



National Nuclear Security Administration  
Sandia Site Office  
P.O. Box 5400  
Albuquerque, New Mexico 87185-5400



MAR 27 2007

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

Mr. James Bearzi, Bureau Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Road East  
Building 1  
Santa Fe, NM 87505



Dear Mr. Bearzi:

On behalf of the Department of Energy (DOE) and Sandia Corporation (Sandia), DOE is submitting the March 2007 Consolidated Quarterly Report for the Environmental Restoration Project that addresses all quarterly reporting requirements required under 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 for Sandia National Laboratories/New Mexico (SNL/NM), EPA ID No. NM5890110518.

Pursuant to perchlorate screening, detectable concentrations continue to be found at monitoring well CYN-MW6 (at the Burn Site groundwater area). We will continue to sample and monitor the trend, plus provide the results in the next quarterly report due by June 30, 2007. We will initiate discussions with your office to determine a path forward for the groundwater in the vicinity of CYN-MW6.

If you have any questions, please contact me at (505) 845-6036 or Joe Estrada of my staff at (505) 845-5326.

Sincerely,

*Kimberly A. Davis*  
Patty Wagner  
Manager

Enclosure

Mr. J. Bearzi

2

cc w/enclosure:

W. Moats, NMED (via Certified Mail)  
L. King, USEPA, Region VI (via Certified Mail)  
T. Skibitski, NMED-OB (c/o D. Sleeman)  
T. Longo, NNSA/NA-56/HQ, GTN  
Public Reading Room (c/o SNL/NM, Org. 6765)

cc w/o enclosure:

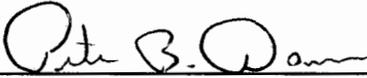
M. Reynolds, NNSA/SSO  
J. Gould, NNSA/SSO  
A. Blumberg, SNL/NM, Org. 11100, MS 0141  
D. Miller, SNL/NM, Org. 6765, MS 0718  
P. Freshour, SNL/NM, Org. 6765, MS 1087  
B. Langkopf, SNL/NM, Org. 6765, MS 1087  
M. J. Davis, SNL/NM, Org. 6765, MS 1087  
Records Center, SNL/NM, Org. 6765, MS 1087

# CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

**Document title:** Consolidated EPA Quarterly Report, March 2007

**Document author:** Paul Freshour, 6765

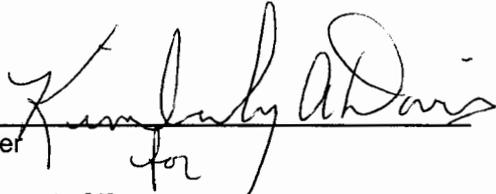
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system,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

Signature:   
Peter B. Davies  
Director  
Nuclear Energy & Global Security Technologies  
Division 6700  
Sandia National Laboratories/New Mexico  
Albuquerque, New Mexico 87185  
Operator

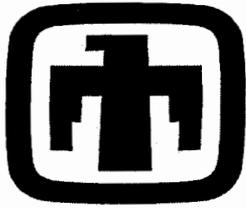
3/12/07

Date

and

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

3/27/07  
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**

**MARCH 2007**



United States Department of Energy  
Sandia Site Office

**CONSOLIDATED  
QUARTERLY REPORT**

March 2007

SANDIA NATIONAL LABORATORIES/NEW MEXICO (SNL/NM)

**ENVIRONMENTAL RESTORATION PROJECT**

**DOE:** SANDIA SITE OFFICE  
**CONTRACTOR:** SANDIA CORPORATION  
**PROJECT MANAGER:** J. PAUL FRESHOUR

**NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO THIS PERMIT: 64**  
**SUSPECT WASTE:** radionuclides, metals, organics, and explosives

**OVERVIEW**

This Consolidated Quarterly Report for the Sandia National Laboratories Environmental Project addresses all quarterly reporting requirements required under 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 are addressed in these Sections:

**SECTION I**

ER Quarterly

**SECTION II**

Chemical Waste Landfill

**SECTION III**

Perchlorate Screening

## **SECTION I**

### **1.0 Introduction**

The technical status of each ongoing activity in the Environmental Restoration (ER) Project is discussed in an Activity Data Sheet (ADS), which corresponds to an Operable Unit (OU) for assessment and remediation, or to a specific functional area of the project in the case of Project Management and Technical Support.

### **2.0 Work Completed in This Quarter (November, December 2006 – January 2007)**

#### **2.1 ADS 1285 Technical Support**

##### **2.1.1 ER Site Tracking (ERST)**

- ER site reviews were completed and delivered for the following:  
11/06/06: Land Use Permit # 41, Exterior Intrusion Assessment and Detection Test Field.  
12/04/06: Land Use Permit # 124, CNSAC 115 kV Power Line ROW.  
01/10/07: Land Use Permit # 27B: Ingrant for Coyote Canyon Headquarters Facilities Site, Building 9925

##### **2.1.2 Risk Assessment**

- As part of the response to the NOD on the MWL CMIP, trigger levels for contaminants in the vadose zone were defined. Also, other risk-related comments were addressed.
- As part of the response to the Notice of Disapproval for SWMU 58, the risk assessments that were previously completed for both Feature 58FF, and SWMUs 8 and 58 as a whole were revised to incorporate 2006 data.

##### **2.1.3 Environmental Restoration Field Office (ERFO) Support**

- First Quarter sampling was completed for Canyons Ground Water Monitoring (CYN-GWM), the Ground Water Protection Program (GWPP) and for TAV Ground Water Monitoring (TAV-GWM).
- Second Quarter sampling was completed for Tijeras Arroyo Groundwater Investigation (TAG), and sampling was started for the GWPP (completed in February).
- Waste management was supported in discharging purge and decontamination water to the sanitary sewer (3535 gallons for November through January).
- 11/20/06: P&A of Vadose Zone Monitoring Wells RB 11/RW 06 and TAG SV03.
- 11/28/06: Soil pile sampling for MWL.

#### **2.1.4 Geographic Information System (GIS) Program**

Requests received (November 1, 2006 to January 31, 2007)

GPS:	0	-100%	(2 last period)
Data:	2	-100%	(4 last period)
Maps	62	+40%	(37 last period)
Total:	64*	+33%	(43 last period)

Requests completed (November 1, 2006 to January 31, 2007)

GPS:	1
Data:	3
Maps:	62
Total:	66 completed out of 64 received (completion rate 100%)

\* Map requests were up from last quarter with most ER Requests for SWMU 58, groundwater and MWL. SWMU 58 maps (bulk of requests) were fairly simple. This quarter has included much closure work that is not reflected in the map requests. Requests for EM included RCRA maps and Permit Modifications (2).

#### **2.1.5 Environmental Restoration Data Management System (ERDMS)**

- There are now 2,562,488 data records in the ERDMS.
- 44 analytical data packages containing 7,389 new data points were processed and loaded into the ERDMS.
- 4,356 new data validation qualifiers and descriptive flags were entered into the ERDMS.
- 55 tables were generated in support of SWMUs 8, 58, CAMU (Corrective Action Management Unit), groundwater monitoring, MWL (Mixed Waste Landfill).
- 45 data packages were submitted to the Records Center.
- 1,344 field measurements for groundwater monitoring were entered into the database.
- 207 CAMU field measurements were entered into the database.
- Database clean-up activities continued.

#### **2.1.6 ES&H and Security (ESHSEC) Records Center**

- 312 ER records were received and 772 records were processed into the records management system. The difference is due to records received at the end of one month but not processed until the next month.
- 76 records of the 1011 customer requests were retrieved for reviews at the record center. 130 pages were copied.
- Site Closure: Customer Funded Record Center - RC analysts continue to work with ER staff to identify NFA references and records that still need to be submitted to the RC.
- Imaging: Records Center staff has imaged 449 records during this quarter.
- 673 records were sent to Inactive Storage.

### 2.1.7 SMO/Data Validation

- The SMO packaged and shipped 193 samples to contract laboratories for 5 ER/LTS projects. The sample volume for this quarter was approximately 45% less, when compared to the previous quarter.
- GEL and Severn Trent met contractual 30-day TAT (greater than 90% of the time) on 30-day requests. The labs also met customer requirements on 15-day rush for final data packages during this quarter.
- 72 data packages were sent through contract verification review with an average TAT of four calendar days. 54% of the data packages were for ER/LTS projects. The volume of ER/LTS packages was 10% less for the period when compared to last quarter.
- 39 total data packages were validated for ER/LTS. The majority of the data packages were for groundwater monitoring. The average turn-around time (TAT) for packages at validation was two calendar days.

Seventy percent of the work processed during this period was in support of groundwater monitoring. Twenty percent of the work supported CAMU post-closure activities. Ten percent of the work supported MWL Remediation.

