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GROUND WATER
 QUALITY BUREAU



Environmental Management
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Date: March 1, 2024
Refer To: N3B-2024-0048

Justin Ball, Chief
 Ground Water Quality Bureau
 New Mexico Environment Department
 1190 S. St. Francis Drive
 Santa Fe, NM 87502-5469

Subject: Submittal of the Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2023 Quarter 4, Class V Underground Injection Control Wells

Dear Mr. Ball:

On August 31, 2016, the New Mexico Environment Department (NMED) issued Discharge Permit 1835 (DP-1835) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater to the regional aquifer from up to six Class V underground injection control (UIC) wells. On July 21, 2017, NMED approved minor updates to DP-1835. During the second quarter of calendar year (CY) 2018, ownership of the discharge permit transferred from LANS to Newport News Nuclear BWXT-Los Alamos, LLC (N3B). Pursuant to Condition No. 10 of the above-referenced discharge permit, DOE/N3B are required to submit quarterly reports to document the following:

1. influent and discharge volumes from the treatment systems,
2. quarterly groundwater and treated effluent sampling results, and
3. operations and maintenance activities.

Pursuant to Condition No. 11, 12, and 13 of DP-1835, the quarterly reports shall also contain general information, performance information, and monitoring data for treated effluent from each ion-exchange treatment system. Condition No. 10 requires submission of a quarterly report to NMED by March 1, 2024, for the October 1 through December 31, 2023, discharge period.

During the CY 2023 Quarter 4 reporting period for DP-1835, no treated water was injected. Monthly sampling occurred at all injection and extraction wells, and the purged sample water produced during sampling events was treated through Chromium Treatment A and held in storage tanks for disposal at a later date.

The enclosed "Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2023 Quarter 4" provides the information required under DP-1835 for this reporting period.

If you have questions, please contact Clark Short at (505) 551-2942 (clark.short@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,



Robert Edwards III
Acting Program Manager
Environment, Safety, Health and Quality
N3B-Los Alamos

Sincerely,

**ARTURO
DURAN**

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Date: 2024.02.29 09:25:02 -07'00'

Arturo Q. Duran
Office of Quality and Regulatory Compliance
U.S. Department of Energy
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Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files – Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2023, Quarter 4 (EM2024-0060)

cc (letter and enclosure[s] emailed):

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**Quarterly Report for the
Discharge of Treated
Groundwater to the
Regional Aquifer under
Discharge Permit 1835,
Calendar Year 2023 Quarter 4**

Newport News Nuclear BWXT-Los Alamos, LLC (N3B), under the U.S. Department of Energy Office of Environmental Management Contract No. 89303318CEM000007 (the Los Alamos Legacy Cleanup Contract), has prepared this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

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1.0 INTRODUCTION

On August 31, 2016, the New Mexico Environment Department (NMED) issued Discharge Permit 1835 (DP-1835) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater to the regional aquifer through Class V underground injection control (UIC) wells (NMED 2016). On July 21, 2017, NMED approved minor updates to DP-1835 (NMED 2017a). During Quarter 2 of calendar year (CY) 2018, ownership of the discharge permit transferred from LANS to Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (LANL 2018).

On June 6, 2022, NMED Groundwater Quality Bureau (GWQB) issued the “Notice of Violation, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835” (NMED 2022a) to the DOE Environmental Management Los Alamos Field Office (EM-LA) based on measured concentrations of total dissolved chromium in the regional aquifer at well R-45 screen 2 that exceeded the 20.6.2.3103 New Mexico Administrative Code (NMAC) groundwater standard of 50 µg/L. EM-LA reported this exceedance to NMED-GWQB on February 26, 2021, in the “Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer Under Discharge Permit 1835, Calendar Year 2020 Quarter 4, Class V Underground Injection Control Wells” (N3B 2021).

On September 30, 2022, EM-LA submitted the “Regional Aquifer Monitoring Well R-45 Action Plan,” (R-45 Action Plan), providing activities that EM-LA proposed for addressing chromium in the regional aquifer (N3B 2022). On December 12, 2022, NMED-GWQB provided a review of the R-45 Action Plan and direction to cease all injection of treated water authorized under DP-1835 by April 1, 2023, “until the Permittees complete the proposed corrective actions and can definitively prove through qualitative and quantitative analyses, simulations, monitoring well installation, and continued monitoring that further migration is not occurring” (NMED 2022b).

During the CY 2023 Quarter 4 reporting period for DP-1835, no treated water was injected. Monthly sampling occurred at all injection and extraction wells, with the exception of CrEX-1, which was not sampled in November or December because the harmonic filter/transformer was down. Purged sample water produced during sampling events was treated through Chromium Treatment Unit A (CTUA) and held in storage tanks for disposal at a later date.

Condition No. 10 of DP-1835 requires submission of a quarterly report to NMED by March 1 for the October 1 through December 31 discharge period. Several conditions within the permit identify information to be submitted in the quarterly report. These conditions are addressed in this report in the following requirements:

1. Influent and discharge volumes for the ion exchange (IX) treatment systems (Condition No. 10)
2. Quarterly treated-effluent sampling results from each IX treatment system (Conditions Nos. 10 and 13)
3. Quarterly depth-to-groundwater and groundwater-quality sampling results (Conditions Nos. 10 and 14)
4. Any operations/maintenance activities performed (Condition No. 10)
5. Any periodic test of mechanical integrity conducted (Condition No. 11.a)
6. Any replacement of primary or secondary IX vessels or associated treatment system infrastructure (Condition No. 11.b)
7. Any well workovers conducted (Condition No. 11.c)

8. Any additional operational changes with the potential to markedly affect the discharge (Condition No. 11.d)
9. Monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each UIC well (Condition No. 12.a)
10. Total monthly volume of treated effluent transferred to each UIC well (Condition No. 12.b)
11. Monthly average, maximum, and minimum values of injection water level (pressure head) above static level for each UIC well (Condition No. 12.c)
12. Daily volume injected at each UIC well (Condition No. 12.d)
13. Daily volume pumped from each extraction well (Condition No. 12.e)
14. Facility layout map (Condition No. 14)
15. Groundwater elevation contour map (Condition No. 15)

This report addresses each of these requirements.

2.0 REQUIREMENTS

2.1 Influent and Discharge Volumes for the Ion-Exchange Treatment Systems (Requirement 1)

Table 2.1-1 provides the total influent volume to the IX system, and the discharge volumes from IX treatment systems CTUA, and Chromium Treatment Unit C (CTUC), during CY 2023 Quarter 4 for activities completed under DP-1835.

Table 2.1-1
Total Influent and Discharge Volumes
for IX Treatment Systems – CY 2023 Quarter 4, DP-1835

Treatment Unit	Influent Volume ^a (gal.)	Effluent Volume ^b (gal.)
CTUA	34,525	34,563
CTUC	0	0

Note: Individual flow meter accurate to $\pm 5\%$, influent and effluent volumes are within flow meter accuracy.

^a Influent volume based on extraction volumes from CrEX-1, CrEX-2, CrEX-3, CrEX-4 and CrEX-5.

^b Effluent volume based on CTUA flow-meter readings.

2.2 Quarterly Treated Effluent Sampling Results from Each Ion-Exchange Treatment System (Requirement 2)

Analytical results from samples of treated effluent collected during CY 2023 Quarter 4 for activities completed under DP-1835 are summarized in Table 2.2-1.

No sample results for total chromium or perchlorate exceeded 90% of the numeric standards of 20.6.2.3103 NMAC or, for constituents not listed in 20.6.2.3103 NMAC, 90% of the numeric screening levels established for tap water in Table A-1 of the 2022 NMED "Risk Assessment Guidance for Site Investigations and Remediation Volume 1, Soil Screening Guidance for Human Health Risk Assessments" (NMED 2022c).

The values representing 90% of the applicable standards or screening levels for these seven analytes are as follows:

- Chloride 225 mg/L
- Chromium 45 µg/L
- Fluoride 1.44 mg/L
- Nitrate 9 mg/L
- Perchlorate 12.4 µg/L
- Sulfate 540 mg/L
- Total dissolved solids 900 mg/L

The pilot-scale molasses and sodium dithionite amendment studies began with NMED conditional approvals during CY 2017 Quarter 4 (NMED 2017a, NMED 2017b) and continued through CY 2023 Quarter 4. NMED determined that no permit was required for the deployment of these amendments. In accordance with the NMED conditional approvals, sampling for iron, manganese, and arsenic in the treated water from extraction wells was completed, and the results were submitted in the quarterly monitoring reports under DP-1835. The results for CY 2023 Quarter 4 are provided in Table 2.2-2. No results for iron, manganese, or arsenic exceeded 900 µg/L, 180 µg/L, or 9 µg/L, respectively (90% of the numeric standards), as specified in 20.6.2.3103 NMAC.

DP-1835 Permit Condition No. 13 requires treated effluent to be analyzed annually for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants defined in 20.6.2.7.T(2) NMAC. The annual sample for CY 2023 was obtained during CY 2023 Quarter 4, and the results are provided in Table 2.2-3.

Table 2.2-1
Analytical Results from Samples of Treated Effluent – CY 2023 Quarter 4, DP-1835

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	90% of Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301025	REG	10/26/2023	Chloride	17.5	mg/L	225	N	n/a	Y	Y	0.335
CTUA	CrTMT-24-301024	REG	10/26/2023	Chromium	3.00	µg/L	45	N	U	N	N	3.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Chromium	3.00	µg/L	45	N	U	N	Y	3.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Fluoride	0.342	mg/L	1.44	N	n/a	Y	Y	0.0330
CTUA	CrTMT-24-301025	REG	10/26/2023	Nitrate-Nitrite as Nitrogen	3.73	mg/L	9	N	n/a	Y	Y	0.0850
CTUA	CrTMT-24-301025	REG	10/26/2023	Perchlorate	0.803	µg/L	12.4	N	H	Y	Y	0.0500
CTUA	CrTMT-24-301025	REG	10/26/2023	Sulfate	25.4	mg/L	540	N	n/a	Y	Y	0.665
CTUA	CrTMT-24-301025	REG	10/26/2023	Total Dissolved Solids	221	mg/L	900	N	n/a	Y	Y	2.38

Table 2.2-2
Treated Effluent Analytical Results Summary Table Related to Molasses and Sodium Dithionite Pilot Studies under NMED Conditional Approval – CY 2023 Quarter 4, DP-1835

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	90% of Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Arsenic	2.00	µg/L	9	N	U	N	N	2.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Arsenic	2.00	µg/L	9	N	U	N	Y	2.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Iron	30.0	µg/L	900	N	U	N	N	30.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Iron	30.0	µg/L	900	N	U	N	Y	30.0
CTUA	CrTMT-24-301024	REG	10/26/2023	Manganese	2.00	µg/L	180	N	U	N	N	2.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Manganese	2.00	µg/L	180	N	U	N	Y	2.00

Notes: The pilot-scale molasses and sodium dithionite amendment studies, which began with NMED conditional approvals during CY 2017 Quarter 4 (NMED 2017b, NMED 2017c), continued during CY 2023 Quarter 4. NMED determined that no permit was required for the deployment of these amendments.

