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Date: June 15, 2023
Refer To: N3B-2023-0176

RECEIVED

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

JUN 15 2023

**GROUND WATER
QUALITY BUREAU**

**Subject: Submittal of the Report for Characterization of Soils in the Land Application
Zone 4 Used at the Chromium Project Area Under Discharge Permit 1793,
Calendar Year 2022**

Dear Mr. Ball:

Enclosed is the report for characterization of specific constituents (i.e., chromium, RDX [Royal Demolition Explosive], and perchlorate) in soil within designated land application zones under Discharge Permit 1793 (DP-1793). The sampling and analysis plan for the characterization work was submitted to the New Mexico Environment Department (NMED) on October 29, 2019, and NMED approved the plan on December 18, 2019. The report presents results from samples collected from representative locations in each land application zone in the chromium project area in Mortandad Canyon and the RDX project area.

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,

Robert Macfarlane
Program Manager
Environment, Safety, Health and Quality
N3B-Los Alamos

Sincerely,

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DURAN
Date: 2023.06.15 07:13:43 -06'00'

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

Enclosure(s):

1. Report for Characterization of Soils in the Land Application Zone 4 Used at the Chromium Project Area Under Discharge Permit 1793, Calendar Year 2022 (EM2023-0341)

cc (letter and enclosure[s] emailed):

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Raymond Martinez, San Ildefonso Pueblo, NM
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REPORT FOR CHARACTERIZATION OF SOILS IN THE LAND APPLICATION ZONE 4 USED AT THE CHROMIUM PROJECT AREA UNDER DISCHARGE PERMIT 1793, CALENDAR YEAR 2022

1.0 INTRODUCTION

The purpose of this report is to characterize soil within designated land-application zones following land application of extended purge water from wells R-28 and R-42 under Discharge Permit 1793 (DP-1793) Amendment 3, Work Plan #5. This report presents data from soil sampling conducted pursuant to a condition of the July 13, 2021, New Mexico Environment Department (NMED) Approval, Amendment 3 to Work Plan #5, Discharge Permit 1793, Inclusion of an Additional Water Source (NMED 2017), that requires soil samples to be collected upon completion of the land application of the water produced from the extended pumping activities at R-28 and R-42. The samples are required to be collected and analyzed for iron, manganese, and chromium at the areas where land application occurred. Soil sampling results from the sampling conducted in January 2020 and reported in the “Report for Characterization of Soils in the Land Application Zones Used at the Chromium Project Area under Discharge Permit 1793” (N3B 2020) will be used as baseline conditions for comparison of chromium concentrations. Background values for iron and manganese are taken from the “Statistical Methods for Background Comparisons” 1998 report issued by Los Alamos National Laboratory (LANL 2011). No land application in the subject areas has occurred since the soil sampling event in January 2020.

2.0 APPROACH

2.1 Chromium Project Area

Zone 4 and the 45-acre area for spray by truck are designated for land application of treated groundwater in the chromium project area. Baseline samples were collected in January 2020 from two depths (0–6 in. and 6–12 in.) and post land-application samples were collected from the same locations in 2022 (Figure 2.1-1).

3.0 RESULTS

The soil sampling results from the chromium project land-application area are presented in Table 3.0-1. The table presents comparisons between the results of baseline samples collected in 2020 with data from post land-application samples collected from the same locations in 2022. The comparisons are made to evaluate whether loading of key constituents may have occurred in association with land application of purge water. Table 3.0-1 includes the residential soil screening levels for soils from NMED’s 2022 “Risk Assessment Guidance for Site Investigations and Remediation,” Table A-1 (NMED 2022) and an applicable soil background concentration for chromium.

For the samples collected in the chromium project area, the baseline and post land-application results for chromium, iron, and manganese show similar concentrations for all locations and are within background concentrations.

The conclusion of this sampling is that application of purge water at concentrations below the limits allowed under DP-1793 has not resulted in increased concentrations of chromium, iron, and manganese in soils where application occurs.

4.0 REFERENCES

- LANL (Los Alamos National Laboratory), 2011, "Statistical Methods for Background Comparisons 1998," Los Alamos National Laboratory report LA-UR-11-11061, Los Alamos, New Mexico. (LANL 2011)
- N3B (Newport News Nuclear BWXT-Los Alamos, LLC), April 2020, "Report for Characterization of Soils in the Land Application Zones Used at the Chromium and RDX Project Areas Under Discharge Permit 1793," Newport News Nuclear BWXT-Los Alamos, LLC, report EM2020-0039. (N3B 2020)
- NMED (New Mexico Environment Department), June 15, 2017. "Approval with Modification of Work Plan #5 for Treatment and Land Application of Groundwater at TA-05, Los Alamos National Laboratory, Discharge Permit 1793," New Mexico Environment Department letter to J. Bretzke (LANL) and C. Rodriguez (EM-LA) from M. Hunter (NMED-GWQB), Santa Fe, New Mexico. (NMED 2017)
- 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 2022)

