



DEPARTMENT OF THE ARMY
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WASHINGTON, DC 20310-0600

December 30, 2020

Base Realignment and Closure Operations Branch

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: Revised Final 2022 Interim Northern Area Groundwater Monitoring Plan
Fort Wingate Depot Activity, McKinley County, New Mexico. EPA# NM6213820974

Dear Mr. Pierard:

This letter provides responses to the comments issued in the *Disapproval Letter – Final 2019 Interim Northern Area Groundwater Monitoring Plan* from the New Mexico Environment Department (NMED), dated July 27, 2020. The following are the Army's response to NMED comments, detailing where each comment was addressed and cross referencing the numbered NMED comments. In addition to the comment responses provided in this letter, two (2) hard copies and one (1) electronic (CD) copy of the *Revised Final 2022 Interim Northern Area Groundwater Monitoring Plan* are enclosed for your review and consideration. The electronic transmittal includes a redline-strikeout version of the abovementioned report showing where all revisions to the report were made.

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,

George H. Cushman IV

George H. Cushman IV
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Fort Wingate Depot Activity
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Enclosures

CF:

Kevin Pierard, NMED, HWB
Dave Cobrain, NMED, HWB
Ben Wear NMED, HWB
Michiya Suzuki, NMED, HWB
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Clayton Seoutewa, SW BIA
George Padilla, BIA, NRO
Sharlene Begay-Platero, Navajo Nation
Mark Harrington, Pueblo of Zuni
Admin Record, NM
Admin Record, Ohio

Attachment

GENERAL COMMENT

1. Objectives of Groundwater Monitoring Plan

NMED Comment: The Permittee submitted a groundwater monitoring plan for 2019, which should have been submitted in fiscal year 2018. The groundwater monitoring plan must discuss the upcoming groundwater monitoring activities planned for 2021. The entire Plan must be revised to propose groundwater monitoring activities for 2022. While the Permittee failed to submit several annual updates to the groundwater monitoring plan, a plan must propose future activities, not past activities or those already underway. Revise the Plan accordingly.

Permittee Response:

- a) Comment Acknowledged. Please note that there are several factors that caused the schedule delays; new contract awarded; multiple revisions to accommodate PDT/NMED comments and lengthy review times.
- b) The Army revised the plan to include 2021 and 2022 monitoring activities.

SPECIFIC COMMENTS

2. Executive Summary, line 31-34, page ES-1

Permittee Statement: “Other non-traditional sampling techniques for RCRA compliant groundwater monitoring (i.e., borehole purging) are deployed as necessary due to insufficient well yield.”

NMED Comment: Non-traditional sampling techniques must be approved prior to use. No revision required.

Permittee Response: Comment Acknowledged. The Army concurs that all non-traditional sampling techniques will be submitted to NMED for review approval prior to their application or implementation in the field.

The plan was revised to state on Page ES-1, Lines 33-35 (RLSO: Page ES-1, Lines 33-35) as follows:

“Other non-traditional sampling techniques for RCRA compliant groundwater monitoring (i.e., borehole purging) will be submitted to NMED for review prior to deployment if necessary.”

3. Executive Summary, lines 23-24, page ES-2, Section 2.2.15, Approved Final RCRA Facility Investigation Parcel 21 – 2012, Fire Training Ground (SWMU 7), lines 20-21, page 21 of 71, and Section 3.7, Fate and Transport of Contamination in Groundwater, lines 32-33, page 39 of 71

Permittee Statements: “Fire Training Ground (SWMU 7, Parcel 21) had suspected releases of DROs due to historical firefighting operations.”

and,

“Based on the sampling results, DRO concentrations exceeded cleanup criteria/project screening levels in two samples from the beneath the western (fill) end of the pipe.”

NMED Comment: Confirm whether or not firefighting foam was historically used in the fire training sites in a response letter.

Permittee Response: Comment Acknowledged. The Army confirms that firefighting foam was not used at FWDA and the Plan was revised on page ES-2, Lines 25-26 (RLSO: Page ES-2, Lines 29-30), and Page 40, Lines 2-4 (RLSO: Page 40, Lines 14-16) as follows:

“The Army has confirmed that firefighting foam was not used at the facility as part of the installation activities.”

4. Section 1.4, Data Quality Objectives, Step 7 - Develop the Sampling Plan for Obtaining the Data, lines 32-35, page 5 of 71

Permittee Statement: “Wells designated as upgradient and downgradient of a contaminant plume will be used to monitor plume boundaries and plume migration. Where no contaminant plume can be drawn, downgradient locations will be selected based on the groundwater flow direction from the point of release. Sentinel wells will monitor potential off-site migration of contaminants.”

NMED Comment: Although it is appropriate to identify dry wells, other designations such as downgradient, upgradient, or sentinel wells are unnecessary. According to the Final Groundwater Periodic Monitoring Report January through June 2019 (Report), dated March 2020, wells TMW01 and TMW31S are designated as primary downgradient wells. However, these wells are located upgradient of the TNT Leaching Beds and Workshop Area, potential source areas of nitrate in groundwater. Therefore, these wells are not considered primary downgradient wells. Such well designations can be misleading and must not be used in the future periodic monitoring reports.

Permittee Response: Concur. Well designations such as downgradient, upgradient, or sentinel will be removed from future periodic monitoring reports.

5. Section 2.2.8, Phase 1 RCRA Facility Investigation Report for Building 600 and 542 – 2002, lines 1-4, page 14 of 71

Permittee Statement: “Monitoring wells TMW14A, TMW16, TMW17, TMW18, and TMW19 were completed in the deeper, sandstone bedrock aquifer. TMW14A was also installed as a potential background well. Fluoride was detected at concentrations exceeding cleanup criteria/project screening levels.”

NMED Comment: Anions including fluoride are not included in current analytical suite according to Table 5-2, Northern Area Groundwater Sampling Matrix, although nitrate and nitrite concentrations have been monitored and reported in the periodic groundwater monitoring reports. Include nitrate and nitrite analyses in the revised table. In addition, explain why fluoride concentrations are no longer monitored or reported in the periodic groundwater monitoring reports in the revised Plan. Propose to conduct major anion analyses for groundwater samples collected from these wells in the revised Plan.

Permittee Response:

- a) Comment Acknowledged. Nitrate and nitrite are already included in Table 5-2, no revision required.
- b) Major anion testing is now proposed in this plan as described in Section 5.2.1, Page

61, Lines 11-13 (RLSO: Page 62, Lines 15-17) and Section 5.2.2, Page 63, Lines 1-2 (RLSO: Page 64, Lines 13-14):

“Starting in 2021 all wells sampled for nitrate and nitrite will also be sampled for additional major anions to include chloride, fluoride, sulfate, phosphate, and bromide.”

And in Section 7.0, Page 70, Lines 8-20 (RLSO: Page 72, Lines 8-20):

“In addition, major anion analysis will be included per the request of NMED for all wells that were previously sampled for nitrate/nitrite. The current analytical program includes the sampling and analysis of nitrate/nitrite. The current list of wells that are sampled and analyzed for nitrate and nitrite will also include major anions per NMED comment #5 and #11 in Disapproval Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11, dated July 29, 2020. Major anion analytical method limits and screening levels are presented in Table 3 and include the following:

- Nitrate/ Nitrite
- Chloride
- Fluoride
- Bromide
- Sulfate
- Phosphate.”

And updated in Tables 4-3 and 5-2.

6. Section 2.2.11, Parcel 11 RFI Report – 2011, Building 6, Gas Station (SWMU 45) and Structure 35, Former UST 7 (SWMU 50), lines 2-3, page 17 of 71

Permittee Statement: “GRO was detected in six of 21 samples from the area around Building 6; however, there are no cleanup criteria/project screening levels for GRO.”

NMED Comment: Note that screening levels for gasoline are available in NMED’s Risk Assessment Guidance for Site Investigations and Remediation (RAG), dated February 2019. Soil screening levels for gasoline are applicable to those for GRO. Apply the gasoline soil screening levels for comparison to GRO concentrations in future investigations. No revisions required.

