



National Nuclear Security Administration

Sandia Site Office

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JUN 24 2010

CERTIFIED MAIL-RETURN RECEIPT REQUESTED



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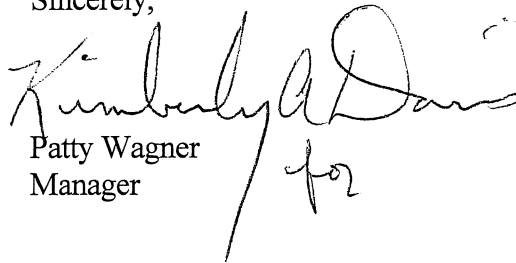
Subject: June 2010 Consolidated Quarterly Report for the Environmental Restoration Project

Dear Mr. Bearzi:

On behalf of the Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation, DOE/NNSA is submitting the June 2010 Consolidated Quarterly Report for the Environmental Restoration Project that addresses all quarterly reporting (February 2010 through April 2010) 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 Number 5890110518.

Should you have any questions regarding this correspondence, 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 John Gould of my staff at (505) 845-6089.

Sincerely,

  
Patty Wagner  
Manager

Enclosure

cc w/enclosure:

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L. King, EPA, Region 6 (via Certified Mail)

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## CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

**Document title:** Environmental Restoration Project Consolidated Quarterly  
Report, June 2010

**Document author:** John Cochran, Department 06765

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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.

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and

Signature: Kimberly A Davis  
**Ms. Patty Wagner, Manager**  
U.S. Department of Energy  
National Nuclear Security Administration  
Sandia Site Office  
Owner and Co-Operator

6/24/10  
Date



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Sandia National Laboratories, New Mexico (SNL/NM)

**Environmental Restoration Project**

A Department of Energy Environmental Cleanup Program

**CONSOLIDATED  
Quarterly Report**

**February through April 2010**

**June 2010**



United States Department of Energy  
Sandia Site Office

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# CONSOLIDATED QUARTERLY REPORT

June 2010

SANDIA NATIONAL LABORATORIES/NEW MEXICO (SNL/NM)

ENVIRONMENTAL RESTORATION PROJECT

**DEPARTMENT OF ENERGY (DOE):** SANDIA SITE OFFICE  
**CONTRACTOR:** SANDIA CORPORATION  
**PROJECT MANAGER:** John Cochran

**NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO THIS PERMIT:** 36

**SUSPECT WASTE:** radionuclides, metals, organics, and explosives.

## OVERVIEW

This Consolidated Quarterly Report for the Sandia National Laboratories Environmental Project addresses all quarterly reporting requirements pertaining to the Hazardous and Solid Waste Amendments (HSWA) Module of the Resource Conservation and Recovery Act (RCRA) Permit, the Compliance Order on Consent (Consent Order), and the Chemical Waste Landfill (CWL) Closure Plan. The following entities and reporting periods are addressed in these Sections:

### SECTION I

Environmental Restoration Project Quarterly Report, reporting period:  
February through April 2010

### SECTION II

Chemical Waste Landfill Progress Report, reporting period:  
February through April 2010

### SECTION III

Perchlorate Screening Semiannual Report, reporting period:  
January through March 2010

## ABBREVIATIONS AND ACRONYMS

AOC	Areas of Concern
AOP	Administrative Operating Procedure
ARCOC	analysis request and chain of custody
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 Investigation
COA	certificates of analyses
COC	Constituents of Concern
CWL	Chemical Waste Landfill
CY	calendar year
CYN	Canyons (Burn Site)
DO	dissolved oxygen
DOE	Department of Energy
EB	equipment blank
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration Project
ET	evapotranspirative
FB	field blank
FOP	Field Operating Procedure
FY09	Fiscal Year 2009
GEL	General Engineering Laboratories
LTES	Long Term Environmental Stewardship
LWDS	Liquid Waste Disposal System
MCL	maximum contaminant level
MDL	method detection limit
µg/L	microgram per liter
mg/L	milligram per liter
MW	monitoring well
MWL	Mixed Waste Landfill
ND	non-detect
NMED	New Mexico Environment Department
NOD	Notice of Deficiency
NTU	Nephelometric Tributary Units

ORP	oxidation-reduction potential
pH	potential of hydrogen
PQL	practical quantitation limits
PSL	primary sub-liner
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
Sandia	Sandia Corporation
SAP	Sampling and Analysis Plan
SC	specific conductance
SNL/NM	Sandia National Laboratories/New Mexico
SWMU	Solid Waste Management Unit
TA	Technical Area
TAG	Tijeras Arroyo Groundwater
TB	trip blank
TCE	trichloroethene
VCM	Voluntary Corrective Measure
VE	Vapor Extraction
VOC	volatile organic compound
VZMS	Vadose Zone Monitoring System
W	well

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Environmental Restoration Project Consolidated Quarterly Report

Section I

**Environmental Restoration Project Quarterly Report**

**June 2010**



United States Department of Energy  
Sandia Site Office



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## **1.0 Introduction**

This Environmental Restoration Consolidated Quarterly Report (ER Quarterly Report) discusses ongoing corrective actions being implemented by the Sandia National Laboratories (SNL) Environmental Restoration (ER) Project. The status of regulatory closure activities is outlined below. In this Section, the Quarter refers to the February through April 2010 quarterly reporting period.

## **2.0 ER Work Completed this Quarter**

### **2.1 Mixed Waste Landfill (MWL)**

- Activities during this reporting period included Final Preparation of the MWL Annual Groundwater Monitoring Report for Calendar Year (CY) 2009 to be submitted to NMED in June 2010.
- On April 30, 2010 DOE/Sandia received a letter from NMED entitled “Toluene Detections in Groundwater” requiring further investigation to determine the source of toluene in the groundwater at MWL. Toluene and bis(2ethylhexylphthalate) were detected in CY 2009 groundwater samples at very low concentrations. Both of these compounds have been detected historically and are common laboratory contaminants; however, Sandia/DOE initiated an investigation in late 2009 to confirm the source. The NMED provided further direction in the April 30, 2010 letter for conducting a purging/sampling study of the groundwater along with any other studies necessary to determine the source. This investigation is ongoing and will be completed in August of 2010.
- Mixed Waste Landfill groundwater monitoring activities for the third quarter of Fiscal Year 2010 were completed at the end of April 2010. The April sampling event included a purge/sampling study for toluene as requested by the NMED (see above). Results will be presented in the MWL Toluene Investigation Report as requested by the NMED. The MWL Annual Groundwater Monitoring Report for CY 2010 is anticipated for delivery to NMED in the spring of 2011.

### **2.1.1 MWL Documents Submitted to NMED Pending Regulatory Review and Approval**

- The MWL Corrective Measures Implementation (CMI) report was submitted for NMED review and approval on January 26, 2010.

## **2.2 Project Management and Site Closure**

- ER Sites undergoing regulatory and administrative closure activities are presently addressed under project management. Two permit modification requests are currently in progress with the NMED and are summarized in this section. The sites, listed below, were discussed with NMED and public stakeholders in June 2009 as part of comment resolution process for the renewal of the SNL Resource Conservation and Recovery Amendment (RCRA Permit). NMED verbally outlined their decisions about these sites at that meeting. In April 2010, DOE/Sandia received official written communication from NMED regarding their decisions on these sites. NMED's decisions from this April 2010 letter are outlined in this section.

### **2.2.1 Permit Modification Request Submitted in March 2006**

- Twenty-six sites were submitted to NMED for the final determination of Corrective Action Complete (CAC) in March 2006. The sites included nineteen Solid Waste Management Units (SWMUs), and seven Areas of Concern (AOCs). The NMED issued a Notice of Public Comment Period and Intent to Approve a Class 3 Permit Modification of the RCRA Permit for Sandia National Laboratories for these 26 sites on December 10, 2007. The NMED public review and comment period ended on February 8, 2008. The SWMUs and AOCs included in this permit modification request are listed below.

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

AOCs – 1090, 1094, 1095, 1114, 1115, 1116, and 1117.

### **2.2.2 Permit Modification Request Submitted in January 2008**

- Five sites were submitted for the final regulatory determination of CAC in a permit modification request in January 2008. This permit modification included all remaining SNL ER sites with the exception of the three active sites (SWMUs 83, 84, and 240), three Groundwater Investigation sites (Tijeras Arroyo, Technical Area V, and Burn Site), and the MWL (SWMU 76). Final reporting of the Corrective Measure Implementation for the MWL is pending. The MWL is addressed separately in section 2.1 of this Section of this ER

Quarterly Report. The four SWMUs and one AOC included in the January 2008 permit modification request are listed below.

SWMUs – 8, 28-2, 58, and 105

AOC – 1101

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

- On April 08, 2010, DOE/Sandia received a letter from NMED entitled: “Class 3 Permit Modification Requests for Granting Corrective Action Complete Status For 26 SWMUs [Solid Waste Management Units]/AOCs [Areas of Concern] (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” on April 14, 2010. This letter included four main sections: “SWMUs Requiring Corrective Action,” “SWMUs/AOCs to be Subject to Groundwater Monitoring Controls,” “SWMUs/AOCs to be Restricted to Industrial Land Use,” and “SWMUs/AOCs that do not Require Corrective Action.” NMED requirements stated in this letter are outlined here:
  - The section entitled “SWMUs Requiring Corrective Action,” specifies additional characterization requirements for SNL/NM SWMUs 68 (Old Burn Site), 149 (Building 9930 Septic System), 154 (Building 9960 Septic System and Seepage Pits), and 8 and 58 (Open Dump [Coyote Canyon Blast Area] and Coyote Canyon Blast Area). Additional groundwater monitoring is required to be completed at existing wells associated with SWMUs 149 and 154; the work plan for these efforts is required to be submitted to the NMED by June 30, 2010. Groundwater monitoring wells are required to be installed and monitored at SWMUs 68, and 8/58. The work plan for the efforts at Sites 68 and 8/58 must be submitted to the NMED by September 30, 2010.
  - The section titled “SWMUs/AOCs to be Subject to Groundwater Monitoring Controls,” specifies that annual groundwater monitoring be conducted at SWMUs 49 and 116.

- The section titled “SWMUs/AOCs to be Restricted to Industrial Land Use” indicates that 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 196 - Building 6597 Cistern
4. SWMU 234 - Storm Drain System Outfall
5. AOC 1090 - Building 6721 Septic System

- The Section titled “SWMUs/AOCs that do not Require Corrective Action” includes the following SWMUs/AOCs:

1. SWMU 4 - Liquid Waste Disposal System Surface Impoundments
2. SWMU 5 - Liquid Waste Disposal System Drainfield
3. SWMU 28-2- Mine Shaft
4. SWMU 46 - Old Acid Waste Line Outfall
5. SWMU 49 - Building 9820 Drains (Lurance Canyon)
6. SWMU 91 - Lead Firing Site
7. SWMU 101 - Building 9926/9926A Septic System and Seepage Pit (Coyote Test Field)
8. SWMU 105 - Mercury Spill (Building 6536)
9. SWMU 116 - Building 9990 Septic System (Coyote Test Field)
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 (Coyote Test Field)
13. SWMU 150 - Building 9939/9939A Septic System and Drainfield (Coyote Test Field)
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 (Coyote Test Field)
21. AOC 1101 - Building 885 Septic System
22. AOC 1114 - Building 9978 Drywell (Coyote Test Field)
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)

## **2.3 Site-Wide Hydrogeologic Characterization**

### **2.3.1 Technical Area-3/5 (TA 3/5) Groundwater**

- Groundwater sampling in TA-3/5 was completed in February 2010. Results of perchlorate analysis are discussed in Section III of this ER Quarterly Report, and other analytical results will be discussed in the Calendar Year 2010 Groundwater Protection Program (GWPP) Annual Groundwater Monitoring Report (anticipated delivery to NMED in the summer of 2011).
- In December 2010, DOE/Sandia received a third Notice of Deficiency (NOD) from the NMED on the Technical Area V Corrective Measures Evaluation (CME) Report (submitted July 2005). A response to the third NOD was submitted by DOE/Sandia in February 2010.

### **2.3.2 Burn Site Groundwater (BSG)**

- Groundwater sampling was completed in February and March 2010. Results of perchlorate analysis are discussed in Section III of this ER Quarterly Report, and other analytical results will be discussed in the Calendar Year 2010 GWPP Annual Groundwater Monitoring Report (anticipated delivery to NMED in the summer of 2011).
- On February 16, 2010, DOE/Sandia received from the NMED a Notice of Conditional Approval of the Burn Site Groundwater Characterization Work Plan, submitted in November 2009.

### **2.3.3 Tijeras Arroyo Groundwater (TAG)**

- Groundwater sampling was completed in February 2010. Results of perchlorate analysis are discussed in Section III of this ER Quarterly Report, and other analytical results will be discussed in the Calendar Year 2010 GWPP Annual Groundwater Monitoring Report (anticipated delivery to NMED in the summer of 2011).
- On February 25, 2010, DOE/Sandia received from the NMED a Notice of Approval for the TAG Continuing Investigation Report (submitted in November 2005).

### **2.3.4 Mixed Waste Landfill Groundwater (MWL)**

- Groundwater sampling was performed in April 2010. Results from these MWL sampling events will be discussed in the MWL Annual Groundwater Monitoring Report for Calendar Year 2010 (anticipated delivery to NMED in the spring of 2011).

