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1.0 GENERAL BACKGROUND

Alluvial aquifer monitoring wells will be installed in Pajarito Canyon and Rendjia Canyon as part of the Environmental Programs-Water Stewardship Project. All work outlined in this drilling plan is performed under the 'Statement of Work for Drilling Alluvial Wells in Pajarito and Rendija Canyons' (LANL, 2006) and must also be in accordance with the 'Compliance Order on Consent' (NMED, 2005) between the State of New Mexico Environment Department (NMED) and the Department of Energy (DOE)/Los Alamos National Laboratory (LANL) and other commitments made to NMED within the approved 'Pajarito Work Plan' (LANL, 1998) and the 'Response to the Notice of Disapproval for the Work Plan for Pajarito Canyon' (LANL, 2005).

Pajarito Canyon and Rendjia Canyon have individual drilling and well installation requirements. Each characterization borehole and possible monitoring well or piezometer has its own set of data quality objectives, identified in Tables 1.0 and 2.0. Pajarito Canyon wells and piezometers are listed in Table 1.0 and generally range in depth from shallow subsurface drill holes of 3 to 8 ft bgs to as deep as 75 ft bgs. Only one well is planned for Rendija Canyon, drilled to a depth of 40 ft (Table 2.0). Alluvial monitoring wells shall be installed as single-screen completions, in addition to two nested groups of two piezometers each, as specified in Table 1.0. If insufficient water is encountered or the borehole is dry to target depth (5 ft into bedrock) at a proposed location, the borehole will be plugged and abandoned upon completion of sampling. All core samples for all borings shall be screened by LANL radiation control technicians (RCTs) before they are transported off-site. All work will be conducted according to the latest revision of the Environmental and Remediation Support Services (ERSS) SOPs listed in Table 3.0.

2.0 SITE PREPARATION

All drill sites will be prepared with as minimal an impact and disturbance to the area as practical. Road or drill pad construction will not be required for any locations. Any ground disturbance will be kept to a minimum, but if a drill site area is disturbed then BMPs will be installed to minimize erosion and any surface water run on or run off from the site. All borehole locations near stream channels will have a sediment barrier installed between drilling operations and the stream channel. Borehole PCAO-8 and piezometer nest PCAP-2 will require building a fence to separate and secure the drilling areas from Technical Area (TA)-36. If LANL's Subcontractor Technical Representative (STR) has determined that a drill site has excessive ground disturbance, once the drilling has been completed and the drill rig demobilizes, the site will be re-vegetated with LANL approved grass mixture and/or stabilized with organic matting material. BMPs will remain in place until instructed by LANL management to remove them.

3.0 DRILLING METHODS

Fourteen boreholes are proposed in Pajarito Canyon and one in Rendija Canyon. Five boreholes in Pajarito Canyon will be completed manually using a hand auger (or hand-held power auger if required) and nine boreholes will be drilled with an 8¼-inch outside diameter (OD) hollow-stem auger equipped with a continuous core barrel sampler (see Table 1 and Figure 1). Boreholes will be over-drilled (reamed) with an 11-inch OD hollow-stem auger for installation of 4-inch diameter PVC monitoring wells. The boring in Rendija Canyon will be drilled with an air-rotary casing hammer rig because of the abundance of large cobbles in the geological formation in the area (see Table 2 and Figure 2). Water or other fluids will not be used for any drilling method anticipated for this project.

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Drilling Plan for Pajarito and Rendija Canyons Alluvial Wells

The installation of new monitoring wells is primarily intended to provide hydrogeology and groundwater water-quality data to achieve specific data quality objectives consistent with the Water Stewardship Project for LANL. Secondary objectives for new monitoring wells and boreholes are to collect geologic cores and/or cuttings samples, and to collect screening groundwater samples of any encountered perched zones for possible contaminants.

