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

ENTERED NNSA National Nuclear Security Administration

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Mr. Rick Shean
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, October 2022, 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. Shean:

The Department of Energy, National Nuclear Security Administration, Sandia Field Office, and National Technology & Engineering Solutions of Sandia, LLC, submit the Subject document dated October 2022. This report addresses all quarterly reporting from April 1 through June 30, 2022, 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

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NNSA-2022-007848

ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED QUARTERLY REPORT, OCTOBER 2022

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.

Paul E. Shoemaker Digitally signed by Paul E. Shoemaker Date: 2022.10.04 11:35:44 -06'00'

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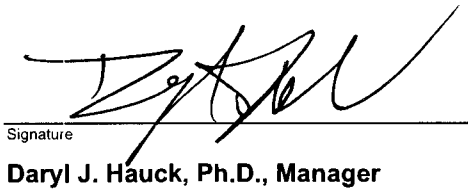
and



Signature

OCT 20, 2022

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

April – June 2022

October 2022

United States Department of Energy
Sandia Field Office

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA-0003525.

CONSOLIDATED QUARTERLY REPORT

October 2022

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: April – June 2022

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 Compliance Order on Consent. Table I-1 lists the six sites remaining in the corrective action process. This ER Quarterly Report presents activities and data as follows:

SECTION I:	Environmental Restoration Operations Consolidated Quarterly Report, April - June 2022
SECTION II:	Because there is no perchlorate sampling collection to report this quarter, this edition of the ER Quarterly Report does not include any analysis of data in Section II "Perchlorate Screening Quarterly Groundwater Monitoring Report."
SECTION III [Final]:	Additional Sampling at Technical Area-V Groundwater Monitoring Wells TAV-INJ1 and TAV-MW6, April - June 2022

ABBREVIATIONS AND ACRONYMS

µg/L	microgram(s) per liter
AGMR	Annual Groundwater Monitoring Report
AOC	Area of Concern
AVN	Area-V (North) (acronym used for well identification only
BSG	Burn Site Groundwater
CCM	Current Conceptual Model
CME	Corrective Measures Evaluation
COC	constituent of concern
CY	Calendar Year
CYN	Canyons (acronym used for well identification only)
DOE	U.S. Department of Energy
DP	Discharge Permit
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration Operations
ER Quarterly Report	Environmental Restoration Operations Consolidated Quarterly Report
GWQB	Ground Water Quality Bureau
HWB	Hazardous Waste Bureau
INJ	injection (acronym used for well identification only)
ISB	in-situ bioremediation
LWDS	liquid waste disposal system (acronym used for well identification only)
MCL	maximum contaminant level
mg/L	milligrams per liter
MW	monitoring well (acronym used for well identification only)
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NPN	nitrate plus nitrite
PGWS	Perched Groundwater System
SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit
TAG	Tijeras Arroyo Groundwater
TAV	Technical Area-V (acronym used for well identification only)
TA-V	Technical Area-V
TAVG	Technical Area-V Groundwater
TCE	trichloroethene
TOC	total organic carbon
TSWP	Treatability Study Work Plan

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SECTION I
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SECTION I
ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED QUARTERLY REPORT, April – June 2022

1.0 Introduction

This Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) provides the status of ongoing corrective action activities being implemented at Sandia National Laboratories, New Mexico (SNL/NM) during the April - June 2022 reporting period.

Table I-1 lists the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) currently identified for corrective action at SNL/NM. This section of the ER Quarterly Report summarizes the work completed during this reporting period at sites undergoing corrective action. Corrective action activities were conducted during this reporting period at the three groundwater AOCs:

- Burn Site Groundwater (BSG) AOC,
- Technical Area-V (TA-V) Groundwater (TAVG) AOC, and
- Tijeras Arroyo Groundwater (TAG) AOC.

Corrective action activities are 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 active mission sites are located in Technical Area-III.

There were no SWMUs or AOCs in the corrective action complete regulatory process during this reporting period. Corrective action complete status has been approved for all SWMUs within the surface boundaries of each of the three groundwater AOCs.

2.0 Environmental Restoration Operations Work Completed

The following subsections identify the constituents of concern (COCs), summarize the corrective action milestones, and describe the ER work completed during the April – June 2022 reporting period at the three groundwater AOCs.

2.1 Sites Undergoing Corrective Action

In a letter dated April 14, 2016, the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) defined the scope and milestones for corrective action at three groundwater AOCs (BSG AOC, TAVG AOC, and TAG AOC) (NMED April 2016). Sections I.2.1.1 through I.2.1.3 discuss the specific milestones from this letter.

2.1.1 Burn Site Groundwater Area of Concern

Nitrate has been identified as a COC in groundwater at the BSG AOC based on detections above the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) in samples collected from groundwater monitoring wells (NMED April 2004). The EPA MCL and State of New Mexico groundwater standard for nitrate (as nitrogen) is 10 milligrams per liter (mg/L). SNL/NM personnel are preparing a Current Conceptual Model (CCM) and Corrective Measures Evaluation (CME) Report for delivery to the NMED HWB in 2023.

The following activity occurred at the BSG AOC during the April - June 2022 reporting period:

- Groundwater sampling was conducted at 14 groundwater monitoring wells in April and May 2022. Table I-2 presents the identification and the sampling frequency for BSG AOC groundwater monitoring wells. The complete analytical results for Calendar Year (CY) 2022 groundwater monitoring will be presented in the SNL/NM CY 2022 Annual Groundwater Monitoring Report (AGMR), which is anticipated to be submitted to the NMED HWB in the summer of 2023.

2.1.2 Technical Area-V Groundwater Area of Concern

Trichloroethene (TCE) and nitrate have been identified as COCs in groundwater at the TAVG AOC based on detections above EPA MCLs in samples collected from monitoring wells (NMED April 2004). The EPA MCLs and the State of New Mexico groundwater standards for TCE and nitrate (as nitrogen) are 5 micrograms per liter (µg/L) and 10 mg/L, respectively.

Personnel from the U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA) , DOE Headquarters Office of Environmental Management, SNL/NM, and NMED HWB worked together to address the groundwater contamination at the TAVG AOC. A meeting was held with the NMED HWB on July 20, 2015, and all parties agreed

on a phased Treatability Study to evaluate the effectiveness of in-situ bioremediation (ISB) as a potential technology to treat groundwater contamination at the TAVG AOC.

To implement the ISB Treatability Study, SNL/NM personnel planned to install up to three injection wells (TAV-INJ1, TAV-INJ2, and TAV-INJ3) at TA-V near the highest contaminant concentrations in groundwater detected in monitoring wells TAV-MW6, TAV-MW10, and LWDS-MW1, respectively. Substrate solution containing essential food, nutrients, and biodegradation bacteria would be gravity-injected to groundwater via the injection well(s).

The NMED HWB approved the Revised Treatability Study Work Plan (TSWP) (SNL/NM March 2016) in May 2016 (NMED May 2016). In accordance with the Revised TSWP, Phase I of the ISB Treatability Study included a pilot test, followed by a full-scale test at the first injection well (TAV-INJ1). If implemented, Phase II of the ISB Treatability Study would have included well installation and full-scale tests at the second and third injection wells (TAV-INJ2 and TAV-INJ3). The decision to install the Phase II injection wells would be dependent upon the findings of the Phase I full-scale test.

The NMED Ground Water Quality Bureau (GWQB) required a groundwater Discharge Permit (DP) for operation of the injection wells. The NMED GWQB issued DP-1845 to DOE/NNSA for the SNL/NM ISB Treatability Study injection wells on May 26, 2017 (NMED May 2017a). The term of DP-1845 was from May 30, 2017 to May 29, 2022. As required by DP-1845, DOE/NNSA and SNL/NM personnel submitted separate quarterly reports to the NMED GWQB until the end of the Phase I Treatability Study in May 2021.

SNL/NM personnel started the Phase I Treatability Study at injection well TAV-INJ1 and monitoring well TAV-MW6 in November 2017 and completed the Phase I Treatability Study in May 2021. As the Phase I Treatabilty Study concluded, in order to terminate DP-1845, the oversight of the five wells regulated under DP-1845 (TAV-INJ1, LWDS-MW1, TAV-MW6, TAV-MW7, TAV-MW10) was transferred from NMED GWQB to NMED HWB (DOE August 2021; NMED October 2021). Injection well TAV-INJ1 was re-designated as a groundwater monitoring well starting in the third quarter of CY 2021 and became the 19th well of the TAVG monitoring network (18 active monitoring wells plus well TAV-INJ1). Consequently, DP-1845 was terminated by the NMED GWQB in February 2022 (NMED February 2022).

DOE/NNSA and SNL/NM personnel proposed to continue quarterly monitoring of wells TAV-INJ1 and TAV-MW6 (i.e., treatment zone of the Phase I Treatability Study) for one

year from July 2021 to June 2022 (DOE August 2021). This one-year additional sampling was concluded in this reporting period, and this is the final reporting (in Section III) of the additional year of sampling at these two wells. These monitoring results will be incorporated in the future CCM/CME Report and will support the NMED HWB's selection of a final remedy for the TAVG AOC Corrective Action.

The following activities occurred at the TAVG AOC during the April - June 2022 reporting period:

- The operation and results of the Phase I Treatability Study were summarized in the Phase I Treatability Study Report that was submitted to the NMED HWB in April 2022 (DOE April 2022). The NMED HWB subsequently approved the Phase I Treatability Study Report in June 2022 and concurred with the recommendation not to proceed to Phase II of the Treatability Study (NMED June 2022).
- DOE/NNSA and SNL/NM personnel requested an extension for submittal of the TAVG AOC CCM/CME Report, which was due to the NMED HWB by May 20, 2022 (DOE April 2022). The extension was approved by the NMED HWB on May 24, 2022 (NMED May 2022). The updated CCM/CME Report which will incorporate the Phase I Treatability Study findings is now due to the NMED HWB by May 20, 2024.
- Groundwater sampling at wells TAV-INJ1 and TAV-MW6 was conducted on April 13 and 14, 2022, respectively. Section III of this ER Quarterly Report presents the monitoring results collected at these two wells for this reporting period.
- Table I-2 presents the sampling frequency for the 19 wells currently in the TAVG monitoring network. Due to Stage III fire restrictions implemented at SNL/NM, groundwater sampling was conducted at 15 wells in May and June 2022 for this reporting period: LWDS-MW1, LWDS-MW2, TAV-MW2, TAV-MW4, TAV-MW5, and TAV-MW7 through and TAV-MW16. The remaining two wells (AVN-1 and TAV-MW3) will be sampled after the Stage III fire restrictions are lifted. The analytical results for CY 2022 groundwater monitoring (other than the results for wells TAV-INJ1 and TAV-MW6 up to June 2022) will be presented in the SNL/NM CY 2022 AGMR, which is anticipated to be submitted to the NMED HWB in the summer of 2023.

2.1.3 Tijeras Arroyo Groundwater Area of Concern

Two COCs, nitrate and TCE, were identified for the TAG AOC (NMED April 2004). Nitrate was identified as a COC based on exceedances of the EPA MCL in samples collected from monitoring wells completed in the Perched Groundwater System (PGWS) and in the Merging Zone above the Regional Aquifer. TCE was identified as a COC for

only the PGWS. No TCE concentrations in Regional Aquifer samples have exceeded the EPA MCL. The EPA MCLs and State of New Mexico groundwater standards for TCE and nitrate (as nitrogen) are 5 µg/L and 10 mg/L, respectively.

In May 2017, NMED HWB completed its review of the CCM/CME Report for the TAG AOC (SNL/NM December 2016), which was submitted to the NMED HWB on November 23, 2016 (DOE November 2016). This report was submitted in accordance with NMED's "Summary of Agreements and Proposed Milestones…" letter of April 14, 2016 (NMED April 2016). The subsequent disapproval letter issued by the NMED HWB (NMED May 2017b) requested the inclusion of additional information in a revised report. The Revised TAG CCM/CME Report was submitted to the NMED HWB on February 13, 2018 (SNL/NM February 2018).

Because of Stage III fire restrictions, no groundwater samples were collected at the TAG AOC during the April - June 2022 reporting period. The sampling will be conducted during the next reporting period.

2.2 Sites in Corrective Action Complete Regulatory Process

There are currently no SWMUs or AOCs at SNL/NM in the corrective action complete regulatory process.

3.0 References

DOE, see U.S. Department of Energy.

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.

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New Mexico Environment Department (NMED), May 2016. Letter to J. Harrell (U.S. Department of Energy NNSA/Sandia Field Office) and P. Davies (Sandia National Laboratories, New Mexico), "Approval Revised Treatability Study Work Plan for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern, Sandia National Laboratories, EPA ID# NM5890110518, HWB-SNL-15-020," NMED Hazardous Waste Bureau, Santa Fe, New Mexico. May 10, 2016.

New Mexico Environment Department (NMED), May 2017a. "Ground Water Discharge Permit, Sandia National Laboratories/New Mexico, Discharge Permit-1845," NMED Ground Water Quality Bureau, Santa Fe, New Mexico. May 26, 2017.

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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: 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), February 2022. Letter to D. Hauck (U.S. Department of Energy NNSA/Sandia Field Office), "Termination of Discharge Permit, DP-1845, Sandia National Laboratories/New Mexico Technical Area-V Groundwater Remediation Treatability Study," NMED Ground Water Quality Bureau, Santa Fe, New Mexico. February 4, 2022.

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.

NMED, see New Mexico Environment Department.

Sandia National Laboratories, New Mexico (SNL/NM), March 2016. *Revised Treatability Study Work Plan for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern, Sandia National Laboratories, Albuquerque, New Mexico,* Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories, New Mexico (SNL/NM), December 2016. *Tijeras Arroyo Groundwater Current Conceptual Model and Corrective Measures Evaluation Report*, Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

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SNL/NM, see Sandia National Laboratories, New Mexico.

U.S. Department of Energy (DOE), November 2016. Letter to J.E. Kieling (New Mexico Environment Department), "Tijeras Arroyo Groundwater Current Conceptual Model and Corrective Measures Evaluation Report, December 2016." November 23, 2016.

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), November 2021. Letter to A. Romero (New Mexico Environment Department), "Request to New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) to Terminate Discharge Permit (DP)-1845, U.S. Department of Energy, National Nuclear Security Administration, Sandia Field Office, Albuquerque, New Mexico." November 18, 2021.

U.S. Department of Energy (DOE), April 2022. Letter to R. Shean (New Mexico Environment Department), "Submittal of Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater (TAVG) Area of Concern (AOC) for Sandia National Laboratories, New Mexico (SNL/NM), Environmental Protection Agency Identification Number NM5890110518." April 1, 2022.

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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Tables

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

Solid Waste Management Units and Areas of Concern	
Site Number	**Site Description**
83	Long Sled Track
84	Gun Facilities
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)

Notes:

AOC = Area of Concern.
BSG = Burn Site Groundwater.
NA = Not applicable. A site number was not assigned.
TAG = Tijeras Arroyo Groundwater.
TA-V = Technical Area-V.
TAVG = Technical Area-V Groundwater.

Table I-2
Groundwater Sampling and Analysis Schedule[a]

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
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] All analytical results will be presented in subsequent Annual Groundwater Monitoring Reports, except for wells TAV-INJ1 and TAV-MW6. Results from these two wells for this reporting period are presented in Section III and will not be included in the CY 2022 Annual Groundwater Monitoring Report.

[b] Monitoring well WYO-4 was removed from the TAG sampling schedule in response to the August 2017 meeting with NMED HWB personnel.