Table 2.2-3

Treated Effluent Analytical Results Summary Table Annual Sample – CY 2023 Quarter 4, DP-1835

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Acenaphthene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Acenaphthene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Acenaphthylene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Acenaphthylene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Acetone	1.74	µg/L	U	N	N	1.74
CTUA	CrTMT-24-301024	REG	10/26/2023	Acetonitrile	8.33	µg/L	U	N	N	8.33
CTUA	CrTMT-24-301025	REG	10/26/2023	Acidity or Alkalinity of a solution	7.93	SU	H	Y	Y	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Acrolein	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Acrylonitrile	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Aldrin	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301025	REG	10/26/2023	Alkalinity-CO3	0.725	mg/L	U	N	Y	0.725
CTUA	CrTMT-24-301025	REG	10/26/2023	Alkalinity-CO3+HCO3	77.5	mg/L	n/a	Y	Y	0.725
CTUA	CrTMT-24-301024	REG	10/26/2023	Aluminum	68.0	µg/L	U	N	N	68.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Aluminum	68.0	µg/L	U	N	Y	68.0
CTUA	CrTMT-24-301024	REG	10/26/2023	Aniline	4.20	µg/L	U	N	N	4.20
CTUA	CrTMT-24-301024	REG	10/26/2023	Anthracene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Anthracene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Antimony	1.00	µg/L	U	N	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Antimony	1.00	µg/L	U	N	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1016	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1221	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1232	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1242	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1248	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1254	0.0333	µg/L	U	N	N	0.0333

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1260	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Aroclor-1262	0.0333	µg/L	U	N	N	0.0333
CTUA	CrTMT-24-301024	REG	10/26/2023	Arsenic	2.00	µg/L	U	N	N	2.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Arsenic	2.00	µg/L	U	N	Y	2.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Atrazine	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Azobenzene	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Barium	51.9	µg/L	n/a	Y	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Barium	50.4	µg/L	n/a	Y	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzidine	3.90	µg/L	U	N	N	3.90
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(a)anthracene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(a)anthracene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(a)pyrene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(a)pyrene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(b)fluoranthene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(b)fluoranthene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(g,h,i)perylene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(g,h,i)perylene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(k)fluoranthene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzo(k)fluoranthene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzoic Acid	6.00	µg/L	U	N	N	6.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Benzyl Alcohol	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Beryllium	1.00	µg/L	U	N	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Beryllium	1.00	µg/L	U	N	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	BHC[alpha-]	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	BHC[beta-]	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	BHC[delta-]	0.00665	µg/L	U	N	N	0.00665

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	BHC[gamma-]	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	Bis(2-chloroethoxy)methane	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Bis(2-chloroethyl)ether	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Bis(2-ethylhexyl)phthalate	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Boron	20.7	µg/L	J	Y	N	15.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Boron	20.1	µg/L	J	Y	Y	15.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Bromide	0.139	mg/L	J	Y	Y	0.0670
CTUA	CrTMT-24-301024	REG	10/26/2023	Bromobenzene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Bromochloromethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Bromodichloromethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Bromoform	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Bromomethane	0.337	µg/L	U	N	N	0.337
CTUA	CrTMT-24-301024	REG	10/26/2023	Bromophenyl-phenylether[4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Butanol[1-]	21.1	µg/L	U	N	N	21.1
CTUA	CrTMT-24-301024	REG	10/26/2023	Butanone[2-]	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Butylbenzene[n-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Butylbenzene[sec-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Butylbenzene[tert-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Butylbenzylphthalate	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Cadmium	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301025	REG	10/26/2023	Cadmium	0.300	µg/L	U	N	Y	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Calcium	33.2	mg/L	n/a	Y	N	50.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Calcium	32.2	mg/L	n/a	Y	Y	50.0
CTUA	CrTMT-24-301024	REG	10/26/2023	Carbazole	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Carbon Disulfide	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Carbon Tetrachloride	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlordane[alpha-]	0.00665	µg/L	U	N	N	0.00665

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlordane[gamma-]	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301025	REG	10/26/2023	Chloride	17.5	mg/L	n/a	Y	Y	0.335
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloro-1,3-butadiene[2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloro-1-propene[3-]	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloro-3-methylphenol[4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloroaniline[4-]	3.30	µg/L	U	N	N	3.30
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlorobenzene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlorodibromomethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloroethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloroform	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloromethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloronaphthalene[2-]	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Chloronaphthalene[2-]	0.410	µg/L	U	N	N	0.410
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlorophenol[2-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlorophenyl-phenyl[4-] Ether	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlorotoluene[2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chlorotoluene[4-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Chromium	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Chromium	3.00	µg/L	U	N	Y	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Chrysene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Chrysene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Cobalt	1.00	µg/L	U	N	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Cobalt	1.00	µg/L	U	N	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Copper	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Copper	3.00	µg/L	U	N	Y	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Cyanide (Total)	0.00167	mg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	DDD[4,4'-]	0.0100	µg/L	U	N	N	0.0100

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	DDE[4,4'-]	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	DDT[4,4'-]	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Dibenz(a,h)anthracene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Dibenz(a,h)anthracene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Dibenzofuran	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dibromo-3-Chloropropane[1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dibromoethane[1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dibromomethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzene[1,2-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzene[1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzene[1,3-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzene[1,3-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzene[1,4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzene[1,4-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorobenzidine[3,3'-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorodifluoromethane	0.355	µg/L	U	N	N	0.355
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloroethane[1,1-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloroethane[1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloroethene[1,1-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloroethene[cis/trans-1,2-]	0.667	µg/L	U	N	N	0.667
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloroethene[cis-1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloroethene[trans-1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichlorophenol[2,4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloropropane[1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloropropane[1,3-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloropropane[2,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloropropene[1,1-]	0.333	µg/L	U	N	N	0.333

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloropropene[cis-1,3-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dichloropropene[trans-1,3-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Dieldrin	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Diethyl Ether	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Diethylphthalate	0.710	µg/L	J	Y	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Dimethyl Phthalate	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Dimethylphenol[2,4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Di-n-butylphthalate	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Dinitro-2-methylphenol[4,6-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dinitrophenol[2,4-]	5.00	µg/L	U	N	N	5.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dinitrotoluene[2,4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dinitrotoluene[2,6-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Di-n-octylphthalate	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Dinoseb	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dioxane[1,4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Dioxane[1,4-]	16.7	µg/L	U	N	N	16.7
CTUA	CrTMT-24-301024	REG	10/26/2023	Diphenylamine	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Endosulfan I	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	Endosulfan II	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Endosulfan Sulfate	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Endrin	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Endrin Aldehyde	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	Endrin Ketone	0.0100	µg/L	U	N	N	0.0100
CTUA	CrTMT-24-301024	REG	10/26/2023	Ethyl Methacrylate	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Ethylbenzene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Fluoranthene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Fluoranthene	0.0300	µg/L	U	N	N	0.0300

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Fluorene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Fluorene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301025	REG	10/26/2023	Fluoride	0.342	mg/L	n/a	Y	Y	0.0330
CTUA	CrTMT-24-301024	REG	10/26/2023	Hardness	117	mg/L	n/a	Y	N	0.453
CTUA	CrTMT-24-301025	REG	10/26/2023	Hardness	114	mg/L	n/a	Y	Y	0.453
CTUA	CrTMT-24-301024	REG	10/26/2023	Heptachlor	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	Heptachlor Epoxide	0.00665	µg/L	U	N	N	0.00665
CTUA	CrTMT-24-301024	REG	10/26/2023	Hexachlorobenzene	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Hexachlorobutadiene	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Hexachlorobutadiene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Hexachlorocyclopentadiene	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Hexachloroethane	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Hexanone[2-]	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Indeno(1,2,3-cd)pyrene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Indeno(1,2,3-cd)pyrene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Iodomethane	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Iron	30.0	µg/L	U	N	N	30.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Iron	30.0	µg/L	U	N	Y	30.0
CTUA	CrTMT-24-301024	REG	10/26/2023	Isobutyl alcohol	16.7	µg/L	U	N	N	16.7
CTUA	CrTMT-24-301024	REG	10/26/2023	Isophorone	3.50	µg/L	U	N	N	3.50
CTUA	CrTMT-24-301024	REG	10/26/2023	Isopropylbenzene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Isopropyltoluene[4-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Lead	0.500	µg/L	U	N	N	0.500
CTUA	CrTMT-24-301025	REG	10/26/2023	Lead	0.500	µg/L	U	N	Y	0.500
CTUA	CrTMT-24-301024	REG	10/26/2023	Magnesium	8.23	mg/L	n/a	Y	N	110
CTUA	CrTMT-24-301025	REG	10/26/2023	Magnesium	8.12	mg/L	n/a	Y	Y	110
CTUA	CrTMT-24-301024	REG	10/26/2023	Manganese	2.00	µg/L	U	N	N	2.00

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301025	REG	10/26/2023	Manganese	2.00	µg/L	U	N	Y	2.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Mercury	0.0670	µg/L	U	N	N	0.0670
CTUA	CrTMT-24-301025	REG	10/26/2023	Mercury	0.0670	µg/L	U	N	Y	0.0670
CTUA	CrTMT-24-301024	REG	10/26/2023	Methacrylonitrile	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Methoxychlor[4,4'-]	0.0500	µg/L	U	N	N	0.0500
CTUA	CrTMT-24-301024	REG	10/26/2023	Methyl Methacrylate	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Methyl tert-Butyl Ether	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Methyl-2-pentanone[4-]	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylene Chloride	0.500	µg/L	U	N	N	0.500
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylnaphthalene[1-]	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylnaphthalene[1-]	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylnaphthalene[2-]	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylnaphthalene[2-]	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylphenol[2-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Methylphenol[3-,4-]	3.70	µg/L	U	N	N	3.70
CTUA	CrTMT-24-301024	REG	10/26/2023	Molybdenum	0.281	µg/L	J	Y	N	0.200
CTUA	CrTMT-24-301025	REG	10/26/2023	Molybdenum	0.282	µg/L	J	Y	Y	0.200
CTUA	CrTMT-24-301024	REG	10/26/2023	Naphthalene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Naphthalene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Nickel	4.34	µg/L	n/a	Y	N	0.600
CTUA	CrTMT-24-301025	REG	10/26/2023	Nickel	4.43	µg/L	n/a	Y	Y	0.600
CTUA	CrTMT-24-301025	REG	10/26/2023	Nitrate-Nitrite as Nitrogen	3.73	mg/L	n/a	Y	Y	0.0850
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitroaniline[2-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitroaniline[3-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitroaniline[4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitrobenzene	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitrophenol[2-]	3.00	µg/L	U	N	N	3.00