Table 1.0
Pajarito Canyon Alluvial Well Drilling Requirements

Well	Location	Approximate Alluvial Thickness/ Borehole Depth	Drilling Method	Sampling/Core Needs	Estimated Screen Length	Well Material (diameter)
PCAO-B	Upper Pajarito Canyon west of SR 501	~10/15 ft	Hollow-stem auger	None	5 ft	PVC (4 in. inner diameter [ID])
PCAO-2	Upper Pajarito Canyon below the confluence with Starmer Gulch	~3/8 ft	Manual drive point	Collect sample at 5 ft bgs and base of alluvium	1.5 ft	PVC 1.0 in. OD
PCAO-3	Upper Pajarito Canyon below the confluence with South Anchor East Basin	~10/15 ft	Manual drive point	Collect sample at 5 ft bgs and base of alluvium	5 ft	PVC 1.0 in. OD)
PCAO-4	Middle Pajarito Canyon above the confluence with Twomile Canyon	~10/15 ft	Manual drive point	Collect sample at 5 ft bgs and base of alluvium	5 ft	PVC 1.0 in. OD)
PCAO-5	Middle Pajarito Canyon immediately below Flood Retention Structure	~20/25 ft	Hollow-stem Auger	Collect core sample at 10 ft intervals and at base of alluvium	10 ft	PVC (4 in. ID)

Drilling Plan for Pajarito and Rendija Canyons Alluvial Wells

Well	Location	Approximate Alluvial Thickness/ Borehole Depth	Drilling Method	Sampling/Core Needs	Estimated Screen Length	Well Material (diameter)
PCAO-7(a)	Lower Pajarito Canyon below Threemile Canyon North of Pajarito Rd	~70/75 ft	Hollow-stem Auger	Collect core sample at 10 ft intervals and at base of alluvium	10 ft	PVC (4 in. ID)
PCAO-7(b)	Lower Pajarito Canyon below Threemile Canyon North of Pajarito Rd	~70/75 ft	Hollow-stem Auger	Collect core sample at 10 ft intervals and at base of alluvium	10 ft	PVC (4 in. ID)
PCAO-7(c)	Lower Pajarito Canyon below Threemile Canyon South of Pajarito Rd	~70/75 ft	Hollow-stem Auger	Collect core sample at 10 ft intervals and at base of alluvium	10 ft	PVC (4 in. ID)
PCAO-8	Lower Pajarito Canyon south of TA-54	~40/45 ft	Hollow-stem Auger	Collect core sample at 10 ft intervals and at base of alluvium	10 ft	PVC (4 in. ID)
PCAP-1(a–b) piezometer nest	Lower Pajarito Canyon south of TA-54	~40/45 ft	Hollow-stem Auger	Collect core samples at 10 ft intervals and at base of alluvium	(a) 0.5ft (b) 0.5 ft	PVC (1 in. ID)
PCAP-2(a–b) piezometer nest	Lower Pajarito Canyon south of TA-54	~40/45 ft	Hollow-stem Auger	Collect core samples at 10 ft intervals and base of alluvium	(a) 0.5 ft (b) 0.5 ft	PVC (1 in. ID)

Drilling Plan for Pajarito and Rendija Canyons Alluvial Wells

Well	Location	Approximate Alluvial Thickness/ Borehole Depth	Drilling Method	Sampling/Core Needs	Estimated Screen Length	Well Material (diameter)
TMO-1	Lower Two Mile Canyon near confluence with Pajarito	~10/15 ft	Manual Drive Point	Collect sample at 5 ft bgs and base of alluvium	5 ft	PVC 1.0 in. OD)
3MAO-1	Lower Three Mile Canyon west of TA-18	~10/15 ft	Manual Drive Point	Collect sample at 5 ft bgs and base of alluvium	5 ft	PVC 1.0 in. OD
3MAO-2	Upper Three Mile Canyon just below confluence with West Fork of Three Mile Canyon in Reach TM-1 East	~30/35 ft	Hollow-stem Auger	Collect core sample at 10 ft intervals and at base of alluvium	10 ft	PVC (4 in. ID)

Table 2.0
Rendija Canyon Alluvial Well Drilling Requirements

Well	Location	Approximate Alluvial Thickness/ Borehole Depth	Drilling Method	Sampling/Core Needs	Estimated Screen Length	Well Material (diameter)
RCA0-1	Rendija Canyon above Guaje confluence	~40/40 ft	Air Rotary casing hammer	None	10 ft	PVC (4 in. ID)

Hollow-Stem Auger Drilling

Each of the nine hollow-stem auger boreholes, PCAO-B, PCAO-5, PCAO-7(a), PCAO-7(b), PCAO-7(c), PCAO-8, PCAP-1(a-b), PCAP-2(a-b), and 3MAO-2 will be continuously cored five feet into tuff using 4.25 inch inside diameter (ID) hollow-stem augers with a split-barrel sampler to total depth (TD). All auger drilling activities will be performed to appropriate ERSS SOPs, Laboratory guidance documents, and protocol. Core will be field screened for VOCs, visually inspected, and geologically logged. Nominal total depth and analytical sample collection depths are presented in Table 1.

