



MICHELLE LUJAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

Via Certified Mail – Return Receipt Requested – and Email

May 27, 2021

Arturo Q. Duran
Compliance and Permitting Manager
Environmental Management
U.S. Department of Energy
Los Alamos Field Office
P.O. Box 1663 MS M984
Los Alamos, New Mexico 87544

Re: Notice of Non-Compliance, Los Alamos National Laboratory (LANL), Regional Aquifer Wells R-28 And R-42

Dear Mr. Duran,

The New Mexico Environment Department (NMED) issues this Notice of Non-Compliance (NONC) because actions taken by the U.S. Department of Energy (DOE) have caused the degradation of groundwater above the groundwater protection standards at 20.6.2.3103 NMAC in violation of 20.6.2.3101(A)(1) NMAC and the New Mexico Water Quality Act, NMSA 1978, Section 74-6-12(F). DOE activities leading to the violations are related to two DOE notices of intent (NOI), both dated May 22, 2017, to conduct pilot-scale amendment studies, one study at LANL regional aquifer monitoring well R-28 utilizing molasses and a second study at LANL regional aquifer monitoring well R-42 utilizing sodium dithionite. This letter also informs you of NMED's requested response actions associated with the degraded groundwater.

NMED's two NOI response letters are dated June 27, 2017, and July 18, 2017, and are attached to this letter as Attachments 1 and 2, respectively. The response letters deem that a groundwater discharge permit is unnecessary in both instances "because information presented [by DOE] in the NOIs indicates the discharge of the amendments would not adversely affect groundwater quality." The response letters state that NMED does not relieve DOE of its liability should the operations result in actual pollution of groundwater. Ultimately, in both instances the addition of (bio)chemical amendments did cause additional groundwater pollution in exceedance of New Mexico's groundwater protection standards at 20.6.2.3103 NMAC.

On April 15, 2021, in preparation for a meeting on a proposal to rehabilitate the wells, DOE provided a draft NOI to NMED (Attachment 3). The draft NOI documents that the addition of amendments to the monitoring wells caused additional groundwater pollution at R-28 and R-42. The draft NOI proposes to discharge, via land application, the groundwater DOE would collect from extended pumping at R-28 and R-42. The draft NOI states that "[t]he analytical results show that two analytes from R-28 samples (iron and manganese) and two analytes at R-42 (manganese and chromium) exceed their respective 20.6.2.3103 New Mexico Administrative Code (NMAC) standards." NMED understands that the iron and manganese exceedances have resulted from the addition of the amendments, but that the chromium contamination at R-42 is not solely a result of the addition of sodium dithionite and sodium sulfite.

Due to DOE's non-compliance referenced above, NMED requests DOE take appropriate actions to improve all parties' understanding of the hydraulic migration, or fate and transport, of the new contaminants from the

Arturo Q. Duran
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impacted wells within the regional aquifer. NMED requests DOE first produce a hydrological conceptual model of that migration based on the prevailing hydraulic gradient of the regional aquifer, the current hydraulic impact of the on-going injection and extraction within the chromium plume, the influence of County production wells, e.g., PM-3 and PM-4, the current measured impact to extraction well CrEX-3, the anticipated fate, i.e., either oxidation, adsorption, or precipitation of the contaminants, and other relevant factors. The goal of the hydraulic conceptual modeling would be to estimate the locations of the 1.0 mg/L Fe and 0.2 mg/L Mn contours in three dimensions within the aquifer and to execute a computer simulation of the contaminant fate and transport in three dimensions and to identify data gaps in the existing monitoring well network.

NMED requests DOE then take the results of the data gap analysis from the model to locate, and subsequently install, new monitoring wells, with the goal of completing the modeling of hydraulic transport of the contaminants from both R-28 and R-42 in the direction of County production wells or the boundary between LANL and Pueblo del San Ildefonso, whichever is more pronounced based on the modeling. These new wells would measure the horizontal and vertical migration of the contaminants by being screened in the known transmissive zones within the regional aquifer, including, but not limited to, the same hydrostratigraphic position as R-28 and R-42 and the Miocene riverine deposits (Tcar). Upon construction of the new monitoring wells and the associated characterization of the contaminants and hydraulic properties within each transmissive zone, DOE would refine the contaminant migration model.