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitrophenol[4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitrosodiethylamine[N-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitrosodimethylamine[N-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitroso-di-n-butylamine[N-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitroso-di-n-propylamine[N-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Nitrosopyrrolidine[N-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Oxybis(1-chloropropane)[2,2'-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Pentachlorobenzene	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Pentachlorophenol	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Perchlorate	0.803	µg/L	H	Y	Y	0.0500
CTUA	CrTMT-24-301024	REG	10/26/2023	Perfluorohexanesulfonic acid	0.622	ng/L	U	N	N	0.622
CTUA	CrTMT-24-301024	REG	10/26/2023	Perfluorooctanesulfonic acid	0.754	ng/L	U	N	N	0.754
CTUA	CrTMT-24-301024	REG	10/26/2023	Perfluorooctanoic acid	0.754	ng/L	U	N	N	0.754
CTUA	CrTMT-24-301024	REG	10/26/2023	Phenanthrene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Phenanthrene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Phenol	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Potassium	1.61	mg/L	n/a	Y	N	50.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Potassium	1.54	mg/L	n/a	Y	Y	50.0
CTUA	CrTMT-24-301024	REG	10/26/2023	Prometon	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Propionitrile	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Propylbenzene[1-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Pyrene	0.0300	µg/L	U	N	N	0.0300
CTUA	CrTMT-24-301024	REG	10/26/2023	Pyrene	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Pyridine	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Radium-226	0.479	pCi/L	n/a	N	N	n/a
CTUA	CrTMT-24-301024	REG	10/26/2023	Radium-226 and Radium-228	0.719	pCi/L	J	N	N	n/a
CTUA	CrTMT-24-301024	REG	10/26/2023	Radium-228	0.240	pCi/L	U	N	N	n/a

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Selenium	1.50	µg/L	U	N	N	1.50
CTUA	CrTMT-24-301025	REG	10/26/2023	Selenium	1.50	µg/L	U	N	Y	1.50
CTUA	CrTMT-24-301024	REG	10/26/2023	Silicon Dioxide	75.8	mg/L	n/a	Y	N	53.0
CTUA	CrTMT-24-301025	REG	10/26/2023	Silicon Dioxide	74	mg/L	n/a	Y	Y	53.0
CTUA	CrTMT-24-301024	REG	10/26/2023	Silver	0.300	µg/L	U	N	N	0.300
CTUA	CrTMT-24-301025	REG	10/26/2023	Silver	0.300	µg/L	U	N	Y	0.300
CTUA	CrTMT-24-301024	REG	10/26/2023	Sodium	13.8	mg/L	n/a	Y	N	100
CTUA	CrTMT-24-301025	REG	10/26/2023	Sodium	13.5	mg/L	n/a	Y	Y	100
CTUA	CrTMT-24-301025	REG	10/26/2023	Specific Conductance	297	uS/cm	n/a	Y	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Strontium	136	µg/L	n/a	Y	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Strontium	133	µg/L	n/a	Y	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Styrene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301025	REG	10/26/2023	Sulfate	25.4	mg/L	n/a	Y	Y	0.665
CTUA	CrTMT-24-301024	REG	10/26/2023	Sulfolane	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Tetrachlorobenzene[1,2,4,5]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Tetrachloroethane[1,1,1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Tetrachloroethane[1,1,2,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Tetrachloroethene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Tetrachlorophenol[2,3,4,6-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Thallium	0.600	µg/L	U	N	N	0.600
CTUA	CrTMT-24-301025	REG	10/26/2023	Thallium	0.600	µg/L	U	N	Y	0.600
CTUA	CrTMT-24-301024	REG	10/26/2023	Tin	1.00	µg/L	U	N	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Tin	2.22	µg/L	J	Y	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Toluene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301025	REG	10/26/2023	Total Dissolved Solids	221	mg/L	n/a	Y	Y	2.38
CTUA	CrTMT-24-301024	REG	10/26/2023	Toxaphene (Technical Grade)	0.150	µg/L	U	N	N	0.150
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2.98	µg/L	U	N	N	2.98

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichlorobenzene[1,2,3-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichlorobenzene[1,2,4-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichlorobenzene[1,2,4-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichloroethane[1,1,1-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichloroethane[1,1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichloroethene	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichlorofluoromethane	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichlorophenol[2,4,5-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichlorophenol[2,4,6-]	3.00	µg/L	U	N	N	3.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Trichloropropane[1,2,3-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trimethylbenzene[1,2,4-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Trimethylbenzene[1,3,5-]	0.500	µg/L	U	N	N	0.500
CTUA	CrTMT-24-301024	REG	10/26/2023	Uranium	0.0670	µg/L	U	N	N	0.0670
CTUA	CrTMT-24-301025	REG	10/26/2023	Uranium	0.0670	µg/L	U	N	Y	0.0670
CTUA	CrTMT-24-301024	REG	10/26/2023	Vanadium	7.65	µg/L	n/a	Y	N	1.00
CTUA	CrTMT-24-301025	REG	10/26/2023	Vanadium	7.66	µg/L	n/a	Y	Y	1.00
CTUA	CrTMT-24-301024	REG	10/26/2023	Vinyl acetate	1.67	µg/L	U	N	N	1.67
CTUA	CrTMT-24-301024	REG	10/26/2023	Vinyl Chloride	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Xylene[1,2-]	0.333	µg/L	U	N	N	0.333
CTUA	CrTMT-24-301024	REG	10/26/2023	Xylene[1,3-]+Xylene[1,4-]	0.500	µg/L	U	N	N	0.500
CTUA	CrTMT-24-301024	REG	10/26/2023	Zinc	89.8	µg/L	n/a	Y	N	3.30
CTUA	CrTMT-24-301025	REG	10/26/2023	Zinc	84.5	µg/L	n/a	Y	Y	3.30
CTUA	CrTMT-24-304717	REG	11/20/2023	2,4-Diamino-6-nitrotoluene	0.521	µg/L	U	N	N	0.521
CTUA	CrTMT-24-304717	REG	11/20/2023	2,6-Diamino-4-nitrotoluene	0.521	µg/L	U	N	N	0.521
CTUA	CrTMT-24-304717	REG	11/20/2023	3,5-Dinitroaniline	0.312	µg/L	U	N	N	0.312
CTUA	CrTMT-24-304717	REG	11/20/2023	Amino-2,6-dinitrotoluene[4-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Amino-4,6-dinitrotoluene[2-]	0.0833	µg/L	U	N	N	0.0833

Table 2.2-3 (continued)

Location ID	Field Sample ID	Sample Purpose	Sample Date	Parameter Name	Report Results	Report Unit	Qualifier	Detected	Filtered	Method Detection Limit
CTUA	CrTMT-24-304717	REG	11/20/2023	Dinitrobenzene[1,3-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Dinitrotoluene[2,4-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Dinitrotoluene[2,6-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	DNX	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	HMX	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	MNX	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Nitrobenzene	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Nitrotoluene[2-]	0.0854	µg/L	U	N	N	0.0854
CTUA	CrTMT-24-304717	REG	11/20/2023	Nitrotoluene[3-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Nitrotoluene[4-]	0.156	µg/L	U	N	N	0.156
CTUA	CrTMT-24-304717	REG	11/20/2023	PETN	0.104	µg/L	U	N	N	0.104
CTUA	CrTMT-24-304717	REG	11/20/2023	RDX	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	TATB	0.312	µg/L	UJ	N	N	0.312
CTUA	CrTMT-24-304717	REG	11/20/2023	Tetryl	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	TNX	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Trinitrobenzene[1,3,5-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Trinitrotoluene[2,4,6-]	0.0833	µg/L	U	N	N	0.0833
CTUA	CrTMT-24-304717	REG	11/20/2023	Tris (o-cresyl) phosphate	0.312	µg/L	U	N	N	0.312

2.3 Quarterly Depth to Groundwater and Groundwater Quality Sampling Results (Requirement 3)

Depth to groundwater is expressed as the elevation of the groundwater above sea level. Figure 2.3-1 is the groundwater elevation map, and Table 2.3-1 provides the quarterly groundwater elevation measurements for a nonexhaustive selection of wells. An explanation of how the groundwater elevation map was generated is provided below.

Quarterly groundwater analytical results from samples collected during CY 2023 Quarter 4 for the monitoring wells listed in Condition No. 14 are summarized in Table 2.3-2. Note that some analytes reported in this table exceed their corresponding groundwater standard or screening level.

Sample results for chloride, perchlorate, total chromium, fluoride, nitrate, sulfate, and total dissolved solids are compared with numeric standards of 20.6.2.3103 NMAC or, for constituents not listed in 20.6.2.3103 NMAC, the numeric screening levels established for tap water in Table A-1 of the 2022 NMED “Risk Assessment Guidance for Site Investigations and Remediation Volume 1, Soil Screening Guidance for Human Health Risk Assessments” (NMED 2022c). The values of the applicable standards of screening levels for these seven analytes are as follows:

- Chloride 250 mg/L
- Chromium 50 µg/L
- Fluoride 1.6 mg/L
- Nitrate 10 mg/L
- Perchlorate 13.8 µg/L
- Sulfate 600 mg/L
- Total dissolved solids 1000 mg/L

The regional aquifer beneath the Pajarito Plateau, on which Los Alamos National Laboratory (LANL or the Laboratory) is situated, is a complex hydrogeological system. The shape of the regional water table is predominantly controlled by the areas of recharge to the west (the flanks of the Sierra de los Valles and the Pajarito fault zone) and discharge to the east (the Rio Grande and the White Rock Canyon Springs). At a more local scale, such as within the plume area, the structure of the regional water table and groundwater flow is also expected to be influenced by:

- local infiltration zones and recharge areas (e.g., beneath canyons),
- heterogeneity and anisotropy in the aquifer properties, and
- extraction and injection locations (municipal water-supply wells and chromium interim measure [IM] extraction/injection wells).

Long-term water-level data, contaminant transport observations (travel times and direction of migration), and calibrated model results suggest that the water table was relatively flat in the area of the chromium plume before the implementation of CrEX extraction and CrIN injection wells. Steeper gradients are found to the west, because of the mountain-front recharge, and to the east toward the Rio Grande. The low ambient gradient in the chromium plume area could be related to any or all of the following:

- the relatively high permeability of the Puye Formation and Miocene pumiceous sediments
- anisotropy of the regional aquifer

- localized recharge along the canyons above the regional aquifer, faults, or other lineaments that affect regional-scale hydraulic conductivity
- nearby water-supply pumping

Although it is difficult to infer absolute groundwater flow directions from the relatively flat contours in the chromium plume area, the general flow of groundwater can be determined. Groundwater elevation data and contaminant transport observations indicated that, before operation of the IM, the groundwater flowed generally toward the east-southeast. When the IM was in operation, the groundwater flowed generally towards the southeast, with the influence of IM operations being seen mainly in the vicinity of the extraction wells. Local flow direction near these wells was inward, as influenced by the extraction-induced depression in potentiometric surface when extraction wells were in operation. With the IM inactive, flow directions appear to be reverting to prior conditions.

Water-table elevations in the chromium plume area can vary temporally as a result of transient effects that include injection into, and extraction from, the chromium IM infrastructure wells, and pumping of Los Alamos County's water-supply wells. This is discussed below for the case of CY 2023 Quarter 4.

