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Date: December 1, 2020
Refer To: N3B-2020-0436

Michelle Hunter, 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 2020 Quarter 3, Class V Underground Injection Control Wells

Dear Ms. Hunter:

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 to Newport News Nuclear BWXT-Los Alamos, LLC (N3B) from LANS. Pursuant to Condition No. 10 of the above-referenced discharge permit, DOE/N3B are required to submit quarterly reports for the previous quarter 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.

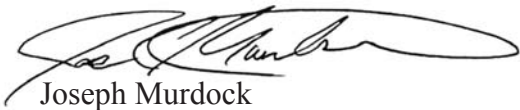
Pursuant to Condition No. 11, 12, and 13 of DP-1835, the quarterly reports shall also contain general information, performance information, and monitoring data for treated effluent from each ion exchange treatment system. Condition No. 10 requires submission of a quarterly report to NMED by December 1 for the July 1 through September 30 discharge period.

During the CY 2020 Quarter 3 reporting period for DP-1835, discharge of treated groundwater to the regional aquifer occurred at five UIC wells: CrIN-1 through CrIN-5. Groundwater originated predominantly from three extraction wells: CrEX-1, CrEX-2, and CrEX-5. The groundwater was treated by chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC) before injection at the UIC wells.

The enclosed "Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2020 Quarter 3," provides the information required under DP-1835 for this reporting period.

If you have questions, please contact Christian Maupin at (505) 695-4281 (christian.maupin@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,



Joseph Murdock
Program Manager
Environment, Safety and Health
N3B-Los Alamos

Sincerely,

arturo q duran

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Arturo Q. Duran
Compliance and Permitting Manager
Environmental Management
Los Alamos Field Office

Enclosure(s):

1. Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2020 Quarter 3 (EM2020-0583)

cc (letter and enclosure[s] emailed):

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Pamela T. Maestas

From: Hunter, Michelle, NMENV <Michelle.Hunter@state.nm.us>
Sent: Tuesday, December 1, 2020 4:27 PM
To: Pamela T. Maestas
Cc: Pullen, Steve, NMENV; Romero, Andrew C, NMENV; Longmire, Patrick, NMENV; Emily M. Day; Regulatory Documentation; cheryl.rodriguez@em.doe.gov; Christian T. Maupin
Subject: RE: Submittal to NMED on 12/1/2020 of DP-1835 Qtrly Rpt, 3QCY20

Thank you,
Michelle

Michelle Hunter
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From: Pamela T. Maestas <pamela.maestas@em-la.doe.gov>
Sent: Tuesday, December 1, 2020 4:25 PM
To: Hunter, Michelle, NMENV <Michelle.Hunter@state.nm.us>
Cc: Pullen, Steve, NMENV <steve.pullen@state.nm.us>; Romero, Andrew C, NMENV <AndrewC.Romero@state.nm.us>; Longmire, Patrick, NMENV <Patrick.Longmire@state.nm.us>; Emily M. Day <Emily.Day@em-la.doe.gov>; Regulatory Documentation <RegDocs@EM-LA.DOE.GOV>; cheryl.rodriguez@em.doe.gov; Christian T. Maupin <Christian.Maupin@em-la.doe.gov>
Subject: [EXT] Submittal to NMED on 12/1/2020 of DP-1835 Qtrly Rpt, 3QCY20

Ms. Hunter,
Attached for submittal is a pdf of the following:

- Submittal of the Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2020 Quarter 3, Class V Underground Injection Control Wells (N3B-2020-0436, letter and enclosure)

Please acknowledge receipt of this submittal by responding to this email.
Let me know if you have any questions.
Thank you.

Pamela T. Maestas
Regulatory Documentation Manager

Newport News Nuclear BWXT-Los Alamos, LLC

c. 505-927-7882

regdocs@em-la.doe.gov



1200 Trinity Drive, Suite 150

Los Alamos, NM 87544

**Quarterly Report for the
Discharge of Treated
Groundwater to the
Regional Aquifer under
Discharge Permit 1835,
Calendar Year 2020 Quarter 3**

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. 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 and N3B are required to submit quarterly reports.

During the CY 2020 Quarter 3 reporting period for DP-1835, discharge of treated groundwater to the regional aquifer occurred at five UIC wells: CrIN-1 through CrIN-5. Groundwater originated predominantly from three extraction wells: CrEX-1, CrEX-2, and CrEX-5. The groundwater was treated by chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC) before injection at the UIC wells.

Condition No. 10 of DP-1835 requires submission of a quarterly report to NMED by December 1 for the July 1 through September 30 discharge period. Several conditions within the permit identify information to be submitted in the quarterly report, as follows:

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 (Condition No. 10 and 13)
3. Quarterly depth-to-groundwater and groundwater-quality sampling results (Condition No. 10 and 14)
4. Any operations/maintenance activities performed (Condition No. 10)
5. Any periodic test of mechanical integrity conducted (Condition No. 11)
6. Any replacement of primary or secondary IX vessels or associated treatment system infrastructure (Condition No. 11)
7. Any well workovers conducted (Condition No. 11)
8. Any additional operational changes with the potential to markedly affect the discharge (Condition No. 11)
9. Monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each UIC well (Condition No. 12)
10. Total monthly volume of treated effluent transferred to each UIC well (Condition No. 12)
11. Monthly average, maximum, and minimum values of injection water level (pressure head) above static level for each UIC well (Condition No. 12)
12. Daily volume injected at each UIC well (Condition No. 12)
13. Daily volume pumped from each extraction well (Condition No. 12)
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 influent and discharge volumes for IX treatment systems during 2020 Quarter 3 for activities completed under DP-1835. As previously identified, injection occurred at UIC wells CrIN-1 through CrIN-5 during the quarter. Treated discharge, which originated from extraction wells CrEX-1, CrEX-2, and CrEX-5, was treated with treatment units CTUA and CTUC.

Table 2.1-1
Total Influent and Discharge Volumes
for IX Treatment Systems – CY 2020 Quarter 3, DP-1835

Treatment Unit	Influent Volume ^a (gal.)	Effluent Volume ^b (gal.)
CTUA	14,980,866	13,754,666
CTUC		1,038,109

Note: Individual flow meter accurate to $\pm 5\%$.

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

^b Effluent volume based on CTUA and CTUC flow meter reading.

2.2 Quarterly Treated Effluent Sampling Results from Each IX Treatment System (Requirement 2)

Treated effluent analytical results from samples collected during 2020 Quarter 3 for activities completed under DP-1835 are summarized in Table 2.2-1. No results for total chromium, nitrate, perchlorate, sulfate, fluoride, chloride, or total dissolved solids exceeded 90% of the numeric standards of 20.6.2.3103 New Mexico Administrative Code (NMAC) or 90% of the numeric screening levels established for tap water in Table A-1 of the 2019 NMED "Risk Assessment Guidance for Site Investigations and Remediation" for constituents not listed in 20.6.2.3103 NMAC. The 90% values for these seven analytes are as follows:

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

Table 2.2-1
Treated Effluent Analytical Results Summary Table – CY 2020 Quarter 3, DP-1835

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-193114	7/16/2020	Chloride	17.7	mg/L	225 mg/L	n/a ^b	Y ^c	F ^d	0.268
CTUA	CTUA-20-193116	7/22/2020	Chloride	18.2	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198523	7/27/2020	Chloride	21.4	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198524	8/3/2020	Chloride	18.1	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198525	8/10/2020	Chloride	17.3	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-206256	8/10/2020	Chloride	17.4	mg/L	225 mg/L	n/a	Y	UF ^e	0.335
CTUA	CTUA-20-198528	8/18/2020	Chloride	88.6	mg/L	225 mg/L	n/a	Y	F	1.34
CTUA	CTUA-20-206411	8/18/2020	Chloride	88	mg/L	225 mg/L	n/a	Y	F	1.34
CTUA	CTUA-20-198526	8/26/2020	Chloride	18.5	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-206412	8/26/2020	Chloride	18.4	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198527	8/31/2020	Chloride	18.7	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-206413	8/31/2020	Chloride	18.5	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198529	9/8/2020	Chloride	18.5	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198530	9/22/2020	Chloride	17	mg/L	225 mg/L	n/a	Y	F	0.335
CTUA	CTUA-20-198532	9/28/2020	Chloride	82.7	mg/L	225 mg/L	n/a	Y	F	1.34
CTUA	CTUA-20-193114	7/16/2020	Chromium	3	µg/L	45 µg/L	U ^f	N ^g	F	3
CTUA	CTUA-20-193116	7/22/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198523	7/27/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198524	8/3/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198525	8/10/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-206256	8/10/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198528	8/18/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-206411	8/18/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198526	8/26/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-206412	8/26/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198527	8/31/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-206413	8/31/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198529	9/8/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198530	9/22/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-198532	9/28/2020	Chromium	3	µg/L	45 µg/L	U	N	F	3
CTUA	CTUA-20-193114	7/16/2020	Fluoride	0.268	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-193116	7/22/2020	Fluoride	0.32	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198523	7/27/2020	Fluoride	0.374	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198524	8/3/2020	Fluoride	0.318	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198525	8/10/2020	Fluoride	0.25	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-206256	8/10/2020	Fluoride	0.249	mg/L	1.44 mg/L	n/a	Y	UF	0.033
CTUA	CTUA-20-198528	8/18/2020	Fluoride	0.033	mg/L	1.44 mg/L	U	N	F	0.033
CTUA	CTUA-20-206411	8/18/2020	Fluoride	0.033	mg/L	1.44 mg/L	U	N	F	0.033
CTUA	CTUA-20-198526	8/26/2020	Fluoride	0.474	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-206412	8/26/2020	Fluoride	0.473	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198527	8/31/2020	Fluoride	0.332	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-206413	8/31/2020	Fluoride	0.329	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198529	9/8/2020	Fluoride	0.337	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198530	9/22/2020	Fluoride	0.301	mg/L	1.44 mg/L	n/a	Y	F	0.033
CTUA	CTUA-20-198532	9/28/2020	Fluoride	0.033	mg/L	1.44 mg/L	U	N	F	0.033
CTUA	CTUA-20-193114	7/16/2020	Nitrate-Nitrite as Nitrogen	2.96	mg/L	9 mg/L	n/a	Y	F	0.085
CTUA	CTUA-20-193116	7/22/2020	Nitrate-Nitrite as Nitrogen	2.35	mg/L	9 mg/L	n/a	Y	F	0.17
CTUA	CTUA-20-198523	7/27/2020	Nitrate-Nitrite as Nitrogen	2.62	mg/L	9 mg/L	n/a	Y	F	0.085
CTUA	CTUA-20-198524	8/3/2020	Nitrate-Nitrite as Nitrogen	2.55	mg/L	9 mg/L	n/a	Y	F	0.17

