



Environmental Restoration Project Consolidated Quarterly Report

Section III

Perchlorate Screening Quarterly Monitoring Report Fourth Quarter of Calendar Year 2009 (October, November, and December 2009)

March 2010



United States Department of Energy
Sandia Site Office

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Section III: Perchlorate Screening Quarterly Monitoring Report Fourth Quarter of Calendar Year 2009 (October, November, and December 2009)

Executive Summary

Section IV.B of the Compliance Order on Consent (the Order), between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia) for Sandia National Laboratories/New Mexico (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells be sampled for perchlorate at SNL/NM (NMED April 2004). This report summarizes the perchlorate monitoring completed during the fourth quarter of Calendar Year 2009 (CY2009) (October, November, and December 2009) in response to the requirements of the Order. During the fourth quarter of CY2009, groundwater samples were collected from LWDS-MW1, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27.

LWDS-MW1 is in the Technical Area V (TA-V) Groundwater Investigation study area and was sampled for the third time for perchlorate based on requirements stipulated in an April 2009 letter from the NMED (NMED April 2009). TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27 are in the Tijeras Arroyo Groundwater (TAG) Investigation study area and were sampled for the second time for perchlorate based on NMED requirements (NMED April 2009). All samples were submitted to General Engineering Laboratories (GEL) for perchlorate analysis using U.S. Environmental Protection Agency (EPA) Method 314.0 (EPA November 1999). No perchlorate was detected in the environmental samples from LWDS-MW1, TA1-W-06, TA1-W-08, TA2-W-01, or TA2-W-27 at a method detection limit of 4 micrograms per liter ($\mu\text{g/L}$). The April 30, 2009 NMED letter also required that monitoring well TA1-W-03 be sampled for perchlorate. However, a groundwater sample could not be collected from TAG monitoring well TA1-W-03 due excessive turbidity from fine grained sediments in the well. TA1-W-03 is scheduled to be redeveloped in February 2010 and will be sampled immediately after redevelopment. The laboratory analytical results for this sample will be reported in the next consolidated quarterly report.

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Acronyms

AOP	Administrative Operating Procedures
ARCOC	analysis request and chain of custody
CME	Corrective Measures Evaluation
COA	certificates of analyses
CY	Calendar Year
DO	dissolved oxygen
DOE	Department of Energy
EPA	U.S. Environmental Protection Agency
FOP	Field Operating Procedure
GEL	General Engineering Laboratories
LTES	Long Term Environmental Stewardship
LWDS	Liquid Waste Disposal System
MDL	method detection limit
MW	monitoring well
ND	non-detect
NMED	New Mexico Environment Department
NTU	Nephelometric Turbidity Units
ORP	oxidation-reduction potential
pH	potential of hydrogen
PQL	practical quantitation limits
QC	quality control
SAP	Sampling and Analysis Plan
SC	specific conductance
SNL/NM	Sandia National Laboratories, New Mexico
TA	Technical Area
TAG	Tijeras Arroyo Groundwater
µg/L	microgram per liter
W	well

1.0 Introduction

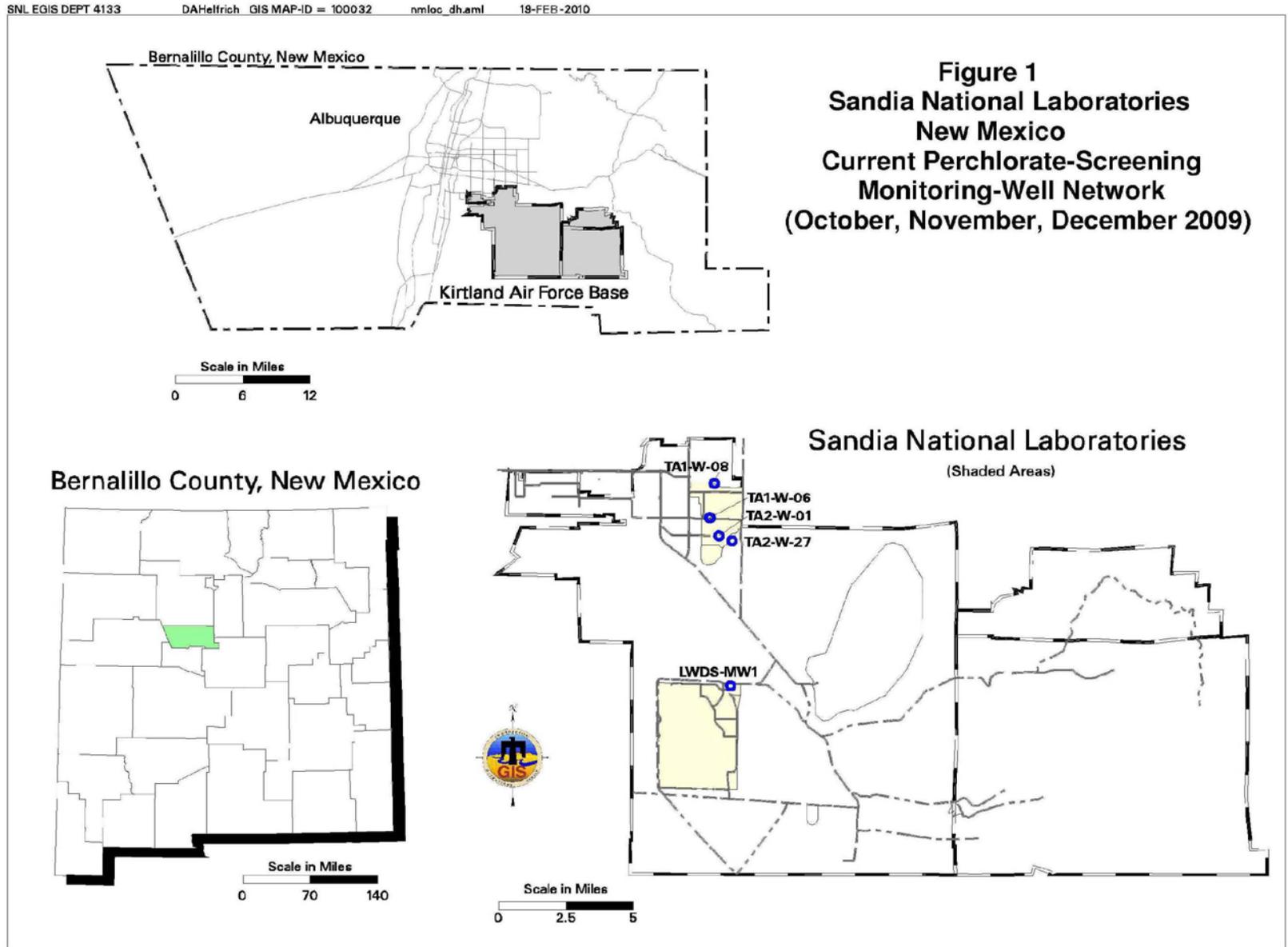
Section IV.B of the Compliance Order on Consent (the Order), between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia) for Sandia National Laboratories/New Mexico (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells be sampled for perchlorate at SNL/NM (NMED April 2004). This report summarizes the perchlorate screening monitoring completed during the fourth quarter of Calendar Year 2009 (CY2009) (October, November, and December 2009) in response to the requirements of the Order. The outline of this report is based on the required elements of a "Periodic Monitoring Report" described in Section X.D. of the Order (NMED April 2004).