#### **2.3.5 Chemical Waste Landfill Groundwater (CWL)**

- CWL semi-annual groundwater monitoring activities were performed in April 2010. Validated analytical results associated with the April 2010 sampling were not available in time to be included in this June 2010 ER Quarterly Report, but will be summarized in Section II of the next ER Quarterly Report to be submitted in September 2010.
- DOE/Sandia proceeded with field activities associated with the installation of the four new groundwater monitoring wells (CWL-BW5 and CWL-MW9 through MW11); and decommissioning of groundwater monitoring wells CWL-BW4A, CWL-MW4, MW5U/L, and MW6U/L according to the approved Closure Plan Amendment. Well installation and decommissioning at the CWL should be completed in June 2010.

##### **2.3.5.1 Groundwater Documents Submitted to the NMED Pending Regulatory Review and Approval**

- Technical Area V Groundwater Corrective Measure Evaluation (CME) Work Plan, submitted April 2004.
- CME Report for Tijeras Arroyo Groundwater, submitted August 2005.
- BSG Interim Measures Work Plan, submitted May 2005.
- BSG Current Conceptual Model of Groundwater Flow and Contaminant Transport, submitted April 2008.
- BSG CME Work Plan, submitted April 2008.
- Response to the third NOD on the Technical Area V CME Report, submitted February 2010.

#### **2.4 Corrective Action Management Unit (CAMU)**

CAMU Post-closure Care operations consist of vadose-zone monitoring, leachate removal, and post-closure inspections, as required in the permit. Activities for this reporting period include the following:

- Weekly pumping of leachate from the leachate collection and removal system.
- Weekly inspection of the less-than-90-day area.
- Quarterly inspection of the site (March 2010), including containment cell cover, storm water diversion structures, security fences, gates, signs, and benchmarks:
  - 12 four-wing saltbush plants and 24 snakeweed plants were identified growing on the cover. Because these plants can develop extensive root systems that could damage the high-density polyethylene cover, they were removed on March 25, 2010.

- Site-wide removal of tumbleweeds was completed on April 16, 2010.
  - Site-wide trimming of vegetation, excluding the containment cell cover, was completed on April 16, 2010.
  - A service request was submitted on April 22, 2010 to SNL/NM Facilities for replacing an electrical outlet cover on the south side of the containment cell.
  - Two strands of the security fence were tightened on April 27, 2010.
  - A small Chinese elm tree growing next to a benchmark was removed on April 28, 2010.
  - Repainting of the Primary Sub-liner's (PSL) protective steel casings is currently in progress.
- Quarterly monitoring of the Vadose Zone Monitoring System (VZMS) was conducted in March 2010. Results will be posted in the annual CAMU report.
  - Waste management associated with the leachate collection was conducted and is outlined below, in this section.
  - Composite leachate sampling for waste characterization was conducted on February 2, 2010.

#### 2.4.1 **CAMU Waste Management Activities**

- Waste stored on site at the beginning of this period:
  - 123 gallons of leachate.
  - 2 lbs Personal Protective Equipment (PPE).
- Waste generated on-site during the period:
  - 142 gallons of leachate.
  - 6 gallons of rinsate.
  - 5 lbs PPE, paper wipes, plastic drum pump.
- Waste removed from site by the Hazardous Waste Management Facility:
  - 134 gallons of leachate on February 9, 2009.
  - 4 gallons of rinsate on February 9, 2010.
  - 5 lbs PPE, paper wipes, plastic drum pump on February 9, 2010.
- Waste remaining on site at the end of this period:
  - 131 gallons of leachate.
  - 2 gallons of rinsate.
  - 2 lbs PPE.

##### 2.4.1.1 **CAMU Regulatory Activities**

- There were no regulatory activities during this quarter.



**2.5 Solid Waste Management Unit: Long Term Environmental Stewardship (LTES) Site 1, Cable Debris Site**

- The DOE/Sandia response to NMED's "Notice of Disapproval: Investigation Report and Proposal for LTES Site 1 –Cable Debris Site" dated September 21, 2009 was submitted to NMED on February 12, 2010.

**2.5.1 LTES Documents Submitted to NMED Pending Regulatory Review and Approval**

- Investigation Report and Proposal for Corrective Action Complete for LTES Site 1/Cable Debris Site, was delivered to NMED in March 2009.

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Environmental Restoration Project Consolidated Quarterly Report

Section II

**Chemical Waste Landfill  
Quarterly Closure Progress Report**

**June 2010**



United States Department of Energy  
Sandia Site Office

## **SECTION II. CHEMICAL WASTE LANDFILL QUARTERLY PROGRESS REPORT**

This Sandia National Laboratories/New Mexico (SNL/NM) Chemical Waste Landfill (CWL) Quarterly Closure Progress Report has been prepared pursuant to the CWL Final Closure Plan and Post-closure Permit Application (Closure Plan) (SNL/NM December 1992). This section documents activities at the CWL for the reporting period of February through April 2010. The second FY10 semi-annual groundwater sampling event occurred at the CWL during April of this reporting period. Validated analytical results associated with this sampling event have not been received at this time and will be summarized in Section II of the next Environmental Restoration (ER) Consolidated Quarterly Report to be submitted in September 2010.

### **1.0 Introduction**

All voluntary corrective measures (VCMs) 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 in the February 22, 2006 CWL Quarterly Closure Progress Report (SNL/NM February 2006), as Appendix B, all LE VCM regulatory deliverables have been submitted. With the completion of the VCMs, technical meetings will be held on an as-needed basis. The public will continue to be informed of significant events through the Environmental Restoration (ER) Project public meeting process.

Installation of the cover as an interim measure was requested in April 2004 (Wagner April 2004) and approved with conditions in September 2004 (Kielling September 2004); the cover was completed in September 2005 in accordance with the conditions of approval. All field activities have been completed at the CWL, with the exception of installation of new groundwater monitoring wells CWL-BW5 and CWL-MW9 through MW11 and decommissioning of groundwater monitoring wells CWL-BW4A, CWL-MW4, MW5U/L, and MW6U/L which are detailed in Section 2.0 below. Long-term monitoring under the NMED-approved CWL Post-Closure Care Permit (NMED October 2009) will commence after NMED approval of final closure.

### **2.0 Status of Closure**

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

Upcoming CWL Closure Plan reporting activities include revising and submitting the Final Resource Conservation and Recovery Act (RCRA) Closure Report, to be submitted after NMED

approval of the Corrective Measures Study (CMS) Report has been received. The Final RCRA Closure Report will document both the backfilling of the former CWL and installation of the cover.

On May 21, 2007, the NMED issued, for public comment, the draft post-closure care permit for the CWL. Also included in the public notices were the CMS Report and the Closure Plan amendment (changes to Chapter 12 revising the closure process). On July 19, 2007, DOE and Sandia responded in opposition to the issuance of the CWL post-closure care permit as drafted and offered a number of comments, the most important of which were related to groundwater and vadose zone monitoring. In addition, DOE and Sandia requested that a public hearing be scheduled to address these outstanding issues.

The post-closure care permit negotiations that included a CWL Closure Plan amendment addressing the replacement of four groundwater monitoring wells, the CWL Post-Closure Care Permit, and the CWL Final Remedy, 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 2009). NMED issued a "Notice of Approval Final Remedy and Closure Plan Amendment Chemical Waste Landfill" on October 16, 2009.

Sandia completed the planning and contracting activities associated with the installation of the four new groundwater monitoring wells (CWL-BW5 and CWL-MW9 through MW11) and decommissioning of groundwater monitoring wells CWL-BW4A, CWL-MW4, MW5U/L, and MW6U/L according to the approved Closure Plan Amendment. Representatives of the NMED participated in a pre-drilling site field visit on February 24, 2010 and confirmed the location of the four wells to be installed in the field. A GIS map was provided after the meeting that reflected the well locations pin flagged in the field. Drilling field work began the week of April 5, 2010. By the end of April groundwater monitoring wells CWL-BW5, CWL-MW9, and CWL-MW11 were installed and wells CWL-BW4A, CWL-MW4, CWL-MW5U/L, and CWL-MW6U/L were decommissioned. During the next reporting period the remaining monitoring well (CWL-MW10) will be installed and all four new wells will be developed.

### **3.0 Water Monitoring Assessment**

CWL semi-annual groundwater monitoring activities were performed in April 2010. Final validated analytical results associated with this groundwater sampling event are pending receipt by SNL/NM personnel. The report describing groundwater sampling activities and presenting analytical sample results from the second FY10 semi-annual groundwater assessment period will be summarized in the September 2010 Environmental Restoration (ER) Consolidated Quarterly Report.

No soil-gas sampling was performed at the CWL during this reporting period. Soil-gas sampling is not required under the Closure Plan but will be a requirement for post-closure care (Kieling, December 2003).

#### **4.0 Projected Activities for the Upcoming Quarter**

Drilling, well installation, well development, and plugging and abandonment field work associated with the replacement of four groundwater monitoring wells at the CWL, according to the approved Closure Plan Amendment, represents final CWL closure activities and will be completed during the next quarter. After completion of all related field work, Sandia and DOE will prepare and submit the CWL Final RCRA Closure Report, including a Well Installation and Decommissioning Report documenting the 2010 field activities as an appendix.

#### **5.0 References**

Bearzi, J.P. (New Mexico Environment Department), October 2005. Letter to P. Wagner (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Notice of Approval: Chemical Waste Landfill Site Operational Boundary Closure Addendum to the Landfill Excavation Corrective Measure Final Report; August 2005, Sandia National Laboratories, NM5890110518, HWB-SNL-05-021." October 25, 2005.

Cooke, G. (U.S. Environmental Protection Agency Region 6), June 2002. Letter to M.J. Zamorski (U.S. Department of Energy), "Approval of the TSCA Risk-Based Approach Request for the CWL." June 26, 2002.

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Environmental Restoration Project Consolidated Quarterly Report

## Section III

# **Perchlorate Screening Quarterly Monitoring Report First Quarter of Calendar Year 2010 (January, February, and March 2009)**

**June 2010**



United States Department of Energy  
Sandia Site Office

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## **Section III:**

### **Perchlorate Screening Quarterly Monitoring Report First Quarter of Calendar Year 2010 (January, February, and March 2010)**

#### **Executive Summary**

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 be sampled for perchlorate at SNL/NM (NMED April 2004). This report summarizes the perchlorate monitoring completed during the first quarter of Calendar Year 2010 (CY2010) (January, February, and March 2010) in response to the requirements of the Order. During the first quarter of CY2010, groundwater samples were collected from CYN-MW6, LWDS-MW1, TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27.

CYN-MW6 is one of the seven wells in the Burn Site Groundwater (BSG) monitoring well network and was sampled for perchlorate for the fourteenth time. LWDS-MW1 is in the Technical Area V (TA-V) Groundwater Investigation study area and was sampled for the fourth time for perchlorate based on requirements stipulated in an April 2009 letter from the NMED (NMED April 2009). TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27 are in the Tijeras Arroyo Groundwater (TAG) Investigation study area and were sampled for the third time for perchlorate based on NMED requirements (NMED April 2009). TA1-W-03 is also in the TAG Investigation study area and was required to be sampled for perchlorate based on NMED requirements (NMED April 2009) beginning in July 2009. However, before a sample could be collected, TA1-W-03 required well maintenance and was sampled for perchlorate for the first time during this reporting period.

All samples were submitted to General Engineering Laboratories (GEL) for perchlorate analysis using U.S. Environmental Protection Agency (EPA) Method 314.0 (EPA November 1999). No perchlorate was detected in the environmental samples from LWDS-MW1, TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, or TA2-W-27 at a method detection limit of 4 micrograms per liter ( $\mu\text{g/L}$ ). No perchlorate has been detected during four consecutive quarterly sampling events at LWDS-MW1, so this well will be removed from the perchlorate screening well network. In March of 2010 the environmental samples from CYN-MW6 revealed perchlorate at concentrations of 4.59  $\mu\text{g/L}$ . The source for the perchlorate in the groundwater at CYN-MW6 is unknown although a natural source may be present.

Because perchlorate concentrations in monitoring well CYN-MW6 have exceeded the screening level since March 2006, DOE/Sandia had initiated a negotiation process with the NMED (SNL/NM March 2007) to determine the frequency of continued monitoring. In November 2008, DOE/Sandia received approval from NMED to discontinue quarterly monitoring and proceed with semiannual sampling for perchlorate at CYN-MW6 (NMED November 2008).



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Appendix A. Analytical Laboratory Certificates of Analysis for the Perchlorate Data

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

## 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 be sampled for perchlorate at SNL/NM (NMED April 2004). This report summarizes the perchlorate screening monitoring completed during the first quarter of Calendar Year 2010 (CY2010) (January, February, and March 2010) 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).