Permittee Response: Comment Acknowledged. Gasoline screening levels from NMED RAG, dated February 2019, will be used as screening levels for comparison to GRO concentrations in future investigations. No revisions required.

7. Section 2.2.12, Parcel 22 RFI Report – 2011, Building 528 Complex (SWMU 27, AOC 121, AOC 122, 1 AOC 125, and AOC 126), lines 18-20, page 18 of 71

Permittee Statement: “[D]ue to the widespread use of bis(2-ethylhexyl) phthalate as a plasticizer, bis(2-ethylhexyl) phthalate is regarded as a common laboratory and sampling contaminant.”

NMED Comment: Detection of bis(2-ethylhexyl) phthalate in groundwater samples is a recurring issue. For example, bis(2-ethylhexyl) phthalate was detected in the groundwater sample collected from well BGMW08 during the April 2019 sampling event. Resolve the

issue (e.g., eliminate the use of materials containing bis(2-ethylhexyl) phthalate in future sampling events, demonstrate that bis(2-ethylhexyl) phthalate was detected in laboratory blanks). No revisions required.

Permittee Response: Comment Acknowledged. Please note that the tubing in several of the wells were replaced last year. The Army has discussed this issue with our new contractor's lab and has requested to assess their quality control methods and use of bis (2-ethylhexyl) phthalate. A statement was added to Section 4.6.2, Page 55, Lines 20-22 (RLSO: Page 56, Lines 23-25):

"Due to recurring detections of bis(2-ethylhexyl) phthalate, a plasticizer and a common laboratory and sampling contaminant, all use of materials containing bis(2-ethylhexyl) phthalate are to be avoided in the field and laboratory."

8. Section 2.2.16, Final RCRA Facility Investigation Parcel 6 – 2012, Feature 2 (AOC 79), lines 21-22, page 23 of 71

Permittee Statement: "NMED concurred in a Notice of Disapproval for the RFI Work Plan for Parcel 6 that AOC 79 required no further characterization."

NMED Comment: NMED concurred that AOC 79 required no further characterization; however, issued a Notice of Disapproval. The statement appears to be contradictory. Provide a reference to the Notice of Disapproval, including the page number and comment number, in the revised Plan.

Permittee Response: Concur. The sentence was removed and re-phrased per NMED letter, dated February 25, 2015, as described on Page 23, Lines 29-31 (RLSO: Page 23, Lines 32-24):

"NMED provided approval to the Class 3 Permit Modification for AOC 79, as stated in a letter dated February 25, 2015. In the letter, NMED granted corrective action without control status to SWMU 26 and AOC 79."

9. Section 2.2.16, Final RCRA Facility Investigation Parcel 6 – 2012, Feature 9 (AOC 80), Feature 11 (AOC 81), Feature 12 (AOC 84), Feature 18 (AOC 78 and AOC 82), and Feature 22 (AOC 83), lines 25-26, page 23 of 71

Permittee Statement: "The Army proposed no further action and removal from the RCRA permit."

NMED Comment: The Permittee explains what was proposed in the investigation report; however, does not provide NMED's response to the proposal. Consequently, readers will not know current status of the sites from the statement. Revise the Plan to include a brief description regarding the NMED's response to identify the current status of the sites to readers.

Permittee Response: Concur. NMED's response has been added to the description on Page 23, Lines 33-37 through Page 24, Lines 1-4 (RLSO: Page 23, Lines 36-37 through Page 24, Lines 1-7):

"The Army proposed no further action and removal from the RCRA permit (USACE, 2012b). In the Disapproval to the Final RCRA Facility Investigation Report Parcel 6, dated October 28, 2016, NMED stated that the groundwater contamination at each

SWMU and AOC is not addressed in 12 of the 14 sections related to specific sites, and the subject of potential groundwater contamination must be discussed for each site. NMED further stated that if the Army can demonstrate the SWMU or AOC did not contribute to groundwater contamination, the Army may request a Corrective Action Complete with Control status, with the controls being long-term monitoring of contaminated groundwater and restrictions on use of the groundwater.”

10. Section 2.2.26, Final Groundwater Supplemental RCRA Facility Investigation Work Plan, Revision 4 – 2016, lines 35-36, page 27 of 71

Permittee Statement: “A revised document is currently being prepared.”

NMED Comment: The statement is not accurate. NMED issued an approval for the above referenced document in September 19, 2018. The Permittee requested permission to deviate from the field procedures described in the approved document on April 22, 2020. Subsequently, NMED issued an approval for the deviation in May 6, 2020. The work plan does not require a revision at this time. All statements in the Plan must be accurate and current; otherwise, clarification must be provided for the statements in a revise the Plan.

Permittee Response:

- a) Concur. HDR has completed the work plan and has completed the field efforts. The statement, “A revised document is currently being prepared,” was removed and replaced with the statement below.
- b) The work plan description was revised in Section 2.2.26, Page 28, Lines 13-15 (RLSO: Page 28, Lines 18-20):

“The Army requested permission to deviate from the field procedures described in the approved document on April 22, 2020. Subsequently, NMED issued an approval for the deviation on May 6, 2020.”

11. Section 2.3, Semiannual RCRA Groundwater Monitoring Reports and Updated Groundwater Monitoring Plans – Ongoing, lines 4-6, page 29 of 71

Permittee Statement: “Detected concentrations of other anions (fluoride, sulfate, chloride, and phosphate) are associated with hard water and brackish groundwater conditions observed at FWDA.”

NMED Comment: The result of anion analyses except nitrate and nitrite have not been reported in the periodic groundwater monitoring reports. According to Table 2-3, Northern Area Groundwater Sampling Analyte Groups with Screening Level Exceedances, anions are included under constituents of potential concern analyzed for most wells. The results of anion analyses must be included in future periodic groundwater monitoring reports.

Permittee Response: Comment Acknowledged. Anions are not currently part of the analytical program. Major anion testing is now proposed in this plan as described in Section 5.2.1, Page 61, Lines 11-13 (RLSO: Page 62, Lines 15-17) and Section 5.2.2, Page 63, Lines 1-2 (RLSO: Page 64, Lines 13-14):

“Starting in 2021, all wells sampled for nitrate and nitrite will also be sampled for additional major anions to include chloride, fluoride, sulfate, phosphate, and bromide.”

And in Section 7.0, Page 70, Lines 8-20 (RLSO: Page 72, Lines 8-20):

“In addition, major anion analysis will be included per the request of NMED for all wells that were previously sampled for nitrate/nitrite. The current analytical program includes the sampling and analysis of nitrate/nitrite. The current list of wells that are sampled and analyzed for nitrate and nitrite will also include major anions per NMED comment #5 and #11 in Disapproval Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11, dated July 29, 2020. Major anion analytical method limits and screening levels are presented in Table 3 and include the following:

- Nitrate/ Nitrite
- Chloride
- Fluoride
- Bromide
- Sulfate
- Phosphate.”

And updated in Tables 4-3 and 5-2.

12. Section 2.3, Semiannual RCRA Groundwater Monitoring Reports and Updated Groundwater Monitoring Plans – Ongoing, lines 30-34, page 29 of 71

Permittee Statement: “To better assess the presence of 1,4-dioxane onsite, all wells will be sampled for 1,4-dioxane during the first sampling event; then for the second event, only wells that have a history of detection for chlorinated solvents in the last ten years will be sampled. The first of the two consecutive sampling events will start in April 2020, and the second will be in October 2020.”

NMED Comment: The deviation to the direction provided in NMED’s August 15, 2019 letter regarding the requirement of 1,4-dioxane analysis is hereby approved. No revision to the Plan is necessary.

Permittee Response:

- a) Comment Acknowledged. The sampling program will continue with analysis of 1,4-dioxane per NMED’s approval to the deviation from the letter, dated August 15, 2019, comment number 3.
- b) 1,4-dioxane sampling began in year 2020 for two consecutive events. No revision required.

