



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



JAN 09 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, DOE is submitting the first Consolidated Quarterly Report for the Environmental Restoration Project that addresses all quarterly reporting requirements required under the Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act Permit, the Compliance Order on Consent (Consent Order) and the Chemical Waste Landfill Closure Plan for Sandia National Laboratories/New Mexico, EPA ID No. NM5890110518.

In summary, no potentially controversial issues are presented in this report. 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.

As a routine, one copy of this report will be provided to the EPA Region VI office and two copies to the New Mexico Environment Department (one to you and one to Mr. W. Moats). The next quarterly report will be submitted by March 30, 2007.

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. James Bearzi

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**JAN 09 2007**

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  
UNM Zimmerman Library (or other Public reading room)

cc w/o enclosure:

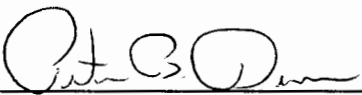
M. Reynolds, NNSA/SSO, MS-0184  
J. Gould, NNSA/SSO, MS-0184  
A. Blumberg, SNL/NM, Org. 11100, MS- 0141  
D. Miller, SNL/NM, Org. 6765, MS- 0718  
P. Freshour, SNL/NM, Org. 6765, MS -1087  
B. Langkopf, SNL/NM, Org. 6765, MS- 1087  
M. J. Davis, SNL/NM, Org. 6765, MS -1087  
Records Center, SNL/NM, Org. 6765, MS -1087

## CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

Document title: Consolidated EPA Quarterly Report, December 2006

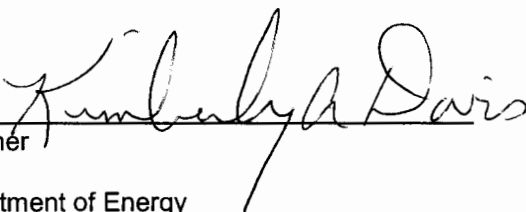
Document author: Paul Freshour, 6765

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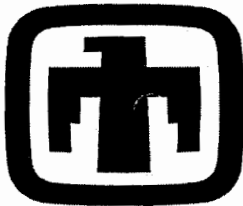
Signature:   
Peter B. Davies  
Director  
Nuclear Energy & Global Security Technologies  
Division 6700  
Sandia National Laboratories/New Mexico  
Albuquerque, New Mexico 87185  
Operator

1/3/07  
Date

and

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

1/9/07  
Date



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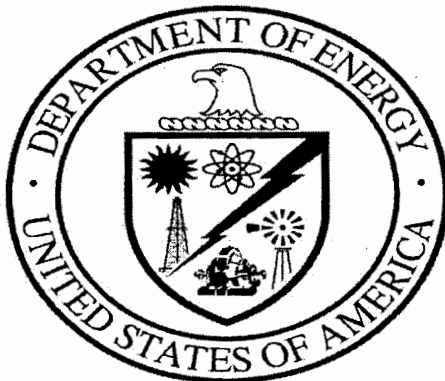
Sandia National Laboratories, New Mexico (SNL/NM)

**Environmental Restoration Project**

A Department of Energy Environmental Cleanup Program

**CONSOLIDATED  
Quarterly Report**

**DECEMBER 2006**



United States Department of Energy  
Sandia Site Office



# CONSOLIDATED QUARTERLY REPORT

December 2006

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 first 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

For this first consolidated period, realignment of the reporting periods was required. This first period reports activities as follows:

ER Project (September – October 2006).  
Chemical Waste Landfill (July, August, September, October 2006).  
Perchlorate Screening (July, August, September 2006 sampling period).

Future Consolidated reports will report on a standard quarter for all Sections. The next quarterly report will cover November and December 2006, and January 2007 and will be submitted by March 30, 2007.

# **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 (September – October 2006)**

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

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

- ER site reviews were completed and delivered for the following:

10/30/06: Land Use Permit # 230, TA-V Berm and Security Buffer.

#### **2.1.2 Risk Assessment**

- Risk-related documents and references were archived.

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

- Fourth quarter sampling was completed for TAV ground water monitoring (GWM), Canyons (CYN) GWM and the Ground Water Protection Program (GWPP).
- First quarter sampling was completed for CWL GWM and nearly completed for Tijeras Arroyo Groundwater (TAG) Investigation (three wells were sampled in November, the remaining six wells will be sampled in December).
- Waste management was supported in discharging well water and decontamination water to the sanitary sewer (1759 gallons).
- Field sampling was completed for SWMU 58.
- External customer supported ERFO field support; placement of signs for 10336 (Emergency Operations) in Area 5.

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

Requests received (September 1, 2006 to October 31, 2006)

GPS:	2	-50%	(4 last period)
Data:	4	+100%	(2 last period)
Maps	37	-32%	(54 last period)
Total:	43*	-37%	(59 last period)

Requests completed (September 1, 2006 to October 31, 2006)

GPS:	2
Data:	4
Maps:	37
Total:	43 completed out of 43 received (completion rate 100%)

\* Map requests were down from last quarter with most ER Requests for SWMU 58 and groundwater. Requests for EM included RCRA maps for Permits, and data mining and maps for Kuai.

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

- There are now 2,559,099 data records in the ERDMS.
- 71 analytical data packages containing 17,247 new data points were processed and loaded into the ERDMS.
- 9,312 new data validation qualifiers and descriptive flags were entered into the ERDMS.
- 49 tables were generated in support of SWMUs 8, 58, CAMU (Corrective Action Management Unit), groundwater monitoring, MWL (Mixed Waste Landfill).
- 51 data packages were submitted to the Records Center.
- Database clean-up activities continued.

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

- 419 ER records were received and 462 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.
- 142 records of the 575 customer requests were retrieved for reviews at the record center. 350 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 216 records during this quarter.
- 545 records were sent to Inactive Storage.

### **2.1.7 SMO/Data Validation**

- The SMO packaged and shipped 353 samples to contract laboratories for 6 ER/LTS projects. The sample volume for this quarter was approximately 20% greater, for only 2 months, 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.
- 94 data packages were sent through contract verification review with an average TAT of two calendar days. 46% of the data packages were for ER/LTS projects. The volume of ER/LTS packages was 20% more for the two month period when compared to last quarter.
- 57 total data packages were validated for ER/LTS. The majority of the data packages were for groundwater monitoring and SWMU 58. The average TAT for packages at validation was four calendar days.

Fifty percent of the work processed during this period was in support of SWMU 58. Forty percent of the work supported groundwater monitoring. Ten percent of the work supported CAMU operations.

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

- Subgrade preparation activities at the MWL were initiated on June 5, 2006, and continued through the end of this quarter. Soil screening at the borrow area was conducted to obtain native material for the subgrade. The MWL perimeter fence was removed, and the landfill surface was cleared and grubbed, with rocks and vegetative material removed from the cover and stockpiled onsite. The first lifts of subgrade material were placed on October 31, 2006. The total thickness of the subgrade will vary from 2 to 40 inches across the MWL by the time subgrade preparation is complete.
- A geophysical survey was conducted of the MWL classified area using magnetometer and EM-61 techniques. Results show exact delineation of the pit locations at the MWL, and will be used to supplement geophysical survey data collected earlier on the remainder of the landfill.
- The MWL Annual Groundwater Report for 2006 was drafted and submitted for Management review. Groundwater sampling was conducted in April 2006 indicated that chromium concentrations in MWL-MW3 exceeded the EPA MCL. This exceedance is believed due to corrosion of the monitoring well's stainless steel screen.
- Citizen Action issued a "Notice of Intent to Sue" to DOE, Sandia, NMED, EPA and DOD regarding the MWL Regulatory path forward, and alleged deficiencies with the MWL monitoring well network.

- On June 21, 2006, the DOE Office of Inspector General (OIG) issued a Management Referral memorandum entitled "Possible Deficiencies in Monitoring Wells at Sandia National Laboratories Mixed Waste Landfill". The memorandum requested a written response from the DOE regarding an attached report alleging deficiencies in the Mixed Waste Landfill (MWL) groundwater monitoring program.
- Sandia/DOE reviewed the MWL monitoring well network, and completed a formal response which was submitted to the OIG in mid-September. The MWL monitoring well network was determined to be functioning as designed, and the allegations regarding deficiencies with the wells were determined by NNSA to be unfounded; a notification of dismissal from the OIG has not yet been received. No corrective actions were recommended by the NNSA.

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

- AOC 1101 (Building 885 Septic System (TA-I) is pending NMED acceptance for Corrective Action Complete (CAC) and is one of five sites remaining to undergo the Permit Modification process.
- Final signatures were obtained to complete the administrative closure process for nineteen DSS sites:
  - 48 - Bldg. 904 Septic System and HE Drain System (TA-II)
  - 135- Bldg. 906 Drain System (TA-II)
  - 136 - Bldg. 907 Septic System and HE Drain System (TA-II)
  - 159 - Bldg. 935 Septic System and Drywell (TA-II)
  - 165 - Bldg. 901 Septic System (TA-II)
  - 166 - Bldg. 919 Septic System and Seepage Pit (TA-II)
  - 167 - Bldg. 940 Septic System and Seepage Pits (TA-II)
  - 1006 - Bldg. 6741 Septic System (TA-III)
  - 1007 - Bldg. 6730 Septic System (TA-III)
  - 1010 - Bldg. 6536 Septic System and Seepage Pit (TA-III)
  - 1015 - Former MO 231-234 Septic System (TA-V)
  - 1020 - MO-146, MO-235, and T-40 Septic System (TA-III)
  - 1024 - MO 242-245 Septic System (TA-III)
  - 1028 - Bldg. 6560 Septic System (TA-III)
  - 1029 - Bldg. 6584 North Septic System (TA-III)
  - 1083 - Bldg. 6570 Septic System (TA-III)
  - 1086 - Bldg. 6523 Septic System (TA-III)
  - 1108 - Bldg. 6531 Seepage Pits (TA-III)
  - 1110 - Bldg. 6536 Drain System (TA-III)
- Forty-one DSS sites are awaiting regulatory approval for the September 2006 and March 2006 permit modification requests.

#### **2.4     ADS 1302     Technical Area I**

- No work scope is remaining in the Technical Area I Operable Unit. This OU has been closed and will not be included in the next quarterly report. Site closure activities that may be remaining will be included in Project Management and reported in that section.

#### **2.5     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

#### **2.6     ADS 1306     Technical Areas 3 and 5**

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

- In October, the NMED issued a Certificate for Corrective Action Complete with controls for SWMU 105 (Mercury Spill at Building 6536). SWMU 105 is one of five sites remaining to undergo the permit modification process.
- 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

#### **2.7     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

## 2.8 ADS 1326 Project Management

- The SNL ER Project Management structure was modified significantly in this reporting period which crosses the FY0206/2007 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.

## 2.9 ADS 1330 Site-Wide Hydrogeologic Characterization

### TA-3/5 Groundwater

- Quarterly sampling was performed.

### Canyons Groundwater

- Quarterly sampling was performed.

### Tijeras Arroyo Groundwater

- Notified the NMED of increasing TCE concentrations in groundwater samples from TJA-3.

### Mixed Waste Landfill Groundwater

- No groundwater sampling was performed.

### Chemical Waste Landfill Groundwater

- Semi-annual sampling was performed.

### DSS Groundwater

- No groundwater activities were performed.

## **2.10 ADS 1332 Foothills Test Area**

- In September, 86 samples were collected from five boreholes at Feature FF associated with Site 58 (Coyote Canyon Blast Area). The collection effort followed the Sample and Analysis Plan (SAP) that was written in response to a Notice of Disapproval received from the NMED in June 2006.
- SWMU 28-2 (Mine Shaft) is pending NMED acceptance for Corrective Action Complete (CAC). This site together with SWMUs 8 [Open Dump (Coyote Canyon Blast Area)] and 58 (Coyote Canyon Blast Area) are three of the five sites remaining to undergo the Permit Modification process.

## **2.11 ADS 1333 Canyons Test Area**

- No work scope is remaining in the Canyons Test Area Operable Unit. This OU has been closed and will not be included in the next quarterly report. Site closure activities that may be remaining will be included in Project Management and reported in that section.

## **2.12 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.

## **2.13 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.

## **2.14 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, (September 2006), including containment cell cover, storm water diversion structures, security fences, gates, and signs.



- Quarterly monitoring of the VZMS was conducted in September 2006.
- Waste management associated with the leachate collection was conducted.
- No sampling of the leachate was conducted during this reporting period per authorization by the NMED (June 6, 2006) to reduce the sampling frequency.

### CAMU Waste Management Activities

For this quarter (September – October 2006),

- Waste stored on site at the beginning of this period:
  - 312 gallons of leachate.
  - 5 lbs PPE, paper wipes, plastic drum cap, plastic drum pump.
- Waste generated on-site during the period:
  - 267 gallons of leachate.
  - 0.5 lbs PPE.
- Waste removed from site by the Hazardous Waste Management Facility:
  - 285 gallons of leachate.
  - 0.5 lbs PPE.
- Waste remaining on site at the end of this period:
  - 294 gallons of leachate.
  - 0.5 lbs PPE.

### Regulatory Activities

- On September 27, 2006, the CAMU Vadose Zone Monitoring System Annual Monitoring Results Report was submitted to the NMED.
- On October 3, 2006, the NMED performed an audit of the CAMU. There were no findings.

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

- See discussions under each ADS.

## **5.0 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).

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

### ***September 2006***

- None.

### ***October 2006***

- None.

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

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

# SUMMARY OF QUARTERLY REPORT

September–October  
Fiscal Year 2006

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**

**December 2006**

United States Department of Energy  
Sandia Site Office

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## **LIST OF APPENDICES**

- Appendix A    Chemical Waste Landfill Groundwater Monitoring Assessment Report,  
November 2006
- Appendix B    Replacement pages for the August 22, 2006 CWL Quarterly Closure Progress  
Report, revised Table A-8.

## **ACRONYMS AND ABBREVIATIONS**

CFR	Code of Federal Regulations
CMS	corrective measures study
CWL	Chemical Waste Landfill
DOE	U.S. Department of Energy
HWB	Hazardous Waste Bureau
LE	Landfill Excavation
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
PA	Permit Application
PCCP	Post-Closure Care Plan
RAP	Remedial Action Proposal
RCRA	Resource Conservation and Recovery Act
RSI	Request for Supplemental Information
Sandia	Sandia Corporation
SNL/NM	Sandia National Laboratories/New Mexico
TSCA	Toxic Substances Control Act
VCM	voluntary corrective measure

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# 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 July, August, September, and October of 2006.

## 1.0 INTRODUCTION

All voluntary corrective measures (VCMs) activities 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 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 (Kielling 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 (November 2006 through January 2007).

## 2.0 CLOSURE PLAN PROGRESS AND DELIVERABLES

Closure planning and reporting activities related to the CMS continued this quarter. In May 2003, the DOE and Sandia submitted the CMS Report, the RAP, and the Post-Closure Care Plan (PCCP)/Permit Application (PA) (SNL/NM May 2003) to the NMED as a Class 3 Closure Plan Amendment request. The NMED rejected the CMS Report in December 2003 (Kielling December 2003) and postponed review of the RAP and PCCP/PA. On September 14, 2004, the NMED documented that the DOE and Sandia were required to revise and resubmit the PCCP/PA to address the post-closure permitting requirements of Title 20, Chapter 4, Part 1, Section 900 of the New Mexico Administrative Code (NMAC) incorporating Title 40, Part 270, Section 28 of the Code of Federal Regulations (CFR) (Kielling September 2004). The DOE and Sandia submitted the revised CMS Report on December 21, 2004 (SNL/NM December 2004a). The revised RAP was included as an annex in the revised CMS Report, consistent with



NMED direction. The December 2004 submittal also included proposed revisions to Chapter 12 of the Closure Plan that resulted from the NMED rejection of the CMS Report. The DOE and Sandia submitted the revised PCCP for the CWL on September 8, 2005 (SNL/NM September 2005).

In February of this calendar year, the DOE and Sandia received NMED revisions to the proposed amendment to Chapter 12 of the Closure Plan. The purpose of these additional revisions is to update information in the original proposal, and to set forth more clearly the current regulatory path preferred by the NMED. In March, the DOE and Sandia responded to the comments from the NMED on the proposed amendment to the Closure Plan (SNL/NM March 2006). Informal interactions with NMED staff indicate that NMED action on the CMS Report, the PCCP and the Chapter 12 revisions is expected in the spring of 2007.

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 the installation of the interim cover.

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).

### **3.0 WATER MONITORING ASSESSMENT**

In October 2006, samples were collected from background wells (CWL-BW3 and CWL-BW4A) and monitoring wells (CWL-MW2BL, CWL-MW2BU, CWL-MW4, CWL-MW5L, CWL-MW5U, CWL-MW6L, and CWL-MW6U). The samples were analyzed for 40 CFR 264 (Appendix IX) VOCs and total metals plus iron. No analytes were detected at concentrations exceeding the associated EPA MCLs. Appendix A documents the data results and assessment report for the October 2006 sampling event.

Recently, DOE and Sandia conducted a review of acetone detections in various SNL groundwater monitoring samples. In August 2006, it was determined that numerous SNL samples, including those for the CWL, analyzed in late April and early May 2006 were suspect. It was discovered that, during this time period, the off-site laboratory analyzed two non-SNL samples with high levels of acetone along with SNL/NM samples. The information affected by this, which was reported in the August 22, 2006 CWL Quarterly Closure Progress Report (SNL/NM August 2006) has been amended and provided in Appendix B of this report; the only changes necessary were associated with the data validation qualifiers in Table A-8.

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

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

No activities are projected pending issuance of the NMED action on the Class 3 amendment, including the CMS Report, the PCCP, and the Chapter 12 revisions.

## REFERENCES

Bearzi, J.P. (New Mexico Environment Department), December 2004. Letter to P. Wagner (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Sandia National Laboratories Response to Comments on the Chemical Waste Landfill, Corrective Measures Study Report, May 2003, Sandia National Laboratories, EPA ID #NM5890110518, HWB SNL 03-013." December 17, 2004.

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.

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**APPENDIX A**  
**Chemical Waste Landfill Semiannual Groundwater Monitoring Assessment**  
**Report, December 2006**

**CHEMICAL WASTE LANDFILL  
SEMIANNUAL GROUNDWATER MONITORING  
ASSESSMENT REPORT  
October-December 2006**

Sandia National Laboratories/New Mexico  
Environmental Restoration Project  
Department 6146  
Albuquerque, New Mexico 87185-1148

December 2006

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December 2006



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## ABBREVIATIONS AND ACRONYMS

BW	background well
CFR	Code of Federal Regulations
CWL	Chemical Waste Landfill
EB	equipment blank
EPA	U.S. Environmental Protection Agency
FB	field blank
FOP	Field Operating Procedure
FY07	Fiscal Year 2007
MCL	maximum contaminant level
MDL	method detection limit
µg/L	microgram per liter
mL	milliliter
MW	monitoring well
NMED	New Mexico Environment Department
QC	quality control
RPD	relative percent difference
Sandia	Sandia Corporation
SC	specific conductance
SNL/NM	Sandia National Laboratories/New Mexico
TB	trip blank
TCE	trichloroethene
VCM	Voluntary Corrective Measure
VE	Vapor Extraction
VOC	volatile organic compound

## 1.0 Introduction

This report was prepared pursuant to Sections 1.2.1.6 and 1.3 of the *Chemical Waste Landfill [CWL] Final Closure Plan and Postclosure Permit Application* (SNL/NM December 1992). The activities associated with the groundwater monitoring task are summarized as follows.

Sandia Corporation (Sandia) performed Fiscal Year 2007 (FY07) semiannual groundwater sampling at the CWL, Sandia National Laboratories/New Mexico (SNL/NM) (Figure A-1) between October 2 and October 20, 2006. CWL groundwater sampling is required by the interim status standards of the Resource Conservation and Recovery Act contained in Title 40 of the Code of Federal Regulations (CFR), Part 265, Subpart F, and the State of New Mexico Hazardous Waste Management Regulations. This groundwater sampling event was conducted in conformance with procedures outlined in the *Sampling and Analysis Plan for Groundwater Assessment Monitoring at the Chemical Waste Landfill*, Appendix G, Revision 4 of the CWL Final Closure Plan (SNL/NM December 1992).

In March 1998, the New Mexico Environment Department (NMED) approved eliminating chlorinated dioxins, furans, and pesticides from the Appendix IX list of constituents for CWL groundwater monitoring (Dinwiddie March 1998). In May 2000, the NMED approved the following changes to Appendix G, Revision 4 (Bearzi May 2000):

- Biannual frequency (every other year) for Appendix IX constituents
- Semiannual frequency (twice a year) for volatile organic compounds (VOC) and metals

This report describes groundwater sampling activities and presents analytical results from the second FY07 semiannual groundwater assessment monitoring period. In October 2006, samples were collected from background wells (BW) (CWL-BW3 and CWL-BW4A) and monitoring wells (MW) (CWL-MW2BL, CWL-MW2BU, CWL-MW4, CWL-MW5L, CWL-MW5U, CWL-MW6L, and CWL-MW6U) (Figure A-2). These samples were analyzed for 40 CFR 264 (Appendix IX) VOCs and total metals plus iron. All analytical results from the October 2006 sampling of all CWL monitoring wells are included in this report.

Groundwater samples were not collected from CWL-MW1A or CWL-MW3A because these wells partially filled with sediment during the Vapor Extraction (VE) Voluntary Corrective Measure (VCM) while being used as VE wells, do not contain water, and cannot be restored for

the purpose of compliance groundwater monitoring. In July 2003, Sandia installed a BaroBall™ in CWL-MW2A at SNL/NM to investigate whether the cause of trichloroethene (TCE) contamination was the result of VOC vapors entering the well casing and being pushed downward to the groundwater via barometric pumping during high atmospheric pressure periods. On December 16, 2003, after six months of operation, the BaroBall™ was to be removed from CWL-MW2A so that groundwater sampling could be performed. During the manual removal of the BaroBall™, the top piece of casing (approximately 9 feet long) was accidentally broken. When the top casing piece separated, annular material from 2 to 3 feet above the separated joint fell into the well. With NMED approval, CWL-MW2A was plugged and abandoned in June 2004 (SNL/NM July 2004).

Three of the monitoring wells (CWL-MW2B, CWL-MW5, and CWL-MW6) are multi-completion wells with two separate polyvinyl chloride and screen intervals. One is screened across the water table, and the other is screened at an interval approximately 30 feet below the water table. The wells screened across the water table are designated as CWL-MW2BU, CWL-MW5U, and CWL-MW6U to indicate the upper (“U”) screened well completions. The wells screened below the first water-bearing zone are designated CWL-MW2BL, CWL-MW5L, and CWL-MW6L to indicate the lower (“L”) screened well completions. Further discussion of the completion of these wells is presented in the CWL Groundwater Assessment Report (SNL/NM October 1995). The following sections provide descriptions of the field methods used and a discussion of the analytical and quality control (QC) results.

## **2.0 Field Methods and Measurements**

The field measurements collected as part of groundwater sampling activities are in conformance with the “Sampling and Analysis Plan for Groundwater Assessment Monitoring at the Chemical Waste Landfill,” Appendix G of the CWL Closure Plan (SNL/NM December 1992).

Groundwater monitoring is being performed according to Appendix G, Revision 4 of the Closure Plan (SNL/NM December 1992) and updated SNL/NM Environmental Restoration Project field operating procedures (FOP) (SNL/NM November 1995, September 1996, and February 1997).

### **2.1 Groundwater Elevation Determinations**

Groundwater elevations at the CWL wells were determined using a Solinst® water level indicator prior to purging activities. Measurements were taken in accordance with FOP 95-02,

*A Technical Procedure for the Measurement of Static Water Levels* (SNL/NM November 1995) until three replicate measurements agreed to within 0.05 foot of each other. The portion of the well sounder in contact with the groundwater was decontaminated between measurements at different wells (SNL/NM February 1997). CWL-MW1A and CWL-MW3A were checked in October 2006 and did not contain water. Table A-1 summarizes the depth-to-water measurements for all CWL wells, and Attachment A presents complete field measurement information.

## **2.2 Well Evacuation**

A Bennett Company groundwater sampling system was used to collect groundwater samples from all wells, except CWL-MW2BU, CWL-MW5L, and CWL-MW6L. Because these are small-diameter wells (less than 2 inches), dedicated sampling systems manufactured by QED Environmental Systems, Inc. were used to collect samples. Prior to sample collection, each monitoring well was purged to remove stagnant well casing water. More than one day was required to complete purging and sampling at CWL-BW3, CWL-BW4A, CWL-MW2BU, CWL-MW5U, and CWL-MW6U, due to the slow recharge rate of the monitoring wells. Monitoring wells purged to dryness were allowed to recover before sampling to ensure the most representative groundwater sample possible given the low yield of these wells. CWL-MW2BL and CWL-MW4 were purged a minimum of three well-bore volumes prior to sampling. CWL-MW5L and CWL-MW6L were each purged a minimum of two tubing water volumes prior to sampling. CWL-MW2BU was purged to dryness twice then sampled. A total of 3,300 milliliters (mL) of water was purged from CWL-MW2BU. Based upon historical sampling events, CWL-MW2BU will purge dry between 500 and 2,500 mL.

Collection of field analytical measurements and groundwater samples was performed in accordance with procedures described in FOP 94-48, *Sampling Groundwater Monitoring Wells* (SNL/NM September 1996), as required by the CWL Sampling and Analysis Plan (SNL/NM December 1992). Groundwater temperature, specific conductance (SC), and pH were measured using a YSI™ Model 620 Water Quality Meter. Turbidity was measured with a Hach™ Model 2100P portable turbidity meter. Groundwater stability is considered acceptable when measurements are within 5 nephelometric turbidity units, 0.2 pH units, and 0.2 degrees Celsius, and SC is within 1 percent or 10 micromhos per centimeter (whichever is greater). Monitoring wells CWL-MW2BL, CWL-MW4, CWL-MW5L, and CWL-MW6L were purged until three stable measurements of turbidity, temperature, SC, and pH were obtained. All purged

water was placed into 55-gallon containers and stored at the Building 9925 waste accumulation area pending the results of the analyses. Table A-2 summarizes average pumping rates, pumping duration, and well discharge volumes for each well sampled. Table A-3 summarizes temperature, pH, SC, and turbidity measurements. Field Measurement Logs in Attachment A document well purging and water quality measurements.

### **2.3 Groundwater Sample Collection**

All groundwater samples were collected directly from the pump discharge tube into laboratory-prepared sample containers. Chemical preservatives for samples intended for chemical analyses were added to the sample containers at the laboratory prior to shipment to SNL/NM.

Table A-4 presents the sample number assigned to each sample. Table A-5 summarizes the analyses performed, analytical methods, sample containers, preservatives, and holding time requirements. Section 3.0 of this report summarizes the analytical results. Analysis Request/Chain-of-Custody documentation for all samples submitted for analyses are presented in Attachment B and filed in the SNL/NM Customer Funded Records Center (formerly the Environment, Safety, and Health [ES&H] and Security Records Center).

### **2.4 Pump Decontamination**

A Bennett Company groundwater sampling system was used to collect groundwater samples from all wells, except for CWL-MW2BU, CWL-MW5L, and CWL-MW6L. The sampling pump and tubing bundle were decontaminated prior to installation in monitoring wells according to procedures described in FOP 94-26, *General Equipment Decontamination* (SNL/NM February 1997). Two equipment blank (EB) or rinsate samples were collected to verify the effectiveness of the equipment decontamination process. These samples were collected prior to sampling CWL-MW4 and CWL-MW5U. No VOCs, except bromodichloromethane and dibromochloromethane, were detected in either EB sample. Various metal parameters were detected at low concentrations in both EB samples. All associated environmental samples with detectable VOCs or metals at concentrations less than five times the EB contamination were flagged with a "B2" notation in the associated data validation reports provided in Attachment C.

### **3.0 Analytical Results**

Groundwater samples collected for analysis of VOCs and metals were submitted to General Engineering Laboratories, Inc. in Charleston, South Carolina. Tables A-6 and A-7 summarize the chemical parameters, laboratory method detection limits (MDL), and U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCL) for drinking water supplies. Tables A-8, A-9, and A-10 summarize all analytes detected in samples collected from CWL groundwater monitoring wells during the second FY06 semiannual sampling event. All chemical analytical results are compared to EPA MCLs for drinking water supplies. Analytical reports, including the results of the analyses, analytical methods, quantitation limits, dates of analysis, and results of QC analyses, are filed in the SNL/NM Customer Funded Records Center.

No VOCs were detected at concentrations exceeding the associated MCL. No VOCs were detected in any sample except for acetone, carbon disulfide, toluene, and TCE. Acetone was detected in CWL-BW3, CWL-MW2BU, and CWL-MW6L at a maximum concentration of 2.39 micrograms per liter ( $\mu\text{g/L}$ ). Carbon disulfide was detected in CWL-MW5U only, at a concentration of 24.8  $\mu\text{g/L}$ , but was qualified during data validation as estimated laboratory control and matrix spike samples did not meet acceptance criteria. Toluene was detected in CWL-BW3, CWL-BW4A, CWL-MW5U, CWL-MW5U duplicate sample, and CWL-MW6U at concentrations ranging from 0.347 to 1.45  $\mu\text{g/L}$ . TCE was detected below the MCL of 5.0  $\mu\text{g/L}$  in the groundwater samples from CWL-BW4A, CWL-MW2BU, CWL-MW5L, CWL-MW5U, CWL-MW6L, and CWL-MW6U at concentrations ranging from 0.256 to 2.36  $\mu\text{g/L}$ . Table A-8 summarizes the detected VOCs.

No total metal parameters were detected above established regulatory limits in any groundwater sample. In general, chromium, nickel, and iron results from CWL-BW3, CWL-MW2BU, and CWL-MW4 groundwater samples correlate to increased field turbidity measurements. Table A-9 summarizes the total metal parameters for all groundwater samples collected during the second FY07 semiannual sampling event at the CWL.

### **4.0 Quality Control**

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



## **4.1 Field QC Samples**

Field QC samples included environmental duplicate, field blank (FB), and trip blank (TB) samples. The field QC samples were submitted for analysis along with the groundwater samples in accordance with QC procedures specified in the CWL Sampling and Analysis Plan (SNL/NM December 1992).

### **4.1.1 Duplicate Environmental Samples**

A total of two duplicate environmental samples were collected and analyzed for all parameters in order to determine the overall reproducibility of the sampling and analysis process. Duplicate samples were collected at CWL-MW4 and CWL-MW5U immediately after the original environmental samples in order to reduce variability caused by time and/or sampling mechanics.

Relative percent difference (RPD) calculations between duplicate samples were performed for all analytes. Table A-10 summarizes the results of the duplicate sample analyses and calculated RPD values. The results show that sampling and analysis precision was in conformance with the CWL Sampling and Analysis Plan requirements for all measured parameters, except copper from CWL-MW4, and antimony from CWL-MW5U. RPD calculations for these parameters may be affected by increased field turbidity measurements and/or associated results reported at estimated concentrations below the effective practical quantitation limit.

