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**CERTIFIED MAIL – RETURN RECEIPT REQUESTED**

October 15, 2015

Doug Hintze, Manager  
U.S. Department of Energy  
EM-Los Alamos Field Office, DOE  
3747 West Jemez Rd, MS A316  
Los Alamos, NM 87544

Michael Brandt, Associate Director  
Environment, Safety, Health  
Los Alamos National Laboratory  
P.O. Box 1663, MS K491  
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**RE: APPROVAL WITH MODIFICATIONS  
WORK PLAN FOR CHROMIUM PLUME CENTER CHARACTERIZATION  
LOS ALAMOS NATIONAL LABORATORY  
EPA ID#NM0890010515  
HWB-LANL-15-036**

Dear Mr. Hintze and Mr. Brandt:

The New Mexico Environment Department (NMED) is in receipt of the United States Department of Energy (DOE) and the Los Alamos National Security, L.L.C.'s (collectively, the Permittees) document entitled *Work Plan for Chromium Plume Center Characterization (Plan)* dated July 2015, referenced by EP2015-0127, and received on July 28, 2015. NMED has reviewed the Plan, and hereby issues this approval with the following modifications.

**Modifications:**

**1. 3.0 Investigation of Source Removal, page 2**

NMED is in agreement with the Permittees' proposal to install plume-center chromium extraction well CrEX-3 as presented in the Plan. The Permittees must submit a drilling work plan for the installation of plume-center chromium extraction well CrEX-3 no later than **November 25, 2015**. However, NMED notes that significant uncertainties exist

regarding chromium distribution and aquifer heterogeneity near the plume-center area south and southeast of R-42, and that additional characterization data may be needed in this particular area of the plume. It is NMED's understanding that the Permittees will install proposed extraction well CrEX-3 by the end of 2015, and are planning to continuously pump CrEX-3 and CrEX-1 starting in spring 2016. The goal of this pumping test is to determine capture zones, hydraulic responses, and aquifer properties, and to potentially delineate changes in chromium concentrations under transient conditions. Results and findings from the pumping test must be submitted in a summary report to NMED no later than **November 30, 2016**. The report must contain recommendations regarding potential further characterization activities, such as installation of additional plume-center extraction and/or injection wells, monitoring wells or piezometers.

## **2. 3.4 Characterization of Infiltration beneath Lower Sandia Canyon, page 4**

NMED concurs with the Permittees' proposal to further investigate infiltration in Sandia Canyon as presented in the Plan. Additionally, NMED offers that during the period of chromium releases to upper Sandia Canyon, the area of infiltration may have been further upstream than the investigation reach proposed in the Plan (see Figure 3.4-1, page 13). This assertion is based on NMED's review of aerial photographs taken prior to and during the chromium-release period from 1956 to 1972, as well as recent field observations and aerial photographs. Comparison of the referenced historical aerial photos to more recent aerial-view (e.g., Google Earth) photos and field observations indicate that a significant volume of alluvial material has been removed by erosion along a 2,000 foot long reach extending from surface-water monitoring station SCS-2 downstream to alluvial well SCA-2. Along this reach, an incised channel has formed measuring up to 12 - 15 ft below older depositional surfaces (e.g., floodplain). Thus, the available groundwater storage capacity in the alluvium was likely much greater along this reach prior to incision and during the chromium release period, and therefore, provided an area of significant recharge to underlying strata such as the permeable Cerro Toledo interval. Based on this observation, the Permittees must conduct an additional infiltration investigation along a reach extending from SCS-2 for an approximate distance of 1,000 ft downstream. The Permittees must submit a supplemental work plan for the infiltration investigation for both reaches no later than **December 31, 2015**.

## **3. 4.0 SCHEDULE**

Once all applicable National Environmental Policy Act (NEPA) Environmental Assessment requirements are met and permits by the New Mexico Office of the State Engineer (NMOSE) and NMED Groundwater Quality Bureau (GWQB) are granted, the Permittees must submit an itemized schedule of completion or projected completion specific to deliverables proposed in the Plan and additional NMED requirements, including: a) installation of CrEX-3 and associated injection wells, and hydraulic testing of CrEX-1 and CrEX-3; b) aquifer-dilution tracer tests and a field cross-hole tracer study; c) injection well study, and d) investigation to assess infiltration beneath Sandia Canyon.

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The Permittees' itemized schedule of completion and/or projected completion must be submitted to NMED no later than **30 days** after satisfying NEPA, GWQB, and NMOSE regulatory requirements.

In summary, the Permittees must submit the drilling work plan for the installation of plume-center extraction well CrEX-3 no later than **November 25, 2015** and submit a supplemental work plan for the Sandia Canyon infiltration investigation no later than **December 31, 2015**.

Please contact Michael Dale at (505) 476-3078 if you have questions.

Sincerely,



John E. Kieling  
Chief  
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB  
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File: Reading and LANL 2015, Cr Plume