AOC = Area of Concern.
AVN = Area-V (North) (acronym used for well identification only).
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.
INJ = Injection well (acronym used for well identification only).
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).
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, April – June 2022

Currently there are no wells in the perchlorate groundwater sampling and analysis program. Therefore, this edition of the Environmental Restoration Operations Consolidated Quarterly Report does not include any analysis of data in this section. When new groundwater monitoring wells are installed in the future, they will require perchlorate monitoring and the corresponding analytical results will be reported in subsequent Environmental Restoration Operations Consolidated Quarterly Reports.

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SECTION III
ADDITIONAL SAMPLING AT TECHNICAL AREA-V GROUNDWATER MONITORING WELLS TAV-INJ1 AND TAV-MW6, April – June 2022

1.0 Background

The U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia National Laboratories, New Mexico (SNL/NM) personnel have completed Phase I of a Treatability Study of in-situ bioremediation (ISB) to address the groundwater contamination by nitrate and trichloroethene (TCE) at the Technical Area-V (TA-V) Groundwater (TAVG) Area of Concern (AOC). Operation and results of the Phase I Treatability Study were summarized in the "Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater Area of Concern" that was submitted to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) in April 2022 (Phase I Report, SNL/NM March 2022 and DOE April 2022). The NMED HWB subsequently approved the Phase I Report in June 2022 and concurred with the recommendation not to proceed to Phase II of the Treatability Study (NMED June 2022).

In a letter dated August 23, 2021 to the NMED HWB, DOE/NNSA and SNL/NM personnel requested to re-designate well TAV-INJ1 as a groundwater monitoring well and to revert well TAV-MW6 to the TAVG monitoring network, and proposed to continue quarterly monitoring these two wells for one year from July 2021 to June 2022 (DOE August 2021). Results of the additional year of monitoring will be incorporated in the future Current Conceptual Model/Corrective Measures Evaluation Report and will support the NMED HWB's selection of a final remedy for the TAVG AOC Corrective Action. The NMED HWB subsequently approved the request and the sampling plan (with modification) for an additional year of monitoring at wells TAV-INJ1 and TAV-MW6 (NMED October 2021). Appendix A provides a copy of the DOE/NNSA's letter and the NMED HWB's approval with modification.

This Section III of the Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) presents the monitoring results at wells TAV-INJ1 and TAV-MW6 for the April – June 2022 reporting period. The additional year of monitoring was concluded in this reporting period; therefore, this is the final reporting of the additional year of monitoring at wells TAV-INJ1 and TAV-MW6.

2.0 Groundwater Sampling at Wells TAV-INJ1 and TAV-MW6

Monitoring well TAV-MW6 was used to evaluate the effectiveness of ISB in the Phase I Treatability Study treatment area. It is located approximately 50 feet from well TAV-INJ1. The additional one-year quarterly sampling at wells TAV-INJ1 and TAV-MW6 included the following analytical parameters (Appendix A):

- Alkalinity (total, bicarbonate, and carbonate)
- Ammonia (as nitrogen)
- Anions (bromide, chloride, and sulfate)
- Dissolved metals (arsenic, iron, and manganese)
- Methane, ethene, and ethane
- Nitrate plus nitrite (NPN) as nitrogen
- Total organic carbon (TOC)
- Volatile organic compounds

In addition, the analytical parameters annually monitored at all TA-V groundwater wells were sampled at wells TAV-INJ1 and TAV-MW6 during this reporting period, including fluoride, 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 (Appendix A). The other annual parameters (alkalinity, bromide, chloride, and sulfate) are already included in the quarterly parameters listed above.

Groundwater sampling was conducted by SNL/NM Long-Term Stewardship personnel as part of the TAVG AOC investigation. The sampling protocol at well TAV-INJ1 was described in more detail in Section III of previous ER Quarterly Reports (e.g., in 2019). SNL/NM personnel used a bailer to remove groundwater on the day before sampling to prevent sediment from clogging the sampling pump, let the well to recharge overnight, and collected samples the next day. The sampling protocol at well TAV-MW6 follows the standard field operating procedures adopted by SNL/NM Long-Term Stewardship personnel.

Groundwater sampling at wells TAV-INJ1 and TAV-MW6 was conducted on April 13 and 14, 2022, respectively. Before each well was sampled, field water quality parameters were collected using an aboveground Aqua TROLL® 600 multi-parameter sonde. Tables III-1 and III-2 present the analytical results at wells TAV-INJ1 and TAV-MW6, respectively, for the April – June 2022 reporting period. Table III-3 summarizes the stabilized field water quality

parameters measured immediately before sample collection at each well. Note that alkalinity as bicarbonate and carbonate were inadvertently omitted during this sampling event; only total alkalinity was analyzed (Tables III-1 and III-2). However, alkalinity was entirely comprised of bicarbonate throughout the Phase I Treatability Study; carbonate was never detected (i.e., total alkalinity always equaled alkalinity as bicarbonate) (Phase I Report, SNL/NM March 2022).

2.1 Groundwater Sampling Results at Well TAV-INJ1

Sections 6.3.2 and 7.3.2 of the Phase I Report describe the concentration profiles of the analytical parameters at well TAV-INJ1 (SNL/NM March 2022). These profiles cover the entire duration of the Phase I Treatability Study, from the beginning of the Pilot Test (November 2017) through the end of the two-year performance monitoring of the Full-Scale Test (May 2021), including baseline data (collected before the Pilot Test). Results of the four additional quarterly sampling events (July 2021, November 2021, January 2022, and April 2022) for the analytes listed in Section 2.0 were added to the concentration profiles presented in Appendix E of the Phase I Report and are provided in Figures III-1 through III-11. Discussions here focus on the additional year's data from July 2021 to April 2022 at well TAV-INJ1.

The two constituents of concern at the TAVG AOC are nitrate (analyzed as NPN) and TCE. Note that NPN concentration is representative of nitrate concentration because historical groundwater sampling results have demonstrated that nitrite concentration is negligible in the groundwater at TA-V. At well TAV-INJ1, NPN was not detected in all four quarters of the additional year of monitoring. TCE was not detected except for this reporting period at an estimated J-qualified value of 0.34 micrograms per liter (µg/L) (Table III-1). There was no concentration rebound of either nitrate or TCE at well TAV-INJ1 during this additional year of monitoring.

Figures III-1 through III-11 show the results for the other analytical parameters from baseline sampling to April 2022 at well TAV-INJ1. Discussions below follow the same sequence as in Sections 6.3.2 and 7.3.2 of the Phase I Report.

Figure III-1 presents the concentration of (total) alkalinity over time at well TAV-INJ1. In the additional year of monitoring, the alkalinity concentration at well TAV-INJ1 continued to decrease gradually but was still above 900 milligrams per liter (mg/L) in April 2022, compared to the baseline concentration of 188 mg/L.

Figure III-2 presents the concentration of bromide over time at well TAV-INJ1. In the additional year of monitoring, bromide concentrations remained steady and close to the

19 mg/L treatment solution concentration. The bromide concentration at well TAV-INJ1 has not been diluted by the natural advection, dispersion, and diffusion forces in the saturated zone three years after the end of Full-Scale injections in April 2019.

Figure III-3 presents the concentration of chloride over time at well TAV-INJ1. Chloride was not analyzed during the Full-Scale Test; however, it was added to the analytical suite in the last sampling event of the Full-Scale Test in May 2021. Chloride was analyzed in the additional year of monitoring from July 2021 to April 2022. Similar to bromide, the chloride concentration at well TAV-INJ1 has not been diluted by the natural transport mechanisms in the saturated zone three years after the end of Full-Scale injections in April 2019, remaining between 25 and 30 mg/L.

Figure III-4 presents the concentration of TOC over time at well TAV-INJ1. In the additional year of monitoring, the TOC concentrations at well TAV-INJ1 continued to decrease and were all below 10 mg/L.

Figure III-5 presents the concentration of ammonia over time at well TAV-INJ1. In the additional year of monitoring, the ammonia concentration at well TAV-INJ1 remained between 35 and 40 mg/L.

Figures III-6, -7, and -8 present the concentration of arsenic, iron, and manganese over time at well TAV-INJ1, respectively. In the additional year of monitoring, the arsenic concentration at well TAV-INJ1 remained slightly above the U.S. Environmental Protection Agency maximum contaminant level of 0.01 mg/L and was 0.0115 mg/L in April 2022. The iron concentration at well TAV-INJ1 varied and was 0.775 mg/L in April 2022. The manganese concentration at well TAV-INJ1 remained steady and was 1.18 mg/L in April 2022.

Figure III-9 presents the concentration of sulfate over time at well TAV-INJ1. In the additional year of monitoring, the sulfate concentration at well TAV-INJ1 started at 49.7 mg/L and decreased to 15.9 mg/L, compared to baseline concentration of 31.9 mg/L.

Figure III-10 presents the concentration of methane over time at well TAV-INJ1. In the additional year of monitoring, the methane concentration at well TA-INJ1 remained high between 10,000 and 12,000 µg/L.

Ethene was not detected in the additional year of monitoring. Ethane is the product of complete dechlorination under methanogenic conditions. Figure III-11 presents the concentration of ethane over time at well TAV-INJ1. In the additional year of monitoring, all four detected ethane concentrations at well TAV-INJ1 were estimated (J-qualified) values below 0.5 µg/L.

In summary, in the additional year of monitoring, there was no concentration rebound of either nitrate or TCE at well TAV-INJ1. The bromide concentration at well TAV-INJ1 has not shown significant effect from natural advection, dispersion, and diffusion forces in the saturated zone. The elevated arsenic concentration was the result of the ISB process where anaerobic and reduced conditions were generated in the aquifer, which is only in the vicinity of well TAV-INJ1. The level of methane remained high, indicating sustained methanogenic conditions at well TAV-INJ1. Small but consistent amounts of ethane production suggest complete dechlorination is occurring at well TAV-INJ1.

2.2 Groundwater Sampling Results at Well TAV-MW6

In the additional year of monitoring, concentrations of alkalinity, ammonia, manganese, sulfate, and TOC at well TAV-MW6 remained similar to the Phase I Full-Scale Test results. Also, arsenic, iron, and ethane were not detected; ethene was only detected once at an estimated value (J-qualified) of 0.28 μg/L in April 2022. Therefore, concentration profiles of the above-mentioned analytes were not generated.

Sections 6.4.2 and 7.4.2 of the Phase I Report describe the concentration profiles of the remaining analytical parameters at well TAV-MW6 (SNL/NM March 2022), including bromide, NPN, methane, TCE, and cis-1,2 dichloroethene (DCE). These profiles cover the entire duration of the Phase I Treatability Study, from the beginning of the Pilot Test (November 2017) through the end of the two-year performance monitoring of the Full-Scale Test (May 2021), including baseline data (collected before the Pilot Test). Results of the four additional quarters of sampling (July 2021, November 2021, January 2022, and April 2022) were added to the concentration profiles presented in Appendix E of the Phase I Report. This Section also presents the concentration profile of chloride at well TAV-MW6. Figures III-12 through III-17 show the results for bromide, chloride, NPN, methane, TCE, and cis-1,2-DCE from baseline sampling to April 2022 at well TAV-MW6. Discussions here focus on the additional year's data from July 2021 to April 2022 at well TAV-MW6.

Figure III-12 presents the concentration of bromide over time at well TAV-MW6. In the additional year of monitoring, the bromide concentration at well TAV-MW6 remained steady and close to the baseline concentration of 1 mg/L.

Figure III-13 presents the concentration of chloride over time at well TAV-MW6. Chloride was not analyzed during the Full-Scale Test; however, it was added to the analytical suite in the last sampling event of the Full-Scale Test in May 2021. Chloride was analyzed in the additional year of monitoring from July 2021 to April 2022. From the Phase I Report, the baseline concentration of chloride at well TAV-MW6 was 75.1 mg/L and the chloride

concentrations at well TAV-MW6 ranged from 70.4 to 78 mg/L during the Pilot Test monitoring (SNL/NM March 2022). The chloride concentrations at well TAV-MW6 ranged from 85.2 to 98.9 mg/L from May 2021 to April 2022, slightly higher than the concentrations during the Pilot Test monitoring.

Figure III-14 presents the concentration of NPN over time at well TAV-MW6. In the additional year of monitoring, the NPN concentration at well TAV-MW6 remained steady and was 5.3 mg/L in April 2022.

Figure III-15 presents the concentration of methane over time at well TAV-MW6. In the additional year of monitoring, the methane concentration at well TAV-MW6 decreased from 99 µg/L in July 2021 to 26 µg/L in April 2022, which was qualified as a non-detect during data validation (Table III-2) because methane was detected at a similar concentration in the equipment blank.

Figures III-16 and III-17 present the concentrations of TCE and cis-1,2-DCE over time at well TAV-MW6, respectively. In the additional year of monitoring, the TCE and cis-1,2-DCE concentrations at well TAV-MW6 remained similar to the Phase I Full-Scale Test results and did not show any effect of dechlorination. Concentrations of TCE remained above the U.S. Environmental Protection Agency maximum contaminant level of 5 µg/L.

In summary, in the additional year of monitoring, dechlorination is not occurring at well TAV-MW6 and the concentration of TCE remained unchanged. The bromide concentration at well TAV-MW6 decreased to the baseline level of approximately 1 mg/L since April 2020. Although low levels of methane have been measured at well TAV-MW6, methane was not produced at this well, as indicated by the water quality parameters (Table III-3). Rather, methane could have migrated to well TAV-MW6 from the injection well or from small pockets of methanogenic zones that formed between these two wells.

3.0 Conclusion

After the Phase I Treatability Study concluded in May 2021, DOE/NNSA and SNL/NM personnel requested an additional year of monitoring for wells TAV-INJ1 and TAV-MW6 (i.e., the injection well and the performance monitoring well of the Phase I Treatability Study, respectively), in order to allow time for the Phase I Report to be completed, submitted, and reviewed by the NMED HWB. Since the Phase I Report was approved by the NMED HWB (NMED June 2022) and results of the additional year of monitoring (July 2021 to April 2022) confirmed the findings of the Phase I Report, DOE/NNSA and SNL/NM personnel will formally request to decommission well TAV-INJ1 and revert the

monitoring of well TAV-MW6 to the TAVG monitoring network sampling plan.
The reporting of the additional year of monitoring is concluded and these monitoring results will be included in the future Current Conceptual Model/Corrective Measures Evaluation Report.

4.0 References

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), 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.

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.

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 (GQWB) to NMED Hazardous Waste Bureau (HWB)." August 23, 2021.

U.S. Department of Energy (DOE), April 2022. Letter to R. Shean (New Mexico Environment Department), "Submittal of Phase I Treatability Study Report for In-Situ Bioremediation at the Technical Area-V Groundwater (TAVG) Area of Concern (AOC) for Sandia National Laboratories, New Mexico (SNL/NM), Environmental Protection Agency Identification Number NM5890110518." April 1, 2022.

