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DAIM-ODB

July 24, 2018

Mr. John Kieling
Chief, Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

RE: Final 2017 Interim Facility-Wide Groundwater Monitoring Plan Version 10, Response to November 30, 2017 Disapproval letter, Fort Wingate Depot Activity, McKinley County, New Mexico EPA # NM6213820974, HWB-FWDA-17-007

Dear Mr. Kieling:

This letter is in reply to the NMED Disapproval letter dated November 30, 2017, reference number HWB-FWDA-17-007, regarding the Final 2017 Interim Facility-Wide Groundwater Monitoring Plan Version 10. The following are the Army's responses to comments received from NMED in the letter, detailing where each comment was addressed and cross-referencing the numbered NMED comments. This letter also transmits the revised work plan, and a red-line strike-out electronic copy of the edits.

Comments:

1) Permittee Statement – Section 1.0, Introduction, lines 15-16, page 1-1

“Responses to comments on Version 9 of the Interim Facility-wide GMP are presented in Appendix A.”

NMED Comment:

No documentation is included in Appendix A. The Plan cannot be approved without review of the responses to comments. Provide the documentation in the revised Plan.

Army Response:

Appendix A now contains the responses to comments on Version 9 of the 2016 Interim Measures Facility-wide Groundwater Monitoring Plan.

2) Permittee Statement – Section 1.4, Data Quality Objectives, line 39, page 1-3

“The FWDA boundary is the study boundary for facility-wide monitoring (Figure 1-2).”

NMED Comment:

Figure 1-2 is Project Organization Chart. The Project Organization Chart is unnecessary. Provide the relevant reference in the revised Plan.

Army Response:

This figure reference should have referenced Figure 1-1, the Site Location map, and has been corrected. Figure 1-1 shows the study background for facility-wide monitoring. The Project Organization Chart has also been removed from the Plan, and Figure 1-2 now depicts the Project Screening Value hierarchy.

- 3) **Permittee Statement – Section 2.2, Previous Investigations, lines 18-20, page 2-2**
“To date, approximately 121 groundwater monitoring wells and 10 piezometers have been installed to characterize the nature and extent of contamination across FWDA.”

NMED Comment:

In Executive Summary, lines 40-42, page ES-1, the Permittee also states, “[c]urrently, 117 groundwater monitoring wells have been installed to characterize the nature and extent of contamination from activities associated with the OB/OD Area and various Solid Waste Management Units (SWMUs) and Area of Concern.” Correct the discrepancy in the revised Plan.

Army Response:

The Executive Summary has been corrected on Page ES-2, line 7, to indicate “121 groundwater monitoring wells have been installed to characterize the nature and extent of contamination...”

- 4) **Permittee Statement – Section 3.5, Hydrogeology, lines 12-14, page 3-5**
“Reducing conditions are indicated where dissolved oxygen is less than 1.0 mg/L and are persistent in bedrock units and in some alluvial units. Reducing conditions are attributed to natural conditions present in formations with high organic matter content, such as clays and shales.”

NMED Comment:

Reducing conditions result in degradation of some contaminants while other constituents become more toxic and mobile. The Permittee must assess fate and transport of each contaminant in the Facility wells and to develop a contaminant-specific data evaluation approach for monitoring and/or mitigating groundwater contamination. For example, dechlorination of 1,2-dichloroethane is favored under reducing conditions. Dissolved oxygen was detected at less than 1.0 mg/L in well MW18D in the April 2017 sampling event, suggesting the presence of reducing conditions in the vicinity of the 1,2-dichloroethane plume. Although the 1,2-dichloroethane concentration in the groundwater samples collected from well MW18D routinely exceeds the screening level, the plume may be attenuated in the future due to the reducing conditions. On the other hand, arsenic becomes more toxic and mobile under reducing conditions. Dissolved oxygen was detected at less than 1.0 mg/L in well TMW27, suggesting the presence of reducing conditions. The dissolved arsenic concentrations in the groundwater samples collected from well TMW27 routinely exceed the screening level, and the arsenic contamination may expand in the vicinity of well TMW27 in the future. Remedial actions may be necessary to address the arsenic contamination. Provide a contaminant-specific data evaluation in Section 1.4, Data Quality Objectives, and optimize the groundwater monitoring program in the revised Plan.

