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Cobrain, Dave, NMENV

From: David E. Broxton [broxton@lanl.gov]
To: Cobrain, Dave, NMENV
Cc: Thomas J. Whitacre; katzman@lanl.gov
Subject: Drilling Work Plan for LAOI-7
Attachments:  [IntermedWell_LAOI7_drilling_work_plan.doc\(82KB\)](#)

Sent: Mon 8/1/2005 5:29 PM

David,

Attached is the LAOI-7 Drilling Work Plan. Please contact Mark Everett at 667-5931 or meverett@lanl.gov if you have any questions about this plan.

Thank you for agreeing to provide a prompt review and approval of this drilling work plan.

David

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LANL TA-74 [Drilling Work Plan]



4347

Drilling Work Plan for Regional Aquifer Well LAOI-7

Primary Purpose	<p>LAOI-7 is required by the “Los Alamos Canyon and Pueblo Canyon Intermediate and Regional Aquifer Groundwater Work Plan”, and it fulfills the Consent Order requirement to install an intermediate well in Los Alamos Canyon between LAO-4.5 and LAO-6. The primary purpose of LAOI-7 is to define the western extent of perched groundwater found in basalt at R-9/R-9i. LAOI-7 will also help define the eastern extent of contaminant migration through the vadose zone in Los Alamos Canyon.</p> <p>LAOI-7 will be cored to collect samples for contaminant and moisture profiles. A single-screen well will be installed in the corehole if perched water is encountered; otherwise, LAOI-7 will be backfilled.</p>
Projected Depth	<p>The borehole should extend through the Cerros del Rio basalt and 20 ft into the Puye Formation, a target depth of approximately 350 ft, or to refusal.</p>
Drilling Methods	<p>Dry drilling using HQ coring techniques.</p>
Potential Drilling Fluids, Composition, and Use	<p>The corehole will be drilled dry to the extent possible. Foam will be used only if there are zones of persistent circulation loss or insufficient core recovery.</p>
Hydrogeologic Objectives	<ul style="list-style-type: none"> • Define the western extent of perched groundwater found in basalt at R-9/R-9i, but absent in R-8. • Define the eastern extent of contaminant migration through the vadose zone in Los Alamos Canyon. • LAOI-7 will confirm the continuity of stratigraphic units identified in the R-8 and R-9 wells.
Potential Groundwater Occurrence & Detection	<ul style="list-style-type: none"> • Perched: 90 ft, perched water is possible in the Puye Formation on top of the Cerros del Rio basalt. • Perched: 300 ft, perched water is possible in central and lower part of the Cerros del Rio basalt, similar to the occurrence at R-9/9i. <p>Methods for groundwater detection may include: drillers observations, water level measurements, borehole video, and borehole geophysics</p>
Core Sampling	<ul style="list-style-type: none"> • Core analytical samples will be collected from lined core barrels, sealed in ProtecCore™ moisture protection, and submitted to the SMO under Chain-of-Custody • Collect vadose zone core and analyze for anions, cations/metals, radionuclides, and stable isotopes at 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 150, 200, 250, and 350 ft or until core refusal, whichever comes first.
Groundwater Screening Sampling	<ul style="list-style-type: none"> • Screening water samples will be collected during drilling at any perched horizon producing sufficient water for sampling. • Screening water samples will be collected from the installed well at the end of development. <p>Screening samples of groundwater will be analyzed for cations/metals (dissolved & total) and anions (dissolved) by the LANL EES-6 chemistry laboratory.</p>
Groundwater Characterization Sampling	<ul style="list-style-type: none"> • A groundwater sample will be collected from the completed well between 10 and 60 days after well development, in accordance with the Consent Order. This sample will be analyzed for the full suite of constituents including: radiochemistry, metals/cations, general inorganics, VOCs compounds, and stable isotopes. • Subsequent groundwater samples will be collected under the Interim Facility-Wide Groundwater Monitoring Plan
Geophysical Testing	<p>Borehole video, natural-gamma, and induction logs will be collected. The geophysical logs will be used in conjunction with other data collected in the corehole to characterize the hydrogeologic setting of perched water zones and to select the well-screen interval.</p>

Well Completion Design	A single-screen well will be installed if perched water is found. Otherwise, the borehole will be plugged and abandoned in accordance with the Consent Order.
Well Development	<ul style="list-style-type: none"> • Well may be developed by mechanical means. Mechanical means include swabbing, bailing and pumping. • Water quality parameters to be monitored: pH, specific conductance, temperature, turbidity, and total organic carbon (TOC) • Target water quality parameters: turbidity < 5 NTU, TOC < 2 ppm, other parameters stable
Hydraulic Testing	A constant-rate pumping test will be used if well development indicates that a high-transmissivity water-bearing interval is present. Slug tests will be used if well development indicates that a low-transmissivity water-bearing interval is present.
Number of Well Screens	One screen will be installed in a perched-water zone if sufficient water to make a well is found.

LAOI-7 Tentative Coring Schedule	
Proposed Start Date September 12, 2005	
Activity	Duration (days)
Coring	14
Development	7
Pumping Testing	14
Investigation-Derived Waste Analyses	45
Site Restoration	7