### **4.1.2 Field Blank Samples**

Two FB samples were collected for VOCs to assess whether contamination of the samples resulted from ambient field conditions. The FB samples were prepared by pouring deionized water into sample containers at the CWL-BW4A and CWL-MW5L wellheads to simulate the transfer of environmental samples from the sampling system to the sample container. Acetone was detected in the FB sample associated with CWL-BW4A. Acetone was qualified as not detected in CWL-BW4A during data validation, since the compound was detected at a concentration less than ten times the blank contamination.

### **4.1.3 Trip Blanks**

TB samples are submitted whenever samples are collected for VOC analysis to assess whether contamination of the samples has occurred during shipment and storage. TB samples consist of laboratory reagent grade water with hydrochloric acid preservative contained in 40-mL VOC vials prepared by the analytical laboratory, which accompany the empty sample containers supplied by the laboratory. TBs were brought to the field and accompanied each sample shipment. A total of ten TBs were submitted with the FY07 semiannual samples. No VOCs were detected above laboratory MDLs in any TB sample, except for acetone. If acetone was detected in associated environmental samples at concentrations less than ten times the TB contamination, then compounds were qualified as not detected during data validation.

### **4.2 Laboratory QC**

Internal laboratory QC analyses performed included method blank, laboratory control sample, matrix spike, matrix spike duplicate, and surrogate spike analyses. All laboratory data were reviewed and qualified in accordance with AOP [Administrative Operating Procedure] 00-03, Revision 0, *Data Validation Procedure for Chemical and Radiochemical Data* (SNL/NM January 2000). Although some analytical results were qualified during the data validation process, no significant data quality problems were noted. Data validation reports associated with the second FY07 semiannual groundwater sampling event are provided in Attachment C.

### **4.3 Variances and Nonconformances**

Variances and nonconformances from requirements in the CWL Sampling and Analysis Plan (SNL/NM December 1992) are identified as follows:

- CWL-MW1A and CWL-MW3A are no longer sampled (since 1998) because these wells do not contain water. The wells partially filled with sediment during the VE VCM and have not recovered.
- CWL-MW2A was plugged and abandoned in June 2004 with NMED approval (SNL/NM July 2004).
- CWL-BW3, CWL-BW4A, CWL-MW2BU, CWL-MW5U, and CWL-MW6U were purged to dryness, allowed to recover, and then sampled to collect the most representative groundwater sample possible given the low yield of these wells.

- CWL-MW2BU, CWL-MW5L, and CWL-MW6L were sampled using dedicated sampling systems manufactured by QED Environmental Systems, Inc.

## 5.0 Summary

In October 2006, samples were collected from background wells (CWL-BW3 and CWL-BW4A) and monitoring wells (CWL-MW2BL, CWL-MW2BU, CWL-MW4, CWL-MW5L, CWL-MW5U, CWL-MW6L, and CWL-MW6U). The samples were analyzed for 40 CFR 264 (Appendix IX) VOCs and total metals plus iron. No analytes were detected at concentrations exceeding the associated EPA MCLs.

## 6.0 References

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

## FIGURES

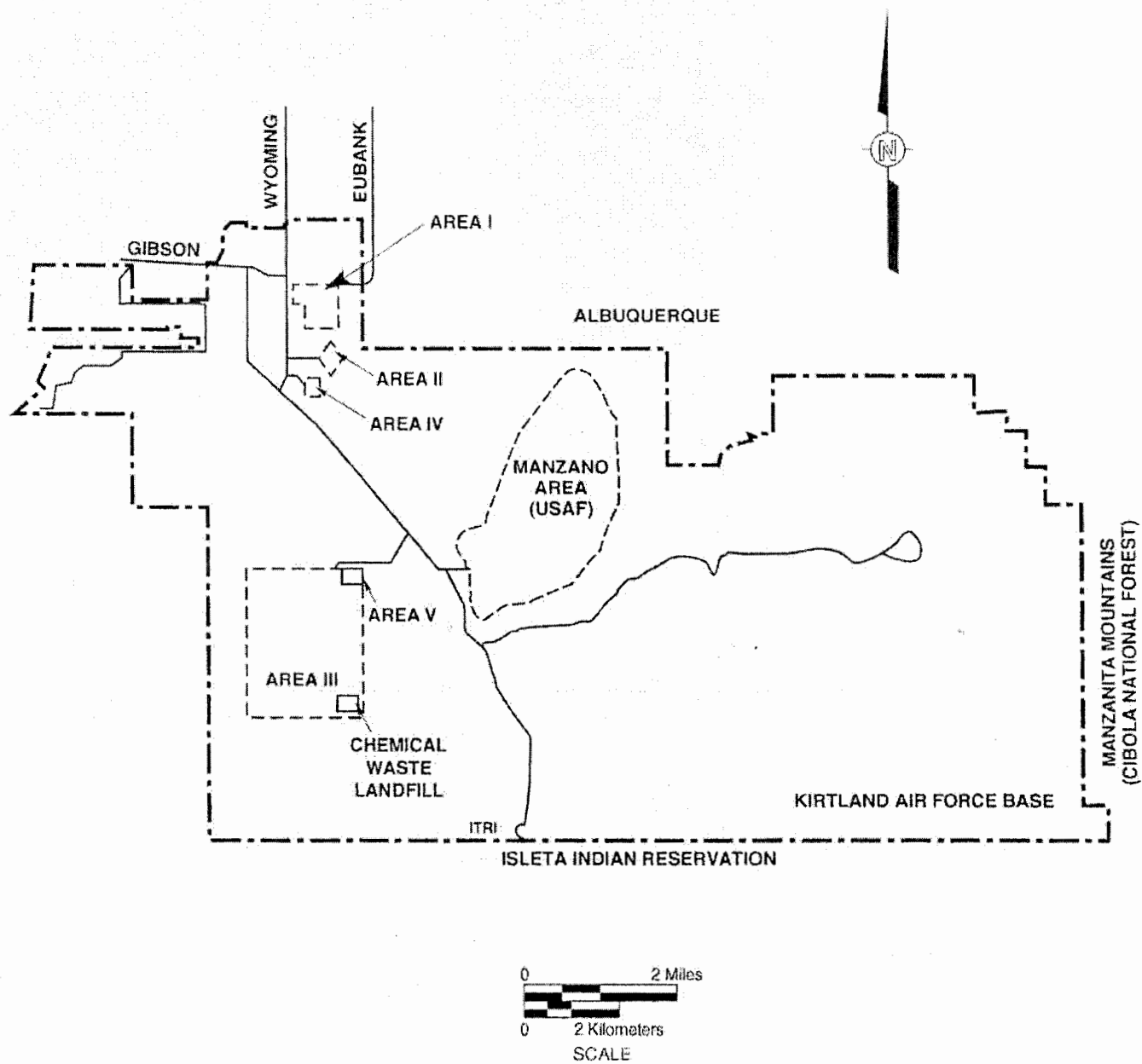
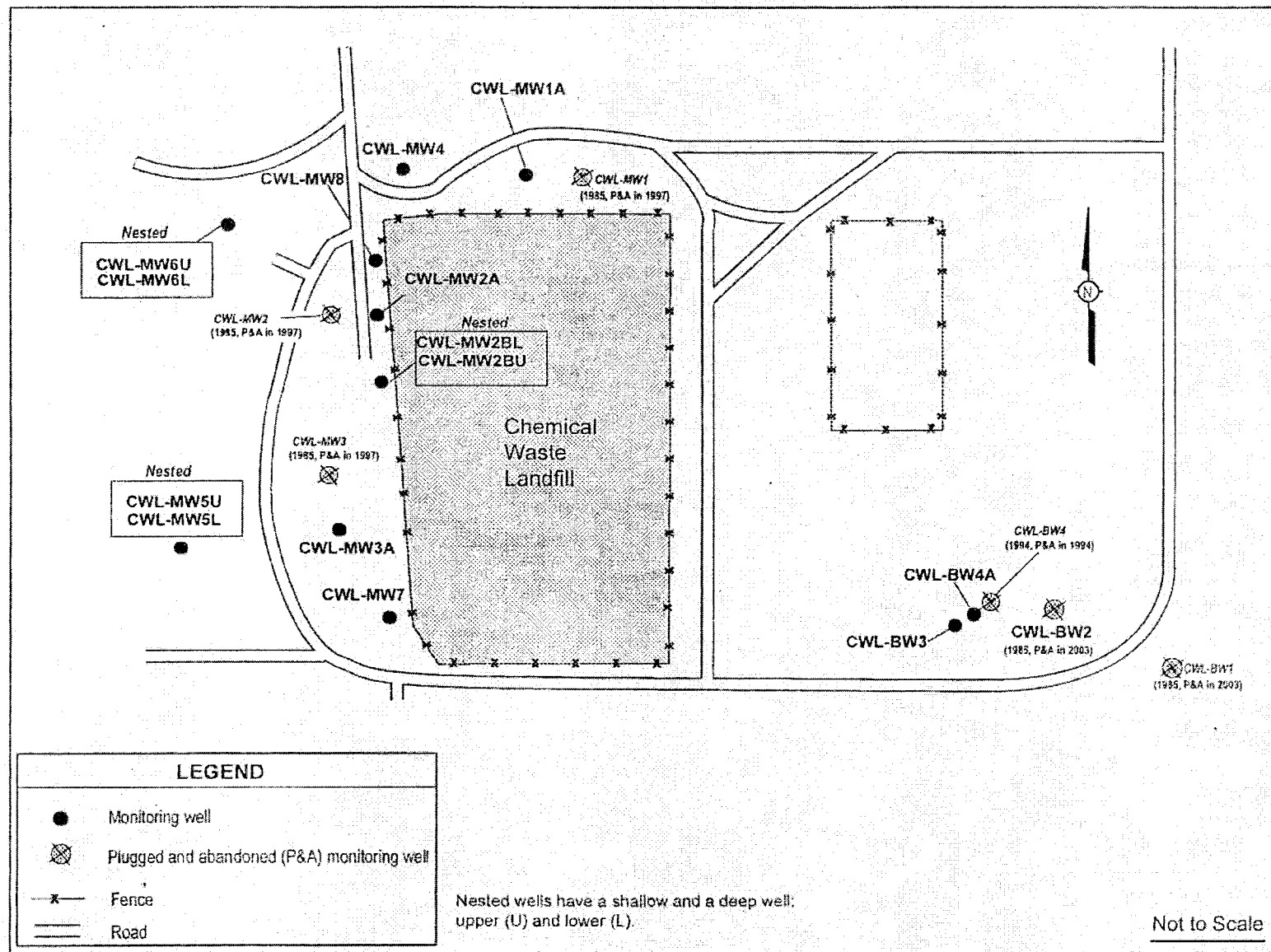


Figure A -1  
Location of the Chemical Waste Landfill  
Sandia National Laboratories/New Mexico



**Figure A-2**  
**Monitoring Well Locations at the Chemical Waste Landfill,**  
**Sandia National Laboratories/ New Mexico**





**Table A-1**  
**Monitoring Well Groundwater Elevations**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Well Number	Measuring Point Elevation (famsl)	Depth to Water <sup>a</sup> (feet)	Groundwater Elevation (famsl)	Total Well Depth <sup>b</sup> (feet)	Bottom of Well Elevation (famsl)	Static Water Height <sup>c</sup> (feet)
CWL-BW3	5430.23	501.59	4928.64	507.48	4921.05	7.59
CWL-BW4A	5431.36	501.97	4929.39	510.00	4919.24	10.15
CWL-MW1A	5421.49	NA	NA	495.00	4925.41	NC
CWL-MW2BL	5419.39	496.45	4922.94	557.50	4859.87	63.07
CWL-MW2BU	5419.42	490.49	4928.93	501.00	4916.37	12.56
CWL-MW3A	5417.78	NA	NA	492.00	4924.39	NC
CWL-MW4	5420.33	494.82	4925.51	503.00	4915.38	10.13
CWL-MW5L	5415.80	493.15	4922.65	558.00	4856.02	66.63
CWL-MW5U	5416.01	488.23	4927.78	502.00	4912.02	15.76
CWL-MW6L	5417.13	494.73	4922.40	564.00	4850.65	71.75
CWL-MW6U	5416.78	488.75	4928.03	502.00	4912.65	15.38

<sup>a</sup>Measurements transcribed from Groundwater Sample Collection Logs.

<sup>b</sup>Derived from well completion logs.

<sup>c</sup>Calculated as difference between depth to water and bottom of well.

BW = Background well.

CWL = Chemical Waste Landfill.

famsl = Feet above mean sea level. Measured from top of casing.

L = Lower well completion zone.

NA = Not applicable since CWL-MW1A and CWL-MW3A are dry wells.

NC = Not calculated.

MW = Monitoring well.

U = Upper well completion zone.

**Table A-2**  
**Volumes Purged from Monitoring Wells**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Well Number	Volume Purged <sup>a</sup> (gal)	Time Pumped (minutes)	Average Pump Rate (gal/minute)	Well Pumped to Dryness
CWL-BW3	14	37	0.38	Yes
CWL-BW4A	13	35	0.37	Yes
CWL-MW2BL	489	297	1.65	No
CWL-MW2BU	3,300 mL	81	41 mL/minute	Yes
CWL-MW4	42	113	0.37	No
CWL-MW5L	14,000 mL	66	212 mL/minute	No
CWL-MW5U	21.5	50	0.43	Yes
CWL-MW6L	14,000 mL	129	109 mL/minute	No
CWL-MW6U	22	54	0.41	Yes

<sup>a</sup>Volume of groundwater purged before sampling.

BW = Background well.

CWL = Chemical Waste Landfill.

gal = Gallon(s).

L = Lower well completion zone.

mL = Milliliter(s).

MW = Monitoring well.

U = Upper well completion zone.

**Table A-3**  
**Summary of Field Measurements**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Well Number	Measurement Period	pH	Temperature °C	SC (µmhos/cm)	Turbidity (NTU)
CWL-BW3	Purge measurements <sup>a</sup> :	7.59	19.67	875	1.35
		7.79	14.55	866	4.11
		7.79	15.18	859	2.83
CWL-BW4A	Purge measurements <sup>a</sup> :	7.28	16.33	971	0.54
		7.26	17.37	978	0.78
		7.25	17.82	978	0.69
CWL-MW2BL	Purge measurements <sup>a</sup> :	6.87	22.84	1,042	0.52
		6.87	22.82	1,042	0.56
		6.87	22.86	1,042	0.57
CWL-MW2BU	Purge measurements <sup>a</sup> :	8.06	14.18	863	58.5
		7.81	14.77	906	10.1
		7.81	15.00	890	12.8
CWL-MW4	Purge measurements <sup>a</sup> :	7.04	18.15	913	2.84
		7.05	18.13	913	2.71
		7.05	18.09	913	3.32
CWL-MW5L	Purge measurements <sup>a</sup> :	6.87	15.20	1,012	3.33
		6.87	15.18	1,012	3.28
		6.87	15.19	1,012	3.30
CWL-MW5U	Purge measurements <sup>a</sup> :	7.26	13.63	841	0.68
		7.15	15.65	890	0.52
		7.15	16.96	882	0.47
CWL-MW6L	Purge measurements <sup>a</sup> :	6.93	13.10	991	0.68
		6.93	13.12	991	0.66
		6.93	13.13	990	0.59
CWL-MW6U	Purge measurements <sup>a</sup> :	7.29	14.49	873	0.82
		7.24	15.28	873	0.81
		7.22	16.20	876	0.79

<sup>a</sup>Last three water quality measurements prior to sampling. For complete record reference Attachment A.

BW = Background well.

°C = Degrees Celsius.

CWL = Chemical Waste Landfill.

L = Lower well completion zone.

µmhos/cm = micromhos per centimeter

MW = Monitoring well.

NTU = Turbidity measured in nephelometric turbidity units.

SC = Specific conductance.

U = Upper well completion zone.

**Table A-4**  
**Sample Number Identification**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Sample Identification	AR/COC	Sample Number	Date Sampled	Laboratory	Sample Type
CWL-BW3	610835	083040	10-09-06	GEL	Environmental Sample
CWL-BW4A	610834	083037	10-05-06	GEL	Environmental Sample
CWL-MW2BL	610833	083035	10-03-06	GEL	Environmental Sample
CWL-MW2BU	610839	083049	10-20-06	GEL	Environmental Sample
CWL-MW4	610841	083053	10-17-06	GEL	Environmental Sample
CWL-MW4	610841	083054	10-17-06	GEL	Duplicate Sample
CWL-MW5L	610843	083058	10-19-06	GEL	Environmental Sample
CWL-MW5U	610838	083046	10-13-06	GEL	Environmental Sample
CWL-MW5U	610838	083047	10-13-06	GEL	Duplicate Sample
CWL-MW6L	610842	083056	10-18-06	GEL	Environmental Sample
CWL-MW6U	610836	083042	10-11-06	GEL	Environmental Sample
CWL-EB1	610837	083044	10-11-06	GEL	Equipment Blank
CWL-EB2	610840	083051	10-13-06	GEL	Equipment Blank
CWL-FB1	610834	083038	10-05-06	GEL	Field Blank
CWL-FB2	610843	083059	10-19-06	GEL	Field Blank

AR/COC = Analysis Request/Chain-of-Custody Record.

BW = Background well.

CWL = Chemical Waste Landfill.

GEL = General Engineering Laboratories.

EB = Equipment blank sample.

FB = Field blank sample.

L = Lower well completion zone.

MW = Monitoring well.

U = Upper well completion zone.

**Table A-5**  
**Analysis, Methods, Sample Containers, Preservatives, and Holding Times**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Analysis	Method <sup>a</sup>	Container Type/ Volume/Preservative	Holding Time
Appendix IX Volatile Organic Compounds	8260B	Glass; 3 x 40 mL; HCl, 4°C	14 days
Total Appendix IX metals + iron	6020/7470A	Polyethylene; 500 mL; HNO <sub>3</sub> , 4°C	28 days/ 180 days <sup>b</sup>

<sup>a</sup>U.S. Environmental Protection Agency, November 1986. "Test Methods for Evaluating Solid, Physical/Chemical Methods," 3rd ed., (and updates), *SW-846*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

<sup>b</sup>Holding time for mercury is 28 days; all other metals are 180 days.

HCl = Hydrochloric acid.

HNO<sub>3</sub> = Nitric acid.

mL = Milliliter(s).

°C = Degrees Celsius.

**Table A-6**  
**Chemical Parameters, MDL/MCL for Volatile Organic Compounds Analyzed**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Test Method 8260B <sup>a</sup> (Appendix IX List) <sup>b</sup>	MDL (µg/L)	MCL (µg/L)	Test Method 8260B <sup>a</sup> (Appendix IX List) <sup>b</sup>	MDL (µg/L)	MCL (µg/L)
1,1,1,2-Tetrachloroethane	0.250	NE	Carbon tetrachloride	0.250	5.0
1,1,1-Trichloroethane	0.300	200	Chlorobenzene	0.250	100
1,1,2,2-Tetrachloroethane	0.250	NE	Chloroethane	0.500	NE
1,1,2-Trichloroethane	0.250	5.0	Chloroform	0.250	NE
1,1-Dichloroethane	0.300	NE	Chloromethane	0.500	NE
1,1-Dichloroethene	0.300	7.0	Chloroprene	0.300	NE
1,2,3-Trichloropropane	0.300	NE	Dibromochloromethane	0.250	NE
1,2,4-Trichlorobenzene	0.300	70	Dibromomethane	0.300	NE
1,2-Dibromo-3-chloropropane	0.500	0.2	Dichlorodifluoromethane	0.500	NE
1,2-Dibromoethane	0.250	0.05	Ethyl benzene	0.250	700
1,2-Dichloroethane	0.250	5.0	Ethyl cyanide	1.50	NE
1,2-Dichloropropane	0.250	5.0	Ethyl methacrylate	1.00	NE
2-Butanone	1.25	NE	Iodomethane	1.25	NE
2-Hexanone	1.25	NE	Isobutanol	12.5	NE
4-methyl-, 2-Pentanone	1.25	NE	Methacrylonitrile	1.00	NE
Acetone	1.25	NE	Methyl methacrylate	1.00	NE
Acetonitrile	6.25	NE	Methylene chloride	2.00	5.0
Acrolein	3.00	NE	Pentachloroethane	1.00	NE
Acrylonitrile	1.00	NE	Styrene	0.250	100
Allyl chloride	3.70	NE	Tetrachloroethene	0.250	5.0
Benzene	0.300	5.0	Toluene	0.250	1,000
Bromodichloromethane	0.250	NE	Trichloroethene	0.250	5.0
Bromoform	0.250	NE	Trichlorofluoromethane	0.310	NE
Bromomethane	0.500	NE	Vinyl acetate	1.50	NE
Carbon disulfide	1.25	NE	Vinyl chloride	0.500	2.0
Xylenes (Total)	0.250	10,000	trans-1,2-Dichloroethene	0.300	100
Bis(2-Chloroisopropyl)ether	1.50	NE	trans-1,3-Dichloropropene	0.250	NE
cis-1,3-Dichloropropene	0.250	NE	trans-1,4-Dichloro-2-butene	1.00	NE

<sup>a</sup>U.S. Environmental Protection Agency November 1986. "Test Methods for Evaluating Solid, Physical/Chemical Methods," 3rd ed., (and updates), *SW-846*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

<sup>b</sup>Title 40 CFR, Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Appendix IX, Groundwater Monitoring List.

CFR = Code of Federal Regulations.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant levels (established by the U.S. EPA Primary Drinking Water Regulations in 40 CFR 141.11(b), subsequent amendments, or the New Mexico Environmental Improvement Board in the *New Mexico Register*, Title 20, Chapter 7, Part 1).

MDL = The method detection level of an analyte that can be determined, but not quantified, with 99% confidence.

µg/L = Microgram(s) per liter.

NE = Not established.

**Table A-7**  
**Chemical Parameters, MDL/MCL for Metal Parameters Analyzed**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Appendix IX List <sup>a</sup>	Test Method <sup>b</sup>	MDL (mg/L)	MCL (mg/L)
Antimony	6020	0.0005	0.006
Arsenic	6020	0.0015	0.01
Barium	6020	0.0005	2.0
Beryllium	6020	0.0001	0.004
Cadmium	6020	0.0001	0.005
Chromium	6020	0.001	0.1
Cobalt	6020	0.0001	NE
Copper	6020	0.0002	NE
Iron	6020	0.010	NE
Lead	6020	0.0005	NE
Mercury	7470A	0.00006	0.002
Nickel	6020	0.0005	NE
Selenium	6020	0.0025	0.05
Silver	6020	0.0002	NE
Thallium	6020	0.0004	0.002
Tin	6020	0.001	NE
Vanadium	6020	0.002	NE
Zinc	6020	0.002	NE

<sup>a</sup>Title 40 CFR, Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Appendix IX, Groundwater Monitoring List. Addition metal parameter includes iron.

<sup>b</sup>U.S. Environmental Protection Agency November 1986. "Test Methods for Evaluating Solid, Physical/Chemical Methods," 3rd ed. (and updates), *SW-846*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

CFR = Code of Federal Regulations.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant levels (established by the U.S. EPA Primary Drinking Water Regulations in 40 CFR 141.11(b), subsequent amendments, or the New Mexico Environmental Improvement Board in the *New Mexico Register*, Title 20, Chapter 7, Part 1).

MDL = The method detection level of an analyte that can be determined, but not quantified, with 99% confidence.

mg/L = Milligram(s) per liter.

NE = Not established.

**Table A-8**  
**Summary of Detected Volatile Organic Compounds**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

<b>Sample No.:</b> <b>Well No.:</b> <b>Sample Type:</b> <b>Sample Method:</b> <b>Laboratory:</b> <b>Date Sampled:</b>			<b>083040</b> <b>CWL-BW3</b> <b>Environmental</b> <b>Bennett Pump</b> <b>GEL</b> <b>10-09-06</b>	<b>083037</b> <b>CWL-BW4A</b> <b>Environmental</b> <b>Bennett Pump</b> <b>GEL</b> <b>10-05-06</b>	<b>083035</b> <b>CWL-MW2BL</b> <b>Environmental</b> <b>Bennett Pump</b> <b>GEL</b> <b>10-03-06</b>	<b>083049</b> <b>CWL-MW2BU</b> <b>Environmental</b> <b>QED Pump</b> <b>GEL</b> <b>10-20-06</b>	<b>083053</b> <b>CWL-MW4</b> <b>Environmental</b> <b>Bennett Pump</b> <b>GEL</b> <b>10-17-06</b>	<b>083054</b> <b>CWL-MW4</b> <b>Duplicate</b> <b>Bennett Pump</b> <b>GEL</b> <b>10-17-06</b>
<b>Parameter</b>	<b>Method</b>	<b>MCL</b>	<b>All results in µg/L</b>					
Acetone	8260	NE	1.58 (5.00) J	5.0UJ	5.0UJ, B1	2.39 (5.00) J	ND (1.25)	ND (1.25)
Carbon Disulfide	8260	NE	ND (1.25)	ND (1.25)	ND (1.25)	5.0UJ, B	ND (1.25)	ND (1.25)
Toluene	8260	1,000	1.45	1.28	ND (0.250)	ND (0.250)	ND (0.250)	ND (0.250)
Trichloroethene	8260	5	ND (0.250)	0.280 (1.00) J	ND (0.250)	0.256 (1.00) J	ND (0.250)	ND (0.250)



Table A-8 (Continued)

**Summary of Detected Volatile Organic Compounds  
Sandia National Laboratories/New Mexico  
Chemical Waste Landfill  
Semiannual Assessment, October-December 2006**

Sample No.: Well No.: Sample Type: Sample Method: Laboratory: Date Sampled:			083058 CWL-MW5L Environmental QED Pump GEL 10-19-06	083046 CWL-MW5U Environmental Bennett Pump GEL 10-13-06	083047 CWL-MW5U Duplicate Bennett Pump GEL 10-13-06	083056 CWL-MW6L Environmental QED Pump GEL 10-18-06	083042 CWL-MW6U Environmental Bennett Pump GEL 10-11-06
Parameter	Method	MCL	All results in µg/L				
Acetone	8260	NE	ND (1.25)	ND (1.25)	ND (1.25)	2.11 (5.00) J	ND (1.25)
Carbon Disulfide	8260	NE	ND (1.25)	ND (1.25)	24.8 A, A2, J	ND (1.25)	ND (1.25)
Toluene	8260	1,000	ND (0.250)	0.435 (1.00) J	0.423 (1.00) J	ND (0.250)	0.347 (1.00) J
Trichloroethene	8260	5	0.579 (1.00) J	2.36	2.32	0.804 (1.00) J	0.421 (1.00) J

Note: If result detected below laboratory practical quantitation limit, then practical quantitation limit is indicated in parentheses.

A = Laboratory accuracy and/or bias measurements for the laboratory control and/or duplicate do not meet acceptance criteria.

A2 = Laboratory accuracy and/or bias measurements for the matrix spike and/or duplicate do not meet acceptance criteria.

B = Analyte present in associated laboratory method blank.

B1 = Analyte present in associated trip blank.

BW = Background well.

CFR = Code of Federal Regulations.

CWL = Chemical Waste Landfill.

EPA = U.S. Environmental Protection Agency.

GEL = General Engineering Laboratories.

J = The associated value is an estimated quantity and/or detected below the practical quantitation limit.

L = Lower well completion zone.

MCL = Maximum contamination levels (established by the EPA Primary Drinking Water Regulations in 40 CFR 141.11(b), subsequent amendments or the New Mexico Environmental Improvement Board in the New Mexico Register, Title 20, Chapter 7, Part 1).

µg/L = Microgram(s) per liter.

MW = Monitoring well.

ND = Analyte not detected at listed value.

NE = Not established.

U = Upper well completion zone.

XUJ = Analyte was analyzed for but not detected. The associated value/detection limit is an estimate and may be inaccurate or imprecise.

**Table A-9**  
**Summary of Total Metal Parameters**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

<b>Sample No.: Well No.: Sample Type: Sample Method: Laboratory: Date Sampled:</b>			<b>083040 CWL-BW3 Environmental Bennett Pump GEL 10-09-06</b>	<b>083037 CWL-BW4A Environmental Bennett Pump GEL 10-05-06</b>	<b>083035 CWL-MW2BL Environmental Bennett Pump GEL 10-03-06</b>	<b>083049 CWL-MW2BU Environmental QED Pump GEL 10-20-06</b>	<b>083053 CWL-MW4 Environmental Bennett Pump GEL 10-17-06</b>
<b>Parameter</b>	<b>Method</b>	<b>MCL</b>	<b>All results in mg/L</b>				
Antimony	6020	0.006	ND (0.0005)	ND (0.0005)	0.000704 (0.002) B, B3, J	0.000716 (0.002) B3, J	ND (0.0005)
Arsenic	6020	0.01	0.0031 (0.005) J	ND (0.0015)	ND (0.0015)	0.00485 (0.005) J	ND (0.0015)
Barium	6020	2.0	0.055	0.0519	0.0627	0.055	0.060
Beryllium	6020	0.004	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)
Cadmium	6020	0.005	0.00143	ND (0.0001)	ND (0.0001)	ND (0.0001)	0.000216 (0.001) B3, J
Chromium	6020	0.1	0.0342	0.00234 (0.003) B, J	ND (0.001)	0.0116	0.00504
Cobalt	6020	NE	0.000399 (0.001) J	0.000254 (0.001) J	0.000237 (0.001) J	0.000471 (0.001) J	0.0036
Copper	6020	NE	0.00416	0.00117	0.00107	0.00306	0.00182
Iron	6020	NE	0.485	0.582	0.446	0.912	0.765
Lead	6020	NE	ND (0.0005)	ND (0.0005)	ND (0.0005)	0.00107 (0.002) J	0.0005 (0.002) B2, J
Mercury	7470A	0.002	ND (0.00006) B3, UJ	ND (0.00006)	ND (0.00006)	ND (0.00006)	ND (0.00006)
Nickel	6020	NE	0.089	0.00246	0.00234	0.0158	0.334
Selenium	6020	0.05	ND (0.0025)	ND (0.0025)	ND (0.0025)	ND (0.0025)	0.00338 (0.005) J
Silver	6020	NE	ND (0.0002)	ND (0.0002)	ND (0.0002)	0.000411 (0.001) J	ND (0.0002)
Thallium	6020	0.002	ND (0.0004)	ND (0.0004)	0.000569 (0.001) B3, J	0.000546 (0.001) J	ND (0.0004)
Tin	6020	NE	0.108	ND (0.001)	ND (0.001)	0.00119 (0.005) J	ND (0.001)
Vanadium	6020	NE	0.00691 (0.030) B, J	ND (0.002)	ND (0.002)	0.00273 (0.030) J	ND (0.002)
Zinc	6020	NE	0.00947 (0.010) B, J	0.00838 (0.010) B, J	0.00322 (0.010) B, J	0.0171	0.00461 (0.010) B2, J

Refer to footnotes at end of table.