NMED requests DOE estimate the amount of time until the extraction wells CrEX-1, CrEX-2, and CrEX-4 will be impacted by the contaminant migration based on the hydraulic modeling and projected extraction rates. Based on the model's estimated time of contaminant arrival at the extraction wells, DOE would propose for NMED's approval a sampling frequency of the extraction wells so that contaminant concentrations within those wells can be appropriately identified and other precautions can be taken to ensure that extracted groundwater is appropriately monitored and managed.

NMED requests DOE submit a workplan for NMED's approval, within 30 days of the date of this letter, detailing DOE's proposed initial modeling, both conceptual and computer simulation, of the contaminant migration. Within 60 days of NMED's approval of the modeling results, DOE would submit a workplan for NMED's approval detailing the location and construction design of the new monitoring wells. DOE would timely report to NMED results of the initial modeling, the as-built construction design of the new monitoring wells, and the final modeling results.

NMED also requests DOE purge R-28 and R-42 to effectively remove the new contaminants from the regional aquifer. NMED requests DOE submit a separate workplan for NMED's approval, within 60 days of the date of this letter, detailing the proposed aquifer rehabilitation effort. The workplan must adhere to the conditions specified in the NOI response letters, i.e., that DOE will manage the purge water in accordance with the Land Application Decision Tree approved by NMED on December 2, 2016 (Attachment 4).

NMED is at this time not assessing a penalty pursuant to 20.6.2.1220 NMAC associated with this non-compliance. NMED considers DOE to have been acting in good faith in conducting the pilot-scale amendment studies. Pursuant to the New Mexico Water Quality Act, NMSA 1978, Section 74-6-9(D), NMED may make a reasonable effort to obtain voluntary cooperation in the prevention or abatement of water pollution. Note, however, that DOE's failure to perform any or all of the actions requested in this correspondence may cause NMED to elevate its enforcement action(s) associated with this non-compliance, including the assessment of civil penalties pursuant to Section 74-6-10(A) of the Water Quality Act.

Arturo Q. Duran
May 27, 2021

Please contact Steve Pullen at 505-660-7567 or at steve.pullen@state.nm.us with questions regarding this correspondence.

Sincerely,

**Jason
Herman** Digitally signed
by Jason Herman
Date: 2021.05.27
10:01:03 -06'00' **MOD for**

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SP

Attachments 1, 2, 3 and 4

Cc:

J. Rhoderick, NMED-WPD
S. Pullen, NMED-GWQB
M. Sandoval, NMED-GWQB
P. Longmire, NMED-GWQB
A. Romero, NMED-GWQB
C. Catechis, NMED-RPD
K. Pierard, NMED-HWB
N. Dhawan, NMED-HWB
C. Krambis, NMED-HWB
M. Petersen, NMED-HWB
S. Yanicak, NMED-DOEOB
L. King, US EPA R6
C. Rodriguez, EM-LA
San Ildefonso Pueblo
Santa Clara Pueblo
Jemez Pueblo
Cochiti Pueblo
San Felipe Pueblo
Kewa Pueblo
Ohkay Owingeh Pueblo
Pojoaque Pueblo
Tesuque Pueblo
Nambe Pueblo
D. Katzman, N3B

Attachment 1



NEW MEXICO
ENVIRONMENT DEPARTMENT



SUSANA MARTINEZ
Governor

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965

BUTCH TONGATE
Cabinet Secretary

JOHN A. SANCHEZ
Lieutenant Governor

www.env.nm.gov

J. C. BORREGO
Deputy Secretary

June 27, 2017

John C. Bretzke, Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security, LLC
PO Box 1663, K491
Los Alamos, NM 87545