In November 2005, DOE/Sandia submitted a letter report on the status of perchlorate screening in groundwater at SNL/NM monitoring wells (SNL/NM November 2005). The purpose of that letter report was to summarize previous correspondence and sampling results, and to outline proposed future work to comply with NMED requirements for perchlorate screening in groundwater. Per the letter report, quarterly reports will be submitted for wells actively in the perchlorate-screening monitoring-well network. Based on NMED response (NMED January 2006), DOE/Sandia will submit each quarterly report within 90 days following the quarter that the data represent. In November 2008, DOE/Sandia received approval from NMED to proceed to semiannual reporting (NMED November 2008), and then upon further consideration NMED once more required quarterly reporting (NMED April 2009). This did not alter the previously negotiated frequency for CYN-MW6, an existing Burn Site Groundwater study area well that has been under the sampling and reporting requirements of the Order since the well was installed, which will remain at semiannual sampling and reporting.

This report is the sixteenth to be submitted since the November 2005 letter report; the previous reports were submitted Fourth Quarter of Calendar Year 2005 through the Third Quarter of Calendar Year 2009 (SNL/NM February 2006, SNL/NM June 2006, SNL/NM September 2006, SNL/NM December 2006, SNL/NM March 2007, SNL/NM June 2007, SNL/NM September 2007, SNL/NM December 2007, SNL/NM March 2008, SNL/NM June 2008, SNL/NM September 2008, SNL/NM December 2008, SNL/NM June 2009, SNL/NM September 2009, and SNL/NM December 2009).

TA-V well LWDS-MW1 (Figure 1) has been sampled three consecutive quarters; and TAG wells TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27 (Figure 1) have been sampled two consecutive quarters. The Order requires that new wells be sampled for perchlorate for a minimum of four quarters (NMED April 2004). Reporting will continue as long as a groundwater monitoring well remains in the perchlorate-screening monitoring well network unless negotiated otherwise with NMED. The April 30, 2009 NMED letter, required that monitoring well TA1-W-03 be sampled for perchlorate. However, a groundwater sample could not be collected from TAG monitoring well TA1-W-03 due to unstable turbidity measurements. Two attempts were made to sample this well on July 16th and 24th, 2009. A total of 88 gallons was purged and turbidity measurements ranged from 5.30 Nephelometric Turbidity Units (NTU) to >1000 NTU. SNL/NM personnel have completed a borehole camera survey of this monitoring well, and have found the well casing to be in good physical condition. TA1-W-03 is scheduled to be redeveloped in the first quarter of CY2010 to remove the silt and clay material that produced the turbid water. This well will be sampled immediately after redevelopment and the laboratory analytical results for this sample will be reported in the next consolidated quarterly report.