**Table A-9 (Continued)**  
**Summary of Total Metal Parameters**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Sample No.: Well No.: Sample Type: Sample Method: Laboratory: Date Sampled:			083054 CWL-MW4 Duplicate Bennett Pump GEL 10-17-06	083058 CWL-MW5L Environmental QED Pump GEL 10-19-06	083046 CWL-MW5U Environmental Bennett Pump GEL 10-13-06	083047 CWL-MW5U Duplicate Bennett Pump GEL 10-13-06	083056 CWL-MW6L Environmental QED Pump GEL 10-18-06	083042 CWL-MW6U Environmental Bennett Pump GEL 10-11-06
Parameter	Method	MCL	All results in mg/L					
Antimony	6020	0.006	ND (0.0005)	ND (0.0005)	0.00138 (0.002) B3, J	0.000543 (0.002) B3, J	ND (0.0005)	ND (0.0005)
Arsenic	6020	0.01	ND (0.0015)	ND (0.0015)	0.00192 (0.005) J	0.00203 (0.005) J	ND (0.0015)	0.00295 (0.005) J
Barium	6020	2.0	0.0588	0.0581	0.0706	0.0693	0.0569	0.073
Beryllium	6020	0.004	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)
Cadmium	6020	0.005	0.000214 (0.001) B3, J	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	0.000108 (0.001) J
Chromium	6020	0.1	0.00484	0.00205 (0.003) J	0.00359 B2, J	0.00345 B2, J	ND (0.001)	0.0067
Cobalt	6020	NE	0.00339	0.000225 (0.001) J	0.000187 (0.001) J	0.000197 (0.001) J	0.000161 (0.001) J	0.000257 (0.001) J
Copper	6020	NE	0.00137	0.00134	0.00194	0.00205	0.000555 (0.001) J	0.00153
Iron	6020	NE	0.733	0.457	0.351	0.362	0.424	0.352
Lead	6020	NE	ND (0.0005)	0.000721 (0.002) J	0.000624 (0.002) J	ND (0.0005)	ND (0.0005)	ND (0.0005)
Mercury	7470A	0.002	ND (0.00006)	ND (0.00006)	ND (0.00006)	ND (0.00006)	ND (0.00006)	ND (0.00006) B3, UJ
Nickel	6020	NE	0.313	0.00247	0.00464	0.00456	0.00222	0.00539
Selenium	6020	0.05	0.0032 (0.005) J	0.00333 (0.005) J	0.00288 (0.005) J	0.00342 (0.005) J	0.00327 (0.005) J	ND (0.0025)
Silver	6020	NE	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)
Thallium	6020	0.002	ND (0.0004)	ND (0.0004)	ND (0.0004)	ND (0.0004)	ND (0.0004)	ND (0.0004)
Tin	6020	NE	ND (0.001)	ND (0.001)	0.00309 (0.005) J	0.00273 (0.005) J	ND (0.001)	0.00183 (0.005) B3, J
Vanadium	6020	NE	ND (0.002)	0.00217 (0.030) J	ND (0.002)	ND (0.002)	ND (0.002)	0.00485 (0.030) B, J
Zinc	6020	NE	0.00384 (0.010) B2, J	0.0106	0.0367	0.0371	0.00209 (0.010) J	0.0101 B, J

Refer to footnotes at end of table.

**Table A-9 (Concluded)**  
**Summary of Total Metal Parameters**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Note: If result detected below laboratory practical quantitation limit, then practical quantitation limit is indicated in parentheses.

- B = Analyte present in associated laboratory method blank sample.
- B2 = Analyte present in associated equipment blank sample.
- B3 = Analyte present in laboratory initial calibration blank or continuing calibration blank.
- BW = Background well.
- CFR = Code of Federal Regulations.
- CWL = Chemical Waste Landfill.
- EPA = U.S. Environmental Protection Agency.
- GEL = General Engineering Laboratories.
- J = The associated value is an estimated quantity and/or detected below the practical quantitation limit.
- L = Lower well completion zone.
- MCL = Maximum contamination levels (established by the EPA Primary Drinking Water Regulations in 40 CFR 141.11(b), subsequent amendments or the New Mexico Environmental Improvement Board I n the New Mexico Register, Title 20, Chapter 7, Part 1).
- mg/L = Milligram(s) per liter.
- MW = Monitoring well.
- ND = Analyte not detected at listed value.
- NE = Not established.
- U = Upper well completion zone.
- UJ = The analyte was analyzed for but not detected. The associated value/detection limit is an estimate and may be inaccurate or imprecise.

**Table A-10**  
**Summary of Environmental and Duplicate Analyses**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, October-December 2006**

Parameter	Environmental Sample Results (R <sub>1</sub> ) (mg/L)	Duplicate Sample Results (R <sub>2</sub> ) (mg/L)	RPD
<b>CWL-MW4</b>			
Barium	0.060	0.0588	2
Cadmium	0.000216 (0.001) B3, J	0.000214 (0.001) B3, J	1
Chromium	0.00504	0.00484	4
Cobalt	0.0036	0.00339	6
Copper	0.00182	0.00137	28
Iron	0.765	0.733	4
Lead	0.0005 (0.002) B2, J	ND (0.0005)	NC
Nickel	0.334	0.313	6
Selenium	0.00338 (0.005) J	0.0032 (0.0005) J	5
Zinc	0.00461 (0.010) B2, J	0.00384 (0.010) B2, J	18
<b>CWL-MW5U</b>			
Carbon Disulfide	ND (1.25) µg/L	24.8 A, A2, J µg/L	NC
Toluene	0.435 (1.00) J µg/L	0.423 (1.00) J µg/L	3
Trichloroethene	2.36 µg/L	2.32 µg/L	2
Antimony	0.00138 (0.002) B3, J	0.000543 (0.002) B3, J	87
Arsenic	0.00192 (0.005) J	0.00203 (0.005) J	6
Barium	0.0706	0.0693	2
Chromium	0.00359 B2, J	0.00345 B2, J	4
Cobalt	0.000187 (0.001) J	0.000197 (0.001) J	5
Copper	0.00194	0.00205	6
Iron	0.351	0.362	3
Lead	0.000624 (0.002) J	ND (0.0005)	NC
Nickel	0.00464	0.00456	2
Selenium	0.00288 (0.005) J	0.00342 (0.005) J	17
Tin	0.00309 (0.005) J	0.00273 (0.005) J	12
Zinc	0.0367	0.0371	1

- A = Laboratory accuracy and/or bias measurements for the laboratory control and/or duplicate do not meet acceptance criteria.
- A2 = Laboratory accuracy and/or bias measurements for the matrix spike and/or duplicate do not meet acceptance criteria.
- B2 = Analyte present in associated equipment blank sample.
- B3 = Analyte present in laboratory initial calibration blank or continuing calibration blank.
- BW = Background well.
- J = The associated value is qualified as an estimated quantity and/or detected below the practical quantitation limit.
- L = Lower well completion zone.
- µg/L = Microgram(s) per liter.
- mg/L = Milligram(s) per liter.
- MW = Monitoring well.
- NC = Not calculated for non-detected and/or qualified estimated values.
- ND = Analyte not detected at listed value.
- 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.  
R<sub>2</sub> = duplicate analysis result.

## **APPENDIX B**

**Replacement pages for the August 22, 2006 CWL Quarterly Closure Progress  
Report, revised Table A-8.**

**Table A-8 Revised**  
**Summary of Detected Volatile Organic Compounds**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, April-September 2006**

<b>Sample No.: Well No.: Sample Type: Sample Method: Laboratory: Date Sampled:</b>			<b>076886 CWL-BW3 Environmental Bennett Pump GEL 04-07-06</b>	<b>076891 CWL-BW4A Environmental Bennett Pump GEL 04-05-06</b>	<b>076892 CWL-BW4A Duplicate Bennett Pump GEL 04-05-06</b>	<b>076894 CWL-MW2BL Environmental Bennett Pump GEL 04-26-06</b>	<b>076896 CWL-MW2BU Environmental QED Pump GEL 04-24-06</b>	<b>076898 CWL-MW4 Environmental Bennett Pump GEL 04-11-06</b>
<b>Parameter</b>	<b>Method</b>	<b>MCL</b>	<b>All results in µg/L</b>					
Acetone	8260	NE	5.0U, B1, B2	ND (1.25)	ND (1.25)	11.3U	11.3U	3.70 (5.00) J
Acetonitrile	8260	NE	ND (6.25) UJ	ND (6.25)	ND (6.25)	ND (6.25) UJ	ND (6.25) UJ	ND (6.25) UJ
Methylene Chloride	8260	5	ND (2.00)	ND (2.00)	2.01 (5.00) J	ND (2.00)	ND (2.00)	ND (2.00)
Toluene	8260	1,000	0.409 (1.00) J	0.844 (1.00) J	0.696 (1.00) J	ND (0.250)	ND (0.250)	ND (0.250)
Trichloroethene	8260	5	ND (0.250)	ND (0.250)	ND (0.250)	ND (0.250)	3.34	ND (0.250)

**Table A-8 Revised (Concluded)**  
**Summary of Detected Volatile Organic Compounds**  
**Sandia National Laboratories/New Mexico**  
**Chemical Waste Landfill**  
**Semiannual Assessment, April-September 2006**

Sample No.: Well No.: Sample Type: Sample Method: Laboratory: Date Sampled:			076900 CWL-MW5L Environmental QED Pump GEL 04-18-06	076903 CWL-MW5U Environmental Bennett Pump GEL 04-14-06	076905 CWL-MW6L Environmental QED Pump GEL 04-20-06	076906 CWL-MW6L Duplicate QED Pump GEL 04-20-06	076910 CWL-MW6U Environmental Bennett Pump GEL 04-18-06
Parameter	Method	MCL	All results in µg/L				
Acetone	8260	NE	11.3UJ	11.3UJ	ND (1.25)	ND (1.25)	17.5UJ, B1, B2
Acetonitrile	8260	NE	7.15 (25.0) J	ND (6.25) UJ	ND (6.25)	ND (6.25)	ND (6.25) UJ
Methylene Chloride	8260	5	ND (2.00)	ND (2.00)	ND (2.00)	ND (2.00)	ND (2.00)
Toluene	8260	1,000	ND (0.250)	0.623 (1.00) J	ND (0.250)	ND (0.250)	0.403 (1.00) J
Trichloroethene	8260	5	0.818 (1.00) J	1.64	0.714 (1.00) J	0.644 (1.00) J	0.458 (1.00) J

Note: If result detected below laboratory practical quantitation limit, then practical quantitation limit is indicated in parentheses.

B1 = Analyte present in associated trip blank.

B2 = Analyte present in associated equipment blank.

BW = Background well.

CFR = Code of Federal Regulations.

CWL = Chemical Waste Landfill.

EPA = U.S. Environmental Protection Agency.

GEL = General Engineering Laboratories.

J = The associated value is an estimated quantity and/or detected below the practical quantitation limit.

L = Lower well completion zone.

MCL = Maximum contamination levels (established by the EPA Primary Drinking Water Regulations in 40 CFR 141.11(b), subsequent amendments or the New Mexico Environmental Improvement Board in the New Mexico Register, Title 20, Chapter 7, Part 1).

µg/L = Microgram(s) per liter.

MW = Monitoring well.

ND = Analyte not detected at listed value.

NE = Not established.

U = Upper well completion zone.

XU = Analyte was qualified as not detected at corrected detection limit as specified by the Data Validator.

XUJ = Analyte was analyzed for but not detected. The associated value/detection limit is an estimate and may be inaccurate or imprecise.



**ATTACHMENT A**  
**FIELD MEASUREMENT LOGS AND**  
**DOCUMENTATION**

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>CWL - BW3</u>	Date: <u>10-06-06</u>
Weather: <u>Cool Partly cloudy</u>	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>506'</u>	

### 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 %	<del>Color and appearance</del> <span style="float: right;">DO mg/L</span>
<u>501.59</u>	<u>0832</u>		<u>Start Purge</u>							
<u>505.16</u>	<u>0847</u>	<u>5</u>	<u>19.50</u>	<u>803</u>	<u>301.2</u>	<u>6.09</u>		<u>0.44</u>	<u>83.2</u>	<u>7.69</u>
<u>506.30</u>	<u>0853</u>	<u>7</u>	<u>19.61</u>	<u>875</u>	<u>298.8</u>	<u>7.56</u>		<u>1.18</u>	<u>20.4</u>	<u>1.87</u>
<u>506.63</u>	<u>0855</u>	<u>8</u>	<u>19.67</u>	<u>875</u>	<u>296.9</u>	<u>7.59</u>		<u>1.35</u>	<u>19.3</u>	<u>1.69</u>
<u>10/9/06</u>										
<u>501.42</u>	<u>0806</u>	<u>—</u>	<u>START</u>							
<u>505.60</u>	<u>0818</u>	<u>5</u>	<u>14.55</u>	<u>866</u>	<u>219.5</u>	<u>7.79</u>		<u>4.11</u>	<u>89.6</u>	<u>9.09</u>
<u>506.32</u>	<u>0820</u>	<u>6</u>	<u>15.18</u>	<u>859</u>	<u>218.6</u>	<u>7.79</u>		<u>2.83</u>	<u>90.2</u>	<u>9.21</u>
	<u>0821</u>		<u>Start Sampling</u>							
COC number(s): <u>610835</u>										
Sample number(s): <u>083040</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) = \_\_\_\_\_ millileters  
 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millileters  
 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ millileters

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>CWL-BW4A</u>	Date: <u>10-04-06 / 10-5-06</u>
Weather <u>Windy, high cloud coverage</u>	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>507'</u>	

### 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 %	DO mg/L	<del>Color and appearance</del>
501.97	0841		Start	Purge							
506.28	0852	5	18.06	003	305.2	6.53		.58	106.4	10.01	
506.93	0853	6	18.00	561	325.7	6.52		0.74	112.8	10.29	
507.20	0855	7	18.15	978	322.1	6.99		1.23	73.0	6.88	
		8	DRY								
		9									
10/5 502.06	0821		START								
504.01	0831	2	16.33	971	238.3	7.28		0.54	71.1	6.95	
505.25	0837	4	17.37	978	243.6	7.26		0.78	75.3	7.25	
506.06	0842	6	17.82	978	245.7	7.25		0.69	79.3	7.59	
	0843		Sample								
COC number(s):											
Sample number(s):											

### 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

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>CWL - MW2BL</u>	Date: <u>10 - 3 - 06</u>
Weather <u>cool &amp; cloudy</u>	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>550'</u>	

### PURGE MEASUREMENTS

Depth to Water (FT)	Time 24 hr	Vol. L <u>(5)</u>	Temp °C	Ec µmho	ORP MV	pH	Flow L g/s	Turb NTU	DO %	<u>DO mg/L</u> <del>Color and appearance</del>
<u>496.45</u>	<u>0810</u>		<u>Start Purge</u>						<u>78.8</u>	<u>7.98</u>
<u>496.66</u>	<u>0905</u>	<u>100</u>	<u>21.18</u>	<u>1044</u>	<u>285.8</u>	<u>6.87</u>		<u>4.45</u>	<u>78.8</u>	<u>6.98</u>
<u>496.71</u>	<u>1005</u>	<u>200</u>	<u>21.78</u>	<u>1041</u>	<u>244.9</u>	<u>6.87</u>		<u>0.74</u>	<u>78.1</u>	<u>6.84</u>
<u>496.70</u>	<u>1105</u>	<u>300</u>	<u>22.20</u>	<u>1041</u>	<u>298.3</u>	<u>6.87</u>		<u>0.51</u>	<u>79.1</u>	<u>6.86</u>
<u>496.70</u>	<u>1204</u>	<u>400</u>	<u>23.13</u>	<u>1042</u>	<u>298.6</u>	<u>6.87</u>		<u>0.47</u>	<u>80.7</u>	<u>6.87</u>
<u>496.68</u>	<u>1234</u>	<u>450</u>	<u>22.75</u>	<u>1041</u>	<u>298.5</u>	<u>6.87</u>		<u>0.51</u>	<u>80.0</u>	<u>6.88</u>
<u>496.67</u>	<u>1250</u>	<u>470</u>	<u>23.05</u>	<u>1041</u>	<u>298.4</u>	<u>6.87</u>		<u>0.56</u>	<u>79.9</u>	<u>6.84</u>
<u>496.67</u>	<u>1258</u>	<u>480</u>	<u>23.01</u>	<u>1041</u>	<u>298.5</u>	<u>6.87</u>		<u>0.53</u>	<u>79.9</u>	<u>6.85</u>
<u>496.67</u>	<u>1301</u>	<u>485</u>	<u>22.84</u>	<u>1042</u>	<u>298.6</u>	<u>6.87</u>		<u>0.52</u>	<u>80.1</u>	<u>6.88</u>
<u>496.67</u>	<u>1304</u>	<u>487</u>	<u>22.82</u>	<u>1042</u>	<u>298.6</u>	<u>6.87</u>		<u>0.56</u>	<u>79.9</u>	<u>6.85</u>
<u>496.64</u>	<u>1307</u>	<u>489</u>	<u>22.86</u>	<u>1042</u>	<u>298.5</u>	<u>6.87</u>		<u>0.57</u>	<u>80.0</u>	<u>6.85</u>
	<u>1308</u>	<u>Start Sample</u>								
COC number(s): <u>610 833</u>										
Sample number(s): <u>083035</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

Project Name: CWL-GWM	Project No.: 98026.01.07
Well I.D.: CWL-MWABU	Date: 10-2-06
Weather	
Method: _____ Portable pump <input checked="" type="checkbox"/> Dedicated pump	
Pump depth: 491'	

## PURGE MEASUREMENTS

[illegible]

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

Project Name:	Project No.: 98026.01.07
Well I.D.: CWL-mw2BU	Date: 10-16-06 10-20-06
Weather	
Method: _____ Portable pump <input checked="" type="checkbox"/> Dedicated pump <span style="float: right;">Pump depth:</span>	

## PURGE MEASUREMENTS

[illegible]

### 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) = \_\_\_\_\_ millileters

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

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

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL-GWM</u>	Project No.: <u>98026-01.07</u>
Well I.D.: <u>CWL-MW4</u>	Date: <u>10-17-06</u>
Weather	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>500.</u>	

### PURGE MEASUREMENTS

Depth to Water (FT)	Time 24 hr	Vol. <u>L gls</u>	Temp °C	Ec µmho	ORP MV	pH	Flow L gls	Turb NTU	DO %	Color and appearance
494.82	0816	—	START							
496.48	0846	10	15.90	874	73.2	6.76		14.5	8.9	0.88
496.66	0907	20	17.82	905	91.3	6.96		13.5	39.7	4.08
496.46	0924	25	17.76	908	118.0	7.00		4.88	49.7	4.70
496.77	0933	30	18.12	912	141.1	7.03		3.03	57.3	5.40
496.66	0947	35	18.31	912	158.2	7.04		12.0	60.3	5.60
496.70	0952	37	18.39	913	168.5	7.04		3.66	59.5	5.53
496.45	1002	39	18.15	913	178.5	7.04		2.84	59.1	5.67
496.40	1005	41	18.13	913	181.7	7.05		2.71	61.9	5.83
496.33	10:09	42	18.09	913	185.6	7.05		3.32	59.0	6.16
	1011	—	SAMPLING							
COC number(s): <u>610841</u>										
Sample number(s): <u>083053, 083054</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" ODI: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL-GWM</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>CWL-MW5L</u>	Date: <u>10-19-06</u>
Weather	
Method: _____ Portable pump _____ Dedicated pump	
Pump depth: <u>543'</u>	

### 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 %	<del>Color and appearance</del>
493.15	0832	START								
493.23	0849	2	14.54	745	235.8	7.86		0.76	72.7	7.39
493.24	0856	4	15.36	783	240.4	7.72		1.12	71.5	7.14
493.24	0904	6	15.40	968	253.1	7.09		1.03	63.2	6.30
493.24	0912	8	15.86	1008	264.0	6.90		2.48	69.3	6.85
493.23	0920	10	15.55	1010	270.8	6.88		3.77	71.4	7.09
493.23	0923	11	15.26	1010	272.6	6.88		3.27	71.6	7.15
493.23	0927	12	15.20	1012	275.4	6.87		3.33	71.8	7.17
493.24	0932	13	15.18	1012	276.0	6.87		3.28	72.7	7.26
493.23	0938	14	15.19	1012	276.2	6.87		3.30	71.8	7.19
	0939	SAMPLE								
COC number(s): <u>610843</u>										
Sample number(s): <u>083058, 083059</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



# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL-GWM</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>CWL-mw5U</u>	Date: <u>10-12-06</u>
Weather	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump Pump depth: <u>499'</u>	

### 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
<u>488.23</u>	<u>0835</u>		<u>START</u>							
<u>492.75</u>	<u>0844</u>	<u>5</u>	<u>11.75</u>	<u>119</u>	<u>295.0</u>	<u>7.12</u>		<u>0.39</u>	<u>177.4</u>	<u>19.00</u>
<u>494.42</u>	<u>0848</u>	<u>7</u>	<u>13.88</u>	<u>825</u>	<u>287.6</u>	<u>7.25</u>		<u>0.50</u>	<u>67.3</u>	<u>6.69</u>
<u>496.15</u>	<u>0852</u>	<u>9</u>	<u>16.28</u>	<u>821</u>	<u>283.0</u>	<u>7.26</u>		<u>0.73</u>	<u>67.7</u>	<u>6.61</u>
<u>497.20</u>	<u>0855</u>	<u>10</u>	<u>16.97</u>	<u>817</u>	<u>281.4</u>	<u>7.27</u>		<u>0.80</u>	<u>68.5</u>	<u>6.58</u>
<u>497.85</u>	<u>0857</u>	<u>11</u>	<u>17.40</u>	<u>816</u>	<u>280.6</u>	<u>7.27</u>		<u>0.54</u>	<u>68.4</u>	<u>6.56</u>
<u>498.25</u>	<u>0900</u>	<u>12</u>	<u>17.51</u>	<u>816</u>	<u>279.6</u>	<u>7.29</u>		<u>0.72</u>	<u>69.7</u>	<u>6.63</u>
<u>499.02</u>	<u>0902</u>	<u>12.5</u>	<u>17.99</u>	<u>817</u>	<u>278.5</u>	<u>7.28</u>		<u>1.00</u>	<u>68.1</u>	<u>6.43</u>
<u>499.02</u>	<u>0902</u>	<u>DRY</u>								
<u>489.85</u>	<u>0810</u>	<u>START</u>								
<u>494.25</u>	<u>0822</u>	<u>5</u>	<u>13.63</u>	<u>841</u>	<u>234.7</u>	<u>7.26</u>		<u>0.68</u>	<u>112.0</u>	<u>11.55</u>
<u>495.81</u>	<u>0827</u>	<u>7</u>	<u>15.65</u>	<u>890</u>	<u>239.4</u>	<u>7.15</u>		<u>0.52</u>	<u>67.6</u>	<u>6.55</u>
<u>497.32</u>	<u>0833</u>	<u>9</u>	<u>16.96</u>	<u>882</u>	<u>242.0</u>	<u>7.15</u>		<u>0.47</u>	<u>61.6</u>	<u>5.90</u>
	<u>0834</u>	<u>SAMPLE</u>								
COC number(s): <u>610838</u>										
Sample number(s): <u>083046, 083047</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" ODI: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL-Gwm</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>MW6L</u>	Date: <u>10-18-06</u>
Weather	
Method: _____ Portable pump <u>X</u> Dedicated pump Pump depth: <u>549</u>	

### PURGE MEASUREMENTS

Depth to Water (FT)	Time 24 hr	Vol. (L) gals	Temp °C	Ec µmho	ORP MV	pH	Flow L gals	Turb NTU	DO %	DO mg/L	Color and appearance
494.73	0826	—	START								
494.74	0844	2	9.75	590	210.1	8.34		3.99	78.9	8.41	
494.73	0900	4	10.90	640	215.7	8.32		3.72	76.1	8.38	
494.92	0924	6	12.16	899	248.8	7.05		1.46	77.0	8.18	
494.75	0942	8	13.22	988	263.0	6.94		1.63	77.2	8.06	
494.74	1001	10	13.32	988	271.4	6.93		0.86	76.0	7.92	
494.75	1009	11	13.04	990	275.2	6.93		0.79	73.4	7.70	
494.74	1017	12	13.10	991	274.9	6.93		0.68	73.5	7.72	
494.74	1026	13	13.12	991	275.1	6.93		0.66	73.6	7.72	
494.74	1035	14	13.13	990	274.8	6.93		0.59	73.4	7.69	
494.74	1036	—	SAMPLE								
COC number(s): <u>610842</u>											
Sample number(s): <u>083056</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

# ATTACHMENT A

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>CWL</u>	Project No.: <u>98026.01.07</u>
Well I.D.: <u>CWL - MW6U</u>	Date: <u>10-10-06</u> / <u>10-11-06</u>
Weather: <u>Partly cloudy, cool</u>	
Method: <u>X</u> Portable pump _____ Dedicated pump _____ Pump depth: <u>499'</u>	

### 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 %	DO <sup>mg/L</sup>	<del>Color and appearance</del>
488.75	0823		Start	Purge							
492.61	0834	5	9.53	000	266.3	8.06		0.69	71.8	8.18	
494.09	0838	7.10 <sup>RL</sup>	11.40	871	285.8	7.26		0.51	53.3	5.76	
495.78	0843	9.12 <sup>RL</sup>	14.45	874	281.3	7.25		0.71	53.8	5.45	
496.97	0847	11	16.17	875	278.6	7.23		1.39	54.5	5.29	
498.21	0854	13	16.69	876	277.0	7.20		0.92	53.7	5.19	
499.01	0856	14	17.41	876	276.6	7.20		0.99	53.8	5.14	
10-11-06											
488.92	0822	—	START								
493.10	0835	5	13.14	873	233.5	7.30		0.89	77.2	8.04	
493.70	0838	6	14.49	873	235.6	7.29		0.82	97.3	9.93	
494.35	0840	7	15.28	873	233.1	7.24		0.81	62.6	6.17	
495.08	0843	8	16.20	876	228.9	7.22		0.79	56.8	5.55	
	0844		SAMPLE								
COC number(s): <u>610836</u>											
Sample number(s): <u>083042</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: 2.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 2.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0712	4.02	18.4	7.01	18.4	10.00	18.4
2. Time: 1003	4.01	19.1	7.00	19.1	9.99	19.1
3. Time: 0640	4.01	17.0	7.00	17.0	10.01	17.0
4. Time: 1122	4.02	18.7	7.01	18.7	10.00	18.7
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time: 0710	1279	18.4				
2. Time: 1004	1280	19.0				
3. Time: 0643	1279	17.0				
4. Time: 1124	1277	18.7				
Comments:						
Calibration Done by: JLI RL			Date: 10-2-06 10-9-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time:	0700 219.9	18.4		
2. Time:	1006 220.1	19.0		
3. Time:	0646 219.9	17.0		
4. Time	1125 220.0	18.6		
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time	0750 .10	19.9	99.9	796
2. Time	1002 .09	19.9	100	797
3. Time	0803 .09	20.0	100	796
4. Time	1059 .09	20.1	101	796
Comments:				
Calibration Done By:			Date:	
PL PL			10-2-06 10-9-06	

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0649	81.6%	7.51	24.49
2. Time: 1000	81.5	7.49	24.49
3. Time: 0633	81.6	7.79	24.40
4. Time: 1120	81.4	7.77	24.40
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 390			
Calibration done by: JLC JLC		Date: 10-2-06 10-9-06	

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0700	4.00	20.4	7.00	20.4	10.00	20.5
2. Time: 1504	4.01	21.2	7.01	21.2	9.99	21.2
3. Time:						
4. Time:						
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time: 0710	1277	20.6				
2. Time: 1505	1279	21.2				
3. Time:						
4. Time:						
Comments:						
Calibration Done by: RL			Date: 10-3-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time: 0709	219.6	20.5 0709 20		
2. Time: 1513	220.1	21.2		
3. Time:				
4. Time				
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time 0850	.11	20.1	101	798
2. Time 14:10	.09	19.9	99.9	796
3. Time				
4. Time				
Comments:				
Calibration Done By: <i>R</i>			Date: 10-3-06	



ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L		Atmospheric Pressure in/Hg
1. Time: 0702	81.6	8.14	24.49
2. Time: 1500	81.4	8.11	24.48
3. Time:			
4. Time:			
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 38.0			
Calibration done by: RL		Date: 10-3-06	

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0630	4.01	18.9	7.00	18.9	10.00	18.9
2. Time: 1050	4.02	20.6	6.99	20.6	9.99	20.6
3. Time: 0640	4.01	19.4	7.00	19.4	9.99	19.4
4. Time: 0955	4.02	20.1	7.01	20.1	9.99	20.1
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time: 0634	1277	18.9				
2. Time: 1048	1276	20.6				
3. Time: 0642	1279	19.4				
4. Time: 0956	1279	20.1				
Comments:						
Calibration Done by: PL			Date: 10-4-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time: 0637	219.9	18.8		
2. Time: 1055	220.1	20.6		
3. Time: 0646	220.1	19.6		
4. Time: 0957	219.8	20.1		
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time 0750	.09	20.0	101	799
2. Time 1100	.10	19.9	100	797
3. Time 0800	.11	20.0	100	798
4. Time 1010	.10	19.9	101	796
Comments:				
Calibration Done By: PL			Date: 10-4-06	

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0625	81.6	7.31	24.52
2. Time: 1045	81.5	7.28	24.51
3. Time: 0633	81.6	7.27	24.58
4. Time: 0949	81.7	7.29	24.58
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.  DO Charge= 39.0			
Calibration done by: RL		Date: 10-4-06	

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time:	0644	4.01	19.7	7.01	19.7	10.00
2. Time:	1100	4.02	20.0	7.02	20.0	9.99
3. Time:	0640	4.01	17.0	7.00	17.0	10.01
4. Time:	1100	4.01	18.1	6.99	18.1	10.00
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time:	0641	1277	19.7			
2. Time:	1104	1277	20.0			
3. Time:	0643	1279	17.0			
4. Time:	1101	1277	18.1			
Comments:						
Calibration Done by:			Date:			
JCL			10-6-06 10-9-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time:	0640 220.1	19.7		
2. Time:	1111 220.2	20.1		
3. Time:	0646 219.9	17.0		
4. Time	1100 222.0	18.1		
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time	0800 .09	19.9	100	796
2. Time	1040 .10	20.1	101	797
3. Time	0803 .09	20.0	100	796
4. Time	1050 .10	20.1	100	797
Comments:				
Calibration Done By: RL RL			Date: 10-6-06 10-9-06	

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0638	81.6	7.25	24.51
2. Time: 1000	81.5	7.80	24.49
3. Time: 0633	81.6	7.79	24.40
4. Time: 1050	81.6	7.77	24.41
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 39.0			
Calibration done by: RL RL		Date: 10-6-06 / 10-9-06	

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time:	0646	4.03	16.8	6.99	16.8	9.98
2. Time:	1045	4.01	19.7	7.00	19.7	10.01
3. Time:	0728	4.03	15.7	7.00	15.7	9.99
4. Time:	0915	4.02	17.0	7.01	17.0	9.99
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time:	0647	1275	16.8			
2. Time:	1044	1276	19.7			
3. Time:	0730	1277	15.6			
4. Time:	0917	1277	17.0			
Comments:						
Calibration Done by:			Date:			
PL			10-10-06			



ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01		
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J		
Reference value: 220.0			Standard Lot No. 03K0868		
	Value	Temp	Expiration Date: 10/2007		
1. Time:	0644	220.1			16.8
2. Time:	1050	220.2			19.8
3. Time:	0729	219.9			15.6
4. Time	0920	219.8			17.0
TURBIDIMETER					
Make & Model No.: HACH 2100P			Serial No.: 030900032367		
Reference Value	.1	20	100	800	
Standard Lot No.					
1. Time	0750	.09	19.9	99.8	
2. Time	0948	.10	20.1	100	
3. Time	0800	.09	20.0	99.9	
4. Time	0855	.10	20.0	99.8	
Comments:					
Calibration Done By:			Date:		
PL			10-10-06		

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0640	81.6	8.02	24.41
2. Time: 1040	82.4	7.99	24.44
3. Time: 0720	81.6	8.22	24.39
4. Time: 0913	81.8	8.20	24.39
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 39.0			
Calibration done by: <i>TL</i>		Date: 10-10-06	

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time:	0641	4.01	19.2	7.00	19.2	10.01
2. Time:	1050	4.01	20.0	7.01	20.0	10.00
3. Time:	0650	4.01	18.1	7.01	18.1	9.99
4. Time:	1015	4.01	19.0	7.00	19.0	10.01
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time:	0642	1277	19.2			
2. Time:	1051	1278	20.0			
3. Time:	0652	1279	18.1			
4. Time:	1014	1277	19.0			
Comments:						
Calibration Done by:			Date:			
RL RL			10-12-06 10-13-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time:	0644 220.1	19.2		
2. Time:	1049 219.8	20.0		
3. Time:	0650 219.8	18.1		
4. Time	1016 220.0	19.0		
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time	0750 .09	19.9	100	798
2. Time	0915 .09	20.0	99.9	797
3. Time	0810 .10	20.0	101	299
4. Time	0912 .09	20.1	100	296
Comments:				
Calibration Done By: RL RL			Date: 10-12-06 10-13-06	

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:
1. Time:	Value:	Span Setting:
2.		
3.		
4.		