Arturo Q. Duran, Permitting Manager
Environmental Management
Los Alamos Field Office
3747 West Jemez Road, A316
Los Alamos, NM 87544

RE: 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

Dear Mr. Bretzke and Mr. Duran:

On May 22, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS) for a pilot study involving the injection of a molasses solution containing sodium bromide into a regional aquifer groundwater monitoring well. The proposed discharge is located at regional groundwater monitoring well, R-28, located in Los Alamos National Laboratory (LANL) Technical Area 05 (TA-05) in Section 24, Township 19N, Range 6E, Los Alamos County. Groundwater beneath the site is at a depth of approximately 900 feet.

The NOI satisfies the requirements of Subsection B of 20.6.2.1201 NMAC, Ground and Surface Water Protection regulations (20.6.2 NMAC).

The proposed discharge is briefly described as follows.

A molasses solution with a conservative, innocuous sodium bromide tracer will be injected into the regional aquifer beneath Mortandad Canyon via monitoring well R-28 during a pilot amendment study designed to evaluate the potential use of molasses as a biostimulant to reduce hexavalent chromium to trivalent chromium.

Five thousand gallons of solution containing 20% food-grade molasses in untreated groundwater from R-28, 10 kilograms of sodium bromide, and 25,000 gallons of untreated

groundwater from monitoring well R-28 will be injected into monitoring well R-28 in a single deployment. Approximately 165 gallons of ethanol, or an equivalent alcohol, will be mixed with potable water from the Los Alamos County Water Supply System to create a total volume of 500 gallons. The solution will be injected into monitoring well R-28 to reduce microbial populations in the well screen and filter pack.

It is expected that organic carbon from the molasses solution will provide a food source to enhance microbial activity, which will create reducing conditions in the aquifer. The resultant conditions are then expected to lead to the reduction of hexavalent chromium to stable, non-toxic trivalent chromium. To observe the effects of the molasses amendment, a closed circulation loop will be used to passively sample groundwater for total organic carbon, hexavalent chromium, nitrate, sulfate/sulfide, and dissolved iron, arsenic, and manganese. No water disposal will be required during passive sampling, as water will flow back into the well.

In the event that monitoring well R-28 is pumped after several months of passive sampling, groundwater pumped from R-28 will be managed under the Land Application Decision Tree approved by NMED on December 2, 2016.

Based on the information provided in your Notice of Intent, NMED has determined that a Discharge Permit is not required as long as the discharge is as described and the following requirements are met.

- No amendments outside of those described in this letter shall be injected into monitoring well R-28 during this pilot study.
- Copies of quarterly reports prepared for the NMED Hazardous Waste Bureau and a final report shall be submitted to the GWQB following completion of the pilot study. The reports should include monitoring results and interpretation of the results.
- Prior to and during the pilot study, groundwater sampling for iron, manganese, and arsenic shall be performed in the treated water from extraction wells CrEX-1, CrEX-2, and CrEX-3. Results shall be included in quarterly monitoring reports required by Discharge Permit, DP-1835.

A Discharge Permit is not required at this time because the information provided indicates it is unlikely that the discharge will adversely affect ground water quality.

Although a Discharge Permit is not being required for this pilot study at this time, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

Mr. Bretzke and Mr. Duran, AI:856 PRD20170003

June 27, 2017

Page 3

If you have any questions, please contact Kathryn Hayden at (505) 827-1046.

Sincerely,

A handwritten signature in black ink, appearing to be 'Michelle Hunter', with a long horizontal line extending to the right.