13. Section 3.3.2, Stratigraphy, lines 18-20, page 33 of 71

Permittee Statement: “Near Fort Wingate High School (east of FWDA), alluvial deposits are approximately 75 feet thick, and in the Administration Area deposit thickness varies from 30 feet to 70 feet.”

NMED Comment: The location of the referenced building (Fort Wingate High School) was not identified. Provide a figure that presents the location in the revised Plan. Similarly, Section 3.4.2, Site-Specific Surface Water, page 34 of 71, describes the locations of the drainage systems; however, these locations are not presented in any figures. Provide a figure that presents the locations of the drainage systems in the revised Plan.

Permittee Response:

- a) Comment Acknowledged. The referenced building east of the site was removed from

the sentence as the location was beyond the existing map boundary. The sentence in Section 3.3.2, Page 33, Lines 18-20 (RLSO: Page 33, Lines 19-20) was revised as follows:

“Just east of FWDA, alluvial deposits are approximately 75 feet thick, and in the Administration Area deposit thickness varies from 30 feet to 70 feet.”

- b) Concur. The locations of the drainage systems (arroyos) are now illustrated in Figures 2-2, 2-3, 2-4, 3-1, 3-2, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9, 3-10, 3-11, 3-12, 3-13, and 3-14.

14. Section 3.5, Hydrogeology, line 37, page 34 of 71, and lines 1-2, page 35 of 71

Permittee Statement: “The San Andres-Glorieta aquifer was utilized as the drinking water source for FWDA prior to the closure of the installation in 1993.”

NMED Comment: Note that Well 69, which is screened to the San Andres-Glorieta aquifer, currently produces groundwater for non-potable use at the facility. Include the statement that clarifies the current use of the aquifer in the revised Plan.

Permittee Response: Concur. Description was rephrased in Section 3.4.3, Page 35, Lines 4-5 (RLSO: Page 35, Lines 4-5) as follows:

“Currently Well 69 (screened in the San Andres-Glorieta aquifer) produces groundwater continuously; and it may be used for non-potable purposes occasionally.”

15. Section 3.5, Hydrogeology, line 32, page 35 of 71

Permittee Statement: “October 2018 quarterly water level measurements event are shown on Figure 3-1 and Figure 3-2.”

NMED Comment: Figure 3-1, Groundwater Elevations Alluvial Wells presents a sufficient number of alluvial wells to depict groundwater contours and estimate groundwater flow direction. However, the estimated bedrock groundwater flow direction presented in Figure 3-2 is not accurate. The bedrock groundwater flow direction cannot be determined from the existing well network. Revise Figure 3-2 to remove the depicted groundwater flow direction.

In addition, separating the groundwater elevations inside and outside of an inset makes the data presentation difficult to follow and is potentially misleading. The inset in Figure 3-2 presents the area bounded by wells BGMW10, TMW37, TMW38, and TME39D. However, more than half of the figure (west of well TMW19) does not depict any bedrock wells. The relevant area east of well TMW19 should be enlarged and the area west of well TMW19 should be removed to present relevant information without an inset. Revise the figure accordingly.

Permittee Response:

- a) Concur. The bedrock groundwater flow direction depicted in Figure 3-2 was removed to be consistent with previous submittals.
- b) Concur. The inset of Figure 3-2 was removed, however the area east of TMW19 was not enlarged as the information was still readable and to keep all figures on the same scale.

16. Section 3.5, Hydrogeology, lines, page 35 of 71

Permittee Statement: “Groundwater adjacent to recharge sources such as exposed bedrock uplands, or surface water drainage systems have water with lower salinity and a higher dissolved oxygen (DO) content. DO and calculated redox potential values indicate a mixture of reducing and aerobic conditions.”

NMED Comment: Previously, redox potential readings were based on field measurements rather than calculated values. Provide a clarification in the response letter. Revise the statement, as appropriate. In addition, the correlation between DO values and distances from the recharge sources may be appropriate as a general statement; however, the data do not always demonstrate a correlation at the site. For example, well TMW14A is located farthest south among bedrock wells according to Figure 2-3, FWDA Well Locations, and presumably close to the recharge source; however, the DO reading at TMW14A was less than one mg/L during the April 2019 sampling event. Revise the statement to clarify that the correlation is not always representative of site-specific conditions or remove the statement from the revised Plan.

Permittee Response:

- a) Concur. Redox potential readings are based on field readings and the word “calculated” will be removed to avoid confusion.
- b) Concur. The word “calculated” was removed in Section 3.4.3, Page 36, Line 4 (RLSO: Page 36, Line 4)
- c) Concur. The statement was revised in Section 3.4.3 Page 36 Lines 1-4 (RLSO: Page 36, Lines 1-4) to say:

“Typically, groundwater adjacent to recharge sources, such as exposed bedrock uplands or surface water drainage systems, have water with lower salinity and a higher dissolved oxygen (DO) content, indicating variable groundwater conditions.”

17. Section 3.5.1, Northern Area Alluvial Groundwater System, lines 23-25, page 36 of 71

Permittee Statement: “Although this water supply well is no longer in use, the welded casing joints are possibly deteriorating causing a leak under artesian pressure into the alluvium.”

NMED Comment: NMED was previously notified that Well 69 was still in non-potable use. Clarify the current status of Well 69 in the response letter. If Well 69 is still in use, revise the Plan to correct the statement.

Permittee Response: Concur. The description of Well 69 was modified in Section 3.4.3, Page 35, Lines 4-5 (RLSO: Page 35, Lines 4-5):

“Currently Well 69 (screened in the San Andres-Glorieta aquifer) produces groundwater occasionally for non-potable use at the facility.”

The Plan was also revised in Section 3.4.4, Page 36, Line 27 (RLSO: Page 36, Line 29) to state:

“The welded casing joints are possibly deteriorating causing a leak under artesian pressure into the alluvium.”

18. Section 3.5.2, Northern Area Bedrock Groundwater System, line 38, page 36 of 71, and lines 1-2, page 37 of 71, and Section 3.7, Fate and Transport of Contamination in Groundwater, lines 15-16, page 40 of 71

Permittee Statements: “Steep horizontal gradients from east to west (between wells TMW38 and TMW40D, and between wells TMW17 and TMW37) indicate a geologic structural feature (i.e., fault or fracture zone) impedes groundwater flow.”

and,

“[S]tructural barriers, such as faulting and folding of bedrock units may greatly impede the flow of shallow groundwater from one valley to another.”

NMED Comment: Comment 5 in NMED’s Disapproval Final Groundwater Periodic Monitoring Report January through June 2016, dated August 7, 2017, states, “[s]ince the theory of a geologic structural feature is unconfirmed, the Permittee must revise the statement to include the fact that the groundwater flow direction has not been fully characterized in the bedrock aquifer beneath the Workshop Area.” Although the Permittee addressed this comment in the Final Revision 1, Groundwater Periodic Monitoring Report January through June 2016, dated November 2017, the same statement reappeared in this submittal. Both the Permittee and NMED have collectively made significant efforts to improve the quality of submittals, particularly periodic groundwater monitoring reports and groundwater monitoring plans for the past few years; however, previous efforts, revisions, and provisions necessary for the improvement appear to have been neglected in recent submittals. The Permittee must follow the format of the previous reports and plans, including where previous comments were addressed. Failure to follow NMED direction constitutes noncompliance and may result in an enforcement action.

Permittee Response: Concur. The statement was revised in Section 3.4.5, Page 37, Lines 2-6 (RLSO: Page 37, Lines 2-7) to indicate that

“...groundwater flow direction has not been fully characterized in the bedrock aquifer beneath the Work Shop Area, groundwater flow in the shallow bedrock is generally to the north and west in the Workshop Area (Figure 3-2). Anomalously steep horizontal gradients from east to west (between wells TMW38 and TMW40D, and between wells TMW17 and TMW37) may indicate a geologic structural feature (i.e., fault or fracture zone) that impedes groundwater flow.”

And removed the following statement in Section 3.6 Fate and Transport (RLSO: Page 40, Lines 36-38):

“In addition, structural barriers, such as faulting and folding of bedrock units may greatly impede the flow of shallow groundwater from one valley to another.”

