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Environment Restoration Operations Consolidated Quarterly Report - July 2015

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Sandia National Laboratories, New Mexico

Environmental Restoration Operations

A U.S. Department of Energy Environmental Cleanup Program

Consolidated Quarterly Report

January – March 2015



July 2015



United States Department of Energy
Sandia Field Office

CONSOLIDATED QUARTERLY REPORT

July 2015

SANDIA NATIONAL LABORATORIES, NEW MEXICO

ENVIRONMENTAL RESTORATION OPERATIONS

U.S. DEPARTMENT OF ENERGY:
CONTRACTOR:
PROJECT MANAGER:

SANDIA FIELD OFFICE
SANDIA CORPORATION
John Cochran

NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO THIS PERMIT: 13

SUSPECT WASTE: Radionuclides, metals, organic compounds, and explosives

REPORTING PERIOD: January – March 2015

OVERVIEW

This Sandia National Laboratories, New Mexico Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) fulfills all quarterly reporting requirements set forth in the Resource Conservation and Recovery Act Facility Operating Permit, and the Compliance Order on Consent. The 13 sites in the Corrective Action regulatory process are listed in Table I-1. The 13 sites consist of 9 Solid Waste Management Units and 4 Areas of Concern (AOCs). A summary of post-closure care activities performed in accordance with the Chemical Waste Landfill Post-Closure Care Permit is also included in this document. This ER Quarterly Report presents activities and data in sections as follows:

SECTION I: Environmental Restoration Operations Consolidated Quarterly Report,
January – March 2015

SECTION II: Perchlorate Screening Quarterly Groundwater Monitoring Report,
January – March 2015

ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
µg/L	microgram(s) per liter
µmhos/cm	micromhos per centimeter
% Sat	percent saturation
AGMR	Annual Groundwater Monitoring Report
ALTMM	Annual Long-Term Monitoring and Maintenance
AOC	Area of Concern
AR	Analysis Request
AVN	Area V (North)
BSG	Burn Site Groundwater
BW	background well
CAC	Corrective Action Complete
CAMU	Corrective Action Management Unit
CCBA	Coyote Canyon Blast Area
CFR	Code of Federal Regulations
CME	Corrective Measures Evaluation
COA	certificates of analyses
COC	Chain-of-Custody
CTF	Coyote Test Field
CWL	Chemical Waste Landfill
CY	Calendar Year
CYN	Canyons (Burn Site Groundwater Area of Concern)
DO	dissolved oxygen
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration Operations
ER Quarterly Report	Environmental Restoration Operations (ER) Consolidated Quarterly Report
ET Cover	evapotranspirative cover
FOP	Field Operating Procedure
GEL	GEL Laboratories LLC
HQ	hazard quotient
LCRS	leachate collection and removal system
LTMMMP	Long-Term Monitoring and Maintenance Plan
LTS	Long-Term Stewardship
LWDS	liquid waste disposal system
MCL	maximum contaminant level
MDL	method detection limit

mg/L	milligram(s) per liter
MRN	Magazine Road North
mV	millivolt
MW	monitoring well
MWL	Mixed Waste Landfill
NA	not applicable
ND	nondetect
NE	not established
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NTU	nephelometric turbidity unit
NWTA	Northwest Technical Area
OBS	Old Burn Site
ORP	oxidation-reduction potential
PCCP	Post-Closure Care Permit
Permit	Hazardous Waste Facility Operating Permit
pH	potential of hydrogen
PQL	practical quantitation limit
QC	quality control
RCRA	Resource Conservation and Recovery Act
Sandia	Sandia Corporation
SAP	Sampling and Analysis Plan
SC	specific conductance
SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit
SWTA	Southwest Technical Area
TA	Technical Area
TAVG	Technical Area-V Groundwater
TAG	Tijeras Arroyo Groundwater
TAV	Technical Area-V
TJA	Tijeras Arroyo
The Consent Order	the Compliance Order on Consent
WYO	Wyoming

SECTION I

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SECTION I

ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED

QUARTERLY REPORT, January – March 2015

1.0 Introduction

This Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) provides the status of ongoing corrective actions and related Long-Term Stewardship (LTS) activities being implemented by Sandia National Laboratories, New Mexico (SNL/NM) ER for the January, February, and March 2015 quarterly reporting period. Section 2.0 provides the status of ER Operations activities including closure activities for the Mixed Waste Landfill (MWL), project management and site closure, and groundwater sampling and analysis. Section 3.0 provides the status of LTS activities that relate to the MWL, Chemical Waste Landfill (CWL), and Corrective Action Management Unit (CAMU). Section 4.0 provides the references noted in Section I of this report.

2.0 Environmental Restoration Operations Work Completed

2.1 Mixed Waste Landfill

The Long-Term Monitoring and Maintenance Plan (LTMMP) was submitted to the New Mexico Environment Department (NMED) in March 2012 (SNL/NM March 2012). NMED approved the LTMMP on January 8, 2014 (Blaine January 2014). Monitoring, inspections, maintenance/repair, and reporting activities required by the LTMMP are now presented in Section I.3.1, including MWL evapotranspirative cover (ET Cover) supplemental watering and maintenance (LTS Activities). Remaining ER Operations activities at the MWL are presented below.

The U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation (Sandia) requested a Certificate of Completion for the MWL on September 25, 2014 (Beausoleil September 2014). NMED provided the Certification of Completion for the MWL on October 8, 2014 (Cobrain October 2014) and DOE/NNSA and Sandia subsequently submitted a request to NMED for a Class 3 Permit Modification to the Resource Conservation and Recovery Act (RCRA) Facility Operating Permit (Permit). The Final Order became effective on February 26, 2015. The Class 3 Permit Modification Request was dated October 17, 2014 and petitioned the NMED to change the MWL status to Corrective Action Complete (CAC) with Controls (Beausoleil October 2014). The request and associated legal notice initiated the DOE/NNSA and Sandia 60-day public comment

period that was completed on January 5, 2015, and included a public meeting that was held on November 18, 2014. After DOE and Sandia completed their public comment period on January 5, 2015, NMED issued a public notice announcing their intent to approve the DOE and Sandia request for corrective action complete with controls status for the MWL and initiated a 60-day public comment period that started on January 12, 2015 (Cobrain January 2015). On March 17, 2015, NMED extended this public comment period an additional 30 days, to April 13, 2015.