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft./ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0640	81.6	7.52	24.48
2. Time: 1047	81.8	7.48	24.48
3. Time: 0647	81.6	7.57	24.36
4. Time: 1010	81.5	7.54	24.36
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 38.0			
Calibration done by: RL RL		Date: 10-12-06 10-13-06	

10/13

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0640	4.01	20.2	7.01	20.2	10.00	20.2
2. Time: 1300	4.03	20.6	7.02	20.6	10.01	20.6
3. Time: 0650	4.01	20.0	7.00	20.0	9.99	20.0
4. Time: 1008	4.02	20.7	7.01	20.7	10.00	20.7
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time: 0642	1278	20.2				
2. Time: 1302	1279	20.6				
3. Time: 0654	1277	20.0				
4. Time: 1010	1277	20.7				
Comments:						
Calibration Done by: PL PL			Date: 10-16-06 10-20-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time: 0644	219.9	20.2		
2. Time: 1303	220.1	20.6		
3. Time: 0651	220.2	20.0		
4. Time: 1004	219.9	20.7		
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time 0750	.10	20.1	101	798
2. Time 1110	.11	20.0	99.9	796
3. Time 0655	.09	19.9	100	795
4. Time 0910	.10	20.1	101	796
Comments:				
Calibration Done By: RL RL			Date: 10-16-06 10-20-06	

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0631	81.6%	7.32	24.08
2. Time: 1250	81.8	7.35	24.09
3. Time: 0645	81.6	7.33	24.32
4. Time: 1000	81.5	7.28	24.32
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.  DO Charge= 38.0 39.0			
Calibration done by:		Date:	
RL RL		10-16-06 10-20-06	



ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01				
Contractor Project Name:			Contractor Project No.:				
pH, TEMPERATURE Meter							
Make & Model: YSI 6820			Serial No.: 99J0064				
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J				
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00				
Reference Value:	4.00		7.00		10.00		
	Value	Temp	Value	Temp	Value	Temp	
1. Time:	0635	4.02	19.8	7.01	19.8	10.01	19.8
2. Time:	1130	4.01	20.6	7.00	20.6	10.02	20.6
3. Time:							
4. Time:							
Standard Lot No.: 031187							
Expiration Date: 8-2007							
Ec Probe Model No.: YSI6560			Serial No.: 03J1141				
Reference Value: 1278 @ 20C			Standard Lot #: 2307212				
	Value	Temp	Expiration Date: JUL 2007				
1. Time:	0637	1277	19.8				
2. Time:	1133	1279	20.6				
3. Time:							
4. Time:							
Comments:							
Calibration Done by: <i>DL</i>			Date: 10-17-06				

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01		
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J		
Reference value: 220.0			Standard Lot No. 03K0868		
	Value	Temp	Expiration Date: 10/2007		
1. Time:	0634	219.8			19.9
2. Time:	1132	220.2			20.6
3. Time:					
4. Time					
TURBIDIMETER					
Make & Model No.: HACH 2100P			Serial No.: 030900032367		
Reference Value	.1	20	100	800	
Standard Lot No.					
1. Time	0710	.09	19.9	100	
2. Time	1100	.11	20.1	101	
3. Time					
4. Time					
Comments:					
Calibration Done By: RL			Date: 10-17-06		

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0625	81.6	7.39	24.13
2. Time: 1129	81.5	7.41	24.13
3. Time:			
4. Time:			
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 38.0			
Calibration done by: RL		Date: 10-17-06	

# ATTACHMENT A-1

## WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01				
Contractor Project Name:			Contractor Project No.:				
pH, TEMPERATURE Meter							
Make & Model: YSI 6820			Serial No.: 99J0064				
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J				
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00				
Reference Value:	4.00		7.00		10.00		
	Value	Temp	Value	Temp	Value	Temp	
1. Time:	0640	4.01	20.1	7.00	20.1	10.01	20.1
2. Time:	1230	4.02	20.6	7.01	20.6	9.99	20.6
3. Time:							
4. Time:							
Standard Lot No.: 031187							
Expiration Date: 8-2007							
Ec Probe Model No.: YSI6560			Serial No.: 03J1141				
Reference Value: 1278 @ 20C			Standard Lot #: 2307212				
	Value	Temp	Expiration Date: JUL 2007				
1. Time:	0642	1276	20.1				
2. Time:	1231	1279	20.6				
3. Time:							
4. Time:							
Comments:							
Calibration Done by: RL			Date: 10-18-06				

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time:	0643 219.9	20.2		
2. Time:	1229 220.1	20.6		
3. Time:				
4. Time				
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time	0715 .09	20.1	101	797
2. Time	1110 .10	19.9	100	796
3. Time				
4. Time				
Comments:				
Calibration Done By: RL			Date: 10-18-06	

ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L	Atmospheric Pressure in/Hg	
1. Time: 0633	81.6	7.26	24.29
2. Time: 1225	81.8	7.24	24.31
3. Time:			
4. Time:			
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 40.0			
Calibration done by: RL		Date: 10-18-06	

ATTACHMENT A-1

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			SNL/NM Project No.: 98026.01.04.01			
Contractor Project Name:			Contractor Project No.:			
pH, TEMPERATURE Meter						
Make & Model: YSI 6820			Serial No.: 99J0064			
PH Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J			
pH Calibrated to (std): 7.00			pH sloped to (std): 10.00			
Reference Value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0646	4.01	19.7	7.01	19.6	10.01	19.6
2. Time: 1110	4.03	20.2	7.00	20.2	10.00	20.2
3. Time:						
4. Time:						
Standard Lot No.: 031187						
Expiration Date: 8-2007						
Ec Probe Model No.: YSI6560			Serial No.: 03J1141			
Reference Value: 1278 @ 20C			Standard Lot #: 2307212			
	Value	Temp	Expiration Date: JUL 2007			
1. Time: 0646	1277	19.7				
2. Time: 1106	1279	20.2				
3. Time:						
4. Time:						
Comments:						
Calibration Done by: RI			Date: 10-19-06			

ATTACHMENT A-2

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL			Project No.: 98026.01.04.01	
ORP Probe Model No.: YSI 6565			Serial No.: YSI 6565 03J	
Reference value: 220.0			Standard Lot No. 03K0868	
	Value	Temp	Expiration Date: 10/2007	
1. Time:	0644 220.2	19.7		
2. Time:	1108 219.9	20.1		
3. Time:				
4. Time				
TURBIDIMETER				
Make & Model No.: HACH 2100P			Serial No.: 030900032367	
Reference Value	.1	20	100	800
Standard Lot No.				
1. Time	0715 110	19.9	99.8	795
2. Time	1040 11	20.1	100	797
3. Time				
4. Time				
Comments:				
Calibration Done By: RL			Date: 10-18-06	



ATTACHMENT A-3

WATER-SAMPLE-COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: CWL	SNL/NM Project No.: 98026.01.04.01
Contractor Project Name:	Contractor Project No.:

ORGANIC VAPOR DETECTOR

Make & Model:		Serial No.:	
Cal. Gas: Isobutylene	Conc., ppm:	Bulb, eV:	
1. Time:	Value:	Span Setting:	
2.			
3.			
4.			

DISSOLVED OXYGEN METER

Make & Model: YSI 6820		Serial No.: YSI 6562	
DO Probe Serial No.: 03J0967			
Calibration value:	81% Air Saturation @ 5200 ft/ DO mg/L		Atmospheric Pressure in/Hg
1. Time: 0640	81.6	7.37	24.44
2. Time: 1105	81.4	7.34	24.44
3. Time:			
4. Time:			
Comments: Nova Lynx Digital Barometer/ Altimeter S# 986870-T3 used in calibration.			
DO Charge= 40.0			
Calibration done by: RL		Date: 10-19-06	





ENVIRONMENTAL RESTORATION  
TAILGATE SAFETY MEETING FORM

Date: 10/04/06 / 10-5-06

Sheet \_\_\_\_ of \_\_\_\_

ER Site #(s): CWL -GWM Well=CWL-BW4A

Operable Units(s) \_\_\_\_\_

Applicable documentation:

Site Work Plan: PHS :9631246780-008, HASP 222696

FOP's : 94-01,94-25,94-26,94-28,94-30,94-34,94-46,94-47,94-48,95-02

MEETING CONDUCTED BY: Robert Lynch  
NAME PRINTED

SIGNATURE

10-5-06

SAFETY TOPICS PRESENTED

Protective Cloting/Equipment: Level-D, when sampling

Chemical Hazards: Acids in Sample containers, safety glasses and latex gloves when sampling

Radiological Hazards: None

Physical Hazards: Elements, slip, trip, falls, possible biological

Emergency Procedures: Aide, Call, Transport

Hospital/Clinic: Sandia Medical Phone: ( ) 844-0911/ 911 Paramedic Phone: ( ) 911

Hospital Address: 7<sup>th</sup> & F street

Special Equipment: Sampling pumps

Other: \_\_\_\_\_

ATTENDEES

NAME PRINTED: William Gibson SIGNATURE: William Gibson

NAME PRINTED: ALFRED SANTILLANES SIGNATURE: Alfred Santillanes

10/5 NAME PRINTED: William Gibson SIGNATURE: William Gibson

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

UNK: Unknown: NA: Not applicable: ND: Not done.

ENVIRONMENTAL RESTORATION  
TAILGATE SAFETY MEETING FORM

Date: 10/06/06 / 10-9-06

Sheet \_\_\_ of \_\_\_

ER Site #(s): CWL -GWM Well=CWL-BW3

Operable Units(s) \_\_\_\_\_

Applicable documentation:

Site Work Plan: PHS :9631246780-010, HASP 222696

FOP's : 94-01,94-25,94-26,94-28,94-30,94-34,94-46,94-47,94-48,95-02

MEETING CONDUCTED BY: Robert Lynch  
NAME PRINTED

SIGNATURE Robert Lynch

SAFETY TOPICS PRESENTED

Protective Cloting/Equipment: Level-D, when sampling

Chemical Hazards: Acids in Sample containers, safety glasses and latex gloves when sampling

Radiological Hazards: None

Physical Hazards: Elements, slip, trip, falls, possible biological

Emergency Procedures: Aide, Call, Transport

Hospital/Clinic: Sandia Medical Phone: ( ) 844-0911/ 911 Paramedic Phone: ( ) 911

Hospital Address: 7<sup>th</sup> & F street

Special Equipment: Sampling pumps

Other: \_\_\_\_\_

ATTENDEES

NAME PRINTED: William Gibson SIGNATURE: William Gibson

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

10/9 NAME PRINTED: William Gibson SIGNATURE: William Gibson

NAME PRINTED: Cardyn Daniel SIGNATURE: Cardyn Daniel

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

UNK: Unknown: NA: Not applicable: ND: Not done.

ENVIRONMENTAL RESTORATION  
TAILGATE SAFETY MEETING FORM

Date: 10/10/06 / 10-11-06

Sheet \_\_\_\_ of \_\_\_\_

ER Site #(s): CWL -GWM Well=CWL-MW6U

Operable Unit(s) \_\_\_\_\_

Applicable documentation:

Site Work Plan: PHS :9631246780-010, HASP 222696

FOP's : 94-01,94-25,94-26,94-28,94-30,94-34,94-46,94-47,94-48,95-02

MEETING CONDUCTED BY: Robert Lynch  
NAME PRINTED

  
SIGNATURE

SAFETY TOPICS PRESENTED

Protective Cloting/Equipment: Level-D, when sampling

Chemical Hazards: Acids in Sample containers, safety glasses and latex gloves when sampling

Radiological Hazards: None

Physical Hazards: Elements, slip, trip, falls, possible biological

Emergency Procedures: Aide, Call, Transport

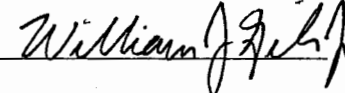
Hospital/Clinic: Sandia Medical Phone: ( ) 844-0911/ 911 Paramedic Phone: ( ) 911

Hospital Address: 7<sup>th</sup> & F street

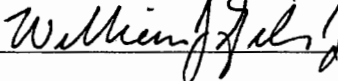
Special Equipment: Sampling pumps

Other: \_\_\_\_\_

ATTENDEES

NAME PRINTED: William Gibson SIGNATURE: 

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

NAME PRINTED: William Gibson SIGNATURE: 

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

NAME PRINTED: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

UNK: Unknown: NA: Not applicable: ND: Not done.



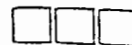






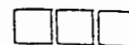






SANDIA NATIONAL LABORATORIES  
GROUND-WATER MONITORING PROGRAM  
PORTABLE PUMP AND TUBING DECONTAMINATION FIELD LOG

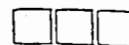
Project Name: <u>CWL-GWM</u>	Project No.: <u>98026.01.04.01</u>
Decon. Location: <u>9425</u>	Date: <u>10-03-06</u>
<p>The portable pump and tubing bundle (S/N <u>pump 1</u>) were decontaminated prior to installation in well <u>BW4A</u>, according to the following procedure:</p> <ol style="list-style-type: none"> <li>1. 5 gallons tap water<sup>(a)</sup> + Liquinox wash.</li> <li>2. 5 gallons tap-water<sup>(a)</sup> rinse.</li> <li>3. 5 gallons tap water<sup>(a)</sup> + 50 mL HNO<sub>3</sub><sup>(b)</sup> (0.04M).</li> <li>4. 10 gallons deionized-water<sup>(c)</sup> rinse.</li> <li>5. 5 gallons deionized water<sup>(c)</sup> for sampling.</li> <li>6. Equipment blank sample # _____ was collected at _____ (time).</li> </ol>	
Weather:	
Personnel Performing Decontamination: <u>R. Lynch</u>	
Name of Sampler: <u>R. Lynch</u>	
Signature of Sampler: <u>R. Lynch</u>	Date: _____
<sup>a</sup> Tap-Water Source: <u>DI water, Crystal Springs</u>	
<sup>b</sup> HNO <sub>3</sub> Grade: Reagent	UN #: <u>2031</u>
Lot No.: <u>002735</u>	Manufacturer: <u>Fisher</u>
<sup>c</sup> DI Water Source: <u>Crystal Springs</u>	Lot No.: <u>9-20-06</u>
Condition of Tubing Bundle: <u>good</u>	
Condition of Pump: <u>good</u>	
<p>Comments:</p> <p style="text-align: center; font-size: 1.2em;">Att 1 CWL-MW2BC</p>	



SANDIA NATIONAL LABORATORIES  
GROUND-WATER MONITORING PROGRAM  
PORTABLE PUMP AND TUBING DECONTAMINATION FIELD LOG

Project Name <u>CWL-GWM</u>	Project No.: <u>98026.01.04.01</u>
Decon. Location: <u>9425</u>	Date: <u>10-05-06</u>
<p>The portable pump and tubing bundle (S/N <u>pump 1</u>) were decontaminated prior to installation in well <u>BW 3</u>, according to the following procedure:</p> <ol style="list-style-type: none"><li>1. 5 gallons tap water<sup>(a)</sup> + Liquinox wash.</li><li>2. 5 gallons tap-water<sup>(a)</sup> rinse.</li><li>3. 5 gallons tap water<sup>(a)</sup> + 50 mL HNO<sub>3</sub><sup>(b)</sup> (0.04M).</li><li>4. 10 gallons deionized-water<sup>(c)</sup> rinse.</li><li>5. 5 gallons deionized water<sup>(c)</sup> for sampling.</li><li>6. Equipment blank sample # _____ was collected at _____ (time).</li></ol>	
Weather:	
Personnel Performing Decontamination: <u>R. Lynch</u>	
Name of Sampler: <u>R. Lynch</u>	
Signature of Sampler: <u>R. Lynch</u>	Date: _____
<sup>a</sup> Tap-Water Source: <u>DI water, Crystal Springs.</u>	
<sup>b</sup> HNO <sub>3</sub> Grade: Reagent	UN #: <u>2031</u>
Lot No.: <u>002735</u>	Manufacturer: <u>Fisher</u>
<sup>c</sup> DI Water Source: <u>Crystal Springs</u>	Lot No. <u>9-20-06</u>
Condition of Tubing Bundle: <u>good</u>	
Condition of Pump: <u>good</u>	
Comments:  <p style="text-align: center; font-size: 1.2em;">After CWL-BW4A</p>	

Project Name	CWL-Gwm	Project No.:	98026.01.04.01
Decon. Location:	9925	Date:	10-9-06
<p>The portable pump and tubing bundle (S/N Pump 1) were decontaminated prior to installation in well CWL-6U, according to the following procedure:</p> <ol style="list-style-type: none"> <li>5 gallons tap water<sup>(a)</sup> + Liquinox wash.</li> <li>5 gallons tap-water<sup>(a)</sup> rinse.</li> <li>5 gallons tap water<sup>(a)</sup> + 50 mL HNO<sub>3</sub><sup>(b)</sup> (0.04M).</li> <li>10 gallons deionized-water<sup>(c)</sup> rinse.</li> <li>5 gallons deionized water<sup>(c)</sup> for sampling.</li> <li>Equipment blank sample # _____ was collected at _____ (time).</li> </ol>			
Weather:			
Personnel Performing Decontamination: R. Lynch			
Name of Sampler: R. Lynch			
Signature of Sampler: R. Lynch			Date:
<sup>a</sup> Tap-Water Source: DI Water, Crystal Springs.			
<sup>b</sup> HNO <sub>3</sub> Grade: Reagent		UN #: 2031	
Lot No.: 002735		Manufacturer: Fisher	
<sup>c</sup> DI Water Source: Crystal Springs		Lot No. 9-20-06	
Condition of Tubing Bundle: good			
Condition of Pump: good			
Comments:			
After CWL-13W3			

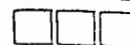


SANDIA NATIONAL LABORATORIES  
GROUND-WATER MONITORING PROGRAM  
PORTABLE PUMP AND TUBING DECONTAMINATION FIELD LOG

Project Name <u>CWL-GWM</u>	Project No.: <u>98026.01.04.01</u>
Decon. Location: <u>9425</u>	Date: <u>10-11-06</u>
<p>The portable pump and tubing bundle (S/N <u>pump1</u>) were decontaminated prior to installation in well <u>MN5U</u> according to the following procedure:</p> <ol style="list-style-type: none"><li>1. 5 gallons tap water<sup>(a)</sup> + Liquinox wash.</li><li>2. 5 gallons tap-water<sup>(a)</sup> rinse.</li><li>3. 5 gallons tap water<sup>(a)</sup> + 50 mL HNO<sub>3</sub><sup>(b)</sup> (0.04M).</li><li>4. 10 gallons deionized-water<sup>(c)</sup> rinse.</li><li>5. 5 gallons deionized water<sup>(c)</sup> for sampling.</li><li>6. Equipment blank sample # _____ was collected at _____ (time).</li></ol>	
Weather:	
Personnel Performing Decontamination: <u>R. Lynch</u>	
Name of Sampler: <u>R. Lynch</u>	
Signature of Sampler: <u>R. Lynch</u>	Date: _____
<sup>a</sup> Tap-Water Source: <u>DI Water, Crystal Springs</u>	
<sup>b</sup> HNO <sub>3</sub> Grade: Reagent	UN #: <u>2039</u>
Lot No.: <u>002735</u>	Manufacturer: <u>Fisher</u>
<sup>c</sup> DI Water Source: <u>Crystal Springs</u>	Lot No.: <u>9-20-06</u>
Condition of Tubing Bundle: <u>good</u>	
Condition of Pump: <u>good</u>	
Comments:  <p style="text-align: center; font-size: 1.2em;">After cal-mu6U</p>	

Project Name	CWL-GWM	Project No.:	98026-01.04.01
Decon. Location:	9925	Date:	10-13-06
<p>The portable pump and tubing bundle (S/N <u>pump 1</u>) were decontaminated prior to installation in well _____, according to the following procedure:</p> <ol style="list-style-type: none"> <li>1. 5 gallons tap water<sup>(a)</sup> + Liquinox wash.</li> <li>2. 5 gallons tap-water<sup>(a)</sup> rinse.</li> <li>3. 5 gallons tap water<sup>(a)</sup> + 50 mL HNO<sub>3</sub><sup>(b)</sup> (0.04M).</li> <li>4. 10 gallons deionized-water<sup>(c)</sup> rinse.</li> <li>5. 5 gallons deionized water<sup>(c)</sup> for sampling.</li> <li>6. Equipment blank sample # <u>083051</u> was collected at <u>0937</u> (time).</li> </ol> <p style="text-align: center;"><del>COCF</del> 610840</p>			
Weather:			
Personnel Performing Decontamination: <u>R. Lynch</u>			
Name of Sampler: <u>R. Lynch</u>			
Signature of Sampler: <u>R. Lynch</u>			Date: <u>10-13-06</u>
<sup>a</sup> Tap-Water Source: <u>DI water, Crystal Springs</u>			
<sup>b</sup> HNO <sub>3</sub> Grade: Reagent		UN #: <u>2031</u>	
Lot No.: <u>002735</u>		Manufacturer: <u>Fisher</u>	
<sup>c</sup> DI Water Source: <u>Crystal Springs</u>		Lot No. <u>9-20-06</u>	
Condition of Tubing Bundle: <u>good</u>			
Condition of Pump: <u>good</u>			
Comments:  <u>After CWC-man 5</u>			





SANDIA NATIONAL LABORATORIES  
GROUND-WATER MONITORING PROGRAM  
PORTABLE PUMP AND TUBING DECONTAMINATION FIELD LOG

Project Name <u>CWL-GWM</u>	Project No.: <u>98026-01.04.01</u>
Decon. Location: <u>9925</u>	Date: <u>10-17-06</u>
<p>The portable pump and tubing bundle (S/N <u>pump 1</u>) were decontaminated prior to installation in well _____, according to the following procedure:</p> <ol style="list-style-type: none"><li>1. 5 gallons tap water<sup>(a)</sup> + Liquinox wash.</li><li>2. 5 gallons tap-water<sup>(a)</sup> rinse.</li><li>3. 5 gallons tap water<sup>(a)</sup> + 50 mL HNO<sub>3</sub><sup>(b)</sup> (0.04M).</li><li>4. 10 gallons deionized-water<sup>(c)</sup> rinse.</li><li>5. 5 gallons deionized water<sup>(c)</sup> for sampling.</li><li>6. Equipment blank sample # <u>      </u> was collected at <u>      </u> (time).</li></ol>	
Weather:	
Personnel Performing Decontamination:	
Name of Sampler: <u>R. Lynch</u>	
Signature of Sampler: <u>R. Lynch</u>	Date: <u>✓</u>
<sup>a</sup> Tap-Water Source: <u>DI Water, Crystal Springs</u>	
<sup>b</sup> HNO <sub>3</sub> Grade: Reagent	UN #: <u>2039</u>
Lot No.: <u>002735</u>	Manufacturer: <u>Fisher</u>
<sup>c</sup> DI Water Source: <u>Crystal Springs</u>	Lot No: <u>9-20-06</u>
Condition of Tubing Bundle: <u>good</u>	
Condition of Pump: <u>good</u>	
Comments:  <u>After CWL-mny</u>	

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William Gibson To the best of my knowledge this information is correct & accurate.

<b>Container I.D. #</b> <small>(site-date-sequence)</small>	CWL-MW2BU-100206	CWL-100206	CWL-QED-101806
<b>Container Certification #</b> <small>(i.e. SNL/NM#####)</small>	NA	NA	NA
<b>Project Name</b>	CWL-GWM	CWL-GWM	CWL-GWM
<b>Site Number</b>	NA	NA	NA
<b>Waste Mgt. Case #</b>	98026.01.04.01	98026.01.04.01	98026.01.04.01
<b>Initial Label Type</b>	Haz-Waste	Haz-Waste	Haz-Waste
<b>Waste Matrix</b> <small>(i.e. Water, Cuttings, Soil, Samples, Metal, etc.)</small>	Purge water	PPE	Purge water
<b>Container Type / Vol</b> <small>(always use Certified containers)</small>	Bucket      5gal.	Bucket      5gal.	CHPD      55gal.
<b>Volume of Waste</b>	.8 gals		10 gals
<b>Total Container Weight</b>	5 lbs.	8 lbs.	100 lbs.
<b>Waste Char. Samples</b> <small>(COC#: Sample#-Fraction)</small>	COC# 610839 SMO# 083050	COC# SMO#	COC# 610842, 610843 SMO# 083056, 083058, 083059
<b>SMO Hazardous [ ]</b>			
<b>SMO Radioactive [ ]</b>	NA	NA	NA
<b>ERCL Haz [ ] Rad [ ]</b>	NA	NA	NA
<b>RPSD Rad [ ]</b> <small>(Amir's on-site Rad Lab)</small>	NA	NA	NA
<b>Container Exterior RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
<b>Container Contents RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
<b>Accumulation Date</b>	Start 10/02/06 Full 10/20/06	Start 10/02/06 Full 10/20/06	Start 10/18/06 Full 10/19/06
<b>Date Moved to Waste Accumulation Area</b>	10/20/06	10/20/06	10/19/06
<b>Accumulation Area Name</b>	9925	9925	9925
<b>ERwm Memo #</b>			
<b>Comments</b>	QED pump	Contains gloves and wipes used through out the CWL well monitoring; 1 <sup>st</sup> Qtr. 07	Contains CWL-MW5L and CWL-MW6L purge water CoC 610842, 610843

(OHSD)= open head steel drum; (CHSD)= closed head steel drum; (CHPD)= closed head poly drum; (OHPD)= open head poly drum;

(OHPB)= open head poly bucket; (RL-Off)= roll off; (WGLR)= wrangler bag; (744)= 7'x4'x4' steel box; (BB)= Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William Gibson To the best of my knowledge this information is correct & accurate.

<b>Container I.D. #</b> <small>(site-date-sequence)</small>	CWL-MW2BL-100306-01	CWL-MW2BL-100306-02	CWL-MW2BL-100306-03
<b>Container Certification #</b> <small>(i.e. SNL/NM#####)</small>	NA	NA	NA
<b>Project Name</b>	CWL-GWM	CWL-GWM	CWL-GWM
<b>Site Number</b>	NA	NA	NA
<b>Waste Mgt. Case #</b>	98026.01.04.01	98026.01.04.01	98026.01.04.01
<b>Initial Label Type</b>	Haz-Waste	Haz-Waste	Haz-Waste
<b>Waste Matrix</b> <small>(i.e. Water, Cuttings, Soil, Samples, Metal, etc.)</small>	Purge water	Purge water	Purge water
<b>Container Type / Vol</b> <small>(always use Certified containers)</small>	CHPD 55gal.	CHPD 55gal.	CHPD 55gal.
<b>Volume of Waste</b>	50 gals	50 gals	50 gals
<b>Total Container Weight</b>	500lbs.	500lbs.	500lbs.
<b>Waste Char. Samples</b> <small>(COC#: Sample#-Fraction)</small>	COC# 610833 SMO# 083035	COC# 610833 SMO# 083035	COC# 610833 SMO# 083035
<b>SMO Hazardous [ ]</b>			
<b>SMO Radioactive [ ]</b>	NA	NA	NA
<b>ERCL Haz [ ] Rad [ ]</b>	NA	NA	NA
<b>RPSD Rad [ ]</b> <small>(Amir's on-site Rad Lab)</small>	NA	NA	NA
<b>Container Exterior RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
<b>Container Contents RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
<b>Accumulation Date</b>	Start 10/03/06 Full 10/03/06	Start 10/03/06 Full 10/03/06	Start 10/03/06 Full 10/03/06
<b>Date Moved to Waste Accumulation Area</b>	10/03/06	10/03/06	10/03/06
<b>Accumulation Area Name</b>	9925	9925	9925
<b>ERwm Memo #</b>			
<b>Comments</b>			

(OHSD) = open head steel drum; (CHSD) = closed head steel drum; (CHPD) = closed head poly drum; (OHPD) = open head poly drum;

(OHPB) = open head poly bucket; (RL-Off) = roll off; (WGLR) = wrangler bag; (744) = 7'x4'x4' steel box; (BB) = Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

<b>Form Generator: <u>William Gibson</u> Phone: <u>284-5232</u> Task Leader: <u>Paul Freshour</u></b>							
Signature: <u>William J. Gibson</u> To the best of my knowledge this information is correct & accurate.							
Container I.D. # (site-date-sequence)	CWL-MW2BL-100306-04		CWL-MW2BL-100306-05		CWL-MW2BL-100306-06		
Container Certification # (i.e. SNL/NM#####)	NA		NA		NA		
Project Name	CWL-GWM		CWL-GWM		CWL-GWM		
Site Number	NA		NA		NA		
Waste Mgt. Case #	98026.01.04.01		98026.01.04.01		98026.01.04.01		
Initial Label Type	Haz-Waste		Haz-Waste		Haz-Waste		
Waste Matrix (i.e. Water, Cuttings, Soil, Samples, Metal, etc.)	Purge water		Purge water		Purge water		
Container Type / Vol (always use Certified containers)	CHPD	55gal.	CHPD	55gal.	CHPD	55gal.	
Volume of Waste	50 gals		50 gals		50 gals		
Total Container Weight	500lbs.		500lbs.		5000lbs.		
Waste Char. Samples (COC#: Sample#-Fraction)	COC# 610833 SMO# 083035		COC# 610833 SMO# 083035		COC# 610833 SMO# 083035		
SMO Hazardous [ ]	NA		NA		NA		
SMO Radioactive [ ]	NA		NA		NA		
ERCL Haz [ ] Rad [ ]	NA		NA		NA		
RPSD Rad [ ] (Amir's on-site Rad Lab)	NA		NA		NA		
Container Exterior RAD SURVEY #	Survey: NA Swipes:		Survey: NA Swipes:		Survey: NA Swipes:		
Container Contents RAD SURVEY #	Survey: NA Swipes:		Survey: NA Swipes:		Survey: NA Swipes:		
Accumulation Date	Start 10/03/06 Full 10/03/06		Start 10/03/06 Full 10/03/06		Start 10/03/06 Full 10/03/06		
Date Moved to Waste Accumulation Area	10/03/06		10/03/06		10/03/06		
Accumulation Area Name	9925		9925		9925		
ERwm Memo #							
Comments							

(OHSD)= open head steel drum; (CHSD)= closed head steel drum; (CHPD)= closed head poly drum; (OHPD)= open head poly drum;

(OHPB)= open head poly bucket; (RL-Off)= roll off; (WGLR)= wrangler bag; (744)= 7'x4'x4' steel box; (BB)= Burrito bag.

