July 21, 2017

John C. Bretzke, Division Leader
Environmental and Compliance Division
Los Alamos National Laboratory
PO Box 1663, K491
Los Alamos, NM 87545

Cheryl L. Rodriguez, Program Manager, FPD-II
Environmental Management
Los Alamos Field Office
3747 West Jemez Road, A316
Los Alamos, NM 87544

RE: Discharge Permit Amendment, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835

Dear Mr. Bretzke and Ms. Rodriguez:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Amendment (DP Amendment) for the above referenced facility to the U.S. Department of Energy and Los Alamos National Security, LLC (Permittees) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Ground and Surface Water Protection Regulations, 20.6.2 NMAC. This DP Amendment does not change the permitted quantity or quality of effluent or the location of the discharge and is therefore not considered a permit modification.

This DP Amendment changes specific terms and/or conditions contained in the Discharge Permit, DP-1835, issued to the Permittees on August 31, 2016. The terms and conditions contained herein and those in the Discharge Permit that remain unchanged shall be complied with by the Permittees and are enforceable by NMED pursuant to Section 20.6.2.3104 NMAC and NMSA 1978 §74-6-5 and §74-6-10. Issuance of this DP Amendment does not relieve the Permittees of the responsibility to comply with the WQA, Ground and Surface Water Protection Regulations, and any other applicable federal, state and local laws, regulations, zoning requirements, and nuisance ordinances.

Pursuant to Paragraph (4) of Subsection H of 20.6.2.3109 NMAC, the term of this DP Amendment shall be the same as the remaining term of the Discharge Permit, which expires on August 31, 2021.
If you have any questions, please contact Steve Pullen at (505) 827-2962 or Michelle Hunter at (505) 827-2919.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SP

enc:  Discharge Permit Amendment, DP-1835
      Discharge Permit, DP-1835, dated August 31, 2016

cc:   Steve Pullen, NMED/GWQB
      Shelly Lemon, NMED/SWQB
      John E. Kieling, NMED/HWB
      Susan Lucas Kamat, NMED/DOE-OB
      Stephen M. Yanicak, NMED/DOE-OB
      Bob Beers, DOE/LANS (bbeers@LANL.gov)
I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Amendment (DP Amendment) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Ground and Surface Water Protection Regulations, 20.6.2 NMAC. This DP Amendment changes specific terms and/or conditions contained in the Discharge Permit, DP-1835, issued to the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS, Permittees) on August 31, 2016. This DP Amendment does not change the permitted quantity or quality of effluent or the location of the discharge.

The description contained in DP-1835 of the activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge, is amended as follows, with changes indicated by underline and strikethrough:

Up to 648,000 gallons per day (gpd) of contaminated groundwater is to be pumped from up to three extraction wells installed in the regional aquifer, treated in ion exchange (IX) treatment systems to meet the groundwater concentration limits set by 20.6.2.3103 NMAC, and injected into the regional aquifer through up to six Class V Underground Injection Control (UIC) wells. Untreated groundwater pumped from three extraction wells (CrEX 1, CrEX 2, and CrEX 3) will be conveyed through double-walled piping with leak detection systems to the IX treatment systems. Multiple IX treatment trains, each consisting of a primary vessel and a polishing unit, will be operated to treat chromium levels to below the limits set by 20.6.2.3103 NMAC. Treated water will be pumped through single-walled piping and distributed to six Class V UIC wells (CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5, and CrIN-6) that will be equipped with submersible pumps to allow for periodic back flushing as dictated by increased injection well pressures. The groundwater generated from back flushing of the injection wells or general well maintenance will be pumped into storage tanks, tested, transported to an IX treatment unit for treatment if necessary, stored in lined impoundments, and then land applied under DP-1793 or discharged pursuant to another applicable permit.

Specific monitoring of the extraction, treatment, and injection systems will be conducted to ensure proper system operation using a supervisory control and data acquisition (SCADA) control system. Incoming data, including flowrates, pressures, liquid levels, groundwater levels, motor status, and alarms for the system sites, will be monitored, flowrate of injected water will be managed by motor controlled valves, and pressure at each injection well will be maintained at a specified value using down-hole pneumatic flow control valves (FCV).

