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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 2016



**July 2016**



United States Department of Energy  
Sandia Field Office

# CONSOLIDATED QUARTERLY REPORT

July 2016

SANDIA NATIONAL LABORATORIES, NEW MEXICO

## ENVIRONMENTAL RESTORATION OPERATIONS

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

SANDIA FIELD OFFICE  
SANDIA CORPORATION  
John R. Cochran

**NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO RESOURCE  
CONSERVATION AND RECOVERY ACT FACILITY OPERATING PERMIT, AND THE  
COMPLIANCE ORDER ON CONSENT: 13**

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

**REPORTING PERIOD:** January – March 2016

### 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 process are listed in Table I-1. This ER Quarterly Report presents activities and data in sections as follows:

**SECTION I:** Environmental Restoration Operations Consolidated Quarterly Report,  
January – March 2016

Semiannual sampling at the Burn Site Groundwater Area of Concern currently includes perchlorate analyses at one groundwater monitoring well. Due to the semiannual nature of the sampling, no groundwater samples were collected for perchlorate analyses during this reporting period. Therefore, this edition of the ER Quarterly Report does not include Section II “*Perchlorate Screening Quarterly Groundwater Monitoring Report.*”

## ABBREVIATIONS AND ACRONYMS

µg/L	microgram(s) per liter
AGMR	Annual Groundwater Monitoring Report
ALTMM	Annual Long-Term Monitoring and Maintenance
AOC	Area of Concern
AVN	Area V (North)
BSG	Burn Site Groundwater
BW	background well
CAC	corrective action complete
CCBA	Coyote Canyon Blast Area
CTF	Coyote Test Field
CWL	Chemical Waste Landfill
CY	Calendar Year
CYN	Canyons (Burn Site Groundwater Area of Concern)
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
HWB	Hazardous Waste Bureau
ISB	in situ bioremediation
LWDS	liquid waste disposal system
MCL	maximum contaminant level
MW	monitoring well
MWL	Mixed Waste Landfill
NA	not applicable
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
OIG	Office of Inspector General
PCCP	Post-Closure Care Permit
Permit	RCRA Facility Operating Permit
PGS	Parade Ground South
RCRA	Resource Conservation and Recovery Act
Sandia	Sandia Corporation
SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit
TA	Technical Area
TA1-W	Technical Area I (Well)
TA2-NW	Technical Area II (Northwest)
TA2-SW	Technical Area II (Southwest)

TA2-W	Technical Area II (Well)
TAVG	Technical Area-V Groundwater
TAG	Tijeras Arroyo Groundwater
TAV	Technical Area V (acronym used in tables only)
TA-V	Technical Area V
TCE	trichloroethene
TJA	Tijeras Arroyo
TSWP	Treatability Study Work Plan
WYO	Wyoming
VCA	Voluntary Corrective Action

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# **SECTION I**

## **ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED**

### **QUARTERLY REPORT, January – March 2016**

#### **1.0 Introduction**

This Environmental Restoration Operations Consolidated Quarterly Report (ER Quarterly Report) provides the status of ongoing corrective action activities being implemented by Sandia National Laboratories, New Mexico (SNL/NM) for the January, February, and March 2016 quarterly reporting period.

The Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified for corrective action at SNL/NM are listed in Table I-1. The work completed during this quarter is reported below in Sections I.2.1 and I.2.2. Section I.2.1 summarizes the quarterly activities at sites undergoing corrective action *field* activities (SWMUs 8 and 58, 68, 149, 154, and 502, and three groundwater AOCs). Section I.2.2 summarizes quarterly activities at sites where the New Mexico Environment Department (NMED) has issued a certificate of completion and the sites are in the corrective action complete (CAC) *regulatory* process. Currently, the Mixed Waste Landfill (MWL, SWMU 76) is the only site in the CAC regulatory process.

Corrective action activities have been deferred at the Long Sled Track (SWMU 83), the Gun Facilities (SWMU 84), and the Short Sled Track (SWMU 240) because these three sites are active mission facilities. These three sites are located in Technical Area (TA)- III.