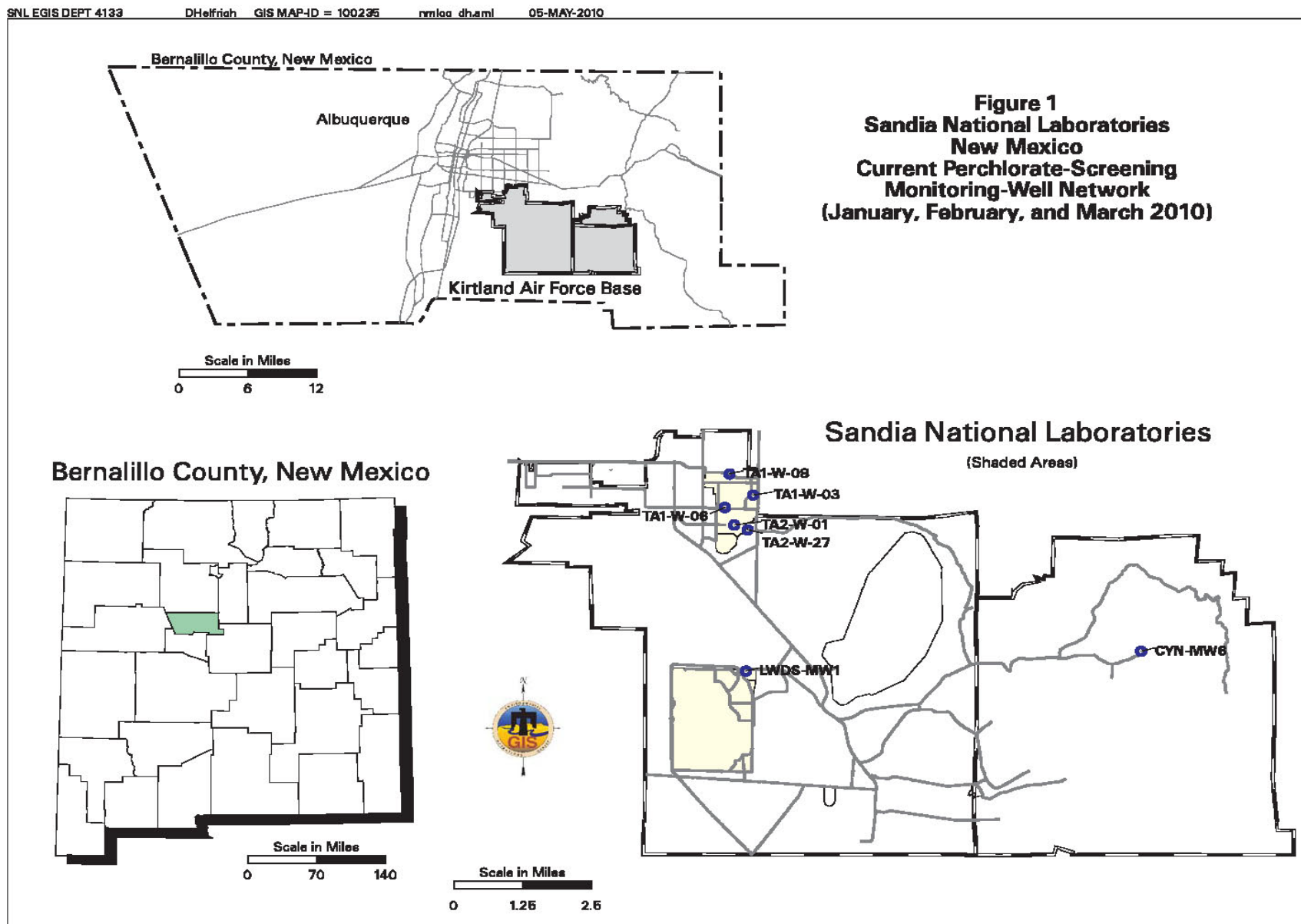
In November 2005, DOE/Sandia submitted a letter report on the status of perchlorate screening in groundwater at SNL/NM monitoring wells (SNL/NM November 2005). The purpose of that letter report was to summarize previous correspondence and sampling results, and to outline proposed future work to comply with NMED requirements for perchlorate screening in groundwater. Per the letter report, quarterly reports will be submitted for wells actively in the perchlorate-screening monitoring-well network. Based on 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 NMED to proceed to semiannual reporting (NMED November 2008), and then upon further consideration 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 well that has been under the sampling and reporting requirements of the Order since the well was installed, which will remain at semiannual sampling and reporting.

This report is the seventeenth to be submitted since the November 2005 letter report; the previous reports were submitted Fourth Quarter of Calendar Year 2005 through the Fourth Quarter of Calendar Year 2009 (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 2009a, and March 2010).

Groundwater monitoring well CYN-MW6 has now been sampled 14 times; TA-V well LWDS-MW1 has been sampled four consecutive quarters; TAG wells TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27 have been sampled three consecutive quarters; and TA1-W-03 has been sampled once (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 a groundwater monitoring well remains in the perchlorate-screening monitoring well network unless negotiated otherwise with NMED.

The April 30, 2009 NMED letter, required that TAG monitoring well TA1-W-03 be sampled for perchlorate and this well should have been sampled during two previous quarterly events. However, two attempts were made to sample this well on July 16<sup>th</sup> and 24<sup>th</sup>, 2009 and a groundwater sample could not be collected due to unstable turbidity measurements. Since July 2009, SNL/NM personnel have completed a borehole camera survey of this monitoring well, which determined that the well casing was in good physical condition. Following the camera survey TA1-W-03 was redeveloped in February 2010 to remove the silt and clay material that produced the turbid water (Sanders and Skelly February 2010).

**Figure 1. Sandia National Laboratories, New Mexico Current Perchlorate-Screening Monitoring-Well Network (January, February, and March 2010)**



## 2.0 Scope of Activities

This report provides perchlorate screening results from the first quarter of CY2010 (January, February, and March 2010) for the wells currently active in the perchlorate screening program as shown on Figure 1 and listed in Table 1. It should be noted that CYN-MW6 is currently being sampled on a semi-annual basis and all other wells are being sampled quarterly. Per the requirements of Table XI-1 of the Order, a well with four consecutive quarters of non-detect results at the screening level/method detection limit (MDL) of 4 micrograms per liter ( $\mu\text{g/L}$ ) is removed from the requirement of continued monitoring for perchlorate. Data from numerous wells identified in the Order have satisfied this requirement and, therefore, these wells have been removed from the perchlorate screening program. Data for these wells were provided in previous reports, and are not discussed in this current report. Wells discussed in previous perchlorate screening reports include: CYN-MW1D, CYN-MW5, CYN-MW7, CYN-MW8, MRN-2, MRN-3D, MWL-BW1, MWL-BW2, MWL-MW1, MWL-MW7, MWL-MW8, MWL-MW9, NWT3-MW2, and SWTA3-MW4.

**Table 1**  
**Current Perchlorate-Screening Monitoring-Well Network**  
**First Quarter of CY2010**  
**(January, February, and March 2010)**

Well	Date Sampled	Number of Consecutive Sampling Events <sup>a</sup>	Remaining Number of Sampling Events <sup>b</sup>	Sampling Equipment
CYN-MW6	03-Mar-2010	14	TBD <sup>c</sup>	Bennett <sup>TM</sup> Pump
LWDS-MW1	17-FEB-2010	4	0	Bennett <sup>TM</sup> Pump
TA1-W-03	26-FEB-2010	1	3	Bennett <sup>TM</sup> Pump
TA1-W-06	11-JAN-2010	3	1	Bennett <sup>TM</sup> Pump
TA1-W-08	12-JAN-2010	3	1	Bennett <sup>TM</sup> Pump
TA2-W-01	13-JAN-2010	3	1	Bennett <sup>TM</sup> Pump
TA2-W-27	14-JAN-2010	3	1	Bennett <sup>TM</sup> Pump

### Notes

<sup>a</sup> Includes this sampling event.

<sup>b</sup> Per the requirements of Table XI-1 of the Order (NMED April 2004) a well will be removed from the perchlorate-screening monitoring-well network after four quarters unless perchlorate is detected above the screening level/MDL of 4  $\mu\text{g/L}$ . 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.

<sup>c</sup> TBD = To be determined. This well has been sampled for the required initial four quarters. Because perchlorate concentrations in this well have exceeded the screening level, DOE/Sandia and the NMED have agreed to further characterization requirements in the BSG study area (NMED February 2010).

DOE/Sandia performed groundwater sampling at seven wells on the dates listed in Table 1. CYN-MW6 was installed after the Order was finalized and was therefore required to be sampled for perchlorate as a “new” well; the other six wells were specifically required by NMED’s April 2009 letter (NMED April 2009). Groundwater sampling activities were conducted in conformance with procedures outlined in the investigation-specific sampling and analysis plans (SAP) entitled:

- ♦ “Tijeras Arroyo Groundwater Investigation, Mini-SAP for FY10, 2<sup>nd</sup> Quarter Sampling, January 2010” (SNL/NM December 2009b),
- ♦ “Tijeras Arroyo Groundwater Investigation, Mini-SAP for TA1-W03, FY10, 2<sup>nd</sup> Quarter Sampling, February 2010” (SNL/NM February 2010a),
- ♦ “TA-V Groundwater Monitoring Mini-SAP for Second Quarter, Fiscal Year 2010” (SNL/NM January 2010), and
- ♦ “Burn Site Groundwater Monitoring, Mini-SAP for Second Quarter Fiscal Year 2010” (SNL/NM February 2010b).

As described in the Mini-SAPs, groundwater sampling was performed in conformance with current Sandia Environmental Management, Long Term Environmental Stewardship (LTES) Project field operating procedures (FOPs). A portable Bennett<sup>TM</sup> 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” (SNL/NM August 2007a). Wells TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27 were purged a minimum of one saturated screen volume before sampling in conformance with FOP 05-01, “LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements” (SNL/NM August 2007b). Wells CYN-MW6 and LWDS-MW1 are low-yield monitoring wells, and were purged dry and allowed to recover before sampling to ensure a representative groundwater sample.

Field water-quality measurements for turbidity, potential of hydrogen (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<sup>TM</sup> Model 620 Water Quality Meter. Turbidity was measured with a HACH<sup>TM</sup> Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when:

- Turbidity measurements are within 10 percent, or less than 5 nephelometric turbidity units (NTUs)
- pH is within 0.1 units,
- Temperature is within 1.0 degrees Celsius, and
- SC is within 5 percent.

Field Measurement Logs documenting details of well purging and water quality measurements were submitted to the Sandia Customer-Funded Records Center.

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

**Table 2**  
**Sample Details for the First Quarter of CY2010 Perchlorate Sampling**

<b>Well</b>	<b>Sample Identification</b>	<b>ARCOG Number</b>	<b>Associated Groundwater Investigation</b>
CYN-MW6	088180-020	612580	BSG
LWDS-MW1	088141-020	612560	TA-V
TA1-W-03	088220-020	612604	TAG
TA1-W-06	088014-020	612513	TAG
TA1-W-08	088015-020	612514	TAG
TA2-W-01	088016-020	612515	TAG
TA2-W-27	088020-020 088021-020	612517	TAG

**Notes**

**ARCOG** = Analysis request and chain of custody.  
**BSG** = Burn Site Groundwater.  
**TAG** = Tijeras Arroyo Groundwater.  
**TA-V** = Technical Area V.

### 3.0 Regulatory Criteria

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

In March 2007, DOE/Sandia received a letter from the NMED stating the requirement that DOE/Sandia “determine the nature and extent of the contamination and complete a Corrective Measures Evaluation for the perchlorate-impacted groundwater in the vicinity of CYN-MW6” (NMED March 2007). As this was based solely on the four quarters of monitoring results,

DOE/Sandia submitted a letter to the NMED in April 2007 (SNL/NM April 2007) which recommended further characterization through continued quarterly monitoring of CYN-MW6 for four additional quarters, ending in December 2007, to assure appropriate characterization of this well. In January 2008, DOE/Sandia requested a meeting with NMED to discuss the need for continued monitoring or additional characterization work, and potentially, a CME.

In preparation of discussing the perchlorate-impacted groundwater in the vicinity of CYN-MW6 and to show that the requirement “to determine the nature and extent of contamination” (NMED March 2007) has been met, DOE/Sandia provided supporting information to the NMED (SNL/NM March 2008). Perchlorate in surface soils has been characterized at Solid Waste Management Units (SWMUs) in the study area (SNL/NM June 2006; SNL/NM March 2008--Appendix C). Based upon these data, DOE/Sandia believe the nature and extent of perchlorate in groundwater at the Burn Site has been sufficiently characterized. Since 2004, four other monitoring wells in the vicinity of the Burn Site have been sampled and analyzed for perchlorate, including CYN-MW1D, CYN-MW5, CYN-MW7, and CYN-MW8. All of these wells were sampled for four quarters and all results were non-detect for perchlorate (SNL/NM March 2008--Appendix D).

Per the requirements of Section VI.K.1.b of the Order (NMED April 2004), a human health risk assessment has been performed to evaluate the potential for adverse health effects from the concentrations of perchlorate detected in CYN-MW6 groundwater. The maximum concentration of perchlorate in CYN-MW6 to date (8.93 µg/L) was used in the assessment. The calculated hazard quotient (HQ) of 0.35 is less than the NMED target level of a Hazard Index (the sum of all HQs) of 1.0 (NMED June 2006) (SNL/NM March 2008--Appendix E).

Because perchlorate concentrations in monitoring well CYN-MW6 have exceeded the screening level, DOE/Sandia initiated a negotiation process with the NMED (SNL/NM March 2007) to determine the frequency of continued monitoring. In November 2008, DOE/Sandia received approval from NMED to proceed with semi-annual monitoring of perchlorate in CYN-MW6 and proceed with semiannual reporting of all perchlorate results (NMED November 2008). Upon further consideration, NMED once more required that DOE/Sandia resume quarterly reporting of perchlorate results with the exception of CYN-MW6 (NMED April 2009).

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 soils 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), and subsequently approved by the NMED (NMED February 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 Technical Area-V monitoring wells, including TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, TA2-W-27, and LWDS-MW1 (NMED April 2009).