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-198525	8/10/2020	Nitrate-Nitrite as Nitrogen	2.47	mg/L	9 mg/L	n/a	Y	F	0.17
CTUA	CTUA-20-206256	8/10/2020	Nitrate-Nitrite as Nitrogen	2.6	mg/L	9 mg/L	n/a	Y	UF	0.17
CTUA	CTUA-20-198528	8/18/2020	Nitrate-Nitrite as Nitrogen	0.017	mg/L	9 mg/L	U	N	F	0.017
CTUA	CTUA-20-206411	8/18/2020	Nitrate-Nitrite as Nitrogen	0.017	mg/L	9 mg/L	U	N	F	0.017
CTUA	CTUA-20-198526	8/26/2020	Nitrate-Nitrite as Nitrogen	2.72	mg/L	9 mg/L	n/a	Y	F	0.085
CTUA	CTUA-20-206412	8/26/2020	Nitrate-Nitrite as Nitrogen	2.71	mg/L	9 mg/L	n/a	Y	F	0.085
CTUA	CTUA-20-198527	8/31/2020	Nitrate-Nitrite as Nitrogen	2.46	mg/L	9 mg/L	n/a	Y	F	0.17
CTUA	CTUA-20-206413	8/31/2020	Nitrate-Nitrite as Nitrogen	2.53	mg/L	9 mg/L	n/a	Y	F	0.17
CTUA	CTUA-20-198529	9/8/2020	Nitrate-Nitrite as Nitrogen	2.65	mg/L	9 mg/L	n/a	Y	F	0.085
CTUA	CTUA-20-198530	9/22/2020	Nitrate-Nitrite as Nitrogen	2.5	mg/L	9 mg/L	n/a	Y	F	0.17
CTUA	CTUA-20-198532	9/28/2020	Nitrate-Nitrite as Nitrogen	0.0193	mg/L	9 mg/L	J ^h	Y	F	0.017
CTUA	CTUA-20-193114	7/16/2020	Perchlorate	0.41	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-193116	7/22/2020	Perchlorate	0.402	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-198523	7/27/2020	Perchlorate	0.428	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-198524	8/3/2020	Perchlorate	0.413	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-198525	8/10/2020	Perchlorate	0.418	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-206256	8/10/2020	Perchlorate	0.463	µg/L	12.4 µg/L	n/a	Y	UF	0.05
CTUA	CTUA-20-198528	8/18/2020	Perchlorate	0.0945	µg/L	12.4 µg/L	J	Y	F	0.05
CTUA	CTUA-20-206411	8/18/2020	Perchlorate	0.0896	µg/L	12.4 µg/L	J	Y	F	0.05
CTUA	CTUA-20-198526	8/26/2020	Perchlorate	0.276	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-206412	8/26/2020	Perchlorate	0.27	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-198527	8/31/2020	Perchlorate	0.339	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-206413	8/31/2020	Perchlorate	0.443	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-198529	9/8/2020	Perchlorate	0.369	µg/L	12.4 µg/L	n/a	Y	F	0.05
CTUA	CTUA-20-198530	9/22/2020	Perchlorate	0.342	µg/L	12.4 µg/L	n/a	Y	F	0.05

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-198532	9/28/2020	Perchlorate	0.128	µg/L	12.4 µg/L	J	Y	F	0.05
CTUA	CTUA-20-193114	7/16/2020	Sulfate	21.9	mg/L	540 mg/L	n/a	Y	F	0.532
CTUA	CTUA-20-193116	7/22/2020	Sulfate	25.2	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198523	7/27/2020	Sulfate	25.5	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198524	8/3/2020	Sulfate	24.8	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198525	8/10/2020	Sulfate	23.9	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-206256	8/10/2020	Sulfate	23.9	mg/L	540 mg/L	n/a	Y	UF	0.665
CTUA	CTUA-20-198528	8/18/2020	Sulfate	0.133	mg/L	540 mg/L	U	N	F	0.133
CTUA	CTUA-20-206411	8/18/2020	Sulfate	0.177	mg/L	540 mg/L	J	Y	F	0.133
CTUA	CTUA-20-198526	8/26/2020	Sulfate	22	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-206412	8/26/2020	Sulfate	21.9	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198527	8/31/2020	Sulfate	25.8	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-206413	8/31/2020	Sulfate	25.6	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198529	9/8/2020	Sulfate	25.5	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198530	9/22/2020	Sulfate	23	mg/L	540 mg/L	n/a	Y	F	0.665
CTUA	CTUA-20-198532	9/28/2020	Sulfate	0.241	mg/L	540 mg/L	J	Y	F	0.133
CTUA	CTUA-20-193114	7/16/2020	Total Dissolved Solids	241	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-193116	7/22/2020	Total Dissolved Solids	220	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198523	7/27/2020	Total Dissolved Solids	239	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198524	8/3/2020	Total Dissolved Solids	184	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198525	8/10/2020	Total Dissolved Solids	220	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-206256	8/10/2020	Total Dissolved Solids	241	mg/L	900 mg/L	n/a	Y	UF	3.4
CTUA	CTUA-20-198528	8/18/2020	Total Dissolved Solids	397	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-206411	8/18/2020	Total Dissolved Solids	441	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198526	8/26/2020	Total Dissolved Solids	207	mg/L	900 mg/L	n/a	Y	F	3.4

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-206412	8/26/2020	Total Dissolved Solids	189	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198527	8/31/2020	Total Dissolved Solids	223	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-206413	8/31/2020	Total Dissolved Solids	224	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198529	9/8/2020	Total Dissolved Solids	203	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198530	9/22/2020	Total Dissolved Solids	217	mg/L	900 mg/L	n/a	Y	F	3.4
CTUA	CTUA-20-198532	9/28/2020	Total Dissolved Solids	281	mg/L	900 mg/L	n/a	Y	F	3.4

^a In accordance with condition 13 of DP-1835, analysis of the treated effluent from each IX unit is required only once every month for the CY 2020 Q3 reporting period.

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

^c Y = Detected.

^d F = Filtered.

^e UF = Unfiltered.

^f U = Analyte is classified as not detected.

^g N = Not detected.

^h J = Analyte is classified as estimated.

The pilot scale molasses and sodium dithionite amendment studies continued during 2020 Quarter 3. NMED determined that no permit was required for the deployment of these amendments, and these studies began with NMED conditional approvals during 2017 Quarter 4 (NMED 2017a, NMED 2017b). In accordance with the NMED conditional approvals, iron, manganese, and arsenic sampling in the treated water from extraction wells was completed, and the results were submitted in the quarterly monitoring reports under DP-1835. These results for 2020 Quarter 3 are provided in Table 2.2-2. No results for iron, manganese, or arsenic exceeded 90% of the numeric standards of 20.6.2.3103 NMAC. The 90% values for iron, manganese, and arsenic are 900 µg/L, 180 µg/L, and 9 µg/L, respectively.

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 2020 was not obtained during Quarter 3 but is expected to be obtained during Quarter 4.

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. An explanation of how the groundwater elevation map was generated is provided below. Quarterly groundwater analytical results from samples collected during 2020 Quarter 3 for the monitoring wells listed in Condition No. 14 are summarized in Table 2.3-2.

The regional aquifer beneath Los Alamos National Laboratory (LANL or the Laboratory) is a complex hydrogeological system. The shape of the regional water table beneath the Pajarito Plateau is predominantly controlled by the areas of recharge to the west (i.e., the flanks of the Sierra de los Valles and the Pajarito fault zone) and discharge to the east (i.e., the Rio Grande and the White Rock Canyon Springs). At a more local scale, such as the chromium plume area, the structure of the regional water table and groundwater flow is also expected to be influenced by (1) local infiltration zones and recharge areas (e.g., beneath canyons), (2) heterogeneity and anisotropy in the aquifer properties, and (3) extraction and injection locations (municipal water-supply wells and chromium interim measure extraction/injection wells).

Long-term water-level data, contaminant transport observations (travel times and direction of migration), and calibrated model results are all lines of evidence that 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 towards the Rio Grande. The low ambient gradient in the chromium plume area could be related to 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, and nearby water-supply pumping. Although it is difficult to infer absolute groundwater flow directions from the relatively flat contours in the chromium plume area, groundwater elevation data and contaminant transport observations indicate that flow direction is generally towards the east-southeast.

