NEW MEXICO
ENVIRONMENT DEPARTMENT

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

RYAN FLYNN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 1, 2015

Mark Patterson
FWDA, BRAC Coordinator
P.O. Box 93
Ravenna, OH 44266

Steve Smith
USACE FWDA Program Manager
CESWF-PEC-EF
819 Taylor Street, Room 3A12
Fort Worth, TX 76102

RE: DISAPPROVAL
FINAL GROUNDWATER SUPPLEMENTAL RCRA FACILITY
INVESTIGATION WORK PLAN, REVISION 0
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO
EPA ID# NM6213820974
HWB-FWDA-15-001

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) has received the *Final, Groundwater Supplemental RCRA Facility Investigation Work Plan, Revision 0,* (Plan) dated January 30, 2015 from Fort Wingate Depot Activity (Permittee). NMED has reviewed the Plan and hereby issues this Disapproval. The Permittee must address the following comments.

Comments:

1. Permittee Statement – Section 2.2.5.2 Stratigraphy, lines 33-35, page 2-4. "Figure 2-7 shows the locations, transect lengths, and directions of five cross-sections (A-A' through E-E') within the Study Area. Figures 2-8, 2-9, 2-10, 2-11, and 2-12 provide the five cross-sections."

NMED Comment:

The distance between monitoring wells is significant and data are interpolated over large distances from a limited number of soil borings. The stratigraphy may vary significantly from

the interpolated data. To reduce the uncertainty, propose to install additional soil borings to more accurately characterize the subsurface.

2. Permittee Statement – Section 3.2.2 Sampling Data, lines 21-27, page 3-2. "The USACE developed a site-specific dilution attenuation factor (DAF) of 529 for the FWDA in accordance with the NMED Risk Assessment Guidance for Site Investigations and Remediation, updated June 2012 (NMED 2012). The methods and results of the DAF development are provided in the Fort Wingate Depot Activity *TNT Leaching Bed Soil Boring Test Results and Development of Site-Specific Dilution Attenuation Factors Report* (USACE, 2014) that was submitted to the NMED by the USACE in October 2014 (Appendix D). The DAF of 529 was used to calculate analyte-specific SSLs in soil for the protection of groundwater (USACE, 2014)."

NMED Comment:
NMED issued a Disapproval dated April 15, 2015 which contained comments regarding the Permittee's DAF calculation. The calculated values cannot be used for comparison until approved by NMED. Remove the references to these DAF values in the Plan.

3. Permittee Statement – Section 3.3 Data Quality Objectives, lines 2-5, page 3-3. "Appendix E contains the Quality Assurance Project Plan (QAPP). Section 1.6 of the QAPP provides the processes used for development of the data quality objectives (DQO) for data collection and characterization activities for the groundwater plumes investigations. Tables 1-1 through 1-4 presented in the QAPP contain the DQO for each CoPC plume."

NMED Comment:
NMED does not review Quality Assurance Project Plans (QAPP). In future submittals, relevant information contained in the QAPP (e.g., methods and procedures, analytical methods) must be included in the appropriate sections of Work Plans and Reports.

4. Permittee Statement – Section 3.4.9 Investigation – Derived Waste Disposal, line 38-39, 1-2, and 3-6, page 3-9 and 3-10. "Field personnel will utilize portable water tanks to collect, manage, and characterize groundwater during drilling. The collected water will be disposed of in the evaporation pond, unless characterization indicates that an alternate disposal method is appropriate. Small volumes of decontamination fluids are anticipated. Decontamination fluids will be contained within the temporally decontamination pad areas during active sampling and decontamination activities at a site. Accumulated wash and rinse water will be left within the decontamination pad and allowed to evaporate."

NMED Comment:
If investigation derived waste (IDW) is determined to be a RCRA hazardous waste, then it would be subject to RCRA land disposal restrictions (LDRs). Revise the Plan to state that the IDW will be characterized prior to disposal and describe the steps that will be taken in the event the IDW is determined to be hazardous waste. In addition, decontamination liquids may be hazardous if contaminated equipment was cleaned during the field activities. Describe the steps taken that would to ensure that the waste is handled appropriately.

5. Permittee Statement – Section 3.4.10 Contaminant Mass Calculation Methodology, lines 17-22, page 3-10. "Remediation design will require the determination of the mass of contaminants present in the aquifers (alluvial and hard-rock water-bearing units) affected by groundwater contaminant plume. Existing and yet-to-be-collected investigative and monitoring data will be used to calculate the contaminant masses. The calculated volumes(s) of groundwater along with contaminant concentrations, and physical aquifer parameters, will be used to arrive at these figures."

