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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

EP2011-5572

December 27, 2011

George J. Rael
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Los Alamos Site Office, DOE
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Los Alamos, NM 87544

Michael J. Graham
Associate Director, Environmental Programs
Los Alamos National Security, L.L.C.
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**RE: APPROVAL WITH MODIFICATION
HYDROLOGIC TESTING REPORT FOR CONSOLIDATED UNIT 16-021(c)-99
LOS ALAMOS NATIONAL LABORATORY
EPA ID#NM0890010515
HWB-LANL-11-046**

Dear Messrs Rael and Graham:

The New Mexico Environment Department (NMED) is in receipt of the United States Department of Energy (DOE) and Los Alamos National Security, L.L.C.'s (collectively, the Permittees) document entitled *Hydrologic Testing Report for Consolidated Unit 16-021(c)-99* (Report) dated June, 2011 and referenced by EP2011-0152. NMED has reviewed the Report and hereby issues this approval with the following modifications.

General Comments:

1. The Permittees proposed a tracer test in the document *Hydrologic Testing Work Plan for Consolidated Unit 16-021(c)-99* dated February 2010. NMED approved that work plan, with modifications, in correspondence dated May 20, 2010. Following the approval, the Permittees requested to postpone the tracer test until after the conclusion of the pumping tests at R-25b and CdV-16-4ip (see Permittees' letter dated June 14, 2010). The request was granted by NMED in a letter dated June 25, 2010.

The Report asserts that the tracer test, as referenced above, is not needed. In response, NMED contends that the tracer test is necessary because considerable uncertainty exists with respect to the hydrologic connectivity and pathways between the contaminant source term(s) and the deep intermediate perched zones and regional aquifer. The interconnectivity between high and low-permeable lithologies (tuff versus Puye sediments) within the deep perched zones is not well defined nor have groundwater flow directions been determined. In addition, the presence of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in samples obtained from newly installed regional aquifer well R-63 indicates a contaminant pathway to the regional aquifer. The presence of RDX at R-63 and the presence of tetrachloroethylene (PCE) in the perched zones, including the upgradient perched zone monitored by well R-26 PZ-2, support the need for tracing the subsurface contaminant pathway(s) to the regional aquifer. Therefore, the Permittees must introduce two different nonreactive tracers to wells CdV-16-1(i) and R-25b. Once the tracers are introduced, monitoring for the tracers must be implemented at the perched zone wells/screens CdV-16-4ip, CdV-16-2(i)r, and R-25 screens 1, 2, and 4. If any tracer is detected in any of the wells/screens CdV-16-4ip, CdV-16-2(i)r, or R-25 screen 2 or 4, then tracer monitoring must be extended to wells R-25 screens 5 through 9, R-18, R-47i, R-48, and R-63. Since the rate of tracer movement through the intermediate perched zone is likely to be slow, it is imperative that the tracer test commences as soon as possible in order to avoid unnecessary delay in collecting tracer test data. The Permittees must submit a tracer test letter work plan no later than **January 31, 2012**.

2. Considerable uncertainty exists regarding contaminant pathways from 260 Outfall to the perched-intermediate zone that contains the bulk of RDX contamination. The uncertainty may be reduced by conducting a geophysical survey (e.g., EM, DC resistivity) with a focus on delineating recharge pathways emanating from 260 Outfall and the spatial dimensions of the underlying perched-intermediate zone. The Permittees must consider the feasibility and suitability of conducting a geophysical survey in the upcoming *Well Evaluation and Network Recommendations Study Report for Technical Area 16 and Upper Water Canyon Watershed* that is due March 30, 2012. If the Permittees' evaluation indicates that the geophysical survey should be conducted, the Permittees must submit a geophysical survey work plan no later than **April 30, 2012**.
3. NMED understands that two-screened well CdV-16-4ip is not equipped with a permanent sampling system but does contain two inert mechanical packers set between the upper and lower screens in order to isolate the two screens. Well CdV-16-4ip may be a good candidate for contaminant detection and monitoring for Consolidated Unit 16-021(c)-99. In order to assess the suitability of that well as a monitoring point, the Permittees must install a permanent sampling system at the upper screen in CdV-16-4ip. The pumping system must be sized and designed to be able to function as part of potential future remediation system for RDX. The sampling system must be installed no later than **February 29, 2012**. The first-

round sampling event at well CdV-16-4ip must include water-quality time-series sampling, with the first sample to be collected once the water in the drop pipe is evacuated, and subsequent samples collected at every one-half casing volume purged, until three casing volumes are purged. If field parameters, such as dissolved oxygen, do not stabilize by the end of three purged casing volumes, then the Permittees must continue purging until stabilization occurs or a total of twelve casing volumes are removed, whichever comes first. During this extended purge sequence, one sample must be collected for every casing volume purged. When purging is completed, the Permittees must collect a first-round full-suite characterization sample.

Specific Comments:

1. **Section 2.1, Vadose Zone Perched Groundwater, page 4, second paragraph**
The Permittees' statement that the Pajarito fault zone is located just to the east of TA-16 is incorrect. The Pajarito fault zone is located west of TA-16.
2. **Figure 2.1-2, page 19**
The placement of screen 1 of well CdV-16-4ip in Figure 2.1-2 is incorrect. Based on the well completion data in Figure 1.2-2, the screen should be located at the elevation range of roughly 6585 to 6648 feet above mean sea level, which is approximately 100 feet higher than its depiction in Figure 2.1-2.
3. **Section C-9.0, Summary, page C-11, last paragraph**
The Permittees' statement that "[t]he lower-bound horizontal hydraulic conductivity computed from the corrected drawdown value was around 0.24 ft/d" is incorrect. According to Figure C-8.2-1, the correct value for that horizontal hydraulic conductivity is around 0.38 ft/d.

A revised Report is not required. Should you have any questions, please contact Michael Dale at (505) 661-2673 or Jerzy Kulis at (505) 476-6039.

Sincerely,



John E. Kieling
Acting Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
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File: Reading and LANL 2011 – Hydro Testing Rpt 16-021(c)-99

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