## 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 first quarter of CY2010 perchlorate data is included as Appendix A. Perchlorate was not detected above the screening level in TA1-W-03, and consistent with historical analytical results, perchlorate was not detected above the screening level in LWDS-MW1, TA1-W-06, TA1-W-08, TA2-W-01, or TA2-W-27. Consistent with historical analytical results, perchlorate was detected above the screening level/MDL in the first quarter of CY2010 in CYN-MW6. As shown in Figure 2, the concentration of perchlorate found in CYN-MW6 in March 2010 (4.59 µg/L) is similar to the concentrations found during the last sampling event, but significantly less than concentrations from previous quarters (for example, SNL/NM June 2009). The hydrograph of CYN-MW6 (Figure 3) shows that the water table is rapidly declining in this well. The decreasing perchlorate concentrations during recent sampling events may be related to declining water levels in this well.

Table 4 summarizes field water quality measurements collected immediately before the analytical sample was collected. Field water quality measurements include turbidity, pH, temperature, SC, ORP, and DO.

The analytical data were reviewed and qualified in accordance with Administrative Operating Procedure (AOP) 00-03 Revision 2, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM July 2007). Although validation qualifiers were assigned to several of the analytical results, no problems were identified with the analytical data that resulted in the qualification of the data as unusable. The data are acceptable and reported quality control measures are adequate. The data validation sample findings summary sheets for the perchlorate data are included as Appendix B.

No variances or nonconformances in field activities or field conditions from requirements in the groundwater monitoring mini-SAPs (SNL/NM December 2009b, January 2010, February 2010a, and February 2010b) were identified during the first quarter of CY2010 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 LWDS-MW1, TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, or TA2-W-27 at a screening level/MDL of 4 µg/L.
- Since June 2004 (the start of sampling required by the Order), perchlorate has only been detected above the screening level/MDL (4 µg/L) in one of the wells (CYN-MW6) in the perchlorate-screening monitoring-well network.
- The analytical result from CYN-MW6 for the first quarter of CY2010 sampling event (4.59 µg/L) is similar to the last sampling event, but significantly less than concentrations reported since the inception of sampling for perchlorate at CYN-MW6 in March 2006 (Figure 2).



**Table 3**  
**Summary of Perchlorate Screening Analytical Results for the**  
**Current Monitoring-Well Network, as of First Quarter CY2010.**

Well ID	Sample Date	ARCO No.	Sample No.	Perchlorate Result <sup>a</sup> (µg/L)	MDL <sup>b</sup> (µg/L)	PQL <sup>c</sup> (µg/L)	MCL <sup>d</sup> (µg/L)	Laboratory Qualifier <sup>e</sup>	Validation Qualifier <sup>f</sup>	Analytical Method <sup>g</sup>	Comments
CYN-MW6	23-Mar-06	609578	075985-020	6.92	4.0	12	NE	J		EPA 314.0	
			075986-020	7.44	4.0	12	NE	J		EPA 314.0	Duplicate sample
			075985-R20	6.39	0.50	2.0	NE	Hh	HT, J	EPA 6850M	Verification/Re-analysis
			075986-R20	6.48	0.50	2.0	NE	Hh	HT, J	EPA 6850M	Verification/Re-analysis
	22-Jun-06	609929	078687-020	6.63	4.0	12	NE	J		EPA 314.0	
			078688-020	6.45	4.0	12	NE	J		EPA 314.0	Duplicate sample
			078687-021	6.99	1.0	4.0	NE			EPA 6850M	Verification
			078688-021	6.92	1.0	4.0	NE			EPA 6850M	Verification/Duplicate Sample
	20-Sep-06	610652	081626-020	7.52	4.0	12	NE	J		EPA 314.0	
			081626-R20	6.96	1.0	4.0	NE		P2	EPA 6850M	Verification/Re-analysis
	15-Dec-06	611057	083858-020	8.46	4.0	12	NE	J		EPA 314.0	
			083859-020	8.93	4.0	12	NE	J		EPA 314.0	Duplicate sample
	14-Mar-07	611200	084237-020	8.12	4.0	12	NE	J		EPA 314.0	
	27-Jun-07	611399	084833-020	6.57	4.0	12	NE	J	J-, X1	EPA 314.0	
			084833-R20	5.94	0.5	2.0	NE			EPA 6850M	Verification/Re-analysis
	12-Sep-07	611581	085249-020	7.74	4.0	12	NE	J		EPA 314.0	
			085249-R20	6.46	0.5	2.0	NE	Hh	J	EPA 6850M	Verification/Re-analysis
	18-Dec-07	611668	085446-020	6.20	4.0	12	NE	J		EPA 314.0	
			085447-020	6.56	4.0	12	NE	J		EPA 314.0	Duplicate sample
	10-Mar-08	611749	085661-020	7.25	4.0	12	NE	J		EPA 314.0	
	23-Jun-08	611912	086280-020	6.67	4.0	12	NE	J		EPA 314.0	
	17-Sep-08	612004	086782-020	6.85	4.0	12	NE	J		EPA 314.0	
	02-Mar-09	612120	087047-020	7.24	4.0	12	NE	J		EPA 314.0	
	30-Sep-09	612392	087734-020	4.12	4.0	12	NE	J	J-	EPA 314.0	
			087735-020	4.71	4.0	12	NE	J	J-	EPA 314.0	Duplicate sample
	03-Mar-10	612580	088180-020	4.59	4.0	12	NE	J		EPA 314.0	

*Refer to notes at the bottom of table.*

**Table 3 (continued)**  
**Summary of Perchlorate Screening Analytical Results for the**  
**Current Monitoring-Well Network, as of First Quarter CY2010.**

Well ID	Sample Date	ARCO No.	Sample No.	Perchlorate Result <sup>a</sup> (µg/L)	MDL <sup>b</sup> (µg/L)	PQL <sup>c</sup> (µg/L)	MCL <sup>d</sup> (µg/L)	Laboratory Qualifier <sup>e</sup>	Validation Qualifier <sup>f</sup>	Analytical Method <sup>g</sup>	Comments
LWDS-MW1	10-Jun-09	612210	087464-020	ND	4.0	12	NE	U		EPA 314.0	
	15-Sep-09	612368	087662-020	ND	4.0	12	NE	HU	UJ	EPA 314.0	
			087663-020	ND	4.0	12	NE	HU	UJ	EPA 314.0	Duplicate sample
	08-Dec-09	612496	087970-020	ND	4.0	12	NE	U		EPA 314.0	
			087971-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	17-Feb-10	612560	088141-020	ND	4.0	12	NE	U		EPA 314.0	
TA1-W-03	26-Feb-10	612604	088220-020	ND	4.0	12	NE	U		EPA 314.0	
TA1-W-06	21-Jul-09	612301	087550-020	ND	4.0	12	NE	U		EPA 314.0	
			087551-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	28-Oct-09	612463	087872-020	ND	4.0	12	NE	U		EPA 314.0	
	11-Jan-10	612513	088014-020	ND	4.0	12	NE	U		EPA 314.0	
TA1-W-08	22-Jul-09	612302	087553-020	ND	4.0	12	NE	U		EPA 314.0	
	29-Oct-09	612464	087873-020	ND	4.0	12	NE	U		EPA 314.0	
	12-Jan-10	612514	088015-020	ND	4.0	12	NE	U		EPA 314.0	
TA2-W-01	30-Jul-09	612306	087562-020	ND	4.0	12	NE	U		EPA 314.0	
	30-Oct-09	612466	087875-020	ND	4.0	12	NE	U		EPA 314.0	
			087876-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	13-Jan-10	612515	088016-020	ND	4.0	12	NE	U		EPA 314.0	
TA2-W-27	03-Aug-09	612308	087566-020	ND	4.0	12	NE	U		EPA 314.0	
			087567-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	02-Nov-09	612467	087877-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Jan-10	612517	088020-020	ND	4.0	12	NE	U		EPA 314.0	
			088021-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample

**Notes**

**<sup>a</sup>Result**

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

ND = not detected (at method detection limit).

µg/L = micrograms per liter.

### Table 3 (concluded)

#### Summary of Perchlorate Screening Analytical Results for the Current Monitoring-Well Network, as of First Quarter CY2010.

*Notes (continued)*

<sup>b</sup>**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.

<sup>c</sup>**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.

<sup>d</sup>**MCL**

Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations [40 CFR 141.11(b)], and subsequent amendments or the New Mexico Environmental Improvement Board in Title 20, Chapter 7, Part 1 of the New Mexico Administrative Code (20MAC 7.1).

NE = Not established.

<sup>e</sup>**Lab Qualifier**

H = Analytical holding time was exceeded.

h = Prep holding time was exceeded.

J = Amount detected is below the practical quantitation limit.

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

<sup>f</sup>**Validation Qualifier**

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

HT = The holding time was exceeded for the associated sample analysis.

J = The associated value is an estimated quantity.

J- = The associated value is an estimated quantity with a suspected negative bias.

P2 = Insufficient quality control data to determine laboratory precision.

UJ = Analyte is absent or below the method detection limit and the associated quantitation limits (MDL and PQL) may be inaccurate or imprecise because the analysis was performed outside method specific hold time requirements.

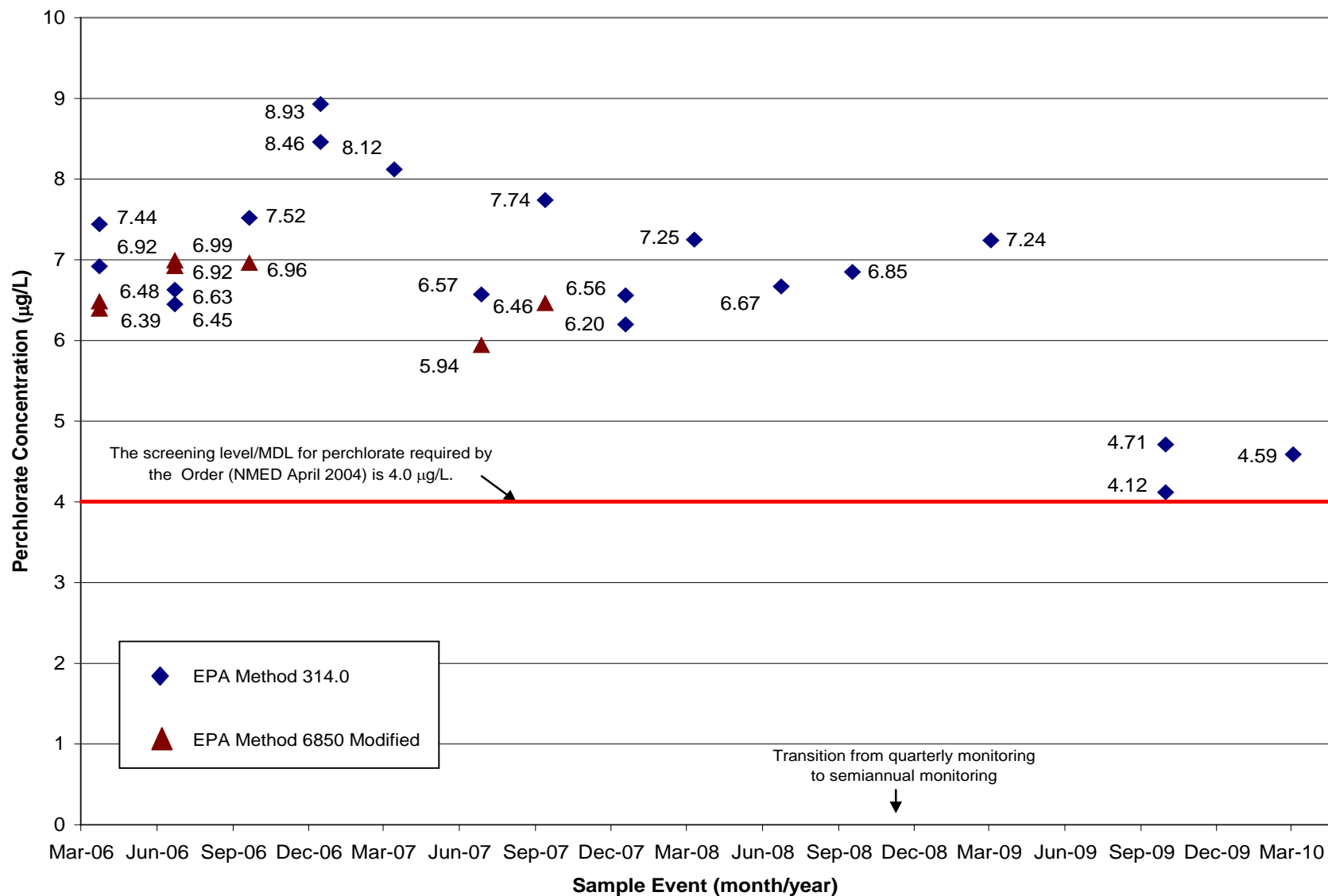
X1 = General data quality is suspect.

