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U.S. Department of Energy
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Date: November 18, 1999
 Refer to: E/ER:99-335

DEC 1999
 RECEIVED

Mr. John Kieling
 NMED-HRMB
 P.O. Box 26110
 Santa Fe, NM 87502

SUBJECT: SAMPLING AND ANALYSIS PLAN (SAP) FOR ACID CANYON

Dear Mr. Kieling:

Enclosed is the Los Alamos National Laboratory's Environmental Restoration (ER) Program's abbreviated SAP for investigation of contaminants in Acid Canyon. Sampling and analysis in this investigation will follow the technical strategy described in the approved *Core Document for Canyons Investigations* (LA-UR-96-2083). This SAP adds investigations in Acid Canyon as an addendum to the *Task/Site Work Plan for Operable Unit 1049: Los Alamos Canyon and Pueblo Canyon* (LA-UR-95-2053). Work conducted under this SAP will be reported in a surface aggregate report for Los Alamos and Pueblo Canyons. The Acid Canyon investigation is being expedited and sampling is expected to begin immediately.

If you have any questions, please call Dave McInroy at (505) 667-0819 or Steven Reneau at (505) 665-3151 of the Los Alamos National Laboratory or Joe Mose at (505) 667-5808 of the Department of Energy.

Sincerely,


 Julie A. Canepa, Program Manager
 Los Alamos National Laboratory
 Environmental Restoration

JC/TT/RB/eim

Sincerely,

 FOR
 Theodore J. Taylor, Program Manager
 Department of Energy
 Los Alamos Area Office

Enclosure: Abbreviated SAP for Investigation of Contaminants

TL



HSCWA LANL 4/10/99/0

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E/ER File, MS M992
RPF, MS M707

Acid Canyon Sediment Sampling and Analysis Plan **18 November, 1999**

Introduction

Stream channels in Acid Canyon downstream from Technical Area (TA) 45 were originally designated as Potential Release Site (PRS) 01-002 and were investigated under the approved *RFI Work Plan for Operable Unit 1079* (LANL 1992, 7668). Results of these investigations were presented in *RFI Report for PRSs 1-002 45-001 45-002 45-003 45-004 C-45-001*, (LANL 1995, 48856), and Radiological Addendum to the RFI Report for Potential Release Sites 1-002, 45-001, 45-002, 45-003, 45-004, C-45-001, (LANL 1996, 54468). The *Task/Site Work Plan for Operable Unit 1049: Los Alamos Canyon and Pueblo Canyon* ("the Los Alamos/Pueblo Canyon work plan") (LANL 1995, 50290) did not include tributary canyons of this size because at that time they were considered to be the responsibility of the Operable Units that included the mesa-top PRSs. Since that time, however, certain tributary canyons have been considered to be more appropriately investigated by the Canyons Focus Area. Specifically, investigations in DP Canyon proposed in the DP Canyon sampling and analysis plan (SAP) (LANL 1998, 57595) were added to the Los Alamos/Pueblo Canyon work plan as an addendum in 1998. This SAP similarly adds investigations in Acid Canyon as an addendum to the Los Alamos/Pueblo Canyon work plan. Work conducted under this SAP will be reported in a surface aggregate report for Los Alamos and Pueblo Canyons.

Site History

Acid Canyon has received contaminants from several sources. Untreated radioactive effluent was discharged into the South Fork of Acid Canyon between 1944 and 1951, and treated radioactive effluent was discharged from TA-45 between 1951 and 1964 (LANL 1981, 6059; LANL 1992, 7668). Acid Canyon has also received contaminants from PRS 0-030(g) (LANL 1995, 51983), and probably has received additional contaminants derived from runoff from the Los Alamos townsite.

Contaminants of potential concern (COPCs) identified in Acid Canyon and downstream in Pueblo Canyon include the radionuclides Am-241, Cs-137, Pu-238, Pu-239,240, Sr-90, and tritium, the inorganic chemicals lead, mercury, and silver, and a series of organic chemicals including pesticides, polychlorinated biphenyls (PCBs), and semivolatile organic compounds (SVOCs) (LANL 1995, 48856; LANL 1995, 51983; LANL 1996, 54468; Reneau et al. 1998, 59159). In Pueblo Canyon the primary COPC known to be derived from PRSs as pertains to human health risk assessments is Pu-239,240 (Reneau et al. 1998, 59159), and this radionuclide is also expected to be the primary COPC in Acid Canyon.

Sampling and Analysis Plan

Sampling and analysis in this investigation will follow the technical strategy described in the *Core Document for Canyons Investigations* ("the core document") (LANL 1997, 55622). Work will be conducted in four reaches. Reach ACS is the south fork of Acid Canyon, extending downstream from the TA-45 outfall to the confluence with the main Acid Canyon channel.