### 2.2 ADS 1289 Mixed Waste Landfill (MWL)

- Subgrade preparation activities at the MWL were completed in December 2006. The total thickness of the subgrade varies from 2 to 40 inches across the MWL. Screening of soils for the MWL cover continue at the borrow area.
- The MWL Annual Groundwater Report for 2006 was completed and submitted to NMED. The report included data from April's groundwater sampling event, and showed chromium concentrations in MWL-MW1 and MWL-MW3 exceeding the EPA MCL. Nickel concentrations in MWL-MW1 continue to increase, and are considerably above background levels. These elevated concentrations of chromium and nickel are attributed to corrosion of the monitoring wells' stainless steel screens. DOE formally notified NMED regarding the exceedance of the MCL in groundwater at the MWL.
- A meeting was held by the Albuquerque-Bernalillo Groundwater Protection Board on November 9, 2006 to discuss the MWL monitoring well network; and whether representative samples are being obtained from the aquifer from wells drilled with drilling fluids. James Bearzi discussed the NMED position on the MWL monitoring well network. Dave McCoy and Bob Gilkeson presented their concerns regarding the MWL well network.
- A Notice of Disapproval regarding the MWL CMI Work Plan was received from the NMED on November 20, 2006. The NOD contained 2 sections. The first section addressed question regarding the MWL cover design, and responses were submitted to NMED on December 19, 2006. The second section of the NOD addressed the MWL Fate and Transport model; responses to the second section were submitted to NMED on January 19, 2007.

- NMED requested a Soil Gas Sampling and Analysis Plan as part of the first NOD response. The SAP was developed and submitted to NMED on December 19, 2006. The SAP includes plans for active soil gas sampling at 6 locations in and around the MWL, and at 2 background locations. The SAP also includes plans for radon sampling once cover construction activities are complete.
- Routine neutron logging of the MWL vadose zone was conducted on November 2, 2006 to obtain baseline data regarding moisture content profiles with depth beneath the landfill. This information will be used to develop triggers for the Long Term Monitoring and Maintenance Plan.
- NMED requested replacement of monitoring well MWL-BW1. Water levels in this well are so low that the pump and tubing bundle must be primed with de-ionized water to collect samples from the well. Less than one ft of water remains in this well. Plans to plug and abandon the well are being developed. Replacement is planned for summer of 2007.

### 2.3 ADS 1295 Drain and Septic Systems (DSS)

- In November, the NMED issued a Certificate for Corrective Action Complete without controls for AOC 1101 (Building 885 Septic System (TA-I). This site is one of five sites that are planned to undergo the Permit Modification process in late FY07.
- A poster write-up was drafted for AOC 1101 (Building 885 Septic System (TA-I) in anticipation of a request for permit modification later in FY07.
- During this quarter, subsidence in the parking lot in the vicinity of SWMU 1101 was repaired. The subsidence was beneath asphalt that was replaced above two trenches that were dug as part of the site investigation at SWMU 1101. The subsidence was attributed to inadequate compaction and the heavy late summer rains.
- Forty-one DSS sites are awaiting regulatory approval for the September 2005 and March 2006 permit modification requests.

### 2.4 ADS 1303 Technical Area II

- Two Technical Area II sites are awaiting regulatory approval of the September 2005 permit modification request:

SWMU 1: Radioactive Waste Landfill  
SWMU 3: Chemical Disposal Pits

### 2.5 ADS 1306 Technical Areas 3 and 5

(Scope for the Liquid Waste Disposal System [LWDS] is included with this ADS).

- Five Technical Area 3/5 sites are awaiting regulatory approval of the September 2005 and March 2006 permit modification requests:

SWMU 4: LWDS Surface Impoundments  
SWMU 5: LWDS Drainfield  
SWMU 52: LWDS Holding Tanks  
SWMU 78: Gas Cylinder Disposal Pit  
SWMU 196: Building 6597 Cistern

**2.6 ADS 1309 Tijeras Arroyo**

- Four Tijeras Arroyo sites are awaiting regulatory approval of the September 2005 and March 2006 permit modification requests:

SWMU 45: Liquid Discharge  
SWMU 46: Old Acid Waste Line Outfall  
SWMU 233: Storm Drain System Outfall  
SWMU 234: Storm Drain System Outfall

**2.7 ADS 1326 Project Management**

- The SNL ER Project Management structure was modified significantly in this reporting period which crosses the FY2006/2007 boundary. ER Project work scope, originally planned for completion at the end of FY2006, was delayed. Funding available for implementation of the remaining work scope along with the quantity of work remaining does not support the previous management structure. The previous structure of 3 departments managed by a Level II Project Manager has been reduced to a Staff Level Project Manager reporting to a Level I Department Manager. Any communication concerning implementation of the ER Project should be initially directed to the Staff Level Project Manager.
- Operable units with only regulatory and administrative closure activities remaining will be closed and those activities will be tracked and managed under the PM ADS.

**2.8 ADS 1330 Site-Wide Hydrogeologic Characterization**

TA-3/5 Groundwater

- Quarterly sampling was performed.

Canyons Groundwater

- Quarterly sampling was performed.

Tijeras Arroyo Groundwater

- Quarterly sampling was performed.

#### Mixed Waste Landfill Groundwater

- No groundwater sampling was performed.

#### Chemical Waste Landfill Groundwater

- No groundwater activities were performed.

#### DSS Groundwater

- No groundwater activities were performed.

### **2.9 ADS 1332 Foothills Test Area**

- In January, a response to NMED's June 2006 Notice of Disapproval for SWMU 58 (Coyote Canyon Blast Area) was submitted to the NMED. In the Notice of Disapproval, NMED indicated that "elevated concentrations of lead and nickel at boring 58FF-GR-FF are not defined horizontally or vertically." The response included the results of the additional surface and subsurface lead and nickel soil sampling that was conducted in September 2006 as a result of the Notice of Disapproval, and the lead and nickel analytical results for all soil samples that were collected from Feature 58FF from 1995 through 2006. All the lead and nickel sampling results were evaluated and discussed, and the risk assessments that were previously completed for both Feature 58FF, and SWMUs 8 and 58 as a whole (presented in the March 2006 RSI response report) were revised to incorporate the 2006 data. Based upon the SWMU 8 and 58 field investigation data and the corresponding human health risk assessment and ecological risk assessment (presented in the April 2005 proposal of Corrective Action Complete), a risk-based determination of Corrective Action Complete without controls was recommended for SWMU 58, Feature 58FF, and for SWMUs 8 and 58.
- In January, the NMED issued a Certificate for Corrective Action Complete with controls for SWMU 28-2 (Mine Shaft). This site together with SWMUs 8 [Open Dump (Coyote Canyon Blast Area)] and 58 (Coyote Canyon Blast Area) are three of the five sites that are planned to undergo the Permit Modification process in late FY07.
- A poster write-up was drafted for SWMU 28-2 (Mine Shaft) in anticipation of a request for permit modification later in FY07.

### **2.10 ADS 1334 Central Coyote Test Area**

- One Central Coyote Test site is awaiting regulatory approval of the March 2006 permit modification request:

- SWMU 68: Old Burn Site.

## 2.11 ADS 1335 Southwest Test Area

- One Southwest Test site is awaiting regulatory approval of the March 2006 permit modification request:
  - SWMU 91: Lead Firing Site.

## 2.12 ADS 1345 Corrective Action Management Unit (CAMU)

### CAMU Post-Closure Care Operations

Vadose-zone monitoring, leachate removal, and post-closure inspections continued as required in the permit. Activities included 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, (December 2006), including containment cell cover, storm water diversion structures, security fences, gates, and signs.
- Quarterly monitoring of the VZMS was conducted in December 2006.
- Waste management associated with the leachate collection was conducted.
- Composite leachate sampling conducted on 11/1/2006 and 1/9/2007.

### CAMU Waste Management Activities

#### For this quarter (November – January 2007),

- Waste stored on site at the beginning of this period:
  - 294 gallons of leachate.
  - 0.5 lbs PPE.
- Waste generated on-site during the period:
  - 409 gallons of leachate.
  - 5.5 lbs PPE, paper wipes, plastic drum pump.
- Waste removed from site by the Hazardous Waste Management Facility:
  - 329 gallons of leachate on November, 3, 2006.
  - 0.5 lbs PPE removed on November 3, 2006.
  - 282 gallons of leachate on January 18, 2007.
  - 5 lbs PPE, paper wipes and plastic drum pump on January 18, 2007.
- Waste remaining on site at the end of this period:
  - 92 gallons of leachate.
  - 0.5 lbs PPE.

## Regulatory Activities

- There were no regulatory activities during this reporting period.

### **3.0 Estimate of the percentage of work completed**

- See discussions under each ADS.

### **4.0 Projected Work for the Next Quarter**

- Work will continue on the following tasks: groundwater monitoring; waste management; data management; administrative closure; CWL activities; MWL CMI-related activities; and documentation (primarily RSI/NOD responses).

### **5.0 Summaries of Contacts Pertaining to Corrective Action**

#### *November 2006*

- None.

#### *December 2007*

- None.

#### *January 2007*

- None.

### **6.0 Summary of Changes to Project Implementation**

- No significant changes have been made to project implementation during this reporting period.