**NOTE: Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.**

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William Gibson To the best of my knowledge this information is correct & accurate.

<b>Container I.D. #</b> (site-date-sequence)	CWL-MW2BL-100306-07	CWL-MW2BL-100306-08	CWL-MW2BL-100306-09
<b>Container Certification #</b> (i.e. SNL/NM#####)	NA	NA	NA
<b>Project Name</b>	CWL-GWM	CWL-GWM	CWL-GWM
<b>Site Number</b>	NA	NA	NA
<b>Waste Mgt. Case #</b>	98026.01.04.01	98026.01.04.01	98026.01.04.01
<b>Initial Label Type</b>	Haz-Waste	Haz-Waste	Haz-Waste
<b>Waste Matrix</b> (i.e. Water, Cuttings, Soil, Samples, Metal, etc.)	Purge water	Purge water	Purge water
<b>Container Type / Vol</b> (always use Certified containers)	CHPD 55gal.	CHPD 55gal.	CHPD 55gal.
<b>Volume of Waste</b>	50 gals	50 gals	50 gals
<b>Total Container Weight</b>	500lbs.	500lbs.	500lbs.
<b>Waste Char. Samples</b> (COC#: Sample#-Fraction)	COC# 610833 SMO# 083035	COC# 610833 SMO# 083035	COC# 610833 SMO# 083035
<b>SMO Hazardous [ ]</b>			
<b>SMO Radioactive [ ]</b>	NA	NA	NA
<b>ERCL Haz [ ] Rad [ ]</b>	NA	NA	NA
<b>RPSD Rad [ ]</b> (Amir's on-site Rad Lab)	NA	NA	NA
<b>Container Exterior RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
<b>Container Contents RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
<b>Accumulation Date</b>	Start 10/03/06 Full 10/03/06	Start 10/03/06 Full 10/03/06	Start 10/03/06 Full 10/03/06
<b>Date Moved to Waste Accumulation Area</b>	10/03/06	10/03/06	10/03/06
<b>Accumulation Area Name</b>	9925	9925	9925
<b>ERwm Memo #</b>			
<b>Comments</b>			

(OHSD) = open head steel drum; (CHSD) = closed head steel drum; (CHPD) = closed head poly drum; (OHPD) = open head poly drum;

(OHPB) = open head poly bucket; (RL-Off) = roll off; (WGLR) = wrangler bag; (744) = 7'x4'x4' steel box; (BB) = Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William Gibson To the best of my knowledge this information is correct & accurate.

<b>Container I.D. #</b> <small>(site-date-sequence)</small>	CWL-MW2BL-100306-10	CWL-100306	
<b>Container Certification #</b> <small>(i.e. SNL/NM#####)</small>	NA	NA	
<b>Project Name</b>	CWL-GWM	CWL-GWM	
<b>Site Number</b>	NA	NA	
<b>Waste Mgt. Case #</b>	98026.01.04.01	98026.01.04.01	
<b>Initial Label Type</b>	Haz-Waste	Haz-Waste	
<b>Waste Matrix</b> <small>(i.e. Water, Cuttings, Soil, Samples, Metal, etc.)</small>	Purge water	Decon water	
<b>Container Type / Vol</b> <small>(always use Certified containers)</small>	CHPD	55gal.	
<b>Volume of Waste</b>	39 gals	35 gals	
<b>Total Container Weight</b>	390lbs.	350lbs.	
<b>Waste Char. Samples</b> <small>(COC#: Sample#-Fraction)</small>	COC# 610833 SMO# 083035	COC# 610833 SMO# 083035	
<b>SMO Hazardous [ ]</b>			
<b>SMO Radioactive [ ]</b>	NA	NA	
<b>ERCL Haz [ ] Rad [ ]</b>	NA	NA	
<b>RPSD Rad [ ]</b> <small>(Amir's on-site Rad Lab)</small>	NA	NA	
<b>Container Exterior RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	
<b>Container Contents RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	
<b>Accumulation Date</b>	Start 10/03/06 Full 10/03/06	Start 10/03/06 Full 10/03/06	
<b>Date Moved to Waste Accumulation Area</b>	10/03/06	10/03/06	
<b>Accumulation Area Name</b>	9925	9925	
<b>ERwm Memo #</b>			
<b>Comments</b>		Decon water after CWL-MW2BL purge, CoC 610833	

(OHSD)= open head steel drum; (CHSD)= closed head steel drum; (CHPD)= closed head poly drum; (OHPD)= open head poly drum;

(OHPB)= open head poly bucket; (RL-Off)= roll off; (WGLR)= wrangler bag; (744)= 7'x4'x4' steel box; (BB)= Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William Gibson To the best of my knowledge this information is correct & accurate.

<b>Container I.D. #</b> <small>(site-date-sequence)</small>	CWL-BW4A-100406	CWL-100506	
<b>Container Certification #</b> <small>(i.e. SNL/NM#####)</small>	NA	NA	
<b>Project Name</b>	CWL-GWM	CWL-GWM	
<b>Site Number</b>	NA	NA	
<b>Waste Mgt. Case #</b>	98026.01.04.01	98026.01.04.01	
<b>Initial Label Type</b>	Haz-Waste	Haz-Waste	
<b>Waste Matrix</b> <small>(i.e. Water, Cuttings, Soil, Samples, Metal, etc.)</small>	Purge water	Decon water	
<b>Container Type / Vol</b> <small>(always use Certified containers)</small>	CHPD	55gal.	CHPD 55gal.
<b>Volume of Waste</b>	16 gals	35 gals	
<b>Total Container Weight</b>	160lbs.	350lbs.	
<b>Waste Char. Samples</b> <small>(COC#: Sample#-Fraction)</small>	COC# 610834 SMO# 083037,083038	COC# 610834 SMO# 083037,083038	
<b>SMO Hazardous [ ]</b>			
<b>SMO Radioactive [ ]</b>	NA	NA	
<b>ERCL Haz [ ] Rad [ ]</b>	NA	NA	
<b>RPSD Rad [ ]</b> <small>(Amir's on-site Rad Lab)</small>	NA	NA	
<b>Container Exterior RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	
<b>Container Contents RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	
<b>Accumulation Date</b>	Start 10/04/06 Full 10/05/06	Start 10/05/06 Full 10/05/06	
<b>Date Moved to Waste Accumulation Area</b>	10/05/06	10/05/06	
<b>Accumulation Area Name</b>	9925	9925	
<b>ERwm Memo #</b>			
<b>Comments</b>		Decon water after CWL-BW4A purge, CoC 610834	

(OHSD) = open head steel drum; (CHSD) = closed head steel drum; (CHPD) = closed head poly drum; (GHPD) = open head poly drum;

(OHPB) = open head poly bucket; (RL-Off) = roll off; (WGLR) = wrangler bag; (744) = 7'x4'x4' steel box; (BB) = Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

<b>Form Generator: <u>William Gibson</u> Phone: <u>284-5232</u> Task Leader: <u>Paul Freshour</u></b>					
<b>Signature:</b> <u>William Gibson</u>		<b>To the best of my knowledge this information is correct &amp; accurate.</b>			
Container I.D. # (site-date-sequence)	CWL-BW3-100906 06		CWL-100906		
Container Certification # (i.e. SNL/NM#####)	NA		NA		
Project Name	CWL-GWM		CWL-GWM		
Site Number	NA		NA		
Waste Mgt. Case #	98026.01.04.01		98026.01.04.01		
Initial Label Type	Haz-Waste		Haz-Waste		
Waste Matrix (i.e. Water, Cuttings, Soil, Samples, Metal, etc.)	Purge water		Decon water		
Container Type / Vol (always use Certified containers)	CHPD	55gal.	CHPD	55gal.	
Volume of Waste	16 gals		35 gals		
Total Container Weight	160lbs.		350lbs.		
Waste Char. Samples (COC#: Sample#-Fraction)	COC# 610835 SMO# 083040		COC# 610835 SMO# 083040		
SMO Hazardous [ ]					
SMO Radioactive [ ]	NA		NA		
ERCL Haz [ ] Rad [ ]	NA		NA		
RPSD Rad [ ] (Amir's on-site Rad Lab)	NA		NA		
Container Exterior RAD SURVEY #	Survey: NA Swipes:		Survey: NA Swipes:		
Container Contents RAD SURVEY #	Survey: NA Swipes:		Survey: NA Swipes:		
Accumulation Date	Start 10/06/06 Full 10/09/06		Start 10/09/06 Full 10/09/06		
Date Moved to Waste Accumulation Area	10/09/06		10/09/06		
Accumulation Area Name	9925		9925		
ERwm Memo #					
Comments			Decon water after CWL-BW3 purge, CoC 610835		

(OHSD) = open head steel drum; (CHSD) = closed head steel drum; (CHPD) = closed head poly drum; (OHPD) = open head poly drum;  
(OHPB) = open head poly bucket; (RL-Off) = roll off; (WGLR) = wrangler bag; (744) = 7'x4'x4' steel box; (BB) = Burrito bag.

**NOTE: Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.**



# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William J Gibson To the best of my knowledge this information is correct & accurate.

<b>Container I.D. #</b> (site-date-sequence)	CWL-MW6U-101006	CWL-101106	
<b>Container Certification #</b> (i.e. SNL/NM#####)	NA	NA	
<b>Project Name</b>	CWL-GWM	CWL-GWM	
<b>Site Number</b>	NA	NA	
<b>Waste Mgt. Case #</b>	98026.01.04.01	98026.01.04.01	
<b>Initial Label Type</b>	Haz-Waste	Haz-Waste	
<b>Waste Matrix</b> (i.e. Water, Cuttings, Soil, Samples, Metal, etc.)	Purge water	Decon water	
<b>Container Type / Vol</b> (always use Certified containers)	CHPD	55gal.	CHPD 55gal.
<b>Volume of Waste</b>	22 gals	35 gals	
<b>Total Container Weight</b>	220lbs.	350lbs.	
<b>Waste Char. Samples</b> (COC#: Sample#-Fraction)	COC# 610836 SMO# 083042	COC# 610836 SMO# 083042	
<b>SMO Hazardous [ ]</b>			
<b>SMO Radioactive [ ]</b>	NA	NA	
<b>ERCL Haz [ ] Rad [ ]</b>	NA	NA	
<b>RPSD Rad [ ]</b> (Amir's on-site Rad Lab)	NA	NA	
<b>Container Exterior RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	
<b>Container Contents RAD SURVEY #</b>	Survey: NA Swipes:	Survey: NA Swipes:	
<b>Accumulation Date</b>	Start 10/10/06 Full 10/11/06	Start 10/11/06 Full 10/11/06	
<b>Date Moved to Waste Accumulation Area</b>	10/11/06	10/11/06	
<b>Accumulation Area Name</b>	9925	9925	
<b>ERwm Memo #</b>			
<b>Comments</b>		Decon water after CWL-MW6U purge, CoC 610836	

(OHSB) = open head steel drum; (CHSD) = closed head steel drum; (CHPD) = closed head poly drum; (OHPD) = open head poly drum;

(OHPB) = open head poly bucket; (RL-Off) = roll off; (WGLR) = wrangler bag; (744) = 7'x4'x4' steel box; (BB) = Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Craig Wood MS-1087 Fax 284-2616

**Form Generator:** William Gibson **Phone:** 284-5232 **Task Leader:** Paul Freshour

**Signature:** William Gibson To the best of my knowledge this information is correct & accurate.

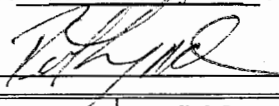
Container I.D. # <small>(site-date-sequence)</small>	CWL-MW5U-101206	CWL-101306	
Container Certification # <small>(i.e. SNL/NM#####)</small>	NA	NA	
Project Name	CWL-GWM	CWL-GWM	
Site Number	NA	NA	
Waste Mgt. Case #	98026.01.04.01	98026.01.04.01	
Initial Label Type	Haz-Waste	Haz-Waste	
Waste Matrix <small>(i.e. Water, Cuttings, Soil, Samples, Metal, etc.)</small>	Purge water	Decon water	
Container Type / Vol <small>(always use Certified containers)</small>	CHPD	55gal.	CHPD 55gal.
Volume of Waste	22 gals	35 gals	
Total Container Weight	220lbs.	350lbs.	
Waste Char. Samples <small>(COC#: Sample#-Fraction)</small>	COC# 610838 SMO# 083046, 083047	COC# 610838 SMO# 083046, 083047	
SMO Hazardous [ ]			
SMO Radioactive [ ]	NA	NA	
ERCL Haz [ ] Rad [ ]	NA	NA	
RPSD Rad [ ] <small>(Amir's on-site Rad Lab)</small>	NA	NA	
Container Exterior RAD SURVEY #	Survey: NA Swipes:	Survey: NA Swipes:	
Container Contents RAD SURVEY #	Survey: NA Swipes:	Survey: NA Swipes:	
Accumulation Date	Start 10/12/06 Full 10/13/06	Start 10/13/06 Full 10/13/06	
Date Moved to Waste Accumulation Area	10/13/06	10/13/06	
Accumulation Area Name	9925	9925	
ERwm Memo #			
Comments		Decon water after CWL-MW5U purge, CoC 610838	

(OHSD) = open head steel drum; (CHSD) = closed head steel drum; (CHPD) = closed head poly drum; (OHPD) = open head poly drum;  
(OHPB) = open head poly bucket; (RL-Off) = roll off; (WGLR) = wrangler bag; (744) = 7'x4'x4' steel box; (BB) = Burrito bag.

**NOTE:** Complete all information, mark boxes NA if Not Applicable. Shaded area is for ERwm use only.

# ER WASTE GENERATION LOG

(Version: 5/2/01) Return completed form with a copy of the Chain of Custody to Ernest Vinsant. MS-1087 Fax 284-2616

Form Generator: <u>Robert Lynch</u> Phone: <u>844-4013</u> Task Leader: <u>Pual Freshour</u>			
Signature: <u></u>		To the best of my knowledge this information is correct & accurate.	
Container I.D. # (site-date-sequence)	CWL-MW4-101706	CWL-101706	
Container Certification # (i.e. SNL/NM#####)			
Project Name	CWL-GWM	CWL-GWM	
Site Number			
Waste Mgt. Case #	98026.01.04.01	98026.01.04.01	
Initial Label Type	HAZ	HAZ	
Waste Matrix (i.e. Water, Cuttings, Soil, Samples, Metal, etc.)	Purge Water	Decon Water	
Container Type / Vol (always use Certified containers)	CHPD 55gal.	CHPD 55gal.	
Volume of Waste	42	35	
Total Container Weight	410	350	
Waste Char. Samples (COC#: Sample#-Fraction) SMO Hazardous [ ]	COC# 610841 SMO# 080353	COC# 610841 SMO# 080353	
SMO Radioactive [ ]			
ERCL Haz [ ] Rad [ ]			
RPSD Rad [ ] (Amir's on-site Rad Lab)			
Container Exterior RAD SURVEY #	Survey: NA Swipes:	Survey: NA Swipes:	Survey: NA Swipes:
Container Contents RAD SURVEY #	Survey: Swipes: NA	Survey: Swipes: NA	Survey: Swipes: NA
Accumulation Date	Start: 10/17/06 Full 10/17/06	Start 10/17/06 Full 10/17/06	Start Full
Date Moved to Waste Accumulation Area	10/17/06	10/17/06	
Accumulation Area Name	9925	9925	
ERwm Memo #			
Comments		Decon after CWL-MW4	

(OHSD)= open head steel drum; (CHSD)= closed head steel drum; (CHPD)= closed head poly drum; (OHPD)= open head poly drum;

(OHPB)= open head poly bucket; (RL-Off)= roll off; (WGLR)= wrangler bag; (744)= 7'x4'x4' steel box; (BB)= Burrito bag.

**ATTACHMENT B**

**ANALYSIS REQUEST/CHAIN-OF-CUSTODY FORMS**

## Internal Lab

Batch No.

AR/COC

610835

[illegible]

## ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab

Batch No.

SMO Use

AR/COC

610834

[illegible]

## Internal Lab

Batch No.

SMO Use

610833

[illegible]

## Internal Lab

Page 1 of 1




Batch No.

SMO Use

AR/COC

610839

<b>Location</b>	Tech Area	Reference LOV(available at SMO)	P.O. Box 5800 MS 0154
Building	Room		Albuquerque, NM 87185-0154

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 checked="" type="checkbox"/> 15 Day <input 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				QC initials.				*Send report to:			
Sample Team Members	Name		Signature		Init		Company/Organization/Phone/Cellular		Tim Jackson/Org 6791/MS 1087/505-284-2547		Lab Use		
	Alfred Santillanes				AS		Weston/6791/844-5130/228-0710		Sampling complete CWL 1st Qtr 07				
	Robert Lynch				RL		Weston/6791/844-4013/250-7090						
	William J Gibson				WJG		Weston/6791/284-5232/239-7367						
									App.IX reporting for SA fractions, 001 & 000. *Please list as separate report.				

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
1. Received by	Org.	Date	Time	4. Received by	Org.	Date	Time
2. Relinquished by	Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by	Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time



## Internal Lab

Page 1 of 1

SMO Use

AR/COC

610841

[illegible]

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. *N/A*

SMO Use

AR/COC

610843

Dept. No./Mail Stop: 6791/1087	Date Samples Shipped: <i>10/19/06</i>	Project/Task No. 98026.01.07	<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: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Project/Task Manager: Paul Freshour	Carrier/Vwaybill No.	SMO Authorization: <i>OK [Signature]</i>	
Project Name: CWL GWM	Lab Contact: Edie Kent/803-556-8171	Contract #: PO 21671	
Record Center Code: ER/1267 074/DAT	Lab Destination: GEL	<i>500 BOTTLES DRAGON</i>	
Logbook Ref. No.: ER 049	SMO Contact/Phone: Pam Puissant/505-844-3185		
Service Order No. CF 025-07	Send Report to SMO: Lorraine Herrera/505-844-3199		

Location		Reference LOV(available at SMO)										Parameter & Method Requested	Lab Samp ID
Building	Room	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Volume	Preservative	Collection Method	Sample Type		
		083058-001 CWL-MW5L	543	<i>N/A</i>	101906/0939	GW	G	3x40ml	HCL	G	SA	VOC (8260)	
		083058-009 CWL-MW5L	543		101906/0941	GW	P	500ml	HNO3	G	SA	Total Metals+Fe (SW846-6020/7470)	
		083059-001 CWL-FB2	NA		101906/0939	DIW	G	3x40ml	HCL	G	FB	VOC (8260)	
		083060-001 CWL-TB11	NA		101906/0939	DIW	G	3x40ml	HCL	G	TB	VOC (8260)	

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Ref. No.	Sample Tracking	Smo 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/yy)	Entered by:	EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Level D Package <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																
Turnaround Time <input type="checkbox"/> 7 Day <input checked="" type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day			*Send report to:																	
Return Samples By:	<input type="checkbox"/> Negotiated TAT	QC inits.	Tim Jackson/Org 6791/MS 1087/505-284-2547																	
Sample Team Members <table border="1"> <tr> <th>Name</th> <th>Signature</th> <th>Init</th> <th>Company/Organization/Phone/Cellular</th> </tr> <tr> <td>Alfred Santillanes</td> <td><i>[Signature]</i></td> <td></td> <td>Weston/6791/844-5130/228-0710</td> </tr> <tr> <td>Robert Lynch</td> <td><i>[Signature]</i></td> <td></td> <td>Weston/6791/844-4013/250-7090</td> </tr> <tr> <td>William J Gibson</td> <td><i>[Signature]</i></td> <td></td> <td>Weston/6791/284-5232/239-7367</td> </tr> </table>	Name	Signature	Init	Company/Organization/Phone/Cellular		Alfred Santillanes	<i>[Signature]</i>		Weston/6791/844-5130/228-0710	Robert Lynch	<i>[Signature]</i>		Weston/6791/844-4013/250-7090	William J Gibson	<i>[Signature]</i>		Weston/6791/284-5232/239-7367			
Name	Signature	Init	Company/Organization/Phone/Cellular																	
Alfred Santillanes	<i>[Signature]</i>		Weston/6791/844-5130/228-0710																	
Robert Lynch	<i>[Signature]</i>		Weston/6791/844-4013/250-7090																	
William J Gibson	<i>[Signature]</i>		Weston/6791/284-5232/239-7367																	

1. Relinquished by <i>[Signature]</i> Org. <i>6791</i> Date <i>10/19/06</i> Time <i>1045</i>	4. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. <i>6791</i> Date <i>10/19/06</i> Time <i>1045</i>	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by _____ Org. _____ Date _____ Time _____	5. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by _____ Org. _____ Date _____ Time _____	5. Received by _____ Org. _____ Date _____ Time _____
3. Relinquished by _____ Org. _____ Date _____ Time _____	6. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by _____ Org. _____ Date _____ Time _____	6. Received by _____ Org. _____ Date _____ Time _____

## Internal Lab

Page 1 of 1

Batch No.

SMO Use

AR/COC

610838

[illegible]

## Internal Lab

Page 1 of 1

N/A

SMO Use

AR/COC

610842

[illegible]

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. *N/A*

SMO Use

AR/COC

610836

Dept. No./Mail Stop:	6791/1087	Date Samples Shipped:	10/11/06	Project/Task No.	98026_01.07	<input type="checkbox"/> Waste Characterization -Send preliminary/copy report to:
Project/Task Manager	Paul Freshour	Carrier/Waybill No.		SMO Authorization:	<i>[Signature]</i>	
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671	<input type="checkbox"/> Released by COC No.: <input checked="" type="checkbox"/> Validation Required
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL	<i>SW BOTTLE ORDER</i>		
Logbook Ref. No.:	ER 049	SMO Contact/Phone	Pam Puissant/505-844-3185			
Service Order No.	CF 025-07	Send Report to SMO	Lorraine Herrera/505-844-3199			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area					P.O. Box 5800 MS 0154
Building	Room					Albuquerque NM 87185-0154

## Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
083042-001	CWL-MW6U	499	N/A	101106/0844	GW	G	3x40ml	HCL	G	SA	VOC (8260)	
083042-009	CWL-MW6U	499		101106/0846	GW	P	500ml	HNO3	G	SA	Total Metals+Fe (SW846-6020/7470)	
083043-001	CWL-TB4	NA	7	101106/0844	DIW	G	3x40ml	HCL	G	TB	VOC (8260)	

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)	Entered by:	Level D Package	EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Turnaround Time	<input type="checkbox"/> 7 Day <input checked="" type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Return Samples By:	<input type="checkbox"/> Negotiated TAT	QC Inits.		*Send report to:		
Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular	Tim Jackson/Org 6791/MS 1087/505-284-2547	Lab Use
	Alfred Santillanes	<i>[Signature]</i>		Weston/6791/844-5130/228-0710		
	Robert Lynch	<i>[Signature]</i>		Weston/6791/844-4013/250-7090		
	William J Gibson	<i>[Signature]</i>		Weston/6791/284-5232/239-7367		
					App.IX reporting for SA fractions,001 & 009.	
					*Please list as separate report.	

1. Relinquished by	<i>[Signature]</i>	Org	6791	Date	10/11/06	Time	0920	4. Relinquished by		Org.		Date		Time	
1. Received by	<i>[Signature]</i>	Org	6791	Date	10/11/06	Time	0920	4. Received by		Org.		Date		Time	
2. Relinquished by		Org.		Date		Time		5. Relinquished by		Org.		Date		Time	
2. Received by		Org.		Date		Time		5. Received by		Org.		Date		Time	
3. Relinquished by		Org.		Date		Time		6. Relinquished by		Org.		Date		Time	
3. Received by		Org.		Date		Time		6. Received by		Org.		Date		Time	

Prior CWL-MW50

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab

Batch No. *NA*

SMO Use

AR/COC

610837

Dept. No./Mail Stop:	6791/1087	Date Samples Shipped:	<i>10/11/06</i>	Project/Task No.	98026_01.07	<input type="checkbox"/> Waste Characterization
Project/Task Manager:	Paul Freshour	Carrier/Waybill No.		SMO Authorization:	<i>OK for SMO</i>	-Send preliminary/copy report to:
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #:	PO 21671	<input type="checkbox"/> Released by COC No.:
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL	<input checked="" type="checkbox"/> Validation Required		
Logbook Ref. No.:	ER 049	SMO Contact/Phone:	Pam Puissant/505-844-3185	Bill To: Sandia National Labs (Accounts Payable)		
Service Order No.	CF 025-07	Send Report to SMO:	Lorraine Herrera/505-844-3199	P.O. Box 5800 MS 0154		

Location	Tech Area	Reference LOV (available at SMO)
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 Type	Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
083044-001	CWL-EB1	NA	<i>OK</i>	10/11/06 0955	DIW	G	3x40ml	HCL	G	EB	VOC (8260)	
083044-009	CWL-EB1	NA	<i>OK</i>	10/11/06 0956	DIW	P	500ml	HNO3	G	EB	Total Metals+Fe (SW846-6020/7470)	
083045-001	CWL-TB5	NA	<i>OK</i>	10/11/06 0955	DIW	G	3x40ml	HCL	G	TB	VOC (8260)	

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)	Level D Package <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		*Send report to: Tim Jackson/Org 6791/MS 1087/505-284-2547	
Turnaround Time	<input type="checkbox"/> 7 Day <input checked="" type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day	Entered by:	*App.IX reporting for SA fractions, 001 & 009.			
Return Samples By:	<input type="checkbox"/> Negotiated TAT	QC initials:	*Please list as separate report.			
Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular		
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	Weston/6791/844-5130/228-0710		
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	Weston/6791/844-4013/250-7090		
	William J Gibson	<i>[Signature]</i>	<i>WJG</i>	Weston/6791/284-5232/239-7367		

1. Relinquished by <i>[Signature]</i>	Org. <i>6791</i>	Date <i>10/11/06</i>	Time <i>1020</i>	4. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i>	Org. <i>6791</i>	Date <i>10/11/06</i>	Time <i>1020</i>	4. Received by	Org.	Date	Time
2. Relinquished by	Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinquished by	Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time



**ATTACHMENT C**

**DATA VALIDATION REPORTS FOR**

**GROUNDWATER ANALYTICAL RESULTS**

**October - December 2006**



### Sample Findings Summary

**Site:** CWL Assessment GWM

AR/COC: 610839

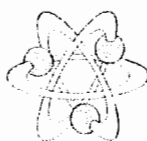
**Data Type:** Organic & Inorganic

[illegible]

Validated By: Kevin A Lambert

Kevin A. Lambert

**Date:** 11/09/06



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

## Memorandum

Date: November 9, 2006  
To: File  
From: Kevin Lambert  
Subject: Organic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610839  
SDG: 174728  
Laboratory: GEL  
Project/Task: 98036.10.11.01

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

All samples were prepared and analyzed with accepted procedures using method EPA8260B (VOC). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

#### 1. VOC:

The continuing calibration verification percent difference (CCV %D) for carbon disulfide (-38%) was > 20% but  $\leq$  40%. The associated sample result that was non-detect should not be qualified and the detect should be qualified "J." Also, carbon disulfide was detected ( $\geq$  DL) in the method blank. The associated sample result that was non-detect should not be qualified. However, the associated sample result that was detect < the RL and < 5X the blank concentration has already been qualified due to poor calibration and, thus should be qualified "UJ" at the RL (5.0 ug/L) with descriptive flag "B."

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

### Holding Times

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

### Calibration

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

#### VOC:

The calibration response factor (RF) for acetonitrile (0.04), isobutyl alcohol (0.01), propionitrile (0.04), and trichloroethene (0.28) was < the specified minimum RF (0.05, 0.05, 0.05, and 0.30, respectively). No data should be qualified based on professional judgment. The CCV %D for 2-chloro-1,3-butadiene (27%), allyl chloride (27%), dichlorodifluoromethane (34%), pentachloroethane (28%), and trans-1,4-dichloro-2-butene (32%) was > 20% but ≤ 40%, and acrolein (46%) was > 40% but ≤ 60% (see Volatile Organics Worksheet). The associated sample results were non-detects and as a result based on professional judgment no data should be qualified.

### **Blanks**

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

#### **VOC:**

1,2,4-Trichlorobenzene was detected (≥ DL) in the method blank. The associated sample results were non-detects; no data should be qualified as a result.

### **Internal Standards (ISs)**

Internal standards data met QC acceptance criteria.

### **Surrogates**

The surrogate recoveries met QC acceptance criteria.

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

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

#### **VOC:**

The LCS recovery for acrolein (146%) was > the upper QC acceptance limit (139%). The associated sample results were non-detects; no data should be qualified as a result. Also, it should be noted that no LCSD was provided with the SDG. Laboratory precision was assessed using the MS/MSD. No data should be qualified as a result.

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

The MS/MSD met QC acceptance criteria.

### **Target Compound Identification/Confirmation**

No target compound identification/confirmation analyses were required.

### **Detection Limits/Dilutions**

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

### **Other QC**

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

#### **VOC:**

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

No other specific issues were identified which affect data quality.



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## Memorandum

Date: November 9, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610839  
SDG: 174728  
Laboratory: GEL  
Project/Task: 98036.10.11.01

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 EPA6020 (ICP-MS metals) and EPA7470A (CVAA mercury). Problems were identified with the data package that result in the qualification of data.

#### 1. ICP-MS metals:

The following target analytes were detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB, MB, EB). The associated sample results are qualified as noted below.

Sample 174728-003      Sb was a detect  $<5X$  the ICB/CCB and should be qualified "J, B3."

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 noted above in the summary section.

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

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

#### **ICP-MS metals and CVAA mercury:**

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**

The serial dilution met QC acceptance criteria.

### **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.

### **Other QC**

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

No other specific issues were identified which affect data quality.