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Figures

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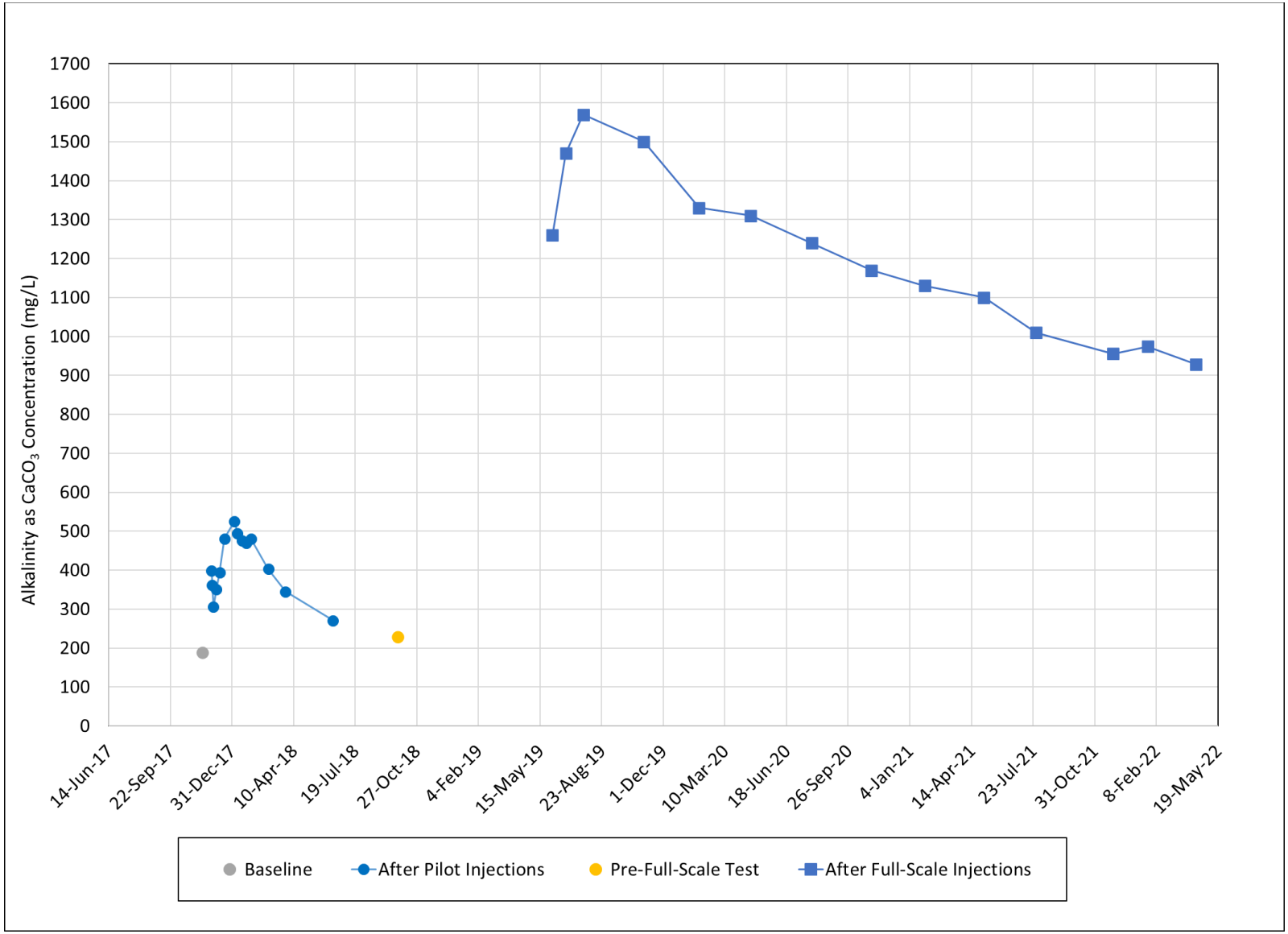


Figure III-1 Concentration of Alkalinity as $CaCO_3$ over Time at Well TAV-INJ1

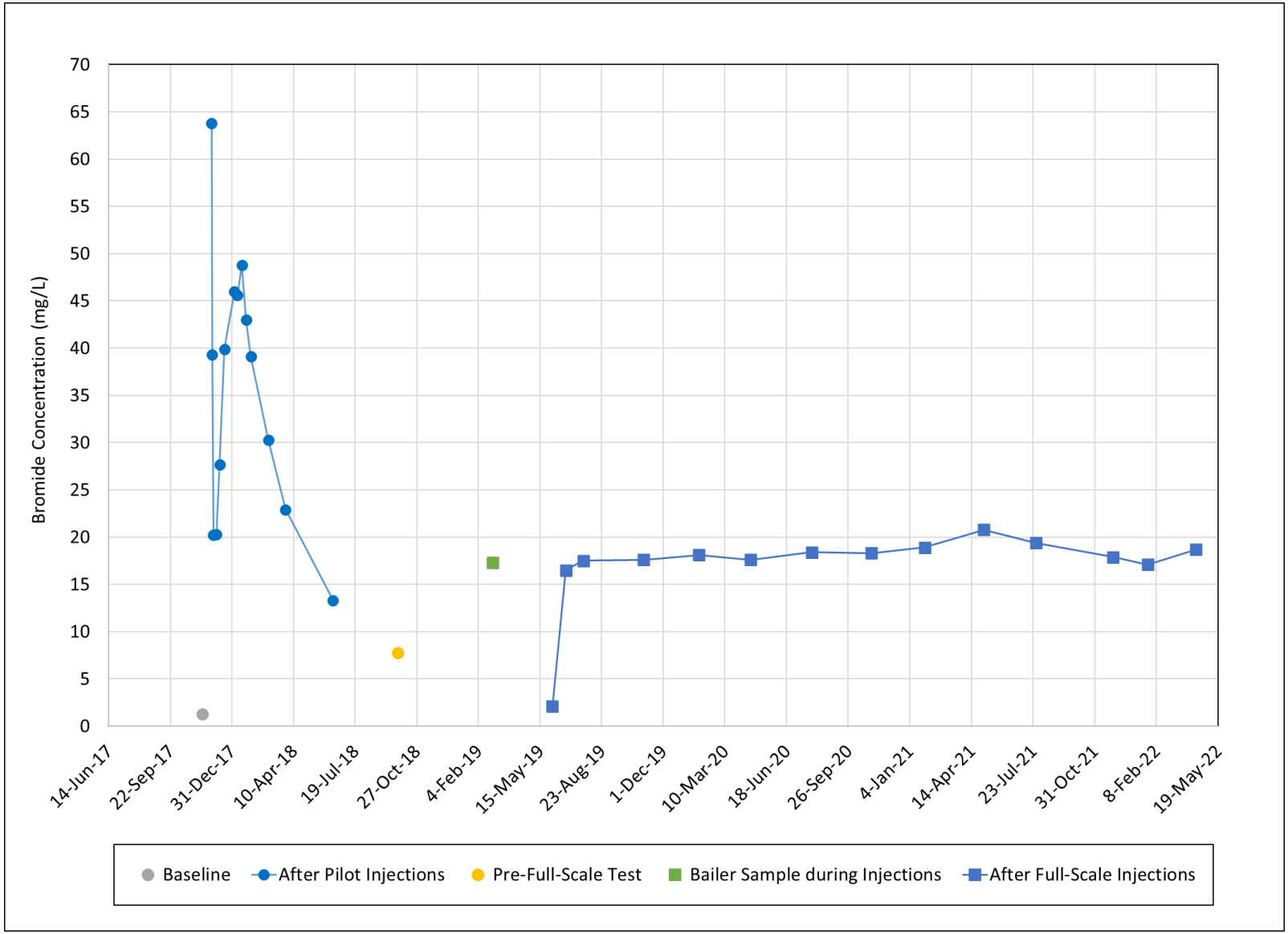
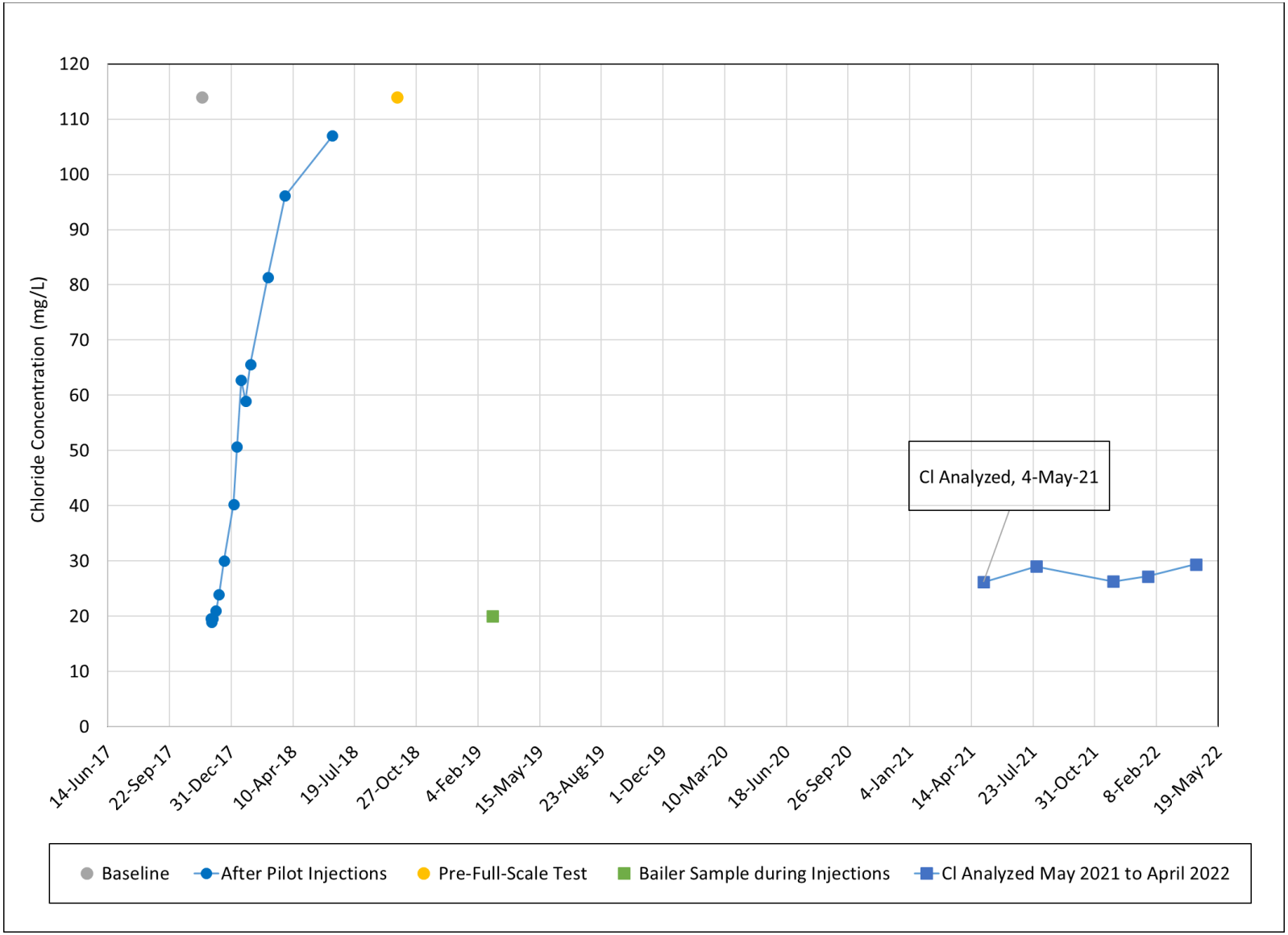


Figure III-2 Concentration of Bromide over Time at Well TAV-INJ1



Note: Chloride was not analyzed during the Full-Scale Test.