Figure 1. Sandia National Laboratories, New Mexico Current Perchlorate-Screening Monitoring-Well Network (October, November, and December 2009)



2.0 Scope of Activities

This report provides perchlorate screening results from the fourth quarter of CY2009 (October, November, and December 2009) for the wells currently active in the perchlorate screening program as shown on Figure 1 and listed in Table 1. Per the requirements of Table XI-1 of the Order, a well with four consecutive quarters of non-detect results at the screening level/method detection limit (MDL) of 4 micrograms per liter ($\mu\text{g/L}$) is removed from the requirement of continued monitoring for perchlorate. Data from numerous wells identified in the Order have satisfied this requirement and, therefore, these wells have been removed from the perchlorate screening program. Data for these wells were provided in previous reports, and are not discussed in this current report. Wells discussed in previous perchlorate screening reports include: CYN-MW1D, CYN-MW5, CYN-MW7, CYN-MW8, MRN-2, MRN-3D, MWL-BW1, MWL-BW2, MWL-MW1, MWL-MW7, MWL-MW8, MWL-MW9, NWT3-MW2, and SWTA3-MW4.

Table 1
Current Perchlorate-Screening Monitoring-Well Network
Fourth Quarter of CY2009
(October, November, and December 2009)

Well	Date Sampled	Number of Consecutive Sampling Events ^a	Remaining Number of Sampling Events ^b	Sampling Method
LWDS-MW1	08-DEC-2009	3	1	Bennett™ Pump
TA1-W-03	Not Sampled ^c	0	4	--
TA1-W-06	28-OCT-2009	2	2	Bennett™ Pump
TA1-W-08	29-OCT-2009	2	2	Bennett™ Pump
TA2-W-01	30-OCT-2009	2	2	Bennett™ Pump
TA2-W-27	02-NOV-2009	2	2	Bennett™ Pump

Notes

^a Includes this sampling event.

^b Per the requirements of Table XI-1 of the Order (NMED April 2004) a well will be removed from the perchlorate-screening monitoring-well network after four quarters unless perchlorate is detected above the screening level/MDL of 4 $\mu\text{g/L}$. If perchlorate is detected above the screening level/MDL in a specific well, monitoring will continue at that well at a frequency negotiated with the NMED.

^c Initial sampling of this well is pending redevelopment (see discussion in Section 1).

DOE/Sandia performed groundwater sampling at five wells on the dates listed in Table 1. These five wells were specifically required by NMED's April 2009 letter (NMED April 2009). Groundwater sampling activities were conducted in conformance with procedures outlined in the investigation-specific sampling and analysis plans (SAP) entitled:

- ♦ "Tijeras Arroyo Groundwater Investigation, Mini-SAP for FY10, 1st Quarter Sampling, October/November 2009" (SNL/NM October 2009a), and
- ♦ "TA-V Groundwater Monitoring Mini-SAP for First Quarter, Fiscal Year 2010" (SNL/NM October 2009b).

As described in the Mini-SAPs, groundwater sampling was performed in conformance with current Sandia Environmental Management, Long Term Environmental Stewardship (LTES) Project field operating procedures (FOPs). A portable BennettTM groundwater sampling system was used to collect the groundwater samples. The sampling pump and tubing bundle were decontaminated prior to installation into monitoring wells in accordance with procedures described in FOP 05-03, "LTES Groundwater Sampling Equipment Decontamination" (SNL/NM August 2007a). Wells TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27 were purged a minimum of one saturated screen volume before sampling in conformance with FOP 05-01, "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM August 2007b). Well LWDS-MW1 is a low-yield monitoring well, and was purged dry and allowed to recover before sampling to ensure the most representative groundwater sample possible.

Field water-quality measurements for turbidity, potential of hydrogen (pH), temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the well prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with a YSITM Model 620 Water Quality Meter. Turbidity was measured with a HACHTM Model 2100P turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability was considered acceptable when measurements were within 10 percent or less than 5 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.

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

Table 2
Sample Details for the Fourth Quarter of CY2009 Perchlorate Sampling

Well	Sample Identification	ARCOG Number	Associated Groundwater Investigation
LWDS-MW1	087970-020 087971-020	612496	TA-V
TA1-W-03	Not Sampled ^a	--	--
TA1-W-06	087872-020	612463	TAG
TA1-W-08	087873-020	612464	TAG
TA2-W-01	087875-020 087876-020	612466	TAG
TA2-W-27	087877-020	612467	TAG

Notes

^a Initial sampling of this well is pending redevelopment (see discussion in Section 1).

ARCOG = Analysis request and chain of custody.

TAG = Tijeras Arroyo Groundwater.

TA-V = Technical Area V.

3.0 Regulatory Criteria

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

In April 2009, DOE/Sandia received a letter from the NMED requiring DOE/Sandia to characterize the nature and extent of the perchlorate contamination in soils and groundwater in the Burn Site Groundwater study area (NMED April 2009). A characterization work plan has been prepared and submitted to the NMED (SNL/NM November 2009). The NMED has also

requested that DOE/Sandia monitor perchlorate concentrations for a minimum of four quarters at several Tijeras Arroyo Groundwater and Technical Area-V monitoring wells, including TA1-W-03, TA1-W-06, TA1-W-08, TA2-W-01, TA2-W-27, and LWDS-MW1 (NMED April 2009).

4.0 Monitoring Results

Table 3 summarizes current and historical perchlorate results for wells currently in the perchlorate monitoring network. The analytical laboratory COA for the fourth quarter of CY2009 perchlorate data is included as Appendix A. Consistent with historical analytical results, perchlorate was not detected above the screening level in LWDS-MW1, TA1-W-06, TA1-W-08, TA2-W-01, or TA2-W-27.