## Data Validation Summary

Site/Project: CWL GWM Project/Task #: 98036, 10, 11, 01 # of Samples: 3 Matrix: aqueous  
 AR/COC #: 610839 Laboratory Sample IDs: 174728-001, -002, -003  
 Laboratory: GEL  
 SDG #: 174728

QC Element	Analysis									RAD	Other
	Organics				Inorganics						
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	MS ICP/AES/KC	GFAA/ AA	CVAA (Hg)	CN			
1. Holding Times/Preservation	✓				✓		✓				
2. Calibrations	UJ				J		✓				
3. Method Blanks	UJ				✓		✓				
4. MS/MSD	✓				✓		✓				
5. Laboratory Control Samples	✓				✓		✓				
6. Replicates					✓		✓				
7. Surrogates	✓										
8. Internal Standards	✓										
9. TCL Compound Identification	✓										
10. ICP Interference Check Sample					✓						
11. ICP Serial Dilution					✓						
12. Carrier/Chemical Tracer Recoveries											
13. Other QC TB	✓				NA		NA				

J = Estimated

R = Unusable

NP

= Not Provided

U = Not Detected

Check (✓) = Acceptable

Other: \_\_\_\_\_

UJ = Not Detected, Estimated

Shaded Cells = Not Applicable (also "NA")

Reviewed By: Karin A Lambert Date: 11-09-06

# Volatile Organics (SW 846 Method 8260)

Page 1 of 3

Site/Project: CWL GWM AR/COC #: 610839 # of Samples: 2 Matrix: aqueous  
 Laboratory: GEL Laboratory Report #: 174728 Laboratory Sample IDs: 174728-001, -002  
 Methods: EPA8260B(VOC) Batch #: 584104

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	5x Blk [10x]
						>.05	<20% / 0.99	20%											
2	630-20-6	1,1,1,2-Tetrachloroethane	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓			✓	
1	71-55-6	1,1,1-Trichloroethane	✓	0.10		✓	✓												
3	79-34-5	1,1,2,2-Tetrachloroethane	✓	0.30		✓	✓												
2	79-00-5	1,1,2-Trichloroethane	✓	0.10		✓	✓												
1	75-34-3	1,1-Dichloroethane	✓	0.10		✓	✓												
1	75-35-4	1,1-Dichloroethene	✓	0.20		✓	✓												
1	563-58-6	1,1-Dichloropropene																	
3	87-61-6	1,2,3-Trichlorobenzene																	
3	96-18-4	1,2,3-Trichloropropane	✓			✓	✓												
3	120-82-1	1,2,4-Trichlorobenzene	✓			✓	✓		0.9625										4.81
3	95-63-6	1,2,4-Trimethylbenzene																	
3	96-12-8	1,2-Dibromo-3-chloropropane	✓			✓	✓												
2	106-93-4	1,2-Dibromoethane (EDB)	✓			✓	✓												
3	95-50-1	1,2-Dichlorobenzene																	
1	107-06-2	1,2-Dichloroethane	✓	0.10		✓	✓												
1	78-87-5	1,2-Dichloropropane	✓	0.01		✓	✓												
3	108-67-8	1,3,5-Trimethylbenzene																	
3	541-73-1	1,3-Dichlorobenzene																	
2	142-28-9	1,3-Dichloropropane		0.01															
3	106-46-7	1,4-Dichlorobenzene																	
	107-04-0	1-Bromo-2-chloroethane																	
1	594-20-7	2,2-Dichloropropane																	
1	78-93-3	2-Butanone (MEK) (10xblk)	✓	0.01		✓	✓												
1	126-99-8	2-Chloro-1, 3-butadiene	✓			✓	✓		27										
1	110-75-8	2-Chloroethyl vinyl ether																	
3	95-49-8	2-Chlorotoluene																	
2	591-78-6	2-Hexanone (MBK)	✓	0.01		✓	✓												
3	106-43-4	4-Chlorotoluene																	
3	99-87-6	4-Isopropyltoluene																	
2	108-10-1	4-Methyl-2-pentanone (MIBK)	✓	0.10		✓	✓												
1	67-64-1	acetone(10xblk)	✓	0.01		✓	✓												
1	75-05-8	Acetonitrile	✓			0.04	✓												
1	107-02-8	Acrolein	✓			✓	✓		46				146(139)						
1	107-13-1	Acrylonitrile	✓			✓	✓												
1	107-05-1	Allyl chloride	✓			✓	✓		27										
1	71-43-2	Benzene	✓	0.50		✓	✓												

Reviewed By: Karin A. Lambert Date: 11-09-06

## Volatile Organics

Site/Project: \_\_\_\_\_ AR/COC #: 610839 Batch #: \_\_\_\_\_  
Laboratory: \_\_\_\_\_ Laboratory Report #: 174728 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	5x Blk [10x]
						>.05	<20% / 0.99	20%											
3	108-86-1	Bromobenzene			NA			✓	✓	✓			✓	✓	✓			✓	
1	74-97-5	Bromochloromethane							✓										
1	75-27-4	Bromodichloromethane	✓	0.20		✓	✓												
3	75-25-2	Bromoform	✓			✓	✓												
1	74-83-9	Bromomethane	✓	0.10		✓	✓												
	108-60-1	bis(2-Chloroisopropyl)ether	✓			✓	✓	✓	✓										
1	75-15-0	Carbon disulfide	✓	0.10		✓	✓	-38	4.213										21.1
1	56-23-5	Carbon tetrachloride	✓	0.10		✓	✓	✓	✓										
2	108-90-7	Chlorobenzene	✓	0.50		✓	✓												
1	75-00-3	Chloroethane	✓	0.01		✓	✓												
1	67-66-3	Chloroform	✓	0.20		✓	✓												
1	74-87-3	Chloromethane	✓	0.10		✓	✓												
1	156-59-2	cis-1,2-Dichloroethene																	
1	10061-01-5	cis-1,3-Dichloropropene	✓	0.20		✓	✓												
2	124-48-1	Dibromochloromethane	✓	0.10		✓	✓												
1	74-95-3	Dibromomethane	✓			✓	✓												
1	75-71-8	Dichlorodifluoromethane	✓			✓	✓	34											
2	97-63-2	Ethyl methacrylate	✓			✓	✓	✓											
2	100-41-4	Ethylbenzene	✓	0.10		✓	✓												
3	87-68-3	Hexachlorobutadiene																	
1	74-88-4	Iodomethane	✓			✓	✓												
	78-83-1	Isobutyl alcohol	✓			0.01	✓												
1	80-62-6	Methyl methacrylate	✓			✓	✓												
	126-98-7	Methylacrylonitrile	✓			✓	✓												
1	75-09-2	Methylene chloride (10xbk)	✓	0.01	✓	✓	✓												
3	91-20-3	Naphthalene			NA														
3	104-51-8	n-Butylbenzene																	
3	103-65-1	n-Propylbenzene																	
2	95-47-6	o-Xylene																	
	76-01-7	Pentachloroethane	✓			✓	✓	28											
1	107-12-0	Propionitrile	✓			0.04	✓	✓											
3	135-98-8	sec-Butylbenzene																	
2	100-42-5	Styrene	✓	0.30		✓	✓												
3	98-06-6	tert-Butylbenzene			NA														
2	127-18-4	Tetrachloroethene	✓	0.20		✓	✓												
3	109-99-9	Tetrahydrofuran			NA														
2	108-88-3	toluene(10xbk)	✓	0.40		✓	✓												
1	156-60-5	trans-1,2-Dichloroethene	✓			✓	✓												
2	10061-02-6	trans-1,3-Dichloropropene	✓	0.10		✓	✓												
3	110-57-6	trans-1,4-dichloro-2-Butene	✓			✓	✓	32											
1	79-01-6	Trichloroethene	✓	0.30		0.28	✓	✓	✓	✓			✓	✓	✓			✓	



# Volatile Organics

Page 3 of 3

Site/Project: \_\_\_\_\_ AR/COC #: 610839 Batch #s: \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Laboratory Report #: 174728 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks		
						>.05	<20% / 0.99	20%												
1	75-69-4	Trichlorofluoromethane	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓			✓		
1	76-13-1	Trichlorotrifluoroethane (Freon 113)																		
1	108-05-4	Vinyl Acetate	✓			✓	✓													
1	75-01-4	vinyl chloride	✓	0.10		✓	✓													
2	1330-20-7	xylene(s)(total)	✓	0.30		✓	✓													

Comments:

Notes: Shaded rows are RCRA compounds.

## Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
	Met					Met			
	Criteria					Criteria			

SMC 1: Bromofluorobenzene  
 SMC 2: Dibromofluoromethane  
 SMC 3: Toluene-d8

IS 1: Fluorobenzene  
 IS 2: Chlorobenzene-d5  
 IS 3: 1,4-Dichlorobenzene-d4

Comments:

# Inorganic Metals

Site/Project: CWL GWM AR/COC #: 610839 Laboratory Sample IDs: 174728-003

Laboratory: GEL Laboratory Report #: 174728

Methods: EPA 6020 (ICP-MS), EPA 7470A (CVAAS)

# of Samples: 1 Matrix: aqueous Batch #: 582602, 582975

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	5X Field Blanks		
7429-90-5 Al								NA	NA		NA	NA								
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-48-4 Co	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-89-6 Fe	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-23-5 Na																				
7440-31-5 Sn	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-62-2 V	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-66-6 Zn	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-36-0 Sb	✓	✓	✓	0.00109	0.0008045	✓	✓			✓			✓	✓	✓			0.00545		
7440-28-0 Tl	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA					
Cyanide CN																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg / kg = µg / g :  $[(\mu\text{g} / \text{g}) \times (\text{sample mass } \{g\}) / \text{sample vol. } \{ml\}] \times (1000 \text{ ml} / 1 \text{ liter}) / \text{Dilution Factor} = \mu\text{g} / \text{l}$

Comments:

Reviewed By: Karin A. Lambert Date: 11-09-06

# Contract Verification Review (CVR)

Project Leader Freshour

Project Name CWL GWM

Case No. 98036\_10.11.01

AR/COC No. 610839

Analytical Lab GEL

SDG No. 174728

In the tables below, mark any information that is missing or incorrect and give an explanation.

## 1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

## 2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L <sub>c</sub>	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

## Contract Verification Review (Continued)

## 3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy		X	VOC LCS recovery failed for Acrolein
a) Laboratory control samples accuracy reported and met for all samples			
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision	X		
a) Replicate sample precision reported and met for all inorganic and radiochemistry samples			
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data		X	1,2,4-Trichlorobenzene, Carbon disulfide detected in VOC Method Blank
a) Method or reagent blank data reported and met for all samples			
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

## Contract Verification Review (Continued)

## 4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		

### Contract Verification Review (Concluded)

## 5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

[illegible]

Were deficiencies unresolved?

**Yes**

No

Based on the review, this data package is complete. (Yes ) No

(Yes

No

If no, provide: nonconformance report or correction request number \_\_\_\_\_ and date correction request was submitted \_\_\_\_\_

Reviewed by: [Signature] Date: 11/08/06 Closed by: \_\_\_\_\_ Date: \_\_\_\_\_

Date: 11/08/06

**Closed by:**

Date: \_\_\_\_\_





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## Memorandum

Date: November 9, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610838, 610840, 610841, 610842, and 610843  
SDG: 174231  
Laboratory: GEL  
Project/Task: 98036.10.11.01

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 EPA6020 (ICP-MS metals) and EPA7470A (CVAA mercury). Problems were identified with the data package that result in the qualification of data.

#### 1. ICP-MS metals:

The following target analytes were detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB, MB, EB). The associated sample results are qualified as noted below.

Samples 174231-005 and -006	Cr was a detect $<5X$ the EB and should be qualified "J, B2." Sb was a detect $<5X$ the ICB/CCB and should be qualified "J, B3."
Sample 174231-011	Pb and Zn were detects $<5X$ the EB and should be qualified "J, B2." Cd was a detect $<5X$ the ICB/CCB and should be qualified "J, B3."
Sample 174231-012	Zn was a detect $<5X$ the EB and should be qualified "J, B2." Cd was a detect $<5X$ the ICB/CCB and should be qualified "J, B3."

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 noted above in the summary section and as follows.

### **ICP-MS metals:**

Cu and V were detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB, MB, EB). The associated sample results were non-detects or detects  $>5X$  the blank concentrations; 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.

### **ICP-MS metals and CVAA mercury:**

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**

The serial dilution met QC acceptance criteria.

## **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.

## **Other QC**

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

### **ICP-MS metals and CVAA mercury:**

EBs and field duplicate pairs were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data should be qualified as a result. Also, it should be noted that the EB associated with SNL samples on ARCO# 610838 were submitted in another SDG on ARCO# 610837.

No other specific issues were identified which affect data quality.



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## Memorandum

Date: November 9, 2006  
To: File  
From: Kevin Lambert  
Subject: Organic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610838, 610840, 610841, 610842, and 610843  
SDG: 174231  
Laboratory: GEL  
Project/Task: 98036.10.11.01

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

All samples were prepared and analyzed with accepted procedures using method EPA8260B (VOC). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. VOC:  
The LCS recovery for carbon disulfide (144%) was > the upper QC acceptance limit (129%). Also, the MS and MSD recovery for carbon disulfide (147% and 134%) were > the upper QC acceptance limit (130%). The associated sample results that were non-detects should not be qualified and detects should be qualified "J, A, A2."

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

### Holding Times

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

### Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

#### VOC:

The calibration response factor (RF) for acetonitrile (0.04), isobutyl alcohol (0.01), and trichloroethene (0.21) was < the specified minimum RF (0.05, 0.05, and 0.30, respectively). No data should be qualified based on professional judgment. The continuing calibration verification percent

difference (CCV %D) for bis(2-chloroisopropyl)ether (-23%), carbon disulfide (-24%), and trans-1,4-dichloro-2-butene (28%) was  $> 20\%$  but  $\leq 40\%$  (see Volatile Organics Worksheet). The associated sample results were non-detects and as a result based on professional judgment no data should be qualified.

### **Blanks**

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

#### **VOC:**

Bromodichloromethane and dibromochloromethane were detected ( $\geq$  DL) in the equipment blank. The associated sample results were non-detects; no data should be qualified as a result.

### **Internal Standards (ISs)**

Internal standards data met QC acceptance criteria.

### **Surrogates**

The surrogate recoveries met QC acceptance criteria.

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

The LCS/LCSD met QC acceptance criteria except noted above in the summary section and as follows.

#### **VOC:**

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

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

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

#### **VOC:**

The MS recovery for bromomethane (131%) was  $>$  the upper QC acceptance limit (130%). The associated sample results were non-detects; no data should be qualified as a result.

### **Target Compound Identification/Confirmation**

No target compound identification/confirmation analyses were required.

### **Detection Limits/Dilutions**

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

### **Other QC**

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

#### **VOC:**

TBs, EBs, and field duplicate pairs were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data should be qualified as a result. Also, it should be noted that the EB associated with SNL samples on ARCO# 610838 were submitted in another SDG on ARCO# 610837.

No other specific issues were identified which affect data quality.

# **Data Validation Summary**

Site/Project: CWL GWM Project/Task #: 98036.10.11.01 # of Samples: 19 Matrix: aqueous  
 AR/COC #: 610838, 610840, 610841, 610842, 610843 Laboratory Sample IDs: 174231-001 to -019  
 Laboratory: 174 KAL GEL  
 SDG #: 174231

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/ <sup>MS</sup> AES <sub>KL</sub>	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓				✓		✓			
2. Calibrations	✓				J		✓			
3. Method Blanks	✓				✓		✓			
4. MS/MSD	J				✓		✓			
5. Laboratory Control Samples	J				✓		✓			
6. Replicates	NA				✓		✓			
7. Surrogates	✓				NA		NA			
8. Internal Standards	✓				NA					
9. TCL Compound Identification	✓				NA					
10. ICP Interference Check Sample	NA									
11. ICP Serial Dilution	NA									
12. Carrier/Chemical Tracer Recoveries	NA				NA		✓			
13. Other QC TB, EB, FDup	✓				J		✓			

J = Estimated

R = Unusable

NP

= Not Provided

U = Not Detected

Check (✓) = Acceptable

Other: \_\_\_\_\_

UJ = Not Detected, Estimated

Shaded Cells = Not Applicable (also "NA")

Reviewed By: Karin A Lambert Date: 11-09-06

# Volatile Organics (SW 846 Method 8260)

Page 1 of 3

Site/Project: CWL GWM AR/COC #: 610838, 610840, 610841 # of Samples: 12 Matrix: aqueous  
 Laboratory: GEL Laboratory Report #: 174231 Laboratory Sample IDs: 174231-001 to -004, -008 to -010, -013, -014, -016 to -018  
 Methods: EP8260B(VOC) Batch #: 581875

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	Field Blk
						> .05	< 20% / 0.99	20%											
2	630-20-6	1,1,1,2-Tetrachloroethane	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
1	71-55-6	1,1,1-Trichloroethane	✓	0.10		✓	✓												
3	79-34-5	1,1,2,2-Tetrachloroethane	✓	0.20		✓	✓												
2	79-00-5	1,1,2-Trichloroethane	✓	0.10		✓	✓												
1	75-34-3	1,1-Dichloroethane	✓	0.10		✓	✓												
1	75-35-4	1,1-Dichloroethene	✓	0.20		✓	✓												
1	563-58-6	1,1-Dichloropropene																	
3	87-61-6	1,2,3-Trichlorobenzene																	
3	96-18-4	1,2,3-Trichloropropane	✓			✓	✓												
3	120-82-1	1,2,4-Trichlorobenzene	✓			✓	✓												
3	95-63-6	1,2,4-Trimethylbenzene																	
3	96-12-8	1,2-Dibromo-3-chloropropane	✓			✓	✓												
2	106-93-4	1,2-Dibromoethane (EDB)	✓			✓	✓												
3	95-50-1	1,2-Dichlorobenzene																	
1	107-06-2	1,2-Dichloroethane	✓	0.10		✓	✓												
1	78-87-5	1,2-Dichloropropane	✓	0.01		✓	✓												
3	108-67-8	1,3,5-Trimethylbenzene																	
3	541-73-1	1,3-Dichlorobenzene																	
2	142-28-9	1,3-Dichloropropane		0.01															
3	106-46-7	1,4-Dichlorobenzene																	
	107-04-0	1-Bromo-2-chloroethane																	
1	594-20-7	2,2-Dichloropropane																	
1	78-93-3	2-Butanone (MEK) (10xblk)	✓	0.01		✓	✓												
1	126-99-8	2-Chloro-1, 3-butadiene	✓			✓	✓												
1	110-75-8	2-Chloroethyl vinyl ether																	
3	95-49-8	2-Chlorotoluene																	
2	591-78-6	2-Hexanone (MBK)	✓	0.01		✓	✓												
3	106-43-4	4-Chlorotoluene																	
3	99-87-6	4-Isopropyltoluene																	
2	108-10-1	4-Methyl-2-pentanone (MIBK)	✓	0.10	✓	✓	✓												
1	67-64-1	acetone(10xblk)	✓	0.01	✓	✓	✓												
1	75-05-8	Acetonitrile	✓		NA	0.04	✓												
1	107-02-8	Acrolein	✓			✓	✓												
1	107-13-1	Acrylonitrile	✓			✓	✓												
1	107-05-1	Allyl chloride	✓			✓	✓												
1	71-43-2	Benzene	✓	0.50	✓	✓	✓												

Reviewed By: Kevin A. Lambert Date: 11-09-06

# Volatile Organics

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Site/Project: 610838, 610840, 610841 AR/COC #: 610842, 610843 Batch #:           
Laboratory:          Laboratory Report #: 174231 # of Samples:          Matrix:         

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	Field Blk
						>.05	<20%/0.99	20%											
3	108-86-1	Bromobenzene			NA			✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
1	74-97-5	Bromochloromethane															✓*		
1	75-27-4	Bromodichloromethane	✓	0.20		✓	✓										0.3275		
3	75-25-2	Bromoform	✓			✓	✓										✓		
1	74-83-9	Bromomethane	✓	0.10		✓	✓												
	108-60-1	bis(2-Chloroisopropyl)ether	✓			✓	✓	-23					131 (130)						
1	75-15-0	Carbon disulfide	✓	0.10		✓	✓	-24***		144 (129)			147 (130) 134						
1	56-23-5	Carbon tetrachloride	✓	0.10		✓	✓												
2	108-90-7	Chlorobenzene	✓	0.50		✓	✓												
1	75-00-3	Chloroethane	✓	0.01		✓	✓												
1	67-66-3	Chloroform	✓	0.20		✓	✓												
1	74-87-3	Chloromethane	✓	0.10		✓	✓												
1	156-59-2	cis-1,2-Dichloroethene																	
1	10061-01-5	cis-1,3-Dichloropropene	✓	0.20		✓	✓										✓** *		
2	124-48-1	Dibromochloromethane	✓	0.10		✓	✓										0.5565 (0.5305)		
1	74-95-3	Dibromomethane	✓			✓	✓												
1	75-71-8	Dichlorodifluoromethane	✓			✓	✓												
2	97-63-2	Ethyl methacrylate	✓			✓	✓												
2	100-41-4	Ethylbenzene	✓	0.10		✓	✓												
3	87-68-3	Hexachlorobutadiene																	
1	74-88-4	Iodomethane	✓			✓	✓												
	78-83-1	Isobutyl alcohol	✓			0.01	✓												
1	80-62-6	Methyl methacrylate	✓			✓	✓												
	126-98-7	Methylacrylonitrile	✓			✓	✓												
1	75-09-2	Methylene chloride (10xblk)	✓	0.01		✓	✓												
3	91-20-3	Naphthalene			NA														
3	104-51-8	n-Butylbenzene																	
3	103-65-1	n-Propylbenzene																	
2	95-47-6	o-Xylene																	
	76-01-7	Pentachloroethane	✓			✓	✓												
1	107-12-0	Propionitrile	✓			✓	✓												
3	135-98-8	sec-Butylbenzene																	
2	100-42-5	Styrene	✓	0.30		✓	✓												
3	98-06-6	tert-Butylbenzene																	
2	127-18-4	Tetrachloroethene	✓	0.20		✓	✓												
3	109-99-9	Tetrahydrofuran																	
2	108-88-3	toluene (10xblk)	✓	0.40		✓	✓									2.8			
1	156-60-5	trans-1,2-Dichloroethene	✓			✓	✓												
2	10061-02-6	trans-1,3-Dichloropropene	✓	0.10		✓	✓												
3	110-57-6	trans-1,4-dichloro-2-Butene	✓			✓	✓	28***											
1	79-01-6	Trichloroethene	✓	0.30		0.21	✓									1.7			

\* applies to -008 & -009

\*\* applies to -001 & -002

\*\*\* applies to -013, -014, -016, -017, -018

# Volatile Organics

Page 3 of 3

Site/Project: \_\_\_\_\_ AR/COC #: 610835, 610840, 610841 Batch #: \_\_\_\_\_

Laboratory: \_\_\_\_\_ Laboratory Report #: 174231 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	Field Blk
						>.05	<20% / 0.99	20%											
1	75-69-4	Trichlorofluoromethane	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
1	76-13-1	Trichlorotrifluoroethane (Freon 113)																	
1	108-05-4	Vinyl Acetate	✓			✓	✓												
1	75-01-4	vinyl chloride	✓	0.10		✓	✓												
2	1330-20-7	xylene(s total)	✓	0.30		✓	✓												

Comments:

Notes: Shaded rows are RCRA compounds.

## Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
	Met				Met				
	Criteria				Criteria				

SMC 1: Bromofluorobenzene  
SMC 2: Dibromofluoromethane  
SMC 3: Toluene-d8

IS 1: Fluorobenzene  
IS 2: Chlorobenzene-d5  
IS 3: 1,4-Dichlorobenzene-d4

Comments:



# Inorganic Metals

Site/Project: CWL GWM AR/COC #: 610838, 610840, 610841 Laboratory Sample IDs: 174231-005 to -007, -011, -012, -015-019  
 Laboratory: GEL Laboratory Report #: 174231  
 Methods: EPAG020(ICP-MS), EPA7470A(CVAA H<sub>2</sub>)  
 # of Samples: 7 Matrix: aqueous Batch #: 581588, 582273

CAS #/ Analyte	QC Element																		*	*	**	**
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks	Eg Field Blanks	Field Dup RPD	5X Blk		
7429-90-5 Al								NA	NA		NA	NA										
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	1.9	✓	✓	2.0			
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓		✓	✓	✓			
7440-43-9 Cd	✓	✓	✓	✓	0.000105	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓	0.00053		
7440-70-2 Ca																						
7440-47-3 Cr	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	4.0	0.00207	✓	4.0	0.0104		
7440-48-4 Co	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	6.0			
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	5.5	✓	0.00245	28	0.00123		
7439-89-6 Fe	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	3.1	✓	✓	4.3			
7439-95-4 Mg																						
7439-96-5 Mn																						
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	1.7	✓	✓	6.5			
7440-09-7 K																						
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓			
7440-23-5 Na																						
7440-31-5 Sn	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓			
7440-62-2 V	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	0.00385	✓	✓	0.0194		
7440-66-6 Zn	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	1.1	0.00207	0.00395	18	0.0104/0.0192		
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	0.00052	✓	0.00264		
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓			
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓			
7440-36-0 Sb	✓	✓	✓	0.00104	0.00175	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓	0.00875		
7440-28-0 Tl	✓	✓	✓			✓	✓			✓			✓	✓	✓	✓	✓	✓	✓			
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	✓	✓	✓	✓			
Cyanide CN																						

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g: [(µg/g) x (sample mass {g}) / sample vol. {ml}] x (1000 ml / 1 liter) / Dilution Factor = µg/l

Comments: \* applies to -005 & -006 \*\* applies to -011 & -012

Reviewed By: Karin A Lambert Date: 11-09-06

# Contract Verification Review (CVR)

Project Leader Freshour

Project Name CWL GWM

Case No. 8036\_10.11.01

AR/COC No. 610838, 610840, 610841,  
610842, 610843

Analytical Lab GEL

SDG No. 174231

In the tables below, mark any information that is missing or incorrect and give an explanation.

## 1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

## 2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided: PQL and MDL (or IDL), MDA and L <sub>c</sub>	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

## Contract Verification Review (Continued)

## 3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples		X	VOC LCS failed for Carbon Disulfide (QC1201213604)
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met		X	VOC MS recovery failed for Carbon Disulfide and Bromomethane (QC1201213602)
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Bromodichloromethane, Dibromochloromethane detected in EB2 (083051-001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

## Contract Verification Review (Continued)

## 4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		

Date: 11/07/06 Closed by: \_\_\_\_\_ Date: \_\_\_\_\_

## Page 1/1

### Data Type: Organic & Inorganic

[illegible]

**Kevin A. Lambert**

**Date:** 10/26/06



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Albuquerque, NM 87123  
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## Memorandum

Date: October 26, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610833 and 610834  
SDG: 173404  
Laboratory: GEL  
Project/Task: 98026.01.07

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 EPA6020 (ICP-MS metals) and EPA7470A (CVAA mercury). Problems were identified with the data package that result in the qualification of data.

#### 1. ICP-MS metals:

The following target analytes were detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results are qualified as noted below.

Sample 173404-003	Zn was a detect $<5X$ the MB and should be qualified "J, B."
	Sb was a detect $<5X$ the ICB/CCB/MB and should be qualified "J, B, B3."
	Tl was a detect $<5X$ the ICB/CCB and should be qualified "J, B3."
Sample 173404-007	Cr and Zn were detects $<5X$ the MB and should be qualified "J, B."

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 noted above in the summary section and as follows.

#### **ICP-MS metals:**

Fe was detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results were detected  $>5X$  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.

#### **ICP-MS metals:**

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**

The serial dilution met QC acceptance criteria.

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

The ICS data met QC acceptance criteria.

### **Detection Limits/Dilutions**

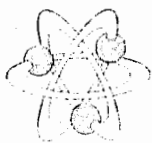
All detection limits were properly reported. No dilutions were required.

### **Other QC**

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

No other specific issues were identified which affect data quality.





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## Memorandum

Date: October 26, 2006  
To: File  
From: Kevin Lambert  
Subject: Organic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610833 and 610834  
SDG: 173404  
Laboratory: GEL  
Project/Task: 98026.01.07

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

All samples were prepared and analyzed with accepted procedures using method EPA8260B (VOC). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

#### 1. VOC:

The continuing calibration verification percent difference (CCV %D) for acetone (-24%) was  $> 20\%$  but  $\leq 40\%$ . The associated sample results that were non-detects should not be qualified based on professional judgment and detects should be qualified "J."

Also, acetone was detected ( $\geq$  DL) in one or more of the blanks. The associated sample results that were non-detects should not be qualified and detects  $< 10X$  the blank concentrations and  $<$  the RL should be qualified "U" at the RL (5 ug/L) with the appropriate descriptive flag. However, it should be noted that the associated sample results have already been qualified due to a calibration problem and, thus will be qualified "UJ."

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

### Holding Times

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

### Calibration

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

VOC:

The calibration response factor (RF) for isobutyl alcohol (0.02) and trichloroethene (0.27) was < the specified minimum RF (0.05 and 0.30, respectively). No data should be qualified based on professional judgment. The CCV %D for seven target analytes were > 20% but  $\leq$  40% (see Data Validation Worksheet). The associated sample results were non-detects and as a result based on professional judgment no data should be qualified.

**Blanks**

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

VOC:

1,2,4-Trichlorobenzene was detected ( $\geq$  DL) in the method blank. The associated sample results were non-detects; no data should be qualified as a result.

**Internal Standards (ISs)**

Internal standards data met QC acceptance criteria.

**Surrogates**

The surrogate recoveries met QC acceptance criteria.

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

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

VOC:

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

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

The MS/MSD met QC acceptance criteria.

**Target Compound Identification/Confirmation**

No target compound identification/confirmation analyses were required.

**Detection Limits/Dilutions**

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

**Other QC**

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

VOC:

TBs, and a FB were submitted on the AR/COC(s).