Figure III-3 Concentration of Chloride over Time at Well TAV-INJ1

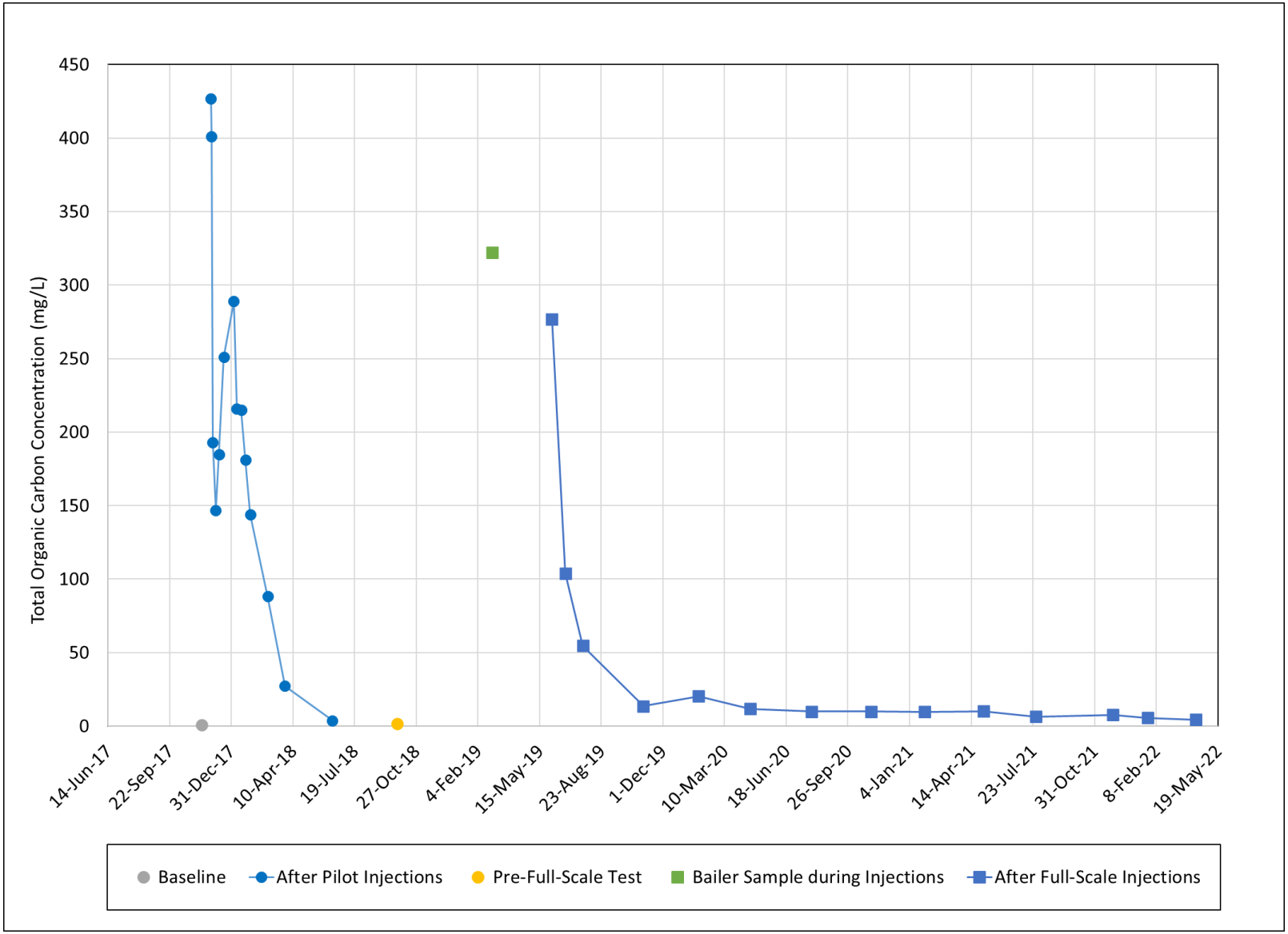


Figure III-4 Concentration of Total Organic Carbon over Time at Well TAV-INJ1

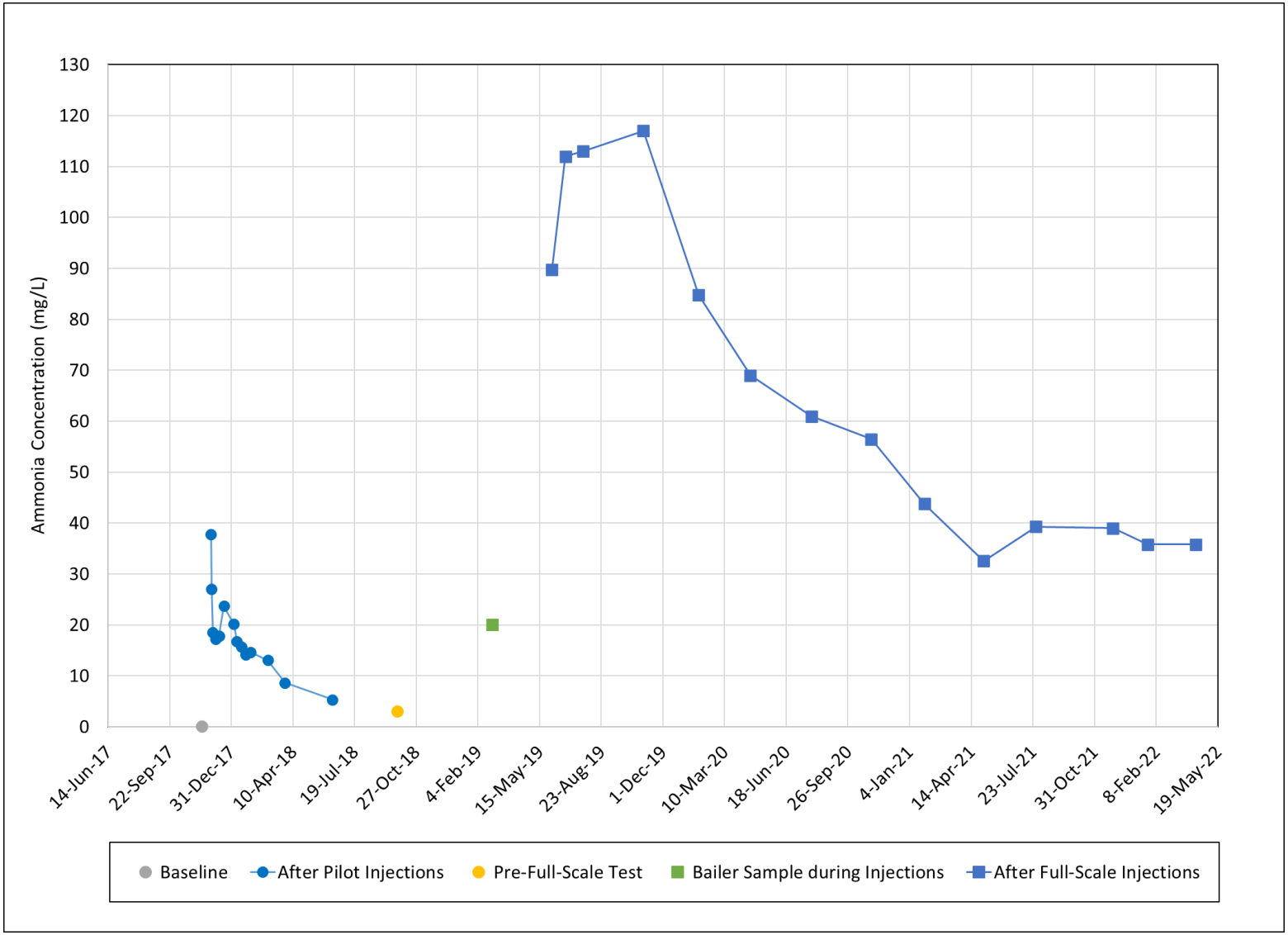


Figure III-5 Concentration of Ammonia over Time at Well TAV-INJ1

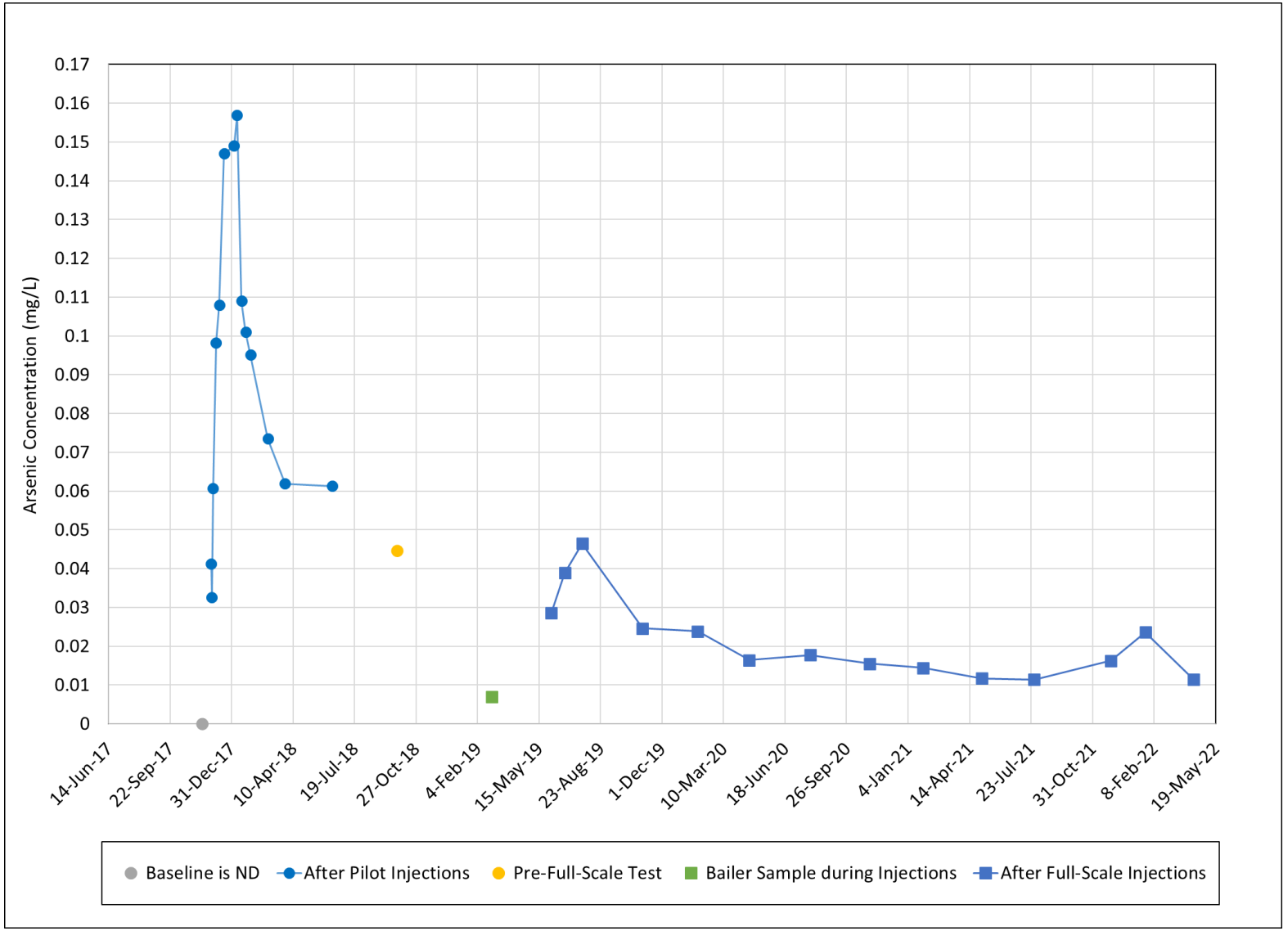


Figure III-6 Concentration of Arsenic over Time at Well TAV-INJ1

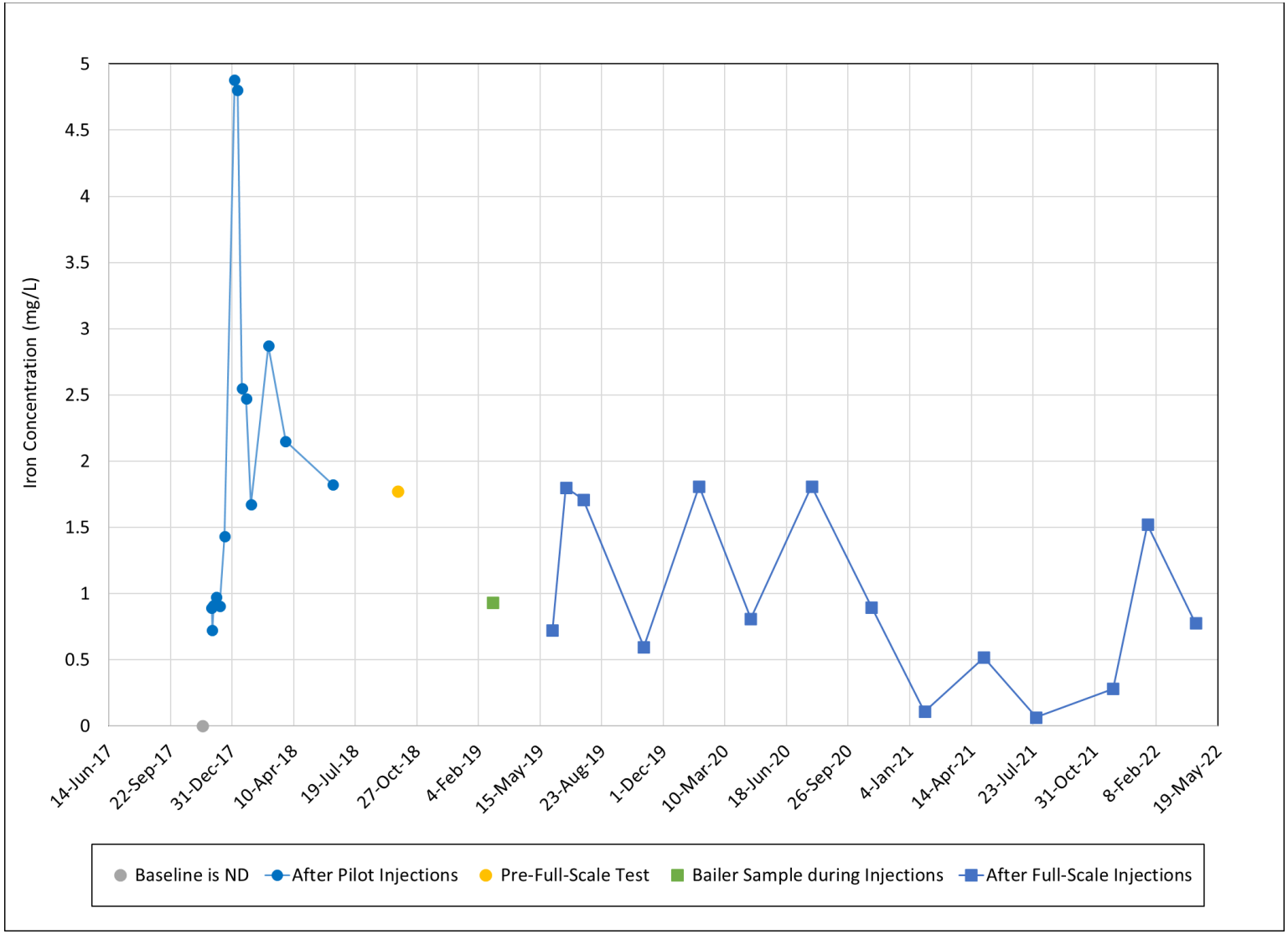


Figure III-7 Concentration of Iron over Time at Well TAV-INJ1

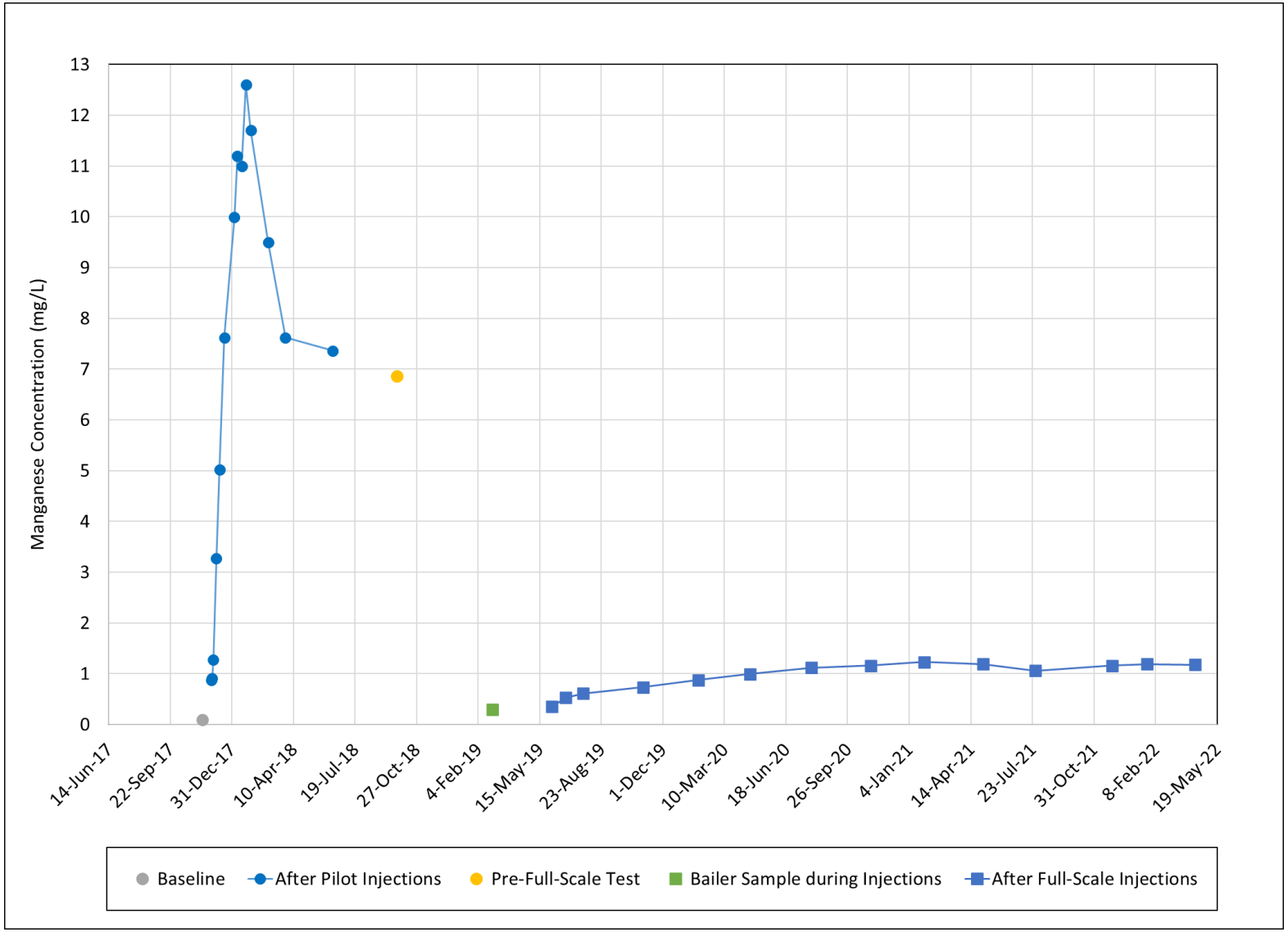


