



**DEPARTMENT OF THE ARMY**  
**OFFICE OF THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT**  
**600 ARMY PENTAGON**  
**WASHINGTON, DC 20310-0600**

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Base Realignment and Closure Division

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

RE: Response to October 31, 2018 Disapproval Letter, Final RCRA Facility Investigation Phase 2 Work Plan, Parcel 23, Fort Wingate Depot Activity, McKinley County, NM EPA #NM6213820974, HWB-FWDA-18-004

Dear Mr. Kieling:

This letter presents our responses to your comments presented in the Disapproval Letter dated October 31, 2018 regarding the Final RCRA Facility Investigation Phase 2 Work Plan, Parcel 23 for the Fort Wingate Depot Activity (FWDA) under RCRA Permit USEPA ID No. NM6213820974 (October 5, 2016). The report has been revised to address each comment as described below and is being submitted under separate cover as *Final RCRA Facility Investigation Phase 2 Work Plan, Parcel 23, Revision 1.0*, April 29, 2019. The revised report describes the removal activities at Parcel 23 FWDA, McKinley County, New Mexico and is being submitted concurrently for tribal and regulatory review.

In addition to changes specific to NMED comments, changes were also made to reference to the NMED 2019 Risk Assessment Guidance for Site Investigations and Remediation.

**NMED COMMENT 1 - Section 1.2, Background Information, lines 7-9, page 1-2**

**Permittee Statement:** "The Approval with Modifications (AwM) (Comment 6) also requires that Army address all comments within the NOD, specifically those comments referencing future actions through the development of a RFI Phase 2 Work Plan."

**NMED Comment:** Although the Permittee's statement is true, the referenced correspondence (Approval with Modifications) does not contain Comment 6. Correct the typographical error in the revised Work Plan.

***Permittee Response:***

The edit has been made as requested. The sentence now reads as follows:

The Approval with Modifications AwM also requires that Army address all comments within the NOD, specifically those comments referencing future actions through the development of a RFI Phase 2 Work Plan.

**NMED COMMENT 2 - Section 1.2, Background Information, lines 9-12, page 1-2**

**Permittee Statement:** "For reference, the following documents are included in Appendix A:

- NOD Letter - August 19, 2014
- Response to NOD - February 28, 2015
- AwM – August 12, 2015."

**NMED Comment:** Appendix A also contains email correspondence between the Permittee and NMED regarding the proposed locations of monitoring wells and a figure showing the locations. Provide a more accurate description. In addition, include all extension request approval letters for this document in Appendix A.

***Permittee Response:***

The text has been edited to reference all documents in Appendix A as follows:

For reference, the following documents are included in **Appendix A:**

- NMED NOD Letter - August 19, 2014
- Army Response to NOD - February 28, 2015
- NMED AwM - August 12, 2015
- Correspondence between NMED and Army regarding downgradient well location – April/May 2018

Appendix A also includes the following documents:

- NMED Work Plan Extension Request Approval Letters – December 22, 2015, January 19, 2016, December 1, 2016, December 6, 2017
- NMED Work Plan NOD Letter – October 31, 2018
- Army Response to NOD Letter – April 29, 2019

**NMED COMMENT 3 - Section 1.2, Background information, Comment 9, lines34-36, page 1-2**

**Permittee Statement:** "The revised RFI Report suggests that observed impacts may be the result of runoff from the adjacent coal burning boiler plant (Building 535)."

**NMED Comment:** A figure showing the location of Building 536 was included in the Work Plan; however, the locations of Building 535 and the borrow pit that supplied the fill material are not indicated in any figure in the Work Plan. Include a figure depicting these locations in the revised Work Plan.

***Permittee Response:***

Figures 1-3, 3-1, 3-2, and 4-1 have been revised to call out the location of Former Buildings 535 and 536.

The source of the fill material is unknown and therefore not indicated on a figure. Because the source is unknown, samples are proposed to be collected from the backfill. This is discussed in Section 3.0 of the work plan.

**NMED COMMENT 4 - Section 1.3, Cultural Resources, lines 36-37, page 1-3 and line 1, page 1-4**

**Permittee Statement:** "No archaeological site is within the horizontal footprint of SWMU 21; however, several archaeological sites are within close proximity to these locations (LA101952 and LA101743)."