19. Section 3.5.2, Northern Area Bedrock Groundwater System, lines 5-7, page 37 of 71

Permittee Statement: “Two water bearing sandstone units within the Painted Desert Member of the Petrified Forest Formation are known to exist below the Workshop Area. The upper sandstone unit is evaluated by monitoring well TMW02.”

NMED Comment: The groundwater elevation in well BGMW08 was more than 100 feet lower than those of other bedrock wells. Well BGMW08 may not have been screened across the same water bearing zones in comparison to the other wells. A third water bearing sandstone unit may be present at the site. Discuss the possibility of the presence of a third sandstone unit in the revised Plan.

Permittee Response: Concur: Language was included in Section 3.4.5, Page 37, Lines 12-14 (RLSO: Page 37, Lines 14-15) as follows:

“A third water bearing sandstone unit is assumed, since groundwater from well BGMW08 was measured at 100 feet lower than those of other bedrock wells”

to discuss the possibility of the presence of a third sandstone unit.

20. Section 3.5.2, Northern Area Bedrock Groundwater System, lines 12-14, page 37 of 71

Permittee Statement: “Survey errors may also affect the interpretation of bedrock aquifer groundwater flow directions since bedrock monitoring wells were installed and surveyed during several different field events, which may introduce well survey data set errors.”

NMED Comment: Comment 7 in NMED’s Approval with Modifications Final Groundwater Periodic Monitoring Report July through December 2015, dated August 16, 2018, states, “NMED provided the comment to re-survey all alluvial and bedrock monitoring wells. On the correspondence dated in November 9, 2016 (page 1), the Permittee states, “[t]he Army has plans on resurveying all wells during the Northern Area RCRA Facility Investigation field efforts, anticipated to begin in June 2017.” Explain whether the survey has already been conducted. If the survey has been conducted, incorporate the data in all future reports. If the survey has not been conducted, ensure that all alluvial and bedrock monitoring wells are re-surveyed. Provide an explanation in the next groundwater periodic monitoring report. If a re-survey was conducted, provide a table listing the original and re-surveyed elevations in future periodic monitoring reports.” Clarify whether the survey errors are still unresolved in the revised Plan.

Permittee Response:

- a) Concur: The new well survey of all the monitoring wells was performed in October 2019. The data was incorporated into the revised plan.
- b) Concur. The paragraph that indicates multiple surveys was removed, and a sentence describing the new survey was included in Section 3.4.5, Page 37, Lines 18-20 (RLSO: Page 37, Lines 23-25) to state that:

“A comprehensive survey was performed in October 2019 for all the Northern Area groundwater network monitoring wells, by DePauli Engineering and Surveying LLC, using the New Mexico State Plane West, Zone Grid NAD 83.”

- c) Concur. A new Table 2-1, listing the original and re-surveyed elevations, will be included in future periodic monitoring reports.
- d) Concur. A sentence was added in Section 3.4.5, Page 37, Lines 20-22 (RLSO: Page 37, Lines 25-27) to discuss the survey results and states:

“The new survey results did not solve the issue of interpreting bedrock aquifer flow directions. In general, most wells measured 0.7 ft to 1.1 ft higher with the new survey without changing any flow patterns.”

21. Section 3.6, Nature and Extent of Groundwater Contamination, lines 20-23 and 29-32, page 37 of 71

Permittee Statements: “Six groundwater contaminant plumes have been identified: two

nitrate plumes, one in the alluvial aquifer and one in the bedrock aquifer; two perchlorate plumes, one in the alluvial aquifer and one in the bedrock aquifer; an explosives plume in the alluvial groundwater unit; and a 1,2-dichloroethane (1,2-DCA) plume in the alluvial aquifer.”

and,

“SVOCs, DRO, and GRO are sporadically detected with occasional or historical exceedances of project screening values for SVOCs and DRO (screening levels for GRO were established in June 2019), but the number of exceedances is too limited for these contaminants to be mapped as contaminant plumes.”

NMED Comment: Comments 13 and 15 in NMED’s Disapproval Final Groundwater Periodic Monitoring Report July through December 2018, dated January 30, 2020, require evaluation of the extent of TPH-GRO and TPH-DRO contamination. A total of eight groundwater contaminant plumes must be evaluated. The Permittee addressed the comments in the Final Groundwater Periodic Monitoring Report, July through December 2018, Response to January 30, 2020 Disapproval Letter, dated April 6, 2020. Accordingly, Figure 3-10, Groundwater Monitoring Alluvial Wells – DRO, and Figure 3-11, Groundwater Monitoring Alluvial Wells – GRO were included to address the comments in the Plan. Although the latter statement states that the number of exceedances is too limited to be mapped, these figures are appropriately included in the Plan. It appears that the statement was copied from previous documents. Ensure that the text of the Plan is consistent with its content.

In addition, the screening levels for GRO were established in February 2019 rather than June 2019 (see Comment 6). Correct the typographical error in the revised Plan.

Permittee Response:

- a) Concur. The text was updated to include DRO and GRO as the 7th and 8th plume as described in Section 3.5, Page 37, Lines 27-31 (RLSO: Page 37, Lines 32-36):

“Eight groundwater contaminant plumes have been identified: two nitrate plumes, one in the alluvial aquifer and one in the bedrock aquifer; two perchlorate plumes, one in the alluvial aquifer and one in the bedrock aquifer; an explosives plume in the alluvial groundwater unit; a DRO plume in the alluvial; a GRO plume in the alluvial; and a 1,2 dichloroethane (1,2-DCA) plume in the alluvial aquifer.”

- b) Concur. The typographical error was corrected from June 2019 to February 2019.

22. Section 3.6, Nature and Extent of Groundwater Contamination, line 39, page 37 of 71, and line 1, page 38 of 71

Permittee Statement: “Figure 3-15 shows the northern area alluvial and bedrock groundwater sentinel and background monitoring wells.”

NMED Comment: Identification of sentinel (detection monitoring) wells (MW23 and MW24) is not appropriate at this time because some contaminants were already detected from these wells. Additionally, wells TMW18, TMW19, and BGMW08 are identified as background wells in Figure 3-15. NMED did not approve these wells to be designated as background wells. Remove the statement and Figure 3-15 from the revised Plan.

Permittee Response: Comment Acknowledged. The identification of wells as sentinel and background designation was removed from the text (Section 3.5) and Figures, along with the removal of Figure 3-15.

23. Section 3.6, Nature and Extent of Groundwater Contamination, lines 6-7, page 38 of 71

Permittee Statement: “The bedrock collocated perchlorate and nitrate plumes either percolate from the alluvial impacts or have a common source at the Building 528 Complex (SWMU 27).”

NMED Comment: The perchlorate plume likely originates from the Building 528 Complex and migrated from bedrock to the alluvial aquifer. The origin of nitrate plume is likely not limited to the Building 528 Complex. The nitrate plume likely migrated from the alluvial to bedrock aquifer. Revise the statement for accuracy.

Permittee Response: Concur. This statement was revised in Section 3.5, Page 38, Lines 12-13 (RLSO: Page 38, Lines 18-19) as follows:

“The bedrock nitrate plume is also present near the TNT Leaching Beds (SWMU 1) (Figure 3-12) and likely migrated from the alluvial aquifer.”

And was also revised in Section 3.5, Page 38, Lines 26-28 (RLSO: Page 38, Lines 34-37) as follows:

“Historical releases of perchlorate-containing materials at the Building 528 Complex (SWMU 27) are believed to have migrated from the bedrock unit to the alluvial aquifer.”

24. Section 3.8, Exposure Pathways for Human and Ecological Receptors, line 34, page 40 of 71

Permittee Statement: “There are no current exposure pathways for human and ecological receptors in the northern area.”

NMED Comment: Section 3.8 does not discuss risk associated with potential for migration of contaminants from soil to groundwater. Such risk currently exists and drives investigations at the facility. Include a discussion in the revised Plan.