Proposed hollow-stem auger borehole locations are presented on Figure 1. The depth and sampling requirements for each borehole and sampling locations are described in Table 1.0. Analytical suite sampling requirements are presented in Table 4.0.

Air Rotary Drilling

Borehole RCAO-1 in Rendija Canyon will be drilled to TD using an air-rotary coring method that will continuously core to a target depth of five feet into bedrock using 3.5 inch outside diameter (OD) air rotary double tube core barrel. The air-rotary core drilling will be completed using dry compressed air supplied by an on site compressor. No fluids will be injected into the drilling system. A LANL supplied dust suppression system will be connected to the drill rig return line, reducing dust emissions produced by the dry core drilling operation. All air-rotary drilling activities will be performed to appropriate ERSS SOPs, Laboratory guidance documents, and protocols. Core will be field screened for VOCs, visually inspected, and geologically logged. Nominal total depth and sample collection depths are presented in Table 2.0. Note that the drilling method for this borehole may change.

The proposed air-rotary borehole location is presented on Figure 2. The depth and sampling requirements for this borehole and sampling location are described in Table 2.0.

Manual Drive Points

Five locations, PCAO-2, PCAO-3, PCAO-4, TMO-1, and 3MAO-1, in Pajarito Canyon and its tributaries have proposed boreholes and monitoring wells installed manually, using a hand auger (or hand-held power auger) to penetrate to TD or refusal. Analytical samples will be collected every 5 feet beginning at 5 ft bgs. Cuttings will be field screened for VOCs, visually inspected, and geologically logged.

Proposed manual-augering borehole locations are presented on Figure 1. The depth and sampling requirements for each borehole and sampling location are described in Table 1.0. Analytical suite sampling requirements are presented in Table 4.0.

Dry Decontamination

All drilling and sampling equipment will be cleaned before being brought on site and decontaminated after use at each borehole. The core barrel, samplers, and all sampling scoops and bowls will be cleaned between sample intervals. Dry decontamination methods and/or cleaning with Fantasik™ will be used to minimize waste products. At a minimum, rinsate blanks on drilling equipment will be collected at a frequency of 1 for every 10 samples taken for quality assurance (QA)/ quality control (QC) verification on decontamination procedures. If dry decontamination methods are inadequate then wet methods may have to be employed.

4.0 SAMPLE COLLECTION AND DOCUMENTATION

Retrieval of Core and Field Screening

Continuous core will be geologically logged and sampled for appropriate field screening. Sample jars and/or plastic re-sealable bags will be filled with discrete segments of the core for field screening. All samples taken from the core and delivered to the SMO will be field screened for gross radioactivity prior to delivery. These measurements will be recorded on borehole logs and sample collection logs.

Core will be logged according to ERSS SOP 12.01 and visually inspected for fractures, staining, moisture content, saturated conditions, and other geological features. These observations will be recorded on borehole logs. All core will be field screened for volatile organic compounds (VOCs) using a hand-held instrument and the headspace method, given in ERSS SOP 6.33. A photo-ionization detector (PID), equipped with a 10.6 (eV) lamp, will be used to measure VOC concentrations associated with the core. These measurements will be recorded on borehole logs.

Detailed logs of each boring shall be completed in the field by a qualified geologist and classified in accordance with Unified Soil Classification System, American Society for Testing and Materials (ASTM) D2487 and D2488, or American Geological Institute (AGI) Methods for Soil and Rock Classification. For each boring, the following information will be recorded on the borehole logs: percent recovery, lithology and respective unit thickness, color (according to Munsell rock and/or soil color chart), relative moisture content, grain size and distribution, and other pertinent observations. Core will also be digitally photographed.

