ESHID-601047

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Date: DEC 15 2015
Refer To: ADESH-15-181
LAUR: 15-29446
Locates Action No.: 1600103_02

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 Drilling Work Plan for Alluvial Piezometers in Sandia Canyon

Dear Mr. Kieling:

Enclosed please find two hard copies with electronic files of the Drilling Work Plan for Alluvial Piezometers in Sandia Canyon. This work plan fulfills New Mexico Environment Department's requirement in its approval with modifications for the Work Plan for Chromium Plume-Center Characterization, dated October 15, 2015, to submit a supplemental work plan for the infiltration investigation in Sandia Canyon by December 31, 2015.

A completion date of early spring 2018 to install the piezometers is proposed in the work plan, reflecting current estimates of the completion based on this scope not being specifically included in the contract between the U.S. Department of Energy Environmental Management Los Alamos Field Office (DOE-EM-LA) and Los Alamos National Security, LLC (LANS). DOE-EM-LA and LANS will actively work to modify the current contract to be able to install the piezometers within the contract period (fiscal years 2016 and 2017); however, until this modification occurs, the piezometers cannot be installed before early spring 2018.

If you have any questions, please contact Stephani Swickley at (505) 606-1628 (sfuller@lanl.gov) or Cheryl Rodriguez at (505) 665-5330 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Bruce Robinson, Program Director
Environmental Remediation Program
Los Alamos National Laboratory

Sincerely,

David S. Rhodes, Supervisor
Environmental Management
Los Alamos Field Office

BR/DR/SF/SS:sm

Enclosures: Two hard copies with electronic files – Drilling Work Plan for Alluvial Piezometers in Sandia Canyon (EP2015-0209)

Cy: (w/enc.)
emla.docs@em.doe.gov
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Stephani Swickley, ADEP ER Program, MS M992

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Raymond Martinez, San Ildefonso Pueblo
Dino Chavarria, Santa Clara Pueblo
Steve Yanicak, NMED-DOE-OB, MS M894
Steve White, ADEP (w/ MS Word files on CD)
Public Reading Room (EPRR)
ADESH Records
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Drilling Work Plan for Alluvial Piezometers in Sandia Canyon

Primary Purpose	In accordance with the New Mexico Environment Department's (NMED's) approval with modifications for the work plan for chromium plume center characterization, dated October 15, 2015 (NMED 2015, 600958), Los Alamos National Laboratory (LANL or the Laboratory) proposes the following locations, drilling, and preliminary design information for a series of new alluvial piezometers in lower Sandia Canyon. This work plan fulfills NMED's requirement to submit a supplemental work plan for the infiltration investigation in Sandia Canyon (NMED 2015, 600958). As stated in the work plan for chromium plume center characterization, dated July 2015 (LANL 2015, 600615), the purpose of the piezometers is to evaluate infiltration over the portion of Sandia Canyon where it is believed that the majority of historical and present-day infiltration occurs (Figure 1). The overall objective of the piezometer configuration will be to evaluate the integrated area of infiltration over the proposed study area. The general approach will be to obtain pressure data at varying depths throughout the saturated portion of the alluvium. Pressure data will be used to refine the current hydrologic model for infiltration of effluent and other surface water sources in Sandia Canyon. The data will also be used to establish a baseline to compare with potential future changes that may occur either because of operational changes in effluent volumes or future remediation strategies that may include discharge of treated groundwater to Sandia Canyon above the infiltration zone monitored by the piezometers. An additional objective is to further constrain the upgradient extent of infiltration in Sandia Canyon. Figure 2 shows the predicted geology and conceptual monitoring design. The final design may change based on observations during drilling.
Piezometer Array Configuration and Completion Design	The proposed approach involves installing pressure monitoring points in a series of transects located along the Sandia Canyon valley floor. Each transect would consist of three boring locations that span the alluvial-fill portion of valley floor where alluvial saturation would likely be present. Figure 1 shows approximate locations for each transect and two additional upgradient piezometers. The estimated maximum depth for the borings is expected to be approximately 50 ft. Each boring would be instrumented with three vertically discrete monitoring points using vibrating wire transducers (VWT). The VWT units will be directly buried within the borehole using sand pack around each instrument and bentonite emplaced to hydraulically separate each transducer. The lower-most instrument will be placed in the bottom of the borehole just above the bedrock contact, and each instrument above that will be separated by approximately 3 ft. Figure 2 shows the conceptual design for installation of three transducers within a borehole. Each instrument is constructed with a pressure-sensitive diaphragm attached to a wire and is expected to have decades-scale longevity.
Drilling Approach	The estimated maximum depth for the piezometers will be approximately 50 ft, so drilling will be accomplished with hollow stem auger drilling or by direct-push drilling. The two upgradient locations will be installed by hand auger. The goal will be to identify the top of bedrock in each borehole, then backfill the borehole with bentonite to the base of alluvium to create a seal to ensure no preferential seepage occurs because of construction.
Groundwater Occurrence	Based on existing alluvial wells and piezometers in the area, the saturated thickness of alluvial groundwater is highly variable. Water-level variability is driven by hydraulic response to the daily variations in effluent discharge, periodic storm flows, and seasonality. Instruments will be preferentially placed in the lower-most portion of each borehole to ensure they are in zones most likely to have persistent saturation.