A groundwater monitoring report for monitoring well MWL-MW4 was submitted to NMED on February 18, 2015 (SNL/NM January 2015) that presents the results of field activities performed in September and December 2014. The field activities that were performed at monitoring well MWL-MW4 to address 2013 elevated unfiltered metals results (SNL/NM May 2014), were consistent with recommendations provided by NMED on July 24, 2014 (Kieling July 2014), and included the following:

- Repeated pumping of the well to remove as much sediment and stainless steel corrosion particles as possible prior to removing the packer and dedicated sampling pump from the monitoring well for inspection, replacement, and/or cleaning,
- Sampling for filtered and unfiltered metals during the pumping effort to determine unfiltered metals concentrations,
- Upon completion of pumping and sampling activities, removal and inspection of the dedicated sampling equipment and inflatable packer for inspection, and
- Recording a video log of the monitoring well to evaluate its condition.

As reported in the previous ER Quarterly Report (SNL/NM April 2015), the pumping and sampling of MWL-MW4 was completed from September 8 through September 29, 2014. On December 16, 2014, all dedicated equipment was removed, inspected, and photographed, and a video log was recorded. All of these activities and results are presented in the report submitted to NMED on February 18, 2015 (SNL/NM January 2015). The pumping and sampling data, along with the visual inspections, confirmed the source of the anomalous unfiltered metals results from the 2013 groundwater samples was corrosion of the dedicated stainless steel sampling pump. The video log confirmed the monitoring well is in reasonable condition. Only the inflatable packer was reinstalled after it was cleaned and inspected. MWL-MW4 will be used to measure and monitor the elevation of the regional aquifer water table in accordance with the LTMMP; future sampling is not required. NMED approved the report on March 10, 2015 (Kieling March 2015).

2.2 **Project Management and Site Closure**

ER sites in the CAC regulatory process are addressed in this section. Two of the three Permit modification requests that are in process with the NMED at this time are summarized in Sections I.2.2.1 through I.2.2.3.

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

Twenty-six (26) sites were the subject of a request submitted to the NMED in March 2006 (Wagner March 2006) for final determination of CAC. The sites include 19 Solid Waste Management Units (SWMUs) and 7 Areas of Concern (AOCs). The following SWMUs and AOCs were included in this Permit modification request:

- SWMUs 4, 5, 46, 49, 52, 68, 91, 101, 116, 138, 140, 147, 149, 150, 154, 161, 196, 223, and 224.
- AOCs 1090, 1094, 1095, 1114, 1115, 1116, and 1117.

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

Five additional sites were submitted for the NMED determination of CAC in a Permit modification request submitted in January 2008 (Wagner January 2008). The four SWMUs and one AOC included in the January 2008 Permit modification request are:

- SWMUs 8, 28-2, 58, and 105.
- AOC 1101.

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

In April 2010, DOE/Sandia received a letter from the NMED entitled, “Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001” (NMED April 2010).

This letter included four main sections:

1. “SWMUs Requiring Additional Corrective Action”.
2. “SWMUs/AOCs to be Subject to Groundwater Monitoring Controls”.

3. "SWMUs/AOCs to be Restricted to Industrial Land Use".
4. "SWMUs/AOCs that do not Require Corrective Action".

The NMED specified additional groundwater characterization requirements for five SWMUs in the section titled, "SWMUs Requiring Additional Corrective Action." The SWMUs include the following:

1. SWMUs 8/58 - Open Dump/Coyote Canyon Blast Area
2. SWMU 68 - Old Burn Site
3. SWMU 149 - Building 9930 Septic System (Coyote Test Field [CTF])
4. SWMU 154 - Building 9960 Septic System and Seepage Pits

Activities associated with these requirements are summarized in Section I.2.3.6 of this ER Quarterly Report.

Subsequent correspondence, in 2012 and 2014 from the NMED, granted CAC status to the remaining SWMUs and AOCs that were listed in the April 2010 letter from the NMED (NMED April 2010). These letters are described below.

In a letter dated July 27, 2012, the NMED granted CAC status to three SWMUs/AOCs that were not opposed by the public in the public comment period ending in February 2008 (NMED July 2012). The two SWMUs and one AOC granted CAC status are as follows:

- SWMUs 233 and 234
- AOC 1115

Via Public Notice and letter (both dated September 17, 2012), the NMED solicited public comments and initiated the public comment period on 24 SWMUs/AOCs that the NMED intends, pending public input, to approve as CAC (NMED September 2012). The 24 SWMUs/AOCs included SWMU 52. Twenty-three of these 24 SWMUs/AOCs were from the March 2006 and January 2008 requests.

In response to the NMED's September 17, 2012 Public Notice, the submitted written public comments included requests for a public hearing on the granting of CAC status to the 24 SWMUs/AOCs. The NMED held the Public Hearing on the "Renewal of Hazardous Waste Permit EPA ID Number NM890110518 and Granting of Corrective Action Complete Status For Certain Solid Waste Management Units and Areas Of Concern at Sandia National Laboratories" from May 5 through 8, 2014, in Albuquerque, New Mexico. Sandia provided testimony at the Hearing in support of granting CAC status to the 24 SWMUs/AOCs.

In December 2014, the NMED Secretary signed the Final Order supporting the granting of CAC status to the 24 SWMUs/AOCs in conjunction with the Facility Operating Permit (NMED December 2014). The Permit for treatment and storage of hazardous and mixed waste at the SNL Facility was issued on January 27, 2015 and became effective on February 26, 2015. Corrective action is now complete at the 24 SWMUs and AOCs.

2.3 **Groundwater Sampling and Analysis**

The following sections present groundwater monitoring activities conducted at three groundwater AOCs (Technical Area-V Groundwater [TAVG], Burn Site Groundwater [BSG], and Tijeras Arroyo Groundwater [TAG]), the MWL, and the CWL. In addition, groundwater monitoring activities conducted at the “SWMUs Requiring Additional Corrective Action” are presented.

Analytical results for groundwater monitoring at TAVG AOC, BSG AOC, TAG AOC, the MWL, and the CWL will be presented in the SNL/NM Calendar Year (CY) 2014 Annual Groundwater Monitoring Report, which is anticipated to be submitted to the NMED in the summer 2015.

Analytical results for the CWL groundwater monitoring will be presented and discussed in the CWL Annual Post-Closure Care Report for CY 2015, which will be submitted to NMED in March 2016. Also, the analytical results for the MWL groundwater monitoring will be presented and discussed in the MWL Long-Term Monitoring and Maintenance Report for the reporting period of April 1, 2014 to March 31, 2015, which will be submitted to NMED in June 2015.

Perchlorate analysis of groundwater samples for BSG AOC is discussed in Section II of this ER Quarterly Report.

2.3.1 **Technical Area-V Groundwater Area of Concern**

Groundwater sampling at TAVG AOC was conducted in February and March 2015.

2.3.2 **Burn Site Groundwater Area of Concern**

Groundwater sampling at BSG AOC was conducted in March 2015.