Army Response:

Comment noted. Section 1.4, Step 7, titled Sampling Design, describes how groundwater analytical data will be used to select monitoring wells to monitor groundwater contaminant plumes from site of COPC release to the extent of plume boundaries.

Please note that a separate RCRA Facility Investigation, titled, “Northern Area Groundwater Supplemental RCRA Facility Investigation Work Plan” was recently approved. An integral part of this Supplemental RFI is to determine contaminant fate and transport and the nature

and extent of each COPC. Supplemental RFI results along with existing historical data will be thoroughly evaluated during the Supplemental RFI to determine future courses of action. This evaluation will also address fate and transport of COPCs. Appropriate remedial actions and an optimized groundwater monitoring program will be developed from the evaluation presented in the Supplemental RFI report. The purpose of this interim groundwater monitoring plan is to monitor and report the contaminants in the saturated zones.

5) Permittee Statement – Section 3.5.1, Northern Area Alluvial Groundwater System, lines 21-23, page 3-5

“The cistern was no longer in service by late 2013; however, groundwater elevations at monitoring well MW02 are still approximately 1.1 feet higher than elevations at MW01 and MW03. This may be the result of leakage from the installation water supply well or borehole.”

NMED Comment:

Refer to Comment 4 in NMED's August 7, 2017 Disapproval Letter for Groundwater Periodic Monitoring Report January through June 2016. Provide all available construction details for the water supply well (e.g., total depth, screened interval) in the submission of the upcoming July - December 2017 Groundwater Monitoring Report. Current information suggests that the water supply well has been reactivated. Clarify whether the water supply well is in use in the upcoming groundwater monitoring report.

Army Response:

Available construction details for Well 69 have been included in the July – December 2017 Groundwater Monitoring Report, and in this work plan for completeness. This information is contained within the third paragraph of Section 3.5.1 and new Figure 3-4. It has been stated in the July – December 2017 Groundwater Monitoring Report that the water supply well is not in use. This statement refers to potable water uses only. The well is however utilized as a minor non-potable water supply.

6) Permittee Statement – Section 3.5.2, Northern Area Bedrock Groundwater System, lines 34-37, page 3-5

“Steep horizontal gradients from east to west (in particular, between monitoring wells TMW38 and TMW40D and between monitoring wells TMW17 and TMW37) indicate that a geologic structural feature impedes groundwater flow. Vertical offset of the sandstone layers in the bedrock aquifer by a fault or fracture zones may be present in this area and may impede groundwater flow.”

NMED Comment:

Refer to Comment 5 in NMED's August 7, 2017 Disapproval Letter. Acknowledge that the groundwater flow direction has not been fully characterized in the bedrock aquifer beneath the Workshop Area in the revised Plan.

Army Response:

Section 3.5.2 has been substantially revised. As requested, the statement “groundwater flow direction has not been fully characterized in the bedrock aquifer beneath the Workshop Area,” has been added to the third paragraph in the revised section. Please note that all existing and proposed new wells (upon completion) will be surveyed during the northern

area Groundwater Supplemental RCRA Facility Investigation field work to eliminate any potential errors in the well survey data. This field work is being planned for fall of 2018.

7) Permittee Statement – Section 3.8, Exposure pathways for Human and Ecological Receptors, line 30, page 3-10

“Groundwater contaminant plumes have not been identified in areas where groundwater is less than 20 feet bgs.”

NMED Comment:

Several metals concentrations have exceeded the screening criteria in wells having groundwater depths less than 20 feet bgs. Also, the nitrate, perchlorate, explosives, VOCs, and SVOCs have been detected at concentrations below the screening criteria in these wells. The data indicate that contamination is present in groundwater at depths less than 20 feet bgs. Revise or remove the statement from the revised Plan.

Army Response, Section 3.8 Exposure Pathways for Human and Ecological Receptors:

Concur. Contaminant concentrations have been identified in groundwater at depths less than 20 feet bgs. A total of six wells have a top of well screen shallower than 20 feet bgs, with only two wells (BGMW01 and BGMW03) with a depth to water less than 20 feet bgs. Metals concentrations exceed screening values at these locations, however groundwater background has not been established to determine if concentrations are naturally occurring.