Collection of Soil and Rock Characterization Samples

The field team will collect soil and rock characterization samples from recovered core/cuttings at 13 of the total 15 boreholes (as indicated in Tables 1.0 and 2.0) to define the nature and extent of possible subsurface contamination and presence of groundwater. ERSS SOPs 6.46 and 9.01 will be followed and all samples will be shipped through the Sample Management Office (SMO) to fixed laboratories for analysis. Sampling documentation and collection will follow ERSS SOPs ENV-DO-206, 1.03, EP-ERSS-SOP-5058, R0, 1.05, and EP-ERSS-SOP-5060, R0 as applicable. Samples will be homogenized and collected using stainless steel bowls and spoons and placed into pre-approved sample containers provided by the LANL SMO. The analytical suites for samples in each borehole are listed in Table 4.0.

Analytical samples from the core/cuttings will be collected at least every 5 or 10 ft, as indicated in Tables 1.0 and 2.0, and at the base of the alluvium, and at TD if deemed necessary. Samples will also be collected from intervals where contamination is suspected if visual inspection identifies staining or field screening indicates probable contamination.

QA/QC samples will include field duplicates, trip blanks, and rinsate blanks that will be collected following ERSS SOP 1.05. At a minimum, one field duplicate (FD) sample will be collected at each borehole or 1 per every 10 characterization samples collected, whichever is more frequent. Sampling equipment rinsate blanks will be collected 1 per every 10 characterization samples to evaluate sampling equipment decontamination procedures.

All sample collection activities will be coordinated with the LANL SMO. Upon collection, samples will remain in controlled custody of the field team at all times, stored in the sample staging area,

until they can be delivered to the SMO. All samples will be field screened for radioactivity prior to submittal to the SMO to ensure compliance with Department of Transportation (DOT) requirements. Upon receipt of the samples, custody will be remanded over to the SMO for delivery to a pre-approved off-site analytical lab.

5.0 INSTALLATION, DEVELOPMENT AND SURVEY OF GROUNDWATER MONITORING WELLS

If groundwater is encountered during drilling, a monitoring well will be installed in the borehole and developed to monitor and characterize the alluvial groundwater. Monitoring wells are to be installed per ERSS SOP EP-ERSS-SOP-5032, R0 and calculated and actual annular fill volumes shall be recorded. The boreholes are estimated to intersect the shallow alluvial aquifer between 5 and 60 feet bgs. Specifications to be followed during well installation are detailed below. Any changes to these specifications by TerranearPMC upon execution of this fieldwork will be coordinated with and approved by the LANL STR prior to implementation.

1. **Well Casing:** Well casing for boreholes PCAO-B, PCAO-5, PCAO-7 (a-c), PCAO-8, 3MAO-2, and RCAO-1 will consist of new, threaded, 4 inch ID, flush-joint PVC pipe. Well casing in wells PCAP-1 (a-b),and PCAP-2 (a-b) will consist of new, threaded, 1 inch ID, flush-joint PVC pipe and will conform to the requirements of ASTM F 480-81 SDR 13.5 (schedule 40) and to the National Sanitation Foundation potable water quality grade pipe. Well casing for boreholes PCAO-2, PCAO-3, PCAO-4, TMO-1, and 3MAO-1 will consist of new, threaded, 1.0 in OD, flush-joint PVC casing. Riser pipes will be delivered on-site wrapped and marked to identify the material.
2. **Well Screens:** Well screens will consist of a non-contaminating, factory-slotted, flush-joint, schedule 40 PVC and will conform to the same standards required for well casing. The planned screen slot width for all wells is 0.010 inches, unless another, more appropriate, screen slot width is determined for individual boreholes based on observations during drilling and in consultation with the LANL STR. Planned screen lengths for each well are provided in Table 1.0 and 2.0 and range from 5 to 10 ft for the 4-in ID wells, 1.5 to 5 ft for the manually installed wells, and 0.5 ft for the nested piezometers. Well screens will be placed within the saturated zone of the borehole and span the static water level determined during drilling.
3. **Filter Pack:** A silica sand filter pack will be installed in each borehole to facilitate flow into and through the well screen, extending from the bottom of the hole to approximately five feet above the top of screen. The size of the filter pack material will be determined based on the gradation of the formation material and approved by the LANL STR prior to placement as part of the final well design. All filter pack material will be emplaced as augers are retracted. The filter pack will be swabbed after emplacement to facilitate settlement and development of the well. In the manually augured boreholes, PCAO-2, PCAO-3, PCAO-4, TMO-1, and 3MAO-1; PVC pre-packed screens will be installed. Pre-packed screens for manually augured boreholes will consist of nominal 0.5 to 5.0 ft length, 1.7 inch OD (a 65 mesh stainless steel outer layer is available on pre-pack) schedule-40 PVC, with 20/40 silica sand and a 0.010 slotted screen. Final pre-pack screen dimensions and filter pack size will be at discretion of LANL STR based on actual conditions encountered. Pre-packed screens may be used in deeper wells (drilled by hollow-stem augur) also at the discretion of the LANL STR.
4. **Seal and Grout:** A 2- to 5-foot thick annular bentonite seal will be installed above the filter pack in the well annulus. Bentonite pellets or chips will be emplaced as the auger is