SUMMARY  
OF  
QUARTERLY REPORT

November –December 2006 – January 2007  
Fiscal Year 2007

1. General.

The Quarterly Report is a deliverable requirement stated in the Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Amendments Act (HWSA) Permit, Section F.1. The Quarterly Report discusses the technical status of each ongoing activity in the Environmental Restoration (ER) Project.

The progress for the past quarter is reported by Activity Data Sheet (ADS), which correspond to Operable Units (OUs) for assessment and remediation, or to a specific functional area of the project in the case of Project Management and Technical Support.

2. Contents.

a. The status for each ADS contains the following, if applicable:

- description of work completed, and
- summaries of all findings.

b. The general status items for the ER Project, which follow ADS status, contain the following:

- summaries of all problems or potential problems,
- projected work for the next quarter, and
- summaries of changes to project implementation.

3. Controversial Issues.

No potentially controversial issues are presented in this report that have not been identified previously to the regulatory agencies.



Sandia National Laboratories/New Mexico

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**CHEMICAL WASTE LANDFILL  
QUARTERLY CLOSURE PROGRESS REPORT**

**March 2007**



United States Department of Energy  
Sandia Site Office

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

## **SECTION II. CHEMICAL WASTE LANDFILL**

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 Postclosure Permit Application (Closure Plan) (SNL/NM December 1992). This section documents activities at the CWL for the time period of November and December of 2006, and January of 2007.

### **1.0 INTRODUCTION**

All voluntary corrective measures (VCMs) activities for the CWL have been completed. The CWL 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 VC Final Report was submitted to the NMED in August 2005 (SNL/NM August 2005a) 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 (SNL/NM April 2004) and approved with conditions in September 2004 (Kieling September 2004); the cover was completed in September 2005 in accordance with the conditions of approval. All field activities, with the exception of long-term monitoring, have been completed at the CWL.

Chapter 2.0 addresses closure progress and regulatory deliverables. Chapter 3.0 discusses monitoring activities, and Chapter 4.0 outlines the activities to be conducted during the next quarterly reporting period (February 2007 through April 2007).

### **2.0 CLOSURE PLAN PROGRESS AND DELIVERABLES**

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 preparing and submitting the Final Resource Conservation and Recovery Act (RCRA) Closure Report, expected to be submitted in 2007, after NMED approval of the CMS Report has been received. The Final RCRA Closure Report will document both the backfilling of the former CWL and installation of the cover.

### **3.0 WATER MONITORING ASSESSMENT**

No groundwater or soil-gas sampling was performed at the CWL during this reporting period. Groundwater monitoring is currently conducted on a semi-annual basis per the requirements of the Closure Plan. Soil-gas sampling is not required under the Closure Plan, but is expected to be a requirement for post-closure care (Kieling December 2003). Groundwater monitoring is planned at the CWL during the second quarter of fiscal year 2007; additional post-closure requirements will be implemented upon approval of the CWL Post-closure Permit by the NMED.

### **4.0 PROJECTED ACTIVITIES FOR THE UPCOMING QUARTER**

A groundwater monitoring sampling event is anticipated to take place during May of 2007.

DOE and Sandia are developing a proposal for discussion with the NMED regarding groundwater monitoring provisions for the post-closure period at the CWL. Because two voluntary corrective measures have successfully remediated the CWL, the long-term groundwater monitoring program should be designed to address current site conditions.

## 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.
- Kieling, J.E. (New Mexico Environment Department), December 2003. Letter to K.L. Boardman (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Chemical Waste Landfill Corrective Measures Study, May 2003, Sandia National Laboratories, NM5890110518, HWB-SNL-03-013." December 12, 2003.
- Kieling, J.E. (New Mexico Environment Department), September 2004. Letter to P. Wagner (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Approval With Conditions of the Landfill Cover Interim Measure at the Chemical Waste Landfill, Sandia National Laboratories, NM5890110518, HWB-SNL-03-013." September 22, 2004.
- Moats, W.P. (New Mexico Environment Department), December 2003. Letter to K.L. Boardman (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Final Approval, Landfill Excavation Voluntary Corrective Measures, Final Report, April 2003, Sandia National Laboratories, NM5890110518 HWB-SNL-03-012." December 16, 2003.
- Sandia National Laboratories/New Mexico (SNL/NM), December 1992. "The Chemical Waste Landfill Final Closure Plan and Postclosure Permit Application," Sandia National Laboratories, Albuquerque, New Mexico.
- Sandia National Laboratories/New Mexico (SNL/NM), October 2001. "Risk-Based Approval Request, 40 CFR 761.61 (c) Risk-Based Method For Management of PCB Materials," Chemical Waste Landfill Remediation and Corrective Action Management Unit, Sandia National Laboratories, Albuquerque, New Mexico. October 24, 2001.
- Sandia National Laboratories/New Mexico (SNL/NM), April 2003. "Chemical Waste Landfill – Landfill Excavation Voluntary Corrective Measure – Final Report," Sandia National Laboratories, Albuquerque, New Mexico.
- Sandia National Laboratories/New Mexico (SNL/NM), April 2004. "Request for Approval to Install the Vegetative Soil Cover Presented in the RAP as an Interim Measure," Sandia National Laboratories, Albuquerque, New Mexico. April 19, 2004.

Sandia National Laboratories/New Mexico (SNL/NM), August 2005. "Chemical Waste Landfill Site Operational Boundary Closure Addendum to the Landfill Excavation Voluntary Corrective Measure Final Report," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), February 2006. "Chemical Waste Landfill Quarterly Closure Progress Report," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), November 2006. "Chemical Waste Landfill Toxic Substances Control Act Final Report." Sandia National Laboratories, Albuquerque, New Mexico. November 2, 2006.

# **Perchlorate Screening Quarterly Monitoring Report**

**Fourth Quarter of Calendar Year 2006  
(October, November, and December 2006)**

**Sandia National Laboratories, New Mexico**

**Environmental Restoration Project, Department 6765**

**March 2007**

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

# **Perchlorate Screening Quarterly Monitoring Report Fourth Quarter of Calendar Year 2006 (October, November, and December 2006)**

## **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 (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 fourth quarter of Calendar Year 2006 (CY2006) in response to the requirements of the Order.

During the fourth quarter of CY2006, groundwater samples were collected from four wells currently in the perchlorate-screening monitoring-well network. The following groundwater monitoring wells were sampled between December 11 and December 19, 2006:

- CYN-MW6,
- CYN-MW7,
- CYN-MW8, and
- SWTA3-MW4

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 above the screening level [or the Method Detection Limit (MDL)] of 4 micrograms per liter ( $\mu\text{g/L}$ ) in three of the four monitoring wells and all four quality control samples.

The environmental sample from CYN-MW6 revealed perchlorate at a concentration of 8.46  $\mu\text{g/L}$ . This concentration was verified by analysis of the duplicate sample, which provided a result of 8.93  $\mu\text{g/L}$ . These two analytical results are in good agreement, indicating that these results are not field-collection or laboratory artifacts. As discussed in the previous quarterly reports, the source for the perchlorate in the groundwater at CYN-MW6 is unknown.

Four consecutive quarters of sampling have been completed for wells CYN-MW7, CYN-MW8, and SWTA3-MW4 with no detectable concentrations of perchlorate above the screening level/MDL. The Order requires wells in the perchlorate-screening monitoring-well network to be sampled at least four quarters (NMED April 2004). Because monitoring wells CYN-MW7, CYN-MW8, and SWTA3-MW4 have four consecutive quarters of analytical results with no detectable concentrations of perchlorate, DOE and Sandia, hereinafter referred to as DOE/Sandia, are no longer required to continue sampling for perchlorate at these wells and they will be removed from the perchlorate-screening monitoring-well network. Data from CYN-MW7, CYN-MW8, and SWTA3-MW4 will not be presented or discussed in future quarterly perchlorate screening reports.

Because perchlorate concentrations in monitoring well CYN-MW6 have exceeded the screening level, DOE/Sandia will initiate the negotiation process with the NMED to determine the frequency of continued monitoring. DOE/Sandia are proposing to continue to monitor perchlorate concentrations in CYN-MW6 for at least four more quarters, continuing with the first quarter of CY2007.

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# **Perchlorate Screening Quarterly Monitoring Report Fourth Quarter of Calendar Year 2006 (October, November, and December 2006)**

## **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 (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells be sampled for perchlorate at SNL/NM [New Mexico Environment Department (NMED) April 2004]. This report summarizes the perchlorate screening monitoring completed during the fourth quarter of Calendar Year 2006 (CY2006) 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. Quarterly reports will be submitted for wells actively in the perchlorate-screening monitoring-well network. Based on NMED guidance (NMED January 2006), DOE/Sandia will submit each quarterly report within 90 days following the quarter that the data represent. This quarterly report is the fifth to be submitted since the November 2005 letter report; the previous quarterly reports were submitted in:

- February 2006 (SNL/NM February 2006),
- June 2006 (SNL/NM June 2006),
- September 2006 (SNL/NM September 2006), and
- December 2006 (SNL/NM December 2006a).

Quarterly reporting will continue throughout the period of perchlorate screening as required by the Order.

