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Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA

Environmental Restoration

Environmental Restoration Project
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Date: September 10, 1997
Refer to: EM/ER:97-370

HSWA LANL 4/10/96

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: FIELD UNIT 4 FIELD ACTIVITIES/ REGIONAL CHARACTERIZATION WELL R-9

Dear Mr. Garcia,

Field Unit 4 will begin field activities which include drilling one borehole for the installation of a deep (750 ft), regional groundwater characterization well, R-9, in upper Los Alamos Canyon, at the eastern boundary of Los Alamos National Laboratory, west of State Road 4. This activity will begin on or about September 22, 1997, through approximately December 4, 1997.

The design and placement of this well will provide water-quality and water-level data for characterization of the regional aquifer as well as any intermediate-depth perched zones present. Well R-9 is also designed to collect hydrologic, geochemical, and geologic data to contribute to the characterization of the vadose zone, potential intermediate-depth groundwater, and regional aquifer in this part of the Laboratory.

Approximately 21 core samples will be collected for geotechnical and contaminant characterization, and 13 core samples will be collected for hydrologic characterization. In addition, approximately 10 core samples will be collected for geologic characterization. Up to 7 groundwater samples will be collected at depths and frequencies determined in the field, based on occurrences of saturated zones. Analytes include stable isotopes, major cations and anions, trace metals, dissolved organic carbon, organic compounds, tritium, ^{90}Sr, ^{137}Cs, ^{241}Am, and Pu and U isotopes. Borehole measurements will be collected using color camera and geophysical tools. Geophysical measurements will include caliper, natural gamma, EMI, magnetic susceptibility, fluid resistivity and temperature, gamma density, and neutron (thermal/epithermal). Air permeability tests will be conducted which include total borehole anemometry and straddle-packer air permeability. Slug tests will also be conducted in selected zones of saturation and pressure transducers will be installed to record water levels.

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This activity is being performed as part of the Task/Site Work Plan for former Operable Unit 1049 and the Draft Hydrogeologic Workplan.

Samples will be collected as shown in the table below.

SAMPLING INFORMATION			
Location	**Number of Samples**	**Sample Type**	**Analyses**
Well R-9	21	Core (Contaminants)	Gross Radiological Screening Radionuclides ^{3}H, ^{90}Sr, ^{137}Cs, ^{241}Am, ^{234}U, ^{235}U, ^{238}U, ^{238}Pu, and $^{239/240}Pu$ Inorganics (Full Suite) Cl, Br, SO_4, NO_3 VOCs (based on field screening and in upper-most Cerros del Rio Basalt) SVOCs (based on field screening and in upper-most Cerros del Rio Basalt)
Well R-9	21	Core (Geotechnical)	*Cerros del Rio Basalt* In-Situ water content Porosity Particle Density Bulk Density Sat. Hydraulic Conductivity (selected samples) Water Retention Curve (selected samples) *Puye Fm.* Particle size and texture (<2mm) In-Situ Water Content Porosity (<2mm) Particle Density (<2mm) Bulk Density Sat. Hydraulic Conductivity by Air and Water Water Retention Curve (<2mm, unsaturated) *Santa Fe Group* Particle size and texture (<2mm) In-Situ Water Content Porosity (<2mm) Particle Density (<2mm) Bulk Density Sat. Hydraulic Conductivity by Water Only
Well R-9	13	Core (Geochem. and Hydrologic)	Stable Isotopes Unsaturated Flow Apparatus
Well R-9	10	Core (Geologic)	Mineralogy (as needed) Modal Petrography (as needed) Chemistry (as needed)

SAMPLING INFORMATION			
Location	**Number of Samples**	**Sample Type**	**Analyses**
Well R-9	7 (max.)	Groundwater	Major Cations and Anions (dissolved) Trace Elements and Metals (dissolved) Trace Elements and Metals (total) Nutrients-Nitrogen Species (dissolved) Radionuclides (dissolved) Radionuclides (total) Stable Isotopes Tritium Tritium (low level) Dissolved Organic Carbon Total Organic Carbon VOCs SVOCs

If you have any questions or concerns please feel free to give me a call at (505) 667-0819.

Sincerely,

David McInroy
Environmental Restoration Project

DM/kr

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