retracted, by tremie or hand dropped into the borehole, depending on depth, and hydrated with potable water, following manufacturer guidelines. The well annulus will be sealed with grout slurry composed of pumpable Portland cement slurry with 2-5% bentonite, placed through a tremie pipe or through the augers as they are retracted. The field team will record the exact quantity of each component used in the production of grout slurry.

5. **Well Completion/Protection:** Wellhead completion will include a protective outer casing, concrete pad, four corner bollards, and tamper-proof well cover plate. LANL will provide the tamper-proof cover plate. Bollards will be painted yellow for visibility. Bollards are not required at remote locations where vehicle access is not anticipated. Pad dimensions will be a 2 ft square of 6-in.-thick concrete slab set into the ground surface. A brass monument will be placed in the northwest corner of the concrete pad as a survey marker point. Temporary wellhead protection measures will be maintained during all drilling and development activities so unauthorized individuals shall not have access to the open borehole/well.

6. **Pump Installation:** Dedicated stainless steel bladder pumps will be installed in all completed wells as appropriate to the actual well design and hydraulic conditions encountered at each well site. It is anticipated that the appropriate size and type of system will be chosen in consultation with the LANL STR in the well design stage. Dedicated pump systems will use a portable battery powered pumping apparatus, such as the Geotech Geocontroller 2® and/or GeoControl Pro®, to extract aquifer water. Pumps will not be installed until well development is deemed complete by the LANL STR.

7. **Tranducers:** In-situ LevelTroll® 500 series vented pressure transducers will be installed in all completed wells for long-term monitoring. Transducers are temperature compensated with full scale pressure and temperature accuracy rated at ± 0.25%. Transducers will be turned over to LANL for installation. Final specifics (pressure range, cable length, etc.) of transducers will be determined in consolation with the LANL STR after well completion and development.

Forty-eight (48) hours after and within the first week of wellhead completion (the well will be developed 48 hr after cement pour if wellhead completion is delayed) the well will be developed to remove cuttings, mobile particulates, and entrapped gases from within and adjacent to the well. Monitoring wells will be developed per ERSS EP-ERSSS-SOP-5033, R0. Installed wells will be pumped or bailed and/or swabbed, or a combination of all three, until the following criteria are met:

1. Well water is clear and measured turbidity is 5 nephelometric turbidity units (NTUs) or less and measured pH, specific conductivity, and temperature have stabilized.
2. A minimum of "five times the standing water volume" is removed[1]

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[1] The "five times (5X) the standing water volume" is calculated to include the well screen and casing plus saturated annulus and assumes 30 percent annular porosity, and assumes that no water was used in the drilling or installation stages of the well.

During development, the field team will ensure that no petroleum products, oils, lubricants or hydraulic fluids are introduced into the well. Also, the LANL Project PM will be contacted if any of the following circumstances occur:

1. Well recharge is so slow that the required volume of water cannot be removed during 10 consecutive hours of development
2. Groundwater samples show persistent water discoloration after well development
3. Sediment remains after well development.

On-site potable and contaminant-free water required for proper well installation, grouting and equipment washing will be provided by the drilling contractor.