## **2.0 Scope of Activities**

This report provides perchlorate screening results from the fourth quarter of CY2006 (October, November, and December 2006) for the wells currently active in the perchlorate screening program as shown on Figure 1 and listed in Table 1. 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 several wells identified in the Order have satisfied this requirement and, therefore, the 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 or subsequent quarterly reports. Wells discussed in previous perchlorate screening reports include: CYN-MW1D, CYN-MW5, MRN-2, MRN-3D, MWL-BW1, MWL-MW1, and NWT3-MW2.

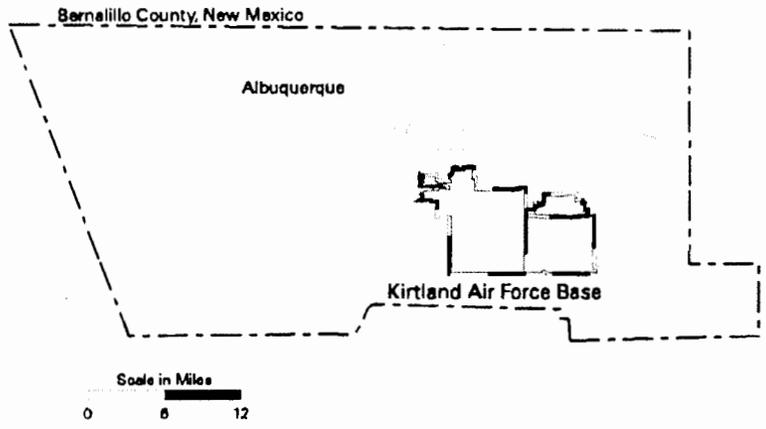
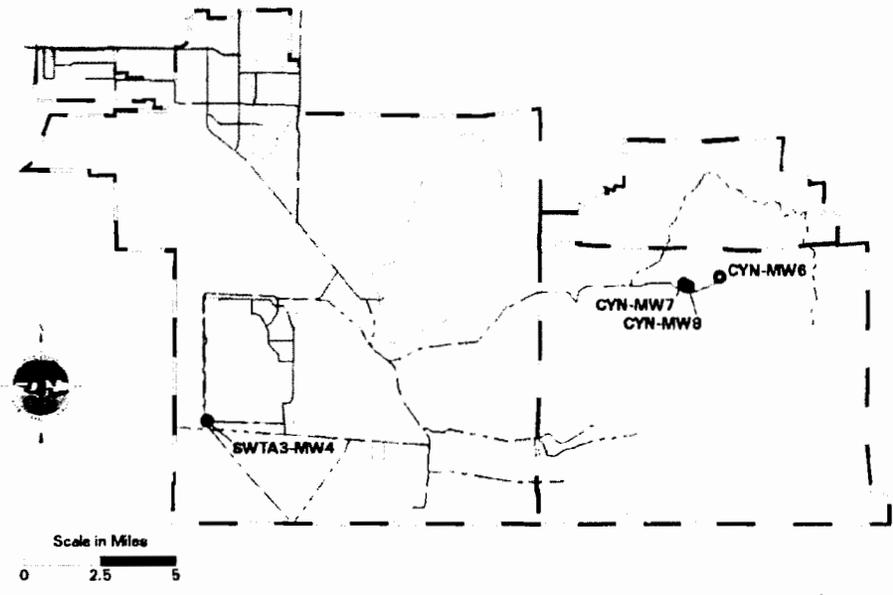
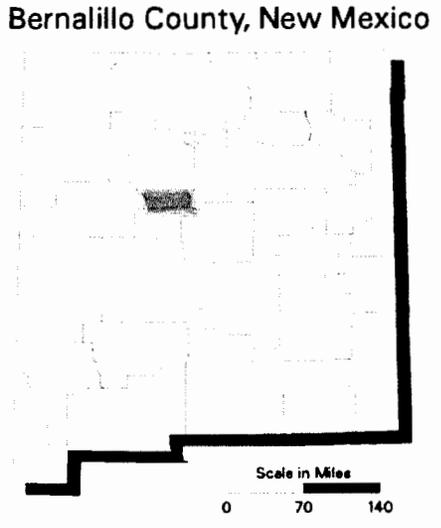


Figure 1  
Sandia National Laboratories  
New Mexico  
Current Perchlorate-Screening  
Monitoring-Well Network  
(Oct/Nov/Dec 2006)



**Table 1  
Current Perchlorate-Screening Monitoring-Well Network  
Fourth Quarter of CY2006 (October, November, and December)**

Well	Date Sampled	Number of Consecutive Sampling Events <sup>a</sup>	Remaining Number of Sampling Events <sup>b</sup>	Sampling Method
CYN-MW6	15-DEC-06	4	4 <sup>c</sup>	Bennett™ Pump
CYN-MW7	11-DEC-06	4	0	Bennett™ Pump
CYN-MW8	12-DEC-06	4	0	Bennett™ Pump
SWTA3-MW4	19-DEC-06	4	0	Bennett™ 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 µg/L. If perchlorate is detected above the screening level/MDL in a specific well, monitoring will continue at that well at a frequency negotiated with the NMED.

<sup>c</sup> This well has been sampled for the required initial four quarters. Because perchlorate concentrations in this well have exceeded the screening level, DOE/Sandia will initiate the negotiation process with the NMED to determine the frequency of continued monitoring. DOE/Sandia are proposing to continue to monitor perchlorate concentrations in CYN-MW6 for at least four more quarters.

DOE/Sandia performed groundwater sampling at four monitoring wells during December 11 through December 19, 2006. All of these wells were installed since the Order was finalized and are required to be sampled for perchlorate as a “new” well. Groundwater sampling activities were conducted in conformance with procedures outlined in the following investigation-specific sampling and analysis plans (SAPs):

- “Canyons Groundwater Monitoring, Mini-SAP for First Quarter Fiscal Year 2007” (SNL/NM November 2006).
- “Groundwater Protection Program, Mini-SAP for First Quarter Fiscal Year 2007” (SNL/NM December 2006b).

As described in the SAPs, groundwater sampling was performed in conformance with current Sandia Environmental Restoration (ER) Project field operating procedures (FOPs). A portable Bennett™ groundwater sampling system was used to collect groundwater samples from all wells. Wells were purged a minimum of one saturated screen volume before sampling.

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 using with an YSI™ Model 620 Water Quality Meter. Turbidity was measured with a HACH™ Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH,

temperature, and SC were obtained. Groundwater stability was considered acceptable when measurements were within 10 percent nephelometric turbidity units for turbidity, 0.1 pH units, 1.0 degree Celsius, and SC within 5 percent. Field Measurement Logs documenting details of well purging and water quality measurements were submitted to the Sandia Customer-Funded Records Center.

For field quality assurance and quality control (QA/QC) purposes, two equipment blank samples were collected and analyzed for perchlorate during the fourth quarter CY2006 sampling event. The sampling pump and tubing bundle were decontaminated prior to installation into monitoring wells according to procedures described in FOP 94-26, "General Equipment Decontamination" (SNL/NM February 1997). Equipment blank samples were collected to verify the effectiveness of the decontamination procedure. One equipment blank was collected prior to sampling CYN-MW6 and the other was collected prior to sampling SWTA3-MW4.

Other field QA/QC samples included two duplicate samples collected at monitoring wells CYN-MW6 and SWTA3-MW4. Duplicate samples are analyzed in order to estimate the overall reproducibility of the sampling and analytical process. In order to reduce variability caused by time and/or sampling mechanics, the duplicate samples were collected immediately after the original environmental samples.

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

**Table 2**  
**Sample Details for Fourth Quarter of CY2006 Perchlorate Sampling**

<b>Well</b>	<b>Sample Identification</b>	<b>AR/COC Number</b>	<b>Date Shipped</b>
CYN-MW6	083858-020 083859-020	611057	18-DEC-06
CYN-MW7	083855-020	611054	11-DEC-06
CYN-MW8	083856-020	611055	12-DEC-06
SWTA3-MW4	083862-020 083863-020	611061	19-DEC-06

Notes:  
AR/COC = Analysis request/chain of custody.

### 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 above the screening level/MDL in a specific well, monitoring will continue at that well at a frequency negotiated with the NMED. The Order (NMED April 2004) requires that the DOE/Sandia 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. Because the timing of and criteria for initiation of these requirements are not clear, DOE and Sandia submitted a letter of clarification to the NMED on this issue in March 2007.

### 4.0 Monitoring Results

Table 3 summarizes current and historical perchlorate results for all wells currently in the perchlorate-screening monitoring-well network. The analytical laboratory certificates of analysis for the fourth CY2006 perchlorate data are included as Appendix A. Consistent with historical analytical results, perchlorate was not detected above the screening level/MDL in the fourth quarter of CY2006 in three of the four monitoring wells. CYN-MW6 is the only well with detectable concentrations of perchlorate.

As shown in Figure 2, the concentrations of perchlorate found in CYN-MW6 in December 2006 are slightly higher than previously reported concentrations (SNL/NM May 2006, SNL/NM June 2006, SNL/NM September 2006, and SNL/NM December 2006).

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.