NMED Comment:
Due to the uncertainties regarding the nature and extent of contaminated groundwater at FWDA, NMED does not recommended calculating contaminant mass. A more appropriate time to calculate mass would be when groundwater contamination is fully characterized and remedies are being evaluated. Remove this text from the Plan.

6. Permittee Statement – Section 4.2.1 Building 5 (SWMU 5) Soil Contamination Related to VOC Groundwater Plume, Line 8-9, page 4-2. "These concentrations are well below the screening level for toluene of 624 mg/kg."

NMED Comment:
Provide a reference to the screening level being 624 mg/kg for toluene. If the screening level is from the USACE developed site-specific dilution attenuation factor (DAF) of 529 then the reference must to be removed. The calculated values cannot be utilized for comparison until approved by NMED. Compare all analytical data to the 2014 NMED Risk Assessment Guidance. This comment applies to all sections of the Plan where analytical results were compared to the site-specific soil screening levels. See also Comment 2.

7. Permittee Statement – Section 4.2.1 Building 5 (SWMU 5) Groundwater Contamination Related to VOC Groundwater Plume, lines 14-15, page 4-2. "A groundwater sample was collected in 2010. 1,2-DCA was detected at a concentration of 0.980 ug/l, which is well below the groundwater screening level for 1,2-DCA of 5 ug/L."

NMED Comment:
Leaded gasoline additives 1,2-dichloroethane (1,2-DCA or EDC) and 1,2-Dibromoethane [ethylene dibromide (EDB)] are typically present at locations where leaded-gasoline was stored or dispensed. 1,2-DCA was detected in six samples from the alluvial monitoring wells. However, EPA Method 8260 cannot detect low concentrations of EDB; therefore, an adequate determination of the presence of EDB or EDB concentrations that are greater than the Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 0.05 ug/L cannot be made. During future groundwater sampling events the Permittee must collect groundwater samples for analysis of EDB using EPA Method 8011.

8. Permittee Statement – Section 4.2.2 Building 6 (SWMU 45), lines 32-43 and 1-2, pages 4-3 and 4-4. "Laboratory analysis of the water sample from Monitoring Well MW-20, located south and west of the UST removal area, indicated a detection of benzene at a

concentration of 110 ug/L for benzene in groundwater. All three wells were resampled in December 1994. Laboratory analysis indicated that the benzene concentration in the sample from Well MW-20 had decreased to 59 ug/L.

A soil gas survey was conducted in the UST area in March 1995 to better define the location of the benzene contamination around MW-20; however, benzene was not found in the soils or water at a depth of 35 to 50 feet bgs in that area. The three wells were resampled during the soil gas survey. Laboratory analysis indicated that the benzene concentration in the sample from MW-20 had fallen below the groundwater screening level to 4.4 ug/L (USACE, 1995).

During investigations from 1998 through 2010, analysis of groundwater samples from Monitoring Wells MW-18D, MW-22D, MW22S, and TMW33 had concentrations of 1,2-DCA ranging from 6.3 ug/L to 30.7 ug/L. These concentrations exceed the groundwater screening level of 5.0 ug/L (USACE, 2013)."

NMED Comment:
The decline in benzene contamination was not adequately explained. Concentrations at MW-20 appeared to be decreasing rather rapidly given the hydraulic conductivity of the soil in this area. From November 1994 to December 1994 the benzene decreased by approximately half (110 ug/L to 59 ug/L). Additionally, from December 1994 to March 1995 it decreased in concentration to 59 ug/l to 4.4 ug/L. Benzene has a relatively high mobility; therefore, further investigation regarding the extent of the contamination is warranted. Propose to install two monitoring wells downgradient to the west of MW-20 to assess the fate of the benzene plume. In addition, leaded gasoline additives 1,2-DCA and EDB are normally present at underground storage tank sites where leaded-gasoline was managed. EPA Method 8260 cannot detect the low range of EDB. (see Comment 7) In future groundwater sampling events analyze groundwater samples collected from each monitoring well in the administrative area for VOCs using EPA Method 8260 and for EDB using EPA Method 8011.

9. Permittee Statement – Section 4.2.3 Building 11 (SWMU 6), lines 12-15, page 4-5.
"In the 2009-2010 investigation the USACE collected one groundwater sample from TMW34. The only VOC detected was acetone. While the acetone concentration was not provided, acetone is a common laboratory contaminant with an EPA Region 6 screening level of 12,000 ug/L. Thus, it is unlikely that the acetone detection represents an exceedance of the site-specific SSL."