Table 2.2-2

**Treated Effluent Analytical Results Summary Table Related to Molasses and
Sodium Dithionite Pilot Studies under NMED Conditional Approval – CY 2020 Quarter 3, DP-1835**

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-193114	7/16/2020	Arsenic	2.61	µg/L	9 µg/L	J ^b	Y ^c	F ^d	2
CTUA	CTUA-20-193116	7/22/2020	Arsenic	2	µg/L	9 µg/L	U ^e	N ^f	F	2
CTUA	CTUA-20-198523	7/27/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-198524	8/3/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-198525	8/10/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-206256	8/10/2020	Arsenic	2	µg/L	9 µg/L	U	N	UF ^g	2
CTUA	CTUA-20-198528	8/18/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-206411	8/18/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-198526	8/26/2020	Arsenic	2.69	µg/L	9 µg/L	J	Y	F	2
CTUA	CTUA-20-206412	8/26/2020	Arsenic	2.78	µg/L	9 µg/L	J	Y	F	2
CTUA	CTUA-20-198527	8/31/2020	Arsenic	2.96	µg/L	9 µg/L	J	Y	F	2
CTUA	CTUA-20-206413	8/31/2020	Arsenic	2.96	µg/L	9 µg/L	J	Y	F	2
CTUA	CTUA-20-198529	9/8/2020	Arsenic	2	µg/L	9 µg/L	J	Y	F	2
CTUA	CTUA-20-198530	9/22/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-198532	9/28/2020	Arsenic	2	µg/L	9 µg/L	U	N	F	2
CTUA	CTUA-20-193114	7/16/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-193116	7/22/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198523	7/27/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198524	8/3/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198525	8/10/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-206256	8/10/2020	Iron	30	µg/L	900 µg/L	U	N	UF	30
CTUA	CTUA-20-198528	8/18/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-206411	8/18/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198526	8/26/2020	Iron	30	µg/L	900 µg/L	U	N	F	30

Table 2.2-2 (continued)

Location ID	Sample ID	Sample Date ^a	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-20-206412	8/26/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198527	8/31/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-206413	8/31/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198529	9/8/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198530	9/22/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-198532	9/28/2020	Iron	30	µg/L	900 µg/L	U	N	F	30
CTUA	CTUA-20-193114	7/16/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-193116	7/22/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198523	7/27/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198524	8/3/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198525	8/10/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-206256	8/10/2020	Manganese	2	µg/L	180 µg/L	U	N	UF	2
CTUA	CTUA-20-198528	8/18/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-206411	8/18/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198526	8/26/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-206412	8/26/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198527	8/31/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-206413	8/31/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198529	9/8/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198530	9/22/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2
CTUA	CTUA-20-198532	9/28/2020	Manganese	2	µg/L	180 µg/L	U	N	F	2

^a In accordance with condition 13 of DP-1835, analysis of the treated effluent from each IX unit is required only once every month for the CY 2020 Q3 reporting period.

^b J = Analyte is classified as estimated.

^c Y = Detected.

^d F = Filtered.

^e U = Analyte is classified as not detected.

^f N = Not detected.

^g UF = Unfiltered.

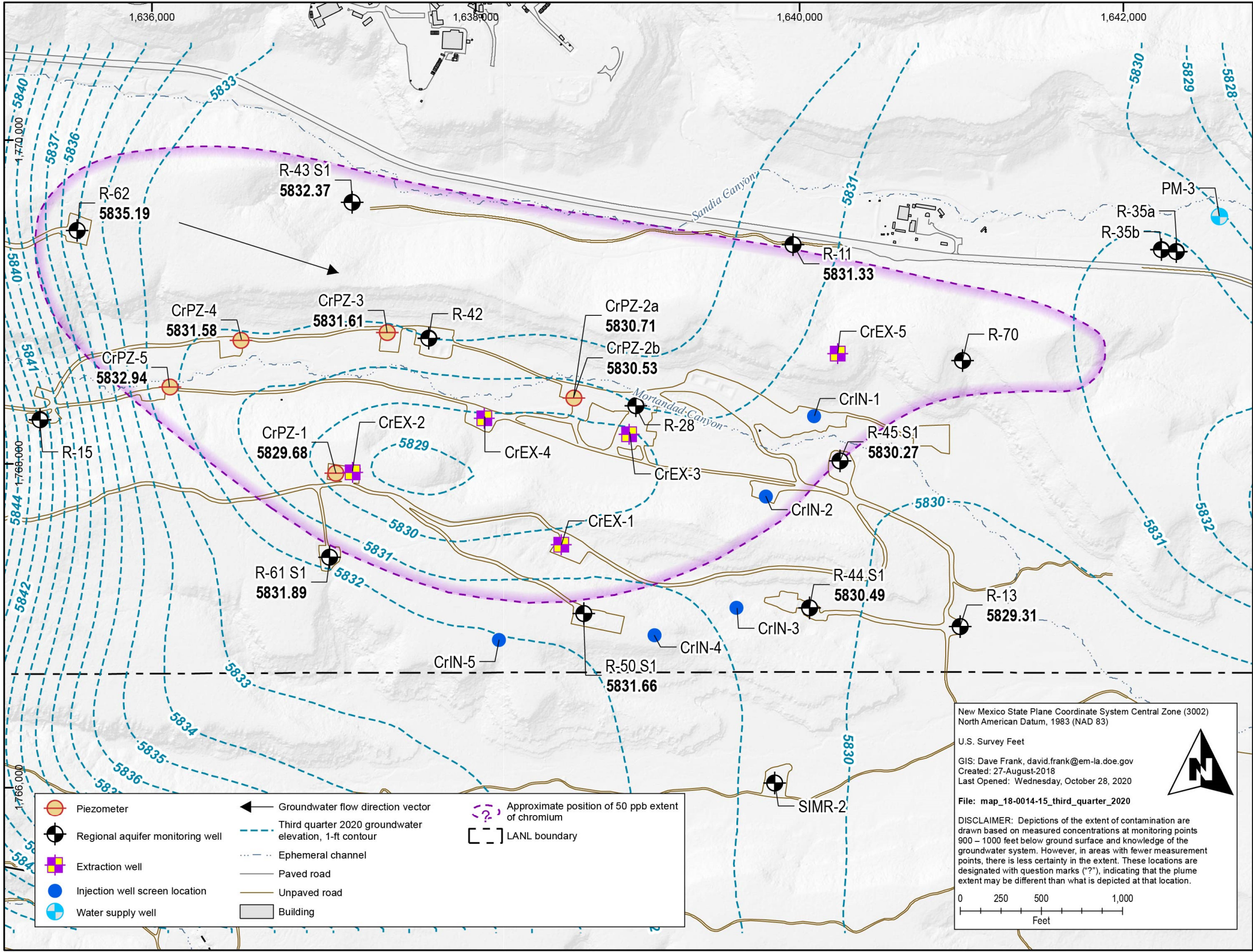


Figure 2.3-1 Groundwater elevation contour map – CY 2020 Quarter 3, DP-1835

Table 2.3-1
Groundwater Elevations Summary
for Groundwater Monitoring Wells – CY 2020 Quarter 3, DP-1835

Monitoring Well	Groundwater Elevation ^a (ft)
CrPZ-1 (CrCH-1)	5829.68
CrPZ-2a (CrCH-2a)	5830.71
CrPZ-2b (CrCH-2b)	5830.53
CrPZ-3 (CrCH-3)	5831.61
CrPZ-4 (CrCH-4)	5831.58
CrPZ-5 (CrCH-5)	5832.94
R-11	5831.33
R-13	5829.31
R-43 S1 ^b	5832.37
R-43 S2 ^c	5831.51
R-44 S1	5830.49
R-44 S2	5829.94
R-45 S1	5830.27
R-45 S2	5831.76
R-50 S1	5831.66
R-50 S2	5830.42
R-61 S1	5831.89
R-61 S2	5831.72
R-62	5835.19
SIMR-2 ^d	5831.04

^a Groundwater elevations provided are based on average August 2020 values from transducers.

^b S1 = Screen 1.

^c S2 = Screen 2.

^d Second quarter average May 2020 SIMR-2 data are reported here in accordance with the DP-1835 2019 Quarter 2 report (N3B 2020). Data were unavailable at the time of that report's preparation in accordance with the memorandum of agreement between San Ildefonso Pueblo and DOE. Data from the current quarter are not available at this time and will be presented in the next quarterly report.

Table 2.3-2

Groundwater Monitoring Wells Analytical Results Summary Table – CY 2020 Quarter 3, DP-1835

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CASA-20-205407	R-11	07/30/2020	Chloride	3.56	mg/L	n/a ^a	Y ^b	F ^c	0.067
CASA-20-205407	R-11	07/30/2020	Perchlorate	0.739	µg/L	n/a	Y	F	0.050
CASA-20-205407	R-11	07/30/2020	Chromium	5.82	µg/L	J ^d	Y	F	3.00
CASA-20-205407	R-11	07/30/2020	Fluoride	0.573	mg/L	n/a	Y	F	0.033
CASA-20-205407	R-11	07/30/2020	Nitrate-nitrite as nitrogen	5.69	mg/L	n/a	Y	F	0.170
CASA-20-205407	R-11	07/30/2020	Sulfate	10.3	mg/L	n/a	Y	F	0.133
CASA-20-205407	R-11	07/30/2020	Total dissolved solids	181	mg/L	J+ ^e	Y	F	3.40
CASA-20-198984	R-11	08/05/2020	Chloride	3.94	mg/L	n/a	Y	F	0.067
CASA-20-198984	R-11	08/05/2020	Perchlorate	0.669	µg/L	n/a	Y	F	0.050
CASA-20-198984	R-11	08/05/2020	Chromium	6.72	µg/L	J	Y	F	3.00
CASA-20-198984	R-11	08/05/2020	Fluoride	0.415	mg/L	n/a	Y	F	0.033
CASA-20-198984	R-11	08/05/2020	Nitrate-nitrite as nitrogen	5.25	mg/L	n/a	Y	F	0.850
CASA-20-198984	R-11	08/05/2020	Sulfate	10.4	mg/L	n/a	Y	F	0.133
CASA-20-198984	R-11	08/05/2020	Total dissolved solids	261	mg/L	n/a	Y	F	3.40
CASA-20-205976	R-11	09/08/2020	Chloride	3.61	mg/L	n/a	Y	F	0.067
CASA-20-205976	R-11	09/08/2020	Perchlorate	0.769	µg/L	n/a	Y	F	0.050
CASA-20-205976	R-11	09/08/2020	Chromium	5.49	µg/L	J	Y	F	3.00
CASA-20-205976	R-11	09/08/2020	Fluoride	0.422	mg/L	n/a	Y	F	0.033
CASA-20-205976	R-11	09/08/2020	Nitrate-nitrite as nitrogen	5.84	mg/L	n/a	Y	F	0.170
CASA-20-205976	R-11	09/08/2020	Sulfate	10.3	mg/L	n/a	Y	F	0.133
CASA-20-205976	R-11	09/08/2020	Total dissolved solids	207	mg/L	J+	Y	F	3.40
CAMO-20-198876	R-13	08/04/2020	Chloride	2.76	mg/L	U ^f	Y	F	0.067
CAMO-20-198876	R-13	08/04/2020	Perchlorate	0.385	µg/L	n/a	Y	F	0.05
CAMO-20-198876	R-13	08/04/2020	Chromium	4024	µg/L	J	Y	F	3.00