2.3.3 **Tijeras Arroyo Groundwater Area of Concern**

Groundwater sampling at TAG AOC was conducted in March 2015.

2.3.4 **Mixed Waste Landfill Groundwater**

No MWL groundwater monitoring activities were performed during this reporting period. Groundwater monitoring results will be presented in the MWL Long-Term Monitoring and Maintenance Report for the reporting period April 1, 2014 to March 31, 2015, which will be submitted to NMED in June 2015.

2.3.5 **Chemical Waste Landfill Groundwater**

Semiannual groundwater sampling at CWL was conducted in January 2015. Groundwater monitoring results will be presented in the CWL Annual Post-Closure Care Report for CY 2015, which will be submitted to NMED in March 2016.

2.3.6 **SWMUs Requiring Additional Corrective Action**

The eight quarters of groundwater monitoring activities at SWMUs 8 and 58, 68, 149, and 154 have been completed. Therefore in October 2014 DOE/SFO and Sandia notified NMED that ground monitoring activities had been completed and would be discontinued (Todd October 2014). In February 2015 NMED agreed that corrective action activities at the sites had been completed (NMED February 2015).

2.4 **Environmental Restoration Operations Documents Submitted to the NMED Pending Regulatory Review and Approval**

This section lists ER documents that have been submitted to the NMED and are, as of this reporting period, still pending review and approval:

- The BSG Interim Measures Work Plan submitted to the NMED on May 26, 2005 (SNL/NM May 2005).
- The BSG Current Conceptual Model of Groundwater Flow and Contaminant Transport submitted to the NMED on April 9, 2008 (SNL/NM March 2008).
- The Technical Area (TA)-V Geophysical Logs and Slug Test Results Report submitted to the NMED on November 24, 2010 (SNL/NM November 2010).

- The MWL Groundwater Monitoring Report for CY 2010 submitted to the NMED on September 30, 2011 (SNL/NM September 2011).
- The Class 3 Permit modification request dated October 17, 2014 for Corrective Action Complete with Controls status for the MWL (Beausoleil October 2014).

3.0 **Long-Term Stewardship Work Completed**

3.1 **Mixed Waste Landfill**

The MWL LTMMP was approved by the NMED on January 8, 2014 (Blaine January 2014). Monitoring, inspections, maintenance/repair, and reporting activities required by the LTMMP represent LTS Program activities and are presented in this section. Implementation of all LTMMP inspection and monitoring activities were initiated upon LTMMP approval. The reporting year for the MWL under the LTMMP is April 1 through March 31 of the next year, with Annual Reports due to the NMED by June 30 of each year.

- Quarterly radon air monitoring is ongoing. The detectors deployed on October 2, 2014 were inspected and collected for analysis on January 7, 2015. No repairs were needed.
- No semiannual groundwater, soil-vapor, or soil-moisture monitoring was performed during the reporting period. These monitoring activities are performed in April and October.
- Passive soil-vapor venting devices were installed on the four compliance groundwater monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) on February 2, 2015.
- The quarterly ET Cover System Inspection was performed on February 16, 2015. Accumulation of wind-blown plant debris was identified on the security fence. The plant debris was removed March 4-5, 2015. Survey monuments were not visible due to excessive weed growth. Weeds were cleared around the monuments March 4-5, 2015. No other inspection parameters required action.
- The ET Cover Biology Inspection frequency changed to annual after the August 14, 2014 inspection. The next inspection will be performed in August 2015.

- ET Cover maintenance (weed removal from the cover and perimeter fence) was performed March 4-5, 2015. A pre-emergent herbicide was applied to the North and South Staging Areas (i.e., graveled staging areas outside the perimeter fence) to prevent future weed growth. Approximately 15 cubic yards of highly compressed weeds were removed from the site, mostly from the perimeter fence.
- No supplemental watering was performed during the reporting period.
- On February 18, 2015, DOE and Sandia submitted five updated reference documents cited in the LTMMP in accordance with requirements of the Groundwater Sampling and Analysis Plan (Appendix F) of the LTMMP (Todd February 2015). Revisions included updates to keep the reference documents current and to reflect ongoing modifications and improvements in industry practices.
- Additional information on activities performed at the MWL during this reporting period are provided in Section I.2.1.

3.2 **Chemical Waste Landfill**

The CWL Post-Closure Care Permit (PCCP) (NMED October 2009) became effective on June 2, 2011, when the NMED approved the CWL Final RCRA Closure Report (Kieling June 2011), transitioning the CWL from SNL/NM ER to LTS. A summary of post-closure care activities at the CWL for this reporting period is provided in this ER Quarterly Report. More detailed documentation of ongoing activities under the PCCP will be reported in the CY 2015 CWL Annual Post-Closure Care Report (due to the NMED in March 2016). Activities for this reporting period include the following:

- The CY 2014 CWL Annual Post-Closure Care Report was submitted to the NMED on March 17, 2015 (SNL/NM March 2015).
- Semiannual groundwater monitoring and annual soil-vapor monitoring was performed in January 2015. Resampling of soil-vapor monitoring port CWL-D2-440 was conducted on March 31, 2015 due to environmental sample-duplicate pair relative percent difference values exceeding the criterion of 50.
- ET Cover maintenance work was conducted February 26 through March 4, 2015. Dead and live weeds were removed from the cover surface, perimeter fence, storm water diversion features, and the perimeter area just outside the fence line. A total of approximately 30 cubic yards of compressed weeds were removed from the site, primarily from the perimeter fence.

- The quarterly ET Cover System Inspection (surface, storm water diversion structures, security fence, and survey monuments) was performed on March 9, 2015. Windblown weeds were removed from the drainage culverts, excess sediment and weeds were removed from the two western-most survey monuments, and cleaning/lubrication of the lock for the main gate in the perimeter fence was completed during the inspection. Windblown plant debris in the perimeter fence was removed just prior to the inspection. No other issues were identified.
- No supplemental watering was performed during the reporting period.

3.3 **Corrective Action Management Unit**

In December 2014, NMED signed the Final Order supporting the issuance of the Permit (NMED December 2014), and issued the Permit on January 27, 2015. The permit took effect on February 26, 2015. Post-closure care of the CAMU will be performed under the Permit in the CY 2015. Post-closure care operations consist of vadose zone monitoring, leachate removal, and inspections as required in the Permit.