NMED Comment:
While it is easy to assume that acetone is a laboratory contaminant, confirmation sampling must always be conducted to quantitatively confirm the presence or absence of the contaminant. If TWM34 has only been sampled in 2009-2010, then additional sampling must be proposed in order to verify the assumption that acetone can be attributed to laboratory contamination. Additionally, the concentration of acetone was not provided. Revise the Plan to propose to sample TMW34 for volatile organic compounds using EPA Method 8260, EDB using EPA Method 8011, semi-volatile organic compounds by EPA Method 8270 and metals by EPA Method 6020.

10. Permittee Statement – Section 4.4 Scope of Activities and Sampling Methods, lines 36-37, page 4-6. "Direct push of 50 soil gas points using a 50-foot grid into the alluvium (Figure 4-10)....and collection and field analysis of gas for VOCs. The soil gas survey will define the horizontal [extent] of the VOC plume and assist in determining optimal locations for additional groundwater monitoring wells."

NMED Comment:
Soil gas prefers to the path of least resistance (i.e., the preferential flow pathway) and the 50-foot sampling grid proposed to characterize all four solid waste management units (SWMUs) may be insufficient to characterize the contamination at each SWMU. If the subsurface lithology follows the groundwater elevation contours shown in Figure 4-10, then the soil gas points must be placed at locations corresponding to lower groundwater elevations. For example, Figure 4-10 shows the majority (32) of the soil gas points beyond groundwater contour 6644 and the minority (19) of soil gas samples located in the vicinity of the 1,2-DCA contour (between 6642 and 6643) in the vicinity of SWMUs 5, 45 and 6. Revise the text to state that each SWMU will be characterized individually utilizing a 30 foot sampling grid and collecting 50 soil gas samples from the vicinities of each SWMU.

11. Permittee Statement- Section 4.4 Scope of Activities and Sampling Methods, lines 5-6, page 4-7. "Collection, lithologic description, and analysis of two subsurface soil samples for fraction organic carbon, grain-size distribution, bulk density, and moisture content."

NMED Comment:
Collecting two subsurface soil samples to characterize this large area is insufficient. In addition, the monitoring wells or soil borings must be placed down-gradient from the 1,2-DCA plume. (see also Comment 8)

12 NMED Comment: Section 4.4.2 Groundwater Monitoring Well Installation, page 4-7. Monitoring wells (MW) 29 and 30 must be installed down-gradient from the 1,2-DCA plume. Propose to install MW29 and 30 to the west in the general area of buildings B086, B007 and B010 (see Comment 8). Propose to sample for volatile organic compounds using EPA Method 8260, EDB using EPA Method 8011, semi-volatile organic compounds by EPA Method 8270 and metals by EPA Method 6020.

13. NMED Comment: Section 5.2.6 Building 515 and the Associated Acid Holding Pond (SWMU 2, Parcel 21), Soil Contamination Related to Nitrate Groundwater Plume.
Although, this section is addresses nitrate contamination, it must be noted that hexavalent chromium was detected in some of the soil samples collected at the Acid Holding Pond. Hexavalent chromium must be evaluated in groundwater. Propose to install monitoring wells to evaluate groundwater conditions in this area.

14. Permittee Statement – Section 5.3.2 Affected Water-Bearing Zones, Alluvial Water-Bearing Zone, lines 37-38 and 1-2, pages 5-9 and 5-10. "Based on cross-sections presented in Section 2.0 of this Work Plan, the saturated thickness of the alluvium in the Nitrate Plume is approximately 30 feet with no continuous confining layer present. Thus the alluvium is

considered one water-bearing zone, and no delineation of the Nitrate Plume's vertical extent is needed."

NMED Comment:
The cross-sections presented in Section 2.0 are mostly of interpolated data. For example cross-section B-B' has three monitoring wells over a lateral distance of 6,000 feet. In addition, the total depth of the monitoring wells is 75 feet below ground surface (ft-bgs) and the cross-section depth/stratigraphy is extrapolated to a depth of 280 feet-bgs (see Comment 1). In addition, nitrate has been detected in both the alluvium and the bedrock water bearing zones. Therefore, vertical delineation of the nitrate plume is required. Revise the text to propose vertical delineation of the nitrate plume or state that vertical delineation of the nitrate plume will be conducted in future investigations.