A long-term decline of approximately 0.2 to 0.5 ft/yr in the regional water levels has been observed throughout the aquifer beneath the Pajarito Plateau. The decline could be caused by long-term changes in the aquifer recharge and discharge conditions. Because of the long-term declines and pumping transience described above, the water-level data and the respective water-table contour maps are variable over time; each map therefore represents a specific period of time. Figure 2.3-1 depicts the average water-level data and water-table contours for November 2023. General regional flow direction is indicated by the arrow.

To generate this quarterly contour map, average water levels are calculated using values from the middle month of the three-month reporting period. Monitoring wells within and surrounding the plume are used, including wells not presented on the map or in Table 2.3-1. These locations consist of CdV-R-15-3 S4, R-6, R-10a, R-15, R-21, R-34, R-35b, R-36, R-37 S2, R-51 S1, R-52 S1, R-53 S1, R-55 S1, R-56 S1, R-66, R-70 S-2, R-72 S1, and SIMR-2. Water levels in wells surrounding the plume provide useful control points for contouring along the edges of the area of interest for this report. R-36 was used for contouring; however, water levels are anomalously high, and may represent a localized condition.

Common interpolation methods for water-table data from a complex heterogeneous site could produce maps that do not represent physically realistic hydrological systems. This water-table map is contoured by incorporating process knowledge of groundwater hydraulics (e.g., flownet conformity rules) as well as conceptual models of groundwater flow in the project area as described above. Key inputs to the conceptual model include knowledge of long-term operations of extraction and injection wells, water-level elevations in monitoring wells near extraction and injection points, and cross-hole tracer data between injection wells and monitoring wells.

In 2018 and 2019, water-table maps for DP-1835 were generated using an interpolation method called Thin-Plate Spline (TPS) (e.g., <https://www.jstor.org/stable/2241837>). TPS is a special case of universal kriging. In 2020, an interpolation method called Bayesian Canonical Correlation Regression (BCCR) (Carson et al. 2020) was implemented. BCCR increased efficiency of map-making by using prior knowledge of water levels to generate an initial water-table map of the expected surface given quarterly water levels. Kriging was then used to update the map using residuals between the water levels and the expected surface for a given quarter. In CY 2023 Quarter 2, the interpolation method reverted to TPS. This change was made because of the greater representation of TPS in the scientific literature. Maps generated with the two methods are analogous because both methods use kriging-based interpolation;

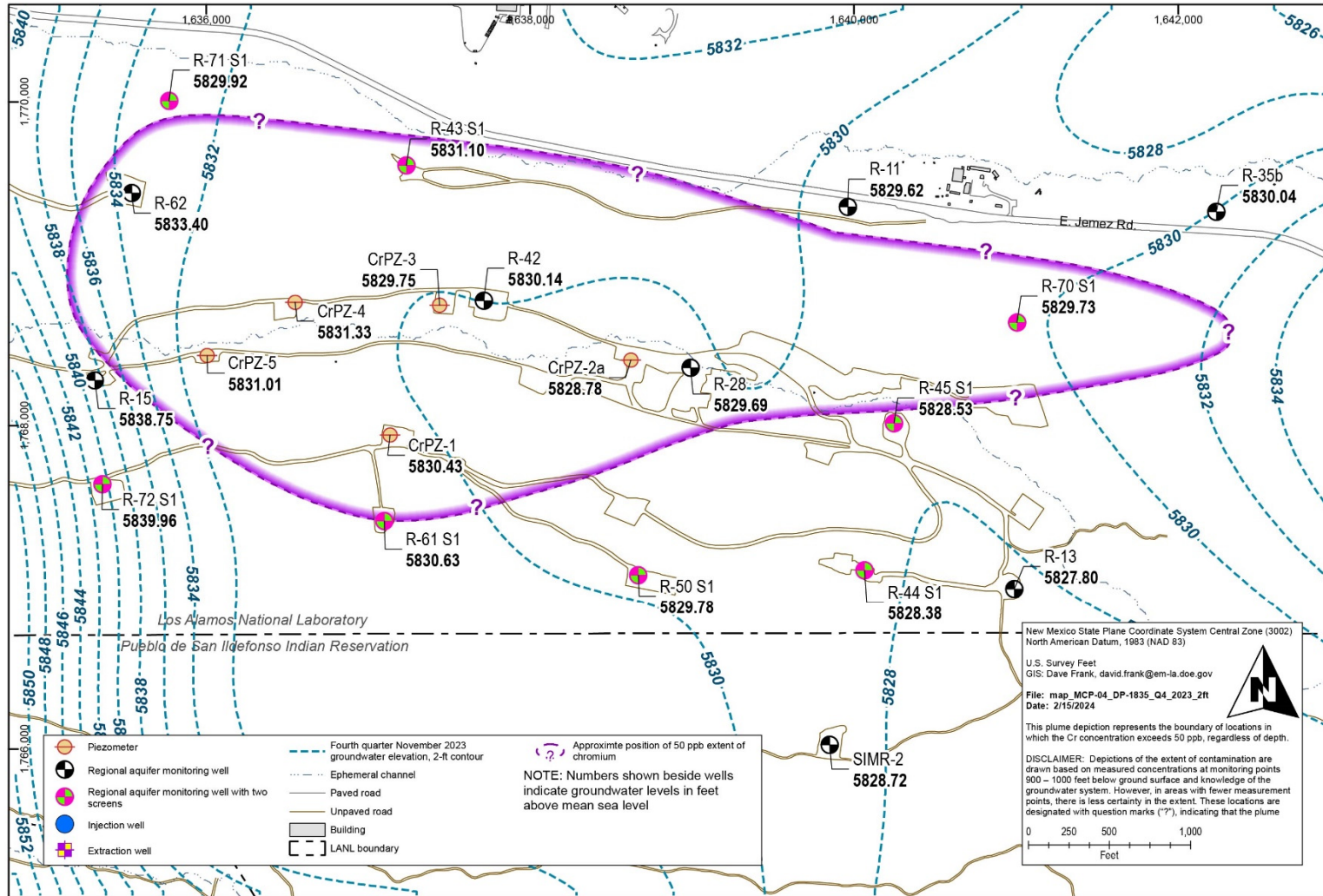
the primary difference between the two methods is the incorporation of prior information as an initial estimate of water levels.

DP-1835 requires contour intervals less than or equal to 2 ft.; originally, 2-ft intervals were used. In 2018 Q4, the contour interval was changed to 1 ft. For the current quarter (2023 Q4), we have reverted to 2-ft intervals with the goal of providing a map that is easier to read.

Because of the spatial coverage of wells and piezometers, and the regional structure of significantly steeper gradients to the east and west of the chromium plume area, surrounding wells (e.g., R-21, R-31, R-32, R-37, and R-40) and control points based on expert opinion are used to provide estimated water-level elevations in areas that do not have sufficient data to provide constraints. As additional analysis is performed using historical and developing data sets from existing wells and data that will be collected from proposed wells, the use of these control points is being reanalyzed, adjusted, or discontinued. The reanalysis is based on additional supporting data and contouring methods.

Over the course of operating the chromium IM system, changes to water-table elevations occur depending upon how the system has been operating. A quarter-by-quarter account of the water-table elevations is not provided as part of this quarterly report. Each quarterly report previously submitted provides information on the water-table elevation near the chromium IM wells, along with possible causes for water-level variations for that specific quarter. Information on the quarterly depth to groundwater for CY 2023 Quarter 4 is provided below.

In the current reporting period of CY 2023 Quarter 4, no IM injection occurred, and extraction was limited to brief sampling events. No closed contour is present in the central area of the map. However, the water level at CrPZ-2 is below 5829 ft, indicating that a 5829 ft contour could be drawn around this well, given a finer contouring interval. Also, R-42 is present in the current quarter, but was excluded in the previous quarter due to insufficient data. The 5830-ft contour that runs down the lateral center of the map dips further south due to data measured at R-42 in Q4 as compared to Q3. Also, in Q4, the influence of R-36 in the southeastern portion of the map was reduced as compared to Q3 due to SME judgement that this well was exerting undue influence in this area. Finally, transducers were replaced at CrPZ-1, CrPZ-2, and CrPZ-3 between 2023 Q3 and Q4 in response to manual measurements at these locations. The equipment update resulted in lower water levels of approximately 1 ft at each of these wells, which are not attributable to variations in water-table elevations.



Notes: Monitoring wells within and surrounding the plume are used for contour generation, including wells not presented on the map. These consist of CdV-R-15-3 S4, R-1, R-2, R-3, R-4, R-6, R-7 S3, R-8 S1, R-10a, R-14, R-15, R-18, R-20 S1, R-21, R-28, R-33 S1, R-34, R-35b, R-36, R-37 S2, R-40 S2, R-42, R-46, R-47, R-51 S1, R-52 S1, R-53 S1, R-54 S1, R-55 S1, R-56 S1, R-60 S1, R-64, R-66, R-67, R-68, R-70 S2, R-72 S1, and SIMR-2. With the exception of sampling events, no operations occurred at PM-3, extraction, or injection wells in November, 2023.

Figure 2.3-1 Groundwater elevation contour map – CY 2023 Quarter 4, DP-1835

Table 2.3-1
Groundwater Elevations Summary for
Groundwater Monitoring Wells – CY 2023 Quarter 4, DP-1835

Monitoring Well	Average Groundwater Elevation ^a (ft)	Range of Groundwater Elevation (ft)
CrPZ-1 (CrCH-1)	5830.4	5830.1—5831.0
CrPZ-2a (CrCH-2a)	5828.8	5828.5—5829.3
CrPZ-2b (CrCH-2b) ^b	n/a	n/a
CrPZ-3 (CrCH-3)	5829.8	5829.4—5830.3
CrPZ-4 (CrCH-4)	5831.3	5830.9—5831.9
CrPZ-5 (CrCH-5)	5831.0	5830.6—5831.6
R-11	5829.6	5829.3—5830.1
R-13	5827.8	5827.4—5828.3
R-43 S1 ^c	5831.1	5830.8—5831.6
R-43 S2 ^{b,d}	5830.6	5830.3—5831.0
R-44 S1	5828.4	5828.0—5828.9
R-44 S2	5828.3	5827.9—5828.8
R-45 S1	5828.5	5828.2—5829.0
R-45 S2	5828.4	5828.1—5828.9
R-50 S1	5829.8	5829.4—5830.3
R-50 S2	5829.5	5829.0—5830.0
R-61 S1	5830.6	5830.2—5831.2
R-61 S2	5830.8	5830.3—5831.3
R-62	5833.4	5833.1—5834.0
SIMR-2 ^e	5828.7	5828.4—5829.3

^a Groundwater elevations provided are based on average November 2023 values from transducers.

^b Not used in map generation

^c S1 = Screen 1.

^d S2 = Screen 2.

^e SIMR-2 data are reported here in accordance with the memorandum of agreement and protocol agreement between Pueblo de San Ildefonso and DOE.

