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Date: **AUG 16 2012**
 Refer To: EP2012-0189

John Kieling, Bureau Chief
 Hazardous Waste Bureau
 New Mexico Environment Department
 2905 Rodeo Park Drive East, Building 1
 Santa Fe, NM 87505-6303

Subject: Submittal of the Analytical Data for Water Samples Collected from Technical Area 21 Distillation Hole

Dear Mr. Kieling:

Enclosed please find two hard copies, with electronic files, of the analyses requested in the New Mexico Environment Department's Approval with Modifications for the Plugging and Abandonment Summary Reports for 14 Wells and Boreholes at Los Alamos National Laboratory for 2011 Commitment.

As requested in Comment 2 of the approval with modifications letter, Los Alamos National Laboratory (the Laboratory) is submitting the results of the analyses for four samples collected from the water in the distillation-apparatus tubing and piping bundle within the borehole at Technical Area 21 (TA-21).

As additional background information, the building housing the stable isotope-distillation apparatus and covering the borehole at TA-21 was demolished in 2010. Before it was demolished, the distillation apparatus consisted of a bundle of tubes and pipes standing two stories tall inside the building, with the remainder of the system hanging in a dry 125-ft-deep borehole drilled through the floor slab of the building into dry tuff below. Geologic logs from the nearby well R-64 indicate the depth to groundwater in this location is about 1200 ft.

The distillation apparatus was used to separate the stable isotopes of carbon, oxygen, and nitrogen. When the building was demolished and the aboveground part of the system was removed, there was no discussion of any fluids inside the apparatus piping and tubing bundle or in the borehole.

When the building and the aboveground part of the distillation apparatus were removed, the building slab and borehole containing the remaining distillation-apparatus piping and tubing were covered with about 1 ft of base course and left open to the elements. The base course-covered building slab was then used to store a variety of items. All precipitation falling on the base course-

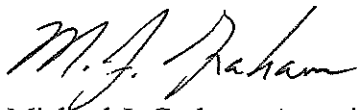
covered slab drained through the base course, to the slab, and then toward the borehole containing the remaining distillation apparatus, in the north-west corner of the slab.

At the beginning of the abandonment project, as the remaining distillation apparatus was being removed from the borehole, subcontractor personnel noticed fluid leaking from the apparatus tubing and piping bundle and requested characterization of the fluid for health and safety purposes. Apparatus removal activities were paused, and three samples of this liquid were collected and analyzed by an on-site laboratory. Work resumed once the fluid was determined to be water. Eight days later, when additional fluid was noted to be coming from some tubing, operations were again stopped, and a fourth sample of fluid was collected and analyzed. It too was determined to be water and work resumed. When the distillation apparatus was completely removed from the borehole, water standing at the bottom of the borehole, some of which had come out of the distillation apparatus, was removed from the borehole, containerized, and analyzed per waste disposal protocol. The volume amounted to 1240 gal. of water that was disposed of at TA-50. After the water was removed, the borehole was plugged and abandoned.

The source of the water was likely precipitation. The attached table presents the results of the analyses of the four water samples collected from the distillation-apparatus tubing and piping. The results show elevated concentrations of aluminum, boron, calcium, copper, and potassium compared with rainwater or local groundwater, and one sample contained 304 ppm nitrate. Because the tubing and piping were used to distill carbon, nitrogen, and oxygen compounds, some of these constituents may be residue from that process, remaining at trace levels in the piping and tubing. Elevated aluminum and copper are believed to be from the apparatus tubing itself, which is made of these elements.

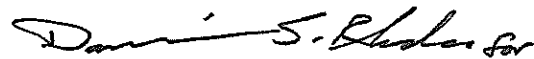
If you have any questions, please contact Ted Ball at (505) 665-3996 (tedball@lanl.gov) or Woody Woodworth at (505) 665-5820 (lance.woodworth@nnsa.doe.gov).

Sincerely,



Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,



Peter Maggiore, Assistant Manager
Environmental Projects Office
Los Alamos Site Office

MG/PM/CD/TB:sm

Enclosures: Two hard copies with electronic files – Analytical Data for Water Samples Collected from Technical Area 21 Distillation Hole (LA-UR-12-23791)

Cy: (w/enc.)
Woody Woodworth, DOE-LASO, MS A316
Ted Ball, EP-CAP, MS J590
Public Reading Room, MS M992 (hard copy)
RPF, MS M707 (electronic copy)

Cy: (Letter and CD and/or DVD)
Laurie King, EPA Region 6, Dallas, TX
Steven Rydeen, San Ildefonso Pueblo
Joe Chavarria, Santa Clara Pueblo
Steve Yanicak, NMED-DOE-OB, MS M894
William Alexander, EP-BPS, MS M992

Cy: (w/o enc.)
Tom Skibitski, NMED-OB (date-stamped letter emailed)
Annette Russell, DOE-LASO (date-stamped letter emailed)
Craig Douglass, EP-CAP (date-stamped letter emailed)
Michael J. Graham, ADEP (date-stamped letter emailed)