**NMED Comment:** The locations of archaeological sites are designated as LA101952 and LA101743; however, they are not shown in any figure. The designation is meaningless unless referenced in a figure. Include a figure showing these locations in the revised Work Plan or remove the reference to the archeological sites from the statement.

***Permittee Response:***

The text has been revised as follows:

No archaeological sites recorded at FWDA are located within the horizontal footprint of SWMU 21. Should any sites outside of SWMU 21 show potential to be impacted by site related activities, these will be flagged and avoided during field work.

**NMED COMMENT 5 - Section 2.2.2, Groundwater Sampling, lines 24-26, page 2-2**

**Permittee Statement:** "The general approach to evaluating whether or not groundwater is impacted will be to collect groundwater samples from the first water-bearing zone by means of a temporary well."

**NMED Comment:** The Parcel 3 groundwater investigation indicates that some wells close to arroyos initially retained groundwater; however, the wells went dry during the subsequent monitoring event. The groundwater conditions in Parcel 23 may be similar to Parcel 3, especially along the arroyos. Since the presence of groundwater may be ephemeral, similar to the arroyos, propose to install and monitor the temporary well for a minimum of two years, even if groundwater is not present at the time of installation. Revise the Work Plan accordingly.

***Permittee Response:***

The Army concurs with installing a monitoring well and leaving it open for approximately 2 years. Text within Section 2.2.2 has not been changed. The revision was made in Section 4.0. The text has been revised as follows:

The downgradient boring/temporary well will be placed as close as possible to the arroyo without jeopardizing the safety of the drilling equipment and field staff. The drilling will be performed by a New Mexico licensed driller using one of, or a combination of, the following techniques: hollow stem auger, air rotary, or rotosonic drilling. The borings will be advanced to the first water bearing zone or a maximum depth of 120 feet if groundwater is not encountered.

The borehole will be converted to a temporary well and screened in the first water bearing zone. If no water bearing zone is encountered the borehole will still be converted to a temporary well and the NMED will be contacted for concurrence on a proposed screening interval, which the field geologist will propose after reviewing the borehole lithology. The

temporary well will be constructed with a filter-pack, 2-inch diameter 0.010-inch slot screen, and casing. Development will be performed by pumping until the groundwater is sufficiently clear to collect a groundwater sample. The well will be left in place for a minimum of two years. During this time the well will be sampled on a quarterly basis in general accordance with the procedures detailed in the Final 2017 Interim Measures Facility-Wide Groundwater Monitoring Plan Version 10, Revision 1 (Sundance, July 2018) as approved with modifications by NMED on October 22, 2018. Even if groundwater is not present in the well at the time of installation, the Army will check the well for the presence of seasonal water on a quarterly basis.

The temporary well will be covered and left in place until groundwater sample analytical results are reviewed and evaluated. Sample results will be compared to current state or federal drinking water standards (or USEPA tap water RSLs for analytes without published drinking water standards), in accordance with the hierarchy of screening values presented in Section 7.1 of the Permit (NMED, 2015a).

If there are no indications of impact to the groundwater quality after the two-year period, the temporary well will be abandoned with NMED's approval. Temporary boreholes will be abandoned following NMOSE guidance and regulations. The casing will be removed as the bentonite slurry is pumped into the borehole. If the casing cannot be removed, it will be cut below the ground surface and abandoned in place.

**NMED COMMENT 6 - Section 2.3.1.1, Quality Control Analyses/Parameters Originated by the Laboratory, Method Blank, lines 14-19, page 2-3**

**Permittee Statement:** "If a target constituent is found at a concentration that exceeds one-half the limit of quantitation (LOQ) in the method blank, the laboratory must perform corrective action in an attempt to identify and, if possible, eliminate the contamination source. If sufficient sample volume remains in the sample container, samples associated with the blank contamination should be re-prepared and re-analyzed after the contamination source has been eliminated."