Activities for this reporting period (January, February, and March 2015) include the following:

- Weekly inspections of the RCRA less than 90-day accumulation area were performed while waste was present, otherwise inspections were performed monthly.
- Weekly pumping of leachate from the leachate collection and removal system (LCRS) concluded on January 6, 2015. The requirement under the new Permit (NMED December 2014) is for leachate to be pumped once a quarter. Leachate was pumped from the LCRS on March 17, 2015. Waste management associated with the LCRS during this reporting period is presented in Section I.3.3.1.
- Quarterly monitoring of the Vadose Zone Monitoring System was conducted in February 2015. The results will be presented in the CY 2015 CAMU Annual Post-Closure Care Report (due to NMED in March 2016),
- ET Cover maintenance work included the following. A small number of plants with the potential to develop a deep root system were clipped at ground level on February 26, 2015. These plants were identified during the September 2014 quarterly inspection, and at the recommendation of the SNL/NM staff biologist, they were clipped during the winter to achieve greatest mortality. On March 4, 2015 dead and live weeds were removed from the cover surface, perimeter fence, and storm water diversion features. A

total of 15 cubic yards of highly compressed weeds were removed from the site, primarily from the perimeter fence.

- Quarterly inspection of the site was performed on March 9 and March 26, 2015, which included the containment cell cover, storm water diversion structures, security fences, gates, signs, and benchmarks. The findings and maintenance activities include the following:
 - A small number of plants with the potential to develop a deep root system were identified growing on the cover. They are scheduled to be clipped at or below ground during the 2015/2016 winter per the SNL/NM staff biologist recommendation that greatest mortality is achieved when clipped during the winter months.

3.3.1 **CAMU Waste Management Activities**

CAMU waste management data for the reporting period are documented in this section. Composite leachate sampling for waste characterization is no longer a requirement under the new Permit (NMED December 2014). Solid waste (i.e., personal protective equipment) generated during this reporting period did not exceed 1 pound. All waste is removed from the site by Hazardous Waste Handling Facility personnel.

- Leachate waste stored on site as of December 31, 2014 and equaled 34 gallons.
- Leachate waste generated on site during the reporting period equaled 62 gallons. Leachate waste removed from the site on February 12, 2015 equaled 48 gallons.
- Leachate waste remaining on site at the end of this reporting period equaled 48 gallons.

3.3.2 **CAMU Regulatory Activities**

In December 2014, NMED signed the Final Order supporting the issuance of the Permit (NMED December 2014), which became effective on February 26, 2015. Post-closure care of the CAMU will be performed under the Permit in the CY 2015.

3.4 **Long-Term Stewardship Documents Submitted to the NMED Pending Regulatory Review and Approval**

The CAMU Vadose Zone Monitoring System Annual Monitoring Results Report for 2014 (reporting period July 2013 through June 2014) was submitted to the NMED on September 29, 2014 (SNL/NM September 2014).

The CWL Annual Post-Closure Care Report, Calendar Year 2013 was submitted to the NMED on March 25, 2014 (SNL/NM March 2014).

The CWL Annual Post-Closure Care Report, Calendar Year 2014 was submitted to the NMED on March 17, 2015 (SNL/NM March 2015).

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Tables

**Table I-1
Solid Waste Management Units and Areas of Concern
Where Corrective Action Is Not Complete**

Solid Waste Management Units	
Site Number	Site Description
8	Open Dump (CCBA)
58	CCBA
68	Old Burn Site
76	MWL (TA-III)
83	Long Sled Track
84	Gun Facilities
149	Building 9930 Septic System (CTF)
154	Building 9960 Septic System and Seepage Pits (CTF)
240	Short Sled Track
Total	9
Areas of Concern	
Site Number	Site Description
300	Tijeras Arroyo Ground-Water Investigation (TAG AOC)
	TA-V Ground-Water Investigation (TAVG AOC)
	Burn Site Ground-Water Investigation (BSG AOC)
502	Building 9938 Surface Discharge Site
Total	4

Notes

- AOC = Area of Concern.
- BSG = Burn Site Groundwater.
- CCBA = Coyote Canyon Blast Area.
- CTF = Coyote Test Field.
- LWDS = Liquid Waste Disposal System.
- MWL = Mixed Waste Landfill.
- TA = Technical Area.
- TAG = Tijeras Arroyo Groundwater.
- TA-V = Technical Area-V.
- TAVG = Technical Area-V Groundwater.

**Table I-2
Groundwater Sampling and Analysis**

Investigation Site	Sampling Frequency in CY 2014 ^a	Quarter of Sampling in CY 2014	Location of Analytical Results	Location of Perchlorate Analytical Results	Monitoring Wells in Network
TAVG AOC	Quarterly	1,2,3,4	AGMR	NA	AVN-1, LWDS-MW1, LWDS-MW2, TAV-MW2, TAV-MW3, TAV-MW4, TAV-MW5, TAV-MW6, TAV-MW7, TAV-MW8, TAV-MW9, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW13, TAV-MW14
BSG AOC	Semiannually	2,4	AGMR	NA	CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW15
TAG AOC	Quarterly	1,2,3,4	AGMR	NA	PGS-2, TA1-W-01, TA1-W-02, TA1-W-03, TA1-W-04, TA1-W-05, TA1-W-06, TA1-W-08, TA2-NW1-595, TA2-SW1-320, TA2-W-01, TA2-W-19, TA2-W-26, TA2-W-27, TA2-W-28, TJA-2, TJA-3, TJA-4, TJA-6, TJA-7, WYO-3, WYO-4
MWL Groundwater	Semiannually	2,4	AGMR, Section 4 of MWL ALTMM Report	NA	MWL-BW2, MWL-MW7, MWL-MW8, MWL-MW9
CWL Groundwater	Semiannually	1,3	AGMR, Section 4 CWL PCCP Report	NA	CWL-BW5, CWL-MW9, CWL-MW10, CWL-MW11

Notes

^aNot all wells in a particular investigation are sampled at the same frequency; this represents the maximum frequency of sampling at a site.

- AGMR = Annual Groundwater Monitoring Report.
- ALTMM = Annual Long-Term Monitoring and Maintenance.
- AOC = Area of Concern.
- AVN = Area V (North).
- BSG = Burn Site Groundwater (Area of Concern).
- BW = Background well.
- CWL = Chemical Waste Landfill.
- CY = Calendar Year.
- CYN = Lurance Canyon.
- LWDS = Liquid Waste Disposal System.
- MW = Monitoring Well.
- MWL = Mixed Waste Landfill.
- NA = Not applicable. No wells in the site network are currently being sampled and analyzed for perchlorate.
- PCCP = Post-Closure Care Permit.
- PGS = Parade Ground South.
- TA1-W = Technical Area-I (Well).
- TA2-NW = Technical Area-II (Northwest).
- TA2-SW = Technical Area-II (Southwest).
- TA2-W = Technical Area-II (Well).
- TAG = Tijeras Arroyo Groundwater (Area of Concern).
- TAV = Technical Area-V.
- TAVG = Technical Area-V Groundwater (Area of Concern).
- TJA = Tijeras Arroyo.
- WYO = Wyoming.