A geodetic survey will be conducted after all wells are installed and surface completions finished. Survey results will be delivered to the appropriate LANL personnel for entry into the LANL database system. Survey results (northing, easting, and elevation) will be given in New Mexico state plane coordinate system, North American Datum (NAD) 1983 for results to brass monument and to top of casing (TOC) for each completed well. Abandoned borings will be surveyed at ground surface location.

6.0 FORMATION WATER LEVEL MONITORING

All monitoring wells installed under this drilling plan are slated for long-term monitoring of water levels. In-situ levelTroll® 500 series vented pressure transducers will be installed for long-term monitoring. ERSS SOPs 7.01 and 7.02 will be followed for installation of pressure transducers.

7.0 WASTE MANAGEMENT AND DISPOSAL

Investigation-derived waste (IDW) refers to all solid waste generated during the drilling operations in Pajarito and Rendija Canyons. The anticipated IDW may include, but is not limited to, (1) drill cuttings; (2) personal protective equipment (PPE); (3) other wastes that may potentially come in contact with contaminants such as plastic, glass, disposable sampling supplies and solid decontamination wastes; (4) spent field-screening supplies, (5) well purge water, (6) petroleum contaminated soil; and (7) petroleum contaminated absorbent materials.

It is anticipated that the IDW generated during implementation of the drilling operations will be characterized as non-hazardous waste, but as a conservative practice all waste will be stored inside a <90 day RCRA Hazardous Waste Storage Area until a final hazardous waste determination is made. Waste characterization and determination will be completed using one or more of the following methods: (1) Acceptable Knowledge (e.g. review of existing data and/or documentation), (2) characterization sampling, (3) direct sampling of waste. Regardless, all wastes generated during each investigation will be characterized, stored in a proper waste accumulation area, managed, and disposed per the processes defined in the approved site-specific Waste Characterization Strategy Forms (WCSFs) as well as in accordance with all applicable ERSS SOPs. SOPs applicable to the characterization and management of IDW are: EP-ERSS-SOP-5022, R0 and SOP-1.10.

Waste containers will be selected based on appropriate DOT requirements, waste types, and the estimated volumes generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information regarding waste classification, item(s), and date generated. Waste will be stored in clearly marked and appropriately constructed and managed waste accumulation areas. Waste accumulation area

postings, regulated storage duration, and inspection requirements will be based on the type of IDW and its classification. The remote locations of some manual dug boreholes will make it necessary to carry 4 five-gallon buckets to each site to store waste produced during the hand auguring, well installation, and development of each well. The waste will be stored on site until characterization has been determined and then either land applied or manually packed out of each remote site.

It is anticipated that all waste will be disposed of at one of the following locations, as appropriate: (1) an approved non-hazardous solid waste disposal facility, (2) an approved offsite hazardous waste disposal facility, (3) a NM Special Waste landfill (or an out-of-state equivalent). No waste will be generated during any of these investigations that does not have an identified disposal path.

7.0 BOREHOLE ABANDONMENT

If boreholes with a TD greater than 20 ft are abandoned, they will be filled with bentonite grout by filling upward from the bottom through augers as they are retracted or via tremie pipe to within 2 ft of the surface. The remainder of the boring will be cemented/grouted to surface grade.

Abandonment of shallow borings (TD ≤ 20 ft) will deviate slightly from the procedures outlined in EP-ERSS-SOP-5034, R0 and the NMED Consent Order (NMED 2005). Borings less than 20 ft TD will be filled with bentonite pellets or chips, hydrated during placement, to within 2 ft of the surface (bentonite grout may also be used if deemed more appropriate). The remainder of the boring will be cemented/grouted to surface grade.

After 24 hours, the backfilled level for all abandon borings shall be checked for settlement and additional concrete/grout added as needed. The placement of backfill materials will be documented with regard to volume used, including calculated vs. actual volumes, intervals of placement, and additives used to enhance backfilling. Water needed for mixing and hydrating material will be supplied by the drilling contractor.

8.0 SITE DEMOBILIZATION AND RESTORATION

Upon completion of investigation activities, all investigation-related equipment and materials will be promptly removed from the site. Staging areas no longer in use will be dismantled. Due to pending waste characterization results, site demobilization will be completed in two phases: (1) following completion of drilling, sampling, and well installation activities and (2) following the removal of waste containers, after receipt of waste characterization results.