## Data Validation Summary

Site/Project: CWL Assess GWM Project/Task #: 98026.01.07 # of Samples: 5 Matrix: aqueous  
 AR/COC #: 610833, 610834 Laboratory Sample IDs: 173404-001, -002, -004, -005, -006  
 Laboratory: GEL  
 SDG #: 173404

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES <sup>MS</sup>	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓				✓		✓			
2. Calibrations	J				J		✓			
3. Method Blanks	✓				J		✓			
4. MS/MSD	✓				✓		✓			
5. Laboratory Control Samples	✓				✓		✓			
6. Replicates					✓		✓			
7. Surrogates	✓									
8. Internal Standards	✓									
9. TCL Compound Identification	✓									
10. ICP Interference Check Sample					✓					
11. ICP Serial Dilution					✓					
12. Carrier/Chemical Tracer Recoveries										
13. Other QC TB, FB	UJ				NA		NA			

J = Estimated

R = Unusable

NP = Not Provided

U = Not Detected

Check (✓) = Acceptable

Other: \_\_\_\_\_

UJ = Not Detected, Estimated

Shaded Cells = Not Applicable (also "NA")

Reviewed By: Kevin A Lambert Date: 10-26-06

# Volatile Organics (SW 846 Method 8260)

Page 1 of 3

Site/Project: CWL Assess GWM AR/COC #: 610833, 610834

# of Samples: 5 Matrix: aqueous

Laboratory: GEL Laboratory Report #: 173404

Laboratory Sample IDs: 173404-001, -002, -004, -005, -006

Methods: EPA8260B(VOC)

Batch #: 578304

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Trip * Equip. Blks -002	** Trip Blks -006	Field ** Blk -005	10x Blk -005
2	630-20-6	1,1,1,2-Tetrachloroethane	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓	NA	✓	✓	✓	
1	71-55-6	1,1,1-Trichloroethane	✓	0.10		✓	✓													
3	79-34-5	1,1,2,2-Tetrachloroethane	✓	0.30		✓	✓													
2	79-00-5	1,1,2-Trichloroethane	✓	0.10		✓	✓													
1	75-34-3	1,1-Dichloroethane	✓	0.10		✓	✓													
1	75-35-4	1,1-Dichloroethene	✓	0.20		✓	✓													
1	563-58-6	1,1-Dichloropropene				NA	NA													
3	87-61-6	1,2,3-Trichlorobenzene	✓			NA	NA													
3	96-18-4	1,2,3-Trichloropropane	✓			✓	✓													
3	120-82-1	1,2,4-Trichlorobenzene	✓			✓	✓	28	0.4505											
3	95-63-6	1,2,4-Trimethylbenzene				NA	NA	✓												
3	96-12-8	1,2-Dibromo-3-chloropropane	✓			✓	✓													
2	106-93-4	1,2-Dibromoethane (EDB)	✓			✓	✓													
3	95-50-1	1,2-Dichlorobenzene				NA	NA													
1	107-06-2	1,2-Dichloroethane	✓	0.10		✓	✓													
1	78-87-5	1,2-Dichloropropane	✓	0.01		✓	✓													
3	108-67-8	1,3,5-Trimethylbenzene				NA	NA													
3	541-73-1	1,3-Dichlorobenzene																		
2	142-28-9	1,3-Dichloropropane		0.01																
3	106-46-7	1,4-Dichlorobenzene																		
	107-04-0	1-Bromo-2-chloroethane																		
1	594-20-7	2,2-Dichloropropane				✓	✓													
1	78-93-3	2-Butanone (MEK) (10xblk)	✓	0.01		✓	✓													
1	126-99-8	2-Chloro-1, 3-butadiene	✓			✓	✓													
1	110-75-8	2-Chloroethyl vinyl ether				NA	NA													
3	95-49-8	2-Chlorotoluene			✓	NA	NA													
2	591-78-6	2-Hexanone (MBK)	✓	0.01	✓	✓	✓													
3	106-43-4	4-Chlorotoluene			NA	NA	NA													
3	99-87-6	4-Isopropyltoluene			NA	NA	NA													
2	108-10-1	4-Methyl-2-pentanone (MIBK)	✓	0.10	✓	✓	✓													
1	67-64-1	acetone(10xblk)	✓	0.01	NA	✓	✓										1.485		2.765	14.8/27.6
1	75-05-8	Acetonitrile	✓			✓	✓	-22												
1	107-02-8	Acrolein	✓			✓	✓													
1	107-13-1	Acrylonitrile	✓			✓	✓													
1	107-05-1	Allyl chloride	✓			✓	✓													
1	71-43-2	Benzene	✓	0.50	✓	✓	✓													

\* applies - 001

\*\* applies - 004

Reviewed By: Kwinn A Lambert Date: 10-26-06

# Volatiles Organics

Page 2 of 3

Site/Project: \_\_\_\_\_ AR/COC #: 610833, 610834 Batch #: \_\_\_\_\_  
Laboratory: \_\_\_\_\_ Laboratory Report #: 173404 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Trip Equip. Blks	KL Trip Blks	Field BLK	
						>.05	<20%/0.99	20%												
3	108-86-1	Bromobenzene			NA	NA	NA	✓	✓	✓			✓	✓	✓	NA	✓	✓	✓	
1	74-97-5	Bromochloromethane			✓	NA	NA	✓												
1	75-27-4	Bromodichloromethane	✓	0.20	✓	✓	✓													
3	75-25-2	Bromoform	✓		✓	✓	✓													
1	74-83-9	Bromomethane	✓	0.10	✓	✓	✓	✓												
	108-60-1	bis(2-Chloroisopropyl)ether	✓		✓	✓	✓	✓												
1	75-15-0	Carbon disulfide	✓	0.10	NA	✓	✓	21												
1	56-23-5	Carbon tetrachloride	✓	0.10	✓	✓	✓	✓												
2	108-90-7	Chlorobenzene	✓	0.50	✓	✓	✓	✓												
1	75-00-3	Chloroethane	✓	0.01	✓	✓	✓	✓												
1	67-66-3	Chloroform	✓	0.20	✓	✓	✓	✓												
1	74-87-3	Chloromethane	✓	0.10	✓	✓	✓	-31												
1	156-59-2	cis-1,2-Dichloroethene	✓		NA	✓	✓	✓												
1	10061-01-5	cis-1,3-Dichloropropene	✓	0.20	NA	✓	✓	✓												
2	124-48-1	Dibromochloromethane	✓	0.10	✓	✓	✓	✓												
1	74-95-3	Dibromomethane	✓		✓	✓	✓	✓												
1	75-71-8	Dichlorodifluoromethane	✓		✓	✓	✓	-30												
2	97-63-2	Ethyl methacrylate	✓		✓	✓	✓	✓												
2	100-41-4	Ethylbenzene	✓	0.10	NA	✓	✓	✓												
3	87-68-3	Hexachlorobutadiene			✓	NA	NA	✓												
1	74-88-4	Iodomethane	✓		✓	✓	✓	✓												
	78-83-1	Isobutyl alcohol	✓		✓	0.02	✓	✓												
1	80-62-6	Methyl methacrylate	✓		✓	✓	✓	✓												
	126-98-7	Methylacrylonitrile	✓		NA	✓	✓	✓												
1	75-09-2	Methylene chloride (10xblk)	✓	0.01	✓	✓	✓	✓												
3	91-20-3	Naphthalene			NA	NA	NA	✓												
3	104-51-8	n-Butylbenzene			✓	✓	✓	✓												
3	103-65-1	n-Propylbenzene			✓	✓	✓	✓												
2	95-47-6	o-Xylene	✓		✓	✓	✓	✓												
	76-01-7	Pentachloroethane	✓		✓	✓	✓	✓												
1	107-12-0	Propionitrile	✓		✓	✓	✓	✓												
3	135-98-8	sec-Butylbenzene			✓	NA	NA	✓												
2	100-42-5	Styrene	✓	0.30	✓	✓	✓	✓												
3	98-06-6	tert-Butylbenzene			NA	NA	NA	✓												
2	127-18-4	Tetrachloroethene	✓	0.20	✓	✓	✓	✓												
3	109-99-9	Tetrahydrofuran			NA	NA	NA	✓												
2	108-88-3	toluene(10xblk)	✓	0.40	✓	✓	✓	✓												
1	156-60-5	trans-1,2-Dichloroethene	✓		✓	✓	✓	✓												
2	10061-02-6	trans-1,3-Dichloropropene	✓	0.10	✓	✓	✓	✓												
3	110-57-6	trans-1,4-dichloro-2-Butene	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	
1	79-01-6	Trichloroethene	✓	0.30	NA	0.27	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	

# Volatile Organics

Page 3 of 3

Site/Project: \_\_\_\_\_ AR/COC #: 610833, 610834 Batch #s: \_\_\_\_\_

Laboratory: \_\_\_\_\_ Laboratory Report #: 173404 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Trip Equip. Blks	Trip Blks	Field Blk
						>.05	<20% / 0.99	20%											
1	75-69-4	Trichlorofluoromethane	✓		NA	✓	✓	-31	✓	✓			✓	✓	✓	NA	✓	✓	✓
1	76-13-1	Trichlorotrifluoroethane (Freon 113)	✓			✓	✓		✓	✓			✓	✓	✓		✓	✓	✓
1	108-05-4	Vinyl Acetate	✓			✓	✓		✓	✓			✓	✓	✓		✓	✓	✓
1	75-01-4	vinyl chloride	✓	0.10		✓	✓		✓	✓			✓	✓	✓		✓	✓	✓
2	1330-20-7	xylenes(total)	✓	0.30		✓	✓		✓	✓			✓	✓	✓		✓	✓	✓

Comments:

Notes: Shaded rows are RCRA compounds.

## Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
	Met				Met				
	Criteria				Criteria				

SMC 1: Bromofluorobenzene  
SMC 2: Dibromofluoromethane  
SMC 3: Toluene-d8

IS 1: Fluorobenzene  
IS 2: Chlorobenzene-d5  
IS 3: 1,4-Dichlorobenzene-d4

Comments:

# Inorganic Metals

Site/Project: CWL Assess GWM AR/COC #: 610833, 610834

Laboratory Sample IDs: 173404-003, -007

Laboratory: GEL Laboratory Report #: 173404

Methods: EPA6020(ICP-MS), EPA7470A(CVAAHg)

# of Samples: 2 Matrix: aqueous

Batch #: 576378, 577648, 577595

CAS #/ Analyte	QC Element																		5X Field Blanks	KAL
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	Equip. Blanks			
7429-90-5 Al								NA	NA		NA	NA								
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	0.001485	✓			✓			✓	✓	✓			0.0074		
7440-48-4 Co	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-89-6 Fe	✓	✓	✓	✓	✓	0.01145	✓			✓			✓	✓	✓			0.057		
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-23-5 Na																				
7440-31-5 Sn	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-62-2 V	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-66-6 Zn	✓	✓	✓	✓	✓	0.00345	✓			✓			✓	✓	✓			0.017		
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-36-0 Sb	✓	✓	✓	0.001275	0.001045	0.0005395	✓			✓			✓	✓	✓			0.0062		
7440-28-0 Tl	✓	✓	✓	✓	0.0005465	✓	✓			✓			✓	✓	✓			0.003		
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA					
Cyanide CN <sup>-</sup>																				
KAL																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g : [(µg/g) x (sample mass {g}) / sample vol. {ml}] x (1000 ml / 1 liter) / Dilution Factor = µg/l

Comments:

Reviewed By: Kevin A Lambert Date: 10-26-06

# Contract Verification Review (CVR)

Project Leader Freshour

Project Name CWL GWM

Case No. 98026\_01.07

AR/COC No. 610833, 610834

Analytical Lab GEL

SDG No. 173404

In the tables below, mark any information that is missing or incorrect and give an explanation.

## 1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

## 2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L <sub>c</sub>	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				



## Contract Verification Review (Continued)

## 3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy	X		
a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision	X		
a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data		X	1,2,4-Trichlorobenzene detected in VOC Method Blank; Zinc & Antimony detected in Metals Method Blank in Sample No. 083035-009; Chromium, Iron, Zinc detected in Metals Blank in Sample No. 083037-009
a) Method or reagent blank data reported and met for all samples		X	Acetone detected in TB-1 (083036-001) and in FB-1 (083038-001)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

## Contract Verification Review (Continued)

## 4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		

### Contract Verification Review (Concluded)

## 5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

[illegible]

Were deficiencies unresolved?

**Yes**

No

Based on the review, this data package is complete. (Yes

No

If no, provide: nonconformance report or correction request number \_\_\_\_\_ and date correction request was submitted \_\_\_\_\_

Reviewed by: W

Date: 10/24/06 Closed by: Date:

## Page 1/1

**Data Type:** Organic & Inorganic

Date: 10/26/06



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## Memorandum

Date: October 26, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610835, 610836, and 610837  
SDG: 173646  
Laboratory: GEL  
Project/Task: 98026.01.07

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 EPA6020 (ICP-MS metals) and EPA7470A (CVAA mercury). Problems were identified with the data package that result in the qualification of data.

#### 1. ICP-MS metals:

The following target analytes were detected ( $\geq$  DL) in one or more of the blanks (ICB, CCB, MB). The associated sample results are qualified as noted below.

Sample 173646-003      V and Zn were detects  $<5X$  the MB and should be qualified "J, B."

Sample 173646-008      V and Zn were detects  $<5X$  the MB and should be qualified "J, B."

Sn was a detect  $<5X$  the ICB/CCB and should be qualified "J, B3."

Sample 173646-009      Cr, V, and Zn were detects  $<5X$  the MB and should be qualified "J, B."

The following target analytes were 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 is qualified as noted below.

Sample 173646-009      Sn was non-detect and should be qualified "UJ, B3."

#### 2. CVAA mercury:

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 is qualified as noted below.

Samples 173646-003, Hg was non-detect and should be qualified "UJ, B3."  
-008, and -009

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 noted above in the summary section.

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

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

##### **ICP-MS metals:**

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**

The serial dilution met QC acceptance criteria.

#### **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.

#### **Other QC**

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

##### **ICP-MS metals and CVAA mercury:**

An EB was submitted on the AR/COC(s). However, it should be noted that the EB submitted on ARCO# 610837 is associated with SNL samples in another SDG.

No other specific issues were identified which affect data quality.



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## Memorandum

Date: October 26, 2006  
To: File  
From: Kevin Lambert  
Subject: Organic Data Review and Validation – SNL  
Site: CWL Assessment GWM  
AR/COC: 610835, 610836, and 610837  
SDG: 173646  
Laboratory: GEL  
Project/Task: 98026.01.07

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

All samples were prepared and analyzed with accepted procedures using method EPA8260B (VOC). All compounds were successfully analyzed. No problems were identified with the data package that result in the qualification of data.

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

### Holding Times

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

### Calibration

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

#### VOC:

The calibration response factor (RF) for acetonitrile, (0.04), isobutyl alcohol (0.01) and trichloroethene (0.21) was < the specified minimum RF (0.05, 0.05, and 0.30, respectively). No data should be qualified based on professional judgment. The continuing calibration verification percent difference (CCV %D) for seven target analytes were > 20% but ≤ 40% (see Data Validation Worksheet). The associated sample results were non-detects and as a result based on professional judgment no data should be qualified.



### **Blanks**

No target analytes were detected in the blanks.

### **Internal Standards (ISs)**

Internal standards data met QC acceptance criteria.

### **Surrogates**

The surrogate recoveries met QC acceptance criteria.

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

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

#### **VOC:**

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

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

The MS/MSD met QC acceptance criteria except as follow.

#### **VOC:**

The MS and MSD recovery for carbon disulfide (135% and 132%) were > the upper QC acceptance Limit (130%). The associated sample results were non-detects; no data should be qualified as a result.

### **Target Compound Identification/Confirmation**

No target compound identification/confirmation analyses were required.

### **Detection Limits/Dilutions**

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

### **Other QC**

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

#### **VOC:**

TBs, and an EB were submitted on the AR/COC(s). However, it should be noted that the EB submitted on ARCO# 610837 is associated with SNL samples in another SDG.

No other specific issues were identified which affect data quality.

## Data Validation Summary

Site/Project: CWL Assess GWM Project/Task #: 98026.01.07 # of Samples: 9 Matrix: aqueous  
 AR/COC #: 610835, 610836, 610837 Laboratory Sample IDs: 173646-001 to -009  
 Laboratory: GEL  
 SDG #: 173646

QC Element	Analysis								RAD	Other
	Organics				Inorganics					
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES <sup>MS</sup>	GC/GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	/			✓		✓			
2. Calibrations	✓				UJ, J		UJ			
3. Method Blanks	✓				J		✓			
4. MS/MSD	✓				✓		✓			
5. Laboratory Control Samples	✓				✓		✓			
6. Replicates					✓		✓			
7. Surrogates	✓									
8. Internal Standards	✓									
9. TCL Compound Identification	✓									
10. ICP Interference Check Sample						✓				
11. ICP Serial Dilution						✓				
12. Carrier/Chemical Tracer Recoveries										
13. Other QC TB	✓					NA	NA/NA	NA		

J = Estimated

R = Unusable

NP = Not Provided

U = Not Detected

Check (✓) = Acceptable

Other: \_\_\_\_\_

UJ = Not Detected, Estimated

Shaded Cells = Not Applicable (also "NA")

Reviewed By: Kevin A Lambert Date: 10-26-06

# Inorganic Metals

Site/Project: CWL Assess GWM AR/COC #: 610835, 610836, 610837 Laboratory Sample IDs: 173646-003, -008, -009\*

Laboratory: GEL Laboratory Report #: 173646

Methods: EPA6020(ICP-MS), EPA7470A(CVAA Hg)

# of Samples: 3 Matrix: aqueous

Batch #: 579601, 579263

CAS #/ Analyte	QC Element																	5X DL		
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilu- tion	Field Dup. RPD	5X Equip. Blanks	Field Blanks	KAL	
7429-90-5 Al								NA	NA		NA	NA				NA				
7440-39-3 Ba	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-43-9 Cd	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-70-2 Ca																				
7440-47-3 Cr	✓	✓	✓	✓	✓	0.001273	✓			✓			✓	✓	✓		0.006			
7440-48-4 Co	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-89-6 Fe	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-09-7 K																				
7440-22-4 Ag	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-23-5 Na																				
7440-31-5 Sn	✓	✓	✓	✓	0.001025	0.00-✓	✓			✓			✓	✓	✓		0.005	0.005	KAL	
7440-62-2 V	✓	✓	✓	✓	✓	0.009473	✓			✓			✓	✓	✓		0.474	0.474	KAL	
7440-66-6 Zn	✓	✓	✓	✓	✓	0.003723	✓			✓			✓	✓	✓		0.019	0.019	KAL	
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7782-49-2 Se	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-36-0 Sb	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7440-28-0 Tl	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓	✓					
7439-97-6 Hg	✓	✓	✓	✓	0.00073	✓	✓	NA	NA	✓	NA	NA	✓	NA	NA	✓		0.0003		
Cyanide CN- KAL																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion:  $\text{mg/kg} = \mu\text{g/g} : [(\mu\text{g/g}) \times (\text{sample mass [g]} / \text{sample vol. [ml]}) \times (1000 \text{ ml} / 1 \text{ liter})] / \text{Dilution Factor} = \mu\text{g/l}$

Comments: \* applies to SNL samples in another SDG

Reviewed By: Kevin A Lambert Date: 10-26-06

# Volatile Organics (SW 846 Method 8260)

Page 1 of 3

Site/Project: CWL Assess GWM AR/COC #: 610835, 610836, 610837 # of Samples: 6 Matrix: aqueous  
 Laboratory: GEL Laboratory Report #: 173646 Laboratory Sample IDs: 173646-001, -002, -004, -005, -006, -007  
 Methods: EPA8260B(VOC) Batch #: 579168

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Bks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Trip Equip. Blanks -002	Trip Blanks -005	Trip Blk -007
2	630-20-6	1,1,1,2-Tetrachloroethane	✓		NA	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓
1	71-55-6	1,1,1-Trichloroethane	✓	0.10		✓	✓	✓											
3	79-34-5	1,1,2,2-Tetrachloroethane	✓	0.30		✓	✓	21											
2	79-00-5	1,1,2-Trichloroethane	✓	0.10		✓	✓	✓											
1	75-34-3	1,1-Dichloroethane	✓	0.10		✓	✓	✓											
1	75-35-4	1,1-Dichloroethene	✓	0.20		✓	✓	✓											
1	563-58-6	1,1-Dichloropropene				NA	NA	NA											
3	87-61-6	1,2,3-Trichlorobenzene				NA	NA	NA											
3	96-18-4	1,2,3-Trichloropropane	✓			✓	✓	✓											
3	120-82-1	1,2,4-Trichlorobenzene	✓			✓	✓	✓											
3	95-63-6	1,2,4-Trimethylbenzene				NA	NA	NA											
3	96-12-8	1,2-Dibromo-3-chloropropane	✓			✓	✓	✓											
2	106-93-4	1,2-Dibromoethane (EDB)	✓			✓	✓												
3	95-50-1	1,2-Dichlorobenzene	✓			✓	✓												
1	107-06-2	1,2-Dichloroethane	✓	0.10		✓	✓												
1	78-87-5	1,2-Dichloropropane	✓	0.01		✓	✓	✓											
3	108-67-8	1,3,5-Trimethylbenzene				NA	NA	NA											
3	541-73-1	1,3-Dichlorobenzene																	
2	142-28-9	1,3-Dichloropropane		0.01															
3	106-46-7	1,4-Dichlorobenzene																	
	107-04-0	1-Bromo-2-chloroethane																	
1	594-20-7	2,2-Dichloropropane				✓	✓	✓											
1	78-93-3	2-Butanone (MEK) (10xblk)	✓	0.01		✓	✓	✓											
1	126-99-8	2-Chloro-1, 3-butadiene	✓			✓	✓	✓											
1	110-75-8	2-Chloroethyl vinyl ether				NA	NA	NA											
3	95-49-8	2-Chlorotoluene				NA	NA	NA											
2	591-78-6	2-Hexanone (MBK)	✓	0.01		✓	✓	✓											
3	106-43-4	4-Chlorotoluene				NA	NA	NA											
3	99-87-6	4-Isopropyltoluene				NA	NA	NA											
2	108-10-1	4-Methyl-2-pentanone (MIBK)	✓	0.10	✓	✓	✓	✓											
1	67-64-1	acetone(10xblk)	✓	0.01	✓	✓	✓												
1	75-05-8	Acetonitrile	✓		NA	0.04	✓												
1	107-02-8	Acrolein	✓			✓	✓												
1	107-13-1	Acrylonitrile	✓			✓	✓												
1	107-05-1	Allyl chloride	✓			✓	✓	-23	✓	✓									
1	71-43-2	Benzene	✓	0.50	✓	✓	✓												

\* applies -001 ; \*\* applies -004 ; \*\*\* applies -006

Reviewed By: Kwam A. Lambert Date: 10-26-06

# Volatile Organics

Page 2 of 3

Site/Project: \_\_\_\_\_ AR/COC #: 610835, 610836, 610837 Batch #: \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Laboratory Report #: 173646 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Trip Equip. Blanks	Trip Blanks	Trip Blk
						>.05	<20%/ 0.99	20%											
3	108-86-1	Bromobenzene			NA	NA	NA	NA	✓	✓			✓	✓	✓		✓	✓	✓
1	74-97-5	Bromochloromethane				NA	NA	NA											
1	75-27-4	Bromodichloromethane	✓	0.20		✓	✓	✓											
3	75-25-2	Bromoform	✓			✓	✓	✓											
1	74-83-9	Bromomethane	✓	0.10		✓	✓	21											
	108-60-1	bis(2-Chloroisopropyl)ether	✓			NA	NA	NA-21											
1	75-15-0	Carbon disulfide	✓	0.10		✓	✓	✓					135/130/32	✓	✓				
1	56-23-5	Carbon tetrachloride	✓	0.10		✓	✓	-23											
2	108-90-7	Chlorobenzene	✓	0.50		✓	✓	✓											
1	75-00-3	Chloroethane	✓	0.01		✓	✓												
1	67-66-3	Chloroform	✓	0.20		✓	✓												
1	74-87-3	Chloromethane	✓	0.10		✓	✓												
1	156-59-2	cis-1,2-Dichloroethene				NA	NA	NA											
1	10061-01-5	cis-1,3-Dichloropropene	✓	0.20		✓	✓	✓											
2	124-48-1	Dibromochloromethane	✓	0.10		✓	✓												
1	74-95-3	Dibromomethane	✓			✓	✓												
1	75-71-8	Dichlorodifluoromethane	✓			✓	✓												
2	97-63-2	Ethyl methacrylate	✓			✓	✓	-24											
2	100-41-4	Ethylbenzene	✓	0.10		✓	✓	✓											
3	87-68-3	Hexachlorobutadiene				NA	NA	NA											
1	74-88-4	Iodomethane	✓			✓	✓	✓											
	78-83-1	Isobutyl alcohol	✓			0.01	✓												
1	80-62-6	Methyl methacrylate	✓			✓	✓												
	126-98-7	Methylacrylonitrile	✓		✓	✓	✓												
1	75-09-2	Methylene chloride (10xblk)	✓	0.01		✓	✓	✓											
3	91-20-3	Naphthalene			NA	NA	NA	NA											
3	104-51-8	n-Butylbenzene																	
3	103-65-1	n-Propylbenzene																	
2	95-47-6	o-Xylene																	
	76-01-7	Pentachloroethane	✓			✓	✓	✓											
1	107-12-0	Propionitrile	✓			✓	✓	✓											
3	135-98-8	sec-Butylbenzene				NA	NA	NA											
2	100-42-5	Styrene	✓	0.30		✓	✓	✓											
3	98-06-6	tert-Butylbenzene				NA	NA	NA											
2	127-18-4	Tetrachloroethene	✓	0.20		✓	✓	✓											
3	109-99-9	Tetrahydrofuran				NA	NA	NA											
2	108-88-3	toluene(10xblk)	✓	0.40		✓	✓	✓											
1	156-60-5	trans-1,2-Dichloroethene	✓			✓	✓												
2	10061-02-6	trans-1,3-Dichloropropene	✓	0.10		✓	✓												
3	110-57-6	trans-1,4-dichloro-2-Butene	✓			✓	✓												
1	79-01-6	Trichloroethene	✓	0.30	✓	0.21	✓		✓	✓			✓	✓	✓		✓	✓	✓

# Volatile Organics

Page 3 of 3

Site/Project: \_\_\_\_\_ AR/COC #: 610835, 610836, 610837 Batch #s: \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Laboratory Report #: 173646 # of Samples: \_\_\_\_\_ Matrix: \_\_\_\_\_

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R <sup>2</sup>	CCV %D	Method Blks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Trip Equip. Blanks	Trip Blanks	Trip Blk	
						>.05	<20%/0.99	20%												
1	75-69-4	Trichlorofluoromethane	✓		NA	✓	✓	-22	✓	✓			✓	✓	✓		✓	✓	✓	
1	76-13-1	Trichlorotrifluoroethane (Freon 113)				NA	NA	NA												
1	108-05-4	Vinyl Acetate	✓			✓	✓	✓												
1	75-01-4	vinyl chloride	✓	0.10		✓	✓													
2	1330-20-7	xylenes(total)	✓	0.30		✓	✓													

Comments:

Notes: Shaded rows are RCRA compounds.

## Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
	Met				Met				
	Criteria				Criteria				

SMC 1: Bromofluorobenzene  
 SMC 2: Dibromofluoromethane  
 SMC 3: Toluene-d8

IS 1: Fluorobenzene  
 IS 2: Chlorobenzene-d5  
 IS 3: 1,4-Dichlorobenzene-d4

Comments:

# Contract Verification Review (CVR)

Project Leader Freshour

Project Name CWL GWM

Case No. 98026\_01.07

AR/COC No. 610835, 610836, 610837

Analytical Lab GEL

SDG No. 173646

In the tables below, mark any information that is missing or incorrect and give an explanation.

## 1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

## 2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L <sub>c</sub>	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

## Contract Verification Review (Continued)

## 3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy	X		
a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met		X	VOC MS recovery for Carbon disulfide failed high
3.4 Precision	X		
a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data		X	Chromium, Vanadium, Zinc detected in Metals Method Blank
a) Method or reagent blank data reported and met for all samples		X	
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Dibromochloromethane detected in EB 1 (083044-001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		



## Contract Verification Review (Continued)

## 4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	N/A		

## Contract Verification Review (Concluded)

## 5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes

No

Based on the review, this data package is complete. Yes

No

If no, provide: nonconformance report or correction request number \_\_\_\_\_ and date correction request was submitted \_\_\_\_\_

Reviewed by: Uk

Date: 10/25/06 Closed by: \_\_\_\_\_ Date: \_\_\_\_\_

# **Perchlorate Screening Quarterly Monitoring Report**

**Third Quarter of Calendar Year 2006  
(July, August, and September 2006)**

**Sandia National Laboratories, New Mexico**

**Environmental Restoration Project, Department 6146**

**December 2006**

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**

## **Third Quarter of Calendar Year 2006**

### **(July, August, and September 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 Sandia groundwater monitoring wells be sampled for perchlorate (NMED April 2004). This report summarizes the perchlorate screening monitoring completed during the third quarter of Calendar Year 2006 (CY2006) in response to the requirements of the Order.

During the third quarter of CY2006, groundwater samples were collected from seven wells currently in the perchlorate-screening monitoring-well network. The following groundwater monitoring wells were sampled between September 13 and September 25, 2006:

- CYN-MW1D,
- CYN-MW6,
- CYN-MW7,
- CYN-MW8,
- MRN-2,
- MRN-3D, 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 six of the seven monitoring wells and all four quality control samples.

The environmental sample from CYN-MW6 detected perchlorate at a concentration of 7.52  $\mu\text{g/L}$ . This concentration was verified by subsequent analysis of the sample with a EPA Method 6850M (EPA April 2005), which provided a result of 6.96  $\mu\text{g/L}$ . 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-MW1D, MRN-2, and MRN-3D with no detectable concentrations of perchlorate above the screening level/MDL. Three consecutive quarters of sampling have been completed for wells CYN-MW6, CYN-MW7, CYN-MW8, and SWTA3-MW4 and there were no detectable concentrations of perchlorate above the screening level/MDL, except for samples collected from CYN-MW6.

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-MW1D, MRN-2, and MRN-3D have four consecutive quarters of analytical results with no detectable concentrations of perchlorate, DOE and 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-MW1D, MRN-2, and MRN-3D will not be presented or discussed in future quarterly perchlorate screening reports. Sandia will continue to perform consecutive quarterly sampling at monitoring wells CYN-MW6, CYN-MW7, CYN-MW8, and SWTA3-MW4 for one more sampling event. These four wells will be sampled during the fourth quarter of CY2006. Per the requirements of Section VI.K.1.b of the Order (NMED April 2004), the sampling schedule at CYN-MW6 beyond the fourth quarter of CY2006 will be negotiated with the NMED.

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# **Perchlorate Screening Quarterly Monitoring Report**

## **Third Quarter of Calendar Year 2006**

### **(July, August, and September 2006)**

#### **1.0 Introduction**

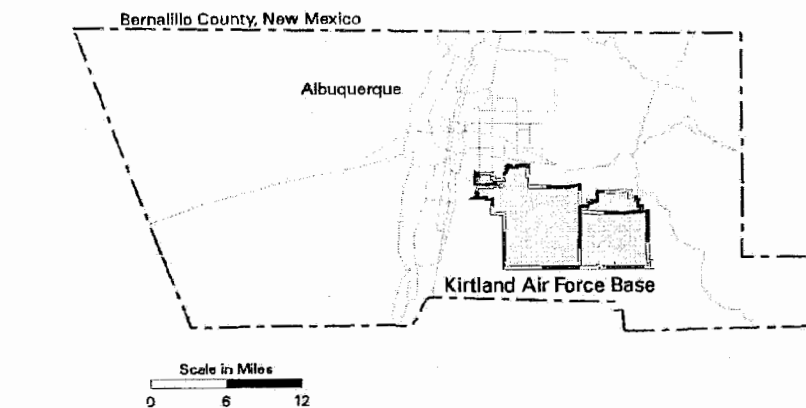
Section IV.B of the Compliance Order on Consent (the Order), between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia) for Sandia National Laboratories (SNL/NM), effective on April 29, 2004, stipulates that a select group of Sandia groundwater monitoring wells be sampled for perchlorate [New Mexico Environment Department (NMED) April 2004]. This report summarizes the perchlorate screening monitoring completed during the third 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 Sandia 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 and Sandia will submit each quarterly report within 90 days following the quarter that the data represent. This quarterly report is the fourth 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), and September 2006 (SNL/NM September 2006). Quarterly reporting will continue throughout the period of perchlorate screening as required by the Order.