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:KH

cc: Steve Pullen, NMED/GWQB
Shelly Lemon, NMED/SWQB
John E. Kieling, NMEDHWB
Susan Lucas Kamat, NMED/DOEOB
Stephen M. Yanicak, NMED/DOEOB
Bob Beers, DOE/LANS (bbeers@LANL.gov)
Stephani F. Swickley, DOE/LANS (sfuller@LANL.gov)

Attachment 2



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
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BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

July 18, 2017

John C. Bretzke, Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security, LLC
PO Box 1663, K491
Los Alamos, NM 87545

Arturo Q. Duran, Permitting Manager
Environmental Management
Los Alamos Field Office
3747 West Jemez Road, A316
Los Alamos, NM 87544

RE: 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

Dear Mr. Bretzke and Mr. Duran:

On May 22, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS) for a pilot study involving the injection of sodium dithionite, sodium sulfate, and sodium bromide into a regional aquifer groundwater monitoring well. The proposed discharge is located at regional groundwater monitoring well, R-42, located in Los Alamos National Laboratory (LANL) Technical Area 05 (TA-05) in Section 24, Township 19N, Range 6E, Los Alamos County. Groundwater beneath the site is at a depth of approximately 900 feet.

The NOI satisfies the requirements of Subsection B of 20.6.2.1201 NMAC, Ground and Surface Water Protection regulations, (20.6.2 NMAC).

The proposed discharge is briefly described as follows.

A sodium dithionite and sodium sulfate solution with a sodium bromide tracer will be injected into the regional aquifer beneath Mortandad Canyon via monitoring well R-42 during a pilot amendment study designed to evaluate the potential use of sodium dithionite as a chemical reductant to reduce hexavalent chromium (Cr(VI)) to trivalent chromium (Cr(III)).

Approximately 9,000 gallons of untreated groundwater from monitoring well R-42 containing the following compounds will be injected back into monitoring well R-42 via tremie during a single deployment.

Compound	Quantity	Purpose
Sodium Dithionite	300 kg	Chemical reductant
Sodium Sulfite	250 kg	Stabilization of sodium dithionite prior to and during injection
Sodium Bromide	5 kg	Tracer to quantify the recovery of the injected water

Following the injection of the amendments, 1,000-1,500 gallons of potable water from the Los Alamos County Water Supply System will be used as chase water.

Phase 1 continuous pumping of monitoring well R-42 will commence 2-3 days following the injection activities. During Phase 1 pumping, it is expected that 40,000 gallons of groundwater will be pumped and byproducts from the degradation of sodium dithionite will be recovered. Groundwater recovered during Phase 1 pumping will be collected in storage tanks and sampled for iron, manganese, sulfate, Cr(VI), nitrate, arsenic, and total dissolved solids. If analytical results exceed standards listed in 20.6.2.3103 NMAC, water will be shipped offsite for disposal at a permitted facility.

Following Phase 1 pumping, it is expected that the concentrations of iron, manganese, arsenic, sulfate, Cr(VI), and TDS will be below the standards listed in 20.6.3103 NMAC and Phase 2 pumping of monitoring well R-42 will begin. Phase 2 pumping will be continuous and is intended to closely monitor the treatment effects of the amendments and to determine when concentrations of nitrate and Cr(VI) return to pre-treatment concentrations. Phase 2 pumping is expected to last months to a year.

Groundwater pumped from monitoring well R-42 meeting the standards listed in 20.6.3103 NMAC will be managed under the Land Application Decision Tree approved by NMED on December 2, 2016.

Based on the information provided in your Notice of Intent, NMED has determined that a Discharge Permit is not required as long as the discharge is as described and the following requirements are met.

- No amendments outside of those described in this letter shall be injected into monitoring well R-42 during this pilot study.
- Copies of quarterly reports prepared for the NMED Hazardous Waste Bureau and a final report shall be submitted to the GWQB following completion of the pilot study. The reports should include monitoring results and interpretation of the results.

July 18, 2017

Page 3

- Prior to and during the pilot study, groundwater sampling for iron, manganese, and arsenic shall be performed in the treated water from extraction wells CrEX-1, CrEX-2, and CrEX-3. Results shall be included in quarterly monitoring reports required by Discharge Permit, DP-1835.