Table 2.3-2
Groundwater Monitoring Wells Analytical Results Summary Table – CY 2023 Quarter 4, DP-1835

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-11	11/1/2023	REG	Chloride	3.31	mg/L	250	N	n/a	Y	Y	0.0670
R-11	10/13/2023	FD	Chloride	3.34	mg/L	250	N	n/a	Y	Y	0.0670
R-11	10/13/2023	REG	Chloride	3.47	mg/L	250	N	n/a	Y	Y	0.0670
R-11	11/1/2023	REG	Chromium	7.21	µg/L	50	N	J	Y	Y	3.00
R-11	10/13/2023	FD	Chromium	5.08	µg/L	50	N	J	Y	Y	3.00
R-11	10/13/2023	REG	Chromium	5.76	µg/L	50	N	J	Y	Y	3.00
R-11	11/1/2023	REG	Fluoride	0.674	mg/L	1.6	N	n/a	Y	Y	0.0330
R-11	10/13/2023	FD	Fluoride	0.399	mg/L	1.6	N	n/a	Y	Y	0.0330
R-11	10/13/2023	REG	Fluoride	0.409	mg/L	1.6	N	n/a	Y	Y	0.0330
R-11	11/1/2023	REG	Nitrate-Nitrite as Nitrogen	8.18	mg/L	10	N	n/a	Y	Y	0.170
R-11	10/13/2023	FD	Nitrate-Nitrite as Nitrogen	8.33	mg/L	10	N	n/a	Y	Y	0.425
R-11	10/13/2023	REG	Nitrate-Nitrite as Nitrogen	8.40	mg/L	10	N	n/a	Y	Y	0.425
R-11	11/1/2023	REG	Perchlorate	0.841	µg/L	13.8	N	n/a	Y	Y	0.0500
R-11	10/13/2023	FD	Perchlorate	0.863	µg/L	13.8	N	n/a	Y	Y	0.0500
R-11	10/13/2023	REG	Perchlorate	0.887	µg/L	13.8	N	n/a	Y	Y	0.0500
R-11	11/1/2023	REG	Sulfate	11.0	mg/L	600	N	n/a	Y	Y	0.133
R-11	10/13/2023	FD	Sulfate	11.4	mg/L	600	N	n/a	Y	Y	0.133
R-11	10/13/2023	REG	Sulfate	11.4	mg/L	600	N	n/a	Y	Y	0.133
R-11	11/1/2023	REG	Total Dissolved Solids	197	mg/L	1000	N	n/a	Y	Y	2.38
R-11	10/13/2023	FD	Total Dissolved Solids	199	mg/L	1000	N	n/a	Y	Y	2.38
R-11	10/13/2023	REG	Total Dissolved Solids	193	mg/L	1000	N	n/a	Y	Y	2.38
R-13	11/14/2023	FD	Chloride	3.48	mg/L	250	N	n/a	Y	Y	0.0670
R-13	11/14/2023	REG	Chloride	3.45	mg/L	250	N	n/a	Y	Y	0.0670
R-13	11/14/2023	FD	Chromium	4.91	µg/L	50	N	J	Y	Y	3.00

Table 2.3-2 (continued)

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-13	11/14/2023	REG	Chromium	5.04	µg/L	50	N	J	Y	Y	3.00
R-13	11/14/2023	FD	Fluoride	0.531	mg/L	1.6	N	n/a	Y	Y	0.0330
R-13	11/14/2023	REG	Fluoride	0.530	mg/L	1.6	N	n/a	Y	Y	0.0330
R-13	11/14/2023	FD	Nitrate-Nitrite as Nitrogen	0.902	mg/L	10	N	n/a	Y	Y	0.0170
R-13	11/14/2023	REG	Nitrate-Nitrite as Nitrogen	0.888	mg/L	10	N	n/a	Y	Y	0.0170
R-13	11/14/2023	FD	Perchlorate	0.411	µg/L	13.8	N	n/a	Y	Y	0.0500
R-13	11/14/2023	REG	Perchlorate	0.404	µg/L	13.8	N	n/a	Y	Y	0.0500
R-13	11/14/2023	FD	Sulfate	4.12	mg/L	600	N	n/a	Y	Y	0.133
R-13	11/14/2023	REG	Sulfate	4.11	mg/L	600	N	n/a	Y	Y	0.133
R-13	11/14/2023	FD	Total Dissolved Solids	112	mg/L	1000	N	n/a	Y	Y	2.38
R-13	11/14/2023	REG	Total Dissolved Solids	121	mg/L	1000	N	n/a	Y	Y	2.38
R-43 S1	10/31/2023	REG	Chloride	5.58	mg/L	250	N	n/a	Y	Y	0.0670
R-43 S1	10/31/2023	REG	Chromium	131	µg/L	50	Y	n/a	Y	Y	3.00
R-43 S1	10/31/2023	REG	Fluoride	0.569	mg/L	1.6	N	n/a	Y	Y	0.0330
R-43 S1	10/31/2023	REG	Nitrate-Nitrite as Nitrogen	4.95	mg/L	10	N	n/a	Y	Y	0.0850
R-43 S1	10/31/2023	REG	Perchlorate	0.694	µg/L	13.8	N	n/a	Y	Y	0.0500
R-43 S1	10/31/2023	REG	Sulfate	12.0	mg/L	600	N	n/a	Y	Y	0.133
R-43 S1	10/31/2023	REG	Total Dissolved Solids	148	mg/L	1000	N	n/a	Y	Y	2.38
R-43 S2	10/31/2023	FD	Chloride	6.07	mg/L	250	N	n/a	Y	Y	0.0670
R-43 S2	10/31/2023	REG	Chloride	6.04	mg/L	250	N	n/a	Y	Y	0.0670
R-43 S2	10/31/2023	FD	Chromium	24.7	µg/L	50	N	n/a	Y	Y	3.00
R-43 S2	10/31/2023	REG	Chromium	26.1	µg/L	50	N	n/a	Y	Y	3.00
R-43 S2	10/31/2023	FD	Fluoride	0.457	mg/L	1.6	N	n/a	Y	Y	0.0330
R-43 S2	10/31/2023	REG	Fluoride	0.612	mg/L	1.6	N	n/a	Y	Y	0.0330
R-43 S2	10/31/2023	FD	Nitrate-Nitrite as Nitrogen	3.66	mg/L	10	N	n/a	Y	Y	0.0850
R-43 S2	10/31/2023	REG	Nitrate-Nitrite as Nitrogen	3.63	mg/L	10	N	n/a	Y	Y	0.0850
R-43 S2	10/31/2023	FD	Perchlorate	0.906	µg/L	13.8	N	n/a	Y	Y	0.0500

Table 2.3-2 (continued)

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-43 S2	10/31/2023	REG	Perchlorate	0.880	µg/L	13.8	N	n/a	Y	Y	0.0500
R-43 S2	10/31/2023	FD	Sulfate	8.92	mg/L	600	N	n/a	Y	Y	0.133
R-43 S2	10/31/2023	REG	Sulfate	8.93	mg/L	600	N	n/a	Y	Y	0.133
R-43 S2	10/31/2023	FD	Total Dissolved Solids	144	mg/L	1000	N	n/a	Y	Y	2.38
R-43 S2	10/31/2023	REG	Total Dissolved Solids	153	mg/L	1000	N	n/a	Y	Y	2.38
R-44 S1	11/7/2023	FD	Chloride	20.5	mg/L	250	N	n/a	Y	Y	0.335
R-44 S1	11/7/2023	REG	Chloride	20.4	mg/L	250	N	n/a	Y	Y	0.335
R-44 S1	10/11/2023	REG	Chloride	20.4	mg/L	250	N	n/a	Y	Y	0.335
R-44 S1	11/7/2023	FD	Chromium	3.00	µg/L	50	N	U	N	Y	3.00
R-44 S1	11/7/2023	REG	Chromium	3.00	µg/L	50	N	U	N	Y	3.00
R-44 S1	10/11/2023	REG	Chromium	3.00	µg/L	50	N	U	N	Y	3.00
R-44 S1	11/7/2023	FD	Fluoride	0.267	mg/L	1.6	N	n/a	Y	Y	0.0330
R-44 S1	11/7/2023	REG	Fluoride	0.267	mg/L	1.6	N	n/a	Y	Y	0.0330
R-44 S1	10/11/2023	REG	Fluoride	0.258	mg/L	1.6	N	n/a	Y	Y	0.0330
R-44 S1	11/7/2023	FD	Nitrate-Nitrite as Nitrogen	2.43	mg/L	10	N	n/a	Y	Y	0.0850
R-44 S1	11/7/2023	REG	Nitrate-Nitrite as Nitrogen	2.96	mg/L	10	N	n/a	Y	Y	0.170
R-44 S1	10/11/2023	REG	Nitrate-Nitrite as Nitrogen	2.85	mg/L	10	N	n/a	Y	Y	0.0850
R-44 S1	11/7/2023	FD	Perchlorate	0.363	µg/L	13.8	N	n/a	Y	Y	0.0500
R-44 S1	11/7/2023	REG	Perchlorate	0.361	µg/L	13.8	N	n/a	Y	Y	0.0500
R-44 S1	10/11/2023	REG	Perchlorate	0.422	µg/L	13.8	N	n/a	Y	Y	0.0500
R-44 S1	11/7/2023	FD	Sulfate	19.1	mg/L	600	N	n/a	Y	Y	0.665
R-44 S1	11/7/2023	REG	Sulfate	19.1	mg/L	600	N	n/a	Y	Y	0.665
R-44 S1	10/11/2023	REG	Sulfate	19.5	mg/L	600	N	n/a	Y	Y	0.665
R-44 S1	11/7/2023	FD	Total Dissolved Solids	176	mg/L	1000	N	n/a	Y	Y	2.38
R-44 S1	11/7/2023	REG	Total Dissolved Solids	182	mg/L	1000	N	n/a	Y	Y	2.38
R-44 S1	10/11/2023	REG	Total Dissolved Solids	179	mg/L	1000	N	n/a	Y	Y	2.38
R-44 S2	11/7/2023	REG	Chloride	2.73	mg/L	250	N	n/a	Y	Y	0.0670

Table 2.3-2 (continued)

