



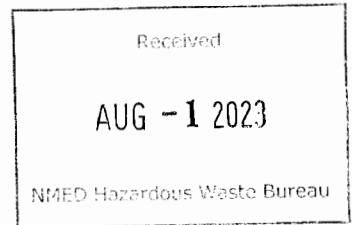
NNSA-2023-005779

Department of Energy
National Nuclear Security Administration
Sandia Field Office
P.O. Box 5400
Albuquerque, NM 87185



JUL 28 2023

 **ENTERED**



Mr. Ricardo Maestas
Acting Chief, Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, New Mexico 87505

Subject: Submittal of Environmental Restoration Operations Consolidated Quarterly Report, July 2023, Referenced in the Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, New Mexico, Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Maestas:

The Department of Energy, National Nuclear Security Administration, Sandia Field Office, and National Technology & Engineering Solutions of Sandia, LLC, submit the Subject document dated July 2023. This report addresses all quarterly reporting from January 1 through March 31, 2023, in accordance with the Compliance Order on Consent for Sandia National Laboratories, New Mexico.

If you should have any questions, please contact me at (505) 845-6036 or Dr. Adria Bodour of our staff at (505) 845-6930, or adria.bodour@nnsa.doe.gov.

Sincerely,

Daryl J. Hauck, Ph.D.
Manager

cc: See Page 2

JUL 28 2023

cc w/enclosure:

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ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED
QUARTERLY REPORT, JULY 2023

CERTIFICATION STATEMENT

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

RODNEY KEITH
(Affiliate)

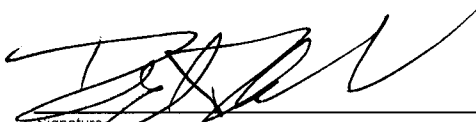
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Date: 2023.07.13 13:36:46 -06'00'

Signature

Date

Rodney L. Keith
Defense Waste Management Programs
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and



Signature

7/28/2023
Date

Daryl J. Hauck, Ph.D., Manager
U.S. Department of Energy
National Nuclear Security Administration
Sandia Field Office
Owner

Sandia National Laboratories, New Mexico

Environmental Restoration Operations

A U.S. Department of Energy Environmental Cleanup Program

Consolidated Quarterly Report

January – March 2023



July 2023



U.S. Department of Energy
Sandia Field Office

CONSOLIDATED QUARTERLY REPORT

July 2023

SANDIA NATIONAL LABORATORIES, NEW MEXICO

ENVIRONMENTAL RESTORATION OPERATIONS

U.S. DEPARTMENT OF ENERGY: SANDIA FIELD OFFICE
CONTRACTOR: NATIONAL TECHNOLOGY AND
ENGINEERING SOLUTIONS OF SANDIA, LLC
PROJECT MANAGER: Michael D. Barthel

NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO CORRECTIVE ACTION: 6

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

REPORTING PERIOD: January – March 2023

OVERVIEW

This Sandia National Laboratories, New Mexico (SNL/NM) *Environmental Restoration Operations Consolidated Quarterly Report* (ER Quarterly Report) fulfills all quarterly reporting requirements set forth in the *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act 74-4-10: Sandia National Laboratories Consent Order* (Consent Order) (NMED April 2004). Table I-1 lists the six SNL/NM sites remaining in the corrective action process.

This ER Quarterly Report consists of the following sections:

SECTION I: Environmental Restoration Operations Consolidated Quarterly Report,
January – March 2023

SECTION II: Perchlorate Screening Quarterly Groundwater Monitoring Report,
January – March 2023

ABBREVIATIONS AND ACRONYMS

AGMR	annual groundwater monitoring report
AOC	Area of Concern
BSG	Burn Site Groundwater
COC	constituent of concern
CY	calendar year
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
HWB	Hazardous Waste Bureau
MCL	maximum contaminant level
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit
TAG	Tijeras Arroyo Groundwater
TAVG	Technical Area-V Groundwater
TCE	trichloroethene

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SECTION I

ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED QUARTERLY REPORT, January – March 2023

1.0 Introduction

This section of the Sandia National Laboratories, New Mexico (SNL/NM) *Environmental Restoration Operations Consolidated Quarterly Report* (ER Quarterly Report) provides the status of the corrective actions the Environmental Restoration Operations Program is implementing at SNL/NM. It summarizes the corrective action work performed/completed during the January - March 2023 reporting period. It also identifies the constituents of concern (COCs) and summarizes the corrective action milestones (NMED April 2016) for the sites currently undergoing corrective action.

