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JAMES C. KENNEY
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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 31, 2019

Colonel Stewart A. Hammons
Commander, 27th Special Operations Wing
110 E. Alison Avenue, Suite 1098
Cannon Air Force Base
New Mexico 88103

RE: DISAPPROVAL
2017 ANNUAL GROUNDWATER MONITORING REPORT
MELROSE AIR FORCE RANGE
EPA ID# NM5572124456
HWB-MELR-18-001

Dear Colonel Hammons:

The New Mexico Environment Department (NMED) has received the U.S. Air Force *2017 Annual Groundwater Monitoring Report, Melrose Air Force Range* (Report), submitted on behalf of Melrose Air Force Range dated April 10, 2018. NMED has reviewed the Report and hereby issues this Disapproval. The Permittee must address the following comments.

GENERAL COMMENTS

1. General Report Tables and Figures Issues

NMED Comment: The following issues were noted for the tables and figures included and referenced in the Report and must be addressed as follows:

a. In accordance with prior direction provided in NMED's October 20, 2017 *Disapproval 2016 Annual Groundwater Monitoring Report* (2016 AGRM Disapproval), figures and tables included with the Report text should have either been included at the end of each

subdivided Report section, or alternatively, as appropriate, in Appendix A: Figures or Appendix B, Tables and Charts of the Report with appropriate references to the corresponding figure or table number and respective appendix. Therefore, Figure 1-1 MAFR Location Map, Figure 1-2: Monitoring Well Network Map, and Figure 1-3: SWMU Map, included in Section 1.0, Introduction, must be moved to Appendix A: Figures. Figures 1-1, 1-2, and 1-3 must be referenced in all pertinent discussions. Table 1: Well Construction Data, must be moved to Appendix B: Tables and Charts, with reference in pertinent sections of the Report where the table information is discussed. Revise the Report accordingly.

b. Figures 2-1, 2-2, 2-3, 2-4, 3-1, 3-2, and 3-3 are only discussed in Section 4.0, Results. As noted for Figures 1-1, 1-2, and 1-3, all figures referenced in each section must be numbered to correlate with the section in which the figures are discussed. In the case of Figures 2-1, 2-2, 2-3, 2-4, 3-1, 3-2, and 3-3, the figures should have been numbered to reference Section 4.0. For example, Figure 2-1, Chinle Groundwater Flow Map, which is only discussed in Section 4.0 of the Report should have been numbered Figure 4-1. Revise the Report figure numbers to reference the section where the information is discussed or provide adequate rationale for the figure number sequencing utilized in the Report.

c. Figure 2-5, Water Level Map April 2016, and Figure 2-6, Water Level Map October 2016, are not referenced in any part of the Report other than the Table of Contents. Figures 2-5 and 2-6 information must be discussed and appropriately numbered and referenced in all pertinent sections of the revised Report.

d. Information provided in Tables A1 through A20 must either be included in the revised Report as a text discussion in each respective section where information was provided in a table format or, if more appropriate based on table content, moved to Appendix B: Tables and Charts of the revised Report. Any table moved to Appendix B must be sequentially numbered in a manner corresponding to the section the table information supports. All Appendix B tables must be appropriately referenced where the table information is discussed in the revised Report. Revise the Report accordingly.

e. Ensure all tables and figures are logically labeled and numbered and also appropriately and accurately referenced in all pertinent sections of the revised Report.

2. General Report Issues, Inaccuracies, and Discrepancies

NMED Comments: The Report contains multiple issues, inaccuracies and discrepancies which have affected multiple sections of the Report and must be addressed as follows:

a. **Sections 4.2.1, SWMU-114, 4.2.2, SWMU-130, 4.2.3, SWMU-131, and 4.2.4, Annual Monitoring Well Network, pages 31-32:** The Permittee states, "[t]hese analytes concentrations have traditionally been above NMAC [New Mexico Administrative Code] 20.6.3103." The correct NMAC screening level section citation is 20.6.2.3103 NMAC.