Core Sampling	A limited amount of core collection is planned for some of the borings. Core will be collected from several borings to identify the bedrock/alluvium interface and to facilitate identification of that contact using cuttings in other boreholes. It is anticipated that coring will be accomplished with a continuous core barrel sampler and auger drilling.
Investigation-Derived Waste Management	Investigation-derived waste (IDW) will be managed in accordance with standard operating procedure (SOP) 10021, Characterization and Management of Environmental Program Waste (http://www.lanl.gov/community-environment/environmental-stewardship/plans-procedures.php). This SOP incorporates the requirements of applicable U.S. Environmental Protection Agency and NMED regulations, U.S. Department of Energy orders, and Laboratory requirements. The primary waste streams will include drill cuttings and contact waste. Drill cuttings will be managed in accordance with the NMED-approved Decision Tree for Land Application of IDW Solids from Construction of Wells and Boreholes (November 2007). Initially, drill cuttings will be stored in U.S. Department of Transportation–approved containers and managed as non-hazardous waste. Representative samples of the drill cuttings will be collected and analyzed, and waste determinations will be made from validated data. If validated analytical data show these wastes cannot be land-applied, they will be placed in accumulation areas appropriate for the classification of waste. Cuttings that cannot be land-applied and are designated as hazardous waste will be sent to an authorized treatment, storage, or disposal facility. Decontamination water will be containerized separately at the point of generation, placed in an accumulation area appropriate to the type of waste, and directly sampled. Contact waste will be containerized at the point of generation, placed in an appropriate accumulation area, and characterized using acceptable knowledge or the media with which it came in contact.
Schedule	The Sandia Canyon alluvial piezometers will be completed by early spring of 2018.

REFERENCES

The following list includes all documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID or ESH ID. This information is also included in text citations. ER IDs were assigned by the Environmental Programs Directorate's Records Processing Facility (IDs through 599999), and ESH IDs are assigned by the Environment, Safety, and Health (ESH) Directorate (IDs 600000 and above). IDs are used to locate documents in the Laboratory's Electronic Document Management System and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the ESH Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), July 2015. "Work Plan for Chromium Plume Center Characterization," Los Alamos National Laboratory document LA-UR-15-24861, Los Alamos, New Mexico. (LANL 2015, 600615)

NMED (New Mexico Environment Department), October 15, 2015. "Approval with Modifications, Work Plan for Chromium Plume Center Characterization," New Mexico Environment Department letter to D. Hintze (DOE-NA-LA) and M. Brandt (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2015, 600958)