2.0 Corrective Action Work Performed/Completed

Table I-1 lists the six SNL/NM sites remaining in the corrective action process. They consist of three Solid Waste Management Units (SWMUs) and three groundwater Areas of Concern (AOCs).

Because the three SWMUs are active mission sites, the corrective actions for them are currently deferred.

The three groundwater AOCs are currently undergoing corrective action, with corrective action work performed/completed for them during the January – March reporting period.

2.1 Sites Currently Undergoing Corrective Action

In a letter dated January 6, 2023, the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) requested a comprehensive site-wide groundwater monitoring plan for SNL/NM that includes the three groundwater AOCs (NMED January 2023a). The first such plan is for calendar year (CY) 2024 and is due at the NMED HWB by April 30, 2023.

2.1.1 Burn Site Groundwater Area of Concern

Based on detections above the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) in groundwater samples collected from Burn Site Groundwater (BSG) AOC monitoring wells, nitrate is the COC for the BSG AOC (NMED April 2004). The EPA MCL and State of New Mexico groundwater standard for nitrate (as nitrogen) is 10 milligrams per liter.

Summary of Corrective Action Work, January – March 2023 Reporting Period:

- Submitted the *Burn Site Groundwater Area of Concern Current Conceptual Model and Corrective Measures Evaluation Report* (SNL January 2023a) to the NMED HWB in January 2023.
- Preparing the BSG AOC section of the comprehensive site-wide groundwater monitoring plan (NMED January 2023a).
- Conducted no groundwater sampling at the BSG AOC monitoring wells. Table I-2 presents the sampling frequency for all the monitoring wells currently in the BSG AOC monitoring well network.
- Will present the analytical results of the CY 2023 BSG AOC groundwater monitoring in the SNL/NM CY 2023 annual groundwater monitoring report (AGMR), which is due at the NMED HWB in the summer of 2024.

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

Based on detections above EPA MCLs in groundwater samples collected from Technical Area-V Groundwater (TAVG) AOC monitoring wells, trichloroethene (TCE) and nitrate are the COCs for the TAVG AOC (NMED April 2004). The EPA MCLs and State of New Mexico groundwater standards for TCE and nitrate (as nitrogen) are 5 micrograms per liter and 10 milligrams per liter, respectively.

U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) and SNL/NM personnel conducted a phased treatability study to evaluate the effectiveness of in-situ bioremediation as a potential technology to treat the TAVG AOC contamination. The technical approach was to gravity-inject substrate solution containing essential food, nutrients, and biodegradation bacteria into the groundwater via injection well(s). Phase I began in November 2017 and ended in May 2021, with the operation and findings summarized in the *Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern* (Phase I Treatability Study Report) (SNL March 2022). Based on the findings, DOE/NNSA and SNL/NM personnel recommended not proceeding to phase II. The NMED HWB subsequently approved the Phase I Treatability Study Report and concurred with the recommendation (NMED June 2022).

After the phased treatability study ended in May 2021, DOE/NNSA and SNL/NM personnel continued quarterly monitoring at monitoring wells TAV-INJ1 and TAV-MW6 (i.e., the phase I treatment zone) for one year from the third quarter of CY 2021 to the second quarter of CY 2022 (DOE August 2021; NMED October 2021). This additional

year of quarterly monitoring ended in April 2022, with the monitoring results presented in the corresponding ER Quarterly Reports. Thereafter, DOE/NNSA and SNL/NM personnel requested approval to decommission monitoring well TAV-INJ1 and revert monitoring well TAV-MW6 to the TAVG AOC monitoring well network (DOE July 2022). The NMED HWB subsequently approved the request (NMED September 2022).