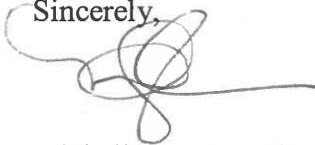
A Discharge Permit is not required at this time because the information provided indicates it is unlikely that the discharge will adversely affect ground water quality.

Although a Discharge Permit is not being required for this pilot study at this time, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

If you have any questions, please contact Steve Pullen at (505) 827-2962.

Sincerely,



Michelle Hunter, Chief
Ground Water Quality Bureau

MH:KH

cc: Steve Pullen, NMED/GWQB
Shelly Lemon, NMED/SWQB
John E. Kieling, NMEDHWB
Susan Lucas Kamat, NMED/DOEOB
Stephen M. Yanicak, NMED/DOEOB
Bob Beers, DOE/LANS (bbeers@LANL.gov)
Stephani F. Swickley, DOE/LANS (sfuller@LANL.gov)

Attachment 3



For Department use Only:

Agency Interest Number _____
PRD Assigned _____

1. Name and mailing address of person proposing to discharge (Responsible Person):

<u>Steve S. White</u>	Work Phone: <u>(505) 309-1370</u>
<u>N3B – Los Alamos</u>	Cell/Home Phone: <u>(505) 309-1370</u>
<u>1200 Trinity Drive Suite 150</u>	Fax: <u>Not Applicable</u>
<u>Los Alamos, NM 87544</u>	Email: <u>steve.white@em-la.doe.gov</u>

2. Name and Position of person Completing Form:

<u>Christian Maupin</u>	Work Phone: <u>(505) 257-7421</u>
<u>Regulatory Compliance</u>	Cell/Home Phone: <u>(505) 695-4281</u>
<u>Environmental Professional</u>	Fax: <u>Not Applicable</u>
_____	Email: <u>christian.maupin@em-la.doe.gov</u>

3. Name of facility:

Los Alamos National Laboratory (LANL)

4. Physical location of the discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):

LANL Technical Area 05 in Township 19N, Range 6E, Section 24. Enclosure 1 contains a location map of the project site. Enclosure 2 contains a map showing the location of the potential land application sites.

5. Type of operation generating the discharge (e.g., agricultural facility, domestic wastewater discharge, industrial discharge, mining operation, etc.):

This Notice of Intent (NOI) is for the disposition of groundwater collected from extended pumping activities at regional aquifer monitoring wells R-28 and R-42. Amendments were added to R-28 and R-42 in 2017 as part of an NMED approved pilot study to evaluate the feasibility of using amendments for in situ remediation of Chromium contamination in groundwater beneath Mortandad Canyon. Addition of the amendments was covered under two Discharge Permit Not Required determinations by NMED dated June 27, 2017 for well R-28 and July 17, 2017 for well R-42. As closeout of the Amendment Pilot Study, extended pumping is planned at each well to promote chromium breakthrough in each of these wells. Land application of the initial development water and additional water pumped from these wells is covered by this NOI. In addition to chromium breakthrough, the data collected during the extended pumping will also provide additional characterization of present-day conditions in the aquifer around each of these wells.

6. Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:

The Department of Energy (DOE) proposes to discharge groundwater to the land surface collected during an extended period of pumping at R-28 and R-42. The specific duration of the pumping at each well is unknown because it is dependent on progress made towards achieving chromium breakthrough at each well. The approximate duration is likely to be on the order of three to eight weeks.

7. Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:

Following redevelopment activities conducted at R-42 and R-28, sampling has been conducted on a biweekly basis with the samples analyzed at GEL Laboratories LLC, a National Environmental Laboratory Accreditation Program



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certified analytical laboratory, and at LANL’s Geology and Geochemistry Research Laboratory (GGRL). R-28 biweekly sampling began on January 21, 2021 and R-42 bi-weekly sampling began on December 21, 2020. Initial redevelopment activities were completed at R-28 on 1/16/2021 and at R-42 on 12/11/2020 by surging the wells, wire brushing the screens, and using a well development methodology called Hydropuls (pneumatic/hydraulic cleaning with compressed nitrogen).

