



Department of Energy
Office of Legacy Management

NOV 24 2009

Tim Murphy, Chief
Bureau of Federal Facilities
Division of Environmental Protection
2030 E. Flamingo Road, Suite 230
Las Vegas, NV 89119-0818

Subject: Final Path Forward: Short-Term Data Acquisition Plan for New Closure Strategy
Subsurface Corrective Action Unit 447, Project Shoal Area, Nevada

Dear Mr. Murphy:

On July 20, 2009, the U.S. Department of Energy, Office of Legacy Management (DOE-LM), issued the draft *Path Forward for Subsurface, Corrective Action Unit 447, Project Shoal Area, Nevada*. Subsequent discussions with the Nevada Division of Environmental Protection, Bureau of Federal Facilities (NDEP), captured in meeting notes dated August 27, 2009, identified how the scope of activities might be revised to improve prospects for managed long-term stewardship of the Project Shoal Area (Shoal) site. NDEP recommended a stepped approach, beginning with a preliminary surface geophysics program and expanded ground water monitoring, to support the development of a new closure strategy for the site. Per NDEP's recommendations, analytical modeling of flow and transport using the code *REMClor* was omitted from the scope of activities. The initial elements of the revised path-forward strategy are described in this document.

Background

Environmental closure activities at the Shoal site near Fallon, Nevada, have followed the decision process prescribed in Appendix VI of the Federal Facility Agreement and Consent Order (FFACO). As part of the corrective action process, DOE-LM, issued the Desert Research Institute report titled *Validation Analysis of the Shoal Groundwater Flow and Transport Model*, dated February 2008. In the cover letter to that report the Legacy Management Support contractor, S.M. Stoller Corporation, stated that it was unable to confirm validation of the ground water flow and transport model. Concerns with the flow and transport model stemmed from two observations: (1) the flow model showed ground water primarily migrating toward the north-northeast, whereas gradients inferred from current water levels measured in wells at the site do not support the modeled flow direction; and (2) the model assumption that the ground water flow system is in a steady-state is incorrect in that water levels west of the shear zone at the site are rising by roughly 1 foot per year.

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REPLY TO: Grand Junction Office

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Pursuant to the FFACO process, DOE-LM will develop a new closure strategy for the Shoal site. The new strategy will be submitted to NDEP for review and approval. This letter summarizes the initial data acquisition plan and associated field investigations that will support development of the new closure strategy for the site.

Data Acquisition Plan

DOE-LM is currently planning to conduct two geophysical surveys and enhance the annual monitoring at the Shoal site. These activities will provide additional data associated with the geology and hydrogeology of the fractured granite underlying the site. A summary of the planned field activities is provided in the following sections.

Geophysical Investigations

DOE-LM is planning to conduct geophysical investigations at the Shoal site in an effort to resolve some of the uncertainty with respect to the ground water flow directions. The two methods under consideration are a seismic reflection survey and an electromagnetic survey. The objectives of the surveys are to obtain data that will help portray the water table configuration, evaluate the prevailing horizontal flow direction, and identify faults/major fracture zones that may affect ground water flow near the site. Small-scale feasibility tests are planned to evaluate each of the geophysical methods to determine if they are likely to provide useful data.

The seismic reflection survey being considered will use a 200 kilogram (or similar size) accelerated hammer as a source with optimum receiver spacing being determined by initial tests in the field. The objective of the seismic survey is to identify faults/shear zones and other structures that may affect ground water flow near the site. The feasibility test will be limited to roads on-site and is currently planned for the spring of 2010.

The electromagnetic survey being considered will use a tensor magnetotelluric technique referred to as controlled-source audio electromagnetics (CSAMT/MT). This geophysical technique determines the earth's subsurface electrical resistivity distribution by measuring time-dependent variations of the earth's natural electric and magnetic fields, as well as the electric and magnetic fields resulting from high-frequency induced waves. The tensor CSAMT/MT method is often used to find structures and subsurface materials that are good producers of ground water or to site high-yield production or monitor wells. The method is designed to investigate depths of 50 to 2,500 feet below ground surface, and, because data are acquired and modeled in two dimensions, horizontal and nonhorizontal features can be mapped accurately. The tensor CSAMT/MT method will not be limited to roads on-site and may image ground water elevation variations over relatively short distances in fractured bedrock. The feasibility test is currently planned for the spring of 2010.

If the initial feasibility tests are successful and provide useful data, a more comprehensive survey may be performed using one or both of the geophysical methods.

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Enhanced Monitoring

DOE-LM is planning to enhance the monitoring that is currently required at the Shoal site and specified in the March 2006 Corrective Action Decision Document/Corrective Action Plan, Rev 3. The enhanced monitoring will include collection of depth-to-water data from all wells/piezometers on-site (within the land withdrawal) and from off-site well H-2. In addition, off-site wells H-3 and HS-1 will be added to the water level network, pending negotiation of access. If access is obtained to these wells, transducers will be installed this fall. Refer to the enclosed figure for the well locations.

The enhanced monitoring will also include collection of samples annually from all wells on-site (within the land withdrawal) for analysis of tritium, isotopic uranium, elemental uranium, and gross alpha activity. Samples will also be analyzed for carbon-14 and iodine-129 on a 5-year basis beginning in 2010. DOE-LM will reevaluate the monitoring locations and frequency on an as-needed basis but will not make any changes to the monitoring program without approval from NDEP. Table 1 presents a summary of the enhanced monitoring program for the Shoal site.