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-20-198876	R-13	08/04/2020	Fluoride	0.459	mg/L	n/a	Y	F	0.033
CAMO-20-198876	R-13	08/04/2020	Nitrate-nitrite as nitrogen	0.742	mg/L	n/a	Y	F	0.017
CAMO-20-198876	R-13	08/04/2020	Sulfate	3.48	mg/L	n/a	Y	F	0.133
CAMO-20-198876	R-13	08/04/2020	Total dissolved solids	106	mg/L	n/a	Y	F	3.40
CASA-20-198996	R-43 S1 ^a	08/05/2020	Chloride	8.77	mg/L	J+	Y	F	0.067
CASA-20-198996	R-43 S1	08/05/2020	Perchlorate	0.767	µg/L	n/a	Y	F	0.050
CASA-20-198996	R-43 S1	08/05/2020	Chromium	194	µg/L	n/a	Y	F	3.00
CASA-20-198996	R-43 S1	08/05/2020	Fluoride	0.347	mg/L	J+	Y	F	0.033
CASA-20-198996	R-43 S1	08/05/2020	Nitrate-nitrite as nitrogen	4.67	mg/L	n/a	Y	F	0.850
CASA-20-198996	R-43 S1	08/05/2020	Sulfate	17.6	mg/L	J+	Y	F	0.133
CASA-20-198996	R-43 S1	08/05/2020	Total dissolved solids	180	mg/L	n/a	Y	F	3.40
CASA-20-198998	R-43 S2 ^b	08/07/2020	Chloride	7.55	mg/L	J+	Y	F	0.067
CASA-20-198998	R-43 S2	08/07/2020	Perchlorate	0.926	µg/L	n/a	Y	F	0.050
CASA-20-198998	R-43 S2	08/07/2020	Chromium	40.3	µg/L	n/a	Y	F	3.00
CASA-20-198998	R-43 S2	08/07/2020	Fluoride	0.471	mg/L	n/a	Y	F	0.033
CASA-20-198998	R-43 S2	08/07/2020	Nitrate-nitrite as nitrogen	3.89	mg/L	n/a	Y	F	0.170
CASA-20-198998	R-43 S2	08/07/2020	Sulfate	11.0	mg/L	n/a	Y	F	0.133
CASA-20-198998	R-43 S2	08/07/2020	Total dissolved solids	190	mg/L	J+	Y	F	3.40
CAMO-20-205413	R-44 S1	07/29/2020	Chloride	19.0	mg/L	n/a	Y	F	0.335
CAMO-20-205413	R-44 S1	07/29/2020	Perchlorate	0.05	µg/L	U	Y	F	0.050
CAMO-20-205413	R-44 S1	07/29/2020	Chromium	4.26	µg/L	J	Y	F	3.00
CAMO-20-205413	R-44 S1	07/29/2020	Fluoride	0.176	mg/L	n/a	Y	F	0.033
CAMO-20-205413	R-44 S1	07/29/2020	Nitrate-nitrite as nitrogen	2.42	mg/L	n/a	Y	F	0.085
CAMO-20-205413	R-44 S1	07/29/2020	Sulfate	19.2	mg/L	n/a	Y	F	0.133
CAMO-20-205413	R-44 S1	07/29/2020	Total dissolved solids	191	mg/L	J	Y	F	3.40
CAMO-20-198884	R-44 S1	08/11/2020	Chloride	19.4	mg/L	n/a	Y	F	0.335

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-20-198884	R-44 S1	08/11/2020	Perchlorate	0.313	µg/L	n/a	Y	F	0.050
CAMO-20-198884	R-44 S1	08/11/2020	Chromium	4.47	µg/L	J	Y	F	3.00
CAMO-20-198884	R-44 S1	08/11/2020	Fluoride	0.319	mg/L	n/a	Y	F	0.033
CAMO-20-198884	R-44 S1	08/11/2020	Nitrate-nitrite as nitrogen	2.32	mg/L	n/a	Y	F	0.170
CAMO-20-198884	R-44 S1	08/11/2020	Sulfate	19.9	mg/L	J+	Y	F	0.133
CAMO-20-198884	R-44 S1	08/11/2020	Total dissolved solids	191	mg/L	n/a	Y	F	3.40
CAMO-20-205999	R-44 S1	09/10/2020	Chloride	19.0	mg/L	n/a	Y	F	0.335
CAMO-20-205999	R-44 S1	09/10/2020	Perchlorate	0.304	µg/L	n/a	Y	F	0.050
CAMO-20-205999	R-44 S1	09/10/2020	Chromium	4.47	µg/L	J	Y	F	3.00
CAMO-20-205999	R-44 S1	09/10/2020	Fluoride	0.249	mg/L	n/a	Y	F	0.033
CAMO-20-205999	R-44 S1	09/10/2020	Nitrate-nitrite as nitrogen	2.49	mg/L	n/a	Y	F	0.085
CAMO-20-205999	R-44 S1	09/10/2020	Sulfate	19.6	mg/L	n/a	Y	F	0.133
CAMO-20-205999	R-44 S1	09/10/2020	Total dissolved solids	190	mg/L	n/a	Y	F	3.40
CAMO-20-205416	R-44 S2	07/29/2020	Chloride	2.23	mg/L	n/a	Y	F	0.067
CAMO-20-205416	R-44 S2	07/29/2020	Perchlorate	0.321	µg/L	n/a	Y	F	0.050
CAMO-20-205416	R-44 S2	07/29/2020	Chromium	6.63	µg/L	J	Y	F	3.00
CAMO-20-205416	R-44 S2	07/29/2020	Fluoride	0.324	mg/L	n/a	Y	F	0.033
CAMO-20-205416	R-44 S2	07/29/2020	Nitrate-nitrite as nitrogen	0.73	mg/L	n/a	Y	F	0.017
CAMO-20-205416	R-44 S2	07/29/2020	Sulfate	2.6	mg/L	n/a	Y	F	0.133
CAMO-20-205416	R-44 S2	07/29/2020	Total dissolved solids	131	mg/L	J	Y	F	3.40
CAMO-20-198886	R-44 S2	08/11/2020	Chloride	2.21	mg/L	n/a	Y	F	0.067
CAMO-20-198886	R-44 S2	08/11/2020	Perchlorate	0.329	µg/L	n/a	Y	F	0.050
CAMO-20-198886	R-44 S2	08/11/2020	Chromium	6.54	µg/L	J	Y	F	3.00
CAMO-20-198886	R-44 S2	08/11/2020	Fluoride	0.357	mg/L	n/a	Y	F	0.033
CAMO-20-198886	R-44 S2	08/11/2020	Nitrate-nitrite as nitrogen	0.685	mg/L	n/a	Y	F	0.085
CAMO-20-198886	R-44 S2	08/11/2020	Sulfate	2.55	mg/L	n/a	Y	F	0.133