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SECTION II

PERCHLORATE SCREENING QUARTERLY GROUNDWATER MONITORING REPORT, January – March 2015

1.0 Introduction

Section IV.B of the Compliance Order on Consent (the Consent Order), between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia), jointly referred to as DOE/Sandia, for Sandia National Laboratories, New Mexico (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells at SNL/NM be sampled for perchlorate (NMED April 2004). This section of the Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) summarizes the perchlorate-screening groundwater monitoring completed during the First Quarter of Calendar Year (CY) 2015 (January, February, and March 2015) in response to the requirements of the Consent Order. The outline of this report is based on the required elements of a “Periodic Monitoring Report” described in Section X.D. of the Consent Order (NMED April 2004).

In November 2005, DOE/Sandia submitted a letter report on the status of perchlorate screening in groundwater at SNL/NM monitoring wells (SNL/NM November 2005). The purpose of the letter report was to summarize previous correspondence and sampling results, and to outline proposed future work to comply with NMED requirements for perchlorate screening of groundwater. As specified in the letter report, quarterly reports will be submitted for wells active in the perchlorate screening monitoring well network.

Based on the NMED response (NMED January 2006), DOE/Sandia will submit each quarterly report within 90 days following the quarter that the data represent. In November 2008, DOE/Sandia received approval from the NMED to proceed to semiannual reporting (NMED November 2008); however, upon further consideration, the NMED once more required quarterly reporting (NMED April 2009). This did not alter the previously negotiated frequency for monitoring well CYN-MW6, an existing Burn Site Groundwater (BSG) Area of Concern (AOC) monitoring well that has been under the sampling and reporting requirements of the Consent Order since the well was installed, which remains at a semiannual frequency for sampling and reporting. Due to declining water levels, CYN-MW6 has insufficient water to routinely sample and the replacement monitoring well (CYN-MW15) was installed in December 2014 and has assumed the negotiated semiannual frequency. In September 2011, DOE/Sandia requested an extension of the submittal dates by one month for ER Quarterly Reports (SNL/NM September 2011). The request was approved by the NMED (September 2011), which allows DOE/Sandia to submit perchlorate quarterly reports within 120 days following the quarter that the data represent.

This report is the thirty-seventh to be submitted since the November 2005 letter report; the previous reports were submitted for Fourth Quarter of CY 2005 through the Fourth Quarter of CY 2014 (SNL/NM February 2006 and April 2015).

Groundwater at BSG AOC monitoring well CYN-MW14A was sampled for the second time during the reporting period (Table II-1). This is in accordance with the Consent Order requirements that a new groundwater monitoring well be sampled for perchlorate for a minimum of four quarters (NMED April 2004). The corresponding reporting will continue for as long as the well remains active in the perchlorate screening network unless otherwise negotiated with the NMED.

2.0 **Scope of Activities**

This report provides perchlorate screening groundwater monitoring analytical results for the First Quarter of CY 2015 (January, February, and March 2015) for the single well currently active in the perchlorate screening program as shown on Figure II-1 and listed in Table II-1. In accordance with the requirements of Table XI-1 of the Consent Order, a well with four consecutive quarters of nondetects (NDs) for perchlorate at the screening level/method detection limit (MDL) of 4 micrograms per liter ($\mu\text{g/L}$) is removed from the requirement of continued monitoring for perchlorate.

Data for numerous wells identified in the Consent Order have satisfied this requirement; therefore, these wells have been removed from the perchlorate screening program. The perchlorate results for these wells have been provided in previous reports and are not discussed in this current report. Wells discussed in previous perchlorate screening reports are included in Table II-2.

SNL/NM personnel performed groundwater sampling for perchlorate at one well on the date listed in Table II-1. This well was installed after the Consent Order was finalized (NMED April 2004) and was therefore required to be sampled for perchlorate as a “new” well.

Groundwater sampling activities were conducted in accordance with procedures outlined in the following investigation-specific sampling and analysis plan (SAP) entitled:

- “Burn Site Groundwater Monitoring, Mini-SAP for Second Quarter, Fiscal Year 2015” (SNL/NM March 2015)

As described in the Mini-SAP, groundwater sampling was performed in accordance with current SNL/NM Environmental Management, Long-Term Stewardship Project Field

Operating Procedures (FOPs). A portable Bennett™ groundwater sampling system was used to collect the groundwater samples. The sampling pump and tubing bundle were decontaminated prior to insertion into the monitoring well in accordance with procedures described in FOP 05-03, “Groundwater Monitoring Equipment Decontamination” (SNL/NM January 2012a). The well was purged a minimum of one saturated screen volume before sampling in accordance with FOP 05-01, “Groundwater Monitoring Well Sampling and Field Analytical Measurements” (SNL/NM January 2012b).

Field water quality measurements for turbidity, pH, temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the well prior to collecting the groundwater sample. Groundwater temperature, SC, ORP, DO, and pH were measured with an YSI™ Model EXO1 water quality meter. Turbidity was measured with a HACH™ Model 2100Q turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when the following parameters are achieved:

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

Field measurement logs documenting details of well purging and water quality measurements have been submitted to the SNL/NM Customer Funded Record Center.

The groundwater samples were submitted to GEL Laboratories LLC (GEL) for chemical analysis of perchlorate using U.S. Environmental Protection Agency (EPA) Method 314.0 (EPA November 1999). The sample identification, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table II-3. The analytical report from GEL, including certificates of analyses (COA) (Appendix A), analytical methods, MDLs, practical quantitation limits, dates of analyses, and results of quality control (QC) analyses and data validation findings (Appendix B), have been submitted to the SNL/NM Records Center.

3.0 **Regulatory Criteria**

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

3.1 **Burn Site Groundwater Area of Concern**

In March 2007, DOE/Sandia received a letter of approval from the NMED, which stated the requirement that DOE/Sandia “determine the nature and extent of the contamination and complete a CME for the perchlorate-impacted groundwater in the vicinity of CYN-MW6” (NMED March 2007). As this was based solely on four quarters of monitoring results, DOE/Sandia submitted a letter to the NMED in April 2007 (SNL/NM April 2007) recommending further characterization through continued quarterly monitoring of monitoring well CYN-MW6 for four additional quarters, ending in December 2007, to ensure appropriate characterization of this well. In January 2008, DOE/Sandia requested a meeting with the NMED to discuss the need for continued monitoring or additional characterization work and, potentially, a CME.