<sup>g</sup>**Analytical Method**

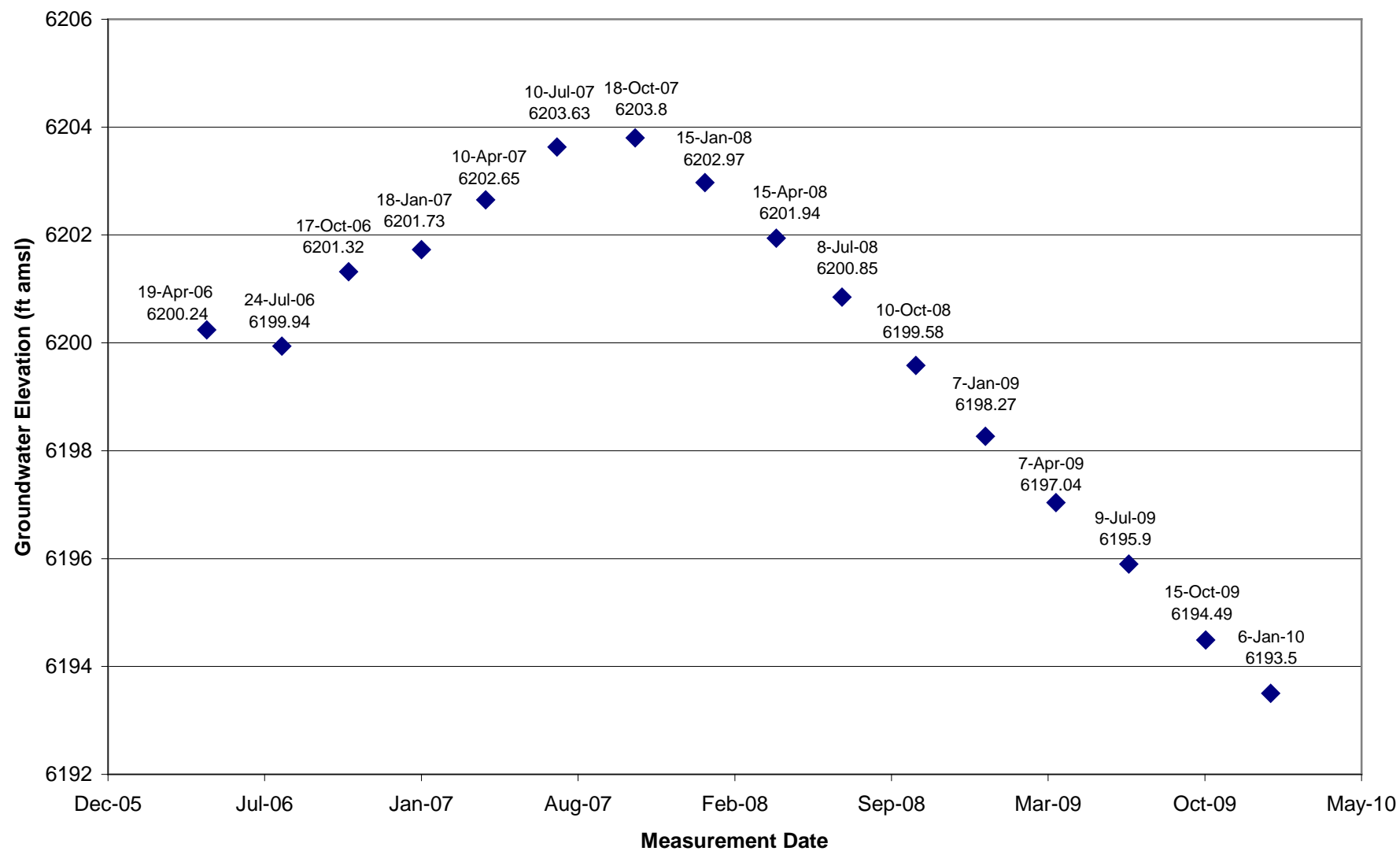
EPA 314.0: U.S. Environmental Protection Agency, November 1999, "Perchlorate in Drinking Water Using Ion Chromatography," EPA 815/R-00-014 (EPA November 1999).

EPA 6850M: U.S. Environmental Protection Agency, April 2005, "Perchlorate in Water, Soils, and Solids Using High Performance Liquid Chromatography/Electrospray Ionization/Mass Spectrometry (HPLC/ESI/MS)," draft, Method 6850 (EPA April 2005).

**Figure 2. Perchlorate Concentrations ( $\mu\text{g/L}$ ) over Time in CYN-MW6**



**Figure 3. Groundwater Elevations over Time at CYN-MW6**



**Table 4**  
**Perchlorate Screening Groundwater Monitoring**  
**Field Water Quality Measurements<sup>a</sup>, First Quarter of CY2010**

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (µmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
CYN-MW6	03-Mar-10	16.27	1302	231.2	6.92	1.74	18.0	1.76
LWDS-MW1	17-Feb-10	17.59	729	234.7	7.19	0.69	75.6	7.31
TA1-W-03	26-Feb-10	14.20	1626	209.6	7.50	0.74	77.3	7.89
TA1-W-06	11-Jan-10	17.39	826	215.1	7.36	0.52	86.1	8.20
TA1-W-08	12-Jan-10	17.33	1841	218.9	7.21	0.46	78.6	7.49
TA2-W-01	13-Jan-10	16.95	603	244.8	7.40	1.88	83.5	8.07
TA2-W-27	14-Jan-10	16.00	799	226.5	7.36	0.40	72.6	7.00

**Notes**

<sup>a</sup> Field measurements made immediately before the groundwater sample was collected.  
°C degrees Celsius.  
% Sat percent saturation.  
µmho/cm micromhos per centimeter.  
mg/L milligrams per liter.  
mV millivolts.  
NTU nephelometric turbidity units.  
pH potential of hydrogen (negative logarithm of the hydrogen ion concentration).

- A human health risk assessment has been performed to evaluate the potential for adverse health effects from the concentrations of perchlorate detected in CYN-MW6 groundwater. The maximum concentration of perchlorate in CYN-MW6 to date (8.93 µg/L) was used in the assessment. The calculated HQ of 0.35 is less than the NMED target level of a Hazard Index (the sum of all HQs) of 1.0 (NMED June 2006 and SNL/NM March 2008).

DOE/Sandia will continue semiannual monitoring of perchlorate in CYN-MW6 and quarterly monitoring of perchlorate in TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27. No perchlorate has been detected during four consecutive quarterly sampling events at LWDS-MW1, so this well will be removed from the perchlorate screening well network.

Based on recent requirements (NMED April 2009), DOE/Sandia has prepared and submitted a work plan that describes efforts to characterize the nature and extent of the perchlorate contamination in soils and groundwater in the BSG study area. In February 2010 NMED approved the work plan (NMED February 2010) and the activities described in the work plan will be implemented during the summer of 2010.

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## **Appendix A**

### **Analytical Laboratory Certificates of Analysis for the Perchlorate Data**

Internal Lab

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: March 31, 2010

Client Sample ID: 088180-020  
Sample ID: 248343007  
Matrix: AQUEOUS  
Collect Date: 03-MAR-10 08:54  
Receive Date: 04-MAR-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: CYN-MW6  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	J	0.00459	0.004	0.012	mg/L	1	MAR103/23/10	2058	962516	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>BSG</u>	Project No.:
Well I.D.: <u>CYN-MW6</u>	Date: <u>3-2-10</u>   <u>3-3-10</u>
Weather: <u>Clear &amp; Cold</u>	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>163'</u>	

### PURGE MEASUREMENTS

Done 4/

Depth to Water (FT)	Time 24 hr	Vol. L gls	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
<u>148.21</u>	<u>0802</u>	<u>/</u>	<u>Start</u>							
<u>153.88</u>	<u>0818</u>	<u>5</u>	<u>15.53</u>	<u>1354</u>	<u>273.5</u>	<u>6.86</u>		<u>0.57</u>	<u>14.3</u>	<u>1.42</u>
<u>156.74</u>	<u>0828</u>	<u>10</u>	<u>15.25</u>	<u>1346</u>	<u>258.1</u>	<u>6.93</u>		<u>1.12</u>	<u>13.3</u>	<u>1.33</u>
<u>159.57</u>	<u>0838</u>	<u>15</u>	<u>15.16</u>	<u>1351</u>	<u>248.9</u>	<u>6.94</u>		<u>1.73</u>	<u>12.5</u>	<u>1.25</u>
<u>162.41</u>	<u>0848</u>	<u>20</u>	<u>14.89</u>	<u>1340</u>	<u>236.8</u>	<u>6.94</u>		<u>2.75</u>	<u>11.9</u>	<u>1.20</u>
<u>163.03</u>	<u>0851</u>	<u>21</u>	<u>14.83</u>	<u>1339</u>	<u>234.2</u>	<u>6.95</u>		<u>4.50</u>	<u>12.5</u>	<u>1.24</u>
<u>163.04</u>	<u>0851</u>	<u>24</u>	<u>Well DRY</u>							
		<u>26</u>								
		<u>28</u>								
<u>148.21</u>	<u>0827</u>	<u>/</u>	<u>START</u>							
<u>151.88</u>	<u>0839</u>	<u>2</u>	<u>16.63</u>	<u>1309</u>	<u>237.3</u>	<u>6.93</u>		<u>1.42</u>	<u>18.3</u>	<u>1.77</u>
<u>153.27</u>	<u>0844</u>	<u>4</u>	<u>16.46</u>	<u>1312</u>	<u>233.9</u>	<u>6.92</u>		<u>1.64</u>	<u>17.6</u>	<u>1.72</u>
<u>154.53</u>	<u>0849</u>	<u>6</u>	<u>16.27</u>	<u>1302</u>	<u>231.2</u>	<u>6.92</u>		<u>1.74</u>	<u>18.0</u>	<u>1.76</u>
	<u>0850</u>	<u>/</u>	<u>SAMPLING</u>							
COC number(s): <u>612580</u>										
Sample number(s): <u>088180</u>										

### Purge Volume Calculations

#### Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

#### Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

~ 4.00 gal purged  
prior to measurement.  
0809  
3-3-10 0835





# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: March 13, 2010

Client Sample ID: 088141-020  
Sample ID: 247072014  
Matrix: AQUEOUS  
Collect Date: 17-FEB-10 08:32  
Receive Date: 18-FEB-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: LWDS-MW1  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR103/04/10	1531	959791	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

## ATTACHMENT A

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE  
COLLECTION

80% = 503.35'

Project Name: <u>TAV-GWM</u>	Project No.:
Well I.D.: <u>LWDS-MW 1</u>	Date: <u>2-16-10</u>   <u>2-17-10</u>
Weather	
Method: <u>X</u> Portable pump <u>      </u> Dedicated pump	Pump depth: <u>513.5'</u>

## PURGE MEASUREMENTS

Done/L

Depth to Water (FT)	Time 24 hr	Vol. L (gls)	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
<u>499.23</u>	<u>0802</u>	<u>/</u>	<u>START</u>							
<u>507.89</u>	<u>0827</u>	<u>4</u>	<u>17.69</u>	<u>710</u>	<u>228.8</u>	<u>7.20</u>		<u>0.40</u>	<u>79.1</u>	<u>7.53</u>
<u>509.79</u>	<u>0833</u>	<u>6</u>	<u>18.05</u>	<u>701</u>	<u>225.8</u>	<u>7.23</u>		<u>0.53</u>	<u>81.76.9</u>	<u>7.30</u>
<u>511.79</u>	<u>0839</u>	<u>8</u>	<u>17.90</u>	<u>703</u>	<u>225.1</u>	<u>7.24</u>		<u>0.66</u>	<u>79.1</u>	<u>7.49</u>
<u>512.11</u>	<u>0842</u>	<u>9</u>	<u>17.65</u>	<u>708</u>	<u>224.6</u>	<u>7.24</u>		<u>0.67</u>	<u>78.6</u>	<u>7.48</u>
	<u>0842</u>	<u>/</u>	<u>Well DRY</u>							
<u>499.29</u>	<u>0803</u>	<u>/</u>	<u>START</u>							
<u>505.00</u>	<u>0818</u>	<u>1</u>	<u>16.53</u>	<u>724</u>	<u>233.3</u>	<u>7.14</u>		<u>0.23</u>	<u>82.7</u>	<u>8.04</u>
<u>505.97</u>	<u>0822</u>	<u>2</u>	<u>17.16</u>	<u>727</u>	<u>233.3</u>	<u>7.16</u>		<u>0.29</u>	<u>76.5</u>	<u>7.36</u>
<u>506.65</u>	<u>0825</u>	<u>3</u>	<u>17.45</u>	<u>729</u>	<u>233.6</u>	<u>7.18</u>		<u>0.56</u>	<u>76.8</u>	<u>7.34</u>
<u>507.60</u>	<u>0829</u>	<u>4</u>	<u>17.59</u>	<u>729</u>	<u>234.7</u>	<u>7.19</u>		<u>0.69</u>	<u>75.6</u>	<u>7.31</u>
	<u>0830</u>	<u>/</u>	<u>SAMPLE</u>							
COC number(s): <u>612560</u>										
Sample number(s): <u>088141</u>										

## Purge Volume Calculations

## Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

## Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

~4.00 gals purged  
 from tubing  
0816  
2-17-10 0816

## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

**Internal Lab**

Page 1 of 1

[illegible]

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## Certificate of Analysis

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

Report Date: March 31, 2010

Client Sample ID: 088220-020  
Sample ID: 248347001  
Matrix: AQUEOUS  
Collect Date: 26-FEB-10 09:30  
Receive Date: 02-MAR-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA1-W-03  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR103/23/10	2158	962516	1	

### **The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

## ATTACHMENT A

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE  
COLLECTION

Project Name: <b>XXXXXXXX TAG</b>	Project No.:
Well I.D.: <b>TA1-W-03</b>	Date: <b>02-26-2010</b>
Weather <b>Clear &amp; Cold</b>	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump	Pump depth: <b>359'</b>