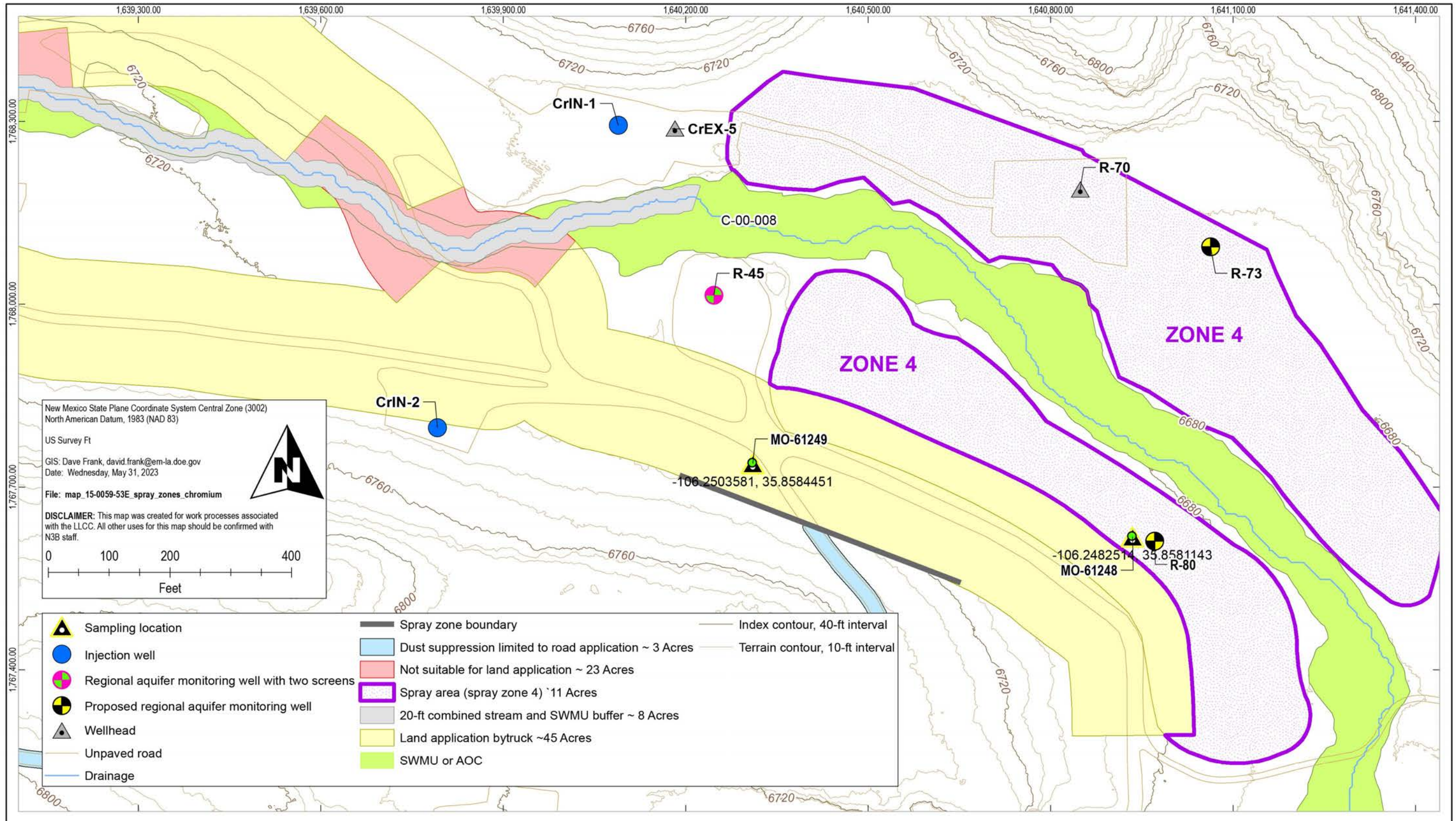


Figure 2.1-1 Chromium project area land-application Zone 4 and locations of baseline and post land-application soil samples

**Table 3.0-1
Comparison of Baseline and Post Land-Application Zone 4 Data from the Chromium Project Area**

Sample Location ID	Sample Depth (in.)	Chromium (mg/kg)				Iron (mg/kg)				Manganese (mg/kg)			
		Baseline (2020)	Lab Qualifier	Post Land Application (2022)	Lab Qualifier	Baseline	Lab Qualifier	Post Land Application (2022)	Lab Qualifier	Baseline	Lab Qualifier	Post Land Application (2022)	Lab Qualifier
MO-61248	0-6	3.98	— ^a	3.62	—	NC ^b	—	8280	—	NC	—	378	—
MO-61248	6-12	4.22	—	3.61	—	NC	—	7360	—	NC	—	352	—
MO-61249	0-6	3.88	—	3.28	—	NC	—	10,000	—	NC	—	405	—
MO-61249	6-12	3.31	—	4.09	—	NC	—	10,200	—	NC	—	393	—

Notes: Chromium background = 19.3 mg/kg; Chromium residential soil screening level cancer = 96.6 mg/kg; Iron background = 21,500 mg/kg; Iron residential soil screening level noncancer = 54,800 mg/kg; Manganese background = 671 mg/kg; Manganese residential soil screening level noncancer = 10,500 mg/kg.

^a — = Not qualified.

^b NC = Not collected.