In preparation for discussing the perchlorate-impacted groundwater in the vicinity of monitoring well CYN-MW6, and to show that the requirement “to determine the nature and extent of contamination” (NMED March 2007) has been met, DOE/Sandia provided supporting information to the NMED (SNL/NM March 2008). Perchlorate in surface soil has been characterized at several SWMUs in the study area (SNL/NM June 2006 and March 2008–Appendix C). Based on these data, DOE/Sandia considers the nature and extent of perchlorate in groundwater at the BSG AOC to be sufficiently characterized. Since 2004, groundwater samples from four other monitoring wells in the vicinity of the BSG AOC have been analyzed for perchlorate, including monitoring wells CYN-MW1D, CYN-MW5, CYN-MW7, and CYN-MW8. All wells were sampled for four quarters and all results were ND for perchlorate (SNL/NM March 2008–Appendix D).

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

Because perchlorate concentrations in samples from monitoring well CYN-MW6 have exceeded the screening level, DOE/Sandia initiated a negotiation process with the NMED (SNL/NM March 2007) to determine the frequency of continued monitoring. In November 2008, DOE/Sandia received approval from the NMED to proceed with semiannual monitoring of perchlorate in monitoring well CYN-MW6 and proceed with semiannual reporting of all perchlorate results (NMED November 2008). Upon further consideration, the NMED once more required that DOE/Sandia resume quarterly reporting of perchlorate results with the exception of monitoring well CYN-MW6 (NMED April 2009). Due to declining water levels, CYN-MW6 has insufficient water to routinely sample and the replacement monitoring well (CYN-MW15) was installed in December 2014 and has assumed the negotiated frequency. Monitoring well CYN-MW14A was also installed in December 2014; this well is considered to be a new monitoring well that requires quarterly sampling due to its deep screen interval.

In April 2009, DOE/Sandia received a letter from the NMED requiring DOE/Sandia to characterize the nature and extent of the perchlorate contamination in soil and groundwater in the BSG AOC (NMED April 2009). A characterization work plan was prepared and submitted to the NMED (SNL/NM November 2009), approved by the NMED (February 2010), and implemented in July 2010.

3.2 **Tijeras Arroyo Groundwater and Technical Area-V Groundwater Areas of Concern**

The April 2009 letter from the NMED to DOE/Sandia was not limited to the BSG AOC (NMED April 2009). In the April 2009 letter, the NMED had also requested that DOE/Sandia monitor perchlorate concentrations for a minimum of four quarters at five monitoring wells in the Tijeras Arroyo Groundwater AOC and at four monitoring wells in the Technical Area-V AOC (NMED April 2009). All nine wells have been sampled for four consecutive monitoring events with no perchlorate detections being reported; therefore, these nine wells have been removed from the perchlorate sampling list. A replacement well, TA2-W-28, was installed in December 2014 for the purpose of monitoring the same depth interval as damaged well TA2-SW1-320. Because well TA2-SW1-320 was not one of the

four Tijeras Arroyo Groundwater wells selected for perchlorate sampling, well TA2-W-28 does not require perchlorate sampling.

3.3 **March 2006 and January 2008 Permit Modification Requests**

During the First Quarter of CY 2011, four monitoring wells were added to the perchlorate monitoring network based on the NMED letter of April 8, 2010, entitled, “Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001” (NMED April 2010). The sites and the corresponding requests are described in Section I.2.2 of this ER Quarterly Report. The NMED letter required work plans and groundwater monitoring at the following SWMUs:

- SWMU 8/58—Installation of at least two groundwater monitoring wells west of and near Features YY and OO and submittal and approval of a work plan.
- SWMU 49—Annual sampling of existing monitoring well CYN-MW5.
- SWMU 68—Installation of monitoring wells near the burn pan and associated ditch/surface impoundments and submittal and approval of a work plan.
- SWMU 116—Annual sampling of existing monitoring well CTF-MW1.
- SWMU 149—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW3 for a minimum of eight quarters.
- SWMU 154—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW2 for a minimum of eight quarters.

To fulfill the requirements of the April 2010 NMED letter, DOE/Sandia submitted a SAP for monitoring wells CTF-MW2 and CTF-MW3 (SNL/NM June 2010) that was subsequently approved (with modifications) by the NMED (December 2010). All of these wells have been sampled for the required number of monitoring events, with no perchlorate detections, and have since been removed from the perchlorate sampling list.

The NMED letter of April 8, 2010, also required work plans, installation of groundwater monitoring wells, and groundwater monitoring at the following SWMUs:

- SWMUs 8/58—Two groundwater monitoring wells must be installed (CCBA-MW1 and CCBA-MW2) and sampled quarterly for a minimum of eight quarters.
- SWMU 68—Three groundwater monitoring wells must be installed (OBS-MW1, OBS-MW2, and OBS-MW3) and sampled quarterly for a minimum of eight quarters.

To fulfill the requirements of the April 2010 NMED letter, DOE/Sandia submitted SWMU 68 and SWMUs 8/58 Groundwater Characterization Work Plans that included a Well Installation Plan/SAP for monitoring wells CCBA-MW1, CCBA-MW2, OBS-MW1, OBS-MW2, and OBS-MW3 (SNL/NM September 2010) that was subsequently approved (with modification) by the NMED (January 2011). All of these wells have been sampled for eight or more consecutive monitoring events with no perchlorate detections and have since been removed from the perchlorate sampling list.

4.0 **Monitoring Results**

Table II-3 summarizes the details of samples collected from monitoring well CYN-MW14A in the First Quarter of CY 2015. Table II-4 summarizes current and historical perchlorate results for the well currently in the perchlorate screening monitoring network. The analytical laboratory COA for the First Quarter of CY 2015 perchlorate data is provided in Appendix A. Consistent with historical analytical results, no perchlorate was detected above the screening level in samples collected from monitoring well CYN-MW14A.

Table II-5 summarizes the stabilized water quality values measured immediately before the groundwater samples were collected. The field water quality measurements include turbidity, pH, temperature, SC, ORP, and DO.

The analytical data were reviewed and validated in accordance with Administrative Operating Procedure 00-03, “Data Validation Procedure for Chemical and Radiochemical Data,” Revision 4 (SNL/NM June 2014). No problems were identified with the analytical data that resulted in qualification of the data as unusable. The data are acceptable, and reported QC measures are adequate. The data validation sample findings summary sheets for the perchlorate data are provided in Appendix B.

No variances or nonconformances in perchlorate sampling field activities, or field conditions from requirements in the groundwater monitoring Mini-SAP (SNL/NM March 2015), were identified during the First Quarter of CY 2015 sampling activities.

