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CERTIFIED MAIL - RETURN RECEIPT REQUESTED



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September 16, 2019

Tim Davis
Chief, Environmental Officer
National Aeronautics and Space Administration
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020

Attention of: RE-18-165

**RE: DISAPPROVAL
400 AREA CLOSURE INVESTIGATION REPORT
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHNSON SPACE CENTER WHITE SANDS TEST FACILITY
DOÑA ANA COUNTY, NEW MEXICO
EPA ID #NM08800019434
HWB-NASA-17-018**

Dear Mr. Davis:

The New Mexico Environment Department (NMED) has received the National Aeronautics and Space Administration Johnson Space Center White Sands Test Facility (Permittee) *400 Area Closure Investigation Report-NMED Disapproval Response* (Report), dated November 29, 2018. NMED has reviewed the Report and hereby issues this Disapproval. The Permittee must address the following comments.

GENERAL COMMENTS

1. 400 Area Closure Risk and Exposure Pathway Evaluation

NMED Comment: Report Section 11.0, Soil Health Risk and Hazard Screening and supporting data tables include an evaluation of human health risk for soils and the soil-to-groundwater pathway in response to NMED's August 14, 2018 *Disapproval 400 Area Closure Investigation Report* response. However, the following issues were identified during review of the risk assessment and must be addressed as follows:

- a. No risk evaluation of the vapor intrusion (VI) pathway was included in the Report. NMED's *Risk Assessment Guidance for Site Investigations and Remediation* (RA Guidance), Section 2.5.2, Evaluation of the Vapor Intrusion Pathway, outlines the guidance for evaluation of the exposure pathway and risk screen. For the 400 Area, risk and hazard for the vapor intrusion pathway must be calculated. In addition, and in accordance with RA Guidance Section 5.0, Use of the SSLs [Soil Screening Levels], the calculated soil-vapor risk and hazard must be summed with the calculated risk and hazard for soil. This is required for complete evaluation of total estimated human health risk and hazard for the 400 Area Closure. Revise the Report accordingly.
- b. Sections 11.6.1 and 11.6.2 and supporting data tables and appendices document calculated risk and hazard estimates for the soil-to-groundwater exposure scenario. However, risk and hazard calculation does not apply to evaluation of the soil-to-groundwater pathway. Evaluation of the soil-to-groundwater pathway only requires a point-to-point comparison of soil contaminant concentrations to NMED's soil-to-groundwater SSLs for a Dilution Attenuation Factor (DAF) of 20 to determine if additional investigation is necessary to evaluate potential leaching and migration of contaminants from the vadose zone to groundwater (see 2019 RA Guidance Sections 4.9 and 5.0). If exceedances of risk-based soil-to-groundwater SSLs are identified during evaluation of constituents of potential concern (COPCs), then multiple lines of evidence must be provided to support any conclusion that migration of COPCs is not occurring at the 400 Area Closure. The revised Report must only include the point-to-point evaluation of soil-to-groundwater pathway and any necessary supporting lines of evidence for an incomplete pathway. Revise the Report accordingly.
- c. Complete ecological risk evaluation is not required at this time for the 400 Area Closure, but will likely be required for any future corrective action status determination for the site. Address the potential need for future evaluation of ecological risk in the revised Report. Currently, RA Guidance Volume II, Soil Screening Guidance for Ecological Risk Assessments, outlines procedures for ecological risk evaluation.

2. Report Tables 11.11, 11.13, and 11.15 (Fluoranthene)

NMED Comment: Tables 11.11, 11.13, and 11.15 list a maximum concentration for fluoranthene of 1.25E-01 milligrams per kilogram (mg/kg) for the 0-10 feet below ground surface (ft bgs) sample interval. This concentration was used to calculate hazards for residents, industrial workers, and construction workers. However, soil concentration data provided in Excel spreadsheet tables provided with the Report indicates a maximum concentration of 1.25E-02 mg/kg was reported for fluoranthene. Review soil concentration data for fluoranthene, ensure that the correct concentration is reported and used for risk screen evaluation in the revised Report. Revise the Report accordingly.

3. Excel Spreadsheet Data Tables

NMED Comment: Ensure all Excel spreadsheet sample chemical analytical data for soil, soil-vapor, and groundwater provided with the Report are accurate and reflect the evaluation and results of the of the assessment documented in the Report. As necessary after review, provide updated spreadsheet tables with the revised Report.