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

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

There was one variance from requirements set forth by NMED (NMED April 2009): no groundwater sample was collected from monitoring well TA1-W-03 due to unstable turbidity measurements during previous a sampling event. No other variances or nonconformances in field activities or field conditions from requirements in the groundwater monitoring mini-SAPs (SNL/NM October 2009a and October 2009b) were identified during the fourth quarter of CY2009 sampling activities.

5.0 Summary and Conclusions

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

- No perchlorate was detected in the environmental sample from groundwater monitoring wells LWDS-MW1, TA1-W-06, TA1-W-08, TA2-W-01, or TA2-W-27 at a screening level/MDL of 4 µg/L.
- Since June 2004 (the start of sampling required by the Order), perchlorate has only been detected above the screening level/MDL (4 µg/L) in one of the wells (CYN-MW6) in the perchlorate-screening monitoring-well network.

**Table 3
Summary of Perchlorate Screening Analytical Results for the
Current Monitoring-Well Network, as of Fourth Quarter CY2009.**

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

Notes

^aResult

ND = not detected (at method detection limit).

µg/L = micrograms per liter.

^bMDL

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.

^cPQL

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

^dMCL

Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations [40 CFR 141.11(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.

Table 3 (concluded)
Summary of Perchlorate Screening Analytical Results for the
Current Monitoring-Well Network, as of Fourth Quarter CY2009.

Notes (continued)

^cLab Qualifier

H = Analytical holding time was exceeded.

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

^fValidation Qualifier

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

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

^gAnalytical Method

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

DOE/Sandia will continue semiannual monitoring of perchlorate in CYN-MW6 and quarterly monitoring of perchlorate in LWDS-MW1, TA1-W-06, TA1-W-08, TA2-W-01, and TA2-W-27. Well TA1-W-03 will be redeveloped to remove the silt and clay material and then be added to the perchlorate screening well network to be sampled a minimum of four consecutive quarters.

Based on recent requirements (NMED April 2009), DOE/Sandia has prepared and submitted a work plan that describes efforts to characterize the nature and extent of the perchlorate contamination in soils and groundwater in the Burn Site Groundwater study area. Upon NMED approval the activities described in the work plan will be implemented.

6.0 References

EPA (see US Environmental Protection Agency).

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

New Mexico Environment Department (NMED) January 2006. "RE: Monitoring Groundwater for Perchlorate, Report of November 22, 2005. Sandia National Laboratories EPA ID# NM5890110518." Letter to Patty Wagner (SSO/NNSA) and Peter Davies (SNL/NM) from James Bearzi. January 27, 2006.

New Mexico Environment Department (NMED) November 2008. "RE: Perchlorate Issues" Personal Communication (electronic mail) to John Cochran (SNL/NM) from Sid Brandwein (NMED/HWB). November 07, 2008.

New Mexico Environment Department (NMED) April 2009. RE: Perchlorate Contamination in Groundwater, Sandia National Laboratories, EPA ID# NM5890110518." Letter to Kimberly Davis (SSO/NNSA) and Francis Nimick (SNL/NM) from James Bearzi. April 30, 2009.

Sandia National Laboratories, New Mexico (SNL/NM) November 2005. To James Bearzi (NMED), "Letter Report on the Status of Perchlorate Screening in Groundwater at Sandia Monitoring Wells" Sandia National Laboratories, New Mexico Environmental Restoration Project. November 22, 2005.

Table 4
Perchlorate Screening Groundwater Monitoring
Field Water Quality Measurements^a, Fourth Quarter of CY2009

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (µmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
LWDS-MW1	08-Dec-09	14.55	699	273.4	7.35	0.27	70.6	7.19
TA1-W-03	Not Sampled ^b							
TA1-W-06	28-Oct-09	15.04	796	279.9	7.60	0.53	80.0	8.01
TA1-W-08	29-Oct-09	15.98	1790	293.6	7.42	0.46	75.0	7.36
TA2-W-01	30-Oct-09	15.99	582	298.8	7.64	1.38	77.6	7.66
TA2-W-27	02-Nov-09	19.03	785	300.6	7.55	0.31	84.8	7.83

Notes

- a Field measurements made immediately before the groundwater sample was collected.
- b Initial sampling of this well is pending redevelopment (see discussion in Section 1).
- °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).

Sandia National Laboratories, New Mexico (SNL/NM) February 2006. "Perchlorate Screening Quarterly Monitoring Report, Fourth Quarter of Calendar Year 2005 (October, November, and December 2005)". Sandia National Laboratories, New Mexico Environmental Restoration Project. February 24, 2006.

Sandia National Laboratories, New Mexico (SNL/NM) June 2006. "Perchlorate Screening Quarterly Monitoring Report, First Quarter of Calendar Year 2006 (January, February, and March 2006)". Sandia National Laboratories, New Mexico Environmental Restoration Project. June 7, 2006.

Sandia National Laboratories, New Mexico (SNL/NM) September 2006. "Perchlorate Screening Quarterly Monitoring Report, Second Quarter of Calendar Year 2006 (April, May, and June 2006)". Sandia National Laboratories, New Mexico Environmental Restoration Project. September 20, 2006.

Sandia National Laboratories, New Mexico (SNL/NM) December 2006. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Third Quarter of Calendar Year 2006 (July, August, and September 2006)". Sandia National Laboratories, New Mexico Environmental Restoration Project. December 2006.

