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

AUG 30 2022

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

Subject: 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

Dear Mr. Shean:

The Department of Energy, National Nuclear Security Administration, Sandia Field Office (DOE/NNSA SFO) and National Technology & Engineering Solutions of Sandia, LLC, the management and operating contractor for Sandia National Laboratories, New Mexico (SNL/NM) hereby formally request to modify the groundwater monitoring program for the Technical Area-V Groundwater (TAVG) Area of Concern (AOC) at SNL/NM. This request was initially discussed among personnel from the DOE/NNSA SFO, SNL/NM, and New Mexico Environment Department Hazardous Waste Bureau during a virtual meeting held on June 30, 2022. Details for the modifications of the monitoring program for the TAVG AOC are provided in Enclosure 1.

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

Enclosure:
1. Modifications to the Groundwater Monitoring Program for TAVG AOC

cc: See page 2

cc w/enclosure:
Beau Masse, Chief
NMED DOE Oversight Bureau
121 Tijeras Avenue, NE, Suite 1000, Albuquerque, New Mexico 87102
Naomi Davidson
NMED/HWB
121 Tijeras Avenue, NE, Suite 1000, Albuquerque, New Mexico 87102
Laurie King
Environmental Protection Agency Region 6
1201 Elm Street, Suite 500, Dallas, Texas 75270-2102
Zimmerman Library
University of New Mexico
1 University of New Mexico, MSC05 3020, Albuquerque, New Mexico 87101-0001

cc w/o enclosure:
David Cobrain, NMED/HWB
Amy Blumberg, SNL/NM
Paul Shoemaker, SNL/NM
Michael Nagy, SNL/NM
Michael Barthel, SNL/NM
Jun Li, SNL/NM
M. Anna Gallegos, SNL/NM
Elizabeth Lisann, DOE/EM-31
Robert Siefert, DOE/EM-31
Wilhelm Wilborn, DOE/EM-EM
Richard Dasher, NNSA/NA-533
Jessica Arcidiacono, NNSA/NA-533
Dori Richards, SFO/Legal
Adria Bodour, SFO/ENG
Conrad Valencia, SFO/ENG
NNSA-2022-006445

Enclosure 1

Modifications to the Groundwater Monitoring Program for TAVG AOC

Background

Personnel at the Department of Energy, National Nuclear Security Administration, Sandia Field Office (DOE/NNSA SFO), and Sandia National Laboratories, New Mexico (SNL/NM) have been implementing the groundwater monitoring program at the Technical Area-V (TA-V) Groundwater (TAVG) Area of Concern (AOC) in accordance with Section 6.1 of the "Revised Treatability Study Work Plan for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern" (Revised TSWP; SNL/NM March 2016) since Calendar Year (CY) 2017 (SNL/NM June 2018). In Section 6.2 of the Revised TSWP indicated that the groundwater monitoring program for the TAVG AOC would be re-evaluated after completion of the Treatability Study (SNL/NM March 2016). DOE/NNSA SFO and SNL/NM personnel completed Phase I of the Treatability Study in May 2021 and submitted the "Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern" to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) in April 2022 (Phase I Report; DOE April 2022). The NMED HWB approved the Phase I Report in June 2022 and concurred with the recommendation not to proceed with Phase II of the Treatability Study (NMED June 2022).

Recent Changes of Groundwater Wells in the TAVG AOC Monitoring Network

In Section 4.4 of the Revised TSWP, DOE/NNSA SFO and SNL/NM personnel planned to install two groundwater wells, TAV-MW15 and TAV-MW16, to 1) better characterize the potentiometric surface along the southern boundary of TA-V, and 2) define the extent of trichloroethene (TCE) contamination (SNL/NM March 2016). These two groundwater wells were installed in January 2017 and the first groundwater sampling event was conducted in February 2017. Since then, these two groundwater wells have been part of the TAVG AOC monitoring network. Monitoring results from CY 2017 at these two groundwater wells indicate that they have fulfilled the purposes of better characterizing the potentiometric surface along the southern boundary of TA-V and defining the southern extent of TCE contamination (SNL/NM March 2022, Attachment C).