Revise Sections 4.2.1, SWMU-114, 4.2.2, SWMU-130, and 4.2.3, SWMU-131 accordingly.

b. **Tables 6a through 6aa and Charts:** The concentration unit discrepancy identified for Tables 6a through 6z table notes (i.e., concentrations units noted as grams per liter) originally noted in NMED's 2016 AGMR Disapproval appears to be an issue with the hard copy of the Report. Review of the provided electronic version Appendix B: Tables and Charts of the February 21, 2017 *2016 Annual Groundwater Monitoring Report* (2016 AGMR) indicates concentrations and corresponding units were reported in micrograms per liter for Tables 6a through 6z of the 2016 AGMR. The same issue was noted for the revised 2016 AGMR dated January 28, 2018 for Tables 6a through 6aa. This issue has been carried over to Tables 6a through 6aa in the hard copy of this Report. In addition, the supporting table data charts for each table (Tables 6a through 6aa) also indicate concentration units are reported in grams per liter on each chart. However, the actual table and chart data appears to be in micrograms per liter. For example, Table 6b, Historical Antimony Concentrations, and associated charts in the hard copy version of the Report specify grams per liter as the concentration units in the table notes and the supporting data charts. Review of the data provided in the electronic version of Appendix B for Table 6b and associated charts specifies antimony concentrations reported in micrograms per liter. The Permittee must ensure specified unit and corresponding concentration data accuracy and consistency for all information, tables, charts, and figures provided in the revised Report hard copy and electronic version. Revise the Report accordingly.

c. **Reporting of Dissolved Oxygen Field Parameter Data:** As previously reported during prior groundwater monitoring reporting and to match the data units recorded during field parameter data collection, all dissolved oxygen concentrations may be reported in milligrams per liter in all applicable tables (e.g., Tables 3a, 3b, and 4b) and supporting charts. Ensure that the concentration data and noted units are accurately presented in all tables and charts in the hard copy and electronic versions of the revised Report. Revise the Report accordingly.

d. **All Report Tables, Figure, and Chart Concentration Data and Units:** All chemical of concern concentration data and corresponding units reported in the revised Report must be clearly, consistently, and accurately presented and referenced throughout the Report (i.e., Report hard copy and electronic version). Review the Report for accuracy and revise the Report accordingly.

e. **Appendix B, Tables and Charts, Tables 4a, 4b, 4c, 4d, and 4e:** Although the concentration units for the reported values are provided at the bottom left hand portion of the table pages, revise Tables 4a, 4b, 4c, 4d, and 4e to include concentration units in the each table notes box (noted as "Blank-No data" for each table) where it will be readily visible. Ensure data and unit consistency between the tables and corresponding chart information. Revise the Report accordingly.

3. Reporting of Volatile Organic Compound Concentration Data

NMED Comments: Review of volatile organic compounds (VOCs) groundwater sample data provided in Appendix C, Analytical Laboratory Reports, indicates groundwater concentration data was reported for only a limited suite of compounds for Environmental Protection Agency (EPA) Method 8260B. Provide clarification for why only sample analysis results for the VOCs acetone, benzene, chloroform, chloromethane, 1,2-dichloroethane, ethylbenzene, 4-methyl-2-pentanone, methylene chloride, toluene, 1,2,4-trimethylbenzene, vinyl chloride, and xylene were reported instead of the full suite of Method 8260B VOCs reported during prior sampling events at Melrose Air Force Range. This was noted for both primary groundwater samples collected for each monitoring well scheduled for VOCs analysis and, where applicable, quality control duplicate samples analyzed by a different laboratory (e.g., Eurofins Lancastor Laboratories Split Sample MAO1MW001Db). For clarification, groundwater samples collected for VOCs analysis must be always be analyzed for the full suite of chemicals of concern (COCs) and must be reported in the laboratory data reports provided with the Report.

SPECIFIC COMMENTS

4. Section 1.0, Introduction, Page 7

NMED Comment: It is unclear why a portion of the Section 1.0 discussion is titled "Figure 1-1: MAFR Location Map. As presented, the figure title should have referenced the actual figure presented in the section. As required by NMED Comment 1a of this letter, Figure 1-1 must be moved to Appendix A: Figures, and be referenced appropriately in the revised Report.

5. Section 1.1, Project Background, Page 8

Permittee Statement: "During the groundwater investigations, up to five distinct water bearing zones were identified beneath MAFR. None of these appeared to correlate with the regional Ogallala Aquifer."

NMED Comment: Provide information describing the water bearing zones (e.g., lateral distribution and depths). Explain why the water bearing zones do not correlate with the Ogallala Aquifer in the revised Report.

6. Section 1.2.1, SWMU Description and History, SWMU-114 – Expended Ordnance and Industrial Waste Burial Site, Page 13

Permittee Statement: "Elevated metals concentrations were attributed to high turbidity and natural conditions. Elevated anion concentrations were attributed to natural conditions."