Permittee Response: The discussion on exposure pathways was revised in Section 3.7. The statement in Section 3.7, Page 41, Lines 9-17 (RLSO: Page 41, Lines 21-29) was revised as follows:

“There are potential dermal and ingestion exposure pathways for future human receptors in the northern area. Although local groundwater resources may be used for human consumption if the property is transferred and used for residential purposes, it is unlikely to present a realistic exposure scenario. Groundwater discharged from possible future drinking water wells would be a potential hypothetical pathway for human exposure. Soil contaminants may migrate to groundwater in the upper water column, both in the alluvial and upper bedrock units. It is improbable that soil contaminants will migrate to the underlying San Andres-Glorieta aquifer. The alluvial and upper bedrock aquifers are not potable without significant treatment and low yield will limit any future use.”

25. Section 4.2.2.1 Traditional Low Flow and ZIST Low Flow Dedicated Pumps, lines 22-25, page 44 of 71

Permittee Statement: “Low hydraulic conductivity conditions exist in many monitoring locations which result in poor well yield. Bedrock wells TMW14A and TMW17 contain a zone isolation sampling technology (ZIST) model packer system manufactured by BESST, Inc., to

maintain the general low-flow methodology.”

NMED Comment: There are many monitoring wells other than wells TMW14A and TMW17 that result in a low yield (e.g., TMW40S). Purging and sampling for well TMW40S is conducted using a hand bailer according to Table 4-1, Northern Area Groundwater Purge Method, page 2 of 3. The ZIST low flow methodology was only used for wells TMW14A and TMW17. Provide a justification for using the ZIST system only for wells TMW14A and TMW17 in the revised Plan.

Permittee Response:

- a) Concur. The ZIST packers for wells TMW14A and TMW17 were installed at the time of the well construction in 2001. The justification was to isolate the bedrock unit and limit the amount of water needed for purging in low yield wells. The ZIST system helps in low flow wells that have a large water column by keeping the rest of the water column away from the screen, thus allowing stabilization before the well goes dry. TMW14A and TMW17 have 40’ and 80’ of water column, respectively. TMW40S usually only has a foot or less of water, thus bailed dry with a bailer. A ZIST system would not be suitable for wells with a limited water column and go dry regardless of pumping method.
- b) The justification for using ZIST packer system for TMW14A and TMW17 was included in Section 4.2.2.1, Page 44, Lines 25-27 (RLSO: Page 45, Lines 25-27) stating:

“Because these two wells have large standing water columns (40 feet and 80 feet respectively) and are low yield, the constant drawdown without the ZIST packer system would prevent stabilization required for traditional low flow.”

26. Section 4.2.2.1, Traditional Low Flow and ZIST Low Flow Dedicated Pumps, Traditional Low Flow, lines 34-38, page 45 of 71 and lines 1-5, page 46 of 71, and ZIST Low Flow, lines 8-17, page 47 of 71

Permittee Statement: “Stabilization has occurred when three consecutive readings are within the following limits.

- Temperature \pm 10% in degrees centigrade
- pH \pm 0.5 standard units
- Specific conductivity \pm 10% in millisiemens per centimeter
- DO \pm 10% or less than 1.0 mg/L
- Turbidity \pm 10% or less than 1 nephelometric turbidity unit
- ORP \pm 10 millivolt
- Water level = 0.00 to 0.33 foot (or 4 inches) or less drawdown during the stabilized water- quality readings.”

NMED Comment: There were circumstances when some water-quality parameters were not stabilized during well purging; however, sampling was conducted. For example, the last three turbidity readings prior to sampling from well BGMW07 were recorded as 0.0, 630, and 749 NTU during the April 2019 sampling event. Similarly, the last three dissolved oxygen (DO) readings prior to sampling from well BGMW08 are recorded as 11.89, 6.96, and 12.20 mg/L during the same sampling event. The DO readings indicate a problem with the instrument. Clarify whether purging is considered complete when some or all of these criteria are met in the revised Plan.

Permittee Response:

- a) Comment Acknowledged. Stabilization is typically used for traditional low flow wells only. The plan has been revised in Section 4.2.2.1, Page 46, Lines 1-2 (RLSO: Page 47, Lines 1-2) as follows:

“Stabilization for traditional low flow has occurred when three consecutive readings are within the following limits.”

- b) The last three water quality parameters collected from well BGMW07 are not considered stable because the parameters are not within 10%, but this well is also not considered a traditional low flow well. These readings were collected prior to the well going dry. The previous two readings were 0.0 NTU and 0.0 NTU; however, once the water level reached the bottom of the well casing, the water contained plenty of settled suspended solids, which caused the discrepancy in nephelometric turbidity units. The field team returned the following day to collect the formation water that had entered the well during recharge. This water sample is representative of the formation water.
- c) The water quality instruments are calibrated daily prior to field deployment, and calibration records are documented in Appendix A of the PMR.
- d) The elevated DO readings in well BGMW08 are a result of purging the well dry with a disposable hand bail. Readings are taken by pouring the water into a receiving cup and lowering the sensor into the cup, versus traditional low flow that is not exposed to the open air. This process can result in numerous air bubbles or other opportunities for user error. Field staff will be instructed to re-check the readings and calibrate or switch instruments if necessary, for future sampling events. This well was purged dry. The team returned the following day to collect formation water that had entered the well during recharge. This water sample is representative of the formation water.

27. Section 4.2.4, Alternative Groundwater Purging and Sampling Procedures, pages 48 through 51

NMED Comment: Section 4.2.4 discusses groundwater purging and sampling procedures using disposable bailers, reusable submersible pumps, and dedicated Bennett pumps. Table 4-2, Field Equipment and Materials also includes “Wattera Pump”. If a Wattera pump is used for purging and sampling, state whether it is a submersible or other type of pump in the revised Plan.

Permittee Response:

- a) Concur. The reference to Wattera pumps was removed from the table.
- b) Although Wattera pumps were proposed in the GWMP V.10, Rev.1, their use has not been implemented and is not being proposed at this time.

28. Section 4.2.4.1, Disposable Bailers, lines 4-5, page 49 of 71, Section 4.2.4.2, Reusable Submersible Pump, lines 4-5, page 50 of 71, and Section 4.2.4.3, Dedicated Bennett Pump, lines 2-3, page 51 of 71

Permittee Statements: “Collect no fewer than 3 groundwater parameter measurements.”

and,

“During well purging, record water levels and monitor and record a minimum of three field-parameter readings.”

and,

“Collect a minimum of three field parameters at a rate of between one per 3 minutes to one per 15 minutes depending on the purge volume.”

NMED Comment: All water quality parameters have been reported in previous periodic groundwater monitoring reports. Continue to record all water quality parameter readings and report them in the reports. Revise the statements in the revised Plan.

Permittee Response:

- a) Comment Acknowledged. The statement is regarding the minimum number of readings to be taken, not a direction to take or record only 3 readings. All recorded readings are reported in the PMR, not just 3 readings, but a minimum of 3 readings.
- b) Comment Acknowledged. All water quality parameters will continue to be recorded and documented in subsequent reports. The statements were revised in all three areas Section 4.2.4.1, Page 48, Line 15 (RLSO: Page 50, Line 14), Section 4.2.4.2, Page 49, Line 12 (RLSO: Page 50, Line 14), Section 4.2.4.3, Page 51, Line 12 (RLSO: Page 52, Line 14) to include “*record all readings*”

29. Section 4.3.3, Sample Shipping, lines 35-36, page 52 of 71

Permittee Statement: “Samples will be transported to the EMAX Laboratories, Inc. (EMAX) located at 1835 W. 205th Street, in Torrance, California for analytical testing.”

NMED Comment: NMED previously provided multiple comments regarding analytes with detection limits greater than applicable screening levels. The Permittee must provide laboratory analysis with practical quantitation limits (PQL) that are less than the applicable screening level for all COCs.

The Permittee has previously been directed to provide analyses with method detection limits, reporting detection limits, and practical quantitation limits that are less than the applicable screening level for each contaminant of concern. All data provided by analyses where the method detection limit, reporting detection limit, or practical quantitation limit exceed the screening level are considered data quality exceptions and cannot be used to demonstrate compliance. In addition, all data quality exceptions must be called out in the text, tables, or figures where the data are presented.