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-20-198886	R-44 S2	08/11/2020	Total dissolved solids	143	mg/L	n/a	Y	F	3.40
CAMO-20-206002	R-44 S2	09/10/2020	Chloride	2.34	mg/L	n/a	Y	F	0.067
CAMO-20-206002	R-44 S2	09/10/2020	Perchlorate	0.333	µg/L	n/a	Y	F	0.050
CAMO-20-206002	R-44 S2	09/10/2020	Chromium	6.42	µg/L	J	Y	F	3.00
CAMO-20-206002	R-44 S2	09/10/2020	Fluoride	0.386	mg/L	n/a	Y	F	0.033
CAMO-20-206002	R-44 S2	09/10/2020	Nitrate-nitrite as nitrogen	0.72	mg/L	n/a	Y	F	0.017
CAMO-20-206002	R-44 S2	09/10/2020	Sulfate	2.61	mg/L	n/a	Y	F	0.133
CAMO-20-206002	R-44 S2	09/10/2020	Total dissolved solids	119	mg/L	n/a	Y	F	3.40
CAMO-20-205420	R-45 S1	07/28/2020	Chloride	16.3	mg/L	n/a	Y	F	0.335
CAMO-20-205420	R-45 S1	07/28/2020	Perchlorate	0.05	µg/L	U	Y	F	0.050
CAMO-20-205420	R-45 S1	07/28/2020	Chromium	14.3	µg/L	n/a	Y	F	3.00
CAMO-20-205420	R-45 S1	07/28/2020	Fluoride	0.225	mg/L	n/a	Y	F	0.033
CAMO-20-205420	R-45 S1	07/28/2020	Nitrate-nitrite as nitrogen	2.71	mg/L	n/a	Y	F	0.085
CAMO-20-205420	R-45 S1	07/28/2020	Sulfate	16.5	mg/L	n/a	Y	F	0.133
CAMO-20-205420	R-45 S1	07/28/2020	Total dissolved solids	216	mg/L	n/a	Y	F	3.40
CAMO-20-198889	R-45 S1	08/11/2020	Chloride	16.4	mg/L	n/a	Y	F	0.134
CAMO-20-198889	R-45 S1	08/11/2020	Perchlorate	0.39	µg/L	n/a	Y	F	0.050
CAMO-20-198889	R-45 S1	08/11/2020	Chromium	15.5	µg/L	n/a	Y	F	3.00
CAMO-20-198889	R-45 S1	08/11/2020	Fluoride	0.241	mg/L	n/a	Y	F	0.033
CAMO-20-198889	R-45 S1	08/11/2020	Nitrate-nitrite as nitrogen	2.72	mg/L	n/a	Y	F	0.085
CAMO-20-198889	R-45 S1	08/11/2020	Sulfate	16.1	mg/L	n/a	Y	F	0.133
CAMO-20-198889	R-45 S1	08/11/2020	Total dissolved solids	173	mg/L	n/a	Y	F	3.40
CAMO-20-206005	R-45 S1	09/14/2020	Chloride	16.6	mg/L	J+	Y	F	0.134
CAMO-20-206005	R-45 S1	09/14/2020	Perchlorate	0.399	µg/L	n/a	Y	F	0.050
CAMO-20-206005	R-45 S1	09/14/2020	Chromium	15.2	µg/L	n/a	Y	F	3.00
CAMO-20-206005	R-45 S1	09/14/2020	Fluoride	0.329	mg/L	n/a	Y	F	0.033

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-20-206005	R-45 S1	09/14/2020	Nitrate-nitrite as nitrogen	2.79	mg/L	n/a	Y	F	0.085
CAMO-20-206005	R-45 S1	09/14/2020	Sulfate	16.5	mg/L	n/a	Y	F	0.133
CAMO-20-206005	R-45 S1	09/14/2020	Total dissolved solids	173	mg/L	n/a	Y	F	3.40
CAMO-20-205428	R-45 S2	07/28/2020	Chloride	5.7	mg/L	n/a	Y	F	0.067
CAMO-20-205428	R-45 S2	07/28/2020	Perchlorate	0.376	µg/L	U	Y	F	0.050
CAMO-20-205428	R-45 S2	07/28/2020	Chromium	42.2	µg/L	n/a	Y	F	3.00
CAMO-20-205428	R-45 S2	07/28/2020	Fluoride	0.356	mg/L	n/a	Y	F	0.033
CAMO-20-205428	R-45 S2	07/28/2020	Nitrate-nitrite as nitrogen	1.12	mg/L	n/a	Y	F	0.017
CAMO-20-205428	R-45 S2	07/28/2020	Sulfate	7.03	mg/L	n/a	Y	F	0.133
CAMO-20-205428	R-45 S2	07/28/2020	Total dissolved solids	176	mg/L	n/a	Y	F	3.40
CAMO-20-198944	R-45 S2	08/11/2020	Chloride	5.69	mg/L	n/a	Y	F	0.067
CAMO-20-198944	R-45 S2	08/11/2020	Perchlorate	0.422	µg/L	n/a	Y	F	0.050
CAMO-20-198944	R-45 S2	08/11/2020	Chromium	43.6	µg/L	n/a	Y	F	3.00
CAMO-20-198944	R-45 S2	08/11/2020	Fluoride	0.327	mg/L	n/a	Y	F	0.033
CAMO-20-198944	R-45 S2	08/11/2020	Nitrate-nitrite as nitrogen	1.09	mg/L	n/a	Y	F	0.085
CAMO-20-198944	R-45 S2	08/11/2020	Sulfate	6.77	mg/L	n/a	Y	F	0.133
CAMO-20-198944	R-45 S2	08/11/2020	Total dissolved solids	160	mg/L	n/a	Y	F	3.40
CAMO-20-206008	R-45 S2	09/14/2020	Chloride	5.95	mg/L	J+	Y	F	0.067
CAMO-20-206008	R-45 S2	09/14/2020	Perchlorate	0.464	µg/L	n/a	Y	F	0.050
CAMO-20-206008	R-45 S2	09/14/2020	Chromium	42.6	µg/L	n/a	Y	F	3.00
CAMO-20-206008	R-45 S2	09/14/2020	Fluoride	0.404	mg/L	n/a	Y	F	0.033
CAMO-20-206008	R-45 S2	09/14/2020	Nitrate-nitrite as nitrogen	1.16	mg/L	n/a	Y	F	0.017
CAMO-20-206008	R-45 S2	09/14/2020	Sulfate	7.31	mg/L	n/a	Y	F	0.133
CAMO-20-206008	R-45 S2	09/14/2020	Total dissolved solids	143	mg/L	n/a	Y	F	3.40
CAMO-20-205431	R-50 S1	07/27/2020	Chloride	17.5	mg/L	n/a	Y	F	0.335
CAMO-20-205431	R-50 S1	07/27/2020	Perchlorate	0.4	µg/L	n/a	Y	F	0.050

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-20-205431	R-50 S1	07/27/2020	Chromium	40.2	µg/L	n/a	Y	F	3.00
CAMO-20-205431	R-50 S1	07/27/2020	Fluoride	0.338	mg/L	n/a	Y	F	0.033
CAMO-20-205431	R-50 S1	07/27/2020	Nitrate-nitrite as nitrogen	2.46	mg/L	n/a	Y	F	0.085
CAMO-20-205431	R-50 S1	07/27/2020	Sulfate	19.3	mg/L	n/a	Y	F	0.133
CAMO-20-205431	R-50 S1	07/27/2020	Total dissolved solids	241	mg/L	n/a	Y	F	3.40
CAMO-20-198946	R-50 S1	08/10/2020	Chloride	17.1	mg/L	n/a	Y	F	0.335
CAMO-20-198946	R-50 S1	08/10/2020	Perchlorate	0.371	µg/L	n/a	Y	F	0.050
CAMO-20-198946	R-50 S1	08/10/2020	Chromium	38.8	µg/L	n/a	Y	F	3.00
CAMO-20-198946	R-50 S1	08/10/2020	Fluoride	0.228	mg/L	n/a	Y	F	0.033
CAMO-20-198946	R-50 S1	08/10/2020	Nitrate-nitrite as nitrogen	2.28	mg/L	n/a	Y	F	0.170
CAMO-20-198946	R-50 S1	08/10/2020	Sulfate	17.4	mg/L	n/a	Y	F	0.665
CAMO-20-198946	R-50 S1	08/10/2020	Total dissolved solids	194	mg/L	n/a	Y	F	3.40
CAMO-20-205434	R-50 S2	07/27/2020	Chloride	2.13	mg/L	n/a	Y	F	0.067
CAMO-20-205434	R-50 S2	07/27/2020	Perchlorate	0.355	µg/L	n/a	Y	F	0.050
CAMO-20-205434	R-50 S2	07/27/2020	Chromium	3.98	µg/L	J	Y	F	3.00
CAMO-20-205434	R-50 S2	07/27/2020	Fluoride	0.348	mg/L	n/a	Y	F	0.033
CAMO-20-205434	R-50 S2	07/27/2020	Nitrate-nitrite as nitrogen	0.551	mg/L	n/a	Y	F	0.017
CAMO-20-205434	R-50 S2	07/27/2020	Sulfate	2.53	mg/L	n/a	Y	F	0.133
CAMO-20-205434	R-50 S2	07/27/2020	Total dissolved solids	181	mg/L	n/a	Y	F	3.40
CAMO-20-198948	R-50 S2	08/14/2020	Chloride	2.22	mg/L	n/a	Y	F	0.067
CAMO-20-198948	R-50 S2	08/14/2020	Perchlorate	0.513	µg/L	n/a	Y	F	0.050
CAMO-20-198948	R-50 S2	08/14/2020	Chromium	4.26	µg/L	J	Y	F	3.00
CAMO-20-198948	R-50 S2	08/14/2020	Fluoride	0.557	mg/L	n/a	Y	F	0.033
CAMO-20-198948	R-50 S2	08/14/2020	Nitrate-nitrite as nitrogen	0.541	mg/L	n/a	Y	F	0.017
CAMO-20-198948	R-50 S2	08/14/2020	Sulfate	2.56	mg/L	n/a	Y	F	0.133
CAMO-20-198948	R-50 S2	08/14/2020	Total dissolved solids	143	mg/L	n/a	Y	F	3.40

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-20-198952	R-62	08/21/2020	Chloride	16.7	mg/L	n/a	Y	F	0.335
CAMO-20-198952	R-62	08/21/2020	Perchlorate	0.937	µg/L	n/a	Y	F	0.050
CAMO-20-198952	R-62	08/21/2020	Chromium	287	µg/L	n/a	Y	F	3.00
CAMO-20-198952	R-62	08/21/2020	Fluoride	0.147	mg/L	n/a	Y	F	0.033
CAMO-20-198952	R-62	08/21/2020	Nitrate-nitrite as nitrogen	1.99	mg/L	n/a	Y	F	0.085
CAMO-20-198952	R-62	08/21/2020	Sulfate	29.3	mg/L	n/a	Y	F	0.665
CAMO-20-198952	R-62	08/21/2020	Total dissolved solids	223	mg/L	n/a	Y	F	3.40
CAMO-20-198588	SIMR-2 ⁱ	06/29/2020	Chloride	2.23	mg/L	n/a	Y	F	0.067
CAMO-20-198588	SIMR-2	06/29/2020	Perchlorate	0.411	µg/L	n/a	Y	F	0.050
CAMO-20-198588	SIMR-2	06/29/2020	Chromium	5.18	µg/L	J	Y	F	3.00
CAMO-20-198588	SIMR-2	06/29/2020	Fluoride	0.472	mg/L	n/a	Y	F	0.033
CAMO-20-198588	SIMR-2	06/29/2020	Nitrate-nitrite as nitrogen	0.781	mg/L	n/a	Y	F	0.017
CAMO-20-198588	SIMR-2	06/29/2020	Sulfate	2.81	mg/L	n/a	Y	F	0.133
CAMO-20-198588	SIMR-2	06/29/2020	Total dissolved solids	139	mg/L	J+	Y	F	3.40

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

^b Y = Detected.