DOE/NNSA and SNL/NM personnel requested an extension (DOE April 2022) for submitting the *Technical Area-V Groundwater Area of Concern Current Conceptual Model and Corrective Measures Evaluation Report* (TAVG AOC CCM/CME Report), which was due at the NMED HWB by May 20, 2022. The NMED HWB approved the extension request on May 24, 2022 (NMED May 2022) and the TAVG AOC CCM/CME Report is now due at the NMED HWB by May 20, 2024. The TAVG AOC CCM/CME Report will include the phased treatability study findings and phase I treatment zone monitoring results.

Summary of Corrective Action Work, January – March 2023 Reporting Period:

- Submitted the *Decommissioning Plan for Well TAV-INJ1 at the Technical Area-V Groundwater Area of Concern* (SNL January 2023b) to the NMED HWB in February 2023. The NMED HWB subsequently approved this plan (NMED March 2023).
- Preparing the TAVG AOC section of the comprehensive site-wide groundwater monitoring plan (NMED January 2023a).
- Plugged and abandoned three existing monitoring wells (AVN-1, AVN-2, and LWDS-MW2) and installed a new monitoring well (TAV-MW17).
- Began preparing the monitoring well decommissioning and installation report per the *Monitoring Well Plug and Abandonment Plan and Well Construction Plan, Decommissioning of Groundwater Monitoring Wells AVN-1, AVN-2, and LWDS-MW2 and Installation of Groundwater Monitoring Well TAV-MW17* (SNL August 2021).
- Conducted groundwater sampling at 10 TAVG AOC monitoring wells in February and March 2023 per the modified TAVG sampling plan approved by the NMED HWB (DOE August 2022; NMED December 2022). Table I-2 presents the sampling frequency for all the monitoring wells currently in the TAVG monitoring well network.

- Removed monitoring wells AVN-1, AVN-2, LWDS-MW2, and TAV-INJ1 from and added monitoring well TAV-MW17 to Table I-2. The first sampling event for monitoring well TAV-MW17 is scheduled for the second quarter of CY 2023.
- Will present the analytical results of the CY 2023 TAVG AOC groundwater monitoring in the SNL/NM CY 2023 AGMR, which is due at the NMED HWB in the summer of 2024.

2.1.3 **Tijeras Arroyo Groundwater Area of Concern**

Based on the NMED HWB correspondence titled *Approval, Final Remedy Decision and Response to Public Comment on Class 3 Permit Modification for Corrective Measures for Tijeras Arroyo Groundwater Area of Concern, Sandia National Laboratories, EPA ID# M5890110518, HWB-SNL-16-020* (NMED January 2023b), nitrate is the COC for the Tijeras Arroyo Grande (TAG) AOC. Per that correspondence, the selected final remedy for the TAG AOC is Monitored Natural Attenuation.

Summary of Corrective Action Work, January – March 2023 Reporting Period:

- Began preparing the *Tijeras Arroyo Groundwater Corrective Measures Implementation Plan*.
- Preparing the TAG AOC section of the comprehensive site-wide groundwater monitoring plan (NMED January 2023a).
- Conducted groundwater sampling at the 11 TAG AOC monitoring wells scheduled for quarterly and semiannual sampling. Table I-2 presents the sampling frequency for all the monitoring wells currently in the TAG AOC monitoring well network.
- Will present the analytical results of the CY 2023 TAG AOC groundwater monitoring in the SNL/NM CY 2023 AGMR , which is due at the NMED HWB in the summer of 2024.

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

There are currently no SNL/NM sites in the Corrective Action Complete regulatory process. The NMED HWB has approved Corrective Action Complete status for all the SWMUs located within the surface boundaries of the three groundwater AOCs and numerous SWMUs located outside of these surface boundaries.

3.0 References

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*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. April 29, 2004.

New Mexico Environment Department (NMED), April 2016. Letter to J.P. Harrell (U.S. Department of Energy, NNSA/Sandia Field Office) and M. W. Hazen (Sandia National Laboratories, New Mexico), *Summary of Agreements and Proposed Milestones Pursuant to the Meeting of July 20, 2015, March 30, 2016, Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-16-MISC*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. April 14, 2016.