The statement in question has been removed from the plan. The text was clarified to indicate that use of shallow groundwater resources at FWDA has ceased. Text was also inserted at the end of the third paragraph in Section 3.8 stating: “Contaminants have been detected in shallow saturated zones less than 20 feet bgs.”

8) NMED Comment: Table 4-1, Groundwater Purge Method

Many wells currently monitored and sampled are not listed in Table 4-1 (e.g., TMW07). Revise the Plan to include all wells that are currently being monitored in Table 4-1.

Army Response:

Table 4-1 has been revised, and includes all wells currently being monitored.

9) Permittee Statement – Section 5.1, Interim Groundwater Monitoring Analytical Program, line 18-20, page 5-1

“For vinyl chloride, bis(2-ethylhexyl) phthalate, and phenol, the DL is sufficient to accurately assess potential contaminant concentrations. For hexachlorobenzene, the DL is sufficient to assess potential contaminant concentrations. “

NMED Comment:

The limit of quantification (LOQ) values are higher than the screening levels for these compounds according to Table 5-1, Groundwater Screening Levels, Detection Levels, and Control Limits. LOQ is the lowest concentration at which the analyte can not only be reliably detected, but also at which some predefined goals for bias and imprecision are met. Provide a basis for why the detection limits are sufficient to assess the contaminant concentrations in the revised Plan; otherwise, the Permittee must use other analytical methods or modify the current analytical methods to attain lower detection limits for these compounds. For example, lower detection limits may be achievable for most purgeable compounds (e.g., vinyl chloride) with the same analytical method when a larger sample is utilized. Similarly, a larger

groundwater sample volume may be extracted for extractable compounds (e.g., bis(2-ethylhexyl) phthalate) to attain lower detection limits.

Army Response:

A limit of quantitation that is below the project screening level cannot be achieved for these compounds because of the following reasons:

- 1) Three DOD-ELAP accredited laboratories were contacted in March of 2018 to provide detection and quantitation limits (DL/LOD/LOQs) for project SVOC contaminants of potential concern with screening levels below LOQs. The three laboratories responded with DL/LOD/LOQs for trace-level analyses by EPA SW-846 Methods 8270D (full scan) and 8270 single ion monitoring (SIM). If available, large volume injection (LVI) detection and quantitation limits were provided. Based on the results of that survey, DOD/ELAP-accredited laboratories cannot achieve an LOQ below the low project screening values for these analytes with current EPA approved methods, either by LVI or standard volume injection for trace-level analyses. For project VOC contaminants of potential concern with low screening levels, high purge volumes may result the need for dilution by concentrating the presence of other VOCs (see number 2 of this response). The DOD ELAP accredited laboratory with the lowest DL/LOD/LOQs for VOCs (TestAmerica Denver) was chosen at the initiation of the project.
- 2) LOQs can be lowered using increased sample volume through large volume injection (LVI) (SVOCs) and increased purge volume (VOCs). In March of 2018, three DOD-ELAP accredited laboratories were contacted to provide LOQs for PAH SIM analyses and LVI LOQs were provided by the responding laboratories (if available). The LVI provided lower LOQs for some screening levels, but were not sufficient to provide LOQs lower than screening levels for all of the contaminants in question. Limitations of LVI include 1) matrix effects from high concentrations of non-target analytes in the same analytical suite and 2) interference from existing site contaminants in different analytical suites. High concentration of non-target SVOCs necessitates sample dilution. Dilutions negate the advantage of the higher sample volumes used in a LVI. Clean-up techniques may be employed to mitigate matrix effects, but because these techniques are based on the physical and chemical properties of the chemical compounds in question, they can only be applied for contaminants outside of the subject analytical suite – in this case SVOCs. The same conditions apply to VOC samples analyzed by purge-and-trap at increased purge volume preparations.
- 3) During each single sampling event the majority of the wells do not produce sufficient water to collect increased volume of sample due to low productivity rates.

Because screening levels are determined by toxicological studies, they are sometimes not achievable in environmental samples using current approved technologies and methodologies. Although detections that are less than the LOQ cannot be quantified within the analytical error determined for concentrations within the calibration curve, analytes can be reliably determined to be present/not present at unknown concentrations less than the LOQ. If detections are reported above the DL, the analytes will be reported as present at less than the LOQ for the purpose of this interim monitoring.