Ensure that the current laboratory is capable of achieving the appropriate detection and quantitation limits. No revision necessary.

Permittee Response: Comment Acknowledged. Constituents where the method of detection limit, reporting detection limit, or practical quantitation limit exceed the screening level were considered data quality exceptions and are identified as such in the text (Section 5.1, Page 57, Line 27 [RLSO: Page 58, Line 29]), Tables, and Figures where they are presented.

30. Section 5.0, Monitoring and Sampling Program, lines 2-3, page 57 of 71

Permittee Statement: “Interim groundwater monitoring at FWDA tracks contaminant plume

concentrations and migration at previously identified groundwater impact areas.”

NMED Comment: The plume figures included in this Plan and the Final Groundwater Periodic Monitoring Report January through June 2019, dated March 2020 are not appropriate because the figures include inappropriate well designations and do not depict wells that are not sampled. The analytical tables included in the report did not provide data for the three previous monitoring events as required by Section V.A.2 of the FWDA RCRA Permit.

Although inaccuracies were found, previous reports provided appropriate presentation in the figures and tables. The current presentation of data does not facilitate the tracking of contaminant plume concentrations and migration. Refer to the previous periodic monitoring reports for appropriate data presentation.

Permittee Response:

- a) Concur. Figures now include proper well designation, and all wells are included whether sampled or not.
- b) Concur. Tables were revised in periodic monitoring reports to include the previous three events of data as required by Section V.A.2 of the FWDA RCRA Permit. The plan was revised to state in Section 5.0, Page 57, Lines 6-7 (RLSO: Page 58, Lines 6-7) as follows:

“All analytical tables will include data from the three previous monitoring events as required by Section V.A.2 of the FWDA RCRA permit.”

31. Section 5.2, Monitoring Location and Frequency, lines 4-7, page 58 of 71

Permittee Statement: “Sentinel well locations are situated to monitor potential off-site contamination migration. Sample analyses for upgradient and downgradient wells were selected based on the association with COPC points of release in accordance with the DQO decision logic.”

NMED Comment: There are multiple source locations and the plumes are comingled at the facility. A well upgradient of one source may be downgradient from another. The designation as sentinel, upgradient, and downgradient wells makes reports and plans more confusing and potentially misleading. It is not appropriate to assign such designations for wells. Remove such designations from all applicable sections of the revised Plan.

Permittee Response: Comment Acknowledged. Well designations of “sentinel” were removed and some designations for “upgradient” and “downgradient” were necessary in some sections to convey plume direction.

32. Section 5.2, Monitoring Location and Frequency, lines 8-9, page 58 of 71

Permittee Statement: “Table 5-2 contains the current sampling matrix in accordance with this GWMP.”

NMED Comment: Table 5-2, Northern Area Groundwater Sampling Matrix, and the text of the Plan lack an explanation for the changes made to the Plan (e.g., inclusion or exclusion of new or existing wells and analytical suite). The revised Plan must include a section that summarizes all changes made to the previous sampling matrix. If the change was directed

by NMED, provide a reference to the direction. If the change is proposed by the Permittee, provide a basis for the proposed change. Revise the Plan accordingly.

Permittee Response: Concur. The following text was added to Section 7.0, Page 69, Line 2 to Page 70, Line 20 (RLSO: Page 71, Line 2 to Page 72, Line 20):

“The 32 wells installed in 2019 were already included into the monitoring program starting in year 2020; however, these 32 wells were only analyzed for 1,4-Dioxane for 2 consecutive events. The 3 wells installed in 2020 (MW-37, MW-38, and MW-39) have not yet been included into the monitoring program. The construction details for these additional 35 monitoring wells are provided in Table 2-1 and their locations are shown on Figure 2-3. The additional wells are: BGMW11, BGMW12, MW13S, MW13D, MW25, MW26, MW27, MW28, MW29, MW30, MW31, MW32, MW33, MW34, MW35, MW36S, MW36D, MW37, MW38, MW39, TMW50, TMW51, TMW52, TMW53, TMW54, TMW55, TMW56, TMW57, TMW58, TMW59, TMW60, TMW61, TMW62, TMW63, and TMW64. The full suite of analytical proposed for these wells is presented in Table 5-2 and are listed below:

- Volatile organic compounds (VOCs) by EPA Method 8260
- Total explosives by EPA Method 8330/8332
- Major anions by EPA Method 9056
 - Nitrate/ Nitrite
 - Chloride
 - Fluoride
 - Bromide
 - Sulfate
 - Phosphate
- Total metals by EPA Method 6020
- Dissolved metals by EPA Method 6020
- Perchlorate by EPA Method 6850
- Semi-volatile organic compounds (SVOCs) by EPA 8270
- 1,4-Dioxane by EPA Method 8270 selected ion monitoring (SIM) (for 2 consecutive events, and only for the 3 wells installed in 2020)
- Pesticides by EPA Method 8081
- TPH-GRO by EPA Method 8015
- TPH-DRO by EPA Method 8015
- Polychlorinated biphenols (PCBs) by EPA Method 8082
- Herbicides by EPA Method 8151

Furthermore, to better define the TPH impacts, select wells near the existing TPH plume will be analyzed for TPH gas and diesel range organics per NMED comment #42 and #43 in Disapproval Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11, dated July 29, 2020. The following wells will be included into the TPH monitoring program for both TPH-DRO and TPH-GRO:

- TMW06
- TMW07
- TMW10
- TMW21
- TMW46

In addition, major anion analysis will be included per the request of NMED for all wells that were previously sampled for nitrate/nitrite. The current analytical program includes the sampling and analysis of nitrate/nitrite. The current list of wells that are sampled and

analyzed for nitrate and nitrite will also include major anions per NMED comment #5 and #11 in Disapproval Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11, dated July 29, 2020. Major anion analytical method limits and screening levels are presented in Table 3 and include the following:

- Nitrate/ Nitrite
- Chloride
- Fluoride
- Bromide
- Sulfate
- Phosphate”

33. Section 5.2.1, Northern Area Alluvial Groundwater Monitoring Design, Explosive Plume, lines 29-31, page 58 of 71

Permittee Statement: “The suspected points of release for the groundwater explosives plume in the northern area are SWMU 1 (TNT Leaching Beds, which have been removed) and SWMU 27 (Building 528 Complex).”

NMED Comment: Comment 14 in NMED’s Disapproval Final Groundwater Periodic Monitoring Report July through December 2018, dated January 30, 2020, states, “[t]he operation associated with the TNT Leaching Beds soil excavation was complete in October 2019 and the concentrations of explosive compounds are expected to decrease gradually. The changes in RDX concentrations must be discussed in future groundwater monitoring reports. Provide plots that depict the concentrations of RDX over time for wells TMW03, TMW04, TMW23, and TMW40S in future groundwater monitoring reports.” This comment serves as a reminder. No revision required.

Permittee Response:

- a) Comment Acknowledged. Changes in RDX concentrations will be discussed in future groundwater monitoring reports due to the interim corrective measures conducted at SWMU 1, TNT washout facility and the TNT Leaching Beds.
- b) This comment is related to the PMRs, not the GWMP. No revision required.

34. Section 5.2.1, Northern Area Alluvial Groundwater Monitoring Design, Explosive Plume, lines 31-32, page 58 of 71

Permittee Statement: “The alluvial aquifer explosives plume extends across the Workshop Area along a favored groundwater flow channel (Figure 3-5).”

NMED Comment: Figure 3-5 indicates that groundwater flows westward in the Workshop Area. However, the RDX plume appears to extend north rather than west from the source area according to Figure 3-5. Provide an explanation for why the RDX plume extends north if alluvial groundwater flows exclusively westward in the revised Plan.