15. Permittee Statement – Section 5.3.2 Affected Water-Bearing Zones, First Bedrock Water-Bearing Zone, lines 4-8, page 5-10. "TMW02 is the only bedrock well completed in the first bedrock water-bearing zone as described in Section 2.0. This zone is believed to be an isolated water-bearing unit that is not continuous. Previous drilling logs indicate the thickness of this unit ranges from 0 (not present) to 15 feet. It was encountered only at this one location. This first bedrock water-bearing zone is not believed to communicate with other bedrock water-bearing zones."

NMED Comment:
Provide additional information (e.g., soil borings, lithologic logs, cross-sections) that substantiates the assertion that the first water-bearing zone is not continuous or provide a reference to a document that supports the statement. In Section 2.0 the Permittee states that "distinct groundwater flow directions and gradients for the first bedrock water-bearing zone have not been established because of lack of data". Propose to further investigate groundwater conditions beneath the Facility.

16. Permittee Statement - Section 5.3.2 Affected Water-Bearing Zones, Second Bedrock Water-Bearing Zone, lines 22-24, page 5-10. "Based on cross-sections presented in Section 2.0 of this Work Plan, total vertical extent is limited by the height and nature of the water-bearing zone. The thickness of this sandstone unit is approximately 20 to 30 feet."

NMED Comment:
The cross-sections presented in Section 2.0 are mostly interpolated data. For example, cross-section B-B' has three monitoring wells over a distance of 6000 feet. In addition, the total depth of the monitoring wells is 75 feet below ground surface (ft-bgs) and the cross-section is extrapolating to a depth of 280 ft-bgs. See Comment 1. In addition, nitrate has been detected in alluvium and within the bedrock water bearing zones and the Plan states on page 5-11 "data gaps for the bedrock nitrate plume: determining if any interaction exists between the first and second bedrock water-bearing zones." Therefore, vertical delineation of the nitrate plume is required. Remove this statement and revise the text to propose to investigate the vertical extent of the nitrate plume.

17. NMED Comment – Section 5.4.1 Groundwater Monitoring Well Installation, page 5-12. Figure 2-2 indicates that TMW51 (bedrock) would be up-gradient or cross-gradient from the TNT leaching Beds and should be moved west of the nitrate plume. Revise the text to propose to move the location of TMW51 to the west of the nitrate plume (north of buildings 522 and 501-F). In addition, propose to install TMW52 (first bedrock zone), TMW58 (second bedrock zone) and TMW53 (alluvium well) as nested wells and position them to the west and down-gradient of the nitrate and perchlorate plumes. These wells must be analyzed for nitrate, perchlorate and explosives. See Comment 20.

18. Permittee Statement – Section 5.4.4 Sanitary Sewer Soil Sampling, lines 6-10, page 5-13. "Up to 20 soil borings will be advanced adjacent to manholes, sanitary sewer joints, and intersections at the locations shown in Figure 5-11 in accordance with Section 3.4.1 of this Work plan. Because the groundwater flow direction is to the west within the Administration Area, 20 potential locations up-gradient of TMW46 (well location with highest nitrate concentration within the Administration Area) have been selected."

NMED Comment:
The purpose of these soil borings is not clear. Installing 20 soil borings up-gradient from the highest detected nitrate does not provide insight regarding the horizontal extent of the contamination with respect to the highest detection of nitrate in groundwater. If the purpose of the soil borings is to identify the sanitary sewer lines as a potential source, then a separate investigation work plan must be submitted to address that issue. Revise the text to state that a separate investigation work plan will be submitted to evaluate the sanitary sewer lines. Additionally, the reference to Figure 5-11 is incorrect, revise the text to refer to Figure 5-10.

19. Permittee Statement – Section 6.3.2 Affected Water-Bearing Zones, Alluvial Water-Bearing Zone, lines 3-6, page 6-5. "Based on cross-sections presented in Section 2.0 of this Work Plan, the saturated thickness of the alluvium in the Perchlorate Plume ranges from 0 to 20 feet with no continuous confining layer present. Thus, the alluvium is considered on water-bearing zone, and no delineation of the Perchlorate Plume's vertical extent in needed."

NMED Comment:
TMW-30 (projected 30 feet to the east) in cross-section E-E' appears to demonstrate that the alluvial potentiometric surface and the first sandstone water-bearing zone are hydraulically connected. Therefore, vertical delineation of the perchlorate plume is warranted. However, information from these cross-sections must only be used as a general guide since the data gaps are significant (see Comment 1). In addition, perchlorate has been detected in groundwater samples obtained from both the alluvium and the bedrock water bearing zones. Revise the text to either propose to investigate the vertical extent of perchlorate contamination or state that vertical delineation of the perchlorate plume will be proposed in a future investigation(s).