Enclosure 3 contains data for R-28 and R-42 analyzed at GEL and GGRL. The analytical results show that two analytes from R-28 samples (Iron and Manganese) and two analytes at R-42 (Manganese and Chromium) exceed their respective 20.6.2.3103 New Mexico Administrative Code (NMAC) standards. R-28 Iron concentrations ranged from 4,790 ug/L to 12,900 ug/L (NMAC Standard of 1,000 ug/L) and Manganese concentrations ranged from 1,720 ug/L to 2,690 ug/L (NMAC Standard of 200 ug/L). Samples collected from R-42 had Manganese concentrations ranging from 1,420 ug/L to 2,172 ug/L (NMAC Standard of 200 ug/L). Additionally, the first of two samples collected on February 25, 2021 from R-42 had a Chromium concentration that exceeded the NMAC standard of 50 ug/L.

Iron and Manganese are naturally occurring constituents associated with sediments that compose the aquifer. Under reducing conditions, which occurred due to the deployment of each amendment, naturally occurring Iron and Manganese were liberated in a soluble form. Correspondingly, the reducing conditions resulted in conversion of Chromium (VI) to Chromium (III). Enclosure 4 contains figures showing the concentrations trends for Iron, Manganese, and Chromium since redevelopment of the wells as stated above. Discharge occurring under this NOI involves the land application of the groundwater. The reduced Iron and Manganese currently above the 20.6.2.3103 NMAC groundwater standards from R-28 and R-42 would rapidly oxidize as the water is land applied. The oxidized Iron and Manganese would be insoluble and would not have the potential to migrate to groundwater which is at approximately 900 ft below ground surface in the land application areas. The assumption is that current concentrations of Iron and Manganese at each of these two wells roughly bound the maximum concentrations that are expected during the extended pumping exercise.

As described in more detail in Section 8 of this form, during the extended pumping at both R-28 and R-42, Chromium concentration will be closely monitored using field and laboratory analytical methods. Additionally, R-28 and R-42 have been sampled and analyzed for all the new constituents and that became effective under the NMAC on December 21, 2018. The results for those analytes are all below their respective groundwater standards found at 20.6.2.3103 or toxic pollutant tap water screening levels found in the “NMED Risk Assessment Guidance for Site Investigations and Remediation Table A-1” of 20.6.2.7.T(2). Enclosure 5 provides a list of these constituents and the results of the sampling.

8. Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., pre-treatment units, impoundments(s), septic tank/leachfield, etc.). Include sizes, site layout map, plans, and specifications, etc. if available:

Groundwater will be extracted from R-28 and R-42 at a rate of approximately 4 gallons per minute (gpm) from each well. Extracted groundwater will be stored in 20,000 gallon frac tanks. The groundwater will be characterized in approximately 20,000 gallon batches with data from samples collected at the R-42 and R-28 wellheads at 10,000 gallon intervals. Samples will be analyzed at LANL’s GGRL. These data will provide information to characterize the evolution of Iron and Manganese concentrations during the extended period of pumping at each of the wells. If groundwater from R-42 and R-28 exceeds the 20.6.2.3103 NMAC standard for Chromium, the water will be treated utilizing the treatment system used under Discharge Permit (DP) 1793 and dispositioned under this NOI. The treated water is not able to be land applied under DP-1793 due to water source restrictions in Work Plan #5 under DP-1793 as extended pumping of wells R-42 and R-28 was not foreseen so not included as a possible source of water in the last Chromium Project-related work plan; Work Plan #5. Staged water (treated where necessary) will be land applied to the dirt roads within Mortandad Canyon as a dust suppressant using water trucks with sprayers or land applied using the sprinkler array system used for disposition of water under DP-1793. Application to the dirt roads in Mortandad Canyon will be restricted to the land application zones utilized in Work Plan #5 under DP-1793. Enclosure 2 shows the location of areas that may be used for land-application. DOE will ensure land application is managed such that no runoff or ponding will occur; there will be no land application during precipitation events; watercourses, areas of concern, solid waste management units, and cultural sites will be avoided.

