-4)	UI, H1
	090673-001/CTF-TB2	Bromoform (75-25-2)	UJ, H1
	090673-001/CTF-TB2	Bromomethane (74-83-9)	ÚJ, H1
	090673-001/CTF-TB2	Carbon disulfide (75-15-0)	UJ, H1
	090673-001/CTF-TB2	Carbon tetrachloride (56-23-5)	UJ, A1
	090673-001/CTF-TB2	Chlorobenzene (108-90-7)	UJ, H1
	090673-001/CTF-TB2	Chloroethane (75-00-3)	W, H1
	090673-001/CTF-TB2	Chloroform (67-66-3)	UJ, H1
	090673-001/CTF-TB2	Chloromethane (74-87-3)	UI, 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)	Ш, H 1
	090673-001/CTF-TB2	Dibromochloromethane (124-48-1)	UJ, H1
	090673-001/CTF-TB2	Ethylbenzene (100-41-4)	(J), 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

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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.

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Revised 7/2007

comments Sunples diluted for chloride, cultate, and Nor/Nor due to high concentrations.

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