Sandia National Laboratories, New Mexico (SNL/NM) March 2007. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Fourth Quarter of Calendar Year 2006 (October, November, and December 2006)". Sandia National Laboratories, New Mexico Environmental Restoration Project. March 27, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) June 2007. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, First Quarter of Calendar Year 2007 (January, February, and March 2007)". Sandia National Laboratories, New Mexico Environmental Restoration Project. June 27, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) July 2007. Sandia Administrative Operating Procedure 00-03, Revision 2, "Data Validation Procedure for Chemical and Radiochemical Data." Sandia National Laboratories, New Mexico Sample Management Office. July 16, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) August 2007a. Sandia Field Operating Procedure 05-03, Revision 02 "LTES Groundwater Sampling Equipment Decontamination," Sandia National Laboratories, New Mexico Long Term Environmental Stewardship, Environmental Management Department. August 16, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) August 2007b. Sandia Field Operating Procedure 05-01, Revision 02 "LTES Groundwater Monitoring Well Sampling and Field Analytical Measurements," Sandia National Laboratories, New Mexico Long Term Environmental Stewardship, Environmental Management Department. August 16, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) September 2007. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Second

Quarter of Calendar Year 2007 (April, May, and June 2007)". Sandia National Laboratories, New Mexico Environmental Restoration Project. September 26, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) December 2007. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Third Quarter of Calendar Year 2007 (July, August, and September 2007)". Sandia National Laboratories, New Mexico Environmental Restoration Project. December 27, 2007.

Sandia National Laboratories, New Mexico (SNL/NM) March 2008. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Fourth Quarter of Calendar Year 2007 (October, November, and December 2007)". Sandia National Laboratories, New Mexico Environmental Restoration Project. March 26, 2008.

Sandia National Laboratories, New Mexico (SNL/NM) June 2008. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, First Quarter of Calendar Year 2008 (January, February, and March 2008)". Sandia National Laboratories, New Mexico Environmental Restoration Project. June 27, 2008.

Sandia National Laboratories, New Mexico (SNL/NM) September 2008. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Second Quarter of Calendar Year 2008 (April, May, and June 2008)". Sandia National Laboratories, New Mexico Environmental Restoration Project. September 23, 2008.

Sandia National Laboratories, New Mexico (SNL/NM) December 2008. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Third Quarter of Calendar Year 2008 (July, August, and September 2008)". Sandia National Laboratories, New Mexico Environmental Restoration Project. December 22, 2008.

Sandia National Laboratories, New Mexico (SNL/NM) June 2009a. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Fourth Quarter of Calendar Year 2008 and First Quarter of Calendar Year 2009 (October 2008 through March 2009)". Sandia National Laboratories, New Mexico Environmental Restoration Project. June 18, 2009.

Sandia National Laboratories, New Mexico (SNL/NM) September 2009. "Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Second Quarter of Calendar Year 2009 (April 2009 through June 2009)". Sandia National Laboratories, New Mexico Environmental Restoration Project. September 30, 2009.

Sandia National Laboratories, New Mexico (SNL/NM) October 2009a. "Tijeras Arroyo Groundwater Investigation, Mini-Sampling and Analysis Plan (SAP) for FY10, 1st Quarter Sampling, October/November 2009". Sandia National Laboratories, New Mexico Environmental Restoration Project. October 19, 2009.

Sandia National Laboratories, New Mexico (SNL/NM) October 2009b. "TA-V Groundwater Monitoring, Mini-Sampling and Analysis Plan (SAP) for First Quarter, Fiscal Year 2010". Sandia National Laboratories, New Mexico Environmental Restoration Project. October 26, 2009.

Sandia National Laboratories, New Mexico (SNL/NM) November 2009. “Burn Site Groundwater Characterization Work Plan , Installation of Groundwater Monitoring Wells CYN-MW9, CYN-MW10, CYN-MW11, Collection of Subsurface Soil Samples, November 2009”. Sandia National Laboratories, New Mexico Environmental Restoration Project. November 23, 2009.

Sandia National Laboratories, New Mexico (SNL/NM) December 2009. “Consolidated Quarterly Report, Section III: Perchlorate Screening Quarterly Monitoring Report, Third Quarter of Calendar Year 2009 (July 2009 through September 2009)”. Sandia National Laboratories, New Mexico Environmental Restoration Project. December 21, 2009.