## PURGE MEASUREMENTS

Depth to Water (FT)	Time 24 hr	Vol. L gls	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
346.75	0758	<del>5</del>	<del>13.45</del>	<del>1622</del>	<del>222.3</del>	<del>7.55</del>				
347.98	0824	5	13.45	1622	222.3	7.55		1.35	76.6	7.95
348.09	0838	10	13.58	1622	207.5	7.56		1.20	73.2	7.57
348.19	0851	15	14.06	1624	207.2	7.52		1.08	77.5	7.94
348.26	0904	20	14.18	1624	207.4	7.51		0.99	76.7	7.83
348.27	0909	22	14.13	1623	208.5	7.50		0.94	77.5	7.92
348.30	0915	24	14.08	1623	208.9	7.51		0.93	77.5	7.93
348.30	0920	26	14.06	1624	209.2	7.50		0.84	77.4	7.92
348.30	0926	28	14.15	1625	209.9	7.50		0.77	77.5	7.92
348.30	0931	30	14.20	1626	209.6	7.50		0.74	77.3	7.89
	0932	<del>32</del>	<del>14.20</del>	<del>1626</del>	<del>209.6</del>	<del>7.50</del>				
COC number(s): <b>612604</b>										
Sample number(s): <b>088220</b>										

## Purge Volume Calculations

## Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

## Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

2 4.00 gal. purged  
prior measurement.  
0811

Internal Lab

## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

[illegible]

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1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C, Groundwater Monitoring

Report Date: February 1, 2010

Client Sample ID: 088014-020  
Sample ID: 244469001  
Matrix: AQUEOUS  
Collect Date: 11-JAN-10 10:11  
Receive Date: 12-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA1-W-06  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101/19/10	1411	942144	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

## PURGE MEASUREMENTS

### Purge Volume Calculations

~4.00 gals purged  
from tubing  
0832

Well Diameter

2" well:  $0.16 \text{ gal/ft} \times \text{_____ (height of water column)} = \text{_____ gallons}$

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

Tubing Diameter

1/4" OD: 2.4 mL/K (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 m/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters

1/2" ODI: 2 1.6 mV/in X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters



## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

[illegible]

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1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C, Groundwater Monitoring

Report Date: February 1, 2010

Client Sample ID: 088015-020  
Sample ID: 244469002  
Matrix: AQUEOUS  
Collect Date: 12-JAN-10 09:56  
Receive Date: 13-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA1-W-08  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101/19/10	1522	942144	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <b>TAG</b>	Project No.:
Well I.D.: <b>TA1-W-08</b>	Date: <b>1-12-10</b>
Weather	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump	
Pump depth: <b>321'</b>	

### PURGE MEASUREMENTS

**DOM/L**

Depth to Water (FT)	Time 24 hr	Vol. L gals	Temp °C	Ec µmho	ORP MV	pH	Flow L gals	Turb NTU	DO %	Color and appearance
<b>308.71</b>	<b>0803</b>	<b>START</b>								
<b>308.71</b>	<b>0832</b>	<b>5</b>	<b>14.86</b>	<b>1837</b>	<b>236.7</b>	<b>7.09</b>		<b>4.63</b>	<b>76.6</b>	<b>7.70</b>
<b>308.71</b>	<b>0848</b>	<b>10</b>	<b>15.50</b>	<b>1836</b>	<b>225.9</b>	<b>7.18</b>		<b>8.41</b>	<b>77.2</b>	<b>7.68</b>
<b>308.71</b>	<b>0905</b>	<b>15</b>	<b>16.47</b>	<b>1845</b>	<b>220.6</b>	<b>7.20</b>		<b>2.76</b>	<b>78.5</b>	<b>7.63</b>
<b>308.71</b>	<b>0924</b>	<b>20</b>	<b>16.90</b>	<b>1842</b>	<b>217.5</b>	<b>7.20</b>		<b>0.97</b>	<b>78.9</b>	<b>7.60</b>
<b>308.71</b>	<b>0933</b>	<b>22</b>	<b>16.95</b>	<b>1841</b>	<b>217.7</b>	<b>7.21</b>		<b>0.80</b>	<b>79.2</b>	<b>7.62</b>
<b>308.71</b>	<b>0942</b>	<b>24</b>	<b>16.98</b>	<b>1840</b>	<b>218.4</b>	<b>7.21</b>		<b>0.58</b>	<b>78.8</b>	<b>7.58</b>
<b>308.71</b>	<b>0951</b>	<b>26</b>	<b>17.38</b>	<b>1841</b>	<b>218.8</b>	<b>7.21</b>		<b>0.48</b>	<b>79.8</b>	<b>7.61</b>
<b>308.71</b>	<b>0956</b>	<b>27</b>	<b>17.33</b>	<b>1841</b>	<b>218.9</b>	<b>7.21</b>		<b>0.46</b>	<b>78.6</b>	<b>7.49</b>
	<b>0956</b>	<b>SAMPLING</b>								
COC number(s): <b>612514</b>										
Sample number(s): <b>088015</b>										

### Purge Volume Calculations

#### Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

#### Tubing Diameter

1/4" OD: 2.4 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 21.6 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

*~ 4.00 gals purged from tubing 0817*

Internal Lab

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

Report Date: February 1, 2010

Client Sample ID: 088016-020  
Sample ID: 244469005  
Matrix: AQUEOUS  
Collect Date: 13-JAN-10 10:07  
Receive Date: 14-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA2-W-01  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101/19/10	1546	942144	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# ATTACHMENT A

FIELD INVESTIGATIVE LOG FOR GROUNDWATER SAMPLE  
COLLECTION

333'

0829 restart

DOM/L

COC number(s): 612515

Sample number(s): 088016

~4.00 gals purged  
from tubing  
0840

Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

ing Diameter

1/4" OD: 2.4 mL/n X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 mL/n X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 21.6 mL/n X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

\* Hit sediment @ bottom  
of well ~ 334'; pulled  
pump cleaned and  
lowered again  
restart  
@ 0629

AL4/99/MISdoc/SNL\_FOP9448\_REV2

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. <u>NA</u>		SMO Use		AR/COC		612517			
Dept. No./Mail Stop: 4133/1126		Date Samples Shipped: 1/14/2010		Project/Task No. 125778.10.11.01		Waste Characterization			
Project/Task Manager: Don Schofield		Client/Mail No. 109203		SMO Authorization: <u>Edie Kent</u>		-Send preliminary/copy report to:			
Project Name: TAG-GWM		Lab Contact: Edie Kent/803-556-8171		Contract #: PO 691436					
Record Center Code: ER/1306/DAT		Lab Destination: GEL		Released by COC No.:					
Logbook Ref. No.: NA		SMO Contact/Phone: Pam Puissant/505-844-3185		Validation Required					
Service Order No.: CFO# 010-10		Send Report to SMO: Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable)					
Location		Tech Area		P.O. Box 5800 MS 0154					
Building		Room		Albuquerque, NM 87185-0154					
Sample No. - Fraction		ER Sample ID or Sample Location Detail		Parameter & Method Requested		Lab Sample ID			
088020-001	TA2-W-27	297	MA	0114101013	GW	G	SA	VOC (SW846/8260B)	007
088020-018	TA2-W-27	297		0114101015	GW	P	SA	NP (353.2)	008
088020-020	TA2-W-27	297		0114101016	GW	P	SA	Perchlorate (314.0)	009
088021-001	TA2-W-27	297		0114101013	GW	G	DU	VOC (SW846/8260B)	010
088021-018	TA2-W-27	297		0114101015	GW	P	DU	NP (353.2)	011
088021-020	TA2-W-27	297		0114101016	GW	P	DU	Perchlorate (314.0)	012
088022-001	TAG-TB3	NA		0114101013	DIW	G	TB	VOC (SW846/8260B)	013
RMMA		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Ref. No.					
Sample Disposal		Return to Client <input checked="" type="checkbox"/> Disposal by lab							
Turnaround Time		7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day <input checked="" type="checkbox"/>							
Return Samples By:		Negotiated TAT		Special Instructions/QC Requirements		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>		Abnormal Conditions on Receipt	
Name		Signature		Init		Company/Organization/Phone/Cellular		Level D Package <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Robert Lynch		<u>Robert Lynch</u>		PL		Weston/4133/844-4013/250-7090		*Send report to:	
Alfred Santillanes		<u>Alfred Santillanes</u>		PL		Weston/4133/844-5130/228-0710		Tim Jackson/ORG. 4133/MS 0756/ 284-2547	
William J. Gibson		<u>William J. Gibson</u>		PL		Weston/4133/844-4013/239-7367		*Please list as separate report.	
Sample Team Members		Date		Time		Date		Time	
1. Relinquished by <u>Alfred Santillanes</u>		Org. 4133		Date 1/14/2010		Time 1038		4. Relinquished by	
1. Received by <u>Don Schofield</u>		Org. 4133		Date 1/14/2010		Time 1038		4. Received by	
2. Relinquished by <u>Don Schofield</u>		Org. 4133		Date 1/14/2010		Time 1200		5. Relinquished by	
2. Received by <u>Don Schofield</u>		Org. 4133		Date 1/14/2010		Time 0555		5. Received by	
3. Relinquished by <u>Don Schofield</u>		Org. 4133		Date 1/14/2010		Time 0555		6. Relinquished by	
3. Received by <u>Don Schofield</u>		Org. 4133		Date 1/14/2010		Time 0555		6. Received by	

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1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C, Groundwater Monitoring

Report Date: February 1, 2010

Client Sample ID: 088020-020  
Sample ID: 244469009  
Matrix: AQUEOUS  
Collect Date: 14-JAN-10 10:16  
Receive Date: 15-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA2-W-27  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR10	1/19/10	1610	942144	1

### The following Analytical Methods were performed

Method	Description	Analyst	Comments
1	EPA 314.0 DOE-AL		



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1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C, Groundwater Monitoring

Report Date: February 1, 2010

Client Sample ID: 088021-020  
Sample ID: 244469012  
Matrix: AQUEOUS  
Collect Date: 14-JAN-10 10:16  
Receive Date: 15-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA2-W-27  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101	19/10	1633	942144	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

THE NATIONAL ARCHIVES  
COLLECTION

Project Name:	TAG	Project No.:	
Well I.D.:	TA2-W-27	Date:	1-14-10
Weather	cloudy & Damp		
Method:	<input checked="" type="checkbox"/> Portable pump	<input type="checkbox"/> Dedicated pump	Pump depth: 297'

## PURGE MEASUREMENTS

DOMA/L

Depth to Water (FT)	Time 24 hr	Vol. L <u>gls</u>	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
277.53	0803			Start						
278.69	0838	10	15.45	802	237.7	7.33		0.93	89.6	8.94
278.45	0852	15	14.96	801	233.6	7.35		0.72	89.4	8.96
278.44	0906	20	15.18	801	231.5	7.35		0.76	87.5	8.77
278.44	0921	25	15.47	802	229.8	7.35		0.73	90.7	9.04
278.43	0936	30	15.56	802	228.7	7.36		0.66	89.0	8.85
278.42	0952	35	15.97	800	227.7	7.36		0.67	67.0	6.60
278.41	0958	37	15.88	800	227.6	7.35		0.56	70.1	6.68
278.40	1006	39	16.15	800	226.6	7.35		0.39	71.6	6.70
278.40	1013	41	16.00	799	226.5	7.36		0.40	72.6	7.00
	1013	Sampling								
COC number(s):		612517								
Sample number(s):		088020, 088021								

### Purge Volume Calculations

~ 4.00 gal. purged  
prior to measurements  
0815

## Well Diameter

Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

### Tubing Diameter

ing Diameter

1/4" OD: 2.4 mV/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters

3/8" OD: 9.7 mV/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters

1/2" OD: 21.6 mV/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters

## **Appendix B**

### **Data Validation Sample Findings Summary Sheets for the Perchlorate Data**

## Memorandum

Date: February 23, 2010

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL  
Site: TAG GWM  
AR/COC: 612513, 612514, 612515, 912516, and 612517  
SDG: 244469  
Laboratory: GEL  
Project/Task: 125778.10.11.01  
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 2.

### Summary

Six samples were prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate). Four samples were prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. Nitrate/Nitrate was detected in the method blank (MB) at a concentration  $\geq$  the method detection limit (MDL) but  $<$  the practical quantitation limit (PQL). The nitrate/nitrate result for sample 244469-015 was a detect  $<5X$  the MB concentration and will be **qualified “0.061U,B”** at  $5X$  the value of the MB (mg/L). The other associated sample results were detects  $>5X$  the MB result and will not be qualified.

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

### Holding Times and Preservation

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

### Calibration

All initial and continuing calibration QC acceptance criteria were met.

### **Blanks**

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

#### **Nitrate/Nitrite:**

Nitrate/Nitrite was detected in the equipment blank (EB) associated with samples -008 and -011 at a concentration > the MDL but < the PQL. However, it should be noted that the nitrate/nitrite result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the field sample results.

### **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. The samples did not required dilution except as follows.

#### **Nitrate/Nitrite:**

Samples -004, -008, and -011 were diluted 10X for nitrate/nitrite due to high concentrations for this analysis. Sample -015 was diluted 5X for nitrate/nitrite was due to matrix interference 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 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. It should be noted that the EB on AR/COC# 612516 is associated with the samples on AR/COC# 612517.

No other specific issues that affect data quality were identified.

Data Type: Organic, Gen Chem

**Validated By:**

Date: 02/23/10

## **Memorandum**

DATE: March 28, 2010

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL  
Site: TAV GWM  
AR/COC: 612557, 612558, 612559, and 612560  
SDG: 247072  
Laboratory: GEL  
Project/Task No: 125778.10.11.01

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 EPA 314.0 (perchlorate) and EPA353.2 (nitrate/nitrite by Cd reduction). No problems were identified with the data package that result in the qualification of data.