Figure III-8 Concentration of Manganese over Time at Well TAV-INJ1

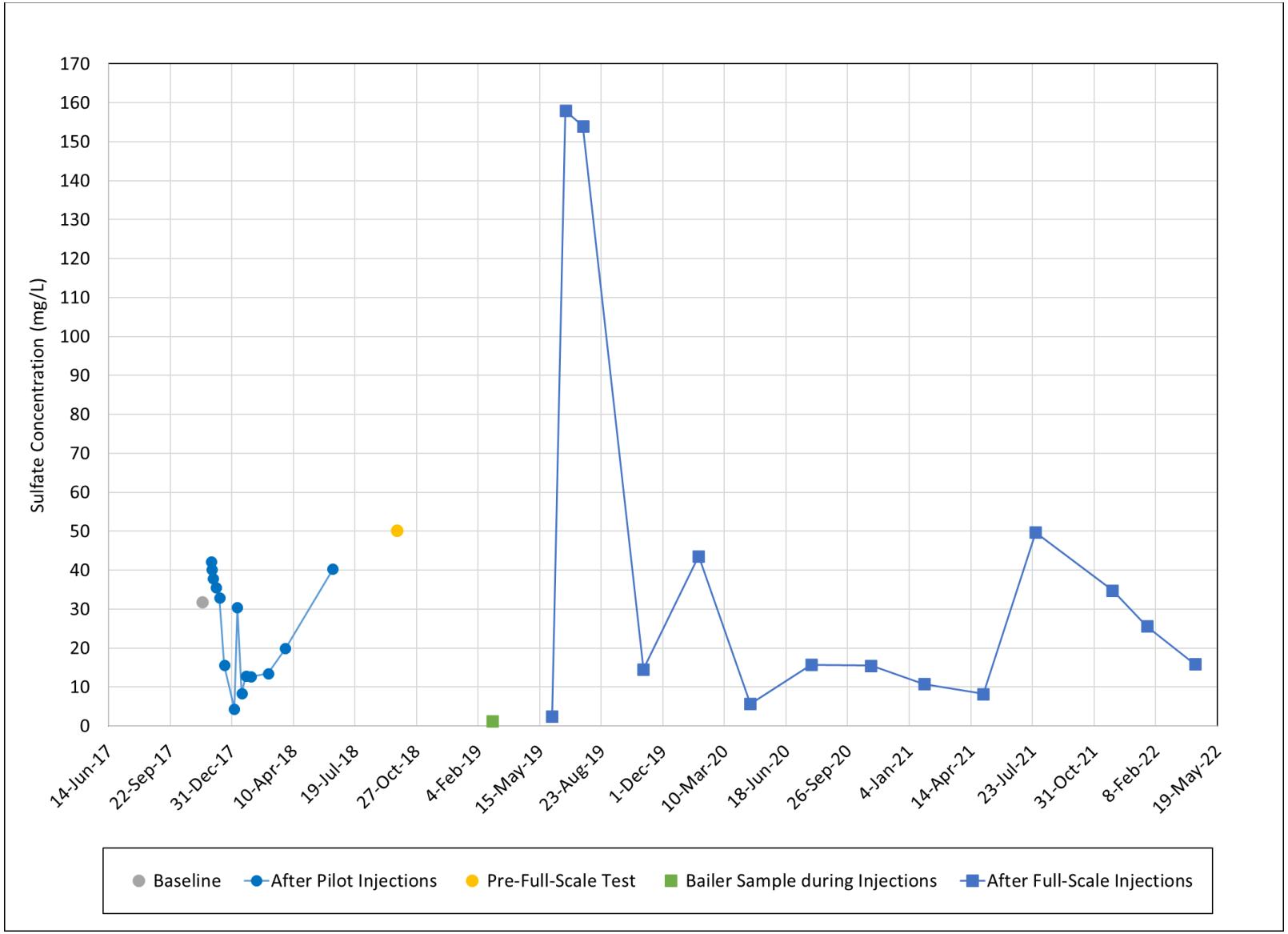


Figure III-9 Concentration of Sulfate over Time at Well TAV-INJ1

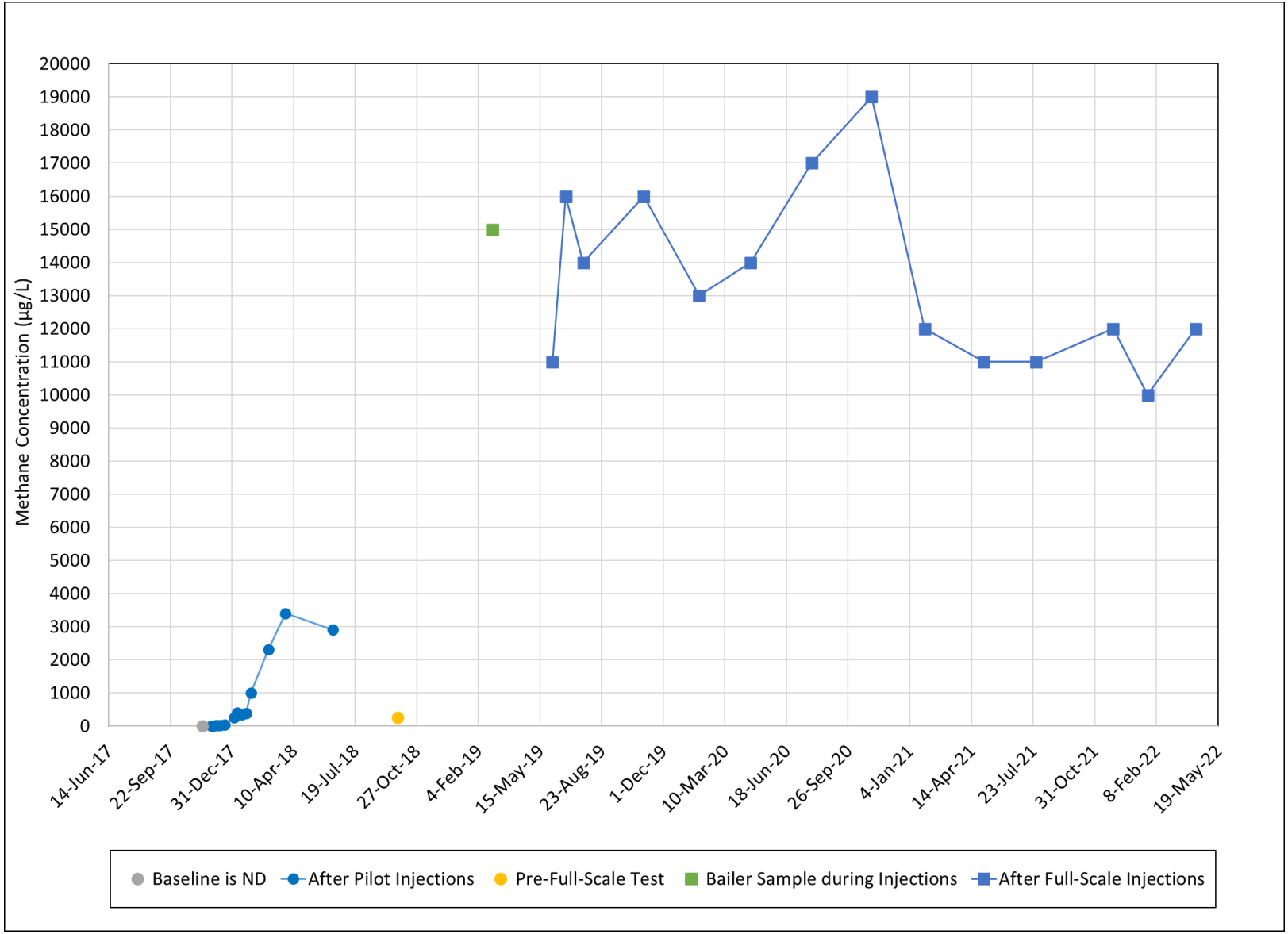
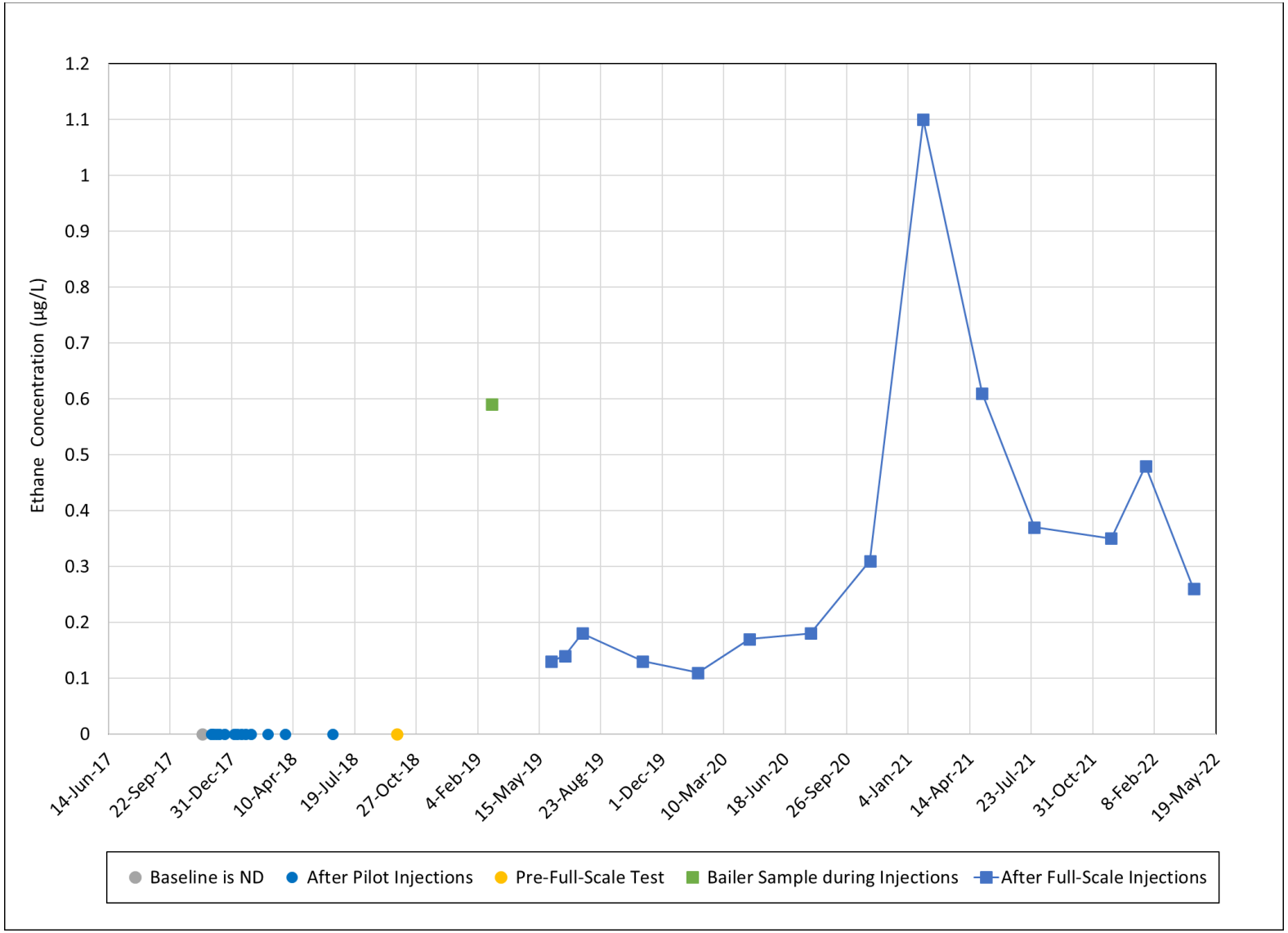


Figure III-10 Concentration of Methane over Time at Well TAV-INJ1



Note: Dots were not connected by line during the Pilot Test because all were non-detects.

Figure III-11 Concentration of Ethane over Time at Well TAV-INJ1

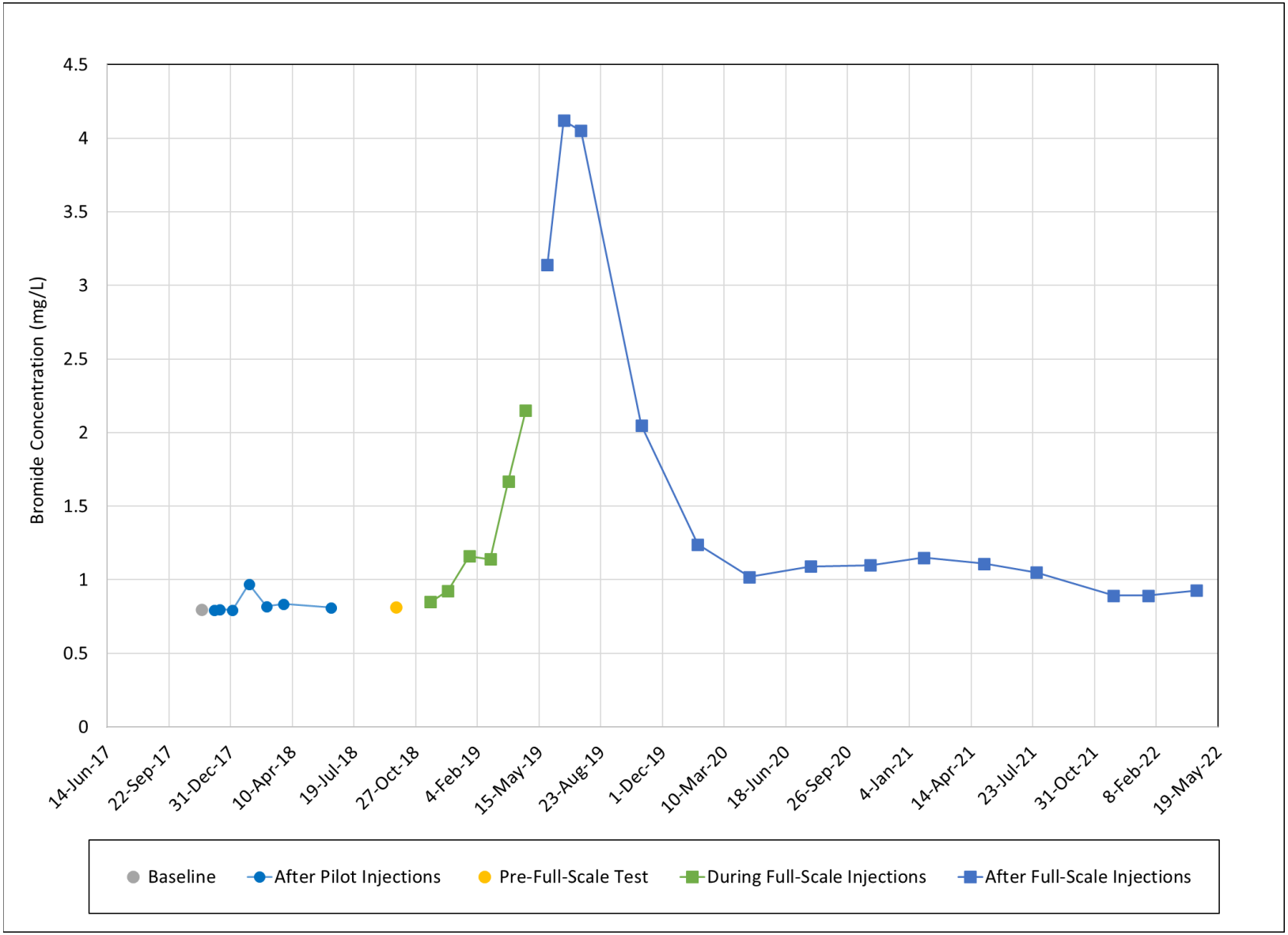
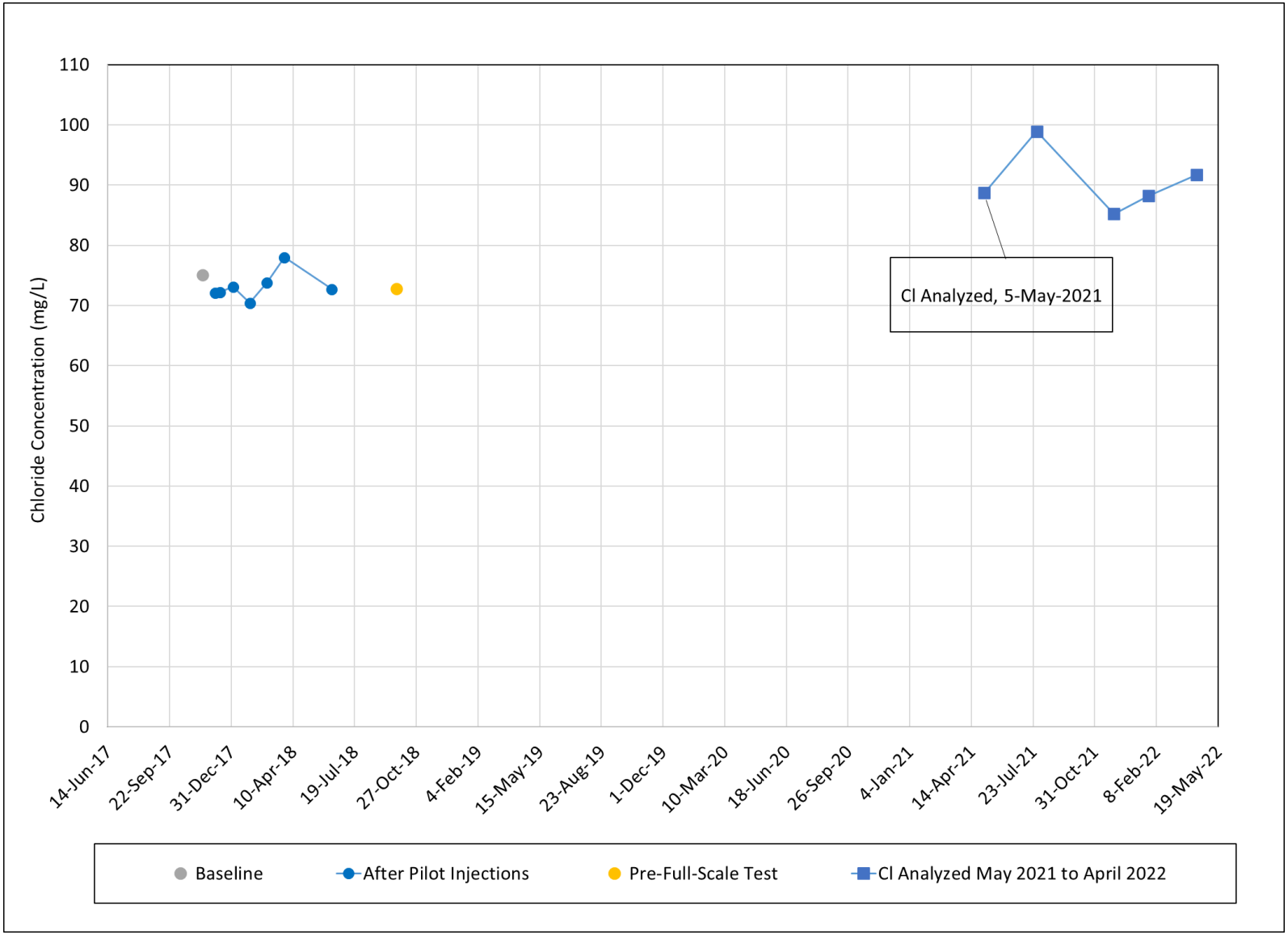