20. NMED Comment – Section 6.4.1 Groundwater Monitoring Well Installation, page 6-6 and 6-7. Figure 2-2 indicates that TMW55 is up-gradient or cross-gradient from Building 528. TMW55 must be moved west or down-gradient from the perchlorate plume source area. It is understood that the proposed alluvial wells TMW54, 56, and 57 and bedrock wells TMW 55

and 58 are being proposed to specifically characterize the perchlorate plume; however, both the nitrate and perchlorate plumes appear to be traveling in a westerly direction. Therefore, the Permittee must install TMW52 (first bedrock zone), TMW58 (second bedrock zone) and TMW59 (alluvium well) as nested wells to attempt to capture all water-bearing zones. Revise the text to propose to move TMW55 to the west (between buildings 515 and 530). In addition, propose to install (TMW 52, 53 and 58 as a nested well and position them to the west and down-gradient from the nitrate and perchlorate plume sources.

21. Permittee Statement – Section 7.2.1 TNT Leaching Beds and Building 503 (SWMU 1, Parcel 21), Remediation Activities, lines 16-18, page 7-2. "Building 503 and related structures were demolished in 1998. Documentation of this demolition project indicates that the underground utilities were not removed as part of the building demolition process."

NMED Comment:
Provide more detail to address whether the underground utilities are a potential source of contamination, and whether the underground utilities been investigated. If investigations have not been conducted then a separate investigation work plan must be submitted to evaluate the underground utilities left in place at Building 503 as potential conduits for contaminant migration.

22. Permittee Statement – Section 7.2.3 Building 514 (AOC 68, Parcel 21), Remediation Activities, line 7, page 7-5. "Utilities to Parcel 21 were terminated and buildings were demolished in 2010, including buildings 514 and 522."

NMED Comment:
Clarify the statement of "utilities to Parcel 21 were terminated." Provide information regarding the removal of the utilities and whether the utilities are a potential source of contamination. If investigations have not been conducted then a separate investigation work plan must be submitted to evaluate the underground utilities left in place at Buildings 514 and 522.

23. Permittee Statement – Section 7.3.2 Affected Water-Bearing Zones, lines 33-36, page 7-5. "Based on cross-sections presented in Section 2.0 of this Work Plan, the saturated thickness of the alluvium in the Explosives Plume ranges from 20 to 30 feet with no continuous confining layer present. Thus, alluvium is considered one water-bearing zone and no delineation of the Explosive Plume's vertical extent is needed."

NMED Comment:
Information from these cross-sections must only be utilized as a general guide since the data gaps are significant. See Comment 1. RDX was detected in groundwater samples collected from well TMW02 in 1996, which is screened in the first sandstone water-bearing zone. Revise the text to state that vertical delineation of the RDX plume must evaluated and propose to sample the proposed monitoring wells for the nitrate, perchlorate plumes and explosives (see Comments 17 and 20).

24. NMED Comment: Section 7.4.1 Groundwater Monitoring Well Installation, pages 7-6 and 7-7. Propose to move TMW59 to the west (close to the Parcel 6 boundary) as the RDX plume has already been detected in monitoring wells TMW23. Proposed well TMW 61 is in a likely location to detect further northward migration of RDX contamination. In addition, groundwater appears to flow from the northeast (up-gradient from the TNT leaching beds).

The Permittee must submit a revised Plan to address all comments contained in this Disapproval. In addition, the Permittee must include a response letter that details where each comment was addressed, cross-referencing NMED's numbered comments. The Permittee must also submit an electronic redline-strikeout version of the revised Plan. The revised Plan must be submitted on or before **March 31, 2016**.

If you have any questions regarding this letter, please contact Dave Cobrain at (505) 476-6055.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: Kristen VanHorn, NMED HWB
Neelam Dhawan, NMED HWB
Dave Cobrain, NMED HWB
Christy Esler, USACE
Laurie King, U.S EPA Region 6
Chuck Hendrickson, U.S. EPA Region 6
Jarvis Williams, Navajo Nation
Val Panteah,Governor, Pueblo of Zuni
Clayton Seoutewa, Southwest Region BIA
Rose Duwyenie, Navajo BIA
Katherine Nunan, BIA
Barbara Davis, BIA

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