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Environmental Management Los Alamos Field Office 1200 Trinity Drive, Suite 400 Los Alamos, New Mexico 87544 (240) 562-1122

MAR 01 2022

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GROUND WATER QUALITY BUREAU

Date: March 1, 2022 *Refer To:* N3B-2022-0028

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

Subject: Discharge Permit DP-1793 Permit Condition #9 Annual Monitoring Report for 2021

Dear Mr. Ball:

This letter serves as the U.S. Department of Energy Environmental Management Los Alamos Field Office and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) submittal of information required under Discharge Permit 1793 (DP-1793). DP-1793 Permit Condition #9 requires an annual monitoring report to be submitted by March 1 of each year. DP-1793 Permit Condition #9 requires that the annual monitoring report include the following:

- quantity, source, and date of each individual discharge;
- water quality tables listing analytical results from samples collected under the water quality sampling plan;
- map(s) depicting discharge locations; and
- copies of laboratory analytical reports.

Each requirement is addressed below.

Requirement Number 1: Quantity, source, and date of each individual discharge

Quantity (gal.)	Source	Date		
11,097	R-28/R-42 Extended Purge Discharge	10/08/2021		
53,364	R-28/R-42 Extended Purge Discharge	10/09/2021		
54,333	R-28/R-42 Extended Purge Discharge	10/11/2021		
41,995	R-28/R-42 Extended Purge Discharge	10/25/2021		

Quantity (gal.)	Source	Date		
36,737	R-28/R-42 Extended Purge Discharge	11/02/2021		
23,583	R-28/R-42 Extended Purge Discharge	11/09/2021		
30,404	R-28/R-42 Extended Purge Discharge	11/30/2021		

Requirement Number 2: Water quality tables listing analytical results from samples collected under the water quality sampling plan

Enclosure 1 contains analytical results from samples collected under DP-1793 Work Plan #5 as modified by the New Mexico Environment Department Ground Water Quality Bureau (GWQB) approval of "Amendment 3 to Work Plan #5, Discharge Permit 1793, Inclusion of an Additional Water Source," on July 13, 2021. The data show that concentrations for perchlorate, chromium, iron, and manganese all met the permit limit for land application. The one exception was the nitrate-nitrite as nitrogen (nitrate) concentration. However, when the Hach method for real-time field results was used before land application, all concentrations met the permit limit for land application. The nitrate values obtained via the Hach method for real-time results before land application were (1) 5.37, taken on October 8, 2021, and (2) 5.3, taken on October 9, 2021. These values met the permit limit for land application.

The first sample, collected on October 7, 2021 during the land application period presented in this report, had a nitrate value of 9.35 mg/L. This is slightly over 90% of the groundwater standard permit limit of 9 mg/L, as specified within the introduction statement to DP-1793. The groundwater standard for nitrate is 10 mg/L. The standard is found in 20.6.2.3103 of the New Mexico Administrative Code. Results from the next three samples were (1) 6.23 mg/L (collected on October 12, 2021), (2) 5.53 mg/L (collected on October 19, 2021), and (3) 4.51 mg/L (collected on November 24, 2021).

The first sample was collected at the initiation of treatment through the ion-exchange vessels, after an extended period of not operating. Observations from prior experience with ion-exchange treatment indicate an initial breakthrough of comparatively elevated nitrate values followed quickly by lower concentrations. Based in part on the subsequent sample results for nitrate, this is likely what occurred. This is further suggested by the fact that the 9.35-mg/L value for nitrate is higher than values of nitrate seen from either R-28 (<1.5 mg/L) or R-42 (<8.0 mg/L) in samples collected at the wellheads during the extended pumping activities.

Requirement Number 3: A map depicting areas that received land-applied groundwater

Enclosure 2 provides a map of the land-application zones within Mortandad Canyon. Groundwater was land applied in Zone 4.

Requirement Number 4: Copies of laboratory analytical reports

Enclosure 3 is on CD. This CD contains the analytical reports from compliance samples obtained in accordance with DP-1793, Work Plan #5. These reports are for the samples collected and sent to the off-site independent National Environmental Laboratory Accreditation Program accredited analytical laboratory.

