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Base Realignment and Closure Division

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

RE: Final Parcel 3 Groundwater Background Wells and Replacement Monitoring Wells Installation Work Plan Disapproval Letter, Fort Wingate Depot Activity, McKinley County, New Mexico, EPA ID#NM6213820974, HWB-FWDA-19-005

Dear Mr. Pierard:

This letter presents the Army's responses to the New Mexico Environment Department (NMED) Disapproval letter, dated February 5, 2020, regarding the Final Parcel 3 Groundwater Background Wells and Replacement Monitoring Wells Installation Work Plan for the Fort Wingate Depot Activity (FWDA), under RCRA Permit USEPA ID No. NM6213820974. The following are the Army's responses to NMED's comments, detailing where each comment was addressed and cross-referencing the numbered NMED comments. This letter also transmits the revised report and a red-line strike-out electronic copy of the edits.

Comments

1) Section 1.1, Purpose and Scope, lines 36-39, page 1-1

Permittee Statement: "Install One Background Well in Parcel 2. Drill one soil boring and install a background well in a water-bearing unit adjacent to an identified arroyo in Parcel 2, approximately 2,500 feet northeast of dry background monitoring well BGMW05 (comment 7, NMED 2019)."

NMED Comment: Comment 7 in the NMED's Approval with Modifications Final Revision 1 Parcel 3 Groundwater RCRA Facility Investigation Report, dated June 14, 2019 states, "Figure 2-10, Geologic Cross Section Transect Location Map, indicates that an arroyo is present approximately 1,500 feet east of well BGMW05, and the arroyo appears to be accessible from an unnamed road extending eastward from AOC 91. Evaluate accessibility in the vicinity of the arroyo and, if found accessible, submit a work plan to install a background monitoring well in the vicinity of the arroyo." Although the proposed background well is located along the same arroyo and appears to be accessible from AOC 92, according to Figure 3-1, Proposed Background Well Locations, the location to be evaluated is more than 2,500 feet upgradient (south) of the proposed location. Explain the basis for the discrepancy in a response letter. If the location approximately 1,500 feet east of well BGMW05 is accessible, change the proposed location, because groundwater at this location is less likely to be affected by potential contaminants. Revise the Work Plan accordingly, as appropriate. If the upgradient location is not

accessible, the Permittee may proceed to install the well at the proposed location, and in that case, no revision is necessary to the Work Plan.

Army Response: Comment Noted. In the Army's response letter dated August 22, 2019, response to NMED's Comment 7, states that the Army performed site reconnaissance on July 24, 2019.

A location northeast of BGMW05 within Parcel 3 was identified to be potentially accessible by track-mounted equipment and within proximity of a north-trending arroyo. The location approximately 1,500 feet east of well BGMW05 was deemed inaccessible, as personnel on foot could not reach the arroyo due to steep terrain. The location, as presented on Figure 3-1, is approximately 2,500 feet downgradient (north) of the location proposed by NMED, however, is the closest location that is accessible by track-mounted equipment. The location as presented is accessed by an unnamed road that extends eastward from AOC 91. Access to this arroyo is limited to areas adjacent to the unnamed road and will require track-mounted equipment.

The Army respectfully requests to proceed to install the well as proposed in this Work Plan.

2) Section 1.1, Purpose and Scope, lines 3-6, page 1-2

Permittee Statement: "Install 11 Replacement Wells in Parcel 3. Drill 11 soil borings proximal to abandoned wells within the HWMU of Parcel 3 and install 11 replacement wells, screened to the specifications of the abandoned wells each new well will replace (comment 14, NMED 2019; response to comment 4, BRACD, 2019)."

NMED Comment: Comment 14 in the June 14, 2019, NMED's Approval with Modifications states, "[t]he Permittee must propose to install a replacement well for CMW18 in a location outside of the HWMU operations." Accordingly, abandoned well CMW18 is proposed to be replaced with proposed well CMW42. It is appropriate to propose to replace abandoned well CMW18. However, in addition to CMW18, wells CMW06, CMW07, CMW10, CMW14, CMW17, CMW19, CMW20, CMW-21, CMW33B, and FW38 are also proposed to be replaced. The replacement wells will be designated as wells CMW37, CMW38, CMW39, CMW40, CMW41, CMW43, CMW44, CMW45, CMW46, and CMW47, respectively, at approximately the same locations. The Permittee must submit documentation to NMED demonstrating that a work plan for well abandonment has been submitted and approved by the New Mexico Office of the State Engineer (NMOSE). Provide copies of the Permittee's work plan and NMOSE's approval letters for the well abandonment.