Reach AC-1 is the part of Acid Canyon upstream from the confluence of the 0-030(g) drainage. Reach AC-2 is the part of Acid Canyon between the 0-030(g) drainage confluence and the south fork confluence. Reach AC-3 is the part of Acid Canyon downstream from the south fork confluence. Field work conducted under this SAP will include geomorphic mapping, geomorphic characterization, radiological field measurements, and sediment sampling in two or more phases, as required to define nature and extent of the contaminants that are determined to be potential risk drivers.

Investigations to date in these reaches and at associated PRSs provide sufficient data to be used in lieu of the typical phase 1 full suite analysis for sediment investigations and allow this investigation to focus on contaminants that are identified as deficiencies in nature and extent (e.g., SVOCs in reach AC-1) and contaminants that have been identified as potential risk drivers (e.g., plutonium-239,240) in reach ACS. Sediment samples will be collected in each reach for limited suite analyses and in some or all reaches for key contaminant analyses. The limited suite for each reach will include all COPCs previously identified in that reach or at upstream sites, or suspected to be derived from townsite sources. The limited suites will include the following:

- ACS and AC-3: isotopic plutonium, isotopic uranium, strontium-90, tritium, gamma spectroscopy radionuclides, target analyte list (TAL) metals, pesticides and PCBs, and SVOCs
- AC-2: isotopic plutonium, isotopic uranium, gamma spectroscopy radionuclides, TAL metals, pesticides and PCBs, and SVOCs
- AC-1: isotopic plutonium, TAL metals, pesticides and PCBs, and SVOCs

Based on an assessment of existing data, the key contaminant for reaches ACS and AC-3 is plutonium-239,240. Available data suggest that no contaminants derived from PRSs upstream from the south fork present a human health risk, and therefore there may be no collection of samples for key contaminants in reaches AC-1 and AC-2. Evaluation of possible additional key contaminants will be made following the first sampling phase.

Data Assessment

Results of the investigation in Acid Canyon will be used to assess human health under current land use (i.e. trail use) and to conduct ecological risk screening. . The results of the risk assessment will be available prior to the preparation of the surface aggregate report for the Los Alamos/Pueblo Canyon watershed, and will be made available through a summary letter to the DOE and NMED. The data from this investigation will also be used to refine the conceptual model for contaminant transport and storage within the Pueblo Canyon watershed which will be presented in the surface aggregate report.

References Cited

LANL (Los Alamos National Laboratory), May 1981. "Formerly Utilized MED/AEC Sites Remedial Action Program, Radiological Survey of the Site of a Former Radioactive Liquid

Waste Treatment Plant (TA-45) and Effluent-Receiving Areas of Acid, Pueblo, and Los Alamos Canyons, Los Alamos, New Mexico," Los Alamos National Laboratory Report LA-8890-ENV (DOE/EV-0005/30), Los Alamos, New Mexico. **(LANL 1981, ER ID 6059)**

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1079," Los Alamos National Laboratory Report LA-UR-92-850, Los Alamos, New Mexico. **(LANL 1992, ER ID 7668)**

LANL (Los Alamos National Laboratory), June 12, 1995. "RFI Report for PRSs 1-002 45-001 45-002 45-003 45-004 C-45-001," Los Alamos National Laboratory Report LA-UR-95-1542, Los Alamos, New Mexico. **(LANL 1995, ER ID 48856)**

LANL (Los Alamos National Laboratory), September 1995. "RFI Report for Solid Waste Management Units 0-030(g)," Los Alamos National Laboratory Report LA-UR-95-3263, Los Alamos, New Mexico. **(LANL 1995, ER ID 51983)**

LANL (Los Alamos National Laboratory), November 1995. "Task/Site Work Plan for Operable Unit 1049: Los Alamos Canyon and Pueblo Canyon," Los Alamos National Laboratory Report LA-UR-95-2053, Los Alamos, New Mexico. **(LANL 1995, ER ID 50290)**

LANL (Los Alamos National Laboratory), March 1996. "Radiological Addendum to the RFI Report for Potential Release Sites 1-002, 45-001, 45-002, 45-003, 45-004, C-45-001," Los Alamos National Laboratory Report LA-UR-95-3692, Los Alamos, New Mexico. **(LANL 1996, ER ID 54468)**

LANL (Los Alamos National Laboratory), April 1997. "Core Document for Canyons Investigations," Los Alamos National Laboratory Report LA-UR-96-2083, Los Alamos, New Mexico. **(LANL 1997, ER ID 55622)**

LANL (Los Alamos National Laboratory), April 1998. "Sampling Plan for DP Canyon Potential Release Site C-0-021," Los Alamos National Laboratory Report LA-UR-97-3071, Los Alamos, New Mexico. **(LANL 1998, ER ID 57595)**

Reneau, S., R. Ryti, M. Tardiff, and J. Linn, September 1998. "Evaluation of Sediment Contamination in Pueblo Canyon: Reaches P-1, P-2, P-3, and P-4," Los Alamos National Laboratory Report LA-UR-98-3324, Los Alamos, New Mexico. **(Reneau et al. 1998, ER ID 59159)**