Field QC samples for this sampling event consisted of two equipment blank samples and two duplicate samples. One equipment blank was collected prior to sampling CYN-MW6 and the other was collected prior to sampling SWTA3-MW4. The field QC samples were submitted for analysis along with the groundwater samples in accordance with QC procedures specified in the applicable SAPs (SNL/NM November 2006 and SNL/NM December 2006b). No perchlorate was detected in either equipment blank above the screening level/MDL (Table 3).

Duplicate samples were collected immediately after the original environmental sample from CYN-MW6 and SWTA3-MW4. Perchlorate was not detected in SWTA3-MW4. Perchlorate was detected in both samples collected from CYN-MW6 and a relative percent difference (RPD) of 5 was calculated for this duplicate set (Table 5). The detected perchlorate concentrations are consistent with the generally-accepted quality-control criterion for duplicate sample data (RPD values < 20%).

The analytical data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data." (SNL/NM December 2003). No problems were identified with the analytical data that resulted in the qualification of the data as unusable. The data are acceptable and reported QC measures are adequate. The data validation sample findings summary sheets for the perchlorate data are included as Appendix B. No variances or nonconformances in field activities or field conditions from requirements in the Groundwater Protection Program mini-SAP or the Canyons Groundwater Monitoring mini-SAP (SNL/NM November 2006 and SNL/NM December 2006b) were identified during the Fourth Quarter CY2006 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:

- Since June 2004 (the start of sampling required by the Order), perchlorate has only been detected above the screening level/MDL in one of the wells (CYN-MW6) in the perchlorate-screening monitoring-well network. Due to the detection of perchlorate in the samples from CYN-MW6 in March 2006, DOE/Sandia submitted the "Notification of Release, Perchlorate at Well CYN-MW6, May 2006" (SNL/NM May 2006) to the NMED. DOE and Sandia were required to notify the NMED of the discovery of a previously unknown release under Section V of the Order (NMED April 2004).
- The perchlorate detected in CYN-MW6 during this reporting period was verified by duplicate samples using EPA Method 314.0. The two analytical results are in good agreement (8.46 and 8.93  $\mu\text{g/L}$ ), with calculated RPD of 5 (Table 5).
- The concentrations from this sampling event (8.46 and 8.93  $\mu\text{g/L}$ ) are slightly higher than the concentrations presented in the previous quarterly reports (Figure 2) (SNL/NM June 2006, SNL/NM September 2006, and SNL/NM December 2006a).
- Four consecutive quarters of sampling have been completed for wells CYN-MW7, CYN-MW8, and SWTA3-MW4. Perchlorate has not been detected above the screening level/MDL for the four sampling events at these wells. Per the requirements of Table XI-1 of the Order (NMED April 2004) these wells will be removed from the perchlorate-screening monitoring-well network, and data will not be presented or discussed in future quarterly perchlorate sampling reports.

As discussed in the previous quarterly reports (SNL/NM June 2006, SNL/NM September 2006), the source for the perchlorate in the groundwater at CYN-MW6 is unknown. Soil sampling completed in 2001 at Solid Waste Management Unit (SWMU) 65—Lurance Canyon Explosives Test Site, or SWMU 94—Lurance Canyon Burn Site did not reveal detectable concentrations of perchlorate in site soils (NMED January 2001; Skelly and Griffith January 2003; and SNL/NM June 2006).

**Table 3  
Summary of Perchlorate Screening Analytical Results for the  
Current Monitoring-Well Network, as of Fourth Quarter CY2006.**

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 <sup>h</sup>
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
	20-Sep-06	610652	078688-021	6.92	1.0	4.0	NE			EPA 6850M	Verification/Duplicate Sample
			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	
CYN-MW7	20-Mar-06	609579	075987-020	ND	4.0	12	NE	U		EPA 314.0	
	13-Jun-06	609923	078676-020	ND	4.0	12	NE	U		EPA 314.0	
	13-Sep-06	610646	081619-020	ND	4.0	12	NE	U		EPA 314.0	
	11-Dec-06	611054	083855-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW8	21-Mar-06	609580	075988-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Jun-06	609924	078678-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Sep-06	610647	081620-020	ND	4.0	12	NE	U		EPA 314.0	
			081621-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	12-Dec-06	611055	083856-020	ND	4.0	12	NE	U		EPA 314.0	
SWTA3-MW4	01-Mar-06	609509	075746-020	ND	4.0	12	NE	U		EPA 314.0	
	12-Jun-06	609922	078674-020	ND	4.0	12	NE	U		EPA 314.0	
			078675-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	22-Sep-06	610656	081631-020	ND	4.0	12	NE	U		EPA 314.0	
	19-Dec-06	611061	083862-020	ND	4.0	12	NE	U		EPA 314.0	
083863-020			ND	4.0	12	NE	U		EPA 314.0	Duplicate sample	
<b>Field Quality Control Samples -- September 2006</b>											
CYN-EB1	12-Dec-06	611056	083857-020	ND	4.0	12	NE	U		EPA 314.0	EB prior to sampling CYN-MW6
GWPP-EB1	18-Dec-06	611060	083861-020	ND	4.0	12	NE	U		EPA 314.0	EB prior to sampling SWTA3-MW4

Footnotes presented on next page.

**Table 3 (concluded)**  
**Summary of Perchlorate Screening Analytical Results for the**  
**Current Monitoring-Well Network, as of Fourth Quarter CY2006.**

**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.

**<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 that 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**

U = Analyte is absent or below the method detection limit.  
 H = Analytical holding time was exceeded.  
 h = Prep holding time was exceeded.  
 J = Amount detected is below the practical quantitation 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.  
 P2 = Insufficient quality control data to determine laboratory precision.

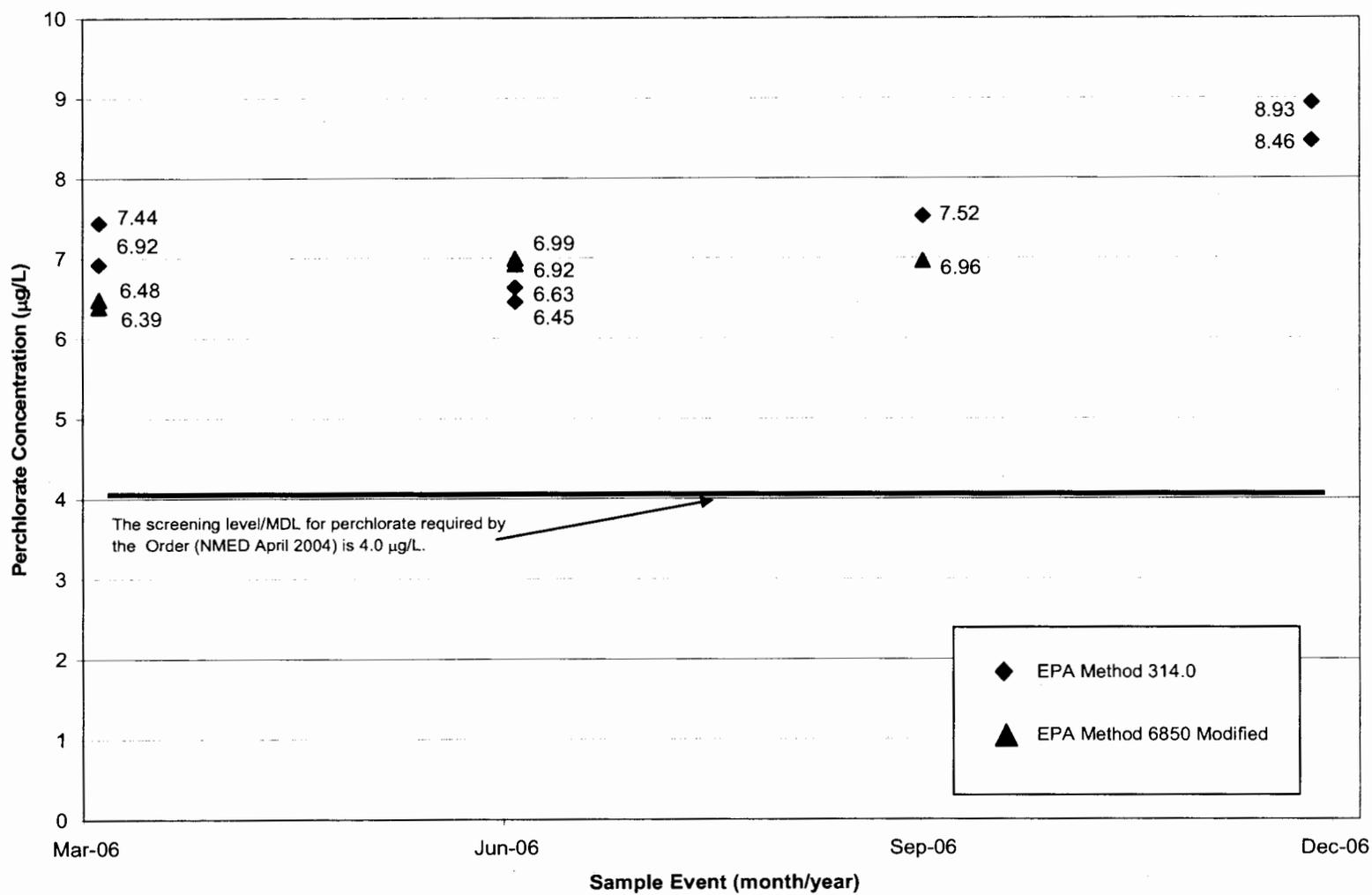
**<sup>g</sup>Analytical Method**

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

**<sup>h</sup>Comments**

EB = Equipment blank sample.