#### **2.0 Environmental Restoration Operations Work Completed**

##### **2.1 Sites Undergoing Corrective Action**

In a letter dated March 30, 2016, the Permittees proposed a set of milestones to the NMED for delivering documents demonstrating progress towards completion of groundwater remediation at the TA-V Groundwater (TAVG), Burn Site Groundwater (BSG) and Tijeras Area Groundwater (TAG) AOCs (DOE March 2016a).

### 2.1.1 **Solid Waste Management Units 8 and 58, 68, 149, and 154**

In February 2015, NMED agreed that corrective action activities at SWMUs 8 and 58, 68, 149, and 154 had been completed, and that certificates of completion could be requested (NMED February 2015). A letter requesting Certificates of Completion for these SWMUs was submitted to NMED on September 9, 2015 (DOE September 2015). In January 2016, NMED granted the Certificates of Completion for these SWMUs (NMED January 2016a).

### 2.1.2 **Solid Waste Management Unit 502**

The U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation (Sandia) formally notified the NMED of this newly identified or suspected SWMU by letter dated December 19, 2012 (DOE December 2012). A January 2013 inspection of the discharge area, with assistance from personnel associated with the processes that generated the wastewater, identified several small zones of discolored soil within a total area approximately 10 feet wide by 25 feet long. Subsequent actions are described in the ER Consolidated Quarterly Report, July – September 2015 (SNL/NM January 2016).

On June 7, 2013, the DOE/NNSA and Sandia submitted a Voluntary Corrective Action (VCA) Plan to NMED (DOE June 2013). On July 23, 2013, field activities were completed in accordance with the VCA Plan.

Results of the VCA were reported to the NMED under a cover letter dated November 12, 2013 (DOE November 2013). DOE/NNSA and Sandia recommended a determination of CAC without controls for SWMU 502, based upon the field investigation results, soil sample analytical data, and the human health and ecological risk assessments. On February 29, 2016, the NMED approved the November 2013 VCA Report and noted that the DOE and Sandia may request a permit modification for CAC status for SWMU 502 (NMED February 2016a).

### 2.1.3 **Burn Site Groundwater Area of Concern**

The DOE/NNSA and Sandia met with the NMED Hazardous Waste Bureau (HWB) on July 20, 2015 to discuss the status of sites currently undergoing corrective action. For the BSG AOC, all parties agreed to a weight-of-evidence characterization program: (1) to conduct additional isotopic analyses/nitrate fingerprinting and age-dating of the groundwater; (2) to conduct a transducer study using existing wells to determine if the

groundwater is unconfined, semi-confined, or confined; and (3) to conduct a detailed aquifer pumping test to help determine the origin of the elevated nitrates in the groundwater. Activities (1) and (2) will be completed using Sandia-internal work plans. For activity (3), the Aquifer Pumping Test Work Plan for the BSG AOC will be transmitted to the NMED in June 2016 for review and approval.

Semiannual sampling at the BSG AOC currently includes perchlorate analyses at one groundwater monitoring well. Due to the semiannual nature of the sampling, no groundwater samples were collected for perchlorate analysis during this reporting period. Therefore, this edition of the ER Quarterly does not include Section II “*Perchlorate Screening Quarterly Groundwater Monitoring Report.*”

The following activities occurred at BSG AOC during January, February, and March 2016:

- For the vertical profiling survey that was conducted at the Burn Site Well and CYN-MW11 in December 2015, a technical memorandum was prepared for internal review. The memorandum is anticipated to be finalized in the next quarter.
- The DOE/NNSA and Sandia met with the NMED HWB on February 19, 2016 to further discuss the status and schedule of the BSG AOC weight-of-evidence characterization program.
- The Long Term Transducer study was implemented with water level data collected in all BSG AOC wells from January 11, 2016 through March 13, 2016.