Figure III-12 Concentration of Bromide over Time at Well TAV-MW6



Note: Chloride was not analyzed during the Full-Scale Test.

Figure III-13 Concentration of Chloride over Time at Well TAV-MW6

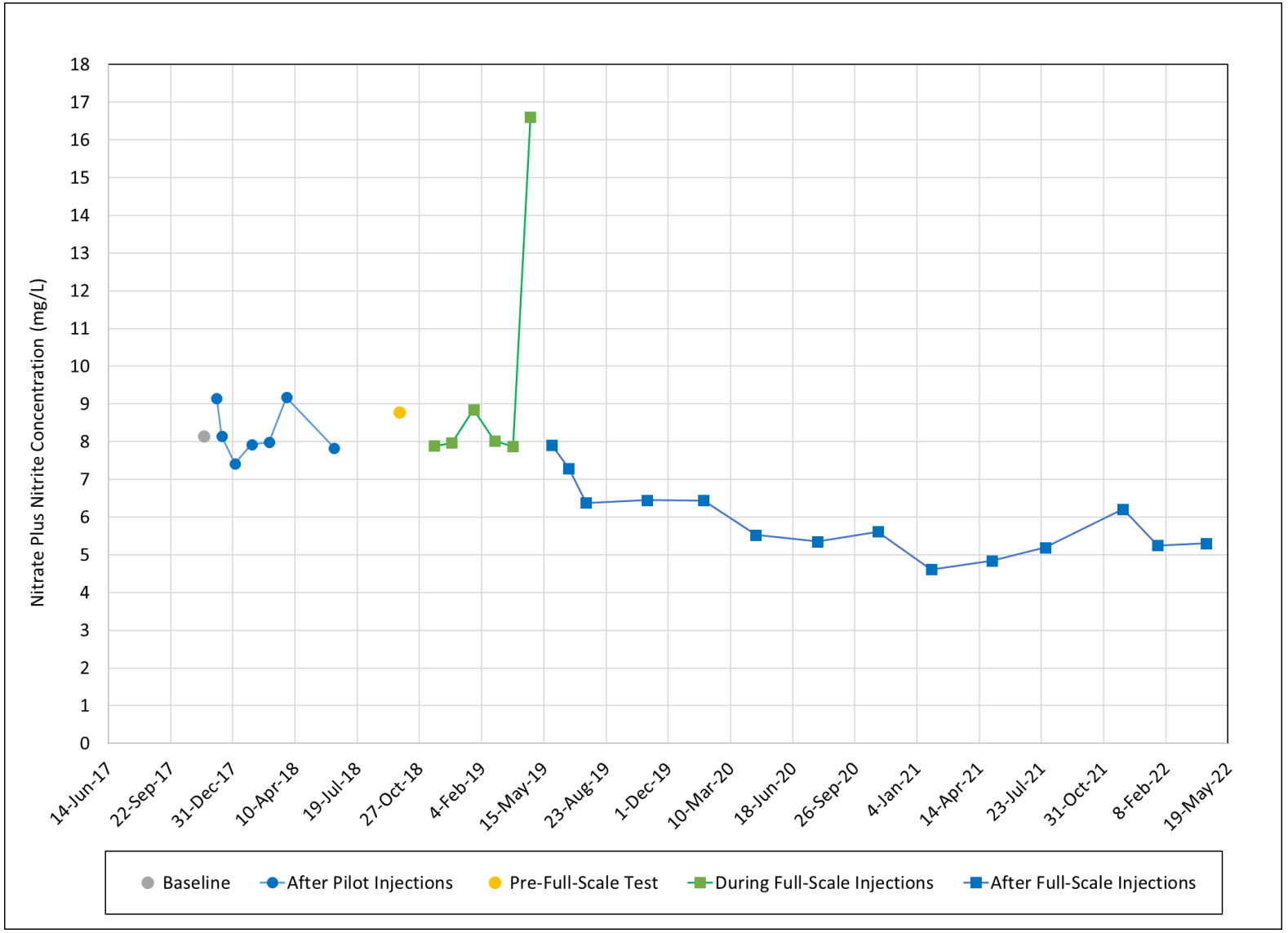
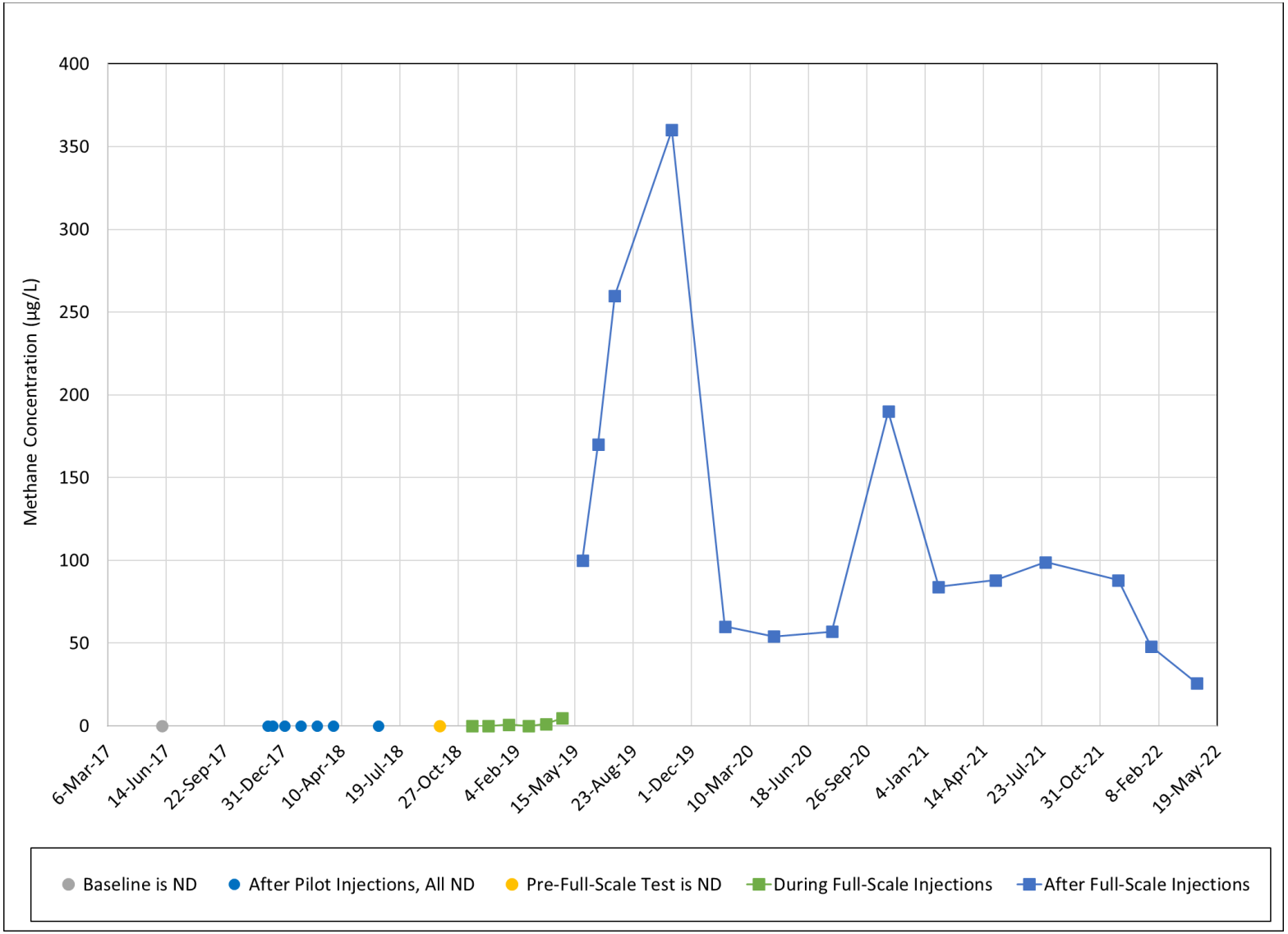


Figure III-14 Concentration of Nitrate Plus Nitrite over Time at Well TAV-MW6



Note: Dots were not connected by line during the Pilot Test because all were non-detects.