9. Estimated maximum daily discharge volume in gallons per day. Provide water usage records or system sizing criteria if available:



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Up to 5,700 gallons/day

10. Estimated depth to ground water (ft): Approximately 900 ft Source of information: Recent water level data

11. Current Total Dissolved Solids Concentration in Groundwater: R-28 is approximately 350 mg/L and at R-42 approximately 415 mg/L

Signature: _____ Date: _____

Printed name: _____ Title: _____

Certification by Responsible Person

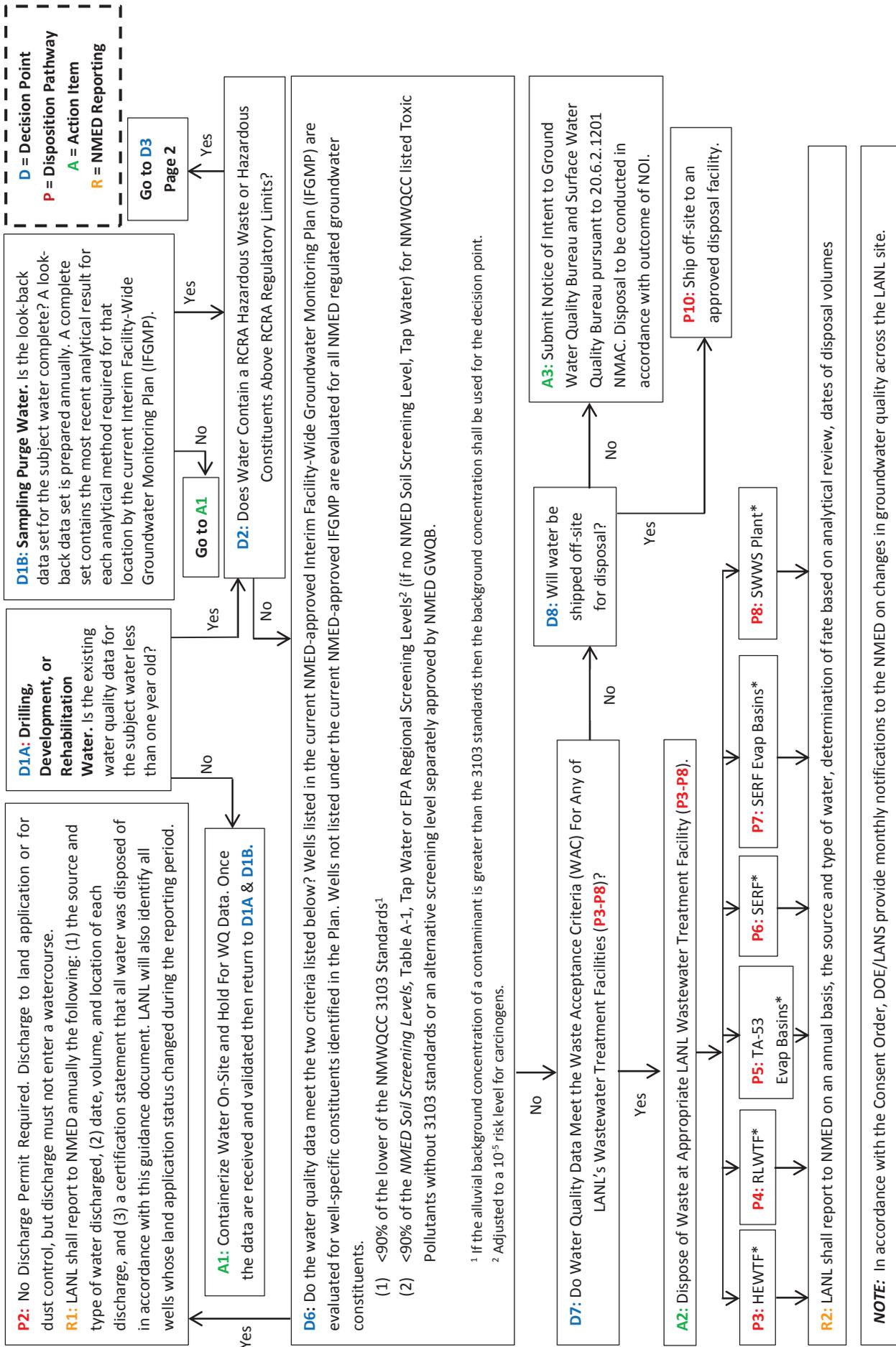
I, _____, hereby certify that the information and data submitted in this application are true and accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this ____ day of _____, _____, upon my oath or affirmation, before a notary of the State of _____