#### 2.1.4 **Technical Area-V Groundwater Area of Concern**

Trichloroethene (TCE) and nitrate have been identified as constituents of concern in groundwater at the TAVG AOC based on detections above the U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs) in samples collected from monitoring wells. The EPA MCLs and State of New Mexico drinking water standards for TCE and nitrate are 5 micrograms per liter ( $\mu\text{g/L}$ ) and 10 milligrams per liter (as nitrogen), respectively.

Personnel from the DOE/NNSA, DOE Headquarters Office of Environmental Management, Sandia, and NMED worked together to address the groundwater contamination at TAVG AOC. A meeting was held at the NMED HWB on July 20, 2015, and all parties agreed on a phased Treatability Study for in-situ bioremediation (ISB) to treat the groundwater contamination at TAVG AOC.

For the Treatability Study, up to three injection wells will be installed at TA-V in the vicinity of the highest contaminant concentrations in groundwater detected in monitoring wells LWDS-MW1, TAV-MW6, and TAV-MW10. The proposed injection wells will be used to deliver substrate solution and bioaugmentation bacteria to groundwater. The substrate solution containing essential food and nutrients for biostimulation will be prepared in aboveground tanks. The substrate solution will be gravity-injected along with the bioaugmentation bacteria to groundwater via injection wells. The overall objective is to assess the feasibility of using ISB to remediate groundwater contamination at TA-V.

The following activities occurred at TAVG AOC during January, February, and March 2016:

- DOE/NNSA and Sandia requested an extension to submit the revised Treatability Study Work Plan (TSWP) and the response letter to NMED's comments on the initial version of the TSWP on January 15, 2016 (DOE January 2016). NMED approved the extension request on January 29, 2016 (NMED January 2016b). The new due date for submittal of the revised TSWP is March 31, 2016.
- DOE/NNSA and Sandia revised the TSWP based on NMED's comments on the initial version of the TSWP (NMED December 2015). The revised TSWP and the response letter (SNL/NM March 2016) were submitted to NMED in March 2016 (DOE March 2016b).
- DOE/NNSA and Sandia are working on Notice of Intent to Discharge for the Treatability Study injection wells per the requirements of NMED Ground Water Quality Bureau.
- Groundwater sampling was conducted in February and March 2016. The well identification and the frequency that these wells were sampled are presented in Table I-2. The analytical results for groundwater monitoring will be presented in the SNL/NM calendar year (CY) 2016 Annual Groundwater Monitoring Report, which is anticipated to be submitted to the NMED in the summer of 2017.

#### 2.1.5 **Tijeras Arroyo Groundwater Area of Concern**

Groundwater sampling at the TAG AOC was conducted in March 2016. The well identification and the frequency that these wells were sampled are presented in Table I-2. The analytical results for groundwater monitoring will be presented in the SNL/NM CY 2016 Annual Groundwater Monitoring Report, which is anticipated to be submitted to the NMED in the summer of 2017.

Preparation of two TAG reports (the Current Conceptual Model and the Corrective Measures Evaluation Report) began this quarter. Submittal of the two reports to NMED HWB is scheduled for December, 2016.

## 2.2 **Sites in Corrective Action Complete Regulatory Process**

After NMED certifies completion of corrective action activities at a SWMU or an AOC, a Class 3 Permit Modification to the Resource Conservation and Recovery Act (RCRA) Facility Operating Permit (Permit) is requested to formally change the status of the SWMU or AOC from Corrective Action Required to either CAC without Controls or CAC with Controls. The Class 3 Permit Modification process is a regulatory process. Currently, the MWL is the only site in the CAC regulatory process.

### 2.2.1 **Mixed Waste Landfill**

The NMED issued the Certificate of Completion for the MWL on October 8, 2014 (NMED October 2014). The DOE/NNSA and Sandia subsequently submitted a Class 3 Permit Modification Request to NMED to change the MWL status to CAC with Controls on October 17, 2014 (DOE 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. NMED issued a public notice announcing their intent to approve the DOE/NNSA and Sandia request for CAC with controls status for the MWL and initiated a 60-day public comment period that started on January 12, 2015 (NMED January 2015). On March 17, 2015, NMED extended this public comment period an additional 30 days, to April 13, 2015. On April 29 and May 4, 2015, NMED conducted informal negotiations open to all parties that requested a hearing during the public comment period. These meetings did not resolve identified issues to the satisfaction of all parties that requested a hearing, so the NMED proceeded with a public hearing from July 8 through 11, 2015. During the hearing, Sandia staff provided direct and rebuttal testimony, as well as being subjected to cross-examination. The Hearing Officer's Report was issued on October 13, 2015 recommending CAC with controls status be granted for the MWL.