Permittee Response: Comment Acknowledged. It is unknown why the RDX plume extends northward instead of west to northwest and several nearby new wells installed in 2019 and 2020 may help in delineating the plume when they are sampled in 2021. The following statement was added to Section 5.2.1, Page 61, Lines 17-19 (RLSO: Page 62, Lines 21-24):

“The alluvial aquifer explosives plume extends northward across the Workshop Area

(Figure 3-5) even though alluvial groundwater flows west to northwest. Additional wells installed in 2019 and 2020 may help delineate the alluvial aquifer explosives plume.”

35. Section 5.2.1, Northern Area Alluvial Groundwater Monitoring Design, Metals, lines 11-13, page 59 of 71

Permittee Statement: “No groundwater metals plumes have been identified at FWDA pending determination of groundwater background concentrations.”

NMED Comment: NMED is in receipt of the Final Groundwater Background Evaluation, dated December 26, 2019, and currently, the document is under review. Once background threshold values for metals presented in the evaluation report are evaluated and approved by NMED, the Permittee must provide a more thorough discussion regarding the detection of metals. No response required

Permittee Response: Concur. A brief discussion on the background metals evaluation will be included in the revised plan. No response required.

36. Section 5.2.2, Northern Area Bedrock Groundwater Monitoring Design, Perchlorate, lines 22-27, page 60 of 71

NMED Comment: In the revised Plan, clarify that the extent of perchlorate groundwater contamination in bedrock aquifer has not been fully delineated in Section 5.2.2. The Final Groundwater Supplemental RCRA Facility Investigation Work Plan Revision 4, dated March 23, 2018, proposed installation of multiple wells to address the data gap. Revise the Plan accordingly.

Permittee Response: Concur. A brief discussion on the RFI workplan included in Section 5.2.2, Page 63, Lines 9-12 (RLSO: Page 64, Lines 22-24):

“Additional wells were installed in 2019 to better delineate the perchlorate plume. These new wells are proposed to be incorporated into the full suite of analytical starting in year 2022, for four consecutive events” of the revised plan to better delineate the perchlorate contamination.

37. Section 5.2.2, Northern Area Bedrock Groundwater Monitoring Design, Other Organic COPCs Monitoring, lines 30-32, page 60 of 71

Permittee Statement: “There are no identified groundwater SVOC plumes at FWDA and no site-related SVOC concentrations exceeding cleanup levels in groundwater samples that are attributable to historical site activities.”

NMED Comment: Carbon disulfide has been detected from both alluvial and bedrock groundwater samples at the site. Section 5.2.2 does not include any discussion regarding the detection of VOCs in the bedrock aquifer. Revise Section 5.2.2 to include a discussion of VOCs detections.

Permittee Response: Comment Acknowledged. Both VOCs and SVOCs are discussed in Section 5.2.2, Page 63, Lines 20-22 (RLSO: Page 65, Lines 1-4) to state that:

“VOC detections in the bedrock aquifer have included carbon disulfide in previous monitoring events. The Army has confirmed that this compound was not used at the facility, thus introduction has been attributed to laboratory contamination.”

38. Section 5.2.2, Northern Area Bedrock Groundwater Monitoring Design, Background and Sentinel Wells, lines 3-5, page 61 of 71

Permittee Statement: “Background wells include BGMW07, BGMW08, BGMW09, and BGMW10. The groundwater flow direction in the bedrock aquifer does not indicate plume migration off site.”

NMED Comment: Well BGMW08 may not be appropriate for use as a background well. NMED is evaluating whether well BGMW08 is appropriate for use as a background well. NMED’s evaluation will be provided in response to the Permittee’s [Response to Comments]

Approval with Modifications Final Northern Area Background Well Installation & Completion Report, dated March 17, 2020.

In addition, as previously discussed, the groundwater flow direction has not been fully characterized in the bedrock aquifer beneath the Workshop Area (see Comment 19). Therefore, off-site migration of the bedrock plumes has not been determined. Remove the statement from the revised Plan.

Permittee Response: Concur. The statement identifying BGMW08 as a background well was removed along with the statement discussing bedrock groundwater flow direction since the groundwater flow direction in the bedrock aquifer beneath the Workshop Area has not been fully characterized.

39. Section 5.3.2, Analytical Data Quality Requirements, Comparability, lines 20-23, page 63 of 71

Permittee Statement: “Data will be considered in disagreement if detections are greater than two times each other. If one result is greater than three times the reporting limit, the data will be considered in disagreement, and if one result is greater than five times the DL, the data will be considered in disagreement.”

NMED Comment: The criteria provided is inappropriate and unacceptable. The data must be considered in disagreement if the difference in values exceeds criteria for relative percent difference listed in Table 5-1. Comparison of data relative to reporting and detection limits are irrelevant to the evaluation of comparability. Revise the statement to appropriately evaluate comparability of data in the revised Plan.

Permittee Response: Concur. This statement was modified in Section 5.3.2, Page 66, Lines 1-2 (RLSO: Page 67, Lines 21-25) to state:

“Data will be considered in disagreement if the difference in values exceeds criteria for relative percent difference listed in Table 5-1.”

40. Figure 2-3, FWDA Well Locations

NMED Comment: There are several issues in Figure 2-3. These issues are addressed below:

- a) The figure includes Inset 1, Northern Area Wells, which is the most relevant figure to present well locations. Inset 1 must be expanded to show the locations of wells more clearly.
- b) The locations of wells presented in Inset 1 are not accurate. For example, bedrock well

TMW30 is presented slightly northeast of bedrock well TMW49. However, northing values of wells TMW30 and TMW49 are listed as 1639957.89 and 1639979.26, respectively, according to Table 2-1, Northern Area Groundwater Well Construction Details, page 2 of 3. The northing data indicate that well TMW30 is located slightly south of well TMW49. The same error is also found in other figures (e.g., Figure 3-2, Groundwater Elevation Bedrock Wells). The locations of wells must be accurate in Figure 2-3 and all other figures.

- c) The figure includes Inset 2, OB/OD Area Wells, which is not relevant to the Plan. Remove Inset 2 and provide the designations for OB/OD wells directly on the main figure.
- d) The figure includes an inset for the Fort Wingate Area Map. However, Figure 1-2, Site Location Map, and Figure 2-1, Site Parcel Map, provide the same information. Remove the inset.

Resolve these issues in the revised Plan.

Permittee Response:

- a) Comment Acknowledged: Please note that Figure 2-4 is dedicated to this area.
- b) Respectfully disagree. Tilting the map to true north will show TMW49 to be more north of TMW30. Well locations are accurate.
- c) Concur. Inset 2 will be removed and designations for OB/OD wells will be provided on the main figure.
- d) Comment Acknowledged. Figure 2-1 does not provide site location areas, only Figure 1-2. Figure 2-3 includes this inset as it was meant to be a standalone figure that contains all relevant information on one map, thus the 22x34 size of the map.

41. Figure 3-4, Groundwater Monitoring Alluvial Wells – Nitrate

NMED Comment: There are several issues in Figure 3-4. These issues are addressed below:

- a) The nitrate concentration is not presented for each well. The concentrations must be provided for each well in the revised figure.
- b) The figure is dated as April 2020. It is not clear whether the figure was prepared or the sampling was conducted during April 2020. The figure must indicate the date when the sampling was conducted for the data presentation.
- c) The well designations “downgradient”, “sentinel”, and “upgradient” must be removed from the revised figure.
- d) Not all alluvial wells appear to be presented in the figure (e.g., TMW27). All alluvial wells whether sampled for nitrate or not must be presented in the figure.

The format of previous periodic groundwater monitoring reports must be followed in the revised figure. Resolve the issues in the revised Plan. This comment applies to all other figures where similar issues are found.

Permittee Response:

- a) Comment Acknowledged. The GWMP V.10, Rev.1 did not include concentration data in the figures, only the PMR’s have done this in the past, thus this plan is following

that format.

- b) Comment Acknowledged. The sampling date is listed in the notes section, but the map edit date will be removed to avoid confusion.
- c) Concur: Well designations were removed.
- d) Concur. All alluvial wells whether sampled for nitrate or not are now presented in the figure.