5.0 **Summary and Conclusions**

Based on the analytical data presented in Table II-4 and in previous reports, the following statements can be made:

- No perchlorate was detected in the environmental samples from groundwater monitoring well CYN-MW14A at the screening level/MDL of 4 µg/L.
- Since June 2004 (the start of sampling as required by the Consent Order), perchlorate was detected above the screening level/MDL (4 µg/L) in groundwater samples from only one of the wells (CYN-MW6) in the perchlorate screening monitoring well network. However, no perchlorate was detected in the environmental samples from groundwater monitoring well CYN-MW15, the well that was installed to replace CYN-MW6.
- DOE/Sandia will continue periodic monitoring of perchlorate for monitoring wells CYN-MW14A (quarterly) and CYN-MW15 (semiannually).

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Figures

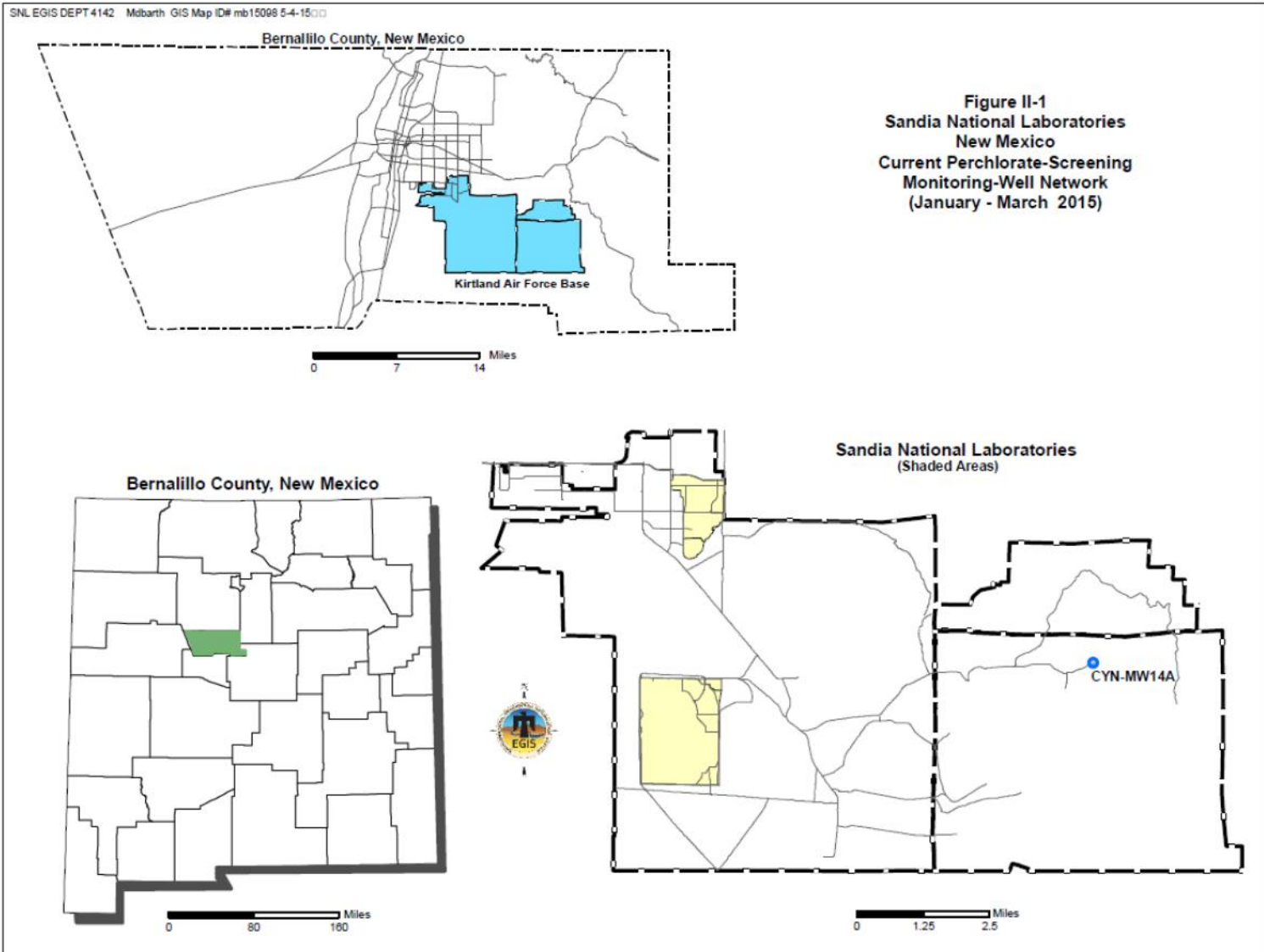


Figure II-1
Sandia National Laboratories, New Mexico
Current Perchlorate Screening Monitoring Well Network, January – March 2015

Tables

**Table II-1
Current Perchlorate Screening Monitoring Well Network
First Quarter, CY 2015**

Well	Date Sampled	Number of Consecutive Sampling Events ^a	Remaining Number of Sampling Events ^b	Sampling Equipment
CYN-MW14A	27-Mar-15	2	2	Bennett™ Pump

Notes

^aIncludes this sampling event.

^bPer the requirements of Table XI-1 of the Consent 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.

µg/L = Microgram(s) per liter.
 CY = Calendar Year.
 CYN = Canyons (Burn Site Groundwater Area of Concern).
 MDL = Method Detection Limit.
 MW = Monitoring Well.
 NMED = New Mexico Environment Department.
 The Consent Order = The Compliance Order on Consent.

Table II-2
Monitoring Wells Discussed in Previous Perchlorate Screening Reports

Well
CCBA-MW1
CCBA-MW2
CTF-MW1
CTF-MW2
CTF-MW3
CYN-MW1D
CYN-MW5
CYN-MW6
CYN-MW7
CYN-MW8
CYN-MW9
CYN-MW10
CYN-MW11
CYN-MW12
CYN-MW15
LWDS-MW1
MRN-2
MRN-3D
MWL-BW1
MWL-BW2
MWL-MW1
MWL-MW7
MWL-MW8
MWL-MW9
NWTA3-MW2
OBS-MW1
OBS-MW2
OBS-MW3
SWTA3-MW4
TA1-W-03
TA1-W-06
TA1-W-08
TA2-W-01
TA2-W-27
TAV-MW11
TAV-MW12
TAV-MW13
TAV-MW14

Notes

- BW = Background Well.
- CCBA = Coyote Canyon Blast Area.
- CTF = Coyote Test Field.
- CYN = Canyons (Burn Site Groundwater Area of Concern).
- LWDS = Liquid Waste Disposal System.
- MRN = Magazine Road North.
- MW = Monitoring Well.
- MWL = Mixed Waste Landfill.
- OBS = Old Burn Site
- NWTA = Northwest Technical Area (III).
- SWTA = Southwest Technical Area (III).
- TA1-W = Technical Area I (Well)
- TA2-W = Technical Area II (Well)
- TAV = Technical Area-V

Table II-3
Sample Details for First Quarter, CY 2015 Perchlorate Sampling

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation
CYN-MW14A	097522-020	616072	BSG AOC

Notes

AR/COC = Analysis Request/Chain-of-Custody.
BSG AOC = Burn Site Groundwater Area of Concern.
CY = Calendar Year.
CYN = Canyons (Burn Site Groundwater Area of Concern).
MW = Monitoring Well.