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-44 S2	10/12/2023	FD	Chloride	2.62	mg/L	250	N	n/a	Y	Y	0.0670
R-44 S2	10/12/2023	REG	Chloride	2.60	mg/L	250	N	n/a	Y	Y	0.0670
R-44 S2	11/7/2023	REG	Chromium	9.22	µg/L	50	N	J	Y	Y	3.00
R-44 S2	10/12/2023	FD	Chromium	8.80	µg/L	50	N	J	Y	Y	3.00
R-44 S2	10/12/2023	REG	Chromium	8.26	µg/L	50	N	J	Y	Y	3.00
R-44 S2	11/7/2023	REG	Fluoride	0.402	mg/L	1.6	N	n/a	Y	Y	0.0330
R-44 S2	10/12/2023	FD	Fluoride	0.399	mg/L	1.6	N	n/a	Y	Y	0.0330
R-44 S2	10/12/2023	REG	Fluoride	0.400	mg/L	1.6	N	n/a	Y	Y	0.0330
R-44 S2	11/7/2023	REG	Nitrate-Nitrite as Nitrogen	0.804	mg/L	10	N	n/a	Y	Y	0.0170
R-44 S2	10/12/2023	FD	Nitrate-Nitrite as Nitrogen	0.874	mg/L	10	N	n/a	Y	Y	0.0170
R-44 S2	10/12/2023	REG	Nitrate-Nitrite as Nitrogen	0.890	mg/L	10	N	n/a	Y	Y	0.0170
R-44 S2	11/7/2023	REG	Perchlorate	0.333	µg/L	13.8	N	n/a	Y	Y	0.0500
R-44 S2	10/12/2023	FD	Perchlorate	0.355	µg/L	13.8	N	n/a	Y	Y	0.0500
R-44 S2	10/12/2023	REG	Perchlorate	0.355	µg/L	13.8	N	H	Y	Y	0.0500
R-44 S2	11/7/2023	REG	Sulfate	3.04	mg/L	600	N	n/a	Y	Y	0.133
R-44 S2	10/12/2023	FD	Sulfate	2.97	mg/L	600	N	n/a	Y	Y	0.133
R-44 S2	10/12/2023	REG	Sulfate	2.95	mg/L	600	N	n/a	Y	Y	0.133
R-44 S2	11/7/2023	REG	Total Dissolved Solids	110	mg/L	1000	N	n/a	Y	Y	2.38
R-44 S2	10/12/2023	FD	Total Dissolved Solids	106	mg/L	1000	N	n/a	Y	Y	2.38
R-44 S2	10/12/2023	REG	Total Dissolved Solids	118	mg/L	1000	N	n/a	Y	Y	2.38
R-45 S1	11/13/2023	REG	Chloride	20.0	mg/L	250	N	n/a	Y	Y	0.335
R-45 S1	10/11/2023	REG	Chloride	21.0	mg/L	250	N	n/a	Y	Y	0.335
R-45 S1	11/13/2023	REG	Chromium	4.28	µg/L	50	N	J	Y	Y	3.00
R-45 S1	10/11/2023	REG	Chromium	4.09	µg/L	50	N	J	Y	Y	3.00
R-45 S1	11/13/2023	REG	Fluoride	0.389	mg/L	1.6	N	n/a	Y	Y	0.0330
R-45 S1	10/11/2023	REG	Fluoride	0.347	mg/L	1.6	N	n/a	Y	Y	0.0330
R-45 S1	11/13/2023	REG	Nitrate-Nitrite as Nitrogen	3.12	mg/L	10	N	n/a	Y	Y	0.0850

Table 2.3-2 (continued)

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-45 S1	10/11/2023	REG	Nitrate-Nitrite as Nitrogen	3.10	mg/L	10	N	n/a	Y	Y	0.0850
R-45 S1	11/13/2023	REG	Perchlorate	0.403	µg/L	13.8	N	n/a	Y	Y	0.0500
R-45 S1	10/11/2023	REG	Perchlorate	0.434	µg/L	13.8	N	n/a	Y	Y	0.0500
R-45 S1	11/13/2023	REG	Sulfate	19.9	mg/L	600	N	n/a	Y	Y	0.133
R-45 S1	10/11/2023	REG	Sulfate	20.7	mg/L	600	N	n/a	Y	Y	0.665
R-45 S1	11/13/2023	REG	Total Dissolved Solids	196	mg/L	1000	N	n/a	Y	Y	2.38
R-45 S1	10/11/2023	REG	Total Dissolved Solids	185	mg/L	1000	N	n/a	Y	Y	2.38
R-45 S2	11/13/2023	REG	Chloride	7.29	mg/L	250	N	n/a	Y	Y	0.0670
R-45 S2	10/11/2023	REG	Chloride	7.10	mg/L	250	N	n/a	Y	Y	0.0670
R-45 S2	11/13/2023	REG	Chromium	61.0	µg/L	50	Y	n/a	Y	Y	3.00
R-45 S2	10/11/2023	REG	Chromium	60.8	µg/L	50	Y	n/a	Y	Y	3.00
R-45 S2	11/13/2023	REG	Fluoride	0.481	mg/L	1.6	N	n/a	Y	Y	0.0330
R-45 S2	10/11/2023	REG	Fluoride	0.396	mg/L	1.6	N	n/a	Y	Y	0.0330
R-45 S2	11/13/2023	REG	Nitrate-Nitrite as Nitrogen	1.50	mg/L	10	N	n/a	Y	Y	0.0850
R-45 S2	10/11/2023	REG	Nitrate-Nitrite as Nitrogen	1.48	mg/L	10	N	n/a	Y	Y	0.0850
R-45 S2	11/13/2023	REG	Perchlorate	0.479	µg/L	13.8	N	n/a	Y	Y	0.0500
R-45 S2	10/11/2023	REG	Perchlorate	0.509	µg/L	13.8	N	n/a	Y	Y	0.0500
R-45 S2	11/13/2023	REG	Sulfate	8.82	mg/L	600	N	n/a	Y	Y	0.133
R-45 S2	10/11/2023	REG	Sulfate	8.85	mg/L	600	N	n/a	Y	Y	0.133
R-45 S2	11/13/2023	REG	Total Dissolved Solids	162	mg/L	1000	N	n/a	Y	Y	2.38
R-45 S2	10/11/2023	REG	Total Dissolved Solids	162	mg/L	1000	N	n/a	Y	Y	2.38
R-50 S1	11/7/2023	REG	Chloride	20.6	mg/L	250	N	n/a	Y	Y	0.335
R-50 S1	10/12/2023	REG	Chloride	20.9	mg/L	250	N	n/a	Y	Y	0.335
R-50 S1	11/7/2023	REG	Chromium	19.2	µg/L	50	N	n/a	Y	Y	3.00
R-50 S1	10/12/2023	REG	Chromium	12.5	µg/L	50	N	n/a	Y	Y	3.00
R-50 S1	11/7/2023	REG	Fluoride	0.297	mg/L	1.6	N	n/a	Y	Y	0.0330
R-50 S1	10/12/2023	REG	Fluoride	0.301	mg/L	1.6	N	n/a	Y	Y	0.0330

Table 2.3-2 (continued)

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-50 S1	11/7/2023	REG	Nitrate-Nitrite as Nitrogen	3.02	mg/L	10	N	n/a	Y	Y	0.170
R-50 S1	10/12/2023	REG	Nitrate-Nitrite as Nitrogen	2.95	mg/L	10	N	n/a	Y	Y	0.170
R-50 S1	11/7/2023	REG	Perchlorate	0.401	µg/L	13.8	N	n/a	Y	Y	0.0500
R-50 S1	10/12/2023	REG	Perchlorate	0.433	µg/L	13.8	N	n/a	Y	Y	0.0500
R-50 S1	11/7/2023	REG	Sulfate	20.0	mg/L	600	N	n/a	Y	Y	0.665
R-50 S1	10/12/2023	REG	Sulfate	20.2	mg/L	600	N	n/a	Y	Y	0.665
R-50 S1	11/7/2023	REG	Total Dissolved Solids	180	mg/L	1000	N	n/a	Y	Y	2.38
R-50 S1	10/12/2023	REG	Total Dissolved Solids	182	mg/L	1000	N	n/a	Y	Y	2.38
R-50 S2	11/7/2023	REG	Chloride	2.26	mg/L	250	N	n/a	Y	Y	0.0670
R-50 S2	10/18/2023	REG	Chloride	2.09	mg/L	250	N	n/a	Y	Y	0.0670
R-50 S2	11/7/2023	REG	Chromium	4.48	µg/L	50	N	J	Y	Y	3.00
R-50 S2	10/18/2023	REG	Chromium	4.41	µg/L	50	N	J	Y	Y	3.00
R-50 S2	11/7/2023	REG	Fluoride	0.444	mg/L	1.6	N	n/a	Y	Y	0.0330
R-50 S2	10/18/2023	REG	Fluoride	0.454	mg/L	1.6	N	n/a	Y	Y	0.0330
R-50 S2	11/7/2023	REG	Nitrate-Nitrite as Nitrogen	0.546	mg/L	10	N	n/a	Y	Y	0.0170
R-50 S2	10/18/2023	REG	Nitrate-Nitrite as Nitrogen	0.631	mg/L	10	N	n/a	Y	Y	0.0170
R-50 S2	11/7/2023	REG	Perchlorate	0.333	µg/L	13.8	N	n/a	Y	Y	0.0500
R-50 S2	10/18/2023	REG	Perchlorate	0.313	µg/L	13.8	N	n/a	Y	Y	0.0500
R-50 S2	11/7/2023	REG	Sulfate	2.68	mg/L	600	N	n/a	Y	Y	0.133
R-50 S2	10/18/2023	REG	Sulfate	2.54	mg/L	600	N	n/a	Y	Y	0.133
R-50 S2	11/7/2023	REG	Total Dissolved Solids	135	mg/L	1000	N	n/a	Y	Y	2.38
R-50 S2	10/18/2023	REG	Total Dissolved Solids	108	mg/L	1000	N	n/a	Y	Y	2.38
R-62	10/30/2023	REG	Chloride	16.6	mg/L	250	N	n/a	Y	Y	0.134
R-62	10/30/2023	REG	Chromium	273	µg/L	50	Y	n/a	Y	Y	3.00
R-62	10/30/2023	REG	Fluoride	0.292	mg/L	1.6	N	n/a	Y	Y	0.0330
R-62	10/30/2023	REG	Nitrate-Nitrite as Nitrogen	2.14	mg/L	10	N	n/a	Y	Y	0.0850
R-62	10/30/2023	REG	Perchlorate	0.985	µg/L	13.8	N	n/a	Y	Y	0.0500

Table 2.3-2 (continued)

Location ID	Sample Date	Sample Purpose	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detected	Filtered	Method Detection Limit
R-62	10/30/2023	REG	Sulfate	27.5	mg/L	600	N	n/a	Y	Y	0.266
R-62	10/30/2023	REG	Total Dissolved Solids	181	mg/L	1000	N	n/a	Y	Y	2.38
SIMR-2	11/9/2023	REG	Chloride	2.14	mg/L	250	N	n/a	Y	Y	0.0670
SIMR-2	10/19/2023	REG	Chloride	2.26	mg/L	250	N	n/a	Y	Y	0.0670
SIMR-2	11/9/2023	REG	Chromium	5.59	µg/L	50	N	J	Y	Y	3.00
SIMR-2	10/19/2023	REG	Chromium	5.38	µg/L	50	N	J	Y	Y	3.00
SIMR-2	11/9/2023	REG	Fluoride	0.372	mg/L	1.6	N	n/a	Y	Y	0.0330
SIMR-2	10/19/2023	REG	Fluoride	0.314	mg/L	1.6	N	n/a	Y	Y	0.0330
SIMR-2	11/9/2023	REG	Nitrate-Nitrite as Nitrogen	0.880	mg/L	10	N	n/a	Y	Y	0.0850
SIMR-2	10/19/2023	REG	Nitrate-Nitrite as Nitrogen	0.865	mg/L	10	N	n/a	Y	Y	0.0170
SIMR-2	11/9/2023	REG	Perchlorate	0.666	µg/L	13.8	N	n/a	Y	Y	0.0500
SIMR-2	10/19/2023	REG	Perchlorate	0.634	µg/L	13.8	N	n/a	Y	Y	0.0500
SIMR-2	11/9/2023	REG	Sulfate	2.66	mg/L	600	N	n/a	Y	Y	0.133
SIMR-2	10/19/2023	REG	Sulfate	2.85	mg/L	600	N	n/a	Y	Y	0.133
SIMR-2	11/9/2023	REG	Total Dissolved Solids	111	mg/L	1000	N	n/a	Y	Y	2.38
SIMR-2	10/19/2023	REG	Total Dissolved Solids	110	mg/L	1000	N	n/a	Y	Y	2.38

^a n/a = Not applicable: no qualifiers applied.