On February 12, 2016, the NMED Secretary Ryan Flynn issued the Final Order *In the Matter of Proposed Permit Modification for Sandia National Laboratories EPA ID No. NM5890110518 to Determine Corrective Action Complete with Controls at the Mixed Waste Landfill*, No. HWB 15-18 (P) (NMED February 2016b). The Class 3 Permit Modification for MWL CAC with Controls was approved by NMED on February 18, 2016

(NMED February 2016c). As of March 13, 2016, the February 2016 Final Order became effective, granting the Class 3 Permit Modification to reflect that the MWL is CAC with Controls.

Ongoing long-term monitoring, inspection, maintenance/repair, and reporting activities are conducted by the SNL/NM Long-Term Stewardship Program and are documented in MWL Annual Long-Term Monitoring and Maintenance Reports submitted to the NMED in June of each year.

The DOE Office of Inspector General (OIG) special investigation of the MWL that was initiated by requests to their hotline in late 2014 and early 2015 was completed on February 18, 2016 with issuance of their *Special Report, Allegations Regarding the Sandia National Laboratories Mixed Waste Landfill* (DOE OIG February 2016). The OIG Report substantiated one of the six allegations investigated: that the inventory of the MWL is not complete. The DOE OIG acknowledged that this issue was previously addressed at the December 2004 public hearing for final remedy selection. The DOE OIG was not able to substantiate the other five allegations during their one-year plus investigation, and they concluded that DOE/NNSA and Sandia should continue to comply with long-term monitoring, inspection, and reporting requirements of the May 2005 NMED Final Order (NMED May 2005).

### 2.3 **Environmental Restoration Operations Documents Submitted to the New Mexico Environment Department 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 TA-V Geophysical Logs and Slug Test Results Report submitted to the NMED on November 24, 2010 (SNL/NM November 2010).

- The Revised TWSP for In-Situ Bioremediation at the TAVG AOC submitted to the NMED on March 18, 2016 (SNL/NM March 2016).
- The MWL Groundwater Monitoring Report for CY 2010 submitted to the NMED on September 30, 2011 (SNL/NM September 2011).

### 3.0 **References**

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New Mexico Environment Department (NMED), February 2016a. Letter to J. Harrell (U.S. Department of Energy NNSA/Sandia Field Office) and P. Davies (Sandia National Laboratories, New Mexico), “Approval Investigation Report for Voluntary Correction Action at Solid Waste Management Unit 502 Building 9938 Surface Discharge Site for Sandia National Laboratories/New Mexico, October 2013, Sandia National Laboratories EPA ID# NM5890110518, SNL-15-013,” NMED, Hazardous Waste Bureau, Santa Fe, New Mexico, February 29, 2016.

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# Tables



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

<b>Solid Waste Management Units and Areas of Concern</b>	
<b>Site Number</b>	<b>Site Description</b>
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
NA	Tijeras Arroyo Groundwater Investigation (TAG AOC)
NA	TA-V Groundwater Investigation (TAVG AOC)
NA	Burn Site Groundwater Investigation (BSG AOC)
502	Building 9938 Surface Discharge Site
<b>Total</b>	<b>13</b>

**Notes**

- AOC = Area of Concern.
- BSG = Burn Site Groundwater.
- CCBA = Coyote Canyon Blast Area.
- CTF = Coyote Test Field.
- MWL = Mixed Waste Landfill.
- NA = Not applicable. A site number was not assigned.
- 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 2016 <sup>a</sup>	Quarter of Sampling in CY 2016	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-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**

<sup>a</sup>Not 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.