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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 28, 2012

Radel Bunker-Farrah  
Environmental Program Manager  
National Aeronautics and Space  
Administration  
White Sands Test Facility  
P.O. Box 20  
Las Cruces, NM 88004-0020

Attention of: RE-E12-078

**RE: DISAPPROVAL  
600 AREA SOIL VAPOR EXTRACTION  
PILOT TEST INVESTIGATION REPORT  
NATIONAL AERONAUTICS SPACE ADMINISTRATION (NASA)  
JOHNSON SPACE CENTER (JSC) WHITE SANDS TEST FACILITY (WSTF)  
DOÑA ANA COUNTY, NEW MEXICO  
EPA ID #NM08800019434  
HWB-NASA-12-009**

Dear Ms. Bunker-Farrah:

The New Mexico Environment Department (NMED) has received NASA's *600 Area Soil Vapor Extraction Pilot Test Investigation Report* (Report), dated June 2012 and received June 18, 2012. NMED has completed its review of the Report, issues this Disapproval and provides the following comments.

**Comments:**

**1. Section 4.8, Pilot Test Results, second paragraph, page 11:**

**Permittee's Statement:** "As described in Section 2.3.2, vacuum equipment limitations precluded the application of vacuum in excess of 67 [inches of water column] in-WC at 600-SVE-1-40, at which point the measurement capability of the TSI velocity meter was exceeded, potentially due to turbulent flow in the piping."

**NMED Comment:** Section 2.3.2 of the Report discusses the design of the soil vapor extraction (SVE) well. Section 2.4.1 of the Report (*Vacuum Equipment Limitations*) includes the discussions referred to by the Permittee. Revise the Report text accordingly.

**2. Section 7.3.1, Interpreting Analytical Data from the SVE Well, last paragraph, page 15 and Section 7.3.2, Interpreting Analytical Data from the MSVM Wells, last sentence:**

**Permittee's Statement:** "These vertical concentration profiles are consistent with the results of sampling performed during the 600 Area Investigation as described in Section 7.2.4 of the revised 600 Area CIR (NASA, 2011a) and support the previous conclusion that VOC concentrations in soil gas are the result of diffusive transport from perched or regional groundwater." and, "As seen in the SVE well, concentrations of COCs in the observation wells tended to increase with depth in the vadose zone."

**NMED Comment:** In both cases, the data also support the concept that contaminant vertical concentration differences are the result of constituent vapor density contrasts relative to the density of air and also the historical downward migration of contaminated water that leaked from the facility when the 600 Area impoundments contained water and waste liquids were being conveyed to the impoundments through the drain line from the 200 Area. No response to this comment is necessary.

**3. Section 7.4, Comparison of Results to Regulatory Criteria, pages 15 and 16 and Development of Site-Specific Risk-Based Regulatory Criteria for Soil Vapor (separate submittal):**

**NMED Comment:** While NMED agrees that the risk-based criteria may be useful to the Permittee when evaluating subsurface soil gas conditions relative to possible vapor intrusion concerns at other site areas, NMED's primary focus is on constituent concentrations in groundwater and in the vadose zone as the presence of contaminants may affect groundwater.

NMED noted that the calculated criteria are based on US EPA's (2012) Regional Screening Levels for indoor air which assume a target risk level of 1E-6 for carcinogens. Since New Mexico evaluates carcinogenic contaminants at the 1E-5 risk

level, the Permittee may want to reevaluate the criteria based on the higher risk level used by NMED.

**4. Section 8.0. Recommendations, page 18:**

**NMED Comment:** Constituent concentrations at and near the 600 Area Closure continue to exceed applicable risk-based standards in both perched and regional groundwater.

Based on the data collected to date, it is clear that contaminants in the perched system will eventually migrate to the regional system. Subsurface conditions in the 600 Area will likely change in the future when the Permittee closes out the sewage lagoons located northeast and south-southwest of the 600 Area Closure. Until subsurface conditions in the 200 Area and between the 200 and 600 Areas are more clearly understood, NMED will not consider any permit modification request that would preclude further investigation (including monitoring of soil gas and groundwater) of the 600 Area Closure.

**5. Table 4.1 Field Data Collected During SVE Pilot Test at 600-SVE-1-40, page 22 and Table 4.2 Field Data Collected During SVE Pilot Test at 600-SVE-1-90, pages 23 and 24:**

**NMED Comment:** Table 4.1 indicates that, prior to the start of testing at 600-SVE-1-40, a measured flow rate of 0.94 standard cubic feet per minute (scfm) resulted in a vacuum of 0.009 inches of water. Similarly, Table 4.2 indicates a measured flow rate of 49.5 scfm and associated vacuum of 14.9 inches of water at 600-SVE-1-90 prior to the start of testing. Ordinarily, there would be no measurable flow rate (or vacuum) prior to the start of testing as was the case at 600-SVE-1-130 according to Table 4.3 (*Field Data Collected During SVE Pilot Test at 600-SVE-1-130*). Provide a brief discussion in the response to these comments concerning the source of the vacuum and air flow in the affected sampling intervals. Revise the Report text, if appropriate.