Figure 2  
Perchlorate Results for CYN-MW6



**Table 4**  
**Perchlorate Screening Groundwater Monitoring**  
**Field Water Quality Measurements<sup>a</sup>, Fourth Quarter of CY2006**

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	15-Dec-06	13.62	1014	311.6	7.00	0.65	24.8	2.55
CYN-MW7	11-Dec-06	14.29	665	185.7	7.08	0.58	21.2	2.18
CYN-MW8	12-Dec-06	14.91	826	251.3	7.11	0.36	27.0	2.74
SWTA3-MW4	19-Dec-06	13.15	414	302.4	7.50	0.52	63.8	6.56

**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).

**Table 5**  
**Duplicate Sample Results for Fourth Quarter of CY2006 Perchlorate Sampling**

Well ID / Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD
	(µg/L)		
<b>CYN-MW6</b>			
Perchlorate (EPA Method 314.0)	8.46	8.93	5
<b>SWTA3-MW4</b>			
Perchlorate (EPA Method 314.0)	ND	ND	NC

**Notes:**

RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number:

$$RPD = \frac{|R_1 - R_2|}{[(R_1 + R_2) / 2]} \times 100$$

- where R<sub>1</sub> = analysis result, and  
R<sub>2</sub> = duplicate analysis result.  
NC = Not calculated for non-detected values.  
ND = Not detected above the method detection limit.  
µg/L = micrograms per liter.

Because perchlorate concentrations in monitoring well CYN-MW6 have exceeded the screening level, DOE/Sandia will initiate the negotiation process with the NMED to determine the frequency of continued monitoring. DOE/Sandia are proposing to continue to monitor perchlorate concentrations in CYN-MW6 for at least four more quarters.

**6.0 References**

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## **Appendix A**

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

## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No.		SMO Use				AR/COC				611054					
Dept. No./Mail Stop: 6791/1087		Date Samples Shipped: 12-11-06		Project/Task No. 98036 10.11.01		<input type="checkbox"/> Waste Characterization -Send preliminary/copy report to:  <input type="checkbox"/> Released by COC No.: <input checked="" type="checkbox"/> Validation Required Bill To: Santa National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154									
Project/Task Manager: Paul Freshour		Carrier/Waybill No. 71928		SMO Authorization: LAB											
Project Name: CYN GWM		Lab Contact: Edie Kent/803-556-8171		Contract #: PO 21671											
Record Center Code: ER/1333/DAT		Lab Destination: GEL		NR											
Logbook Ref. No.: ER 058		SMO Contact/Phone: Pam Pulsant/505-844-3185													
Service Order No. CF#003-07		Send Report to SMO: Lorraine Herrera/505-844-3199													
Location		Tech Area		Reference LOV (available at SMO) 177625%											
Building		Room													
Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container		Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID			
083855-006	CYN-MW7	164		12/11/06 1017	GW	AG	4 x 1L	4C	G	SA	TPH Diesel (8015)	021			
083855-006	CYN-MW7	164		12/11/06 1015	GW	G	3 x 40ml	HCL	G	SA	TPH Gasoline (8015)	002			
083855-018	CYN-MW7	164		12/11/06 1020	GW	P	250 ml	H2SO4	G	SA	NPN (353.1)	003			
083855-020	CYN-MW7	164		12/11/06 1019	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	004			
RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No.		Sample Tracking		Smp Use		Special Instructions/QC Requirements				Abnormal Conditions on Receipt  Lab Use					
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab		Date Entered (mm/dd/yyyy)				EOD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No									
Turnaround Time <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input checked="" type="checkbox"/> 30 Day		Entered by:				Level D Package <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No									
Return Samples By: <input type="checkbox"/> Negotiated TAT <input type="checkbox"/> QC Init.						*Send report to:									
Sample Team Members						Tim Jackson/Org.6731/MS 1087/505-264-2547									
Name		Signature		Job		Company/Organization/Phone/Cellular									
William J Gibson				10/25/06		Weston/8765/284-5232/239-7367									
Robert Lynch				12/11/06		Weston/8765/844-4013/250-7090									
Alfred Santillanes				12/11/06		Weston/6765/844-6130/228-0710									
						*Please list as separate report.									
1. Relinquished by		Org. 6765		Date 12/11/06		Time 1123		4. Relinquished by		Org.		Date		Time	
1. Received by		Org. 6765		Date 12-11-06		Time 1123		4. Received by		Org.		Date		Time	
2. Relinquished by		Org. 6765		Date 12-11-06		Time 1100		5. Relinquished by		Org.		Date		Time	
2. Received by		Org. 6765		Date 12-11-06		Time 1040		5. Received by		Org.		Date		Time	
3. Relinquished by		Org.		Date		Time		6. Relinquished by		Org.		Date		Time	
3. Received by		Org.		Date		Time		6. Received by		Org.		Date		Time	

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Company : Sandia National Laboratories  
Address : MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact : Ms. Pamela M. Puissant  
Project : Level C Data Package GW

Report Date: December 29, 2006

Client Sample ID: 083855-020  
Sample ID: 177623004  
Matrix: Ground Water  
Collect Date: 11-DEC-06 10:19  
Receive Date: 12-DEC-06  
Collector: Client  
Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: CYN-MW7

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR112/13/06	1900	595490	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	



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Address: MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C Data Package GW

Report Date: January 3, 2007

Client Sample ID: 083856-020  
Sample ID: 177687004  
Matrix: Ground Water  
Collect Date: 12-DEC-06 10:50  
Receive Date: 13-DEC-06  
Collector: Client  
Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: CYN-MW8

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR112/18/06	1628	596309	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	



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## Certificate of Analysis

Company : Sandia National Laboratories  
Address : MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact : Ms. Pamela M. Puissant  
Project : Level C Data Package GW

Report Date: January 3, 2007

Client Sample ID: 083857-020  
Sample ID: 177756004  
Matrix: Ground Water  
Collect Date: 12-DEC-06 13:28  
Receive Date: 14-DEC-06  
Collector: Client  
Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: CYN-EB1

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR112/18/06	1743	596309	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

ORIGINAL

CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *MIA*

SMO Use

AR/COC

611057

Dept. No./Mail Stop: 6765/1087	Date Samples Shipped: 12-18-06	Project/Task No. 98036 10.11.01	<input type="checkbox"/> Waste Characterization -Send preliminary/copy report to:  <input type="checkbox"/> Released by COC No.: _____ <input checked="" type="checkbox"/> Validation Required  Bill To: Sendia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 178003
Project/Task Manager: Paul Freshour	Carrier/Waybill No. 72152	SMO Authorization: <i>[Signature]</i>	
Project Name: CYN GWM	Lab Contact: Edie Kent/803-556-8171	Contract #: PO 21871	
Record Center Code: ER/1333/DAT	Lab Destination: GEL	SAS BOTTLE ORDER	
Logbook Ref. No.: ER 058	SMO Contact/Phone: Pam Puissant/505-844-3185		
Service Order No. CF#003-07	Send Report to SMO: Lorraine Herrera/505-844-3199		

Location		Reference LOV (available at SMO)										Parameter & Method Requested		Lab Sample ID
Building	Room	Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type		
								Type	Volume					
		083858-001	CYN-MW6	164		121506/1032	GW	G	3 x 40ml	HCL	G	SA	VOC (8260)	001
		083858-002	CYN-MW6	164		121506/1034	GW	AG	4 x 1L	4C	G	SA	SVOC (8270)	002
		083858-005	CYN-MW6	164		121506/1035	GW	AG	4 x 1L	4C	G	SA	TPH Diesel (8015)	004
		083858-006	CYN-MW6	164		121506/1037	GW	G	3 x 40ml	HCL	G	SA	TPH Gasoline (8015)	006
		083858-016	CYN-MW6	164		121506/1038	GW	P	250 ml	4C	G	SA	Major Anions (SW846/9056)	008
		083858-017	CYN-MW6	164		121506/1039	FGW	P	500 ml	HNO3	G	SA	Major Cations (6020)	009
		083858-018	CYN-MW6	164		121506/1040	GW	P	250 ml	H2SO4	G	SA	NPN (353.1)	010
		083858-020	CYN-MW6	164		121506/1041	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	012
		083859-005	CYN-MW6	164		121506/1035	GW	AG	4 x 1L	4C	G	DU	TPH Diesel (8015)	005
		083859-006	CYN-MW6	164		121506/1037	GW	G	3 x 40ml	HCL	G	DU	TPH Gasoline (8015)	007

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Ref. No.	Sample Tracking	Smo Use	Special Instructions/QC Requirements	Abnormal Conditions on Receipt
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab		Date Entered (mm/dd/yy)		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Turnaround Time <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input checked="" type="checkbox"/> 30 Day		Entered by:		Level D Package <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Return Samples By: <input type="checkbox"/> Negotiated TAT <input type="checkbox"/> QC inits.				*Send report to:	
Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular	Lab Use
	William J Gibson	<i>[Signature]</i>		Weston/8765/284-5232/239-7367	
	Alfred Santillanes	<i>[Signature]</i>		Weston/6765/844-5130/228-0710	
				Tim Jackson/Org.6765/MS 1087/505-284-2547	
				FGW ( filtered in field with 40 micron filter )	
				CYN-GWM COMPLETE	
				*Please list as separate report.	