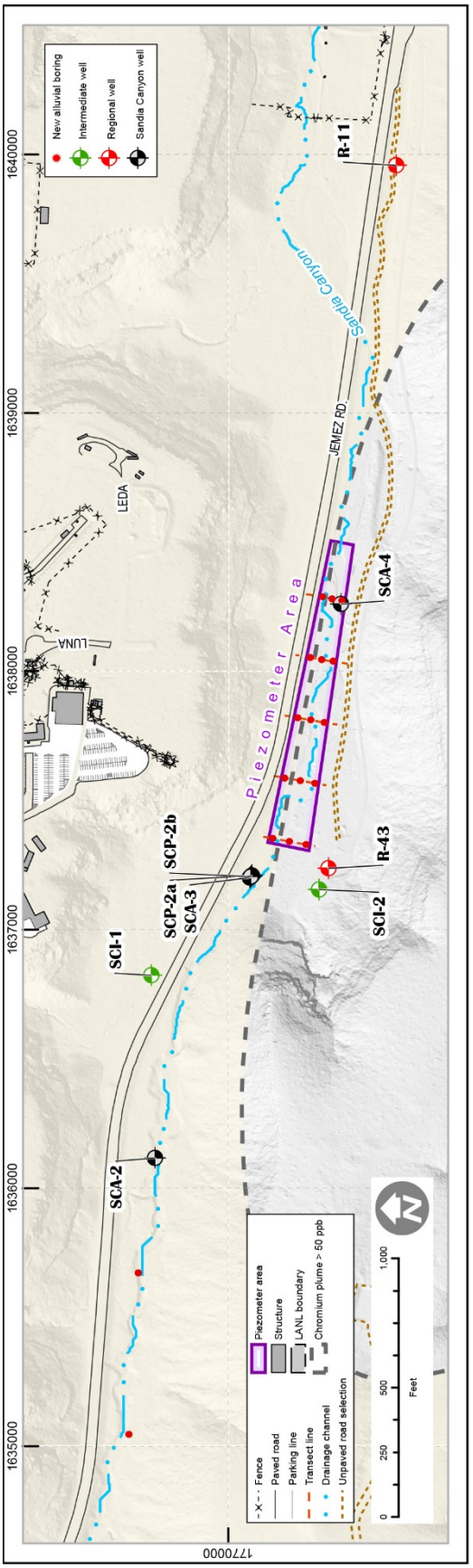

Figure 1 Proposed locations for Sandia Canyon alluvial piezometers

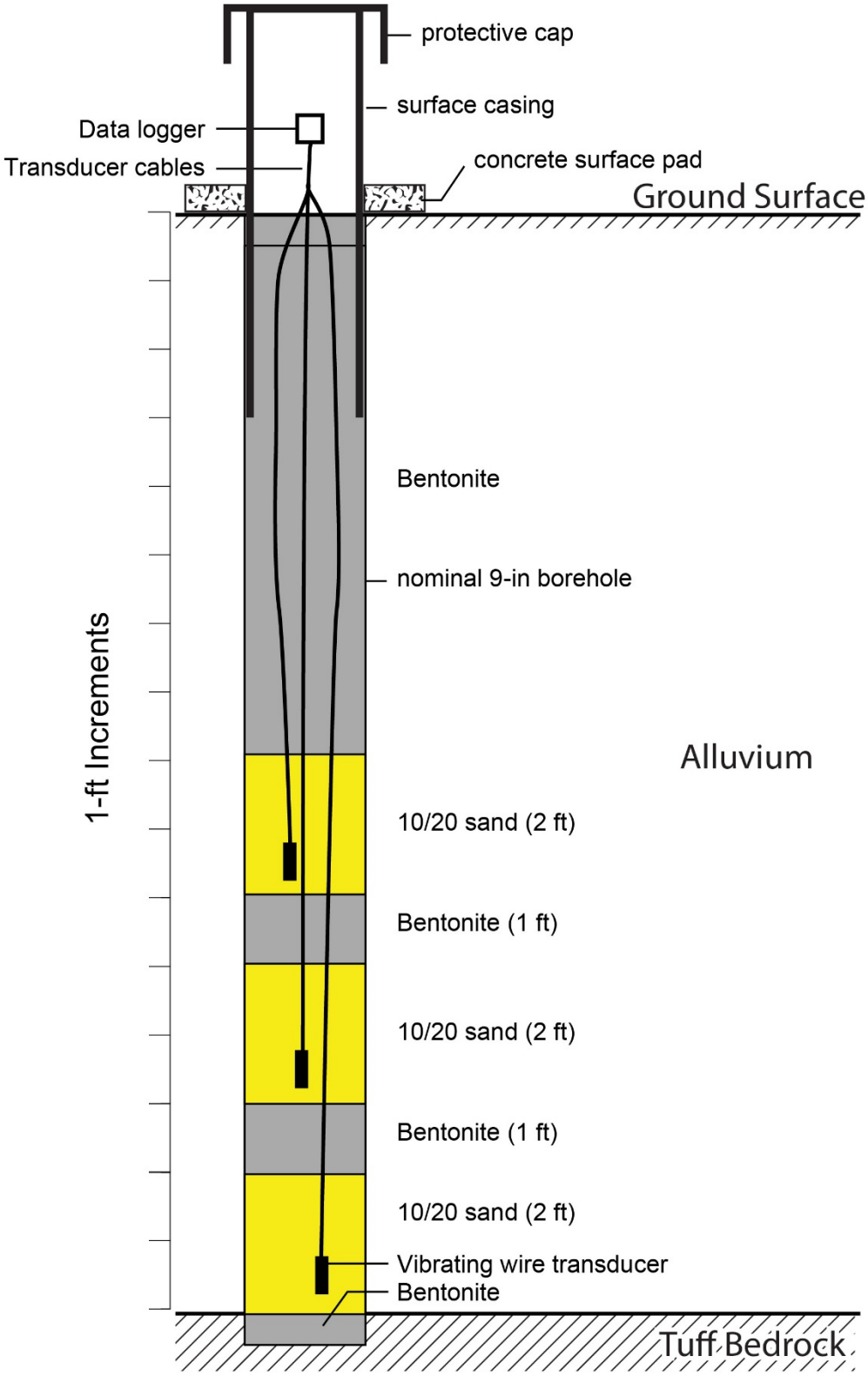

Figure 2 Predicted geology and conceptual well design for piezometers