**NMED Comment:** Several contaminants were eliminated from risk assessment in the Final RCRA Facility Investigation Report Parcel 7 Revision 1, dated June 27, 2018 because these contaminants were detected in blanks. However, the rationale for the elimination must be validated. Regardless of the detection level, if contaminants are detected in both blanks and samples and unless re-analysis after eliminating the source of contamination is performed, provide a table that lists detected contaminant concentrations in both blanks and samples. These concentrations must be compared and evaluated to determine whether elimination is appropriate. Include the protocol in the revised Work Plan.

**Permittee Response:**

The following paragraph was added to this section (Method Blank):

To determine if elimination is appropriate, the contractor will use the following protocol, during data validation, to determine if results should be qualified because of blank detections. If target analytes are detected in blank samples, the contractor will U qualify detected results from the associated field samples, at the higher of the detected concentration or the limit of detection, if the concentration detected in the sample is less than five times the concentration detected in the blank. The validation report will also include a table that summarizes blank

detections, associated samples, and original and revised results that were qualified due to the blank detections.

**NMED COMMENT 7 - Section 3.1, Borings in Areas of Previous Exceedances, lines 11-14, page 3-1**

**Permittee Statement:** "Previous sample locations and analytes which exceed the lowest 2017 NMED SSLs for a residential receptor (which is either the direct contact SSL or the groundwater protection SSL, except for arsenic where the site-specific background level is used instead of an SSL) are summarized in Tables 3-1 through 3-3 and illustrated in Figure 3- 1."

**NMED Comment:** The site-specific background level of 5.6 mg/kg was used to screen arsenic as a potential COPC and for assessing site risk. The agreement with NMED to use 5.6 mg/kg for screening purposes was based on the fact that at the time of this agreement, the SSL for arsenic was below the background level. However, the 2017 direct contact SSL for arsenic is 7.07 mg/kg (residential). The current SSL for arsenic must be used for estimating risk to avoid an overly conservative evaluation for arsenic in future investigations at the site.

***Permittee Response:***

The text, tables and figures have been revised to remove the reference to arsenic site specific background. Further all references to NMED Guidance have been changed to 2019. The revised text for this specific section is as follow:

Previous sample locations and analytes which exceed the lowest 2019 NMED SSLs for a residential receptor (which is either the direct contact SSL or the groundwater protection SSL) are summarized in **Tables 3-1** through **3-3** and illustrated in **Figure 3-1**.

**NMED COMMENT 8 - Section 3.1, Borings in Areas of Previous Exceedances, lines 16-18, page 3-1**

**Permittee Statement:** "All samples will be analyzed for SVOCs, VOCs, extended diesel-range organics (DRO), target analyte list (TAL) metals, and explosives."

**NMED Comment:** Perchlorate may also be a chemical of potential concern due to the past activities at the site. Perchlorate was detected in groundwater samples collected from wells in Parcel 3. The arroyo may be a conduit for contaminants; therefore, perchlorate may be present in groundwater. Include perchlorate analysis for groundwater samples collected at the site. Revise the Work Plan accordingly.

***Permittee Response:***

The analyte list has been revised to include perchlorate. The text has been revised as follows:

All samples will be analyzed for SVOCs, VOCs, extended diesel- range organics (DRO), target analyte list (TAL) metals, perchlorate, and explosives.

**NMED COMMENT 9 - Section 3.1, Boring in Areas of Previous Exceedances, lines 23-25, page 3-1, and Section 3.2, Borings to Characterize the Backfill Material, lines 36-37**

**Permittee Statements:** "[Native soil] [s]amples will be collected from the depth intervals - corresponding to 0-1 foot, 1-2 feet, 3-4 feet; 5-6 feet, 7-8 feet, 8-9 feet, and 9-10 feet below the depth of backfill." - and, "[Backfill] [s]amples will be collected from the 0-1 foot, 1-2 feet, 3-4 feet, 5-6 feet, 7-8 feet, 8-9 feet, and 9-10 feet bgs depth intervals."

**NMED Comment:** It is not clear how the Permittee determines the interface between backfill and native soils. Describe the method for identifying the interface in the revised Work Plan. Residual contaminants likely accumulate close to the fill-native soil interface. Revise the Work Plan to propose to collect all soil samples from immediately above and below the fill-native soil interface. Furthermore, provide information regarding (1) the lateral extent of backfill placement and (2) the thickness of backfill. The thickness of backfill appears to exceed 10 feet at the site. Revise the Work Plan to include this information or provide references to the reports that include the information.