**6. Table 4.1 Field Data Collected During SVE Pilot Test at 600-SVE-1-40, page 22 and Table 4.3 Field Data Collected During SVE Pilot Test at 600-SVE-1-130, pages 25 and 26:**

**NMED Comment:** Over the course of testing, a temperature fluctuation of approximately 15 degrees Fahrenheit was reported at 600-SVE-1-40. Similarly, a temperature fluctuation of over 13 degrees Fahrenheit and over 31 degrees Fahrenheit was reported at 600-SVE-1-90 and 600-SVE-1-130, respectively. Provide a brief discussion in the Report concerning possible reason(s) for the fluctuations.

For example, the temperature probe readings were apparently affected by ambient air temperature variations or, review of the temperature data compared to intake photo-ionization detector (PID) readings taken at approximately the same time indicates

PID readings generally decreased during testing and some degree of short-circuiting may have occurred outside of the well borehole. Indicate whether the temperature fluctuations did or did not adversely affect the associated analytical data in the revised Report.

**7. Table 4.4, Field Data Collected at MSVM (Observation) Wells, pages 27 through 32:**

**NMED Comment:** NMED noted that the measurement dates and times summarized in this table are somewhat confusing. For example, according to the table for vapor monitoring well 600-SGW-1, measurements were started at 1125 on March 22, 2012 and concluded at 1650 that day. According to the table, only two measurements were taken (at 0855 and 0925) on March 23, 2012. Measurements were resumed from 0740 until 1415 on March 24, 2012. The last entry of that portion of the table relists the 1125 measurement taken on March 22, 2012.

The table that follows on page 27 for vapor monitoring well 600-SGW-2 indicates measurements were also collected at exactly the same times and dates as those taken from 600-SGW-1 except that the relisting for the 1125 measurement on March 22, 2012 is not present.

The table (on page 29) shows single measurements were taken at 600-SGW-3 on March 25 through March 27, 2012. However, Section 3.2 of the Report (*SVE Pilot Test*) indicates all testing was conducted between March 22 and March 24, 2012 by URS Corporation. Review the table listings making all necessary corrections and data rearrangements to ensure the accuracy of the data presented.

**8. Table 6.3, Mass Removal, page 35:**

**NMED Comment:** The Time Pumped column of the table indicates the unit measurement is in minutes. This would indicate for example, that the total pumping time at location 600-SVE-1-40 was limited to six minutes and 40 seconds. However, Table 4.1 (*Field Data Collected During SVE Pilot Test at 600-SVE-1-40*) indicates that testing of this interval began at 1200 on March 22, 2012 and that the time of completion for the third test step occurred at 1650 that same day, a period of nearly five hours. Review Table 6.3 and edit the unit of measurement for the Time Pumped column as appropriate.

**9. Appendix C, Groundwater Analytical Data from 600-G, pages 2 and 3 of 9:**

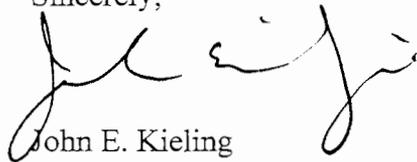
**NMED Comment:** The field parameter measurements (depth to water, turbidity, conductivity, and temperature) are listed in the Appendix table as having been collected on January 11, 2012. The laboratory analytical data that follows the field measurement data in the table indicates a sample collection date of April 10, 2012. Further, Report Table 6.1 (*Groundwater General Chemistry and COC*

*Concentrations in 600-G-138*) indicates the field and analytical measurements at that location were collected in January and April of 2012. Review the data tables in the Appendix and edit the sample collection dates as needed.

The Permittee must address all of the comments included in this Disapproval and submit a revised Report by **September 14, 2012**. As part of the response letter that accompanies the revised Report, include a table that details where all revisions have been made and that cross-references NMED's numbered comments. All submittals (including maps) must be in the form of two paper copies (one of which is bound) and one electronic copy. The Permittee must also submit a redline-strikeout version that includes all changes and edits to the Report (electronic copy) with the response to this Disapproval.

If you have any questions regarding this letter, please contact Daniel Comeau at (505) 476-6043.

Sincerely,



John E. Kieling  
Chief  
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB  
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