New Mexico Environment Department (NMED), October 2021. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), *Approval with Modification: Transition of Five Groundwater Monitoring Wells as Condition to Terminate Discharge Permit (DP)-1845 under the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) to NMED Hazardous Waste Bureau (HWB), Sandia National Laboratories, New Mexico, EPA ID# NM5890110518, HWB-SNL-21-MISC*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. October 12, 2021.

New Mexico Environment Department (NMED), May 2022. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), *Approval: Extension Request for Submittal of the Current Conceptual Model and Corrective Measures Evaluation Report at the Technical Area-V Groundwater Area of Concern, Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-22-MISC*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. May 24, 2022.

New Mexico Environment Department (NMED), June 2022. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), *Approval: Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern, March 2022, Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-22-007*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. June 30, 2022.

New Mexico Environment Department (NMED), September 2022. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), *Approval: Formal Request to Decommission Injection Well TAV-INJ1 and Revert Groundwater Well TAV-MW6 to the Technical Area-V Groundwater Area of Concern Monitoring Network, Sandia National Laboratories, New Mexico, EPA ID# NM5890110518, HWB-SNL-22-MISC*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. September 13, 2022.

New Mexico Environment Department (NMED), December 2022. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), “Approval: Formal Request to Modify the Groundwater Monitoring Program for the Technical Area-V Groundwater Area of Concern at Sandia National Laboratories, New Mexico, EPA ID# NM5890110518, HWB-SNL-22-MISC,” NMED Hazardous Waste Bureau, Santa Fe, New Mexico. December 20, 2022.

New Mexico Environment Department (NMED), January 2023a. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), *Comprehensive Site-Wide Groundwater Monitoring Plan, Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-22-MISC*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. January 6, 2023.

New Mexico Environment Department (NMED), January 2023b. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and P. Shoemaker (Sandia National Laboratories), *Approval, Final Remedy Decision and Response to Public Comment on Class 3 Permit Modification for Corrective Measures for Tijeras Arroyo Groundwater Area of Concern, Sandia National Laboratories EPA ID# NM5890110518 HWB-SNL-16-020*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico, January 6, 2023.

New Mexico Environment Department (NMED), March 2023. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office) and R. Keith (Sandia National Laboratories), *Approval: Decommissioning Plan for Well TAV-INJI at the Technical Area-V Groundwater Area of Concern, Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-23-003*, NMED Hazardous Waste Bureau, Santa Fe, New Mexico. March 9, 2023.

Sandia National Laboratories, New Mexico (SNL/NM), August 2021. *Monitoring Well Plug and Abandonment Plan and Well Construction Plan; Decommissioning of Groundwater Monitoring Wells AVN-1, AVN-2, and LWDS-MW2; Installation of Groundwater Monitoring Well TAV-MW17*, Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), March 2022. *Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern*, Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), January 2023a. *Burn Site Groundwater Area of Concern Current Conceptual Model and Corrective Measures Evaluation Report*, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), January 2023b. *Decommissioning Plan for Well TAV-INJI at the Technical Area-V Groundwater Area of Concern*, Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

U.S. Department of Energy (DOE), August 2021. Letter to R. Maestas (New Mexico Environment Department), “*Transition of Five Groundwater Monitoring Wells as Condition to Terminate Discharge Permit (DP)-1845 under New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) to NMED Hazardous Waste (HWB).*” August 23, 2021.

U.S. Department of Energy (DOE), April 2022. Letter to R. Shean (New Mexico Environment Department), *Extension Request for Submittal of the Current Conceptual Model and Corrective Measures Evaluation Report at the Technical Area-V Groundwater Area of Concern for Sandia National Laboratories, New Mexico, Environmental Protection Agency Identification Number NM5890110518.* April 28, 2022.

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U.S. Department of Energy (DOE), August 2022. Letter to R. Shean (New Mexico Environment Department), “*Formal Request to Modify the Groundwater Monitoring Program for the Technical Area-V Groundwater Area of Concern at Sandia National Laboratories, New Mexico, Environmental Protection Agency Identification Number NM5890110518.*” August 30, 2022.