SPECIFIC COMMENTS

4. Executive Summary, Page iv

Permittee Statement: "As part of the performance acceptance criteria of the data quality objectives (DQOs), validated groundwater chemical analytical data were reviewed and compared to New Mexico residential and industrial groundwater screening levels, in accordance with Attachment 15 of the Permit."

NMED Comment: Permit Attachment 15 requires an evaluation of groundwater concentration data with Environmental Protection Agency (EPA) or NMED tap-water screening levels in the absence of an EPA Maximum Contaminant Level and a New Mexico Water Quality Control Commission groundwater quality standard. RA Guidance Table A-1, NMED Soil Screening Levels, does not include residential or industrial groundwater screening levels, only cancer and non-cancer tap water screening levels. RA Guidance Table A-4, NMED Vapor Intrusion Screening Levels, does include residential and industrial groundwater screening levels; however, they are intended to be used for the vapor intrusion pathway evaluation. Revise the statement for conformance to Permit Attachment 15 requirements for evaluation with applicable groundwater cleanup levels or clarify the statement. Revise the Report accordingly.

5. Section 9.3.5, Soil Chemical Analytical Results and Comparison to Regulatory Criteria, Page 38

NMED Comment: The revised Report must address and discuss any uncertainty associated with use of EPA Method 8315 reporting limits that exceed applicable screening levels for hydrazine, 1,1-dimethylhydrazine, and monomethylhydrazine. Discuss any limitations related to the current technology available for analysis of hydrazines and the potential for low level hydrazine contamination at the 400 Area Closure at concentrations below method detection limits. Provide multiple lines of evidence to support any conclusion that adverse site risk to human health and the environment (e.g., soil-to-groundwater pathway) is not a factor at the 400 Area Closure. Revise the Report accordingly.

6. Section 9.6.3.2, SVOCs [Semi-volatile Organic Compounds], Page 41

Permittee Statement: "At four of these wells (400-FV-131, 400-GV-125, and 400-JV-150), BEHP [bis-2-ethylhexyl phthalate] was detected above the WSTF [White Sands Test Facility] cleanup level of 6 µg/L [micrograms per liter] at concentrations between 6.6 µg/L and 7.3 µg/L."

NMED Comment: Based on Permittee statement and supporting Report information, only three wells exceeded the groundwater cleanup level for BEHP. However, to ensure accuracy, review supporting Report groundwater sample data and, as necessary, reevaluate the data. Revise the Report accordingly.

7. Section 9.6.3.3, Metals, Page 42

Permittee Statement: "Arsenic was the only metal from the COPC list that was detected on a regular basis and was reported in the six wells at concentrations above the NMED tap-water screening level of 0.855 µg/L. Concentrations ranged from 0.7 µg/L at 400-GV-125 to 0.77 µg/L at 400-IV-123."

NMED Comment: The concentration reported for arsenic at well 400-IV-123 on Table 7.5, Groundwater Analytical Results Above WSTF [White Sands Test Facility] Cleanup-Screening Levels is 7.7 µg/L. Correct the discrepancy in the revised Report.

8. Section 9.9.3, Soil Vapor Chemical Analytical Results and Comparison to Regulatory Criteria, Page 45

Permittee Statement: "The RBCs [Risk Based Concentrations] were between two to two orders of magnitude larger than the VOCs analytical results for Freon 11, two orders of magnitude larger for Freon 113, and one order of magnitude larger for chloroform.

NMED Comment: A discrepancy was noted in the order of magnitude comparison for Freon 11 soil vapor concentrations (“two to two orders of magnitude”) to WSTF RBCs. There appears to be two to four orders of magnitude difference between the reported Freon 11 soil vapor concentrations and the RBCs for Freon 11. Review all supporting soil-vapor concentration data and applicable RBCs and revise the Report accordingly.

9. Figure 7.3, 400 Area A-A’ Cross-Section, Page 73

NMED Comment: For multiport soil vapor and groundwater monitoring (MSVGM) well 400-IV-123 the soil vapor port set and sampled at 118 feet below ground surface was not noted on the figure at the well location on the cross-section. Include sampling port for the MSVGM well on the figure in the revised Report.