Table 1. Enhanced Monitoring Program at the Shoal Site

Location	Distance from SGZ	Location Type	Monitoring Parameters	Continuous Water Level Monitoring
MV-1-Piezometer	940 feet	Piezometer	Water Level	Yes
MV-1-Well	940 feet	Well	Water Level/Radionuclides	Yes
MV-2-Piezometer	1,030 feet	Piezometer	Water Level	No
MV-2-Well	1,030 feet	Well	Water Level/Radionuclides	Yes
MV-3-Piezometer	1,030 feet	Piezometer	Water Level	Yes
MV-3-Well	1,030 feet	Well	Water Level/Radionuclides	Yes
HC-1	1,780 feet	Well	Water Level/Radionuclides	Yes
HC-2	1,830 feet	Well	Water Level/Radionuclides	Yes
HC-3	3,100 feet	Well	Water Level/Radionuclides	Yes
HC-4	560 feet	Well	Water Level/Radionuclides	Yes
HC-5	1,265 feet	Well	Water Level/Radionuclides	Yes
HC-6	980 feet	Well	Water Level/Radionuclides	Yes
HC-7	1,125 feet	Well	Water Level/Radionuclides	Yes
HC-8	1,640 feet	Well	Water Level/Radionuclides	Yes
H-2	3.5 miles	Well	Water Level	Yes
H-3*	2.1 miles	Well	Water Level	Yes
HS-1*	3.7 miles	Well	Water Level	Yes

* = assumes access to the well will be obtained.

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Reporting of Results

DOE-LM will continue to provide analytical results and depth-to-water data obtained from site monitoring in annual ground water monitoring reports. Results from the surface geophysics and seismic surveys will be provided to NDEP as a letter report. Data obtained from these activities will be used to support development of the new closure strategy for the site.

Please contact me at (970) 248-6018 if you have any questions or need additional information.

Sincerely,



Mark Kautsky
Site Manager

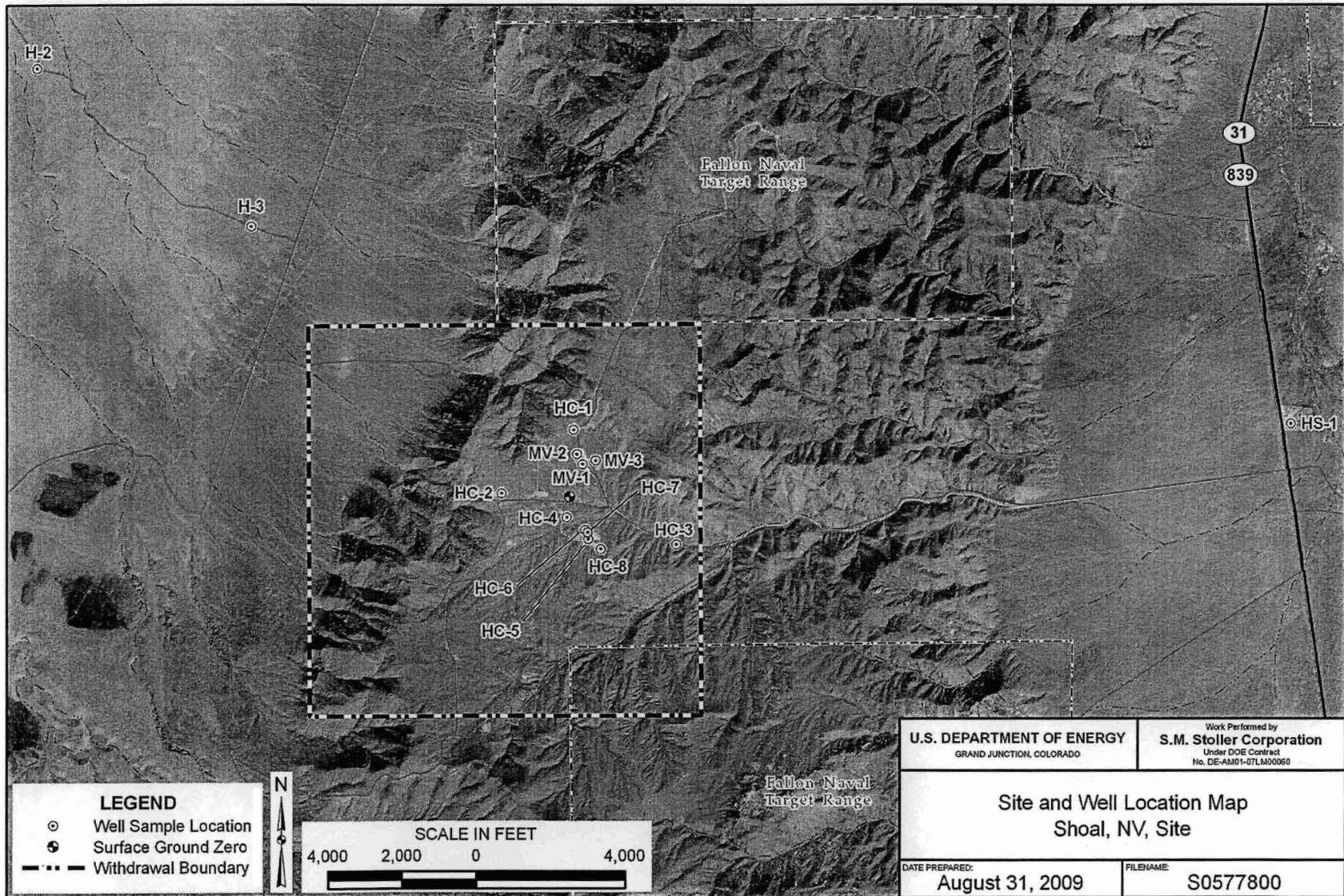
Enclosure:
As stated

cc w/enclosure:

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