^c F = Filtered.

^d J = Analyte is classified as estimated.

^e J+ = Analyte is classified as estimated and biased high because the analyte was detected in the method blank.

^f U = Analyte is classified as not detected.

^g S1 = Screen 1.

^h S2 = Screen 2.

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

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 interim measure infrastructure wells and pumping of Los Alamos County's water-supply wells. This is discussed for the case of 2020 Quarter 3 below.

Effects on flow direction from water-supply pumping are small compared with the local effects of extraction and injection at chromium interim measure wells. Observations of transients in the water levels observed at the monitoring wells within the plume area do not appear to be substantially affected by the water-supply pumping at the nearby production wells (PM-2, PM-3, PM-4, PM-5, and O-4) (LANL 2009).

A long-term decline of approximately 0.5 to 1 ft/yr has been observed in the regional water levels 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 transients described above, the water-level data and the respective water table contour maps are variable over time; therefore, each map is representative of specific periods of time. Figure 2.3-1 depicts the average water-level data and water table contour map for August 2020. General flow direction is indicated by vectors on Figure 2.3-1.

To generate this 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 (i.e., R-21, R-31, R-32, R-37, and R-40). Water levels in wells surrounding the plume provide useful control points for contouring along the edges of the area of interest for this report. Only well screens near the water table are used for contouring. At locations with a history of water-level data but with no data for the present quarter, values can be estimated using linear regression based on relationships with other nearby wells. For 2020 Quarter 3, the well levels data set was complete and therefore imputation was not required for any well.

Regular pumping at wells CrEX-1, CrEX-2, CrEX-3, CrIN-4, and CrIN-5 began on May 23, 2018, and therefore may have started to have a minor influence upon water levels as early as 2018 Quarter 2. During 2018 Quarter 3, an influence was readily recognized that was demonstrated by a cone of depression in the area of the extraction wells. In 2018 Quarter 4, the trend continued, with the cone of depression expanding slightly over the previous quarter. The cone of depression continued to expand in north and west/upstream directions, possibly in response to pumping at CrEX-2, and south and east/downstream directions, likely because of pumping at CrEX-1. Also, increased water levels were observed to the southwest of the cone of depression, possibly in response to injection at CrIN-4 and CrIN-5 (Figure 2.3-1). In 2019 Quarter 3, regular injection occurred at CrIN-3, CrIN-4, and CrIN-5, with regular extraction occurring at CrEX-1 and CrEX-2. The water table elevation appeared to respond strongly to extraction activities with a decrease in the center of the cone of depression near CrEX-2 and an extension of the cone further downstream from CrEX-1 as compared with the previous quarter. During 2019 Quarter 4, the cone of depression continued to expand, likely in response to regular pumping at CrEX-1 and CrEX-2.

The largest injection rates occurred at CrIN-4 and CrIN-5, and an increase in water level at the nearest monitoring well (R-50) was observed (Figure 2.3-1). CrEX-5 (which was converted from CrIN-6), CrIN-1, and CrIN-2 began sustained operation in November 2019, and effects on water levels were not yet detectable in 2019 Quarter 4. In 2020 Quarter 1, injection occurred regularly at CrIN-2, CrIN-4, and CrIN-5. A northward shift in the 5832-ft contour near CrIN-4 and CrIN-5 was evident, as was a westward shift in the 5831-ft contour around the cone of depression west of CrIN-2. The water table also appears to have responded to extraction at CrEX-1, CrEX-2, and CrEX-5. The cone of depression expanded toward CrEX-2, and the 5832-ft contour migrated toward CrEX-5. Consistent injection at CrIN-2, CrIN-4, and CrIN-5 and extraction at CrEX-1, CrEX-2, and CrEX-5 continued until late March 2020, when injection and extraction activities ceased because of the transition to essential mission critical activity (EMCA)

status in response to the COVID-19 pandemic. In 2020 Quarter 2, changes in the water level elevations appeared to be influenced more by seasonal variations than by injection/extraction, with the cone of depression shifting slightly downgradient toward the east/southeast. In the current 2020 Quarter 3 reporting period, water levels declined across the area of the chromium plume, with multiple wells indicating a decline of approximately 1 ft since the previous quarter, likely due in part to seasonal variations and regional drought conditions. Also, pumping recommenced in July 2020 after shutdown in March 2020 due to the EMCA status (DOE 2020). Extraction at CrEX-2 appeared to have a strong impact, with the cone of depression becoming deeper and translating toward CrEX-2.

Simple 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.

Because of the spatial coverage of wells and piezometers available as control points, and because of the regional structure of significantly steeper gradients to the east and west of the chromium plume area, the surrounding control points (i.e., R-21, R-31, R-32, R-37, and R-40) 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 from proposed wells, the use of these control points will be reanalyzed, adjusted, or discontinued based on additional supporting data and contouring methods.

2.4 Any Operations/Maintenance Activities Performed (Requirement 4)

Extraction, treatment, and injection operations continued during 2020 Quarter 3. CrEX-3 was not operated because of plugging of the treatment system influent filters after approximately 3–4 days of operation. An evaluation of the water quality in CrEX-3 is underway to assess filter plugging.

Operations and maintenance activities completed during 2020 Quarter 3 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 2020 Quarter 3, DP-1835

Maintenance Date	Elements Impacted	Operation/Maintenance Description
7/1/20	CrIN-1, CrIN-2	Collected wellhead samples at these injection wells.
7/1/20 through 7/6/20	Entire treatment system	Continued system shutdown due to COVID-19.
7/6/20	CrIN-4, CrIN-5	Tested booster pump with existing treated water.
7/6/20 through 7/14/20	Entire treatment system	Continued system shutdown due to COVID-19.
7/14/20	CrEX-1, CTUA, CrIN-4, CrIN-5	Started system.
7/15/20 through 8/10/20	CrEX-1, CrEX-2, CTUA, CrIN-3, CrIN-4, CrIN-5	Conducted extraction, treatment, and injection of treated groundwater per operational plan.

Table 2.4-1 (continued)

Maintenance Date	Elements Impacted	Operation/Maintenance Description
8/11/20 through 8/18/20	CrEX-1, CrEX-2, CrEX-5, CTUA, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Conducted extraction, treatment, and injection of treated groundwater per operational plan; added CrEX-5, CrIN-1, and CrIN-2 incrementally to induce and record hydraulic responses.
8/18/20	CTUA	Completed IX vessel exchanges as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; installed new secondary IX vessel. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; installed new secondary IX vessel. • Treatment train C – replaced primary IX vessel with the secondary IX vessel; installed new secondary IX vessel. Replaced both influent and all three effluent filter bags.
8/19/20 through 9/15/20	CrEX-1, CrEX-2, CTUA, CrIN-4, CrIN-5	Conducted extraction, treatment, and injection of treated groundwater per operational plan.
9/15/20 through 9/21/20	Entire treatment system	Shut down system for booster pump replacement. Replaced booster pumps with new units. Performed brief system testing on 9/17/20. System remained off over following weekend.
9/22/20 through 9/28/20	CrEX-1, CrEX-2, CTUA, CrIN-4, CrIN-5	Conducted extraction, treatment, and injection of treated groundwater per operational plan.
9/28/20	CTUA	Completed IX vessel exchanges as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; installed new secondary IX vessel. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; installed new secondary IX vessel. • Treatment train C – replaced primary IX vessel with the secondary IX vessel; installed new secondary IX vessel. Replaced both influent and all three effluent filter bags.
9/28/20 through 9/29/20	CrEX-1, CrEX-2, CTUA, CrIN-4, CrIN-5	Conducted extraction, treatment, and injection of treated groundwater per operational plan.
9/30/20	CrEX-1, CrEX-2, CrEX-5, CTUA, CrIN-2, CrIN-4, CrIN-5	Conducted extraction, treatment, and injection of treated groundwater per operational plan; added CrEX-5 and CrIN-2 to operations.

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

Periodic testing of mechanical integrity was not conducted or reported to NMED during 2020 Quarter 3. Mechanical integrity testing was performed and reported to NMED during the 2019 Quarter 2 reporting period. In accordance with Condition No. 3, mechanical integrity testing will occur at least once every five years 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)

New primary and secondary IX vessels were installed at various times for treatment unit CTUA (all three treatment trains) and at CTUC (both treatment trains) during the reporting period as cited in section 2.4.

2.7 Any Well Workovers Conducted (Requirement 7)

No well workovers were conducted during 2020 Quarter 3.

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 continued. In accordance with NMED's conditional approval of these studies, analytical results from iron, manganese, and arsenic testing of the treated water from the extraction wells during the study are being provided in the quarterly monitoring reports under DP-1835. These results for 2020 Quarter 3 are provided in Table 2.2-2.