More recently, the following changes to the TAVG AOC monitoring network have been agreed upon by the stakeholders (NMED October 2021 and DOE July 2022):

- Decommission groundwater wells AVN-1, AVN-2, LWDS-MW2, and injection well TAV-INJ1;
- Install new groundwater well TAV-MW17 in the vicinity of AVN-1/AVN-2 wells; and
- Revert groundwater well TAV-MW6 to the sampling frequency and analytical suite of the TAVG AOC monitoring network.

Rationale for Modifying the Groundwater Monitoring Program at TAVG AOC

DOE/NNSA SFO and SNL/NM personnel submitted the "Current Conceptual Model for Technical Area-V Groundwater Area of Concern at Sandia National Laboratories, New Mexico" in October 2015 (CCM; SNL/NM September 2015), which was approved by the NMED HWB in November 2015 (NMED November 2015). The Current Conceptual Model (CCM) described that the main characteristics of the Regional Aquifer at TA-V are low flow velocity and low hydraulic conductivity. Nitrate and TCE are the two constituents of concerns in the Regional Aquifer at TA-V. The plumes of nitrate and TCE are of low concentrations, limited size, and stagnant, and are not migrating away from TA-V in the Regional Aquifer. Therefore, the plumes do not adversely impact human health and the environment. Results of the Phase I Treatability Study further confirmed the characteristics of the Regional Aquifer and the plumes at TA-V presented in the CCM (SNL/NM March 2022).

DOE/NNSA SFO and SNL/NM personnel propose following sampling frequencies for the groundwater wells at the TAVG AOC with respect to the two constituents of concerns:

- Semiannual sampling for groundwater wells that have detections of TCE or have nitrate plus nitrite (NPN) concentrations exceeding the nitrate maximum contaminant level (MCL) of 10 milligram per liter (mg/L).
- Annual sampling for groundwater wells that have no detections of TCE or have NPN concentrations below the nitrate MCL of 10 mg/L.
- Changes in TCE detections or NPN concentrations exceeding the nitrate MCL of 10 mg/L for a specific well will be evaluated on a well-by-well basis, and any modification of its sampling frequency will be communicated with the NMED HWB.

Modification of Sampling Frequency

Table 1 presents the current sampling frequency of the groundwater wells in the TAVG AOC monitoring network as of the third quarter in CY 2022, showing the to-be-decommissioned wells with strike-through font. Note that groundwater well AVN-2 is not listed in Table 1 because it is an inactive well (dry).

Table 1. Sampling Frequency of Wells in TAVG AOC Monitoring Network as of Third Quarter in CY 2022

Investigation Site	Sampling Frequency in CY 2022	Quarter of Sampling in CY 2022	Monitoring Wells in Network
TAVG AOC	Quarterly	1,2,3,4	LWDS-MW1, ~~TAV-INJ1~~, TAV-MW2, TAV-MW4, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW14, TAV-MW15, TAV-MW16
	Semiannually	2,4	TAV-MW7
	Annually	2	~~AVN-1, LWDS-MW2,~~ TAV-MW3, TAV-MW5, TAV-MW9, TAV-MW13

Table 2 presents the modified sampling frequency for the TAVG AOC monitoring network as proposed. Note that new groundwater well TAV-MW17 is anticipated to be installed in the fourth quarter of CY 2022.

Table 2. Modified Sampling Frequency of Wells in TAVG AOC Monitoring Network as Proposed Starting in CY 2023

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	To be determined	LWDS-MW1, TAV-MW2, TAV-MW4, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW14, TAV-MW16
	Annually	To be determined	TAV-MW3, TAV-MW5, TAV-MW7, TAV-MW9, TAV-MW13, TAV-MW15

Following the criteria stated earlier, Table 2 shows that the sampling frequency of 10 groundwater wells that have TCE detections will be reduced from quarterly to semiannually: LWDS-MW1, TAV-MW2, TAV-MW4, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW14, TAV-MW16.