***Permittee Responses:***

A sentence was added to the end of Section 3.0 as follows:

Section 3.4 was added to this revised work plan to clarify how the proposed borings will be utilized to determine the backfill and native soil interface as well as provide information regarding the lateral extent of the backfill material.

The new Section 3.4 reads as follows:

Section 3.4 has been added to the work plan to describe the approach to determining the interface between the native soil and fill material. This section indicates that proposed sample intervals will be adjusted to ensure samples are collected immediately above and below the interface. Further, it notes that the information from all the borings will be utilized to provide a better understand of the thickness and extent of the backfill material, as this information does not currently exist.

The revised section reads as follows:

**3.4 Thickness and Extent of Backfill Material**

In order to determine the interface between the fill material and native soils, each borehole described in sections 3.1, 3.2 and 3.3 will be drilled using a hollow stem auger rig with continuous split-spoon soil sampling techniques at the direction of a field geologist. The field geologist will be responsible for identifying the interface between the fill material and the native soil. The field geologist will monitor for differences in material density as determined by blow counts as the split spoon sampler is driven into the material. The field geologist will also visually observe each sample for differences in color and/or consistency. The proposed sample intervals will be adjusted as necessary to ensure that soil samples are collected immediately above and below the interface. All information obtained from these borings will be utilized to obtain a better understanding of the extent and thickness of the backfill material. The split-spoon sampling protocol in accordance with American Society for Testing and Materials (ASTM) Designation D 1586 is described below.

- The split-spoon sampler (spoon) consists of a 2-inch (outside diameter) by 1-3/8 inch (inside diameter), 18-inch to 24-inch length, heat-treated, case-hardened steel head, split-spoon, and shoe assembly.
- The drive rods, which connect the spoon to the drive head, have a stiffness equal to or greater than that of the A-rod. The size of the drive rods are kept constant throughout a specific drilling program, as the energy absorbed by the rods will vary with the size and weight of the rod employed.
- The drive head consists of a guide rod to give the drop hammer (140 pounds) free fall in order to strike the anvil attached to the lower end of the assembly. The drop hammer used in determining standard penetration test (SPT) resistance weighs 140 pounds and has a 2.5-inch diameter hole through the center, for passage of the drive head guide rod. The hammer is raised with a rope activated by the drill rig cathead. A 30-inch hammer drop is mandatory for proper SPT determination.
- The pre-cleaned split-spoon sampler is attached to the drill rods and lower the assembly to the bottom of the borehole. The 140-pound hammer is raised 30 inches above the drive-head anvil and then allowed to free fall and strike the anvil. This procedure is repeated until the sampler has penetrated the full length of the sampler (18 to 24 inches depending on the sampler) into the stratum at the bottom of the borehole.
- The number of blows of the hammer required for each 6-inch penetration is counted and recorded on the boring log. The penetration resistance (N) is determined by adding the second and third 6-inch resistance blow counts together.
- The sampler is then withdrawn from the borehole, preferably by pulling on the rope. If the sampler is difficult to remove from the stratum, it may be necessary to remove it by hitting the drive head upward with short, light hammer strokes. The sampler is removed from the bottom of the borehole slowly to minimize disturbance.
- Careful measurement of all drilling tools, samplers, and casing will be exercised during all phases of the boring operations, to insure maximum quality and recovery of the sample.
- The split-spoon is opened and carefully examined, noting all soil characteristics, color seam, disturbance, etc. A representative sample from the specified interval is selected and placed into the sampling containers.
- The field geologist shall record, at a minimum, the weight of the hammer, the length of the split spoon sampler, and the number of hammer blows on the spoon per 6 inches of penetration.
- The field geologist will manually describe soils encountered in accordance with American Society for Testing and Materials (ASTM) Standard D2488-93, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*. These descriptions will be recorded on a boring log for each boring.