No results for arsenic, iron, or manganese exceeded 90% of the numeric standards of 20.6.2.3103 NMAC or 90% of the numeric standards established for tap water in Table A-1 for constituents not listed in 20.6.2.3103 NMAC. The 90% values for arsenic, iron, and manganese are 9 µg/L, 900 µg/L, and 180 µg/L, respectively.

Other than the activities cited in section 2.4, no additional operational changes occurred during the reporting period.

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 2020 Quarter 3.

Table 2.9-1
Flows and Volumes of Treated Effluent Injected – CY 2020 Quarter 3, DP-1835

Injection Well	Flow rate (gpm ^a)			Daily Volume (gal.)			Total Volume (gal.)
	Average ^b	Maximum	Minimum ^c	Average ^b	Maximum	Minimum ^c	
July 2020							
CrIN-1	0.0	0.0	0.0	0	0	0	0
CrIN-2	0.0	0.0	0.0	0	0	0	0
CrIN-3	35.4	53.8	18.0	50,905	77,528	25,927	814,488
CrIN-4	53.6	64.1	9.0	77,248	92,319	12,950	1,467,706
CrIN-5	53.6	62.1	9.1	77,255	89,391	13,130	1,467,843

Table 2.9-1 (continued)

Injection Well	Flow rate (gpm ^a)			Daily Volume (gal.)			Total Volume (gal.)
	Average ^b	Maximum	Minimum ^c	Average ^b	Maximum	Minimum ^c	
August 2020							
CrIN-1	66.8	85.6	35.3	96,207	123,270	50,825	673,447
CrIN-2	32.9	74.9	1.8	47,421	107,905	2,592	237,106
CrIN-3	47.0	83.4	30.0	67,681	120,153	43,171	1,218,259
CrIN-4	62.9	69.8	28.7	90,622	100,559	41,266	2,356,165
CrIN-5	62.1	69.4	27.5	89,420	99,913	39,635	2,324,923
September 2020							
CrIN-1	0.0	0.0	0.0	0	0	0	0
CrIN-2	29.1	29.1	29.1	41,904	41,904	41,904	41,904
CrIN-3	0.0	0.0	0.0	0	0	0	0
CrIN-4	61.3	69.6	6.8	88,238	100,240	9,817	2,205,962
CrIN-5	60.1	69.2	6.6	86,568	99,631	9,433	2,164,207

^a gpm = Gallons per minute.^b Average flow rate and daily volume represent arithmetic mean values of results provided during periods when treated groundwater was being injected.^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. As previously identified, injection occurred at UIC wells CrIN-1, CrIN-2, CrIN-3, CrIN-4, and CrIN-5 during 2020 Quarter 3.

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 2020 Quarter 3, DP-1835

UIC Well	July 2020			August 2020			September 2020		
	Average ^a (ft)	Maximum (ft)	Minimum (ft)	Average ^a (ft)	Maximum (ft)	Minimum (ft)	Average ^a (ft)	Maximum (ft)	Minimum (ft)
CrIN-1	n/a ^b	n/a	n/a	7.5	24.3	1.3	5.1	5.9	0.8
CrIN-2	n/a	n/a	n/a	6.0	10.1	0.7	6.9	7.7	1.9
CrIN-3	5.0	8.3	0.5	7.1	13.3	3.7	n/a	n/a	n/a
CrIN-4	6.9	9.2	0.8	8.8	10.0	3.8	9.0	10.0	2.9
CrIN-5	12.4	19.2	1.1	15.0	17.2	0.9	15.3	17.0	3.6

^a Average values provided represent arithmetic mean values of maximum daily values during periods when treated groundwater was being injected.^b n/a = Not applicable: treated groundwater 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 2020 Quarter 3 are presented in Table 2.12-1.

Table 2.12-1
Daily Injection Summary Table – CY 2020 Quarter 3, DP-1835

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
7/1/2020	0	0	0	0	0	0
7/2/2020	0	0	0	0	0	0
7/3/2020	0	0	0	0	0	0
7/4/2020	0	0	0	0	0	0
7/5/2020	0	0	0	0	0	0
7/6/2020	0	0	0	12,950	13,130	26,080
7/7/2020	0	0	0	0	0	0
7/8/2020	0	0	0	0	0	0
7/9/2020	0	0	0	0	0	0
7/10/2020	0	0	0	0	0	0
7/11/2020	0	0	0	0	0	0
7/12/2020	0	0	0	0	0	0
7/13/2020	0	0	0	0	0	0
7/14/2020	0	0	0	32,120	32,393	64,513
7/15/2020	0	0	0	87,167	88,541	175,708
7/16/2020	0	0	25,927	87,403	89,391	202,721
7/17/2020	0	0	45,124	86,333	87,239	218,696
7/18/2020	0	0	46,856	86,823	86,997	220,676
7/19/2020	0	0	50,027	86,895	87,363	224,286
7/20/2020	0	0	51,160	86,982	87,468	225,610
7/21/2020	0	0	50,968	86,680	87,315	224,963
7/22/2020	0	0	47,043	87,044	85,801	219,889
7/23/2020	0	0	49,680	79,988	78,939	208,607
7/24/2020	0	0	65,004	71,306	71,657	207,967
7/25/2020	0	0	74,942	74,233	73,533	222,707
7/26/2020	0	0	77,528	76,135	76,210	229,874
7/27/2020	0	0	60,492	76,009	75,077	211,578
7/28/2020	0	0	40,073	85,192	84,993	210,257
7/29/2020	0	0	42,202	84,315	86,028	212,546
7/30/2020	0	0	44,093	87,812	87,579	219,484
7/31/2020	0	0	43,369	92,319	88,189	223,876

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
8/1/2020	0	0	43,258	91,779	88,161	223,198
8/2/2020	0	0	43,194	91,990	88,249	223,432
8/3/2020	0	0	43,189	91,795	88,071	223,054
8/4/2020	0	0	43,171	90,371	88,020	221,563
8/5/2020	0	0	43,201	87,601	87,409	218,212
8/6/2020	0	0	43,214	87,309	86,391	216,914
8/7/2020	0	0	43,185	87,465	86,405	217,055
8/8/2020	0	0	43,210	87,318	86,418	216,946
8/9/2020	0	0	43,205	87,487	86,404	217,096
8/10/2020	0	0	58,660	85,870	84,856	229,386
8/11/2020	0	0	68,415	84,951	83,685	237,051
8/12/2020	53,712	52,142	78,203	41,483	41,373	266,914
8/13/2020	107,759	107,905	103,941	0	0	319,605
8/14/2020	108,981	63,605	116,752	0	0	289,338
8/15/2020	112,270	0	114,610	0	0	226,880
8/16/2020	116,630	0	116,714	0	0	233,344
8/17/2020	123,270	10,862	120,153	0	0	254,285
8/18/2020	50,825	0	51,985	41,266	39,635	183,711
8/19/2020	0	0	0	97,536	96,572	194,109
8/20/2020	0	0	0	99,364	98,186	197,550
8/21/2020	0	0	0	99,860	99,592	199,452
8/22/2020	0	0	0	100,035	99,765	199,800
8/23/2020	0	0	0	100,151	99,909	200,060
8/24/2020	0	2,592	0	100,490	99,913	202,995
8/25/2020	0	0	0	100,223	99,547	199,770
8/26/2020	0	0	0	100,321	99,352	199,673
8/27/2020	0	0	0	100,279	99,510	199,789
8/28/2020	0	0	0	100,559	99,369	199,928
8/29/2020	0	0	0	100,546	99,380	199,926
8/30/2020	0	0	0	100,131	99,390	199,521
8/31/2020	0	0	0	99,984	99,361	199,345
9/1/2020	0	0	0	99,993	99,355	199,348
9/2/2020	0	0	0	99,719	99,279	198,998
9/3/2020	0	0	0	99,845	99,361	199,205
9/4/2020	0	0	0	99,785	99,323	199,108
9/5/2020	0	0	0	100,039	99,380	199,419
9/6/2020	0	0	0	100,064	99,422	199,486
9/7/2020	0	0	0	100,240	99,631	199,870

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
9/8/2020	0	0	0	99,814	99,146	198,960
9/9/2020	0	0	0	97,593	97,461	195,053
9/10/2020	0	0	0	96,377	96,460	192,837
9/11/2020	0	0	0	96,535	96,622	193,157
9/12/2020	0	0	0	90,525	91,020	181,546
9/13/2020	0	0	0	89,252	90,418	179,670
9/14/2020	0	0	0	89,124	90,473	179,597
9/15/2020	0	0	0	36,448	36,749	73,198
9/16/2020	0	0	0	0	0	0
9/17/2020	0	0	0	9,817	9,433	19,250
9/18/2020	0	0	0	0	0	0
9/19/2020	0	0	0	0	0	0
9/20/2020	0	0	0	0	0	0
9/21/2020	0	0	0	0	0	0
9/22/2020	0	0	0	58,766	56,520	115,286
9/23/2020	0	0	0	92,186	87,825	180,011
9/24/2020	0	0	0	92,167	87,880	180,048
9/25/2020	0	0	0	92,160	87,857	180,017
9/26/2020	0	0	0	92,186	87,834	180,020
9/27/2020	0	0	0	92,165	88,013	180,178
9/28/2020	0	0	0	92,270	88,446	180,716
9/29/2020	0	0	0	93,607	88,923	182,530
9/30/2020	0	41,904	0	95,286	87,375	224,564
Subtotal 14,972,010						

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

Daily volumes of groundwater pumped from extraction wells during 2020 Quarter 3, are presented in Table 2.13-1.