^b In the Detect Flag column, Y = detected.

^c In the Filtered column, Y = filtered.

^d J = Analyte is classified as estimated.

^e S1 = Screen 1.

^f S2 = Screen 2.

^g U = Analyte is classified as not detected.

^h In the Detect Flag column, N = not detected

2.4 Any Operations/Maintenance Activities Performed (Requirement 4)

During the CY 2023 Quarter 4 reporting period for DP-1835, no treated water was injected. Monthly sampling occurred at injection and extraction wells, and the extracted water was treated through CTUA and held in storage tanks for disposal at a later date.

Operations and maintenance activities completed during CY 2023 Quarter 4 are listed in Table 2.4-1 for the extraction, treatment, and injection system.

Table 2.4-1
Operations and Maintenance Activity Summary Table – CY 2023 Quarter 4

Maintenance Date	Elements Impacted	Operation/Maintenance Description
10/1/23 through 12/31/23	All extraction and injection wells, CTUA, CTUC	Extraction, treatment, and injection of treated groundwater suspended per NMED direction.
10/23/23 through 10/26/23	All extraction and injection wells, CTUA	Monthly sampling of all extraction and injection wells with the exception of CrIN-5. CrIN-5 was not sampled because the UPS and pump starter were damaged during lightning strike on 09/09/2023. The CTUA annual sample was collected on 10/26/2023.
11/20/23	All extraction and injection wells, CTUA	Monthly sampling of extraction wells CrEX-3, CrEX-4, and CrEX-5.
11/27/23 through 11/29/23	All extraction and injection wells, CTUA	Monthly sampling of all extraction and injection wells. CrEX-1 was not sampled because the harmonic filter/transformer was down.
11/30/23	All extraction and injection wells, CTUA, CTUC	Extraction, treatment, and injection of treated groundwater suspended per NMED direction.
12/13/23	All injection wells	Monthly sampling of all injection wells.
12/19/23	All extraction wells, CTUA	Monthly sampling of all extraction wells, with the exception of CrEX-1. CrEX-1 was not sampled because the harmonic filter/transformer was down.

2.5 Any Periodic Test of Mechanical Integrity Conducted (Requirement 5)

Periodic testing of mechanical integrity was not conducted or reported to NMED during CY 2023 Quarter 4. Mechanical integrity testing was performed and reported to NMED during the CY 2019 Quarter 4 reporting period. In accordance with Condition No. 3, mechanical integrity testing will occur at least once every 5 yr unless a UIC well is reconfigured. Under this scenario, a mechanical integrity test before reinjection of treated effluent at a specific reconfigured well will be completed pursuant to Condition No. 3.

2.6 Any Replacement of Primary or Secondary IX Vessels or Associated Treatment System Infrastructure (Requirement 6)

No replacement of vessels occurred during CY 2023 Quarter 4.

2.7 Any Well Workovers Conducted (Requirement 7)

No well workovers were conducted during CY 2023 Quarter 4.

2.8 Any Additional Operational Changes with the Potential to Markedly Affect the Discharge (Requirement 8)

During the reporting period, the pilot-scale molasses amendment and sodium dithionite amendment studies (NMED 2017b) did not occur because only sample water was treated during CY 2023 Quarter 4.

2.9 Monthly Average, Maximum, and Minimum Values for Flow Rate and Volume of Treated Effluent Transferred to Each UIC Well (Requirement 9)

Table 2.9-1 provides the monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each well in CY 2023 Quarter 4.

Table 2.9-1
Flows and Volumes of Treated Effluent Injected – CY 2023 Quarter 4, DP-1835

Injection Well	Flow rate (gpm ^a)			Daily Volume (gal.)			Total Volume (gal.)
	Average ^b	Maximum	Minimum ^c	Average	Maximum	Minimum	
October 2023							
CrIN-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
November 2023							
CrIN-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
December 2023							
CrIN-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CrIN-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

^a gpm = Gallons per minute.

^b Average values provide represent arithmetic mean of daily values during periods when injection of treated groundwater was occurring. All injection of treated water authorized under the DP-1835 was ceased by April 1, 2023.

^c Minimum values represent the minimum daily value recorded during days when pumping occurred.

2.10 Total Monthly Volume of Treated Effluent Transferred to Each UIC Well (Requirement 10)

Table 2.9-1 provides total monthly volumes of treated effluent transferred to each well. No injection occurred at UIC wells during CY 2023 Quarter 4.

2.11 Monthly Average, Maximum, and Minimum Values of Injection Water Level (Pressure Head) Above Static Level for Each UIC Well (Requirement 11)

Table 2.11-1 provides the monthly average, maximum, and minimum values for injection water level above static level for each UIC well.

Table 2.11-1
Water-Level Values Above Static Level by UIC Well – CY 2023 Quarter 4, DP-1835

UIC Well	July 2023			August 2023			September 2023		
	Average ^a (ft)	Maximum (ft)	Minimum (ft)	Average (ft)	Maximum (ft)	Minimum (ft)	Average (ft)	Maximum (ft)	Minimum (ft)
CrIN-1	n/a ^b	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CrIN-2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CrIN-3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CrIN-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CrIN-5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

^a Average values provide represent arithmetic mean of daily values during periods when injection of treated groundwater was occurring. All injection of treated water authorized under the DP-1835 was ceased by April 1, 2023.

^b n/a = Not applicable; treated groundwater was not injected during the month at this location.

2.12 Daily Volume Injected at Each UIC Well (Requirement 12)

Daily volumes of groundwater injected (following treatment) during CY 2023 Quarter 4 are presented in Table 2.12-1.

Table 2.12-1
Daily Injection Summary Table – CY 2023 Quarter 4, DP-1835

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
10/1/2023	0	0	0	0	0	0
10/2/2023	0	0	0	0	0	0
10/3/2023	0	0	0	0	0	0
10/4/2023	0	0	0	0	0	0
10/5/2023	0	0	0	0	0	0
10/6/2023	0	0	0	0	0	0
10/7/2023	0	0	0	0	0	0
10/8/2023	0	0	0	0	0	0
10/9/2023	0	0	0	0	0	0
10/10/2023	0	0	0	0	0	0
10/11/2023	0	0	0	0	0	0
10/12/2023	0	0	0	0	0	0
10/13/2023	0	0	0	0	0	0
10/14/2023	0	0	0	0	0	0

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
10/15/2023	0	0	0	0	0	0
10/16/2023	0	0	0	0	0	0
10/17/2023	0	0	0	0	0	0
10/18/2023	0	0	0	0	0	0
10/19/2023	0	0	0	0	0	0
10/20/2023	0	0	0	0	0	0
10/21/2023	0	0	0	0	0	0
10/22/2023	0	0	0	0	0	0
10/23/2023	0	0	0	0	0	0
10/24/2023	0	0	0	0	0	0
10/25/2023	0	0	0	0	0	0
10/26/2023	0	0	0	0	0	0
10/27/2023	0	0	0	0	0	0
10/28/2023	0	0	0	0	0	0
10/29/2023	0	0	0	0	0	0
10/30/2023	0	0	0	0	0	0
10/31/2023	0	0	0	0	0	0
11/1/2023	0	0	0	0	0	0
11/2/2023	0	0	0	0	0	0
11/3/2023	0	0	0	0	0	0
11/4/2023	0	0	0	0	0	0
11/5/2023	0	0	0	0	0	0
11/6/2023	0	0	0	0	0	0
11/7/2023	0	0	0	0	0	0
11/8/2023	0	0	0	0	0	0
11/9/2023	0	0	0	0	0	0
11/10/2023	0	0	0	0	0	0
11/11/2023	0	0	0	0	0	0
11/12/2023	0	0	0	0	0	0
11/13/2023	0	0	0	0	0	0
11/14/2023	0	0	0	0	0	0
11/15/2023	0	0	0	0	0	0
11/16/2023	0	0	0	0	0	0
11/17/2023	0	0	0	0	0	0
11/18/2023	0	0	0	0	0	0
11/19/2023	0	0	0	0	0	0
11/20/2023	0	0	0	0	0	0
11/21/2023	0	0	0	0	0	0

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
11/22/2023	0	0	0	0	0	0
11/23/2023	0	0	0	0	0	0
11/24/2023	0	0	0	0	0	0
11/25/2023	0	0	0	0	0	0
11/26/2023	0	0	0	0	0	0
11/27/2023	0	0	0	0	0	0
11/28/2023	0	0	0	0	0	0
11/29/2023	0	0	0	0	0	0
11/30/2023	0	0	0	0	0	0
12/1/2023	0	0	0	0	0	0
12/2/2023	0	0	0	0	0	0
12/3/2023	0	0	0	0	0	0
12/4/2023	0	0	0	0	0	0
12/5/2023	0	0	0	0	0	0
12/6/2023	0	0	0	0	0	0
12/7/2023	0	0	0	0	0	0
12/8/2023	0	0	0	0	0	0
12/9/2023	0	0	0	0	0	0
12/10/2023	0	0	0	0	0	0
12/11/2023	0	0	0	0	0	0
12/12/2023	0	0	0	0	0	0
12/13/2023	0	0	0	0	0	0
12/14/2023	0	0	0	0	0	0
12/15/2023	0	0	0	0	0	0
12/16/2023	0	0	0	0	0	0
12/17/2023	0	0	0	0	0	0
12/18/2023	0	0	0	0	0	0
12/19/2023	0	0	0	0	0	0
12/20/2023	0	0	0	0	0	0
12/21/2023	0	0	0	0	0	0
12/22/2023	0	0	0	0	0	0
12/23/2023	0	0	0	0	0	0
12/24/2023	0	0	0	0	0	0
12/25/2023	0	0	0	0	0	0
12/26/2023	0	0	0	0	0	0
12/27/2023	0	0	0	0	0	0
12/28/2023	0	0	0	0	0	0
12/29/2023	0	0	0	0	0	0

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
12/30/2023	0	0	0	0	0	0
12/31/2023	0	0	0	0	0	0
Total						0

2.13 Daily Volume Pumped from Each Extraction Well (Requirement 13)

Daily volumes of groundwater pumped from extraction wells during 2023 Quarter 4 are presented in Table 2.13-1.