#### **2.0 Scope of Activities**

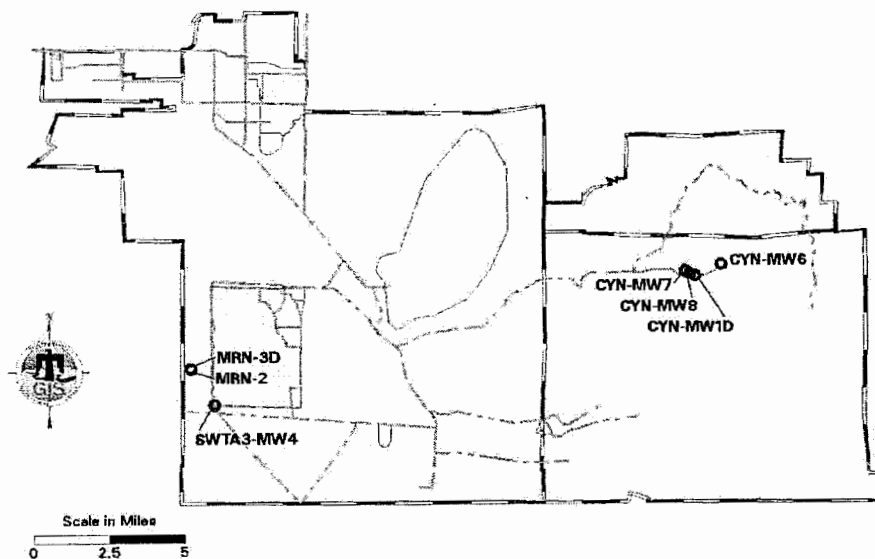
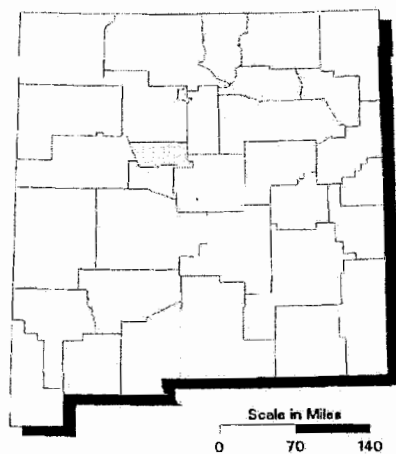
This report provides perchlorate screening results from the third quarter of CY2006 (July, August, and September 2006) from the wells currently active in the perchlorate screening program as shown on Figure 1 and listed in Table 1. Per the requirements of Table XI-1 of the Order, a well will be removed from the perchlorate network after four quarters unless perchlorate is detected above the screening level/Method Detection Limit (MDL) of 4 micrograms per liter ( $\mu\text{g/L}$ ). Data from four wells identified in the Order (CYN-MW5, MWL-BW1, MWL-MW1, and NWT A3-MW2) have satisfied screening requirements, therefore, the wells have been removed from the perchlorate screening program. Data for these four wells were provided in the November 2005 letter report (SNL/NM November 2005) and the September 2006 quarterly report (SNL/NM September 2006), and are not discussed in this current report or subsequent quarterly reports.

SNL EGIS DEPT 6785 DAHeffrich GIS MAP-ID = 070031 nmloc\_dhaml 13-NOV-2006



**Figure 1**  
**Sandia National Laboratories**  
**New Mexico**  
**Current Perchlorate-Screening**  
**Monitoring-Well Network**  
**(Jul/Aug/Sep 2006)**

Bernalillo County, New Mexico



**Table 1**  
**Current Perchlorate-Screening Monitoring-Well Network**  
**Third Quarter of CY2006 (July, August, and September)**

Well	Date Sampled	Number of Consecutive Sampling Events <sup>a</sup>	Remaining Number of Sampling Events <sup>b</sup>	Sampling Method
CYN-MW1D	19-SEP-06	4	0	Bennett <sup>TM</sup> Pump
CYN-MW6	20-SEP-06	3	1	Bennett <sup>TM</sup> Pump
CYN-MW7	13-SEP-06	3	1	Bennett <sup>TM</sup> Pump
CYN-MW8	14-SEP-06	3	1	Bennett <sup>TM</sup> Pump
MRN-2	21-SEP-06	4	0	Bennett <sup>TM</sup> Pump
MRN-3D	25-SEP-06	4	0	Bennett <sup>TM</sup> Pump
SWTA3-MW4	22-SEP-06	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 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.

Sandia performed groundwater sampling at seven monitoring wells during September 13 through September 25, 2006. Three of these wells (CYN-MW1D, MRN-2, and MRN-3D) were identified in the Order (NMED April 2004), and the other 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):

- "Groundwater Protection Program, Mini-SAP for Fourth Quarter Fiscal Year 2006" (SNL/NM August 2006a).
- "Canyons Groundwater Monitoring, Mini-SAP for Fourth Quarter Fiscal Year 2006" (SNL/NM August 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<sup>TM</sup> 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. 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 third 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-MW8 and MRN-3D. 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, method detection limits (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 Third Quarter of CY2006 Perchlorate Sampling**

<b>Well</b>	<b>Sample Identification</b>	<b>AR/COC Number</b>	<b>Date Shipped</b>
CYN-MW1D	081624-020	610650	19-SEP-06
CYN-MW6	081626-020 081626-R20	610652	20-SEP-06
CYN-MW7	081619-020	610646	13-SEP-06
CYN-MW8	081620-020 081621-020	610647	14-SEP-06
MRN-2	081627-020	610653	25-SEP-06
MRN-3D	081629-020 081630-020	610655	25-SEP-06
SWTA3-MW4	081631-020	610656	22-SEP-06

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

### 3.0 Regulatory Criteria

The Order (NMED April 2004) requires that the DOE and Sandia evaluate the nature and extent of perchlorate contamination based on a screening level/MDL of 4 µg/L. In a given monitoring well, four consecutive NDs using this screening level/MDL 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.

### 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 third quarter CY2006 perchlorate data are included as Appendix A. Consistent with historical analytical results, perchlorate was not detected above the screening level/MDL in the third quarter of CY2006 in six of the seven monitoring wells. CYN-MW6 is the only well with detectable concentrations of perchlorate.

As described above, perchlorate was initially analyzed using Method 314.0 (EPA November 1999). Until 2005, this was the only approved analytical method for perchlorate analysis. Method 314.0 has been shown to be reliable at detection limits of 4.0 µg/L and greater; however, studies have indicated that Method 314.0 is susceptible to matrix interference which may result in false positives. For this reason, Sandia uses Method 6850M (EPA April 2005) to confirm perchlorate detections, which are described as "Verification/Re-analysis" samples in Table 3. Method 6850M is a technically sound and reliable method, which is extremely selective using an analyte-specific mass spectrometry dual detection and sample matrix interferences are minimal. The MDL for Method 6850M ranges from 0.5 to 1.0 µg/L. The detected perchlorate concentrations in CYN-MW6 were verified by both analytical methods. The two analytical results from this sampling event are in good agreement (within 20%), ranging from 6.96 to 7.52 µg/L (Table 3).

Due to the verified detection of perchlorate in the samples from CYN-MW6 during the first quarter CY2006 sampling event, 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 concentrations of perchlorate found in CYN-MW6 in September 2006 are consistent with previously reported concentrations as shown in Figure 2 (SNL/NM May 2006, June 2006, and September 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. Groundwater temperature, SC, ORP, DO, and pH were measured using with an YSI<sup>TM</sup> Model 620 Water Quality Meter. Turbidity was measured with a HACH<sup>TM</sup> Model 2100P turbidity meter.

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 August 2006a and 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-MW8 and SWTA3-MW4. Perchlorate was not detected in CYN-MW8 or SWTA3-MW4; therefore, relative percent differences (RPD) could not be calculated for these duplicate set (Table 5). Although the concentrations between two different analytical methods for the same sample does not constitute a true duplicate sample, the RPD was calculated for the two perchlorate results from CYN-MW6 (Table 5). For CYN-MW6, the detected perchlorate concentrations are consistent with the generally-accepted quality-control criterion for duplicate sample data (RPD values < 20%).

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

Well ID	Sample Date	ARCOC 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-MW1D	23-Sep-04	607808	065731-016	ND	4.0	12	NE	U		EPA 314.0	
	22-Nov-04	608043	066418-020	ND	4.0	12	NE	U		EPA 314.0	
	09-Mar-05	608281	067433-020	ND	4.0	12	NE	U		EPA 314.0	
	06-Dec-05	609270	073545-020	ND	4.0	12	NE	U		EPA 314.0	
	27-Mar-06	609576	075982-020	ND	4.0	12	NE	U		EPA 314.0	
			075983-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	21-Jun-06	609927	078684-020	ND	4.0	12	NE	U		EPA 314.0	
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
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	
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
MRN-2	21-Jul-04	607602	065250-024	ND	4.0	12	NE	U		EPA 314.0	
	10-Nov-04	608008	066265-020	ND	4.0	12	NE	U		EPA 314.0	
	09-Dec-05	609272	073547-020	ND	4.0	12	NE	U		EPA 314.0	
	07-Mar-06	609513	075754-020	ND	4.0	12	NE	U		EPA 314.0	
			075755-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	06-Jun-06	609919	078671-020	ND	4.0	12	NE	U		EPA 314.0	
	21-Sep-06	610653	081627-020	ND	4.0	12	NE	U		EPA 314.0	

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

Well ID	Sample Date	ARCOC 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>
MRN-3D	28-Jun-04	607603	065252-024	ND	4.0	12	NE	U		EPA 314.0	
	11-Nov-04	608009	066263-020	ND	4.0	12	NE	U		EPA 314.0	
			066264-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	12-Dec-05	609274	073549-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Mar-06	609514	075757-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Jun-06	609920	078672-020	ND	4.0	12	NE	U		EPA 314.0	
	25-Sep-06	610655	081629-020	ND	4.0	12	NE	U		EPA 314.0	
			081630-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
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	
<b>Field Quality Control Samples – September 2006</b>											
CYN-EB1	19-Sep-06	610651	081625-020	ND	4.0	12	NE	U		EPA 314.0	EB prior to sampling CYN-MW6
GWPP-EB1	21-Sep-06	610654	081628-020	ND	4.0	12	NE	U		EPA 314.0	EB prior to sampling SWTA3-MW4

**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.

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

**<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**

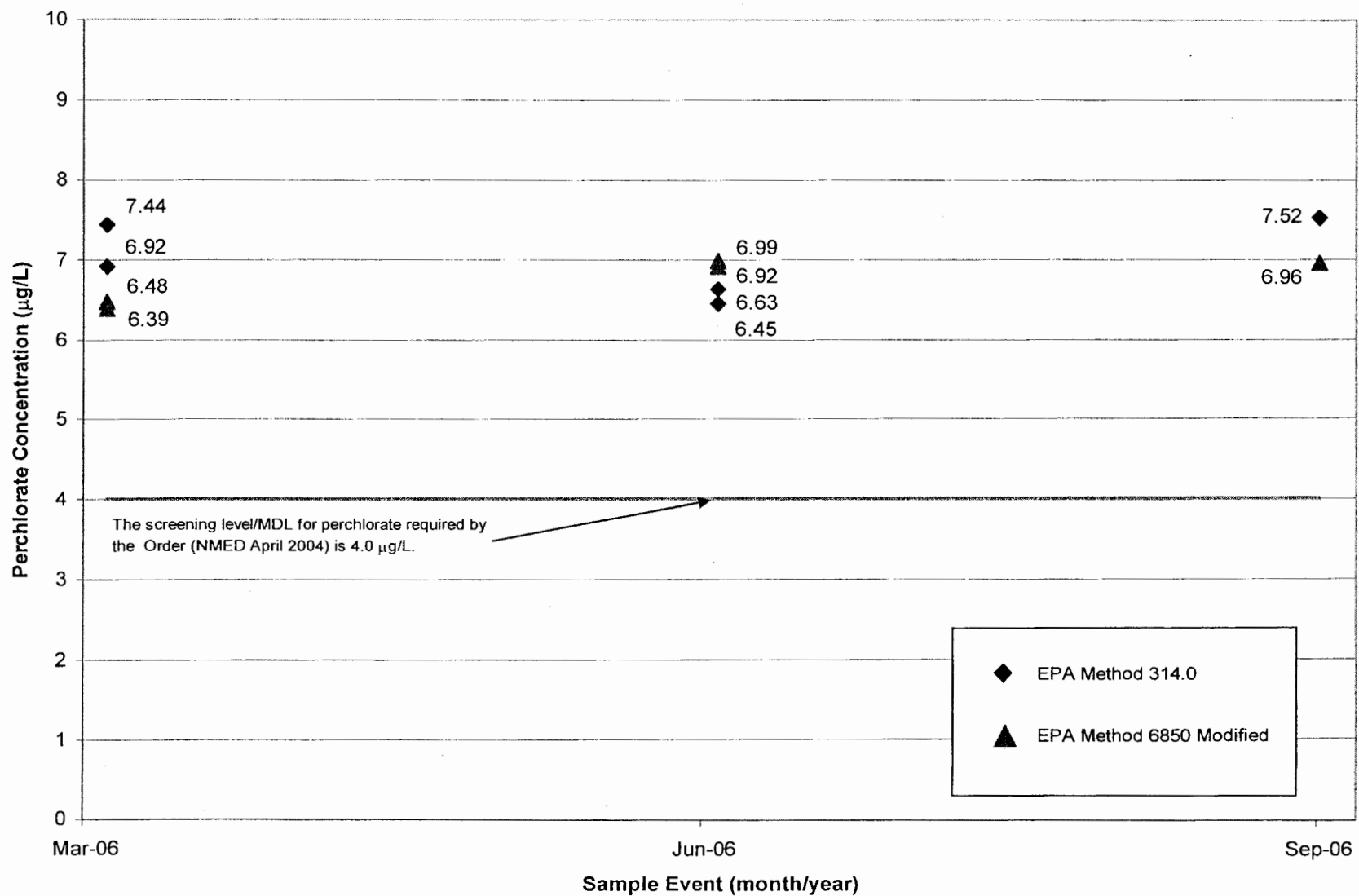
EPA 314.0: U.S. Environmental Protection Agency, November 1999, "Perchlorate in Drinking Water Using Ion Chromatography," EPA 815/R-00-014.

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>, Third 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-MW1D	19-Sep-06	20.05	422	-78.5	8.46	22.0	7.0	0.63
CYN-MW6	20-Sep-06	16.65	1061	313.2	7.02	1.14	24.8	2.42
CYN-MW7	13-Sep-06	19.92	561	60.9	7.36	3.39	23.6	2.14
CYN-MW8	14-Sep-06	18.60	731	148.5	7.37	1.02	19.7	2.03
MRN-2	21-Sep-06	18.39	420	326.6	7.57	0.65	70.8	6.63
MRN-3D	25-Sep-06	20.81	450	303.9	7.44	0.46	2.5	0.23
SWTA3-MW4	22-Sep-06	18.74	426	322.9	7.65	1.33	71.5	6.65

**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 Third Quarter of CY2006 Perchlorate Sampling**

Well ID / Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD
	(µg/L)		
CYN-MW6			
Perchlorate, in this case: R1 = EPA Method 314.0 R2 = EPA Method 6850M	7.52	6.96	8
CYN-MW8			
Perchlorate (EPA Method 314.0)	ND	ND	NC
SWTA3-MW4			
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.

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 August 2006a and 2006b) were identified during the Third 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.
- The perchlorate detected in CYN-MW6 was verified by two analytical methods (EPA Method 314.0 and EPA Method 6850M). The two analytical results are in good agreement (7.52 and 6.96  $\mu\text{g/L}$ ), with calculated RPD of 8 (Table 5). These results are consistent with data presented in the previous quarterly reports (Figure 2) (SNL/NM June 2006, SNL/NM September 2006).
- Four consecutive quarters of sampling have been completed for wells CYN-MW1D, MRN-2, and MRN-3D. 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.
- Three consecutive quarters of sampling have been completed for CYN-MW6, CYN-MW7, CYN-MW8, and SWTA3-MW4. Perchlorate has not been detected above the screening level/MDL for the samples collected from CYN-MW7, CYN-MW8, and SWTA3-MW4.

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).

Sandia will continue to perform consecutive quarterly groundwater sampling at SWTA3-MW4, CYN-MW6, CYN-MW-7, and CYN-MW8 during the fourth quarter of CY2006 (October, November, or December).

Per the requirements of Section VI.K.1.b of the Order (NMED April 2004), any sampling schedule at CYN-MW6 beyond the fourth quarter of CY2006 will be negotiated with the NMED. In addition, if these detectable concentrations continue to be found in CYN-MW6, then the Order requires DOE and Sandia to determine the nature and extent of perchlorate contamination and complete a Corrective Measures Evaluation for perchlorate-impacted groundwater in the vicinity of CYN-MW6.

## 6.0 References

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

# Appendix A

## Analytical Laboratory Certificates of Analysis for the Perchlorate Data

## Page 1 of 1

Batch No. \_\_\_\_\_

SMO Use

AR/COC

610652

[illegible]

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## Certificate of Analysis

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

Report Date: October 26, 2006

Page 1 of 2

Client Sample ID: 081626-R20  
Sample ID: 173772001  
Matrix: Ground Water  
Collect Date: 20-SBP-06 09:39  
Receive Date: 21-SBP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: CYN-MW6

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
LC-MS/MS Perchlorate Federal											
EPA 6850 Modified Perchlorate by LC-MS/MS											
Perchlorate		6.96	1.00	4.00	ug/L	20	MAP	10/17/06	1149	579549	1

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 6850 Modified	EPA 6850 Perchlorate Extraction in Liquid	MAP	10/17/06	0904	579547

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 6850 Modified	

### Notes:

The Qualifiers in this report are defined as follows :

- \* Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- \*\* Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL.
- H Analytical holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- P The response between the confirmation column and the primary column is >40%D
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level
- X Presumptive evidence that the analyte is not present. Please see narrative for further information.
- Z The percent difference is greater than 70%.
- d The 2:1 depletion requirement was not met for this sample
- h Prep holding time exceeded

The above sample is reported on an "as received" basis.

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

Report Date: October 26, 2006

Page 2 of 2

Client Sample ID:	081626-R20	Project:	SNLSGW								
Sample ID:	173772001	Client ID:	SNLS002								
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Edith Kent.

Heather M. Mauer 10/26/06  
Reviewed by



Internal Lab

Page 1 of 1

**Batch No.**

SMO Use

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**610650**

[illegible]

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

Report Date: October 16, 2006

Client Sample ID: 081624-020  
Sample ID: 172242003  
Matrix: Ground Water  
Collect Date: 19-SEP-06 09:44  
Receive Date: 20-SEP-06  
Collector: Client

Project: SNLS00401  
Client ID: SNLS002

Client Desc.: CYN-MW1D

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography Federal											
EPA 314.0 Perchlorate by IC											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MARI	10/02/06	1545	572322	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0	

## Page 1 of 1

Batch No.

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610652

[illegible]

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

Report Date: October 11, 2006

Client Sample ID: 081626-020  
Sample ID: 172331004  
Matrix: AQUEOUS  
Collect Date: 20-SEP-06 09:39  
Receive Date: 21-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: CYN-MW6

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography Federal</b>											
<i>EPA 314.0 Perchlorate by IC, contingent</i>											
Perchlorate	J	0.00752	0.004	0.012	mg/L	1	MAR110/02/06	1746	572325	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOB-AL	

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Page 1 of 1

**Batch No.**

**SMO Use**

AR/COC

**610646**

[illegible]

## Page 1 of 1

Batch No.

ALA

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

Report Date: October 4, 2006

Client Sample ID: 081619-020  
Sample ID: 171636002  
Matrix: Ground Water  
Collect Date: 13-SEP-06 10:10  
Receive Date: 14-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: CYN-MW7

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	MAR109/20/06	1446	569662	1

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Report Date: October 5, 2006

Client Sample ID: 081621-020  
Sample ID: 171770004  
Matrix: Ground Water  
Collect Date: 14-SEP-06 10:12  
Receive Date: 15-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: CYN-MW8

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography Federal											
EPA 314.0 Perchlorate by IC, contingent											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR109/21/06	1721	569662	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 Data Package GW

Report Date: October 5, 2006

Client Sample ID: 081620-020  
Sample ID: 171770003  
Matrix: Ground Water  
Collect Date: 14-SEP-06 10:12  
Receive Date: 15-SEP-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	MAR109/20/06	1724	569662	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Report Date: October 11, 2006

Client Sample ID: 081627-020  
Sample ID: 172584001  
Matrix: Ground Water  
Collect Date: 21-SEP-06 09:57  
Receive Date: 26-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: MRN-2

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	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	MAR110/02/06	1831	572325	1	

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

## Internal Lab

Page 1 of 1

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# **CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY**

Page 1 of 1

Internal Lab

Batch No.

*MA*

SMO Use

AR/COC

**610651**

Dept. No./Mail Stop:	6146/1087	Date Samples Shipped:	9-19-06	Project/Task No. 98026.01.06
Project/Task Manager:	Dwight Stockham	Carrier/Waybill No.	68917	SMO Authorization:
Project Name:	CYN GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 21671
Record Center Code:	ER/1333/DAT	Lab Destination:	GEL	<i>500 BOTTLE ORDER</i>
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	Tech Area	Reference LOV (available at SMO) <i>1722421</i>
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	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
081625-005	CYN-EB1	NA	<i>1/A</i>	09/19/06 1040	DIW	AG	4x1 L	4C	G	EB	TPH Diesel (8015)	<i>005</i>
081625-006	CYN-EB1	NA	<i>1</i>	09/19/06 1041	DIW	G	3x40 ml	HCL	G	EB	TPH Gasoline (8015)	<i>006</i>
081625-018	CYN-EB1	NA	<i>1</i>	09/19/06 1042	DIW	P	250 ml	H2SO4	G	EB	NPN (353.1)	<i>002</i>
081625-020	CYN-EB1	NA	<i>1</i>	09/19/06 1043	DIW	P	250 ml	4C	G	EB	Perchlorate (314.0)	<i>004</i>

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)	Level D Package	<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:	*Send report to:			
Return Samples By:	<input type="checkbox"/> Negotiated TAT	QC Init.	Tim Jackson/Org. 6146/MS 1087/505-284-2547			
Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular		
	Carolyn Daniel	<i>[Signature]</i>	<i>CD</i>	SNL/6031/2849988/221-9153		
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	Weston/6146/844-4013/250-7080		
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	Weston/6146/844-5130/228-0710		
*Please list as separate report.						

1. Relinquished by	Org. 6031	Date 9/19/06	Time 1:20	4. Relinquished by	Org.	Date	Time
1. Received by	Org. 6146	Date 9/19/06	Time 1:20	4. Received by	Org.	Date	Time
2. Relinquished by	Org. 6146	Date 9/19/06	Time 1:30	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date 9/19/06	Time 7:15	5. Received by	Org.	Date	Time
3. Relinquished by	Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

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

Report Date: October 16, 2006

Client Sample ID: 081625-020  
Sample ID: 172242004  
Matrix: Ground Water  
Collect Date: 19-SEP-06 10:43  
Receive Date: 20-SEP-06  
Collector: Client

Project: SNLS00401  
Client ID: SNLS002

Client Desc.: CYN-EB1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography Federal											
EPA 314.0 Perchlorate by IC											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1	10/02/06	1630	572322	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0	

## Internal Lab

Page 1 of 1

[illegible]

# GENERAL ENGINEERING 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: October 11, 2006

Client Sample ID: 081629-020  
Sample ID: 172584003  
Matrix: Ground Water  
Collect Date: 25-SEP-06 09:38  
Receive Date: 26-SEP-06  
Collector: Client  
Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: MRN-3D

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	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	MAR110/02/06	1901	572325	1	

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

# GENERAL ENGINEERING 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: October 11, 2006

Client Sample ID: 081630-020  
Sample ID: 172584004  
Matrix: Ground Water  
Collect Date: 25-SEP-06 09:38  
Receive Date: 26-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: MRN-3D

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography Federal											
EPA 314.0 Perchlorate by IC, contingent											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR11	10/02/06	1917	572325	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	



**Internal Lab**

Batch No.

N/A

SMO Use

AR/COC

**610656**

[illegible]

# GENERAL ENGINEERING 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: October 11, 2006

Client Sample ID: 081631-020  
Sample ID: 172584005  
Matrix: Ground Water  
Collect Date: 22-SEP-06 09:09  
Receive Date: 26-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002

Client Desc.: SWTA3-MW4

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	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	MAR110	02/06	1932	572325	1

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

## Page 1 of 1

Batch No.

**610654**

[illegible]

# GENERAL ENGINEERING 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: October 11, 2006

Client Sample ID: 081628-020  
Sample ID: 172584002  
Matrix: Ground Water  
Collect Date: 21-SEP-06 10:43  
Receive Date: 26-SEP-06  
Collector: Client

Project: SNLSGW  
Client ID: SNLS002  
Client Desc.: GWPP-EB1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	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	MAR110	02/06	1846	572325	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: October 27, 2006  
TO: File  
FROM: David Schwent  
SUBJECT: Inorganic Data Review and Validation - SNL  
Site: Canyons Assess GWM  
AR/COC: 610646  
SDG: 171636  
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

Nitrate/nitrite Analysis: No target analytes were detected in the blanks, except for the following. Nitrate/nitrite was detected in the initial calibration blank (ICB), continuing calibration blank (CCB) and method blank (MB). However, the associated result of Sample 171636-001 was a detect >5X the highest calibration blank concentration and >5X the MB concentration and should not be qualified.

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

## Page 1/1

AR/COC: 610646

Inorganic

[illegible]

David Schwarz

**Mr. David Schwent**

**Date:** 10/27/06

Analytical Quality Associates, Inc.

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

**Memorandum**

DATE: October 27, 2006  
TO: File  
FROM: David Schwent  
SUBJECT: Inorganic Data Review and Validation - SNL  
Site: Canyons Assess GWM  
AR/COC: 610647  
SDG: 171770  
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.



### **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 171636-001 was diluted 5X due to matrix interference.

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 were submitted on the ARCOG.

No other specific issues were identified which affect data quality.

## Sample Findings Summary

**Site:** Canyons Assess GWM

AR/COC: 610647

## Inorganic

[illegible]

**Validated By:**

David Schwartz

**Mr. David Schwent**

Date: 10/27/06

# Analytical Quality Associates, Inc.

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

## Memorandum

Date: October 27, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Canyons Assessment GWM  
AR/COC: 610650 and 610651  
SDG: 172242  
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 EPA353.1 (nitrate/nitrite) and EPA314.0 (perchlorate). Problems were identified with the data package that result in the qualification of data.

#### 1. 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 is qualified as noted below.

Sample 172242-002      Nitrate/Nitrite was non-detect and should be qualified "UJ, B3."

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 noted above in the summary section.

### **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. It should be noted that the PS analysis for perchlorate was performed on a QC sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

### **Replicates**

All Analyses: All replicate QC acceptance criteria were met. It should be noted that the replicate analysis for perchlorate was performed on a QC sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

### **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. Samples 171770-001 and -002 were diluted 5X due matrix interference.

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

### **Other QC**

All Analyses:

No field blanks (FBs) or equipment blanks (EBs) were submitted on the ARCOG. All field duplicates (FD) relate percent differences (RPDs) were <20%. There are no QC acceptance criteria currently in place for the evaluation of FDs.

No other specific issues were identified which affect data quality.

## Sample Findings Summary

**Site:** Canyons Assessment GWM

AR/COC: 610650, 610651

**Data Type:** Organic & Inorganic

[illegible]

**Validated By:**

Kevin A Lambert

Kevin A. Lambert

Date: 10/27/06

# Analytical Quality Associates, Inc.

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

## Memorandum

Date: October 27, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: Canyons Assessment GWM  
AR/COC: 610652  
SDG: 172331  
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 EPA353.1 (nitrate/nitrite) and 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 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 nitrate/nitrite 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 follows.

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

It should be noted that the MS analyses 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 follows.

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

It should be noted that the replicate analyses 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), trip blank (TB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

#### **All Analyses:**

EBs were submitted on the AR/COC(s). However, it should be noted that the EBs submitted on ARCO# 610651 are associated with SNL samples in another SDG.

No other specific issues were identified which affect data quality.

### **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 follows.

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

It should be noted that the MS analyses 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 follows.

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

It should be noted that the replicate analyses 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), trip blank (TB), 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 EBs were submitted in another SDG on ARCO# 610651.

No other specific issues were identified which affect data quality.



### Sample Findings Summary

**Site:** Canyons Assessment GWM

AR/COC: 610652

**Data Type:** Organic & Inorganic

[illegible]

**Validated By:**

Kevin A Lambert

Kevin A. Lambert

Date: 10/27/06

# Analytical Quality Associates, Inc.

616 Maxine NE  
Albuquerque, NM 87123  
Phone: 505-299-5201  
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## Memorandum

Date: November 9, 2006  
To: File  
From: Kevin Lambert  
Subject: LC/MS/MS Inorganic Data Review and Validation – SNL  
Site: Canyons Assessment GWM  
AR/COC: 610652 (perchlorate reanalysis)  
SDG: 173772  
Laboratory: GEL  
Project/Task: 98036.10.11.01

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using DOE NNSA Service Center Model Data Validation Procedure (MDVP) Rev. 4.1

### Summary

The sample was prepared and analyzed with accepted procedures using method EPA6850 Mod (perchlorate by LC/MS/MS). Problems were identified with the data package that result in the qualification of data.

#### 1. Perchlorate by LC/MS/MS:

The MS/MSD was not assessed due to high dilution and high concentration in the parent sample. The LCS percent recovery met QC acceptance criteria. However, no measure of precision was provided for the target analyte. Therefore, the sample result should be flagged "P2" to indicate insufficient QC data to determine laboratory precision.

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

All initial and continuing calibration data met QC acceptance criteria.

### Reporting Limit Verification

The CRI recoveries met QC acceptance criteria. It should be noted that the CRI spiked concentration was at the MDL, not 2X the MDL as stated in the MDVP. No sample data should be qualified as a result.

### **Blanks**

No target analytes were detected in the blanks.

### **Internal Standards**

All internal standards (IS) met QC acceptance criteria.

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

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

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

All LCS recoveries met QC acceptance criteria.

### **Detection Limits/Dilutions**

All detection limits were properly reported. The sample was diluted 20X to bring over range concentrations within the calibration range.

### **Perchlorate Chlorine Ratios**

The sample ratios met QC acceptance criteria.

### **Interference Check Standard (ICS)**

The ICS met QC acceptance criteria.

### **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 which affect data quality.

## Sample Findings Summary

Page 1/1

Site: Canyons Assessment GWM

AR/COC: 610652 (perchlorate reanalysis)

**Data Type:** Inorganic

[illegible]

Validated By: Kevin A Lambert

Kevin A. Lambert

Date: 11/09/06

# Analytical Quality Associates, Inc.

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

## Memorandum

Date: October 27, 2006  
To: File  
From: Kevin Lambert  
Subject: Inorganic Data Review and Validation – SNL  
Site: GWPP  
AR/COC: 610653, 610654, 610655, and 610656  
SDG: 172584  
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 except follows.

#### **Perchlorate:**

It should be noted that the MS analyses 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 follows.

#### **Perchlorate:**

It should be noted that the replicate analyses 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), trip blank (TB), field blank (FB), or field duplicate pair was submitted on the AR/COC(s) except as follows.

#### **Perchlorate:**

An EB and 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 which affect data quality.

### Sample Findings Summary

**Site:** GWPP

AR/COC: 610653, 610654, 610655, 610656

**Data Type:** Inorganic

[illegible]

**Validated By:**

Kevin A Lambert

Kevin A. Lambert

Date: 10/27/06