**NMED COMMENT 10 - Section 3.3, Borings to Assess Arroyo, lines 2-5, page 3-2**

**Permittee Statement:** "Two shallow soil borings (10 feet total depth) will be conducted in the arroyo, one 25 feet northwest and one 50 feet northwest of the northern border of the former landfill (soil boring ID numbers 2321CLAND-SB11 and 2321CLAND-SB12). [Arroyo sediment] [s]amples will be collected from the 0-1 foot, 1-2 feet, 3-4 feet, 5-6 feet, 7-8 feet, 8-9 feet, and 9-10 feet bgs depth intervals."

**NMED Comment:** The location of the backfill was unidentified. The depth to the interface between backfill and native soils, if present, must be identified. Soil samples must be

collected from the depths where residual contaminants are most likely to accumulate (see Comment 9). In this case, contaminants associated with surface water runoff from the landfill are likely detected at (1) six inches below the apparent ground surface and (2) six inches below and above the interface where native soils are encountered. Revise the Work Plan accordingly.

***Permittee Response:***

Determination of the depth to interface between fill material and native soil as well as the extent of backfill is discussed in response to comment 9.

Section 3.3 has been revised to include the following sentence:

Sample intervals and total depth of the borings may be adjusted to ensure samples are collected in the upper 6 inches of the surface and at the native soil and fill interface, as requested by Comment 10 of the 2018 NOD.

**NMED COMMENT 11 - Section 4.0, Groundwater Investigation at SWMU 21- Central Landfill, lines 7-8, page 4-1**

**Permittee Statement:** "The investigation will include the collection a groundwater sample via a temporary well placed in a downgradient direction from the former landfill (2321CLAND-MW-1)."

**NMED Comment:** The wells are designated as P23-TMW01A and P23-TMW01B in a figure included in Appendix A. Provide an explanation for the variance in nomenclature; otherwise, revise the Work Plan to correct the discrepancy.

***Permittee Response:***

The narrative text is the correct nomenclature. The figure included in the Appendix A has been revised with a notation to indicate the correct nomenclature.

**NMED COMMENT 12 - Section 4.0, Groundwater Investigation at SWMU 21 - Central Landfill, lines 15-16, page 4-1, and Section 5.1.4.5, Domestic Tap Water Use, lines 14-15, page 5-4**

**Permittee Statements:** "The borings will be advanced to the first water bearing zone or a maximum depth of 100 feet if groundwater is not encountered."

and,

"The scope of the Phase 2 RFI includes collection and testing of groundwater, if encountered within 100 feet bgs."

**NMED Comment:** The floor of arroyo may be more than 20 feet below the elevation where temporary wells are to be installed. A maximum boring depth of 100 feet below the floor of arroyo must be proposed if groundwater is not encountered. In addition, since the presence of groundwater may be ephemeral, similar to the arroyos, propose to preserve and monitor the temporary well for a period of two years, even if groundwater is not present at the time of installation. Revise the Work Plan accordingly. See Comment 5.



**Permittee Response:**

Section 4.0 of the work plan has been revised as follows:

The downgradient boring/temporary well will be placed as close as possible to the arroyo without jeopardizing the safety of the drilling equipment and field staff. The drilling will be performed by a New Mexico licensed driller using one of, or a combination of, the following techniques: hollow stem auger, air rotary, or rotosonic drilling. The borings will be advanced to the first water bearing zone or a maximum depth of 120 feet if groundwater is not encountered.

The borehole will be converted to a temporary well and screened in the first water bearing zone. If no water bearing zone is encountered the borehole will still be converted to a temporary well and the NMED will be contacted for concurrence on a proposed screening interval. The field geologist will propose the screened interval after reviewing the borehole lithology. The temporary well will be constructed with a filter-pack, 2-inch diameter 0.010-inch slot screen, and casing. Development will be performed by pumping until the groundwater is sufficiently clear to collect a groundwater sample. The well will be left in place for a minimum of two years. During this time the well will be sampled on a quarterly basis in general accordance with the procedures detailed in the Final 2017 Interim Measures Facility-Wide Groundwater Monitoring Plan Version 10, Revision 1 (Sundance, July 2018) as approved with modifications by NMED on October 22, 2018. Even if groundwater is not present in the well at the time of installation, the Army will check the well for the presence of seasonal water on a quarterly basis.