42. Figure 3-10, Groundwater Monitoring Alluvial Wells – DRO

NMED Comment: The southern and northern extent of the TPH-DRO plume is not delineated according to Figure 3-10. Well TMW10 is the closest well located north of well MW22D where a TPH-DRO exceedance was observed. Groundwater samples were not collected from well TMW10 for TPH-DRO analysis. Similarly, wells TMW06, TMW07, and TMW21 are the closest wells located south of MW20 where a TPH-DRO exceedance was observed. Groundwater samples collected from these nearby wells were not analyzed for TPH-DRO according to Table 5-2, Northern Area Groundwater Sampling Matrix. In addition, according to Figure 5-11 included in the Final Groundwater Periodic Monitoring Report January through June 2019, dated March 2020, the TPH-DRO concentrations exceeded the applicable screening level in the groundwater samples collected from wells TMW33 and TMW34. The extent of TPH-DRO plume is not delineated west of well TMW34. Well TMW46 is the closest well located west of well TMW34 where a TPH-DRO exceedance was observed. Groundwater samples also were not collected from well TMW46 for TPH-DRO analysis. In order to delineate the plume, propose to collect groundwater samples from wells TMW06, TMW07, TMW10, TMW21 and TMW46 for TPH-DRO analysis in the revised Plan. Alternatively, the Permittee may propose to submit a separate work plan to install new wells to delineate the plume north of well MW22D, west of well TMW34, and south of well MW20.

Permittee Response: Comment Acknowledged. The following text was added to Section 5.2, Page 60, Lines 13-23, (RLSO: Page 61, Line 17-26) and Section 7.0, Page 69, Line 32 to Page 70, Line 7 (RLSO: Page 71, Line 32 to Page 72, Line 7):

“Furthermore, to better define the TPH impacts, select wells near the existing TPH plume will be analyzed for TPH gas and diesel range organics per NMED comment #42 and #43 in Disapproval Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11, dated July 29, 2020. The following wells will be included into the TPH monitoring program for both TPH-DRO and TPH-GRO:

- TMW06
- TMW07
- TMW10
- TMW21
- TMW46”

43. Figure 3-11, Groundwater Monitoring Alluvial Wells – GRO

NMED Comment: The TPH-GRO concentrations exceed the screening level in groundwater samples collected from wells MW18D and TMW33 according to Figure 3-11. According to Figure 5-12 included in the Final Groundwater Periodic Monitoring Report January through June 2019, dated March 2020, the TPH-GRO concentration exceeded the applicable

screening level in the groundwater sample collected from well MW20, as well. The extent of the TPH-GRO plume is not delineated south of well MW20. Wells TMW06, TMW07, and TMW21 are the closest wells located south of MW20 where a TPH-GRO exceedance was observed. Groundwater samples were not collected from these wells for TPH-GRO analysis. Propose to collect groundwater samples from wells TMW06, TMW07, and TMW21 for TPH-GRO analysis in the revised Plan. Alternatively, the Permittee may propose to submit a separate work plan to install a well to delineate the plume south of well MW20 (see Comment 42).

Permittee Response: Comment Acknowledged. The following text was added to Section 5.2, Page 60, Lines 13-23, (RLSO: Page 61, Line 17-26) and Section 7.0, Page 69, Line 32 to Page 70, Line 7 (RLSO: Page 71, Line 32 to Page 72, Line 7):

“Furthermore, to better define the TPH impacts, select wells near the existing TPH plume will be analyzed for TPH gas and diesel range organics per NMED comment #42 and #43 in Disapproval Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11, dated July 29, 2020. The following wells will be included into the TPH monitoring program for both TPH-DRO and TPH-GRO:

- TMW06
- TMW07
- TMW10
- TMW21
- TMW46”

44. Table 2-1, Northern Area Groundwater Well Construction Details

NMED Comment: The table includes well location data with northing and easting coordinates. Both northing and easting data are noted as Horizontal Coordinate System. However, Horizontal Coordinate System is only applicable to the easting coordinate.

Vertical Coordinate System is applicable to northing coordinate. Revise the table for accuracy.

Permittee Response: Respectfully disagree. Both Easting and Northing are horizontal measurements. Easting and Northing are geographic Cartesian coordinates for a point and is part of the State Plane Coordinate System in use in the USA. Easting is the eastward-measured distance (or the x-coordinate) and northing is the northward-measured distance (or the y-coordinate). Northing is not applicable to a vertical coordinate system.

45. Table 5-1, Groundwater Screening Levels, Detection Limits, and Control Limits, page 1 of 5

NMED Comment: The detection limits of TPH-DRO and TPH-GRO are higher than the applicable screening levels, although these analytes have been detected in multiple groundwater samples. It is essential to achieve detection limits for TPH-DRO and TPH-GRO that are lower than the screening levels in order to demonstrate compliance.

The Permittee has previously been directed to provide analyses with method detection limits, reporting detection limits, and practical quantitation limits that are less than the applicable screening level for each contaminant of concern. All data provided by analyses where the method detection limit, reporting detection limit, or practical quantitation limit

exceed the screening level are considered data quality exceptions and cannot be used to demonstrate compliance. In addition, all data quality exceptions must be called out in the text, tables, or figures where the data are presented.

Permittee Response: Comment Acknowledged. Constituents where the method of detection limit, reporting detection limit, or practical quantitation limit exceed the screening level were considered data quality exceptions and are identified as such in the text (Section 5.1, Pages 57-58 [RLSO: Pages 58-59]), Tables, and Figures where they are presented.

Kimberly Rudawsky

From: Christy Esler
Sent: Wednesday, December 30, 2020 12:56 PM
To: Kimberly Rudawsky; Chasitty Badonie
Cc: Angela Makin
Subject: FW: [Non-DoD Source] Response to Disapproval Final Revision 1, 2022 Northern Area Groundwater Monitoring Plan
Attachments: Response_to_Disapproval_Final_Rev1_2022_Northern_Area_Groundwater_Monitoring_Plan_30Dec20.pdf

Please see the attached correspondence to NMED from the Army for processing.

From: Angela Makin <amakin@sundance-inc.net>
Sent: Wednesday, December 30, 2020 9:54 AM
To: kevin.pierard@state.nm.us
Cc: dave.cobrain@state.nm.us; Ben Wear <benjamin.wear@state.nm.us>; Michiya Suzuki <michiya.suzuki@state.nm.us>; Hendrickson, Charles <hendrickson.charles@epa.gov>; Ian Thomas <ian.m.thomas2.civ@mail.mil>; Smith, Steven W CIV USARMY CESWF (USA) <Steve.W.Smith@usace.army.mil>; Khan, Mohammad Saqib (Saqib) CIV USARMY CESWF (USA) <Mohammad.S.Khan@usace.army.mil>; Becker, David J CIV USARMY CEHNC (USA) <Dave.J.Becker@usace.army.mil>; Clayton Seoutewa <clayton.seoutewa@bia.gov>; Gallegos, Santiago M CIV USARMY CESP (USA) <Santiago.M.Gallegos@usace.army.mil>; george.padilla@bia.gov; Sharlene Begay-Platero <srpb@navajoadvantage.com>; Mark Harrington <mark.harrington@ashiwi.org>
Subject: [Non-DoD Source] Response to Disapproval Final Revision 1, 2022 Northern Area Groundwater Monitoring Plan

Mr. Pierard,

The attached letter presents the Army's responses to the New Mexico Environment Department Notice of Disapproval, July 27, 2020, regarding the Final Rev. 1, 2022 Northern Area Groundwater Monitoring Plan, Fort Wingate Depot Activity.

If you have questions or require further information, please contact George Cushman IV at George.h.cushman.civ@mail.mil, 703-456-3234 (Temporary Home Office, preferred) or 703-608-2245 (Mobile).

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Sundance Consulting, Inc., under contract with the U.S Army Corps of Engineers, is respectfully submitting the attached letter on behalf of the Army.

Thank you,

Angela Makin, PMI - SP, CAPM | Program Scheduler
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Woman-Native American-Owned Small Business
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