The Army agrees that trace-level detections between the DL and LOQ are not sufficient to assess contaminant concentrations within the specified uncertainty limits for individual quantitative measurements. As a result, Section 5-1 has been substantially revised to refer to

LOQs and indicate analytes that have screening values lower than the LOQ. All analytes with LOQs greater than project screening values will be included in future risk evaluations. We have added the following language and made the stated edits to Table 5-1.

“Thirty-five analytes in Table 5-1 have screening values that are lower than the limit of quantitation (LOQ) (highlighted in blue), including 4 VOCs, 28 SVOCs, 2 pesticides, and 1 explosive analyte.

Only 15 of these analytes have been previously detected in groundwater at FWDA. These analytes are highlighted in blue and italicized on Table 5-1, and consist of 13 SVOCs, 1 VOC, and 1 pesticide analyte. Nearly 90% of these detections are estimated (J-flagged). Concentrations are greater than the detection limit, but less than the limit of detection and are also not quantifiable. Some of these detected analytes are plasticizers and polymers, which could be related to sampling activities and laboratory analysis. The rest are primarily explosives breakdown products, related to historical site activities. If detections of these analytes are reported above the DL, the analytes will be reported as present at less than the LOQ during interim monitoring activities. All analytes with LOQs greater than project screening levels will be included in future risk evaluations.”

The purpose of this interim GW monitoring effort is to monitor and report on the presence/absence of COPCs. Any analytes with LOQs greater than the screening values will be retained in the monitoring plan and will be included in any future risk evaluations.

10) Permittee Statement – Section 5.2, Monitoring Location and Frequency, line 9, page 5-2

“The Army does not propose to optimize the interim groundwater monitoring program at this time.”

NMED Comment:

Since the Permittee proposes no changes to the current groundwater monitoring program, the sampling plan shown in Table 5-3, Groundwater Sampling Matrix must be fully implemented; otherwise, the Permittee must provide an explanation for the deviations from the approved work plan in all future Groundwater Periodic Monitoring Reports in accordance with the Section 5.6, Reporting. Some groundwater analyses required by Table 5-3 have not been included in the recent sampling events; for instance, TPH-DRO, TPH-GRO, and SVOC analyses are required for the groundwater samples collected from well BGMW01 according to Table 5-3; however, the results of these analyses have not been reported in the recent groundwater monitoring reports. Conversely, although some groundwater analyses are not required by Table 5-3, groundwater samples have been collected from unassigned wells. For example, perchlorate, VOC, and SVOC analyses are not required for the groundwater samples collected from well BGMW02 according to Table 5-3; however, these analytical results have been reported in the recent groundwater monitoring reports. Revise Table 5-3 to reflect the approved groundwater sampling plan. Provide a corrected Table 5-3, as well as the reference to the latest approved groundwater sampling matrix, in the revised Plan.

Army Response:

Table 5-3 has been revised to reflect the latest approved groundwater sampling matrix. Previous and current periodic groundwater monitoring and periodic monitoring reports have followed the last approved groundwater sampling matrix, which Table 5-3 now presents. Section 5-2 has also been revised to add the requested reference to the latest approved groundwater sampling matrix.

11) NMED Comment: Table 5-1, Groundwater Screening levels, Detection Levels, and Control Limits

Refer to Comment 9 in NMED's April 12, 2017 Disapproval Letter for Final 2016 Interim Facility-Wide Groundwater Monitoring Plan, Version 9. The NMED Risk Assessment Guidance for Site Investigation and Remediation (2017) includes a Tap Water Standard for perchlorate of 13.8 ug/L. The EPA Maximum Contaminant Level is 15 ug/L. Revise Table 5-1 accordingly in the Plan.

Army Response:

Comment noted. Item #6 in Section 1.2 has been updated to read "Previously, no NM WQCC standard or EPA MCL standard was published for perchlorate. An EPA MCL standard of 15 micrograms per liter (µg/L) was published in the November 2017 update, and remains the current standard as of May 2018 (EPA, 2018). The EPA MCL value supersedes the previously selected EPA tap water RSL, so this standard will be followed for perchlorate in accordance with Attachment 7 of the RCRA permit for FWDA (NMED, 2015)." Table 5-1 has also been updated to reflect this information.

If you have questions or require further information, please call me at (505) 721-9770.

Sincerely,

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Enclosures

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