The temporary well will be covered and left in place until groundwater sample analytical results are reviewed and evaluated. Sample results will be compared to current state or federal drinking water standards (or USEPA tap water RSLs for analytes without published drinking water standards), in accordance with the hierarchy of screening values presented in Section 7.1 of the Permit (NMED, 2015a).

If there are no indications of impact to the groundwater quality after the two-year period, the temporary well will be abandoned with NMED's prior approval. Temporary boreholes will be abandoned following NMOSE guidance and regulations. The casing will be removed as the bentonite slurry is pumped into the borehole. If the casing cannot be removed, it will be cut below the ground surface and abandoned in place.

**NMED COMMENT 13 - Section 4.0, Groundwater Investigation at SWMU 21 - Central Landfill, lines 20-22, page 4-1**

**Permittee Statement:** "Sample collection will be conducted in general accordance with the procedures detailed in the Final 2015 Interim Measures Facility-Wide Groundwater Monitoring Plan (Innovar and CB&I, 2015)."

**NMED Comment:** The referenced submittal is not an approved plan. Sample collection must be conducted in accordance with an approved groundwater monitoring plan. Revise the Work Plan accordingly.

***Permittee Response:***

The work plan has been revised as follows:

During this time the well will be sampled on a quarterly basis in general accordance with the procedures detailed in the Final 2017 Interim Measures Facility-Wide Groundwater Monitoring Plan Version 10, Revision 1 (Sundance, July 2018) as approved with modifications by NMED on October 22, 2018.

**NMED COMMENT 14 - Section 5.1.2, Selection of Screening Levels, lines 26-29, page 5-1**

**Permittee Statement:** "Screening levels published by NMED in Appendix A of the NMED risk guidance (NMED, 2017a) for direct contact and groundwater protection. The exception to this is for evaluation of arsenic in soil, where NMED is allowing use of the site-specific background level of 5.6 milligrams per kilogram (mg/kg) in lieu of the NMED screening level."

**NMED Comment:** The site-specific background level of 5.6 mg/kg was used to evaluate arsenic as a potential COPC and for assessing site risk. The agreement with NMED to use 5.6 mg/kg for screening purposes was based on the fact that at the time of this agreement, the SSL for arsenic was below the background level. However, the 2017 SSL for arsenic is 7.07 mg/kg (residential). The current SSL for arsenic must be used for estimating risk for future investigations at the site (see Comment 7).

***Permittee Response:***

The text has been revised to remove reference to using the site-specific background for arsenic. The entire sentence was deleted. The text now reads as follows:

Screening levels published by NMED in Appendix A of the NMED risk guidance (NMED, 2019) for direct contact and groundwater protection.

**NMED COMMENT 15 - Section 5.1.2, Selection of Screening Levels, line 37, page 5-1 and lines 1-2, page 5-2**

**Permittee Statement:** "USEPA risk-based SSLs for the protection of groundwater will be adjusted to a dilution attenuation factor (DAF) of 20 for consistency with the NMED presumption that this DAF is reasonably protective."

**NMED Comment:** The contaminant distribution shown in Figure 3-1, Previous Sample Locations with Analytes Exceeding 2017 NMED SSLs, suggests that the source area of potential groundwater contamination easily exceeds 0.5 acre. Since the DAF of 20 is protective of groundwater for a 0.5-acre source but not for a larger source area, the DAF values must be revised if groundwater is found to be affected. Discuss whether a DAF of 20 is appropriate for the site in the revised Work Plan.

***Permittee Response:***

The Army believes the DAF 20 is appropriate for Parcel 23, SWMU 21, in spite of the fact that NMEDs soil-to-groundwater soil screening levels using a DAF of 20 are based upon a source area of 0.5 acres and the estimated Parcel 23 SWMU 21 source area is estimated to

be slightly in excess of 2 acres. The text of the work plan (Section 5.1.2, bullet 2) has been revised as follows:

2. RSLs published by USEPA for residential and industrial receptors for soil are selected when NMED does not publish a value. USEPA RSLs based on a noncancer endpoint correspond to the NMED target hazard quotient (HQ) of 1.0 for noncarcinogenic analytes. USEPA RSLs based on a cancer endpoint will be adjusted to a cancer risk of  $1 \times 10^{-5}$  for consistency with the NMED target risk threshold of  $1 \times 10^{-5}$  (NMED, 2017a; Section 1.2). USEPA risk-based SSLs for the protection of groundwater will be adjusted to a dilution attenuation factor (DAF) of 20 based upon the following justification:

a) Contaminants of Concern and Their Characteristics: PAHs are the only COCs present in surficial soils that show low-level concentrations exceeding DAF 20 soil-to-groundwater SSLs over the length of the SWMU. PAHs have low water solubility and are not likely to leach vertically and migrate to groundwater (WHO, 2003

[https://www.who.int/water\\_sanitation\\_health/water-quality/guidelines/chemicals/polyaromahydrocarbons.pdf](https://www.who.int/water_sanitation_health/water-quality/guidelines/chemicals/polyaromahydrocarbons.pdf)

USEPA, 1976

<https://nepis.epa.gov/Exe/ZyPDF.cgi/9100RZ55.PDF?Dockey=9100RZ55.PDF>)

b) Lack of Infinite Source: This Phase 2 RFI work plan is in follow-up to the removal of the landfill in 1999. All landfill waste and visibly impacted soil below the former landfill was removed and disposed of at an off-site disposal facility (Final RCRA Facility Investigation Parcel 23 (2012)). This removal will have mitigated the "infinite source" of on-going contamination

c) Soil Characteristics: The boring logs located in Appendix K of the Parcel 23 RFI Report identified the soils using the Unified Soil Classification System (USCS) and classified them as being within the silty clay (CL-ML) and sandy silt (ML) classes (ASTM D2487-17), both of which are classified as fine grained materials composed of fifty percent or more by dry mass of particles passing the No. 200 (75  $\mu$ m) sieve. Such fine grained materials will bind PAHs and retard their vertical migration

(ATSDR, 1995 <https://www.atsdr.cdc.gov/ToxProfiles/tp69-c1-b.pdf>)

d) Infiltration Rates: "Infiltration rates across much of New Mexico are substantially less than the average range of 0.15 to 0.24 m/yr. reported for many of the hydrogeologic regions used in the USEPA analysis" (NMED 2019 (revised), Section 4.4). Aller et al (1987, EPA/600/2-87/035) described the hydrogeologic setting for FWDA as the Colorado Plateau and Wyoming Basin. The infiltration rates used for these arid to semi-arid regions in the USEPA analysis were 0.03 to 0.14 m/y, rates which are 40-80% less than the average range reported for many regions in the U.S., as noted above. Reduced infiltration rates reduce vertical migration

e) Surface Water: The topographic contours for Parcel 23 is relatively flat with the exception of the arroyo channel. Surface runoff during rainfall/snowmelt events collects in the arroyo channel, which only flows intermittently during precipitation events or pools locally in low areas where it evaporates. No other intermittent surface water bodies exist within Parcel 23. However, southwest of Parcel 23 is Parcel 2, which surface water samples have been intermittently collected since 1992. No COC that were analyzed for results were non-detect to low detects.

f) Comparative Source Area Size to DAFs: Default DAFs of 10 for a 30-acre source and 20 for a 0.5-acre source have been proposed by USEPA as values generally protective nationwide. When the relative area of the Parcel 23 source area is considered, it is much closer to the 0.5-acre site than the 30-acre site making the application of the DAF 20 reasonable for screening purposes.

g) Depth to Groundwater: Depth to the first water-bearing zone is unknown for this area, but it is expected to be between approximately 50 and 60 feet bgs, based on installed groundwater monitoring wells to the north of SWMU 21. Depth to the second water-bearing zone is unknown for SWMU 21, but is expected to be between 70 and 120 feet bgs, based on installed groundwater wells to the north of SWMU 21 (Parcel 23 RFI Report Final).

h) Vulnerable Groundwater Environment: Vulnerable groundwater is defined as "areas close to perennial streams or where groundwater is very shallow" (NMED 2017 Revised Guidance Section 4.4 pg77). SWMU 21 is not near a perennial stream and shallow groundwater has not been detected to date. The Army agrees that impacts to groundwater at FWDA need to be investigated and is responding to this in the facility wide groundwater assessment program

i) Lack of Presence of Liquids: Land use around SWMU 21 does not include any liquid source(s) that could drive the vertical migration of COCs.

j) Weather Regimes: semi-arid/arid weather regimes at FWDA result in little precipitation and significant evaporation on an annual basis, further attenuating dissolution and vertical migration.