Figure III-15 Concentration of Methane over Time at Well TAV-MW6

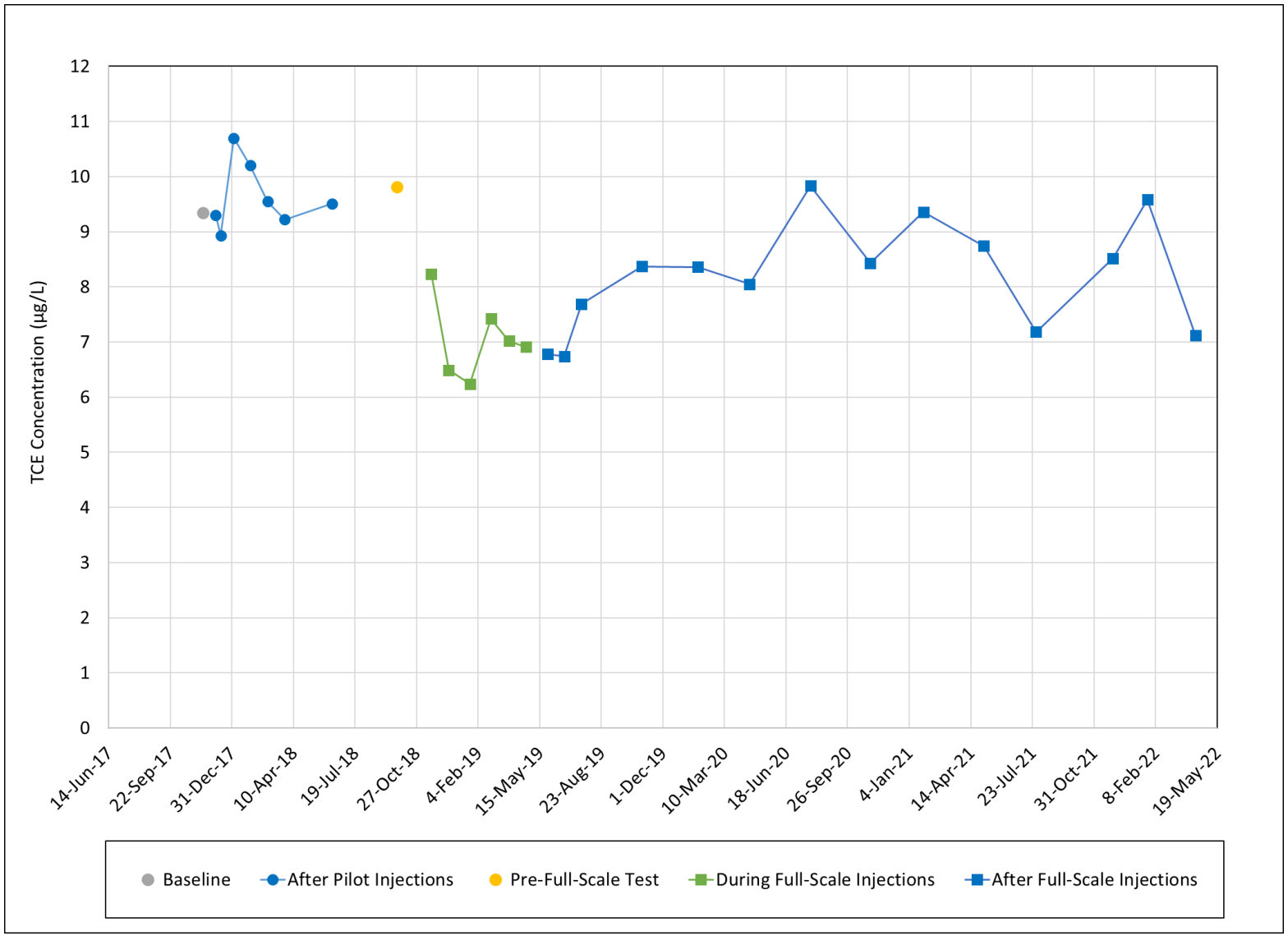


Figure III-16 Concentration of TCE over Time at Well TAV-MW6

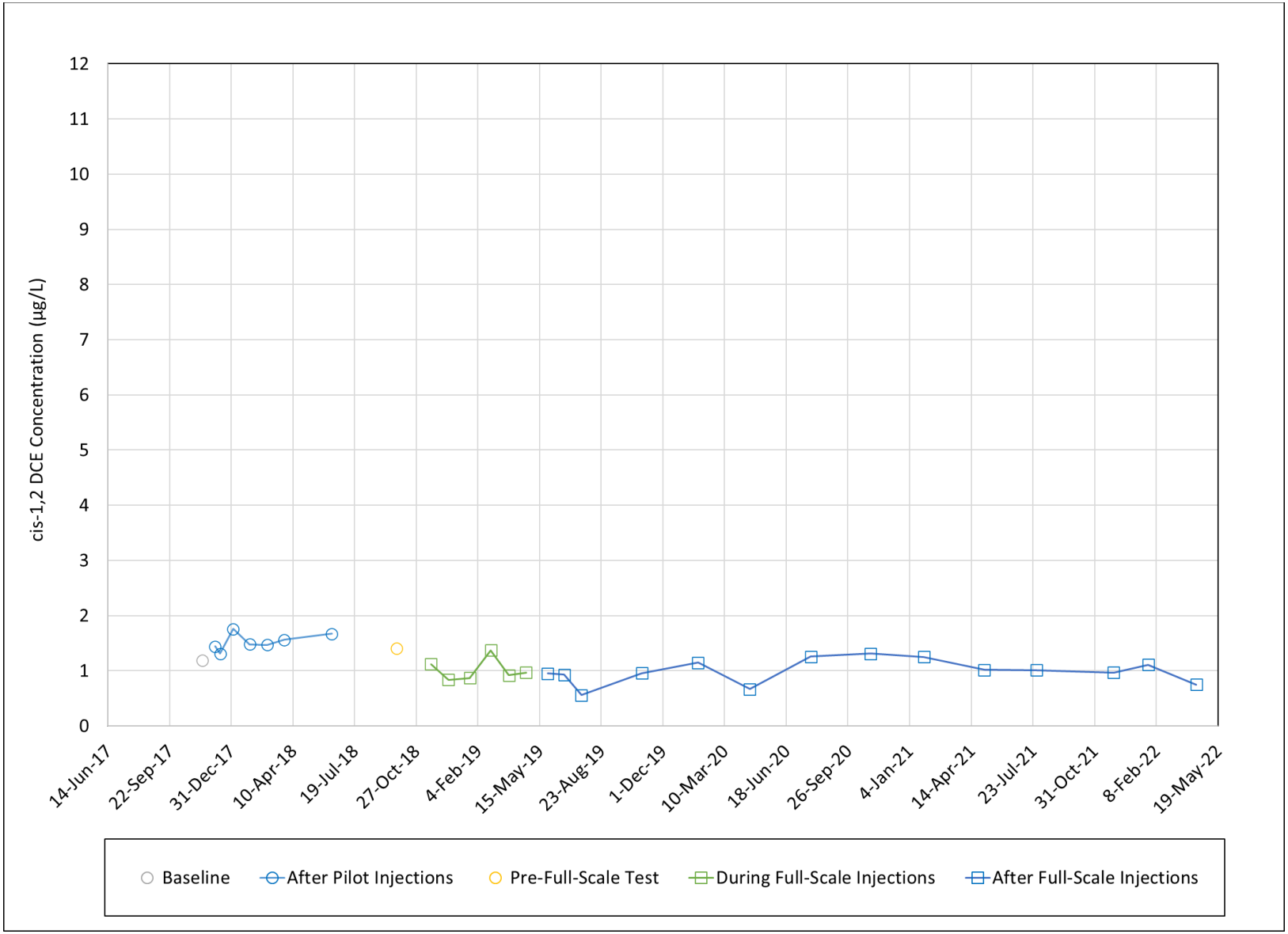


Figure III-17 Concentration of cis-1,2 DCE over Time at Well TAV-MW6

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Tables

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Table III-1

Analytical Results for Groundwater Samples Collected at Well TAV-INJ1, April – June 2022

Sample Date	Analyses	Analyte	Result[a]	MDL or MDA[b]	PQL or Critical Level[c]	MCL[d]	Units	Lab Qual[e]	Val Qual[f]	Sample No.	Analytical Method[g]	Lab[h]
13-Apr-22	Alkalinity	Alkalinity as $CaCO_3$	929	1.45	4	NE	mg/L		NONE	117488-005	SM 2320B	GEL
13-Apr-22	Ammonia	Ammonia	35.8	0.425	1.25	NE	mg/L		NONE	117488-001	EPA 350.1	GEL
13-Apr-22	Anions	Bromide	18.7	0.67	2	NE	mg/L		NONE	117488-003	SW846 9056A	GEL
13-Apr-22	Anions	Chloride	29.4	0.335	1	NE	mg/L		NONE	117488-003	SW846 9056A	GEL
13-Apr-22	Anions	Sulfate	15.9	0.665	2	NE	mg/L		NONE	117488-003	SW846 9056A	GEL
13-Apr-22	Dissolved Metals	Arsenic	**0.0115**	0.002	0.005	0.01	mg/L		NONE	117488-006	SW846 3005A/6020B	GEL
13-Apr-22	Dissolved Metals	Iron	0.775	0.033	0.1	NE	mg/L		NONE	117488-006	SW846 3005A/6020B	GEL
13-Apr-22	Dissolved Metals	Manganese	1.18	0.01	0.05	NE	mg/L		NONE	117488-006	SW846 3005A/6020B	GEL
13-Apr-22	MEE	Methane	12000	2	5	NE	µg/L		J	117496-001	AM20GAX	PACE-GC
13-Apr-22	MEE	Ethane	0.26	0.17	1	NE	µg/L	J	J-	117496-001	AM20GAX	PACE-GC
13-Apr-22	MEE	Ethene	ND	0.24	1	NE	µg/L	U	1UJ	117496-001	AM20GAX	PACE-GC
13-Apr-22	NPN	Nitrate plus nitrite as N	ND	0.17	0.5	10	mg/L	U	NONE	117488-004	EPA 353.2	GEL
13-Apr-22	TOC	Total Organic Carbon Average	4.42	0.66	2	NE	mg/L		NONE	117488-002	SW846 9060A	GEL
13-Apr-22	VOC	Dichloroethene, cis-1,2-	ND	0.333	1	70	µg/L	U	NONE	117486-001	SW846 8260D	GEL
13-Apr-22	VOC	Trichloroethene	0.34	0.333	1	5	µg/L	J	NONE	117486-001	SW846 8260D	GEL
Additional Annual Parameters Analyzed in this Reporting Period												
13-Apr-22	Anions	Fluoride	0.873	0.165	0.5	4	mg/L		NONE	117488-003	SW846 9056A	GEL
13-Apr-22	METALS	Aluminum	0.0324	0.0193	0.05	NE	mg/L	J	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Antimony	ND	0.001	0.003	0.006	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Arsenic	**0.0118**	0.002	0.005	0.01	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Barium	0.303	0.00067	0.004	2	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Beryllium	ND	0.0002	0.0005	0.004	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Cadmium	ND	0.0003	0.001	0.005	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Calcium	209	0.8	2	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Chromium	ND	0.003	0.01	0.1	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Cobalt	0.000451	0.0003	0.001	NE	mg/L	J	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Copper	0.00081	0.0003	0.002	NE	mg/L	J	J+	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Iron	3.98	0.033	0.1	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Lead	ND	0.0005	0.002	NE	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Magnesium	16.4	0.01	0.03	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Manganese	1.26	0.01	0.05	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Mercury	0.000115	0.000067	0.0002	0.002	mg/L	JB	0.0002UJ	117488-007	SW846 7470A	GEL
13-Apr-22	METALS	Nickel	0.00335	0.0006	0.002	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Potassium	104	0.8	3	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Selenium	ND	0.0015	0.005	0.05	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Silver	ND	0.0003	0.001	NE	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Sodium	62.2	0.8	2.5	NE	mg/L		NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Thallium	ND	0.0006	0.002	0.002	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Uranium	0.00132	0.000067	0.0002	0.03	mg/L	*B	J	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Vanadium	0.00425	0.0033	0.02	NE	mg/L	J	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	METALS	Zinc	ND	0.0033	0.02	NE	mg/L	U	NONE	117488-007	SW846 3005A/6020B	GEL
13-Apr-22	RAD	Americium-241	ND	2.79	5.77	NE	pCi/L	U	BD	117488-008	EPA 901.1	GEL
13-Apr-22	RAD	Cesium-137	ND	2.05	4.39	NE	pCi/L	U	BD	117488-008	EPA 901.1	GEL
13-Apr-22	RAD	Cobalt-60	ND	2.33	5.12	NE	pCi/L	U	BD	117488-008	EPA 901.1	GEL
13-Apr-22	RAD	Potassium-40	134	22.7	50	NE	pCi/L		J	117488-008	EPA 901.1	GEL
13-Apr-22	RAD	Gross Alpha	ND	1.08	2.71	15 pCi/L	pCi/L	NU	BD	117488-009	EPA 900.0/SW846 9310	GEL
13-Apr-22	RAD	Gross Beta	83.5	1.26	2.62	4 mrem/yr	pCi/L	*	NONE	117488-009	EPA 900.0/SW846 9310	GEL
13-Apr-22	RAD	Tritium	ND	76.4	168	NE	pCi/L	U	BD	117488-010	EPA 906.0 Modified	GEL

Note: Header nomenclature is explained in the “Footnotes for Analytical Results Tables” following Table III-3.

Table III-2

Analytical Results for Groundwater Samples Collected at Well TAV-MW6, April – June 2022

Sample Date	Analyses	Analyte	Result[a]	MDL or MDA[b]	PQL or Critical Level[c]	MCL[d]	Units	Lab Qual[e]	Val Qual[f]	Sample No.	Analytical Method[g]	Lab[h]
14-Apr-22	Alkalinity	Alkalinity as CaCO3	200	1.45	4	NE	mg/L		NONE	117493-006	SM 2320B	GEL
14-Apr-22	Ammonia	Ammonia	0.059	0.017	0.05	NE	mg/L	B	J+	117493-002	EPA 350.1	GEL
14-Apr-22	Anions	Bromide	0.927	0.067	0.2	NE	mg/L		J	117493-004	SW846 9056A	GEL
14-Apr-22	Anions	Chloride	91.7	1.34	4	NE	mg/L		NONE	117493-004	SW846 9056A	GEL
14-Apr-22	Anions	Sulfate	42.7	2.66	8	NE	mg/L		NONE	117493-004	SW846 9056A	GEL
14-Apr-22	Dissolved Metals	Arsenic	ND	0.002	0.005	0.01	mg/L	U	NONE	117493-007	SW846 3005A/6020B	GEL
14-Apr-22	Dissolved Metals	Iron	ND	0.033	0.1	NE	mg/L	U	NONE	117493-007	SW846 3005A/6020B	GEL
14-Apr-22	Dissolved Metals	Manganese	0.00831	0.001	0.005	NE	mg/L		0.005UJ	117493-007	SW846 3005A/6020B	GEL
14-Apr-22	MEE	Methane	26	2	5	NE	µg/L		26UJ	117498-001	AM20GAX	PACE-GC
14-Apr-22	MEE	Ethane	ND	0.17	1	NE	µg/L	U	R	117498-001	AM20GAX	PACE-GC
14-Apr-22	MEE	Ethene	0.28	0.24	1	NE	µg/L	J	J-	117498-001	AM20GAX	PACE-GC
14-Apr-22	NPN	Nitrate plus nitrite as N	5.3	0.085	0.25	10	mg/L		NONE	117493-005	EPA 353.2	GEL
14-Apr-22	TOC	Total Organic Carbon Average	0.577	0.33	1	NE	mg/L	J	1.0U	117493-003	SW846 9060A	GEL
14-Apr-22	VOC	Dichloroethene, cis-1,2-	0.75	0.333	1	70	µg/L	J	NONE	117493-001	SW846 8260D	GEL
14-Apr-22	VOC	Trichloroethene	**7.12**	0.333	1	5	µg/L		NONE	117493-001	SW846 8260D	GEL
14-Apr-22(DUP)	Alkalinity	Alkalinity as $CaCO_3$	197	1.45	4	NE	mg/L		NONE	117494-006	SM 2320B	GEL
14-Apr-22(DUP)	Ammonia	Ammonia	ND	0.017	0.05	NE	mg/L	U	NONE	117494-002	EPA 350.1	GEL
14-Apr-22(DUP)	Anions	Bromide	0.937	0.067	0.2	NE	mg/L		J	117494-004	SW846 9056A	GEL
14-Apr-22(DUP)	Anions	Chloride	89.8	1.34	4	NE	mg/L		NONE	117494-004	SW846 9056A	GEL
14-Apr-22(DUP)	Anions	Sulfate	41.7	2.66	8	NE	mg/L		NONE	117494-004	SW846 9056A	GEL
14-Apr-22(DUP)	Dissolved Metals	Arsenic	ND	0.002	0.005	0.01	mg/L	U	NONE	117494-007	SW846 3005A/6020B	GEL
14-Apr-22(DUP)	Dissolved Metals	Iron	ND	0.033	0.1	NE	mg/L	U	NONE	117494-007	SW846 3005A/6020B	GEL
14-Apr-22(DUP)	Dissolved Metals	Manganese	0.00822	0.001	0.005	NE	mg/L		0.005UJ	117494-007	SW846 3005A/6020B	GEL
14-Apr-22(DUP)	MEE	Methane	26	2	5	NE	µg/L		26UJ	117499-001	AM20GAX	PACE-GC
14-Apr-22(DUP)	MEE	Ethane	ND	0.17	1	NE	µg/L	U	R	117499-001	AM20GAX	PACE-GC
14-Apr-22(DUP)	MEE	Ethene	ND	0.24	1	NE	µg/L	U	R	117499-001	AM20GAX	PACE-GC
14-Apr-22(DUP)	NPN	Nitrate plus nitrite as N	5.3	0.085	0.25	10	mg/L		NONE	117494-005	EPA 353.2	GEL
14-Apr-22(DUP)	TOC	Total Organic Carbon Average	0.514	0.33	1	NE	mg/L	J	1.0U	117494-003	SW846 9060A	GEL
14-Apr-22(DUP)	VOC	Dichloroethene, cis-1,2-	0.87	0.333	1	70	µg/L	J	NONE	117494-001	SW846 8260D	GEL
14-Apr-22(DUP)	VOC	Trichloroethene	**7.41**	0.333	1	5	µg/L		NONE	117494-001	SW846 8260D	GEL
Additional Annual Parameters Analyzed in this Reporting Period**												
14-Apr-22	Anions	Fluoride	1.15	0.033	0.1	4	mg/L		NONE	117493-004	SW846 9056A	GEL
14-Apr-22(DUP)	Anions	Fluoride	1.15	0.033	0.1	4	mg/L		NONE	117494-004	SW846 9056A	GEL
14-Apr-22	METALS	Aluminum	ND	0.0193	0.05	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Antimony	ND	0.001	0.003	0.006	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Arsenic	ND	0.002	0.005	0.01	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Barium	0.0719	0.00067	0.004	2	mg/L		NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Beryllium	ND	0.0002	0.0005	0.004	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Cadmium	ND	0.0003	0.001	0.005	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Calcium	65.8	0.8	2	NE	mg/L		NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Chromium	ND	0.003	0.01	0.1	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Cobalt	ND	0.0003	0.001	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Copper	ND	0.0003	0.002	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Iron	ND	0.033	0.1	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Lead	ND	0.0005	0.002	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Magnesium	19.5	0.01	0.03	NE	mg/L		NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Manganese	0.00812	0.001	0.005	NE	mg/L		J	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Mercury	ND	0.000067	0.0002	0.002	mg/L	U	NONE	117493-008	SW846 7470A	GEL
14-Apr-22	METALS	Nickel	ND	0.0006	0.002	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Potassium	3.96	0.08	0.3	NE	mg/L		J	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Selenium	0.0027	0.0015	0.005	0.05	mg/L	J	NONE	117493-008	SW846 3005A/6020B	GEL

Table III-2 (Concluded)

Analytical Results for Groundwater Samples Collected at Well TAV-MW6, April – June 2022

Sample Date	Analyses	Analyte	Result[a]	MDL or MDA[b]	PQL or Critical Level[c]	MCL[d]	Units	Lab Qual[e]	Val Qual[f]	Sample No.	Analytical Method[g]	Lab[h]
14-Apr-22	METALS	Silver	ND	0.0003	0.001	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Sodium	61.9	0.8	2.5	NE	mg/L		NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Thallium	ND	0.0006	0.002	0.002	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Uranium	0.0031	0.000067	0.0002	0.03	mg/L	*B	J	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Vanadium	0.00612	0.0033	0.02	NE	mg/L	J	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	METALS	Zinc	ND	0.0033	0.02	NE	mg/L	U	NONE	117493-008	SW846 3005A/6020B	GEL
14-Apr-22	RAD	Americium-241	ND	3.74	7.74	NE	pCi/L	U	BD	117493-009	EPA 901.1	GEL
14-Apr-22	RAD	Cesium-137	ND	1.43	3.06	NE	pCi/L	U	BD	117493-009	EPA 901.1	GEL
14-Apr-22	RAD	Cobalt-60	ND	1.65	3.6	NE	pCi/L	U	BD	117493-009	EPA 901.1	GEL
14-Apr-22	RAD	Potassium-40	ND	12.5	28.2	NE	pCi/L	U	BD	117493-009	EPA 901.1	GEL
14-Apr-22	RAD	Gross Alpha	2.35	0.647	1.45	15 pCi/L	pCi/L	N	J	117493-010	EPA 900.0/SW846 9310	GEL
14-Apr-22	RAD	Gross Beta	4.04	0.559	1.15	4 mrem/yr	pCi/L		NONE	117493-010	EPA 900.0/SW846 9310	GEL
14-Apr-22	RAD	Tritium	ND	77.5	171	NE	pCi/L	U	BD	117493-011	EPA 906.0 Modified	GEL

** Additional annual parameters were analyzed for environmental sample only, except for fluoride which was analyzed for both environmental sample and environmental duplicate sample.