10. Figure 9.1, 400 Area Soil Analytical Results Above NMED SSL, Page 77

NMED Comment: The following issues with Figure 9.1 were identified and must be addressed as follows in the revised Report:

- a. In addition to noted exceedances of human health SSLs, present concentration data and sample depth information for COPCs in exceedance of respective soil-to-groundwater SSLs for a DAF of 20 on the figure in the revised Report.
- b. Ensure that respective listed soil sample concentration data boxes include a “tie-line” to the boring location where the sample(s) were collected and, as practical, locate the presented concentration data near the respective boring location. All the concentration data presented on the figure must be at a scale that is easily readable. Ensure that all identified SSL exceedances for respective screening levels are clearly discernable on the figure.
- c. Ensure that any exceedances of soil screening levels for all human health exposure scenarios (i.e., residential, construction worker, and industrial/occupational) evaluated during assessment and documented in the Report are included on the figure.
- d. Define listed quality assurance (QA) flags for the depicted concentration data in the figure notes.
- e. If duplicate sample concentration data is presented on the figure, clearly note that the concentration data is from a duplicate sample.

11. Figure 9.2, 400 Area Groundwater Analytical Results Above WSTF GMP [Groundwater Monitoring Plan] Cleanup Levels, Page 78

NMED Comment: The following issues with Figure 9.2 were identified and must be addressed as follows in the revised Report:

- a. Ensure that respective listed groundwater sample concentration data boxes include a “tie-line” to the monitoring well location where the sample was collected and, as practical, locate the presented concentration data near the respective monitoring well location. All concentration data presented on the figure must be presented at a scale that is easily readable. Ensure that all identified cleanup level and screening level exceedances are clearly discernable on the figure.
- b. Define the listed quality assurance (QA) flags for the depicted concentration data in the figure notes.
- c. Provide the rationale for listing extraction efficiencies for N-nitrosodimethylamine (NDMA) concentration data in the sample result concentration boxes and clarify the relevance of the extraction efficiency information to the presented groundwater concentration data.
- d. Remove the sample concentration data for 400-KV-142 from the figure to match the data presented on Table 7.5 and the table note clarifying the omission of the concentration data from the evaluation due to the inability to properly purge and sample the monitoring well.
- e. If duplicate sample concentration data is presented on the figure, clearly note that the concentration data is from a duplicate sample.

12. Figure 9.3, 400 Area Soil Vapor Analytical Results Above NMED VISL [Vapor Intrusion Screening Levels], Page 79

NMED Comment: The following issues with Figure 9.3 were identified and must be addressed as follows in the revised Report:

- a. Ensure that respective listed groundwater sample concentration data boxes include a “tie-line” to the monitoring well location where the sample was collected and, as practical, locate the presented concentration data near the respective monitoring well location. All concentration data presented on the figure must be presented at a scale that is easily readable. Ensure that all identified cleanup level and screening level exceedances are clearly discernable on the figure.

- b. Define listed quality assurance (QA) flags for the depicted concentration data in the figure notes.
- c. If duplicate sample concentration data is presented on the figure, clearly note that the concentration data is from a duplicate sample.

13. Figure 12.2, Historical NDMA Trends for the 300 and 400 Areas, Page 82

NMED Comment: The revised figures representing historical NDMA concentrations with concentrations presented in micrograms per liter for the 400 and 300 Area were only included in the red-line electronic version of the Report. The hardcopy and "clean" electronic version of the Report do not include the revised figures. Ensure that the revised Figure 12.2 data is also included in the hard copy and electronic version of the Report.

14. Table 11.13, Maximum Concentration Evaluation: Noncancer Industrial (0-1 ft), Page 113

NMED Comment: A discrepancy was noted in the total calculated industrial cancer risk ($8.18E-12$) for soil documented on Table 11.13. The listed total cancer risk only accounts for the risk calculated for cadmium. The total cancer risk must account for cancer risk calculated for the two identified COPCs beryllium and cadmium. Correct the discrepancy and revise the Report accordingly.

The Permittee must submit a revised Report that addresses all of the comments contained in this letter. In addition, the Permittee must include a response letter that identifies where NMED's comments were addressed. The Permittee must also submit an electronic redline-strikeout version of the revised Report showing where all changes were made to the Report. The revised Report must be submitted to NMED no later than **December 31, 2019**.

Mr. Davis
September 16, 2019
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If you have any questions regarding this letter, please contact Gabriel Acevedo at (505) 476-6043.

Sincerely,



John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
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