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

Appendix A

Analytical Laboratory Certificate of Analysis for the Perchlorate Data

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>N/A</i>	SMO Use	AR/COC	612496
Dept. No./Mail Stop: 4133/1136	Date Samples Shipped: <i>12-8-09</i>	Project/Task No. 125778.10.11.01	
Project/Task Manager: Don Schofield	Carrier/Waybill No. <i>108287</i>	SMO Authorization: <i>[Signature]</i>	
Project Name: TA-V GWM	Lab Contact: Edie Kent/803-556-8171	Contract #: 691436	
Record Center Code: ER/1306/DAT	Lab Destination: GEL	<i>SUB BOTTL @ ROOM</i>	
Logbook Ref. No.: NA	SMO Contact/Phone: Pam Puissant/505-844-3185		
Service Order No. CFO# 012-10	Send Report to SMO: Lorraine Herrera /505-844-3199	<input type="checkbox"/> Waste Characterization -Send preliminary/copy report to:	
Location	Tech Area	<input type="checkbox"/> Released by COC No.: <input checked="" type="checkbox"/> Validation Required	
Building	Room	Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container		Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
087970-001	LWDS-MW1	513.5	NA	120809/0856	GW	G	3x40 ml	HCL	G	SA	VOC (SW846/8260B)	<i>009</i>
087970-018	LWDS-MW1	513.5	NA	120809/0857	GW	P	250 ml	H2SO4	G	SA	NPN (353.2)	<i>010</i>
087970-020	LWDS-MW1	513.5	NA	120809/0858	GW	P	250 ml	4C	G	SA	Perchlorate (314.0)	<i>011</i>
087971-001	LWDS-MW1	513.5	NA	120809/0856	GW	G	3x40 ml	HCL	G	DU	VOC (SW846/8260B)	<i>012</i>
087971-018	LWDS-MW1	513.5	NA	120809/0857	GW	P	250 ml	H2SO4	G	DU	NPN (353.2)	<i>013</i>
087971-020	LWDS-MW1	513.5	NA	120809/0858	GW	P	250 ml	4C	G	DU	Perchlorate (314.0)	<i>014</i>
087972-001	TAV-TB14	NA	NA	120809/0856	DIW	G	3x40 ml	HCL	G	TB	VOC (SW846/8260B)	<i>015</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)	Entered by:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Lab Use
Turnaround Time <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input checked="" type="checkbox"/> 30 Day	Negotiated TAT		QC Inits	Level D Package <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Return Samples By:	*Send report to:		Tim Jackson/ORG. 4133/MS.0756/ 284-2547		
Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular	*Please list as separate report.
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	Weston/4133/844-4013/250-7090	
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	Weston/4133/844-5130/228-0710	
	William J. Gibson	<i>[Signature]</i>	<i>WG</i>	Weston/4133/844-4013/239-7367	

1. Relinquished by <i>[Signature]</i> Org. <i>4133</i> Date <i>12/8/09</i> Time <i>11:10</i>	4. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. <i>4133</i> Date <i>12/8/09</i> Time <i>11:10</i>	4. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. <i>4133</i> Date <i>12/9/09</i> Time <i>12:30</i>	5. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>GEL</i> Date <i>11-9-09</i> Time <i>0800</i>	5. Received by	Org.	Date	Time
3. Relinquished by	6. Relinquished by	Org.	Date	Time
3. Received by	6. Received by	Org.	Date	Time

GEL LABORATORIES LLC

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

Certificate of Analysis

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

Report Date: December 31, 2009

Client Sample ID: 087970-020	Project: SNLSGWater
Sample ID: 242454011	Client ID: SNLS003
Matrix: AQUEOUS	
Collect Date: 08-DEC-09 08:58	
Receive Date: 09-DEC-09	Client Desc.: LWDS-MW1
Collector: Client	Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR12/12/09	0620	931950	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, Groundwater Monitoring**

Report Date: December 31, 2009

Client Sample ID: 087971-020
Sample ID: 242454014
Matrix: AQUEOUS
Collect Date: 08-DEC-09 08:58
Receive Date: 09-DEC-09
Collector: Client

Project: SNLSGWater
Client ID: SNLS003

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

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MARI12/12/09	0731	931950	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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Contact: Ms. Pamela M. Puissant
Project: **Level C, Groundwater Monitoring**

Report Date: November 21, 2009

Client Sample ID: 087872-020
Sample ID: 239954001
Matrix: AQUEOUS
Collect Date: 28-OCT-09 09:32
Receive Date: 29-OCT-09
Collector: Client

Project: SNLSGWater
Client ID: SNLS003

Client Desc.: TA1-W-06
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR11/17/09	1955	922374	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Report Date: November 21, 2009

Client Sample ID: 087873-020
Sample ID: 239954002
Matrix: AQUEOUS
Collect Date: 29-OCT-09 09:24
Receive Date: 30-OCT-09
Collector: Client

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

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	I	MAR11/17/09	2013	922374	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Report Date: December 1, 2009

Client Sample ID: 087875-020
Sample ID: 240248001
Matrix: AQUEOUS
Collect Date: 30-OCT-09 09:42
Receive Date: 03-NOV-09
Collector: Client

Project: SNLSGWater
Client ID: SNLS003

Client Desc.: TA2-W-01
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR11/17/09	2032	922374	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Report Date: December 1, 2009

Client Sample ID: 087876-020
Sample ID: 240248002
Matrix: AQUEOUS
Collect Date: 30-OCT-09 09:42
Receive Date: 03-NOV-09
Collector: Client

Project: SNLSGWater
Client ID: SNLS003

Client Desc.: TA2-W-01
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR11/17/09	2129	922374	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

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

Report Date: December 1, 2009

Client Sample ID: 087877-020
 Sample ID: 240248003
 Matrix: AQUEOUS
 Collect Date: 02-NOV-09 09:57
 Receive Date: 03-NOV-09
 Collector: Client

Project: SNLSGWater
 Client ID: SNLS003

Client Desc.: TA2-W-27
 Vol. Recv.:

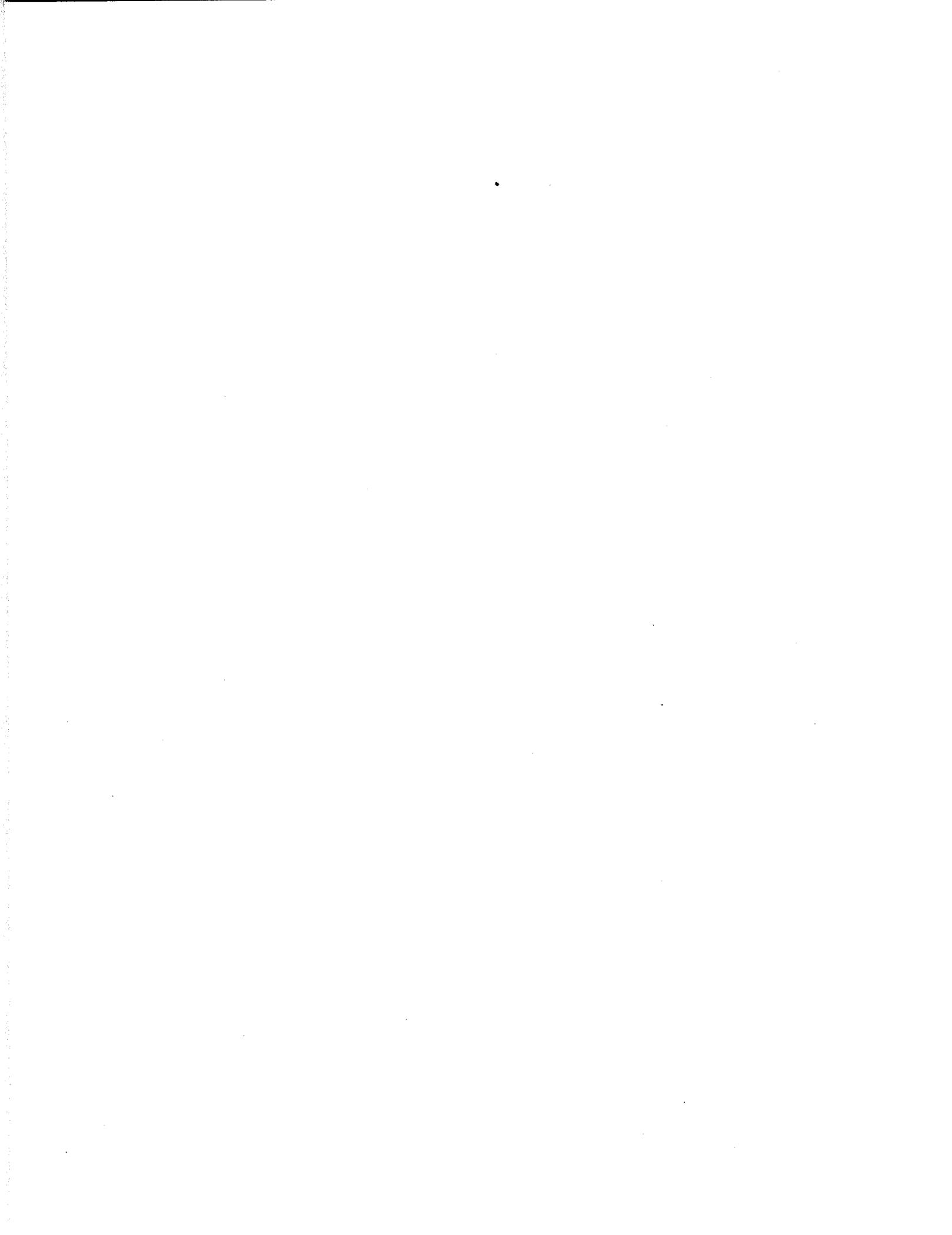
Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
<i>EPA 314.0 Perchlorate by IC "As Received"</i>										
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR11/17/09	2148	922374	1

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



Memorandum

DATE: December 4, 2009

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: TAG GWM
AR/COC: 612463 and 612464
SDG: 239954
Laboratory: GEL
Project/Task No: 125778.10.11.01

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

Summary

The samples were prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate). 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 samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks.

Laboratory Control Sample (LCS)

All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS (PS) QC acceptance criteria were met. No MSD (PSD) analysis was performed. The replicate analysis was used as a measure of laboratory precision. No sample data will be qualified as a result. It should be noted that the MS analysis was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Replicates

All replicate QC acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. No samples required dilution.

Other QC

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

No other specific issues were identified that affect data quality.

Sample Findings Summary

Site: TAG-GWM

AR/COC: 612463 and 612464

Gen Chem

Sample ID	EPA 314.0 (perchlorate):															
	All Acceptance criteria met. No sample data will be qualified.															

Validated By: David Schwart

Date: 12/04/09



Memorandum

Date: December 15, 2009

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: TAG GWM
AR/COC: 612465, 612466, 612467, 612468, 612469, 612470,
612471, and 612472
SDG: 240248
Laboratory: GEL
Project/Task: 125778.10.11.01
Analysis: General Chemistry

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

Summary

Four samples were prepared and analyzed with accepted procedures using methods EPA 314.0 (perchlorate). One sample was prepared and analyzed with accepted procedures using methods EPA 9056 (Br, Cl, Fl, and SO₄ by Ion Chromatography) and EPA 2320B (alkalinity). Six samples were prepared and analyzed with accepted procedures using methods EPA 353.2 (nitrate/nitrite by Cd reduction). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. Ion Chromatography:

Sulfate was detected in the method blank (MB) at a concentration \geq the method detection limit (MDL) but $<$ the practical quantitation limit (PQL). The associated sample result was a detect $<5X$ the MB result and will be **qualified "1.9U,B"** at 5X the MB value.