1. Relinquished by <i>[Signature]</i> Org. 6765 Date 12/18/06 Time 0920	4. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. 6765 Date 12/18/06 Time 0920	4. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. 6765 Date 12/18/06 Time 1000	5. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. GEL Date 12/18/06 Time 4:05	5. Received by	Org.	Date	Time
3. Relinquished by	6. Relinquished by	Org.	Date	Time
3. Received by	6. Received by	Org.	Date	Time



# GEL LABORATORIES LLC

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## Certificate of Analysis

Company : Sandia National Laboratories  
Address : MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C Data Package GW

Report Date: January 12, 2007

Client Sample ID: 083858-020  
Sample ID: 178003012  
Matrix: AQUEOUS  
Collect Date: 15-DEC-06 10:41  
Receive Date: 19-DEC-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: CYN-MW6

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	J	0.00846	0.004	0.012	mg/L	1	RXM101/05/07	1234	600210	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

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1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C Data Package GW

Report Date: January 12, 2007

Client Sample ID: 083859-020  
Sample ID: 178003013  
Matrix: AQUEOUS  
Collect Date: 15-DEC-06 10:41  
Receive Date: 19-DEC-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: CYN-MW6

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	J	0.00893	0.004	0.012	mg/L	1	RXM101/05/07	1249	600210	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	



**Certificate of Analysis**

Company : Sandia National Laboratories  
 Address : MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
 1515 Eubank SE  
 Albuquerque, New Mexico 87123  
 Contact: Ms. Pamela M. Puissant  
 Project: **Level C Data Package GW**

Report Date: January 12, 2007

Client Sample ID:	083861-020	Project:	SNLSGW
Sample ID:	177989001	Client ID:	SNLS002
Matrix:	AQUEOUS		
Collect Date:	18-DEC-06 08:44	Client Desc.:	GWPP EB1
Receive Date:	19-DEC-06		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	RXM101/05/07	1218	600210	1

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

## CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. V/A SMO Use \_\_\_\_\_ AR/COC 611061

Dept. No./Mail Stop: 10331/1042	Date Samples Shipped: <u>12-19-06</u>	Project/Task No. 96750.01.01.05	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Franz Lauffer	Carrier/Waybill No. <u>72220</u>	SMO Authorization: <u>[Signature]</u>	-Send preliminary/copy report to:
Project Name: GWPP	Lab Contact: Edie Kent/803-556-8171	Contract # PO 21671	<input type="checkbox"/> Released by COC No.: _____
Record Center Code: NA	Lab Destination: GEL		<input checked="" type="checkbox"/> Validation Required
Logbook Ref. No.: NA	SMO Contact/Phone: Pam Pussant/505-844-3185		Bill To: Sandia National Labs (Accounts Payable)
Service Order No. CF 084-07	Send Report to SMO: Lorraine Herrera /505-844-3189		P.O. Box 5800 MS 0154

Location: Tech Area \_\_\_\_\_  
Building: Room \_\_\_\_\_

### Reference LOV (available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
083862-020	SWTA3-MW4	453	<u>N/A</u>	121906/1006	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	001
083863-020	SWTA3-MW4	453	<u>N/A</u>	121906/1005	GW	P	250 ml	4C	G	DU	Perchlorate (314.0)	002

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____	Sample Tracking SMO Use _____	Special Instructions/QC Requirements EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Abnormal Conditions on Receipt	
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab	Date Entered (mm/dd/yy) _____	Level O Package <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Lab Use	
Turnaround Time <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input checked="" type="checkbox"/> 30 Day	Entered by: _____	*Send report to: <u>Tim Jackson/ORG. 6765/MS. 1087/284-2547</u>		
Return Samples By: _____	<input type="checkbox"/> Negotiated TAT <input type="checkbox"/> QC Inits.			
Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	<u>[Signature]</u>	<u>[Init]</u>	Weston/8146/844-4013/250-7090
	Alfred Santillanes	<u>[Signature]</u>	<u>[Init]</u>	Weston/6146/844-6130/228-0710
	William J Gibson	<u>[Signature]</u>	<u>[Init]</u>	Weston/6145/284-3232/239-7367
	Matt Stockham	<u>[Signature]</u>	<u>[Init]</u>	Sandia/10333/284-8202
*Please list as separate report.				

1. Relinquished by <u>[Signature]</u> Org. <u>6765</u> Date <u>12/19/06</u> Time <u>10:50</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>[Signature]</u> Org. <u>6765</u> Date <u>12/19/06</u> Time <u>10:50</u>	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. <u>6765</u> Date <u>12/19/06</u> Time <u>13:05</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. _____ Date <u>12/19/06</u> Time <u>11:45</u>	5. Received by _____ Org. _____ Date _____ Time _____
3. Relinquished by _____ Org. _____ Date _____ Time _____	6. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by _____ Org. _____ Date _____ Time _____	6. Received by _____ Org. _____ Date _____ Time _____

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Company : Sandia National Laboratories  
Address : MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact : Ms. Pamela M. Puissant  
Project : Level C Data Package GW

Report Date: January 18, 2007

Client Sample ID: 083862-020  
Sample ID: 178345001  
Matrix: AQUEOUS  
Collect Date: 19-DEC-06 10:06  
Receive Date: 22-DEC-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: SWTA3-MW4

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	RXM101/05/07	1450	600210	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Company : Sandia National Laboratories  
Address : MS-0756, Org. 7578, Bldg. 823/Rm. 4276  
1515 Eubank SE  
Albuquerque, New Mexico 87123  
Contact: Ms. Pamela M. Puissant  
Project: Level C Data Package GW

Report Date: January 12, 2007

Client Sample ID: 083863-020  
Sample ID: 178345002  
Matrix: AQUEOUS  
Collect Date: 19-DEC-06 10:05  
Receive Date: 22-DEC-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: SWTA3-MW4

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Ion Chromatography Federal</b>										
<i>EPA 314.0 Perchlorate by IC, contingent</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	RXM101/05/07	1535	600210	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

## **Appendix B**

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

# Analytical Quality Associates, Inc.

616 Maxine NE  
Albuquerque, NM 87123  
Phone: 505-299-5201  
Fax: 505-299-6744  
Email: minteer@aol.com

## Memorandum

DATE: January 20, 2007  
TO: File  
FROM: David Schwent  
SUBJECT: Inorganic Data Review and Validation - SNL  
Site: Canyons Assess GWM  
AR/COC: 611054  
SDG: 177623  
Laboratory: GEL  
Project/Task: 98026.01.06

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 1.

### Summary

The samples were prepared and analyzed with accepted procedures using methods EPA314.0 (perchlorate) and EPA353.1 (nitrate/nitrite). 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/Laboratory Control Sample Duplicate (LCS/LCSD)

All Analyses: All LCS QC acceptance criteria were met. No LCSD analyses were performed. No sample data will be qualified as a result.

### **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.

### **ICP Serial Dilution**

All Analyses: No serial dilution was required for these methods.

### **ICP Interference Check Sample (ICS)**

All Analyses: No ICS was required for these methods.

### **Detection Limits/Dilutions**

Nitrate/nitrite Analysis: All detection limits were properly reported. Sample 177623-003 diluted 5X due to high concentration of the target analyte.

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

### **Other QC**

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

No other specific issues were identified which affect data quality.

Sample ID	Method/CAS Number (Analysis/Analyte)												
	Diesel Range Organics (EPA8015A/B)	394878-87-0 (Diesel Range Organics)	Gasoline Range Organics (EPA8015B)	Perchlorate (EPA314.0):	Nitrate/nitrite (EPA353.1):								
083855-005 CYN-MW7		53.4U,B	All Acceptance criteria met. No sample data will be qualified.	All Acceptance criteria met. No sample data will be qualified.	All Acceptance criteria met. No sample data will be qualified.								

Validated By:

*David Schwent*

Mr. David Schwent

Date: 01/20/07

# Analytical Quality Associates, Inc.

616 Maxine NE  
Albuquerque, NM 87123  
Phone: 505-299-5201  
Fax: 505-299-6744  
Email: minteer@aol.com

## Memorandum

Date: January 25, 2007  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Canyons Assessment GWM  
AR/COC: 611055  
SDG: 177687  
Laboratory: GEL  
Project/Task: 98026.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

### Summary

The samples were prepared and analyzed with accepted procedures using methods EPA314.0 (Perchlorate) and EPA353.1 (Nitrate/Nitrite). No problems were identified with the data package that result in the qualification of data.