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

Sincerely,

Tur

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

Sincerely,

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Arturo Q. Duran

Office of Quality and Regulatory Compliance U.S. Department of Energy Environmental Management Los Alamos Field Office

Enclosure(s):

- 1. Discharge Analytical Results for DP-1793 Annual Monitoring Report for 2021 (EM2022-0046)
- 2. Land-Application Zones within Mortandad Canyon (EM2022-0046)
- 3. Analytical Reports from Compliance Samples Obtained in Accordance with the DP-1793 Work Plan #5 (on CD included with this report)

cc (letter and enclosure[s] emailed): Laurie King, EPA Region 6, Dallas, TX Raymond Martinez, San Ildefonso Pueblo, NM Dino Chavarria, Santa Clara Pueblo, NM Steve Yanicak, NMED-DOE-OB Patrick Longmire, NMED-GWQB Andrew Romero, NMED-GWQB Neelam Dhawan, NMED-HWB **Rick Shean, NMED-HWB** Chris Catechis, NMED-RPD Shelly Lemon, NMED-SWQB Jennifer Payne, LANL Stephen Hoffman, NA-LA M. Lee Bishop, EM-LA Thomas McCrory, EM-LA Michael Mikolanis, EM-LA David Nickless, EM-LA Kenneth Ocker, EM-LA Cheryl Rodriguez, EM-LA Hai Shen, EM-LA Felicia Aguilar, N3B William Alexander, N3B Emily Day, N3B Thomas Harrison, N3B Debby Holgerson, N3B

Jeff Holland, N3B Danny Katzman, N3B Kim Lebak, N3B Joseph Legare, N3B Dana Lindsay, N3B Pamela Maestas, N3B Christian Maupin, N3B Joseph Noll, N3B Gerald O'Leary III, N3B Joseph Sena, N3B Troy Thomson, N3B Steve Veenis, N3B Steve White, N3B Brinson Willis, N3B emla.docs@em.doe.gov n3brecords@em-la.doe.gov Public Reading Room (EPRR) PRS website

ENCLOSURE 1

Discharge Analytical Results for DP-1793 Annual Monitoring Report for 2021

Location ID	Sample ID	Sample Date	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUB	CTU6B-22-235487	10/07/2021	Perchlorate	0.063	µg/L	12.4 µg/L	J ^a	Y ^b	Yes	0.05
CTUB	CTU6B-22-235487	10/07/2021	Chromium	3.0	µg/L	45 µg/L	Uc	N ^d	Yes	3.0
CTUB	CTU6B-22-235487	10/07/2021	Iron	30.0	µg/L	900 µg/L	U	Ν	Yes	30.0
CTUB	CTU6B-22-235487	10/07/2021	Manganese	42.5	µg/L	180 µg/L	n/a ^e	Y	Yes	2.0
CTUB	CTU6B-22-235487	10/07/2021	Nitrate-nitrite as nitrogen	9.35	mg/L	9 mg/L	n/a	Y	Yes	0.17
CTUB	CTU6B-22-235489	10/12/2021	Perchlorate	0.053	µg/L	12.4 µg/L	J	Y	Yes	0.05
CTUB	CTU6B-22-235489	10/12/2021	Chromium	3.0	µg/L	45 µg/L	U	N	Yes	3.0
CTUB	CTU6B-22-235489	10/12/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235489	10/12/2021	Manganese	76.6	µg/L	180 µg/L	n/a	Y	Yes	2.0
CTUB	CTU6B-22-235489	10/12/2021	Nitrate-nitrite as nitrogen	6.23	mg/L	9 mg/L	n/a	Y	Yes	0.425
CTUB	CTU6B-22-235488	10/19/2021	Perchlorate	0.05	µg/L	12.4 µg/L	U	N	Yes	0.05
CTUB	CTU6B-22-235488	10/19/2021	Chromium	3.0	µg/L	45 µg/L	U	N	Yes	3.0
CTUB	CTU6B-22-235488	10/19/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235488	10/19/2021	Manganese	88.0	µg/L	180 µg/L	n/a	Y	Yes	2.0
CTUB	CTU6B-22-235488	10/19/2021	Nitrate-nitrite as nitrogen	5.53	mg/L	9 mg/L	n/a	Y	Yes	0.17
CTUB	CTU6B-22-235490	11/24/2021	Perchlorate	0.05	µg/L	12.4 µg/L	U	N	Yes	0.05
CTUB	CTU6B-22-235490	11/24/2021	Chromium	3.0	µg/L	45 µg/L	U	N	Yes	3.0
CTUB	CTU6B-22-235490	11/24/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235490	11/24/2021	Manganese	113.0	µg/L	180 µg/L	n/a	Y	Yes	2.0
CTUB	CTU6B-22-235490	11/24/2021	Nitrate-nitrite as nitrogen	4.51	mg/L	9 mg/L	n/a	Y	Yes	0.17

Discharge Analytical Results for DP-1793 Annual Monitoring Report for 2021

^a J = Analyte is classified as estimated.

^b Y = Yes (detected).

^c U = Analyte is classified as not detected.

^d N = No (not detected).

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

ENCLOSURE 2

Land-Application Zones within Mortandad Canyon



Land-application zones within Mortandad Canyon

ENCLOSURE 3

Analytical Reports from Compliance Samples Obtained in Accordance with the DP-1793 Work Plan #5 (on CD included with this report)

These reports are for the samples collected and sent to the off-site independent National Environmental Laboratory Accreditation Program (NELAP) accredited analytical laboratory.