In addition, Section 2.0, Installation and Site Background, lines 20-24, page 2-1, states, "[t]he HWMU soil excavation operations have encroached on existing groundwater monitoring wells and required these wells to be abandoned before excavating surrounding soil. Eleven groundwater monitoring wells within the HWMU have been abandoned as a result of the soil excavation operations." Abandoned wells CMW19 and CMW21 were located more than 500 and 2,000 feet, respectively, from the HWMU boundary according to Figure 3-2, Proposed Replacement Well Locations. It is unclear why these wells were abandoned. Provide an explanation in the revised Work Plan

Army Response: Section 2.0 Installation and Site Background, Page 2-1, lines 22-29; Section 3.0, page 3-1, lines 4-5. Concur. The Army has attached the approved plugging plan of operations and the NMOSE approval letters to this letter.

For Clarification, monitoring well CMW19 was abandoned due to damage incurred during flooding in Parcel 3. The monitoring well was compromised and needed plugging to prevent any cross contamination from occurring. CMW19 was located within the arroyo at the boundary of the inner fence and the HWMU.

Monitoring well CMW21 was abandoned in 2015, as this well had been buried under four feet of sand/sediment after a high energy flood event. The well was located and abandoned to prevent any cross contamination due to the altered integrity of the well. This information regarding CMW21 and CMW19 has been added to the Work Plan in Section 2.0 and Section 3.0

3) Section 1.1, Purpose and Scope, pages 1-1 and 1-2

NMED Comment: The field activities proposed within the Work Plan include the installation, development, and survey of background and replacement wells. However, the Permittee must also include soil and groundwater sampling in the scope of this Work Plan. The collection of soil samples for laboratory analyses is necessary for every boring, because soils in the vicinity of HWMU may be contaminated. In addition, once the wells are developed, groundwater samples must be collected from each well. Include these tasks in the revised Work Plan.

Army Response, Section 1.1, Purpose and Scope, pages 1-1 and 1-2; Section 3.4.2 Subsurface Soil Sampling, pages 3-4 and 3-5; Section 3.7 Groundwater Level Measurement, Page 3-7; Section 3.8 Initial Groundwater Sampling, pages 3-7 through 3-9; Table 3-3 and Table 3-4. Concur. The Army has incorporated soil and groundwater sampling into this Work Plan. Also, see response to Comment 8. Soil samples will be collected during bore hole advancement. Groundwater samples will be collected following monitoring well development, and an additional round of sampling prior to implementation into the groundwater monitoring program (see page 3-8 lines 5-12). The new wells will be analyzed for nitrate, explosives, VOCs, SVOCs, perchlorate, and metals. PCBs will be sampled for at the background wells in accordance with comment 5 of NMED's Approval with Modification letter dated December 30, 2017 (NMED, 2017) regarding the installation of additional background monitoring wells in the FWDA northern area. As the replacement wells are within areas that have had previous monitoring wells installed, and there is no site history at those locations of containing PCBs, the analytical suite will be consistent with that used in the Parcel 3 Groundwater RCRA Facility Investigation

4) Section 2.2.7, Hydrogeologic Conceptual Model, lines 12-15, page 2-5

Permittee Statement: "As observed and presented in the Parcel 3 RFI report, groundwater monitoring wells located along the north-south trending arroyo east of the Nutria Monocline have sufficient groundwater for sampling, and include CMW36A, CMW36B, CMW28B, CMW27B, and CMW26 (Sundance, 2019; Figure 2-8)."

NMED Comment: Wells CMW27B and CMW26 are not depicted in the figures included in the Work Plan. Identify the locations of these wells and all existing and abandoned wells in Parcels 2 and 3 in the appropriate figures in the revised Work Plan.

Army Response: Figure 2-8, Figure 3-1, and Figure 3-2. Comment noted. Also see response to Comment 14. Monitoring Wells CMW26 and CMW27B are at the northern end of Parcel 3 and were not the focus of this work plan. CMW26 and CMW27B were also outside of the map view of Figure 2-8.

The Army has adjusted Figure 2-8 to show all wells within Parcel 3 and Parcel 2. Revised figures 3-1 and 3-2 display wells that exist within the given map scale to maintain the resolution of the maps focus. Not all Parcel 3 wells can be displayed on Figures 3-1 and 3-2 due to the overall size of the area containing all existing wells.