NMED Comment: Appendix B, Table 4e, Historical Turbidity, indicates decreasing turbidity readings following initial sampling of the SWMU 114 monitoring wells. Clarify the statement in the revised Report. In addition, perchlorate (one of the detected anions) may be attributable to past and ongoing range activities. Provide additional lines of evidence to support the statement regarding anions. Revise the Report accordingly.

7. Section 1.3.1, Inactive Wells, Page 18

Permittee Statement: "There are several wells located on MAFR [Melrose Air Force Range] that were included in previous monitoring plans. These wells are abandoned, inaccessible, or inactive and not included in the FSP [Field Sampling Plan]. These well locations are shown on Figures 1-2 and 1-3 on page 10 and 12 of this report. These wells are listed in Table A7 below."

NMED Comment: Table A7, Monitoring Wells No Longer in the FSP, lists eleven wells. However, Figure 1-2 identifies additional inactive wells that are not included in Table A7 (i.e., monitoring wells MWQ-3, 4, 5, 6, 7, 9, 10, 11, 23, and MWL-1). Provide clarification for why these wells are not addressed in the section or revise the provided information to account for all wells identified as inactive or abandoned.

8. Section 1.4.1, Groundwater Elevation, Gradient, and Flow Velocity, Page 19

Permittee Statement: "Some wells (MWQ-2, MWQ-19, MWQ-20, and MAO2MW001D) penetrate deeply into the Chinle (50-120 feet). Water levels in these wells are 15 to 55 feet above the Ogallala/Chinle contact, indicating that the aquifer is confined."

NMED Comment: The screened interval of wells (M114MW001, M114MW002, M114MW003, M114MW004/MWQ-16, MAO1MW002, MWQ-18, and MWQ-22) are submerged below the water table according to Appendix B, Table 2a data. Wells with submerged screened intervals are not appropriate for monitoring constituents that accumulate at the interface. Unless these wells are installed in confined aquifers, the screened intervals must be partially screened across the groundwater table interface. For example, well MWQ-18 was installed in the Ogallala formation, an unconfined aquifer. Clarify why the monitoring well screens were completely submerged in these wells and discuss the placement of the screened intervals in the revised Report.

9. Figure 1-4, Topographic Map of MAFR, Page 20

NMED Comment: The elevation values shown in the Figure 1-4 are not legible. Ensure all information is legible for the figure in the revised Report.

10. Section 1.6, Applicable Regulations/Standards, Page 21

Permittee Statement: "The 2015 NMED Risk Assessment Guidance for Site Investigations and Remediation (New Mexico Environment Department 2015) document will be used to determine whether potential site-related contaminants exceed groundwater screening guidelines."

NMED Comment: NMED issued an updated Risk Assessment Guidance for Site Investigations and Remediation (RA Guidance) in March 2017. Section 1.6 must be revised to cite the 2017 RA Guidance as the correct guidance document for the chemical of concern screening level evaluation where applicable. Updated NMED tap water screening levels are listed in Table A-1 of the 2017 RA Guidance. Revise all affected Report sections and tables accordingly.

11. Section 2.0, Summary of Field Activities, Page 22

Permittee Statement: "Non-disposable equipment was decontaminated in the field prior to sampling activities at each well, following the procedures described in the 2016 Baer/GMI Joint Venture Groundwater Monitoring Field Sampling Plan."

NMED Comment: Reference to work plans or standard operating procedure is not sufficient. Provide detailed descriptions of the actual field decontamination procedures performed in the field. Revise the Report accordingly.

12. Section 2.1, Spring Sampling Event, Page 23

Permittee Statement: "Two wells were not accessible during the spring depth to groundwater data collection due to windmill machinery. These wells are featured in Table A9 below."

NMED Comment: Three wells are depicted as inaccessible in the Table A9-Spring Inaccessible Wells table information. Resolve the discrepancy in the revised Report.

13. Section 2.1, Spring Sampling Event, Table A9, Spring Inaccessible Wells, Pages 23 through 24

NMED Comment: The Permittee states that wells MWL-5, MWL-8, and MWL-10 were not accessible due to windmill machinery and presents photographs that exhibit wells capped with windmill machinery in the Table A9 information. However, the photographs and limited discussion are not sufficient to fully provide an explanation for the inaccessible nature of the wells. Provide additional information as follows:

a. Indicate the parts of windmill machinery that prevent well MWL-5 from being accessed. Discuss any other inaccessibility or safety issues identified during the attempted groundwater level data collection in the section information. Discuss potential measures to resolve the issue(s).

b. The well head of well MWL-8 is circled in yellow in the photograph; however, due to dried vegetation, a clear view of the well was not provided in the photograph included in the section table. If available, provide a better photograph depicting the MWL-8 well head. Discuss the parts of well cap and windmill machinery that prevents well MWL-8 from being accessed in the table entry and explain why the well cap cannot be removed from the casing. Discuss any other inaccessibility or safety issues identified during the attempted groundwater level data collection. Discuss potential measures to resolve the issue(s).

c. Indicate the parts of windmill machinery that prevent well MWL-10 from being accessed to collect groundwater level data from the well. Discuss potential measures to resolve the issue(s).