Table II-4
Summary of Perchlorate Screening Analytical Results for the
Current Monitoring Well Network as of First Quarter, CY 2015

Well	Sample Date	AR/COC Number	Sample Number	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	MCL (µg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Analytical Method ^c	Comments
Burn Site Groundwater Area of Concern											
CYN-MW14A	17-Dec-14	615940	096977-020	ND	4.0	12	NE	U		EPA 314.0	
	27-Mar-15	616072	097522-020	ND	4.0	12	NE	U		EPA 314.0	
			097523-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample

Notes

^aLaboratory Qualifier

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

^bValidation Qualifier

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

^cAnalytical Method

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

µg/L = Micrograms per liter.

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

CFR = Code of Federal Regulations.

CY = Calendar Year.

CYN = Canyons (Burn Site Groundwater Area of Concern).

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11, Subpart B) and subsequent amendments or Title 20, Chapter 7, Part 1 of the New Mexico Administrative Code, incorporating 40 CFR 141.

MDL = Method Detection Limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not Established.

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

Table II-5
Perchlorate Screening Groundwater Monitoring
Field Water Quality Measurements^a, First Quarter, CY 2015

Well	Sample Date	Temperature (°C)	Specific Conductivity (µmhos/cm)	Oxidation-Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
Burn Site Groundwater Area of Concern								
CYN-MW14A	27-Mar-15	16.84	922.3	139.0	7.47	0.15	7.2	0.71

Notes

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

- °C = Degrees Celsius.
- % Sat = Percent saturation.
- µmhos/cm = Micromhos per centimeter.
- CY = Calendar Year.
- CYN = Canyons (Burn Site Groundwater Area of Concern).
- mg/L = Milligrams per liter.
- mV = Millivolt(s).
- MW = Monitoring Well.
- NTU = Nephelometric turbidity unit.
- pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).

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Appendix A
Analytical Laboratory Certificates of
Analysis for the Perchlorate Data

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>N/A</i>	SMO Use		AR/COG 616072
Project Name: BSG	Date Samples Shipped: <i>3/27/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project/Task Manager: Mike Skelly	Carrier/Waybill No. <i>231506</i>	SMO Contact Phone: <i>SMO</i>	
Project/Task Number: 146422.10.11.01	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	
Service Order: CF058-15	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
Contract No.: PO.1303873		Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <i>369676</i>	

Tech Area:	Operational Site:
Building:	Room:

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097522	-020	CYN-MW14A	281	'3/27/15 9:56	GW	P	250 ml	None	G	SA	Perchlorate (EPA 314.0)	001
097523	-020	CYN-MW14A	281	'3/27/15 9:56	GW	P	250 ml	None	G	DU	Perchlorate (EPA 314.0)	002

Last Chain: <input checked="" type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		EDD		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Background: <input type="checkbox"/> Yes		Entered by:		Turnaround Time		<input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day				
Confirmatory: <input type="checkbox"/> Yes		QC inits.:		Negotiated TAT		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab				
Sample Team Members	Name		Signature		Init.		Company/Organization/Phone/Cell		Sample Disposal	
	Robert Lynch		<i>[Signature]</i>		RL		SNL/4142/505-844-4013/505-250-7090		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
	Alfred Santillanes		<i>[Signature]</i>		AS		SNL/4142/505-284-6870/505-228-0710		Return Samples By:	
	William Gibson		<i>[Signature]</i>		WG		SNL/4142/505-284-3307/505-239-7367		Comments: Send report to Tim Jackson/4142/MS 0729/284-2547	
Lab Use										

1. Relinquished by <i>Alfred Santillanes</i> Org. <i>4142</i> Date <i>3/27/15</i> Time <i>1028</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>3/27/15</i> Time <i>1028</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>3/27/15</i> Time <i>1045</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>GEL</i> Date <i>3-28-15</i> Time <i>1110</i>	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 21, 2015

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: Groundwater, Level C Package

Client Sample ID: 097522-020
Sample ID: 369676001
Matrix: AQUEOUS
Collect Date: 27-MAR-15 09:56
Receive Date: 28-MAR-15
Collector: Client

Project: SNLSGWater
Client ID: SNLS004
Client Desc.: CYN-MW14A
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MXL2	04/13/15	2300	1467675	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

Notes:

*

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

Client Sample ID: 097523-020
Sample ID: 369676002
Matrix: AQUEOUS
Collect Date: 27-MAR-15 09:56
Receive Date: 28-MAR-15
Collector: Client

Project: SNLSGWater
Client ID: SNLS004

Client Desc.: CYN-MW14A
Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 314.0 Perchlorate by IC "As Received"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MXL2	04/13/15	2358	1467675	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 314.0 DOE-AL	

Notes:

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



Memorandum

Date: May 5, 2015
To: File
From: Monica Dymerski
Subject: Inorganic Data Review and Validation – SNL
Site: BSG
AR/COC: 616071 and 616072
SDG: 369676
Laboratory: GEL
Project/Task: 146422.10.11.01
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 4.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate by IC). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

Holding Times and Preservation

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

Calibration

All initial and continuing calibration met QC acceptance criteria.

Blanks

No target analyte was detected in the blanks.

Laboratory Control Sample (LCS)

The LCS acceptance criteria were met.

Matrix Spike (MS)

The MS/PS recovery met QC acceptance criteria.

Laboratory Replicate

The replicate analysis met all QC acceptance criteria.

Detection Limits/Dilutions

The detection limits were properly reported. The samples were not diluted.

Other QC

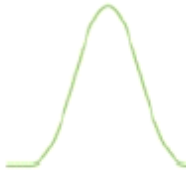
An EB was submitted with ARCOG 616071, and was applied to samples from ARCOG 616072. A field duplicate pair was submitted with ARCOG 616072. There are no “required” review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Linda Thal

Level: I

Date: 05/05/15



Sample Findings Summary



AR/COC: 616071, 616072

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

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