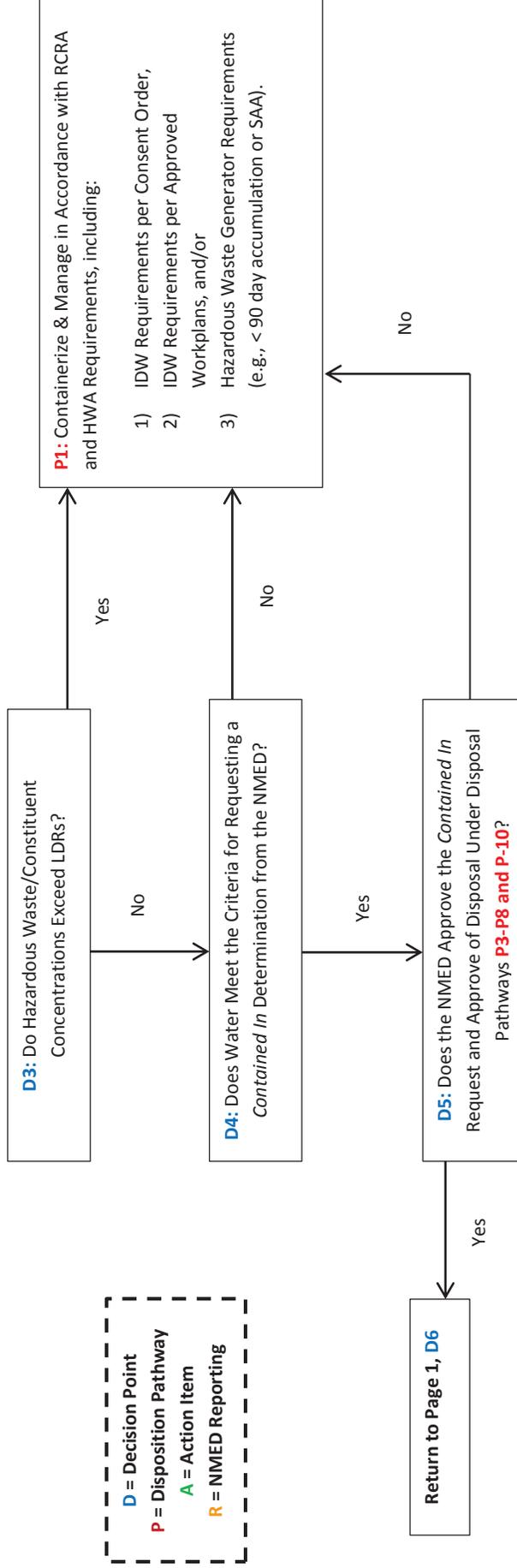
Please return this form to:
NMED Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Telephone: 505-827-2900
Fax: 505-827-2965

Attachment 4



*Nothing in this guidance document shall be construed as relieving the United States Department of Energy or the Los Alamos National Security, LLC, of its obligation to comply with all other applicable federal, state, and local laws, regulations, permits orders.



*Nothing in this guidance document shall be construed as relieving the United States Department of Energy or the Los Alamos National Security, LLC, of its obligation to comply with all other applicable federal, state, and local laws, regulations, permits orders.