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

### Holding Times/Preservation

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

### Calibration

The initial and continuing calibration data met QC acceptance criteria.

### Blanks

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

#### Nitrate/Nitrite:

The target analyte was detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB) at negative concentration with absolute value  $>$  the DL but  $<$  the RL. The associated sample result was a detect  $>5X$  the DL; no data should be qualified as a result.

### Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

All Analyses:

It should be noted that no LCSD was provided with the SDG. No data should be qualified as a result. Laboratory precision was assessed using the replicate.

**Matrix Spike (MS)**

The MS met QC acceptance criteria.

**Replicate**

The replicate met QC acceptance criteria.

**ICP Serial Dilution**

Not Applicable

**ICP Interference Check Sample (ICS)**

Not Applicable

**Detection Limits/Dilutions**

All detection limits were properly reported. No dilutions were required except as follows.

Nitrate/Nitrite:

Sample 177687-003 was diluted 5X due to matrix interference.

**Other QC**

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s).

No other specific issues were identified that affect data quality.

Site: Canyons Assessment GWM

AR/COC: 611055

Data Type: Organic & Inorganic

	Diesel Range Organics	394878-87-0 (DRO)																																												
083856-005 CYN-MW8		50U,B																																												
GRO and General Chemistry analyses met QC acceptance criteria. No data should be qualified.																																														

Validated By:

Kevin A. Lambert



Date: 01/25/07

# Analytical Quality Associates, Inc.

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## Memorandum

Date: January 25, 2007  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Canyons Assessment GWM  
AR/COC: 611056  
SDG: 177756  
Laboratory: GEL  
Project/Task: 98026.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

### Summary

The samples were prepared and analyzed with accepted procedures using methods EPA314.0 (Perchlorate) and EPA353.1 (Nitrate/Nitrite). No problems were identified with the data package that result in the qualification of data.

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

### Holding Times/Preservation

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

### Calibration

The initial and continuing calibration data met QC acceptance criteria.

### Blanks

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

#### Nitrate/Nitrite:

The target analyte was detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB) at negative concentration with absolute value  $>$  the DL but  $<$  the RL. The associated sample result was a detect  $>5X$  the DL; no data should be qualified as a result.

### Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

All Analyses:

It should be noted that no LCSD was provided with the SDG. No data should be qualified as a result. Laboratory precision was assessed using the replicate.

**Matrix Spike (MS)**

The MS met QC acceptance criteria except as follows.

All Analyses:

It should be noted the MS was run on a SNL sample of similar matrix from another SDG. No data should be qualified as a result.

**Replicate**

The replicate met QC acceptance criteria except as follows.

All Analyses:

It should be noted the replicate was run on a SNL sample of similar matrix from another SDG. No data should be qualified as a result.

**ICP Serial Dilution**

Not Applicable

**ICP Interference Check Sample (ICS)**

Not Applicable

**Detection Limits/Dilutions**

All detection limits were properly reported. No dilutions were required.

**Other QC**

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

All Analyses:

It should be noted that the EB on ARCO# 611056 is associated with SNL samples submitted in another SDG on ARCO# 611057.

No other specific issues were identified that affect data quality.



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## Memorandum

Date: January 26, 2007  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Canyons Assessment GWM  
AR/COC: 611057  
SDG: 178003  
Laboratory: GEL  
Project/Task: 98026.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

### Summary

The samples were prepared and analyzed with accepted procedures using methods EPA 6020 (ICP-MS), EPA 9056 (bromide, chloride, fluoride, and sulfate by Ion Chromatography) EPA 314.0 (perchlorate) and EPA 353.1 (nitrate/nitrite). Problems were identified with the data package that result in the qualification of data.

#### 1. ICP-MS metals:

The serial dilution relative percent difference (RPD) for Na (12%) was >10% and the parent sample result was >50X the RL. The associated sample result was a detect and should be qualified "J."

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

### Holding Times/Preservation

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

### Calibration

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

### Blanks

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

#### ICP-MS metals:

Calcium was detected ( $\geq$  DL) in the method blank. The associated sample result was a detect  $>5X$  the blank concentration; no data should be qualified as a result.

Nitrate/Nitrite:

The target analyte was detected ( $\geq$  DL) in the equipment blank (EB). The associated sample results were detects  $>5X$  the blank concentration; no data should be qualified as a result.

**Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)**

The LCS/LCSD met QC acceptance criteria except as follows.

All Analyses:

It should be noted that no LCSD was provided with the SDG. No data should be qualified as a result. Laboratory precision was assessed using the replicate.

**Matrix Spike (MS)**

The MS met QC acceptance criteria except as follows.

ICP-MS metals:

It should be noted that the MS recovery limits do not apply for target analytes with sample concentrations  $>4X$  the spike concentrations (see Inorganic Metals Worksheets). No data should be qualified as a result.

Perchlorate:

It should be noted the MS was run on a SNL sample of similar matrix from another SDG. No data should be qualified as a result.

**Replicate**

The replicate met QC acceptance criteria except as follows.

Perchlorate:

It should be noted the replicate was run on a SNL sample of similar matrix from another SDG. No data should be qualified as a result.

**ICP Serial Dilution**

The serial dilution met QC acceptance criteria except as noted above in the summary section.

**ICP Interference Check Sample (ICS)**

The ICS data met QC acceptance criteria.

**Detection Limits/Dilutions**

All detection limits were properly reported. No dilutions were required except as follows.

ICP-MS metals:

Sample 178003-009 was diluted 5X for calcium due to high concentration for this analysis.

Ion Chromatography (IC):

Sample 178003-008 was diluted 10X for chloride and sulfate due to high concentrations for this analysis.

Nitrate/Nitrite:

Samples 178003-010 and -011 were diluted 10X for nitrate/nitrite due to high concentration for this analysis.

Other QC

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

Perchlorate and Nitrate/Nitrite:

It should be noted that the EB associated with the SNL samples in this SDG was submitted in another SDG on ARCO# 611056. Also, a field duplicate pair was submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data should be qualified as a result.

No other specific issues were identified that affect data quality.



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## Memorandum

Date: January 26, 2007  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: GWPP  
AR/COC: 611060  
SDG: 177989  
Laboratory: GEL  
Project/Task: 96750.01.01.05

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

### Summary

The sample was prepared and analyzed with accepted procedures using methods EPA314.0 (Perchlorate). No problems were identified with the data package that result in the qualification of data.

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

### Holding Times/Preservation

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

### Calibration

The initial and continuing calibration data met QC acceptance criteria.

### Blanks

No target analytes were detected in the blanks.

### Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

#### Perchlorate:

It should be noted that no LCSD was provided with the SDG. No data should be qualified as a result. Laboratory precision was assessed using the replicate.

### **Matrix Spike (MS)**

The MS met QC acceptance criteria except as follows.

#### **Perchlorate:**

It should be noted the MS was run on a SNL sample of similar matrix from another SDG. No data should be qualified as a result.

### **Replicate**

The replicate met QC acceptance criteria except as follows.

#### **Perchlorate:**

It should be noted the replicate was run on a SNL sample of similar matrix from another SDG. No data should be qualified as a result.

### **ICP Serial Dilution**

Not Applicable

### **ICP Interference Check Sample (ICS)**

Not Applicable

### **Detection Limits/Dilutions**

All detection limits were properly reported. No dilutions were required.

### **Other QC**

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

#### **Perchlorate:**

It should be noted that the EB on ARCO# 611060 is associated with SNL samples submitted in another SDG on ARCO# 611061.

No other specific issues were identified that affect data quality.

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## Memorandum

Date: January 26, 2007  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: GWPP  
AR/COC: 611061  
SDG: 178345  
Laboratory: GEL  
Project/Task: 96750.01.01.05

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 1.

### Summary

The samples were prepared and analyzed with accepted procedures using methods EPA314.0 (Perchlorate). No problems were identified with the data package that result in the qualification of data.

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

### Holding Times/Preservation

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

### Calibration

The initial and continuing calibration data met QC acceptance criteria.

### Blanks

No target analytes were detected in the blanks.

### Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD met QC acceptance criteria except as follows.

#### Perchlorate:

It should be noted that no LCSD was provided with the SDG. No data should be qualified as a result. Laboratory precision was assessed using the replicate.

**Matrix Spike (MS)**

The MS met QC acceptance criteria.

**Replicate**

The replicate met QC acceptance criteria.

**ICP Serial Dilution**

Not Applicable

**ICP Interference Check Sample (ICS)**

Not Applicable

**Detection Limits/Dilutions**

All detection limits were properly reported. No dilutions were required.

**Other QC**

No equipment blank (EB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

**Perchlorate:**

It should be noted that the EB associated with the SNL samples in this SDG was submitted in another SDG on ARCO# 611060. Also, a field duplicate pair was submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data should be qualified as a result.

No other specific issues were identified that affect data quality.

