Response to the Notice of Disapproval for the Work Plan for Supplemental Soil-Vapor Extraction Pilot Test Implementation/Reporting at Material Disposal Area G, Technical Area 54, Los Alamos National Laboratory EPA ID No: NM0890010515, HWB-LANL-08-048, Dated December 10, 2009

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment.

GENERAL COMMENTS

NMED Comment

1. *SVE is a remedy proposed in the Corrective Measures Evaluation (CME) for Material Disposal Area (MDA) G. The Permittees must have defensible evidence that demonstrates that SVE is a viable and effective component of remediation including sufficient data to design a full scale SVE system. In NMED's August 20, 2009 letter the Permittees were required to conduct a second pilot test, because the January 2009 Pilot Test for Evaluating Soil-Vapor Extraction at Material Area G at Technical Area 54, Revision 1 (Report) did not present sufficient information to determine whether or not SVE has the potential to be an effective part of remediation at MDA G.*

   The Permittees state that "[t]he results of the 2008 pilot test provide solid evidence that SVE is an effective method for extracting vapor-phase VOC contamination from the higher permeability Tshirege Members (Qbt 2, Qbt 1v, and Qbt 1g) of the Bandelier Tuff in the vadose zone beneath MDA G. The applied vacuum of approximately 5.8 kilopascals (kPa) (23.1 in. of water [in. H2O]) yielded an extraction airflow rate of approximately 104.9 standard cubic feet per minute (scfm). Based on the difference of the initial VOC concentrations and the final VOC concentrations over the 30-d test period, approximately 126.4 kg (278 lb) of VOCs was removed from the Tshirege Member units during the shallow-extraction test. The radius of influence (ROI), based on the pilot test data for the Tshirege, was 33 m (100 ft). This estimate was based on conservative estimates of the permeability of the Tshirege Member units. Numerical analysis, using a more refined estimate of the permeability, estimates the potential ROI could reach approximately 50 m (150 ft) at the tested vacuum."

   NMED agrees that the SVE system worked; VOCs were extracted from the subsurface. However, the Report did not present the data in a manner that clearly showed that: (1) the test was run effectively (e.g., how were the vacuums (23.1 inches of H2O) chosen?), (2) that SVE will be efficient (e.g., would a greater amount of VOCs be extracted using different test parameters?), and (3) that the data collected during the original pilot test or the proposed pilot test are sufficient to design a full-scale SVE system. This type of information is essential to determining whether or not SVE is a defensible, viable remedy.

   NMED is open to alternatives; however the Permittees did not fully address NMED's concerns regarding the original SVE pilot test. In addition to the deficiencies sited above, the first pilot test identified the need to assess the specific zones in the subsurface, identified in item 2 of NMED's August 2009 letter and to conduct a test at varied extraction rates to evaluate actual versus modeled

optimum vacuums and flow rates. The Permittees must revise the Work Plan to include all of the requirements outlined in the August 2009 letter.

LANL Response

1. The attached Material Disposal Area (MDA) G supplemental soil-vapor extraction (SVE) pilot test work plan includes the requirements in NMED's August 2009 letter, with minor modifications. These modifications include changes to the sampling strategy (e.g., no tritium sampling) and how the existing extraction wells will be utilized. Additionally, a schedule based on the technical requirements of the work plan has been proposed, which includes a final report date beyond NMED's required date of May 31, 2010. In support of the development of the final report, LANL requests a meeting with NMED to discuss the structure of the report and the remedial action objectives for the MDA G volatile organic compound (VOC) plumes. The technical and/or logistical basis for all proposed modifications to the August 2009 requirements are detailed in the work plan.

NMED Comment

2. *NMED's August 2009 letter stated that "conclusions must be based on field data; however field data can be used to calibrate models for comparison." The Permittees propose to use a numerical model (based on new non-targeted permeability testing) to draw conclusions regarding the SVE system. The Permittees must also use field data to draw conclusions; the Permittees may use the field data to calibrate numerical models, but cannot use numerical models to draw conclusions. NMED will evaluate the models and the model parameters, but relies on field data to make corrective action decisions. The Permittees must propose to collect field data as outlined in the August 2009 letter.*

LANL Response

2. The MDA G supplemental SVE pilot test work plan proposes to collect field data as outlined in the August 2009 letter.

NMED Comment

3. *In the cover letter for the Work Plan, the Permittees state that "the uniformity through the Tshirege suggests no preferential pathway for air movement as was demonstrated during the 2008 pilot test." The 2008 pilot test did not take into account stratigraphic contacts, surge beds, fracture zones and other variability within the Tshirege. The open portion of the shallow extraction borehole spanned 82 feet and drew air from across the entire Tshirege member. NMED's August 2009 letter directed the Permittees to determine the properties of the specific contacts and permeable zones within the Tshirege. NMED is interested in several characteristics of these contacts and zones, such as whether or not short circuiting is occurring, whether or not specific zones may act as barriers to contaminant movement or as zones that allow expanded influence. The Permittees must collect data that assess stratigraphic contacts, surge beds, fracture zones and other variability within the unit.*

LANL Response

3. The permeability testing and the extraction test proposed in the MDA G supplemental SVE pilot test work plan will provide data to support an evaluation of whether or not short circuiting is occurring and whether or not specific zones may act as barriers to contaminant movement or as zones that allow expanded influence.

NMED Comment

4. The Permittees do not provide sufficient detail regarding the permeability test. On page 9, paragraph 2, the Permittees state "[d]iscrete interval permeability testing will be conducted using methodology and equipment similar to the method described by Wycoff et al (1998, 098069)." The Permittees must describe the methods and equipment proposed to be used in the Work Plan. The Permittees must revise the Work Plan to provide details including, but not limited to the equipment to be used, extraction rates, proposed measurements and the length of time of the tests (see NMED's August 20, 2009 letter).

LANL Response

4. As-built drawings and detailed specifications for all SVE system equipment and instrumentation will be included in the final supplemental SVE pilot test report provided to NMED. The report will also detail the methodology and equipment specifications used to conduct discrete permeability tests. Where appropriate, the report will provide performance details of the SVE system in comparison to the manufacturer's specifications.

NMED Comment

5. In Section 7, Scope of Activities, the Permittees propose using boring 54-24379 to supplement permeability data from the extraction boreholes. The Permittees may use boring 54-24379 for the permeability testing since the configuration of the extraction boreholes prevents sampling from several stratigraphic contacts. Additionally, the Permittees must comply with items 3 and 4 from NMED's August 20, 2009 letter: install additional observation wells, re-use the deep extraction well (with condition) or install a new extraction well, and abandon the shallow extraction well.

LANL Response

5. LANL is no longer proposing to use boring 54-24379 to supplement permeability testing. LANL is proposing the following:

    - install a new extraction well;
    - install one new observation well;
    - convert the shallow extraction well into an observation well; and
    - abandon the deep extraction well.

NMED Comment

6. The Permittees propose to collect additional VOC data at MDA G. NMED agrees that this must be part of the pilot test. The Permittees must include these analyses in the revised Work Plan.

LANL Response

6. LANL is proposing to evaluate the VOC data at MDA G as part of the final report. VOC data will be collected at all available ports in the monitoring boreholes, including those installed specifically for the extraction test, as part of the baseline dataset gathered prior to the SVE tests.