The flow of treated water to be pumped into the injection wells will be controlled with the FCV to keep the down-hole discharge injection pipe filled and prevent cascading of water into the well. Once discharged from the FCV, the water will enter the injection well casing and gravity flow through the well screen into the formation. Pressure in the piping at the surface will be monitored by the control system, which will automatically adjust the FCV operation to maintain the pipeline pressure set point.
The water level in the injection well casing will be monitored by the control system through a down-hole pressure transducer. It is expected that the water pressure in the injection well casing will rise above that of the static water level during injection. Reduced injection capacity within the well is anticipated during on-going operation; thus, the control system will be programmed to alarm the operator and shut down the affected well(s) in the event that water levels within the injection well casings reach the high-level set point.

Water level rise in each injection well will be dependent upon the hydraulic characteristics of each well. High level alarm set points will be used to prevent system overflow and will be identified and fine-tuned during system startup and operations.

The injection pipe will be equipped with a check valve and submersible pump. This pump will be used to maintain well performance by back flushing the well as part of a regular maintenance program. Back flushing is anticipated once the water pressure within the injection well increases above the levels observed initially under static conditions. The specific levels above static conditions that will trigger the back flushing operations will be determined based upon the hydraulic and operational conditions of each well. The level of injection well capacity improvement observed during the initial back flushing will be used to develop ongoing well maintenance schedules. The groundwater generated from injection well back flushing or well maintenance will be pumped into storage tanks, tested, transported to an IX treatment unit for treatment if necessary, stored in lined impoundments, and then land applied under DP-1793 or discharged pursuant to another applicable permit.

Monitoring of the treated water will ensure that contaminant concentrations in the discharge do not exceed the 20.6.2.3103 NMAC standards or the limits in Table A-1 of the most recent version of the NMED Risk Assessment Guidance for Site Investigation and Remediation for 20.6.2.7 WW NMAC Toxic Pollutants (Table A-1).

The groundwater to be treated and discharged may contain water contaminants which may be elevated above the standards of section 20.6.2.3103 NMAC and/or toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC. Prior to discharge, all groundwater will be treated to achieve standards less than (≤) 90% of the numeric standards of 20.6.2.3103 NMAC and <90% of the numeric standards established for tap water in Table A-1 for constituents not listed in 20.6.2.3103 NMAC.

The discharge is located approximately 3 miles southeast of Los Alamos in Sections 24 and 25, Township 19N, Range 06E, Los Alamos County. Groundwater most likely to be affected lies in a regional aquifer from 900-1100 feet below ground surface and has a total dissolved solids concentration of approximately 150 milligrams per liter.

The permittee’s DP Amendment request is dated June 28, 2017. The discharge shall be managed in accordance with all conditions and requirements of Discharge Permit, DP-1835, dated August 31, 2016, and this Discharge Permit Amendment.
II. CONDITIONS

The condition listed below replaces the condition with the same number in the Discharge Permit, DP-1835. This amended condition, and all other conditions in the Discharge Permit, must be complied with by the permittee and are enforceable by NMED.

B. MONITORING, REPORTING, AND OTHER REQUIREMENTS

<table>
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<tr>
<th>#</th>
<th>Terms and Conditions</th>
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<tbody>
<tr>
<td>12</td>
<td>Quarterly reports shall include the following system performance information:</td>
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<tr>
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<td>a) Monthly average, maximum, and minimum values for flow rate and volume of treated</td>
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<td>effluent transferred to each injection well;</td>
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<td>b) The totalized monthly volume of treated effluent transferred to each injection well;</td>
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<td>c) Monthly average, maximum, and minimum values of injection water level (pressure</td>
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<td>head) above static level for each injection well;</td>
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<td>d) The daily volume injected at each injection well;</td>
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<td>e) The daily volume pumped from each groundwater extraction well.</td>
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[20.6.2.3107 NMAC]

ISSUED: July 21, 2017
EXPIRES: August 31, 2021

MICHELLE HUNTER, CHIEF
Ground Water Quality Bureau
New Mexico Environment Department