2. Alkalinity:

Total alkalinity was detected in the MB at a concentration \geq the PQL. The associated sample result was a detect and will be **qualified "7.5UJ,B"** at 5X the MB value.

3. Nitrate/Nitrite:

Sample 240248-009 was diluted 5X for nitrate/nitrite and the relative dilution factor between the field sample and the QC sample was >5 . The associated sample result was a detect and will be **qualified "J,MS1,RP1"** due to lack of matrix-specific accuracy and precision data.

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

Holding Times and Preservation

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

Calibration

All initial and continuing calibration met QC acceptance criteria.

Blanks

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

Nitrate/Nitrite:

Nitrate/nitrite was detected in the MB at a concentration \geq the MDL but $<$ the PQL. The associated sample results were detects $>5X$ the MB result and will not be qualified.

Nitrate/nitrite was detected in the equipment blank (EB) associated with samples -016 and -018 at a concentration \geq the MDL but $<$ the PQL. The associated sample results were detects $>5X$ the EB result and will not be qualified.

Ion Chromatography:

Chloride was detected in the EB at a concentration \geq the MDL but $<$ the PQL and sulfate was detected in the EB at a concentration \geq the PQL. However, it should be noted that no associated field samples were submitted on the AR/COC(s) and, thus, no sample data will be qualified.

Alkalinity:

Alkalinity was detected in the EB at a concentration \geq the PQL. However, it should be noted that no associated field samples were submitted on the AR/COC(s) and, thus, no sample data will be qualified.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicates met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. Sample -014 was diluted 10X, samples -016 and -018 were diluted 25X, and samples -021 and -006 were diluted 50X for nitrate/nitrite due to high concentrations for this analysis. Sample -009 was diluted 5X for nitrate/nitrite due to matrix interference. It should be noted that except for sample -009 the relative dilution factors between the samples and associated QC samples were <5. No sample data will be qualified as a result.

Other QC

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

No other specific issues that affect data quality were identified.



Sample Findings Summary

Site: TAG GWM

AR/COC: 612465, 612466, 612467, 612468,
612469, 612470, 612471, 612472

Data Type: Organic, Metals, Gen Chem

	VOC	78-93-3 (2-butanone)	591-78-6 (2-hexanone)	74-87-3 (chloromethane)	ICP-MS metals	7429-90-5 (aluminum)	7440-41-7 (beryllium)	7440-70-2 (calcium)	7440-50-8 (copper)	7439-89-6 (iron)	7439-95-4 (magnesium)	7440-09-7 (potassium)	CVAA Hg	7439-97-6 (mercury)	General Chemistry	14808-79-8 (sulfate)	ALK (alkalinity)	N599 (nitrate/nitrite)
087878-001 TA2-SW1-320	UJ,C3	UJ,C3																
087879-001 TAG-TB1	UJ,C3	UJ,C3																
087880-001 TA2-W-26	UJ,C3	UJ,C3																
087881-001 TAG-TB2	UJ,C3	UJ,C3																
087882-001 TAG-EB2	UJ,C3	UJ,C3	J-,C3															
087884-001 TA2-W-19	UJ,C3	UJ,C3																
087885-001 TA2-W-19	UJ,C3	UJ,C3																
087886-001 TAG-TB4	UJ,C3	UJ,C3																
087887-001 TJA-4	UJ,C3	UJ,C3																
087888-001 TAG-TB5	UJ,C3	UJ,C3																
087882-009 TAG-EB2					UJ,MS1	UJ,B4	0.17U,B	J,D1	UJ,D1	UJ,D1	UJ,D1	UJ,MS1, D1	UJ,MS1					
087882-016 TAG-EB2														1.9U,B	7.5UJ,B			
087882-018 TAG-EB2																		J,MS1,RP1
Perchlorate analysis met QC acceptance criteria. No sample data will be qualified.																		

Validated By:

Kevin A. Lambert

Kevin A. Lambert

Date: 12/15/09

Memorandum

DATE: January 12, 2010

TO: File

FROM: David Schwent

SUBJECT: General Chemistry Data Review and Validation - SNL
Site: TAV GWM
AR/COC: 612494, 612495, and 612496
SDG: 242454
Laboratory: GEL
Project/Task No: 125778.10.11.01

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

Summary

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

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

Holding Times/Preservation

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

Calibration

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

Blanks

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

Laboratory Control Sample (LCS)

All Analyses: All LCS QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

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

Replicates

All Analyses: All replicate QC acceptance criteria were met.

Detection Limits/Dilutions

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

Nitrate/nitrite Analysis: All detection limits were properly reported. Samples 242454-002, -010, and -013 were diluted 25X for nitrate/nitrite due to high concentration of the target analyte and sample -006 was diluted 5X due to matrix inference. All associated batch QC samples were analyzed at dilution factors that resulted in relative dilution factors to the samples that were $\leq 5X$. No sample data will be qualified as a result.

Other QC

All Analyses: No field blanks (FBs) were submitted on the AR/COCs. All relative percent differences (RPDs) of the field duplicates (FDs) (samples -013 and -014) were $< 20\%$. No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified that affect data quality.