Table 2.13-1
Daily Extraction Summary Table – CY 2023 Quarter 4, DP-1835

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
10/1/2023	0	0	0	0	0	0
10/2/2023	0	0	0	0	0	0
10/3/2023	0	0	0	0	0	0
10/4/2023	0	0	0	0	0	0
10/5/2023	0	0	0	0	0	0
10/6/2023	0	0	0	0	0	0
10/7/2023	0	0	0	0	0	0
10/8/2023	0	0	0	0	0	0
10/9/2023	0	0	0	0	0	0
10/10/2023	0	0	0	0	0	0
10/11/2023	0	0	0	0	0	0
10/12/2023	0	0	0	0	0	0
10/13/2023	0	0	0	0	0	0
10/14/2023	0	0	0	0	0	0
10/15/2023	0	0	0	0	0	0
10/16/2023	0	0	0	0	0	0
10/17/2023	0	0	0	0	0	0
10/18/2023	0	0	0	0	0	0
10/19/2023	0	0	0	0	0	0
10/20/2023	0	0	0	0	0	0
10/21/2023	0	0	0	0	0	0
10/22/2023	0	0	0	0	0	0
10/23/2023	0	0	0	0	0	0
10/24/2023	0	0	0	0	0	0
10/25/2023	6,197	1,409	1,007	1,159	0	9,773

Table 2.13-1 (continued)

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
10/26/2023	0	0	0	0	10,864	10,864
10/27/2023	0	0	0	0	0	0
10/28/2023	0	0	0	0	0	0
10/29/2023	0	0	0	0	0	0
10/30/2023	0	0	0	0	0	0
10/31/2023	0	0	0	0	0	0
11/1/2023	0	0	0	0	0	0
11/2/2023	0	0	0	0	0	0
11/3/2023	0	0	0	0	0	0
11/4/2023	0	0	0	0	0	0
11/5/2023	0	0	0	0	0	0
11/6/2023	0	0	0	0	0	0
11/7/2023	0	0	0	0	0	0
11/8/2023	0	0	0	0	0	0
11/9/2023	0	0	0	0	0	0
11/10/2023	0	0	0	0	0	0
11/11/2023	0	0	0	0	0	0
11/12/2023	0	0	0	0	0	0
11/13/2023	0	0	0	0	0	0
11/14/2023	0	0	0	0	0	0
11/15/2023	0	0	0	0	0	0
11/16/2023	0	0	0	0	0	0
11/17/2023	0	0	0	0	0	0
11/18/2023	0	0	0	0	0	0
11/19/2023	0	0	0	0	0	0
11/20/2023	0	0	927	1,072	3,186	5,185
11/21/2023	0	0	0	0	0	0
11/22/2023	0	0	0	0	0	0
11/23/2023	0	0	0	0	0	0
11/24/2023	0	0	0	0	0	0
11/25/2023	0	0	0	0	0	0
11/26/2023	0	0	0	0	0	0
11/27/2023	0	0	0	0	0	0
11/28/2023	0	0	0	0	0	0
11/29/2023	0	2,953	0	0	0	2,953
11/30/2023	0	0	0	0	0	0
12/1/2023	0	0	0	0	0	0
12/2/2023	0	0	0	0	0	0

Table 2.13-1 (continued)

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
12/3/2023	0	0	0	0	0	0
12/4/2023	0	0	0	0	0	0
12/5/2023	0	0	0	0	0	0
12/6/2023	0	0	0	0	0	0
12/7/2023	0	0	0	0	0	0
12/8/2023	0	0	0	0	0	0
12/9/2023	0	0	0	0	0	0
12/10/2023	0	0	0	0	0	0
12/11/2023	0	0	0	0	0	0
12/12/2023	0	0	0	0	0	0
12/13/2023	0	0	0	0	0	0
12/14/2023	0	0	0	0	0	0
12/15/2023	0	0	0	0	0	0
12/16/2023	0	0	0	0	0	0
12/17/2023	0	0	0	0	0	0
12/18/2023	0	0	0	0	0	0
12/19/2023	0	1,388	923	964	2,477	5,751
12/20/2023	0	0	0	0	0	0
12/21/2023	0	0	0	0	0	0
12/22/2023	0	0	0	0	0	0
12/23/2023	0	0	0	0	0	0
12/24/2023	0	0	0	0	0	0
12/25/2023	0	0	0	0	0	0
12/26/2023	0	0	0	0	0	0
12/27/2023	0	0	0	0	0	0
12/28/2023	0	0	0	0	0	0
12/29/2023	0	0	0	0	0	0
12/30/2023	0	0	0	0	0	0
12/31/2023	0	0	0	0	0	0
Total						34,525

2.14 Facility Layout Map (Requirement 14)

Figure 2.14-1 is the facility layout map for CY 2023 Quarter 4, showing the location and number of each well.

2.15 Groundwater Elevation Contour Map (Requirement 15)

Figure 2.3-1 provides the groundwater elevation contour map. Section 2.3 provides an explanation of how this map was generated.

3.0 REFERENCES

- Carson, J., A. Jordan, A. Rice, P. Black, T. Stockton, D. Katzman, and L. Foster, March 8–12, 2020, “Bayesian Approach to Estimation of Water Table Elevations Using Historical Rasters as Prior Information,” paper presented at WM2020 Conference, March 8–12, 2020, Phoenix, Arizona (Carson et al. 2020).
- Carson, J., A. Jordan, A. Rice, P. Black, T. Stockton, D. Katzman, and L. Foster, March 8–12, 2020, “Bayesian Approach to Estimation of Water Table Elevations Using Historical Rasters as Prior Information,” paper presented at WM2020 Conference, March 8–12, 2020, Phoenix, Arizona (Carson et al. 2020).
- LANL (Los Alamos National Laboratory) March 29, 2018. “Notification of Ground Water Discharge Plan No. 1835 (DP-1835),” Los Alamos National Laboratory letter (ADESH:18-023) to N. Lombardo (N3B) from W.R. Mairson (LANL), Los Alamos, New Mexico (LANL 2018).
- NMED (New Mexico Environment Department), August 31, 2016. “Discharge Permit Issuance, Los Alamos National Laboratory Underground Injection Control Wells, Discharge Permit 1835,” U1601882 to B. Beers (ENV-RCRA) from M. Hunter (NMED), Santa Fe, New Mexico. (NMED 2016)
- NMED (New Mexico Environment Department) July 21, 2017. “Discharge Permit Amendment, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835,” New Mexico Environment Department letter to J.C. Bretzke (LANL) and C.L. Rodriguez (EM-LA) from M. Hunter (NMED-GWQB), Santa Fe, New Mexico (NMED 2017a).
- NMED (New Mexico Environment Department) June 27, 2017. “Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Molasses Amendment Study in Regional Aquifer Monitoring Well R-28, AI:856 PRD20170003,” New Mexico Environment Department letter to J.C. Bretzke (LANL) and A.Q. Duran (EM-LA) from M. Hunter (NMED-GWQB), Santa Fe, New Mexico (NMED 2017b).
- NMED (New Mexico Environment Department), June 6, 2022. “Notice of Violation, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835,” New Mexico Environment Department letter to A. Duran (DOE EM-LA) and J. Murdock (N3B) from J. Ball (NMED-GWQB), Santa Fe, New Mexico. (NMED 2022a)
- NMED (New Mexico Environment Department), December 12, 2022. “Corrective Action Plan Response and Further Action Required, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835,” New Mexico Environment Department Ground Water Quality Bureau letter to A. Duran (DOE-EM-LA) and R. Macfarlane (N3B) from J. Ball (NMED-GWQB), Santa Fe, New Mexico. (NMED 2022b)
- NMED (New Mexico Environment Department), June 2022. “Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments,” Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2022c)

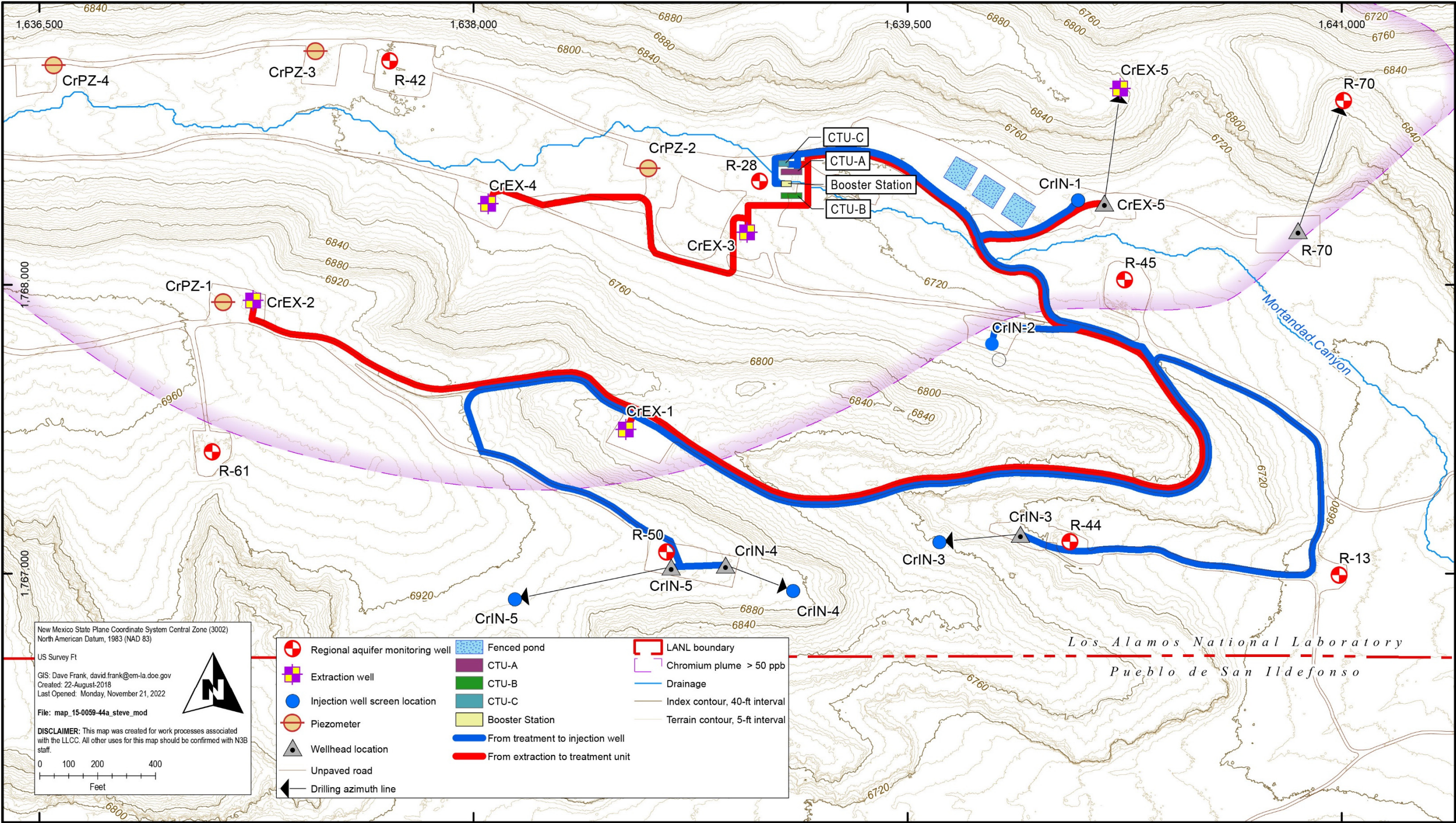


Figure 2.14-1 Facility layout map – CY 2023 Quarter 4, DP-1835