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

### **Holding Times/Preservation**

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

### **Calibration**

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

### **Blanks**

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

### **Laboratory Control Sample (LCS)**

All Analyses: All LCS QC acceptance criteria were met.

### **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

All Analyses: All MS (PS) QC acceptance criteria were met. No MSD (PSD) analyses were performed. The replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

### **Replicates**

All Analyses: All replicate QC acceptance criteria were met.

### **Detection Limits/Dilutions**

Perchlorate Analysis: All detection limits were properly reported. No samples required dilution.

Nitrate/nitrite Analysis: All detection limits were properly reported. Samples 247072-002, -008, -010, and -013 were diluted 25X for nitrate/nitrite due to high concentration of the target analyte and sample -006 was diluted 5X due to matrix inference. 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.

### **Other QC**

All Analyses: No field blanks (FBs) were submitted on the AR/COCs. The relative percent difference (RPD) of the field duplicates (FD) (samples -010) was  $<20\%$ . No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified that affect data quality.



**Site: TAV GWM**

AR/COC: 612557, 612558, 612559, and 612560

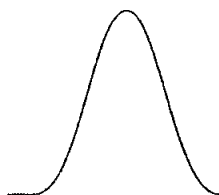
**Organic, Gen Chem**

[illegible]

**Validated By:**

David Schwab

Date: 03/28/10



## **Memorandum**

Date: April 29, 2010  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Burn Site GWM  
AR/COC: 612579 and 612580  
SDG: 248343  
Laboratory: GEL  
Project/Task: 125778.10.11.01  
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 2.

### **Summary**

Two samples were prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction). One sample was prepared and analyzed with accepted procedures using method 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 QC acceptance criteria were met.

### **Blanks**

No target analytes were detected in the blanks.

**Laboratory Control Sample (LCS)**

All LCS recoveries met QC acceptance criteria.

**Matrix Spike (MS)**

All MS recoveries met QC acceptance criteria.

**Laboratory Replicate**

The replicate met all QC acceptance criteria.

**Detection Limits/Dilutions**

All detection limits were properly reported. Sample 248343-003 was diluted 10X and sample - 006 was diluted 25X 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**

No other specific issues that affect data quality were identified.





## **Memorandum**

Date: April 8, 2010  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Tijeras Arroyo Assessment GWM  
AR/COC: 612604  
SDG: 248347  
Laboratory: GEL  
Project/Task: 125778.10.11.01  
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 2.

### **Summary**

One sample was prepared and analyzed with accepted procedures using method 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 sample was analyzed within the prescribed holding times and properly preserved.

### **Calibration**

All initial and continuing calibration QC acceptance criteria were met.

### **Blanks**

No target analytes were detected in the blanks.

**Laboratory Control Sample (LCS)**

All LCS recoveries met QC acceptance criteria.

**Matrix Spike (MS)**

All MS recoveries met QC acceptance criteria. It should be noted that the MS analysis was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

**Laboratory Replicate**

The replicate met all QC acceptance criteria. It should be noted that the laboratory replicate analysis was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

**Detection Limits/Dilutions**

All detection limits were properly reported. The sample did not required dilution.

**Other QC**

No other specific issues that affect data quality were identified.

Data Type: Gen Chem

[illegible]

Kevin A. Lambert

Date: 04/08/10

Kenneth Lambert

## Appendix A

### Analytical Laboratory Certificates of Analysis for the Perchlorate Data



Internal Lab

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: March 31, 2010

Client Sample ID: 088180-020  
Sample ID: 248343007  
Matrix: AQUEOUS  
Collect Date: 03-MAR-10 08:54  
Receive Date: 04-MAR-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: CYN-MW6  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	J	0.00459	0.004	0.012	mg/L	1	MAR103/23/10	2058	962516	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>BSG</u>	Project No.:
Well I.D.: <u>CYN-MW6</u>	Date: <u>3-2-10</u>   <u>3-3-10</u>
Weather: <u>Clear &amp; Cold</u>	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>163'</u>	

### PURGE MEASUREMENTS

Done 4/

Depth to Water (FT)	Time 24 hr	Vol. L gls	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
<u>148.21</u>	<u>0802</u>	<u>/</u>	<u>Start</u>							
<u>153.88</u>	<u>0818</u>	<u>5</u>	<u>15.53</u>	<u>1354</u>	<u>273.5</u>	<u>6.86</u>		<u>0.57</u>	<u>14.3</u>	<u>1.42</u>
<u>156.74</u>	<u>0828</u>	<u>10</u>	<u>15.25</u>	<u>1346</u>	<u>258.1</u>	<u>6.93</u>		<u>1.12</u>	<u>13.3</u>	<u>1.33</u>
<u>159.57</u>	<u>0838</u>	<u>15</u>	<u>15.16</u>	<u>1351</u>	<u>248.9</u>	<u>6.94</u>		<u>1.73</u>	<u>12.5</u>	<u>1.25</u>
<u>162.41</u>	<u>0848</u>	<u>20</u>	<u>14.89</u>	<u>1340</u>	<u>236.8</u>	<u>6.94</u>		<u>2.75</u>	<u>11.9</u>	<u>1.20</u>
<u>163.03</u>	<u>0851</u>	<u>21</u>	<u>14.83</u>	<u>1339</u>	<u>234.2</u>	<u>6.95</u>		<u>4.50</u>	<u>12.5</u>	<u>1.24</u>
<u>163.04</u>	<u>0851</u>	<u>24</u>	<u>Well DRY</u>							
		<u>26</u>								
		<u>28</u>								
<u>148.21</u>	<u>0827</u>	<u>/</u>	<u>START</u>							
<u>151.88</u>	<u>0839</u>	<u>2</u>	<u>16.63</u>	<u>1309</u>	<u>237.3</u>	<u>6.93</u>		<u>1.42</u>	<u>18.3</u>	<u>1.77</u>
<u>153.27</u>	<u>0844</u>	<u>4</u>	<u>16.46</u>	<u>1312</u>	<u>233.9</u>	<u>6.92</u>		<u>1.64</u>	<u>17.6</u>	<u>1.72</u>
<u>154.53</u>	<u>0849</u>	<u>6</u>	<u>16.27</u>	<u>1302</u>	<u>231.2</u>	<u>6.92</u>		<u>1.74</u>	<u>18.0</u>	<u>1.76</u>
	<u>0850</u>	<u>/</u>	<u>SAMPLING</u>							
COC number(s): <u>612580</u>										
Sample number(s): <u>088180</u>										

### Purge Volume Calculations

#### Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

#### Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

~ 4.00 gal purged  
prior to measurement.  
0809  
3-3-10 0835



# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Report Date: March 13, 2010

Client Sample ID: 088141-020  
Sample ID: 247072014  
Matrix: AQUEOUS  
Collect Date: 17-FEB-10 08:32  
Receive Date: 18-FEB-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003

Client Desc.: LWDS-MW1  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR103/04/10	1531	959791	1	

### The following Analytical Methods were performed

Method	Description	Analyst	Comments
1	EPA 314.0 DOE-AL		

## ATTACHMENT A

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE  
COLLECTION

80% = 503.35'

Project Name: TAV-GWM	Project No.:
Well I.D.: LWDS-MW 1	Date: 2-16-10   2-17-10
Weather	
Method: <u>X</u> Portable pump _____ Dedicated pump	Pump depth: 513.5'

## PURGE MEASUREMENTS

Done/L

Depth to Water (FT)	Time 24 hr	Vol. L (gls)	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
499.23	0802	<del>START</del>								
507.89	0827	4	17.69	710	228.8	7.20		0.40	79.1	7.53
509.79	0833	6	18.05	701	225.8	7.23		0.53	77.9	7.30
511.79	0839	8	17.90	703	225.1	7.24		0.66	79.1	7.49
512.11	0842	9	17.65	708	224.6	7.24		0.67	78.6	7.48
	0842	<del>Well DRY</del>								
499.29	0803	<del>START</del>								
505.00	0818	1	16.53	724	233.3	7.14		0.23	82.7	8.04
505.97	0822	2	17.16	727	233.3	7.16		0.29	76.5	7.36
506.65	0825	3	17.45	729	233.6	7.18		0.56	76.8	7.34
507.60	0829	4	17.59	729	234.7	7.19		0.69	75.6	7.31
	0830	<del>SAMPLE</del>								
COC number(s): 612560										
Sample number(s): 088141										

## Purge Volume Calculations

## Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

## Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

~4.00 gals purged  
 from tubing  
 0816  
 2-17-10 0816

[illegible]

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## Certificate of Analysis

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

Report Date: March 31, 2010

Client Sample ID: 088220-020  
Sample ID: 248347001  
Matrix: AQUEOUS  
Collect Date: 26-FEB-10 09:30  
Receive Date: 02-MAR-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA1-W-03  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR103/23/10	2158	962516	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	



## ATTACHMENT A

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE  
COLLECTION

Project Name: <b>XXXXXXXX TAG</b>	Project No.:
Well I.D.: <b>TA1-W-03</b>	Date: <b>02-26-2010</b>
Weather <b>Clear &amp; Cold</b>	
Method: <b>X</b> Portable pump _____ Dedicated pump _____	Pump depth: <b>359'</b>

## PURGE MEASUREMENTS

Depth to Water (FT)	Time 24 hr	Vol. L gls	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
346.75	0758	<del>5</del>	<del>13.45</del>	<del>1622</del>	<del>222.3</del>	<del>7.55</del>				
347.98	0824	5	13.45	1622	222.3	7.55		1.35	76.6	7.95
348.09	0838	10	13.58	1622	207.5	7.56		1.20	73.2	7.57
348.19	0851	15	14.06	1624	207.2	7.52		1.08	77.5	7.94
348.26	0904	20	14.18	1624	207.4	7.51		0.99	76.7	7.83
348.27	0909	22	14.13	1623	208.5	7.50		0.94	77.5	7.92
348.30	0915	24	14.08	1623	208.9	7.51		0.93	77.5	7.93
348.30	0920	26	14.06	1624	209.2	7.50		0.84	77.4	7.92
348.30	0926	28	14.15	1625	209.9	7.50		0.77	77.5	7.92
348.30	0931	30	14.20	1626	209.6	7.50		0.74	77.3	7.89
	0932	<del>32</del>	<del>14.20</del>	<del>1626</del>	<del>209.6</del>	<del>7.50</del>				
COC number(s): <b>612604</b>										
Sample number(s): <b>088220</b>										

## Purge Volume Calculations

## Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

## Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

2 4.00 gal. purged  
prior measurement.  
0811

Internal Lab

## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

[illegible]

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: February 1, 2010

Client Sample ID: 088014-020  
Sample ID: 244469001  
Matrix: AQUEOUS  
Collect Date: 11-JAN-10 10:11  
Receive Date: 12-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA1-W-06  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101/19/10	1411	942144	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

Project Name: TAG	Project No.:
Well I.D.: TAL-W-06	Date: 1-11-10
Weather	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump	Pump depth: 319'

DOING/L

### Purge Volume Calculations

~4.00 gals purged  
from tubing  
0832

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

1/4" OD: 2.4 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 9.7 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 21.6 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

[illegible]

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Report Date: February 1, 2010

Client Sample ID: 088015-020  
Sample ID: 244469002  
Matrix: AQUEOUS  
Collect Date: 12-JAN-10 09:56  
Receive Date: 13-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
  
Client Desc.: TA1-W-08  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101/19/10	1522	942144	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <b>TAG</b>	Project No.:
Well I.D.: <b>TA1-W-08</b>	Date: <b>1-12-10</b>
Weather	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump	Pump depth: <b>321'</b>

### PURGE MEASUREMENTS

**DOM/L**

Depth to Water (FT)	Time 24 hr	Vol. L gals	Temp °C	Ec µmho	ORP MV	pH	Flow L gals	Turb NTU	DO %	Color and appearance
<b>308.71</b>	<b>0803</b>	<b>START</b>								
<b>308.71</b>	<b>0832</b>	<b>5</b>	<b>14.86</b>	<b>1837</b>	<b>236.7</b>	<b>7.09</b>		<b>4.63</b>	<b>76.6</b>	<b>7.70</b>
<b>308.71</b>	<b>0848</b>	<b>10</b>	<b>15.50</b>	<b>1836</b>	<b>225.9</b>	<b>7.18</b>		<b>8.41</b>	<b>77.2</b>	<b>7.68</b>
<b>308.71</b>	<b>0905</b>	<b>15</b>	<b>16.47</b>	<b>1845</b>	<b>220.6</b>	<b>7.20</b>		<b>2.76</b>	<b>78.5</b>	<b>7.63</b>
<b>308.71</b>	<b>0924</b>	<b>20</b>	<b>16.90</b>	<b>1842</b>	<b>217.5</b>	<b>7.20</b>		<b>0.97</b>	<b>78.9</b>	<b>7.60</b>
<b>308.71</b>	<b>0933</b>	<b>22</b>	<b>16.95</b>	<b>1841</b>	<b>217.7</b>	<b>7.21</b>		<b>0.80</b>	<b>79.2</b>	<b>7.62</b>
<b>308.71</b>	<b>0942</b>	<b>24</b>	<b>16.98</b>	<b>1840</b>	<b>218.4</b>	<b>7.21</b>		<b>0.58</b>	<b>78.8</b>	<b>7.58</b>
<b>308.71</b>	<b>0951</b>	<b>26</b>	<b>17.38</b>	<b>1841</b>	<b>218.8</b>	<b>7.21</b>		<b>0.48</b>	<b>79.8</b>	<b>7.61</b>
<b>308.71</b>	<b>0956</b>	<b>27</b>	<b>17.33</b>	<b>1841</b>	<b>218.9</b>	<b>7.21</b>		<b>0.46</b>	<b>78.6</b>	<b>7.49</b>
	<b>0956</b>	<b>SAMPLING</b>								
COC number(s): <b>612514</b>										
Sample number(s): <b>088015</b>										