Groundwater well TAV-MW7 is a deep well, similar to TAV-MW9 and TAV-MW13, with its mid-screen set at 90 feet below the water table. It has no TCE detections, and results from the Phase I Treatability Study showed that this groundwater well was not impacted by the solution injected for the Treatability Study, indicating that no direct hydrogeologic connection exists with nearby water table wells (SNL/NM March 2022). Table 2 shows that the sampling frequency for well TAV-MW7 will be reduced from semiannual to annual.

The four annually sampled groundwater wells, TAV-MW3, TAV-MW5, TAV-MW9, and TAV-MW13, which have no TCE detections, will not change sampling frequency (Table 2). Also, groundwater well TAV-MW15 has no TCE detections; therefore, its sampling frequency will be reduced from quarterly to annually (Table 2).

The new groundwater well TAV-MW17 is anticipated to be part of the TAVG AOC monitoring network starting in the fourth quarter of CY 2022 with the first sampling event approximately one month after installation. This groundwater well will be sampled quarterly for a minimum of one year (Table 2) and its sampling frequency will be re-revaluated thereafter.

The new groundwater well TAV-MW17 will complete the TAVG AOC monitoring network with 17 active groundwater wells: LWDS-MW1, and TAV-MW2 through TAV-MW17.

Modification of Analytical Suite

Currently, the TAVG AOC monitoring network analytical suite includes:

- Nitrate plus nitrite,
- Volatile organic compounds,
- Filtered metals (arsenic, iron, and manganese), and
- Annual parameters including
    - Alkalinity,
    - Anions (bromide, chloride, fluoride, and sulfate),
    - Gamma spectroscopy short-list (americium-241, cesium-137, cobalt 60, and potassium-40),
    - Gross alpha/beta activity,
    - Tritium, and
    - Target Analyte List metals plus total uranium.

The filtered metals were added to the analytical suite starting in CY 2017 because of Treatability Study requirements. Wells located within and surrounding the Treatability Study treatment areas were required to be analyzed for filtered metals to evaluate the aquifer environment during bioremediation. Subsequently, filtered metals were added to the analytical suite for all TAVG AOC groundwater wells. As the Treatability Study concluded, continuing to sample these parameters was not necessary.

DOE/NNSA SFO and SNL/NM personnel propose the following analytical suite for the groundwater wells at the TAVG AOC:

- Nitrate plus nitrite,
- Volatile organic compounds, and
- Annual parameters including
    - Alkalinity,
    - Anions (bromide, chloride, fluoride, and sulfate),
    - Gamma spectroscopy short-list (americium-241, cesium-137, cobalt 60, and potassium-40),

- Gross alpha/beta activity,
- Tritium, and
- Target Analyte List metals plus total uranium.

In addition, well TAV-MW17 will be analyzed for perchlorate for a minimum of four consecutive quarters per the Compliance Order on Consent (NMED April 2004) for newly installed groundwater wells.

Effective Date of the Revised Groundwater Monitoring Program at TAVG AOC

DOE/NNSA SFO and SNL/NM personnel will implement the revised groundwater monitoring program at TAVG AOC starting at the beginning of CY 2023 (Table 2). This start date ensures that a complete year of CY 2022 data (under the current monitoring program) will be presented in the CY 2022 Annual Groundwater Monitoring Report. The specific information on sampling events throughout the year will be provided in Environmental Restoration Consolidated Quarterly Reports submitted to the NMED HWB.

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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: Monitoring Well Plug and Abandonment Plan and Well Construction Plan, Decommission of Groundwater Monitoring Wells AVN-1, ANV-2, and LWDS-MW2, Installation of Groundwater Monitoring Well TAV-MW17, August 2021, Sandia National Laboratories, New Mexico, EPA ID# NM5890110518, HWB-SNL-21-013," NMED Hazardous Waste Bureau, Santa Fe, New Mexico. October 26, 2021.

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