Table 2.13-1
Daily Extraction Summary Table – CY 2020 Quarter 3, DP-1835

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
7/1/2020	0	0	0	0	0	0
7/2/2020	0	0	0	0	0	0
7/3/2020	0	0	0	0	0	0
7/4/2020	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.)
7/5/2020	0	0	0	0	0	0
7/6/2020	0	0	0	0	0	0
7/7/2020	0	0	0	0	0	0
7/8/2020	0	0	0	0	0	0
7/9/2020	0	0	0	0	0	0
7/10/2020	0	0	0	0	0	0
7/11/2020	0	0	0	0	0	0
7/12/2020	0	0	0	0	0	0
7/13/2020	0	0	0	0	0	0
7/14/2020	106,503	0	0	0	0	106,503
7/15/2020	129,158	4,733	0	0	0	133,891
7/16/2020	113,254	62,008	0	0	0	175,262
7/17/2020	123,814	94,947	0	0	0	218,761
7/18/2020	123,863	95,049	0	0	0	218,912
7/19/2020	123,819	95,022	0	0	0	218,841
7/20/2020	123,839	95,324	0	0	0	219,163
7/21/2020	123,879	95,460	0	0	0	219,339
7/22/2020	123,783	95,873	0	0	0	219,656
7/23/2020	119,284	96,490	0	0	0	215,774
7/24/2020	117,891	97,008	0	0	0	214,900
7/25/2020	117,813	97,943	0	0	0	215,756
7/26/2020	118,078	97,691	0	0	0	215,769
7/27/2020	118,063	97,906	0	0	0	215,969
7/28/2020	118,096	98,351	0	0	0	216,448
7/29/2020	119,905	97,372	0	0	0	217,276
7/30/2020	122,110	97,163	0	0	0	219,272
7/31/2020	121,992	98,091	0	0	0	220,084
8/1/2020	121,620	98,634	0	0	0	220,254
8/2/2020	123,026	98,861	0	0	0	221,887
8/3/2020	122,608	98,676	0	0	0	221,284
8/4/2020	121,835	98,405	0	0	0	220,240
8/5/2020	120,961	98,788	0	0	0	219,749
8/6/2020	120,945	98,569	0	0	0	219,514
8/7/2020	120,966	98,598	0	0	0	219,564
8/8/2020	120,984	98,589	0	0	0	219,573
8/9/2020	120,919	98,667	0	0	0	219,587
8/10/2020	121,002	98,773	0	0	0	219,775
8/11/2020	124,509	98,753	0	0	34,630	257,892

Table 2.13-1 (continued)

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
8/12/2020	127,834	98,790	0	0	63,387	290,010
8/13/2020	123,568	98,817	0	0	78,364	300,749
8/14/2020	125,272	99,239	0	0	58,696	283,208
8/15/2020	133,917	99,703	0	0	0	233,620
8/16/2020	133,908	99,957	0	0	0	233,865
8/17/2020	133,942	99,957	0	0	0	233,899
8/18/2020	99,275	100,063	0	0	0	199,339
8/19/2020	95,607	100,056	0	0	0	195,663
8/20/2020	96,473	100,172	0	0	0	196,644
8/21/2020	96,496	100,309	0	0	0	196,806
8/22/2020	96,481	100,534	0	0	0	197,015
8/23/2020	96,472	100,534	0	0	0	197,007
8/24/2020	98,781	100,800	0	0	0	199,581
8/25/2020	100,806	100,776	0	0	0	201,582
8/26/2020	104,136	100,192	0	0	0	204,328
8/27/2020	96,400	101,558	0	0	0	197,958
8/28/2020	96,401	101,583	0	0	0	197,984
8/29/2020	96,419	101,526	0	0	0	197,946
8/30/2020	96,459	101,568	0	0	0	198,027
8/31/2020	96,377	101,539	0	0	0	197,917
9/1/2020	96,463	101,516	0	0	0	197,979
9/2/2020	98,588	101,178	0	0	0	199,766
9/3/2020	102,116	101,040	0	0	0	203,156
9/4/2020	101,827	100,983	0	0	0	202,810
9/5/2020	101,846	100,916	0	0	0	202,762
9/6/2020	101,868	100,889	0	0	0	202,756
9/7/2020	102,133	100,960	0	0	0	203,093
9/8/2020	102,100	100,954	0	0	0	203,054
9/9/2020	101,771	101,095	0	0	0	202,866
9/10/2020	104,813	92,386	0	0	0	197,200
9/11/2020	120,505	41,862	0	0	0	162,367
9/12/2020	115,533	58,816	0	0	0	174,348
9/13/2020	104,794	94,459	0	0	0	199,254
9/14/2020	104,941	94,600	0	0	0	199,541
9/15/2020	46,858	24,731	0	0	0	71,589
9/16/2020	0	0	0	0	0	0
9/17/2020	12,440	10,890	0	0	0	23,330
9/18/2020	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.)
9/19/2020	0	0	0	0	0	0
9/20/2020	0	0	0	0	0	0
9/21/2020	0	0	0	0	0	0
9/22/2020	62,627	57,022	0	0	0	119,650
9/23/2020	92,599	85,645	0	0	0	178,244
9/24/2020	88,270	85,470	0	0	0	173,740
9/25/2020	88,332	87,827	0	0	0	176,159
9/26/2020	89,270	89,270	0	0	0	178,539
9/27/2020	89,304	89,306	0	0	0	178,610
9/28/2020	86,780	82,407	0	0	0	169,187
9/29/2020	93,649	89,339	0	0	0	182,987
9/30/2020	109,857	93,268	0	0	80,713	283,838
Subtotal 14,980,866						

2.14 Facility Layout Map (Requirement 14)

Figure 2.14-1 is the facility layout map for 2020 Quarter 3, 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 and section 2.3 provides an explanation of how this map was generated.

3.0 REFERENCES

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NMED (New Mexico Environment Department) 2017b. "Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Sodium Dithionite Amendment Study in Regional Aquifer Monitoring Well R-42, 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 (July 18, 2017).

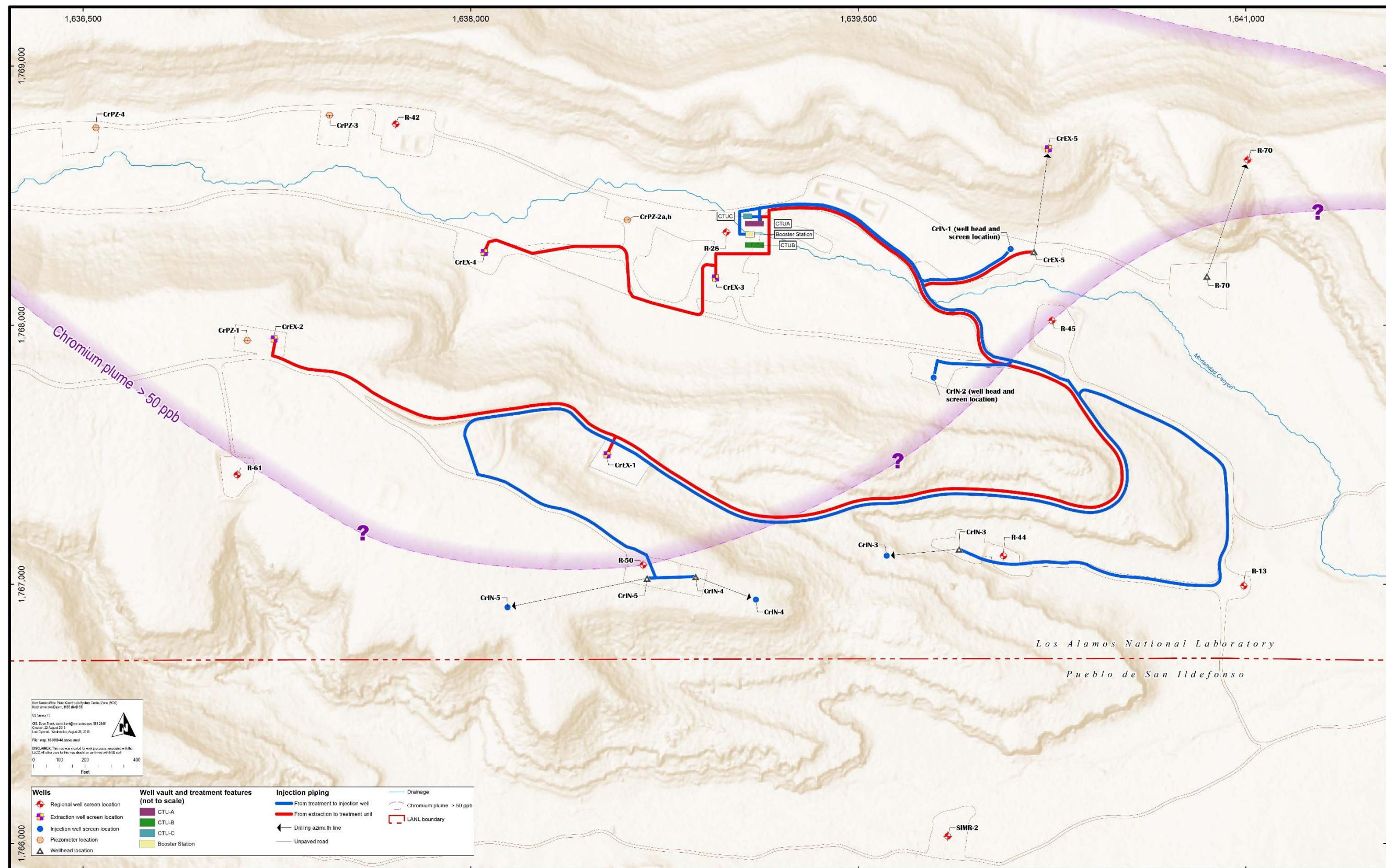


Figure 2.14-1 Facility layout map – CY 2020 Quarter 3, DP-1835