### Purge Volume Calculations

#### Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

#### Tubing Diameter

1/4" OD: 2.4 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 21.6 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

*~ 4.00 gals purged from tubing 0817*

Internal Lab

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[illegible]



# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Report Date: February 1, 2010

Client Sample ID: 088016-020  
Sample ID: 244469005  
Matrix: AQUEOUS  
Collect Date: 13-JAN-10 10:07  
Receive Date: 14-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA2-W-01  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101/19/10	1546	942144	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

FIELD INVESTIGATIVE LOG FOR GROUNDWATER SAMPLE  
COLLECTION

Project Name: TAG		Project No.:	
Well I.D.: TA2-W-01		Date: 1-13-10	
Weather			
Method: <input checked="" type="checkbox"/> Portable pump		Dedicated pump	
		Pump depth: 334'	

333'

## PURGE MEASUREMENTS

0829 restart

DOM/L

Depth to Water (FT)	Time 24 hr	Vol. L gls	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
325.23	0805	/	START							
326.86	0859	5	13.99	574	258.3	7.35		21.6	78.7	8.09
327.16	0915	10	15.59	595	252.5	7.41		21.0	81.2	8.08
327.40	0932	15	16.42	601	248.3	7.40		7.18	75.2	7.34
327.46	0940	17	16.53	603	247.4	7.40		5.65	80.1	7.71
327.51	0948	19	16.71	602	246.2	7.40		3.52	82.6	8.03
327.51	0952	20	16.86	603	245.2	7.41		1.95	82.8	8.01
327.51	0956	21	16.90	602	245.2	7.41		1.93	81.6	7.78
327.51	1001	22	16.98	603	244.9	7.40		1.90	83.4	8.02
327.51	1005	23	16.95	603	244.8	7.40		1.88	83.5	8.07
	1005	/	sampling							
COC number(s):		612515								
Sample number(s):		088016								

### Purge Volume Calculations

Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

Tubing Diameter

1/4" OD: 2.4 mV/A X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millileters

3/8" OD: 9.7 m/ft  $K$  \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters

1/2" OD: 2 1.6 ml/in X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millimeters

~4.00 gals purged  
from tubing  
0840

\* Hit sediment @ bottom  
of well ~ 334'; pulled  
pump cleaned and  
lowered again  
restart  
@ 0629

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. <u>NA</u>		SMO Use		AR/COC		612517			
Dept. No./Mail Stop: 4133/1126		Date Samples Shipped: 1/14/2010		Project/Task No. 125778.10.11.01		Waste Characterization			
Project/Task Manager: Don Schofield		Client/Mail No. 109203		SMO Authorization: <u>Edie Kent</u>		-Send preliminary/copy report to:			
Project Name: TAG-GWM		Lab Contact: Edie Kent/803-566-8171		Contract #: PO 691436					
Record Center Code: ER/1306/DAT		Lab Destination: GEL		Released by COC No.:					
Logbook Ref. No.: NA		SMO Contact/Phone: Pam Puissant/505-844-3185		Validation Required					
Service Order No.: CFO# 010-10		Send Report to SMO: Lorraine Herrera /505-844-3199		Bill To: Sandia National Labs (Accounts Payable)					
Location		Tech Area		P.O. Box 5800 MS 0154					
Building		Room		Albuquerque, NM 87185-0154					
Sample No. - Fraction		ER Sample ID or Sample Location Detail		Parameter & Method Requested		Lab Sample ID			
088020-001	TA2-W-27	297	MA	0114101013	GW	G	SA	VOC (SW846/8260B)	007
088020-018	TA2-W-27	297		0114101015	GW	P	SA	NP (353.2)	008
088020-020	TA2-W-27	297		0114101016	GW	P	SA	Perchlorate (314.0)	009
088021-001	TA2-W-27	297		0114101013	GW	G	DU	VOC (SW846/8260B)	010
088021-018	TA2-W-27	297		0114101015	GW	P	DU	NP (353.2)	011
088021-020	TA2-W-27	297		0114101016	GW	P	DU	Perchlorate (314.0)	012
088022-001	TAG-TB3	NA		0114101013	DIW	G	TB	VOC (SW846/8260B)	013
RMMA		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Ref. No.					
Sample Disposal		Return to Client <input checked="" type="checkbox"/> Disposal by lab							
Turnaround Time		7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day <input checked="" type="checkbox"/>							
Return Samples By:		Negotiated TAT		Special Instructions/QC Requirements		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>		Abnormal Conditions on Receipt	
Name		Signature		Init		Company/Organization/Phone/Cellular		Level D Package <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Robert Lynch		<u>[Signature]</u>		PL		Weston/4133/844-4013/250-7090		*Send report to:	
Alfred Santillanes		<u>[Signature]</u>		PL		Weston/4133/844-5130/228-0710		Tim Jackson/ORG. 4133/MS 0756/ 284-2547	
William J. Gibson		<u>[Signature]</u>		PL		Weston/4133/844-4013/239-7367		*Please list as separate report.	
Sample Team Members		Date		Date		Date		Date	
1. Relinquished by <u>[Signature]</u>		Date 1/14/2010		Time 1038		4. Relinquished by		Time	
1. Received by <u>[Signature]</u>		Date 1/14/2010		Time 1038		4. Received by		Time	
2. Relinquished by <u>[Signature]</u>		Date 1/14/2010		Time 1200		5. Relinquished by		Time	
2. Received by <u>[Signature]</u>		Date 1/14/2010		Time 0555		5. Received by		Time	
3. Relinquished by <u>[Signature]</u>		Date		Time		6. Relinquished by		Time	
3. Received by		Date		Time		6. Received by		Time	

2  
3  
1  
2  
3  
1  
2

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

Report Date: February 1, 2010

Client Sample ID: 088020-020  
Sample ID: 244469009  
Matrix: AQUEOUS  
Collect Date: 14-JAN-10 10:16  
Receive Date: 15-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
  
Client Desc.: TA2-W-27  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR10	1/19/10	1610	942144	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Report Date: February 1, 2010

Client Sample ID: 088021-020  
Sample ID: 244469012  
Matrix: AQUEOUS  
Collect Date: 14-JAN-10 10:16  
Receive Date: 15-JAN-10  
Collector: Client

Project: SNLSGWater  
Client ID: SNLS003  
Client Desc.: TA2-W-27  
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
<i>EPA 314.0 Perchlorate by IC "As Received"</i>											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR101	19/10	1633	942144	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <b>TAG</b>	Project No.:
Well ID.: <b>TA2-W-27</b>	Date: <b>1-14-10</b>
Weather: <b>Cloudy &amp; Damp</b>	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump	Pump depth: <b>297'</b>

### PURGE MEASUREMENTS

**DO mg/L**

Depth to Water (FT)	Time 24 hr	Vol. L gals	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
277.53	0803	/	—	Start						
278.69	0838	10	15.45	802	237.7	7.33		0.93	89.6	8.94
278.45	0852	15	14.96	801	233.6	7.35		0.72	89.4	8.96
278.44	0906	20	15.18	801	231.5	7.35		0.76	87.5	8.77
278.44	0921	25	15.47	802	229.8	7.35		0.73	90.7	9.04
278.43	0936	30	15.56	802	228.7	7.36		0.66	89.0	8.85
278.42	0952	35	15.97	800	227.7	7.36		0.67	67.0	6.60
278.41	0958	37	15.88	800	227.6	7.35		0.56	70.1	6.68
278.40	1006	39	16.15	800	226.6	7.35		0.39	71.6	6.70
278.40	1013	41	16.00	799	226.5	7.36		0.40	72.6	7.00
	1013	/	Sampling							
COC number(s):		612517								
Sample number(s):		088020, 088021								

### Purge Volume Calculations

#### Well Diameter

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

#### Tubing Diameter

1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

~ 4.00 gal. purged  
prior to measurements  
**0815**

## Appendix B

### Data Validation Sample Findings Summary Sheets for the Perchlorate Data

## Memorandum

Date: February 23, 2010

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL  
Site: TAG GWM  
AR/COC: 612513, 612514, 612515, 912516, and 612517  
SDG: 244469  
Laboratory: GEL  
Project/Task: 125778.10.11.01  
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 2.

### Summary

Six samples were prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate). Four samples were prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. Nitrate/Nitrate was detected in the method blank (MB) at a concentration  $\geq$  the method detection limit (MDL) but  $<$  the practical quantitation limit (PQL). The nitrate/nitrate result for sample 244469-015 was a detect  $<5X$  the MB concentration and will be **qualified “0.061U,B”** at  $5X$  the value of the MB (mg/L). The other associated sample results were detects  $>5X$  the MB result and will not be qualified.

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

### Holding Times and Preservation

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

### Calibration

All initial and continuing calibration QC acceptance criteria were met.



### **Blanks**

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

#### **Nitrate/Nitrite:**

Nitrate/Nitrite was detected in the equipment blank (EB) associated with samples -008 and -011 at a concentration > the MDL but < the PQL. However, it should be noted that the nitrate/nitrite result for the EB has already been qualified non-detect due to MB contamination and, thus, does not affect the field sample results.

### **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. The samples did not required dilution except as follows.

#### **Nitrate/Nitrite:**

Samples -004, -008, and -011 were diluted 10X for nitrate/nitrite due to high concentrations for this analysis. Sample -015 was diluted 5X for nitrate/nitrite was due to matrix interference 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 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. It should be noted that the EB on AR/COC# 612516 is associated with the samples on AR/COC# 612517.

No other specific issues that affect data quality were identified.

Data Type: Organic, Gen Chem

[illegible]

**Date: 02/23/10**

## Memorandum

DATE: March 28, 2010

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL  
Site: TAV GWM  
AR/COC: 612557, 612558, 612559, and 612560  
SDG: 247072  
Laboratory: GEL  
Project/Task No: 125778.10.11.01

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 EPA 314.0 (perchlorate) and EPA353.2 (nitrate/nitrite by Cd reduction). No problems were identified with the data package that result in the qualification of data.

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

### Holding Times/Preservation

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

### Calibration

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

### Blanks

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

### Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

### **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

All Analyses: All MS (PS) QC acceptance criteria were met. No MSD (PSD) analyses were performed. The replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

### **Replicates**

All Analyses: All replicate QC acceptance criteria were met.

### **Detection Limits/Dilutions**

Perchlorate Analysis: All detection limits were properly reported. No samples required dilution.

Nitrate/nitrite Analysis: All detection limits were properly reported. Samples 247072-002, -008, -010, and -013 were diluted 25X for nitrate/nitrite due to high concentration of the target analyte and sample -006 was diluted 5X due to matrix inference. 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.

### **Other QC**

All Analyses: No field blanks (FBs) were submitted on the AR/COCs. The relative percent difference (RPD) of the field duplicates (FD) (samples -010) was  $<20\%$ . No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified that affect data quality.

**Site: TAV GWM**

AR/COC: 612557, 612558, 612559, and 612560

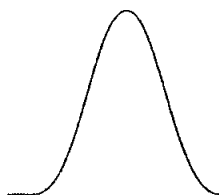
**Organic, Gen Chem**

[illegible]

**Validated By:**

David Schwab

Date: 03/28/10



## **Memorandum**

**Date:** April 29, 2010  
**To:** File  
**From:** Kevin Lambert  
**Subject:** Inorganic Data Review and Validation – SNL  
Site: Burn Site GWM  
AR/COC: 612579 and 612580  
SDG: 248343  
Laboratory: GEL  
Project/Task: 125778.10.11.01  
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 2.

### **Summary**

Two samples were prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite by Cd reduction). One sample was prepared and analyzed with accepted procedures using method 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 QC acceptance criteria were met.

### **Blanks**

No target analytes were detected in the blanks.

**Laboratory Control Sample (LCS)**

All LCS recoveries met QC acceptance criteria.

**Matrix Spike (MS)**

All MS recoveries met QC acceptance criteria.

**Laboratory Replicate**

The replicate met all QC acceptance criteria.

**Detection Limits/Dilutions**

All detection limits were properly reported. Sample 248343-003 was diluted 10X and sample - 006 was diluted 25X 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**

No other specific issues that affect data quality were identified.

Data Type: Organic &amp; Gen Chem

[illegible]

Date: 04/29/10





## **Memorandum**

Date: April 8, 2010  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Tijeras Arroyo Assessment GWM  
AR/COC: 612604  
SDG: 248347  
Laboratory: GEL  
Project/Task: 125778.10.11.01  
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 2.

### **Summary**

One sample was prepared and analyzed with accepted procedures using method 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 sample was analyzed within the prescribed holding times and properly preserved.

### **Calibration**

All initial and continuing calibration QC acceptance criteria were met.

### **Blanks**

No target analytes were detected in the blanks.

**Laboratory Control Sample (LCS)**

All LCS recoveries met QC acceptance criteria.

**Matrix Spike (MS)**

All MS recoveries met QC acceptance criteria. It should be noted that the MS analysis was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

**Laboratory Replicate**

The replicate met all QC acceptance criteria. It should be noted that the laboratory replicate analysis was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

**Detection Limits/Dilutions**

All detection limits were properly reported. The sample did not required dilution.

**Other QC**

No other specific issues that affect data quality were identified.