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Tables

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**Table I-1
SNL/NM Sites Remaining in the Corrective Action Process**

Site Number	Site Description
83	Long Sled Track (SWMU)
84	Gun Facilities (SWMU)
240	Short Sled Track (SWMU)
NA	Tijeras Arroyo Groundwater Investigation (TAG AOC)
NA	Technical Area-V Groundwater Investigation (TAVG AOC)
NA	Burn Site Groundwater Investigation (BSG AOC)

Notes:

- AOC = Area of Concern
- BSG = Burn Site Groundwater
- NA = Not applicable. A site number was not assigned.
- SNL/NM = Sandia National Laboratories, New Mexico
- SWMU = Solid Waste Management Unit
- TAG = Tijeras Arroyo Groundwater
- TAVG = Technical Area-V Groundwater

**Table I-2
Groundwater Sampling and Analysis Schedule^a**

Investigation Site	Sampling Frequency in CY 2023	Quarter of Sampling in CY 2023	Monitoring Wells in Network
TAVG AOC	Quarterly	1,2,3,4	TAV-MW17
	Semiannually	1,3	LWDS-MW1, TAV-MW2, TAV-MW4, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW14, TAV-MW16
	Annually	3	TAV-MW3, TAV-MW5, TAV-MW7, TAV-MW9, TAV-MW13, TAV-MW15
BSG AOC	Semiannually	2,4	CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN-MW14A, CYN-MW15, CYN-MW16, CYN-MW17, CYN-MW18, CYN-MW19
TAG AOC ^b	Quarterly	1,2,3,4	TA2-W-19, TA2-W-26, TA2-W-28, TJA-2, TJA-3, TJA-4, TJA-7
	Semiannually	1,3	TA1-W-06, TA2-W-01, TA2-W-27, TJA-6
	Annually	3	PGS-2, TA1-W-01, TA1-W-02, TA1-W-03, TA1-W-04, TA1-W-05, TA1-W-08, TA2-NW1-595, WYO-3
	Voluntarily	3	TA2-W-24, TA2-W-25, TJA-5

Notes:

^a Will present all analytical results in the SNL/NM CY 2023 annual groundwater monitoring report.

^b Removed monitoring well WYO-4 from the TAG sampling schedule in response to the August 2017 meeting with NMED HWB personnel. Monitoring well PGS-2 is not sampled because grout has intruded through the well screen. Monitoring well TA1-W-03 is not sampled because it is dry.

- AOC = Area of Concern
- BSG = Burn Site Groundwater (Area of Concern)
- CY = calendar year
- CYN = Canyons (Burn Site Groundwater Area of Concern; acronym used for well identification only)
- HWB = Hazardous Waste Bureau
- LWDS = liquid waste disposal system (acronym used for well identification only)
- MW = monitoring well (acronym used for well identification only)
- NMED = New Mexico Environment Department
- PGS = Parade Ground South (acronym used for well identification only)
- SNL/NM = Sandia National Laboratories, New Mexico
- TA1-W = Technical Area-I (Well) (acronym used for well identification only)
- TA2-NW = Technical Area-II (Northwest) (acronym used for well identification only)
- TA2-W = Technical Area-II (Well) (acronym used for well identification only)
- TAG = Tijeras Arroyo Groundwater (Area of Concern)
- TAV = Technical Area-V (acronym used for well identification only)
- TAVG = Technical Area-V Groundwater (Area of Concern)
- TJA = Tijeras Arroyo (acronym used for well identification only)
- WYO = Wyoming (acronym used for well identification only)

SECTION II

PERCHLORATE SCREENING QUARTERLY GROUNDWATER MONITORING REPORT, January – March 2023

Currently, there are no monitoring wells in the perchlorate groundwater sampling and analysis program. Therefore, there are no perchlorate monitoring results to report.

In compliance with the Consent Order, Section IV.B. (NMED April 2004), the Environmental Restoration Operations Program will monitor TAV-MW17, the new monitoring well, for perchlorate and report the results in future ER Quarterly Reports.

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