5) Section 2.2.7, Hydrogeologic Conceptual Model, lines 18-23, page 2-5

Permittee Statement: "Figure 2-8 shows an inferred dry line east and west of the main arroyo. This line represents a boundary between water producing wells within close proximity of the arroyo and wells that do not produce sufficient volume to sample or are dry. The dry line exhibits an approximate distance away from the arroyo where groundwater is generally not encountered. The locations of groundwater-producing monitoring wells provide evidence that groundwater recharge is correlated to surface infiltration from arroyos (Sundance, 2019)."

NMED Comment: NMED agrees that the groundwater producing zones are in close proximity of the arroyos. However, there are no groundwater monitoring wells west of the inferred dry line to confirm the boundary. Accordingly, the water-producing boundary cannot be estimated, and it is not appropriate to speculate such boundary. Remove the line from Figure 2-8 and revise the text in the Work Plan.

Army Response: Figure 2-8; Section 2.2.7, Hydrogeologic Conceptual Model, page 2-5 lines 20-26. Comment Noted. The line was an estimation based on CMW33B and KMW15B located west of the arroyo, as well as evidence seen on the east side of the arroyo, as dry wells were observed further way from the arroyo. Areas west of the arroyo are not accessible in the southern portions of the HWMU.

The Army has removed the inferred dry lines on Figure 2-8. The text in Section 2.2.7 was edited to state:

"Groundwater monitoring wells BGMW05 and CMW32, located outside and east of the arroyo, and KMW15B, located outside and west of the main arroyo, did not recharge following well development or purging activities during the 2017 RFI, and are currently dry. The dry wells represent a boundary between water producing wells within close proximity of the arroyo, and wells that do not produce sufficient volume to sample or are dry. These wells exhibit an approximate distance away from the arroyo where groundwater is generally not encountered."

6) Section 3.0, Field Methodology, lines 5-6, page 3-1, Section 3.4, lines 5-7, page 3-3, and Section 3.6, Well Survey, lines 12-14, page 3-6

Permittee Statements: "The replacement wells will be designed and located according to the specifications of the abandoned wells they are replacing."

and,

"These replacement wells are to be installed approximately to the same specifications as the abandoned well being replaced."

and,

"Once the ground elevation at each replacement well is verified, the total well depth can be calculated and adjusted to allow placing the screened interval consistent with the abandoned well's screened interval."

NMED Comment: Accommodate the decreasing trend in groundwater elevations in recent years in the design of replacement wells, as necessary. Ensure that all new wells produce sufficient groundwater. Include the provision in the revised Work Plan.

Army Response: Table 3-2, Notes; Section 3.4 Monitoring Well Installation, page 3-3, lines 11-17. Comment noted. Also see response to Comment 15. The Army added a provision that efforts to achieve the installation of productive groundwater monitoring wells will be attempted; however, given the extensive soil excavation and rework in the area, and the proven lack of overall groundwater within Parcel 3, the Army cannot ensure every proposed well will produce sufficient groundwater.

- 7) **Section 3.4, Monitoring Well Installation, line 42, page 3-2 and lines 1-3, page 3-3**
Permittee Statement: "The total depths and screened intervals for the background wells may vary based on observed subsurface lithology, observed saturated zones, and the field geologist's professional judgment. The screened interval will be placed to capture first water, thus will not drill through multiple water-bearing zones."

NMED Comment: In order to avoid installing a dry permanent well, unless the presence of the saturated zone is clearly identified, propose to install a temporary well or leave the borehole open to evaluate for presence or absence of groundwater. If appropriate, convert the temporary well/borehole to a permanent groundwater monitoring well. Otherwise, abandon the temporary well/borehole and contact NMED to evaluate an alternative well location. Include the provision in the revised Work Plan.

Army Response: Section 3.4 Monitoring Well Installation, page 3-3, lines 13-17. Concur. The Army added a provision to install temporary monitoring wells in the event a saturated zone within the planned depth of the boring is not encountered.

- 8) **Section 3.4.1, Drilling and Well Construction, lines 27-28, page 3-3**

Permittee Statement: "Sonic drilling technology also generates continuous soil and rock cores from the subsurface."

NMED Comment: In addition to a record of soil and rock cores, soil samples must be collected from near surface, saturation, and termination depths in every boring (see Comment 3). Include the provision in the Work Plan. In addition, include an appropriate analytical suite for the soil samples in the revised Work Plan. At a minimum, the Permittee must submit the soil samples to an analytical laboratory for chemical analysis of semi-volatile organic compounds, metals, explosive compounds, perchlorate, nitrate, cyanide, PCBs, dioxins, and furans.