Note: Header nomenclature is explained in the “Footnotes for Analytical Results Tables” following Table III-3.

Table III-3
Field Water Quality Measurements[i], April – June 2022

Well ID	Sample Date	Temperature (°C)	Specific Conductivity (µmho/cm)	Oxidation Reduction Potential (mV)	pH	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
TAV-INJ1	13-Apr-22	17.19	1567.69	-131.3	6.83	7.53	7.74	0.59
TAV-MW6	14-Apr-22	21.44	737.87	51.9	7.45	1.01	29.88	2.16

Note: Header nomenclature is explained in the “Footnotes for Analytical Results Tables” following Table III-3.

Footnotes for Analytical Results Tables

%	= Percent.
$CaCO_3$	= Calcium carbonate.
DUP	= Duplicate.
EPA	= U.S. Environmental Protection Agency.
ID	= Identifier.
INJ	= Injection well (acronym used for well identification only).
µg/L	= Micrograms per liter.
mg/L	= Milligrams per liter.
MEE	= Methane, ethane, ethene.
mrem/yr	= Millirem per year.
MW	= Monitoring well (acronym used for well identification only).
No.	= Number.
NPN	= Nitrate plus nitrite.
pCi/L	= Picocuries per liter.
RAD	= Radionuclides.
RPD	= Relative percent difference.
TAV	= Technical Area-V (acronym used for well identification only).
TOC	= Total organic carbon.
VOC	= Volatile organic compound.

[a]Result

Detected VOCs are presented in the tables.

Bold	= Concentration exceeds the EPA MCL.
ND	= Not detected (at MDL or MDA).

[b]MDL or MDA

MDA	= The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the critical level.
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.

[c]PQL or Critical Level

Critical Level	= The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix specific.
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 that indicated method under routine laboratory operating conditions.

[d]MCL

MCL	= Maximum contaminant level. 2018 Edition of the Drinking Water Standards and Health Advisories Tables, EPA 822-F-18-001, Office of Water, U.S. Environmental Protection Agency, Washington, D.C., March 2018.
NE	= Not established.

[e]Lab Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

*	= Recovery or percent recover not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
B	= The analyte was found in the blank above the effective MDL.
J	= Estimated value, the analyte concentration fell above the MDL and below the PQL.
N	= Results associated with a spike analysis that was outside control limits.
U	= Analyte is absent or below the MDL.

Footnotes for Analytical Results Tables *(Concluded)*

[f]Validation Qualifier

If cell is NONE, then all quality control samples met acceptance criteria with respect to submitted samples.

BD	= Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.
J	= The associated value is an estimated quantity.
J-	= The associated numerical value is an estimated quantity with a suspected negative bias.
J+	= The associated numerical value is an estimated quantity with a suspected positive bias.
U	= The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ	= The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	= The data are unusable, and resampling or reanalysis are necessary for verification.

[g]Analytical Method

AM20GAX = Proprietary method of Pace Analytical Services, LLC.

Clesceri, Rice, Baird, and Eaton, 2012, "Standard Methods for the Examination of Water and Wastewater." 22nd ed., Method 2320B, published jointly by American Public Health Association, American Water Works Association, and Water Environment Federation, Washington, D.C.

EPA, 1980, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water." EPA-600/4-80-032, Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.

EPA, 1986, (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods." SW-846, 3rd ed., U.S. Environmental Protection Agency, Cincinnati, Ohio.

EPA, 1984, "Methods for Chemical Analysis of Water and Wastes." EPA 600-4-79-020, U.S. Environmental Protection Agency, Cincinnati, Ohio.

EPA, 1993, "Method 350.1, Determination of Ammonia Nitrogen by Semi-Automated Colorimetry." Revision 2.0.

EPA, 1993, "Method 353.2, Determination of Nitrate-Nitrite Nitrogen by Automated Colorimetry." Revision 2.0.

[h]Lab

GEL	= GEL Laboratories LLC, 2040 Savage Road, Charleston, South Carolina 29407.
PACE-GC	= Pace Analytical Gulf Coast, 7979 Innovation Park Drive, Baton Rouge, Louisiana 70820.

[i]Field Water Quality Measurements

Field measurements collected prior to sampling.

°C	= Degrees Celsius.
% Sat	= Percent saturation.
µmho/cm	= Micromhos per centimeter.
mg/L	= Milligrams per liter.
mV	= Millivolts.
pH	= Potential of hydrogen (negative logarithm of the hydrogen ion concentration).
NTU	= Nephelometric turbidity units.

Appendix A

Letter from DOE/NNSA SFO to NMED HWB, dated August 23, 2021; Subject: *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).*

Letter from NMED HWB to DOE/NNSA SFO and SNL/NM, dated October 12, 2021; Subject: *Approval with Modification, 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 Bureau (HWB)*.

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

National Nuclear Security Administration

AUG 2 3 2021

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: Transition of Five Groundwater Monitoring Wells as Condition to Terminate Discharge Permit (DP)-1845 under New Mexico Environment Department (NMED) Ground Water Quality Bureau (GQWB) to NMED Hazardous Waste Bureau (HWB)

Dear Mr. Maestas:

On June 29, 2021, the Department of Energy, National Nuclear Security Administration (DOE/NNSA), Sandia Field Office (SFO) convened a virtual meeting with personnel from the Sandia National Laboratories, New Mexico (SNL/NM) and the NMED GQWB to discuss a proposal for terminating DP-1845. NMED GWQB agreed with the DOE/NNSA SFO proposal to submit a termination request for DP-1845 with the condition that regulatory oversight of the five groundwater wells monitored under DP-1845 will be transitioned to NMED HWB. DOE/NNSA SFO and SNL/NM personnel hereby request that NMED HWB provide regulatory oversight of the five groundwater monitoring wells, for reasons contained herein.

NMED GWQB issued DP-1845 to DOE/NNSA SFO for discharges via up to three Class V underground injection control wells in a phased In-Situ Bioremediation (ISB) Treatability Study at the SNL/NM Technical Area-V (TA-V) Groundwater (TAVG) Area of Concern (AOC). The term of DP-1845 is from May 30, 2017, to May 29, 2022.

SNL/NM personnel have completed Phase I of the Treatability Study using injection well TAV-INJ1. Based on the Phase I Treatability Study results, DOE/NNSA SFO, SNL/NM, and NMED HWB personnel have jointly agreed that continuing to Phase II of the Treatability Study is not warranted. Consequently, the ISB Treatability Study at TAVG AOC concluded in May 2021.

The five groundwater wells monitored under DP-1845 are: TAV-INJ1, TAV-MW6, TAV-MW7, TAV-MW10, and LWDS-MW1. Injection well TAV-INJ1 was installed to deliver bioremediation treatment solution to the aquifer during the Phase I Treatability Study. The other four wells were preexisting wells in the TAVG monitoring network. Figure 1 shows the locations of the five wells monitored under DP-1845 and the other TAVG AOC monitoring wells. Injection well TAV-INJ1 and monitoring wells TAV-MW6 and TAV-MW7 represent the Phase I treatment zone. The well screens of both TAV-INJ1 and TAV-MW6 are across the water table, whereas the midpoint of TAV-MW7 well screen is 90 feet below the water table. Wells TAV-MW10 and LWDS-MW1 were the nearest monitoring points outside the Phase I treatment zone and were the planned locations for the proposed Phase II treatment zones.

In the Phase I Treatability Study, discharges of the treatment solution were completed in April 2019 and the five wells were monitored for two years from May 2019 to May 2021. DP-1845 requires only quarterly sampling of these wells. However, per the monitoring requirements of the Revised Treatability Study Work Plan approved by NMED HWB, from May 2019 to May 2021, wells TAV-INJ1 and TAV-MW6 were sampled monthly for three months followed by quarterly sampling, totaling ten sampling events per well; and wells TAV-MW7, TAV-MW10, and LWDS-MW1 were sampled quarterly, totaling nine sampling events per well. Groundwater monitoring results at these five wells have been provided in the DP-1845 Quarterly Reports to NMED GWQB as well as in Section III of the Environmental Restoration Consolidated Quarterly Reports to NMED HWB.

As the Phase I Treatability Study has concluded and the decision has been made not to conduct the Phase II Treatability Study, DOE/NNSA SFO and SNL/NM personnel request that NMED HWB provide regulatory oversight of the five wells monitored under DP-1845 with the following sampling plan.

- Groundwater monitoring results at wells TAV-MW7, TAV-MW10, and LWDS-MW1 have been consistent with historical values, indicating no impact on groundwater chemistry at these wells during the Phase I Treatability Study. Therefore, these three wells can be reverted to the TAVG monitoring network. They will be monitored for the same parameters as the other TAVG wells and on the same schedule as before the Treatability Study. Specifically, well TA-MW7 will resume the semiannual monitoring schedule and wells TAV-MW10 and LWDS-MW1 will resume the quarterly monitoring schedule. Results of all TAVG wells will be provided in the Annual Groundwater Monitoring Reports.
- DOE/NNSA SFO and SNL/NM personnel propose continued quarterly monitoring of the Phase I treatment wells TAV-INJ1 and TAV-MW6 for one year ending June 2022. The parameters proposed for this one-year monitoring will be the same as those for the Phase I Treatability Study, except for discontinuing monitoring for *Dehalococcoides*. The parameter list includes volatile organic compounds, ammonia, total organic carbon, anions (bromide, chloride, and sulfate), nitrate plus nitrite, alkalinity, dissolved metals (arsenic, iron, and manganese), methane, ethane, and ethene. The discontinuation of *Dehalococcoides* analysis is based on non-detection since October 2019 in well TAV-INJ1 and non-detection in well TAV-MW6 for the entire Phase I Treatability Study. The new monitoring data will be incorporated into the forthcoming Corrective Measures Evaluation Report and further support the NMED HWB selection of a final remedy for the TAVG AOC Corrective Action. Results of wells TAV-INJ1 and TAV-MW6 will continue to be provided in Section III of the Environmental Restoration Consolidated Quarterly Reports.

In summary, DOE/NNSA SFO and SNL/NM personnel request that NMED HWB provide regulatory oversight of the five wells monitored under DP-1845 (TAV-INJ1, TAV-MW6, TAV-MW7, TAV-MW10, and LWDS-MW1) with the proposed sampling plan, as described above. DOE/NNSA SFO will follow the NMED GWQB requirements to terminate DP-1845 and will continue to update NMED HWB on the progress of the termination process.

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

Sincerely,

Daryl J. Hauck, Ph.D.
Manager

cc w/enclosure:
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NNSA-2021-003763

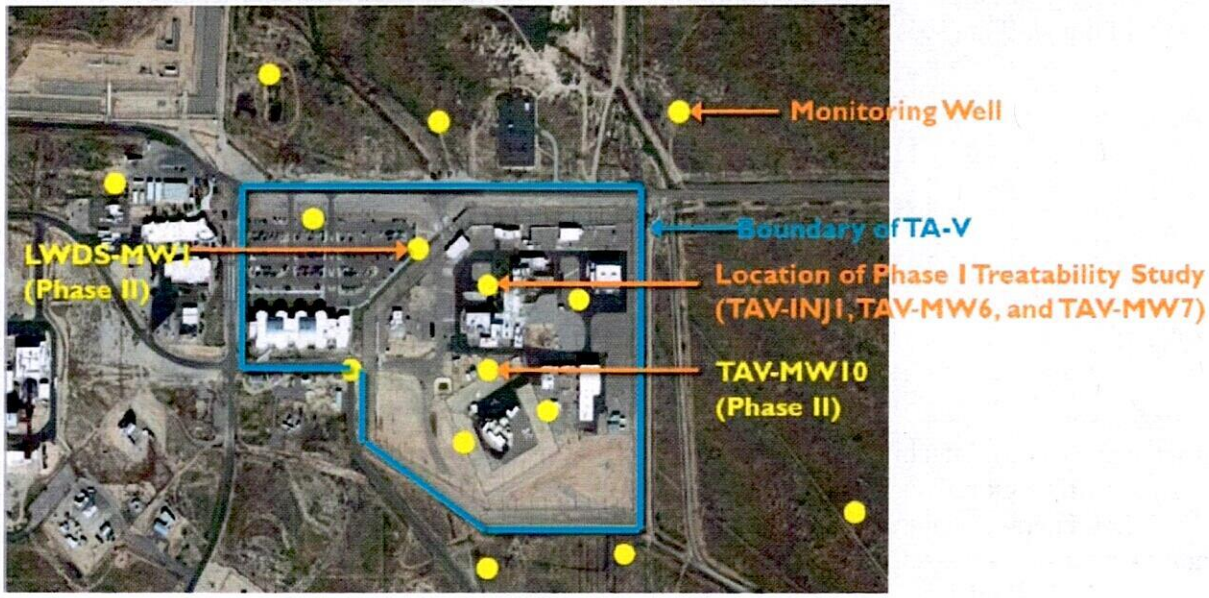

Figure 1. Locations of the Five Wells Monitored under DP-1845. Yellow dots represent the approximately locations of the wells in the TAVG monitoring network.

Certified Mail - Return Receipt Requested

October 12, 2021

Daryl Hauck
Manager
U.S. Department of Energy
NNSA/Sandia Field Office
P.O. Box 5400, MS 0184
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Paul Shoemaker
Director
Sandia National Laboratories/NM
P.O. Box 5800, MS 1512
Albuquerque, NM 87185

RE: 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

Dear Messrs. Hauck and Shoemaker,

The New Mexico Environment Department (NMED) received the August 23, 2021 dated letter titled *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)*, submitted by the U.S. Department of Energy on behalf of itself and National Technology & Engineering Solutions of Sandia, LLC (collectively, the Permittees), on August 25, 2021.

NMED has reviewed the letter and hereby issues this Approval with the following modification:

1. **Addition Of Annual Sampling Parameters**

NMED Comment: The Permittees must continue to include the annual sampling parameters of alkalinity, anions (bromide, chloride, fluoride, and sulfate), gamma spectroscopy, gross alpha/beta activity, tritium, and TAL metals plus total uranium for the five groundwater monitoring wells.

If you have any questions regarding this letter, please contact Naomi Davidson at (505) 222-9504.

Sincerely,

Ricardo Maestas, Acting Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
B. Wear, NMED HWB
N. Davidson, NMED HWB
L. King, EPA Region 6 (6LCRRC)
B. Wechsler, DOE/NNSA/SFO, MS-0184
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C. Leigh, SNL/NM, MS-0737

File: SNL 2021 and Reading

Sandia National Laboratories