14. Section 2.2, Fall Sampling Event, Page 25

Permittee Statement: "Four wells were not accessible during the fall depth to groundwater data collection, these wells are featured in Table A10 below."

NMED Comment: Only three wells are depicted as inaccessible in the Table A10, Fall Inaccessible Wells information. Resolve the discrepancy in the revised Report.

15. Section 2.2, Fall Sampling Event, Table A10, Fall Sampling Event, Pages 25-26

NMED Comment: The Permittee states that wells MWL-5, 8, and 10 were not accessible due to windmill machinery and presents photographs that exhibit wells capped with windmill machinery in the Table A10 information. However, the photographs themselves do not appear to be sufficient to provide an explanation for the inaccessible nature of the wells. See Comment 13 of this letter above and respond accordingly.

16. Section 2.3, Investigation Derived Waste, Pages 26

Permittee Statement: "The IDW for the fall and spring sampling events will remain in the 55 gallon steel drum until the analytical results are returned from the laboratory in April of 2018."

NMED Comment: Information was provided in Section 2.3 regarding the collection and storage of the Investigation Derived Waste (IDW) generated during the spring and fall

events. As additional supporting information and documentation of actual disposal of IDW purge water, include the waste disposal manifests as an additional appendix in the revised Report or provide additional detail regarding the actual disposal of the IDW purge water following receipt of the laboratory analytical result data.

17. Section 3.1, Laboratories, Page 27

Permittee Statement: "The field team was unable to adjust the pH of the hexavalent chromium samples for some monitoring well samples to within the preservation range of the 14 day hold time; in these cases a 24 hour hold time was observed."

NMED Comment: Discuss why the field team was not able to adjust the pH of the samples. If the pH of the sample had been properly adjusted between 9.3 and 9.7, the hold time for the sample would have been 14 days rather than 24 hours. Based on information provided in the 2016 AGRM, the hold time exceedance issue for hexavalent chromium samples is recurring. Revise all affected sections of the Report accordingly. For future sampling events, ensure all samples are properly preserved for the longer hold time.

18. Section 4.1, Groundwater Contours and Flow Direction, Page 30

Permittee Statement: "Depth to groundwater data is tabulated in Appendix B: Table 2a and Table 2b."

NMED Comment: Appendix B, Table 2a, MAFR Summary Depth to Groundwater Data, presents depth to groundwater data, and Table 2b, MAFR Summary Groundwater Level Data 2003 to 2016, present groundwater elevation data. Revise the statement for accuracy in the revised Report.

19. Section 4.1.1, Chinle Formation, Page 30

Permittee Statement: "MWQ-22 is screened in both the Chinle and Ogallala formations."

NMED Comment: Provide the rationale for monitoring well MWQ-22 being screened across both the Chinle and Ogallala formations. Screening a well across two aquifers may cross-contaminate the aquifers. Discuss the potential risk of cross-contamination in the revised Report. Propose to submit a work plan to abandon and replace well MWQ-22 in the revised Report, if appropriate.

20. Section 4.1.1, Chinle Formation and Section, 4.1.2, Ogallala Formation, Page 30

NMED Comment: A discussion regarding the groundwater flow direction was included in the section; however, information on the calculated groundwater hydraulic gradient in each

formation was not provided in the discussion. Provide groundwater hydraulic gradients for the Chinle and Ogallala formations in the revised Report for each aquifer. Revise the Report accordingly.

21. Section 4.2, Analytical Data, Page 30

Permittee Statement: "Discussion regarding individual analytes is limited to concentrations exceeding applicable screening levels."

NMED Comment: The Permittee must evaluate and discuss all detected chemicals of concern (COCs) regardless of reported concentrations falling above or below applicable screening levels. Revise the Report to include a comprehensive discussion of all detected COCs at each SWMU and the respective screening level evaluation results. Revise the Report accordingly.