Army Response: Section 3.4.2 Subsurface Soil Sampling, pages 3-4 and 3-5; Table 3-3. Comment Noted. The Army has included soil sampling in the Work Plan. The Army has included the analytical suite for soils in Table 3-3 as proposed by NMED.

9) Section 3.4.1, Drilling and Well Construction, lines 28-29, page 3-3, and Section 4.0, Investigation-Derived Waste Management, lines 9-11, page 4-1

Permittee Statements: "Soil and rock cores will be contained in boxes and maintained on-site, thus eliminating soil IDW."

and,

"Note that it is anticipated that no soil and rock IDW will be generated, because all recovered material will be contained in boxes and maintained on-site, thus eliminating soil and rock IDW."

NMED Comment: Soil and rock cores must be removed from the site as an investigation derived waste once the investigation is complete. They cannot be kept on-site unless they are proven to be clean by waste characterization analysis. The analytical suite for soil IDW characterization must be provided in the revised Work Plan.

Army Response, Section 3.4.1 Drilling and Well Construction, page 3-3 lines 34-37; Section 4.0 (throughout). Comment Noted. The Army will perform waste characterization analysis on the soil cores. Upon receipt of analytical results showing the cores are clean, the cores will then be transported to onsite storage. In the event any of the boring cores are deemed a hazardous waste, the cores from that representative boring will be removed from the site and disposed of as investigation derived waste. The analytical suite for soil IDW characterization has been added to Table 3-3, Notes, with a reference added in Section 4.1 IDW Segregation, page 4-2, lines 7-9.

10) Section 4.1, IDW Segregation, line 37, page 4-1

Permittee Statement: "Sample analysis [for liquid waste] will include flash point, reactivity, corrosivity, and toxicity tests."

NMED Comment: In addition to the above analyses, include analyses for constituents that are potentially present at the site for characterization of liquid waste. Since groundwater samples are to be collected from all newly installed wells (see Comment 3), the analytical suite for liquid waste must be consistent with that of groundwater samples. Include the provision and revise the Work Plan accordingly.

Army Response, Section 4.1 IDW Segregation, page 4-2, lines 7-13; Table 3-4, Notes. Concur. The Army has added sample analyses for nitrate, explosives, VOCs, SVOCs, perchlorate, and metals. PCBs are not a contaminant of potential concern in groundwater at FWDA, and will not be added to the liquid waste characterization samples. PCBs will be sampled for in soils as required by NMED Comment 8. The text was edited to read:

"Sample analysis will include flash point, reactivity, corrosivity, and toxicity tests, in accordance with Title 40 of the Code of Federal Regulations (CFR) at Part 261, as well as the analytical suites for soil and water presented in Tables 3-3 and 3-4. In the event analytical data indicate soils and/or waters are a RCRA hazardous waste, a U.S. Department of Transportation (DOT)-certified hazardous waste transport and disposal

company will be contacted to collect the hazardous IDW and ship it off site to the appropriate disposal facility within 90 days.”

11) Section 4.2, IDW Containerization and Labeling, lines 6-8, page 4-2

Permittee Statement: "The collected water will be disposed of in the evaporation pond, unless analytical data indicate that an alternate disposal method is appropriate."

NMED Comment: Provide information regarding the evaporation pond (e.g., location, size, and construction details) in the revised Work Plan.

Army Response, Section 4.2 Containerization and Labeling, Page 4-2, lines 18-20.

Comment noted. The Army has edited the statement to read:

“The collected water will be disposed of offsite as non-hazardous waste.”

The evaporation pond previously referenced in this Plan, also known as the evaporation tank, is the same site/location as referenced in the NMED approved 2017 Interim Facility-wide Groundwater Monitoring Plan Version 10, Revision 1; The Fort Wingate Depot Activity Facility-Wide Groundwater Periodic Monitoring Report for April 2009 to July 2009, Version 1, dated January 2010; and previous periodic monitoring reports dating back to 2010. Appendix E of the April 2009 to July 2009 PMR contains construction details of the tank.

12) Section 4.3, Temporary Storage, lines 1-2, page 4-3

Permittee Statement: "Characterization sampling will be composite samples of waste generated from like areas that were generated during the same timeframe."

NMED Comment: Provide more detailed explanation for the composite sampling procedure (e.g., number of subsamples, volume of waste to be represented) in the revised Work Plan.

