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**CERTIFIED MAIL – RETURN RECEIPT REQUESTED**

July 12, 2019

Doug Hintze, Manager  
Environmental Management  
Los Alamos Field Office  
P.O. Box 1663 MS-M984  
Los Alamos, NM 87545

**RE: RESULTS FROM REGIONAL GROUNDWATER MONITORING WELL R-70  
LOS ALAMOS NATIONAL LABORATORY  
EPA ID #NM0890010515  
HWB-LANL-MISC**

Dear Mr. Hintze:

The New Mexico Environment Department (NMED) has reviewed results from the installation and sampling of regional groundwater monitoring well R-70. The R-70 well was installed in May 2019 as part of the interim measure (IM) for chromium plume control (LANL, 2015; see EP2015-0089) according to the *Drilling Work Plan for R-70* (LANL, 2018; see EM2018-0068), approved by NMED on October 31, 2018. The installation of R-70 was recommended by the Department of Energy's (DOE's) *Evaluation of Chromium Plume Control Interim Measure Operational Alternatives for Injection Well CrIN-6* (LANL, 2018; see EP2018-0060) to monitor plume response to the IM and help define the lateral and vertical extent of chromium in the northeastern plume area.

Due to terrain constraints, R-70 was installed in Mortandad Canyon at an angle of approximately 25 degrees from vertical to the north-northeast, approximately 700 ft east of the CrEX-5 well screen. R-70 was completed as a dual-screen well in the upper portion of the regional aquifer. The upper screen interval (screen 1) was installed in the Puye Formation, approximately 13 ft

below the regional groundwater table. The lower screen interval (screen 2) was installed across the geologic contact between the Puye Formation and the underlying Puye pumiceous subunit, approximately 90 ft below the regional groundwater table. Groundwater samples were collected by Newport News Nuclear BWXT-Los Alamos, LLC personnel from R-70 screen 1 on May 24, 2019 and R-70 screen 2 on May 27, 2019 following completion of 24-hour aquifer testing at each screen. The analytical results indicate chromium concentrations of 15.2 µg/L at R-70 screen 1 and 246 µg/L at R-70 screen 2. The chromium concentrations measured at screen 2 are above the New Mexico Water Quality Control Commission groundwater standard of 0.050 mg/L or 50 µg/L.

Comparison of the relatively high chromium concentrations at R-70 screen 2 with the relatively low concentrations at R-70 screen 1 indicates that significant chromium contamination occurs near the base of the Puye Formation at R-70. Nearby wells screened across the base of the Puye Formation also show significant chromium concentrations along this stratigraphic interval—approximately 500 µg/L at R-28 (pre-chromium amendment injections) and approximately 270 µg/L at CrEX-5. The nature of chromium contamination near the base of the Puye Formation downgradient of R-70 is currently unknown. Monitoring wells downgradient of R-70 include R-35a and R-35b, located approximately 1400 ft east-northeast of R-70 and 380 ft southwest (and upgradient) of Los Alamos County production well PM-3. While these wells are intended to act as sentinel monitoring wells for the protection of PM-3, neither R-35a nor R-35b are screened near the base of the Puye Formation, creating a significant data gap regarding the migration of chromium near PM-3. The bottom of the R-35b screen interval is situated approximately 36 ft above the base of the Puye Formation, while the top of the R-35a screen interval is situated approximately 131 ft below the base of the Puye Formation in the underlying Chamita Formation. The tops of the R-35b and R-35a screen intervals are situated approximately 33 ft and 223 ft below the water table, respectively.

As the R-70 screen 2 results indicate, significant chromium contamination can occur near the base of the Puye Formation in the northeastern plume area. Furthermore, because the R-35a and R-35b screen intervals are not situated along this stratigraphic interval, the nature of chromium contamination near the base of the Puye Formation directly upgradient of PM-3 is currently unknown. Additionally, the lateral and vertical extent of chromium in the northeastern plume area is not defined. Therefore, NMED will require DOE to install two (2) additional regional groundwater monitoring wells, R-35c and R-73, to fulfill the following objectives:

1. Characterize chromium contamination near the base of the Puye Formation directly upgradient of PM-3 (R-35c),
2. Define the lateral and vertical extent of chromium contamination in the northeastern portion of the plume (R-73).

It is possible that results from R-35c will satisfy the objectives described above. Therefore, the necessity for R-73 will be based on information gathered from the installation of R-35c. DOE must submit, within thirty days of receipt of this letter, drilling work plans for two (2) monitoring wells

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to address the uncertainties described above. The R-35c well must be completed by **October 31, 2019**. DOE must also meet with the NMED technical team prior to submittal of the drilling work plans to discuss details of the well installations. These monitoring wells shall not replace the R-71 and R-72 monitoring wells that DOE has committed to install in the northwest and southwest portions of the chromium plume, respectively.

If you have any questions or comments regarding this correspondence, please contact Neelam Dhawan at (505) 476-6042.

Sincerely,



John E. Kieling  
Chief  
Hazardous Waste Bureau

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File: Reading and LANL 2019, TA-05 Well R-70 Results