22. Section 5.0, Summary, page 34

Permittee Statement: "Analyte concentrations exceeding applicable screening levels are within historical ranges, with the exception of TDS, chloride, sulfate, and manganese. A table, Table A20, of analytes exceeding historical ranges is below."

NMED Comment: The Permittee must evaluate and discuss all detected COCs in the Report even if the concentrations are below the applicable screening levels. Provide a more comprehensive discussion for each SWMU of the detected COCs and the screening evaluation results in the conclusions section of the revised Report. Revise the Report accordingly.

23. Appendix A, Figures 2-1, 2-2, 2-3, and 2-4, Groundwater Flow Maps

NMED Comment: Include actual groundwater elevations for each depicted monitoring well in the revised Figures 2-1, 2-2, 2-3, and 2-4. Additionally, signify interpreted groundwater flow directions with arrows. Revise the Report accordingly.

24. Appendix A, Figures, Figure 2-5 Water Level Map May 2017 and Figure 2-6, Water Level Map October 2017

NMED Comment: All monitoring well and wells utilized for groundwater level measurements must be included on Figure 2-5 and Figure 2-6 with corresponding groundwater elevation information for each respective well. If necessary, provide a note on the figure for the well explaining why a water level measurement was not included in the figures (e.g., dry, inaccessible, abandoned, etc.). Ensure that Figures 2-5 and 2-6 are appropriately discussed and referenced in the revised Report. Revise the figures accordingly.

25. Appendix B, Tables and Charts, Table 2a, MAFR Summary Depth to Groundwater Data 2003 to 2017 and Table 2b, MAFR Summary Groundwater Level Data 2003 to 2017

NMED Comment: The following issues were noted for Table 2a and 2b and must be addressed as follows:

a. Depth-to-groundwater measurement data was not collected for wells MWQ-3, 4, 5, 6, 7, 10, 11, 23 and MWL-1, and MWL-4 during the 2017 monitoring period. However, table notes were not provided for most wells where depth-to-groundwater measurement data was not collected. Include a note (e.g., inaccessible, abandoned, dry, no data, etc.) for each well listed on Tables 2a and 2b that indicates why the wells were not gauged during the monitoring period and for all other gauging events where groundwater level data was not collected. Revise the Report accordingly.

b. Table 2b shows the dates of groundwater level monitoring in days, months, and years; however, Table 2a shows the gauging dates in months and years only. Revise Table 2a to include the day, month, and year that the groundwater level data was collected for consistency with Table 2b in the revised Report.

26. Appendix B, Tables and Charts, Table 5a, Summary of Analytical Results May 2017, and Table 5b, Summary of Analytical Results October 2017

NMED Comment: Tables 5a and 5b contain multiple issues which must be addressed as follows:

a. The manganese concentrations in the groundwater samples collected from wells MWQ-2 and MWQ-20 exceeded applicable screening levels during the May 2017 sampling event; however, the exceedance was not noted on Table 5a. Revise the table accordingly in the revised Report.

b. Table 5a lists the EPA Maximum Contaminant Level (MCL) for nitrate as 10,000 micrograms per liter (ug/L). Table 5b lists the screening level as 10 ug/L. Resolve the discrepancy in the revised Report.

c. Table 5a lists the EPA MCL for nitrite as 1,000 ug/L. Table 5b lists the screening level as 1 ug/L. Resolve the discrepancy in the revised Report.

d. The analysis method number for the reported vinyl chloride detections has been listed as 6260 on Table 5a. Table 2b lists 8260B as the analysis method for volatile organic compounds. Correct the typographical error in the revised Report.

e. Table 5a lists the NMED Tap Water screening level for hexavalent chromium as 0.25

ug/L. Table 5b lists the screening level as 250 ug/L. Note that the applicable tap water screening levels provided in NMED's 2017 RA Guidance must be listed on the table. NMED's 2017 Tap Water cancer screening level for hexavalent chromium is 0.501 ug/L. Revise the tables and Report accordingly.

f. Define the "NC" abbreviation in the Tables 5a and 5b qualifier notes.

g. Five different screening criteria are listed on the tables. For clarity, highlight the screening level used for evaluation of COC concentration data in Tables 5a and 5b in the revised Report.

h. Define the "U" qualifier in the Tables 5a and 5b qualifier notes.

The Permittee must submit a revised Report that addresses all comments contained in this Disapproval. In addition, the Permittee must include a response letter that cross-references where NMED's numbered comments were addressed. The Permittee must also submit an electronic redline-strikeout version of the revised Report showing where all changes have been made to the Report. The revised Report must be submitted no later than **June 28, 2019**.

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
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