Although the source area orientation is generally to the northeast and parallels both the arroyo and groundwater, this is not expected to override the attenuation of vertical transport supported by the lines of evidences presented above.

**NMED COMMENT 16 - Section 5.1.3, Identification of COPCs, lines 10-12, page 5-3**

**Permittee Statement:** "Analytes that are not detected in any sample will not be retained as COPCs. Analytical testing will be performed for VOCs, SVOCs, total petroleum hydrocarbons (TPH)-DRO, TAL metals, mercury, and explosives."

**NMED Comment:** Perchlorate analysis must also be performed for all groundwater and soil samples collected at the site. Revise the Work Plan accordingly. Refer to Comment 8.

**Permittee Response:**

The work plan has been revised to include perchlorate. The revised text will read as follows:

Analytes that are not detected in any sample will not be retained as COPCs. Analytical testing will be performed for VOCs, SVOCs, total petroleum hydrocarbons (TPH)-DRO, TAL metals, mercury, perchlorate and explosives.

Tables 2-1, 2-3, 2-4, 2-5 and 3-4 have also been revised to include perchlorate.

**NMED COMMENT 17 - Section 5.1.4.2, Beef Ingestion, lines 28-30, page 5-3, and Section 5.1.5, Conceptual Site Model, lines 32-33, page 5-4**

**Permittee Statement:** "The total acreage of SWMU 21 is 2.2 acres, but the beef ingestion pathway is not considered to be complete because SWMU 21 is comprised of two non-contiguous areas, each of which are less than 2 acres in size."

**NMED Comment:** In Figure 3-1, a distribution of SVOC exceedances was observed in the area between the two boundaries as well as in the areas within the boundaries. Therefore, these two areas must be considered to be contiguous and must not be evaluated separately. In addition, the lateral extent of SVOC exceedances is not defined to the north and south along the arroyo. The extent of contamination has not been defined. The beef ingestion pathway must be evaluated in the Phase 2 Investigation Report. Revise the Work Plan accordingly.

***Permittee Response:***

Section 5.1.4.2 has been revised as follows:

NMED risk guidance (NMED, 2019) requires a qualitative evaluation for the beef ingestion pathway for sites that are greater than 2 acres. A qualitative evaluation will be completed.

**NMED COMMENT 18 - Section 5.1.6.3.2, Step 2 - Refined Cumulative Risk Evaluation, lines 14-15, page 5-10**

**Permittee Statement:** "SWMU 21 consists of two separate, non-contiguous areas that may be evaluated separately."

**NMED Comment:** SWMU 21 is contiguous due to the distribution of SVOCs along the arroyo. Refer to Comment 17. The Permittee must evaluate risks associated with SWMU 21 as a continuous area. Revise the Work Plan accordingly.

***Permittee Response:***

The text (bullet item 2.) was revised to strike the sentence: "SWMU 21 consists of two separate, non-contiguous areas that may be evaluated separately." Reference to non-contiguous areas in other sections was also removed, including section 5.1.5, 5.2.4, and Figure 5-1.

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

Sincerely,

PATTERSON.MARK. Digitally signed by  
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Mark Patterson  
BRAC Environmental Coordinator  
Fort Wingate Depot Activity

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## Christy Esler

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**Attachments:** Final Parcel 23 RFI Phase 2 WP\_Response to October 31 2018 Disapproval Ltr\_25April2019.pdf

Mr. Kieling,

The attached letter presents the Army's responses to NMED comments in the October 31, 2018 Disapproval letter, Final RCRA Facility Investigation Phase 2 Work Plan, Parcel 23, Fort Wingate Depot Activity.

If you have any questions or concerns please contact Mark Patterson at 505-721-9770.

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Respectfully submitted,

**Christy Esler | Program Manager**

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