9.0 RESTRICTIONS AND PLANS

Wildland fire restrictions for LANL were rescinded on July 13, 2006. Currently (October, 2007) the fire danger rating is low and proper fire control measures will be in place for the rated fire danger during all drilling or other activities. Forest fire and other fire and spark and flame issues are addressed in the IWD process and job hazard and analysis.

Work will be done under a site-wide Storm Water Pollution Prevention Plan (SWPPP) and all work activities will adhere to the SWPPP as applicable.

10.0 PERSONNEL AND SUBCONTRACTORS

Personnel shall be primarily drawn from the TerranearPMC Los Alamos Office and will consist of Andy Crowder as program manager; Eric Tow, Deborah Steven, and Richard Leishman while Bob Gray and Steve Maze of Daniel B. Stephens and Associates (DBS&A) will act as geologists for field work (including backup and alternate personnel). Selene Moseley will assist with onsite waste management services. In addition to DBS&A, subcontractors consist of Rick Haaker of AQ Safety to provide health and safety oversight and IWD author; Jeff Lee of Energy Solutions will be the site safety officer and will provide waste management services; Mitch Noonan of Southwest Mountain Survey will provide geodetic surveying; WDC Exploration, Inc. will provide drilling services, American Fence Co. will provide installation of necessary fencing, and Comforce will provide needed security escorts.

TABLE 3.0 ERSS SOPs

The following SOPs are applicable to the investigation methods proposed in this plan:

EP-DIR-SOP-2011, R2	Personnel Training and Qualifications
EP-DIR-SOP-4001, R3	Document Control
EP-DIR-SOP-4003, R1	Records Management
EP-DIR-SOP-4004, R0, IPC 1	Records Transmittal and Retrieval Process
EP-DIR-SOP-5006, R0	Control of Measuring and Test Equipment
EP-DIR-8001, R0	Inspection, Test, and Acceptance
EP-ERSS-SOP-4002, R0	Document Development
EP-ERSS-SOP-4005, R0	Peer Review Process
EP-ERSS-SOP-5014, R0	Access to ADEP Geospatial Repositories
EP-ERSS-SOP-5018, R0	Integrated Fieldwork Planning and Authorization
EP-ERSS-SOP-5055, R0	General Instructions for Field Investigations
EP-ERSS-SOP-5056, R0	Sample Container and Preservation
EP-ERSS-SOP-5057, R0	Handling, Packaging and Transporting Samples
EP-ERSS-SOP-5058,R0	Sample Control and Field Documentation (includes Class)
EP-ERSS-SOP-5059,R0	Field Quality Control Samples
EP-ERSS-SOP-5022, R0	Characterization and Management of ER Project Wastes
EP-ERSS-SOP-5060, R0	Operational Guidelines for Taking Soil and Water Samples in Explosive Areas
EP-ERSS-SOP-5061, R0	Field Decontamination of Drilling and Sampling Equipment
EP-ERSS-SOP-5029,R0	Drilling Plan Development
EP-ERSS-SOP-01.12, R0	Field Site Closeout Checklist
EP-ERSS-SOP-5028.R0	Coordinating and Evaluating Geodetic Surveys
EP-ERSS-SOP-5032, R0	Well Construction
EP-ERSS-SOP-5033, R0	Well Development
EP-ERSS-SOP-5034, R0	Monitoring Well and RFI Borehole Abandonment
ENV-DO-203, R0	Water Quality Analyses
SOP -06.03, R3	Sampling of Volatile Organic Compounds in Groundwater
SOP-06.09, R2	Spade and Scoop Methods for the Collection of Soil Samples
SOP-06.10, R3, IPC 1	Hand Auger and Thin-Wall Tube Sampler
SOP-06.26, R2	Core Barrel Sampling for Subsurface Earth Materials

SOP-6.33, R0	Headspace Vapor Screening with a Photo Ionization Detector
ENV-DO-201, R1	Pressure Transducer Installation, Removal, and Maintenance
ENV-DO-202, R0	Manual Water-Level Measurements
EP-ERSS-SOP-5077, R0	Field Sampling of Core and Cuttings for Geological Analysis
SOP-12.01, R4	Field Logging, Handling, and Documentation of Borehole Materials

11.0 REFERENCES

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