Army Response, Section 4.3, Temporary Storage, page 4-3 Lines 15-20. Comment Noted. As soil IDW is expected to be low and only contain the soil cores from each boring, a maximum of three borings within proximity of each other will be grouped as a like area. A minimum of three sub-samples from each boring's soil cores taken from near surface, the midpoint, and at termination, will be composited and represent the characterization for the boring group. This approach will make nine sub-samples from three borings, or six sub-samples from two borings grouped together for a characterization sample.

Liquid IDW will be bulked into tanks that are 800 gallons or less. A grab sample from each liquid IDW container will be collected for analysis.

This information has been added to the revised Work Plan.

13) Section 4.4.1, IDW Sampling, lines 16-17, page 4-3

Permittee Statement: "Accumulated wash and rinse water will be left within the decontamination pad and allowed to evaporate."

NMED Comment: If it rains during the process, the waste may overflow from the pad. If the ambient temperature is too low, the water may not evaporate in a timely manner. The waste management practice does not appear to be viable under some circumstances. Address the issue and revise the Work Plan accordingly.

Army Response, Section 4.4.1 IDW Sampling, Lines 34-35. Comment Noted. The statement has been edited to read: "Accumulated wash and rinse water will be collected from the decontamination pad and bulked with other decontamination fluids."

14) Figure 3-1, Proposed Background Well Locations and Figure 3-2, Proposed Replacement Well Locations

NMED Comment: The presentation of existing and abandoned wells is not consistent between the figures. For example, wells CMW02, CMW16, CMW22, CMW24, KMW09, KMW10, KMW11, KMW12, KMW13 and KMW16 are depicted as existing wells in Figure 3-1, while these wells are not depicted in Figure 3-2. Include all existing wells in Figure 3-1 in the revised Work Plan. Additionally, two abandoned wells labeled CMW33B are depicted in Figure 3-1, while only one abandoned well CMW33B is depicted in Figure 3-2. Provide a clarification. Furthermore, abandoned well CMW21 is depicted in Figure 3-2, while the well is not depicted in Figure 3-1. Resolve the discrepancies in the revised Work Plan

Army Response, Figure 2-8, Figure 3-1; Figure 3-2. Comment Noted. Also see response to Comment 4. All the existing wells in Parcel 3 are now displayed on Figure 2-8, Hydrogeologic Map. The focus of Figure 3-1 is to showcase the proposed background well locations, and the map scale is set to appropriately show the proposed background wells. The duplicate label for CMW33B on Figure 3-1 has been removed. The label for well CMW21 has also been added to Figure 3-1.

The purpose of Figure 3-2 is to showcase the proposed replacement well locations in relationship to the abandoned well locations. Figure 3-2 is at a larger scale that does not have CMW02, CMW22, KMW09, and KMW12 in the extent of the map. Other existing monitoring wells within the map view have been added to Figure 3-2.

15) Table 3-2, Replacement Monitoring Well Construction Detail

NMED Comment: Abandoned wells CMW06, CMW20, and FW38 are highlighted on the table to indicate that the replacement for these abandoned wells will likely be dry due to shallow intervals of the abandoned wells. It does not make sense to install replacement wells that do not produce any groundwater. Propose to move the boring locations or install the wells with deeper screened interval to allow for sufficient ground water production. Include the provision in the revised Work Plan.

Army Response, Table 3-2, Notes; Section 3.4 Monitoring Well Installation, page 3-3, lines 12-17. Concur. The Army added a provision to extend the total depths of these highlighted wells to encounter a groundwater producing interval. Table 3-2, notes, yellow highlight now reads:
"due to shallow intervals of the abandoned well, the proposed well likely will be advanced to a deeper total depth to reach a viable water bearing zone."

Section 3.4 Monitoring Well Installation has been edited to include the following provision:

“Some monitoring wells being replaced had a shallow screened interval, and thus were determined dry. Efforts to screen the replacement well in a water-bearing zone will be made, including advancing the borings to a deeper total depth, moving the well location laterally up to 100 feet, and/or installing temporary wells in the event a saturated zone within the planned depth of the boring is not encountered before well monument completion.”

Please note additional edits were made to Section 5.0, now titled “Data Validation, Reporting, and Project Management”. These edits, not specifically discussed in the above comments, are required quality control measures with the addition of soil and groundwater sampling and analysis.

If you have questions or require further information, please contact me at George.h.cushman.civ@mail.mil, 703-455-3234 (Temporary Home Office, preferred) or 703-608-2245 (Mobile).

Sincerely,



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Enclosures

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