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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 29, 2018

Mark Patterson
BRAC Environmental Coordinator
Fort Wingate Depot Activity
13497 Elton Road
North Lima, OH 44452

Steve Smith
USACE
CESWF-PER-DD
819 Taylor Street, Room 3B06
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RE: DISAPPROVAL
FINAL RCRA FACILITY INVESTIGATION REPORT
PARCEL 7 REVISION 1
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO
EPA ID# NM6213820974
HWB-FWDA-17-003

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) is in receipt of the Fort Wingate Depot Activity (Permittee) *Final RCRA Facility Investigation Report Parcel 7 Revision 1* (Report), dated June 27, 2018. NMED has reviewed the Report and hereby issues this Disapproval. The Permittee must address the following comments.

GENARAL COMMENTS

1. Response to NMED's Comments (RTC) Letter

NMED Comment: Not all revised sections, tables, and/or figures are referenced in the RTC letter. The RTC letter must identify all revised parts of the Report required by the NMED comments. Ensure that the RTC letter is accurate and complete for all future submittals.

2. Redline Strikeout (RLSO) Version of the Report

NMED Comment: The Report was revised extensively; however, all revisions were not identified in the RLSO version. For example, although many new sections, tables and figures were added to the revised Report, these changes were not identified in the RLSO version. Similarly, new acronyms and abbreviations were added to the *List of Acronyms and Abbreviations*; however, most of the new acronyms and abbreviations were not identified in the RLSO version. The RLSO version must identify all revisions made to the previous version of the Report. Failure to provide in accurate RLSO version slows review, creates the potential for changes to be overlooked, and the inability to identify changes to a document can be misleading.

3. Investigation in SWMU 25

NMED Comment: Comment 5 in the NMED's *Approval with Modifications for RCRA Final Facility Investigation Work Plan and Historical Information Summary Document Parcel 7*, dated January 31, 2014, directs the Permittee to propose to conduct an investigation that is more inclusive of the total scarred earth as seen in the [SWMU 25] aerial images. The dark stained area is clearly visible within Feature 5 according to Figure 4-2, *SWMU 25 – Trash Burning Ground Property Disposal Office – Previous Sample Location.* The comment instructs the Permittee to investigate the area; however, no soil borings were advanced and no investigative trenches were installed within the dark stained area. Only one surface soil sample (0725F5SS003) was collected within the dark stained area. The Permittee did not fully investigate the dark stained area despite the NMED's direction. Similarly, SWMU 9 was investigated and an exposure concentration for the stained area was improperly calculated (See Comment 10 in the NMED's *Disapproval for Final RCRA Facility Investigation Report Parcel 7*, dated August 7, 2017). The nature and extent of contamination has not been defined correctly at SWMUs 9 or 25; therefore, sample distribution is not representative of actual contamination at the SWMUs. While further investigation and remediation activity was proposed for the stained area in SWMU 9 in the Report, no further investigation was proposed for SWMU 25. The Permittee must investigate the dark stained area in SWMU 25 and reevaluate the risk. Submit a Phase 2 RCRA Facility Investigation Work Plan (Work Plan) to propose further investigation in the dark stained area found within SWMU 25 no later than **September 5, 2019**.

4. Screening Levels

NMED Comment: The risk assessment was generally revised in accordance with the NMED's *Risk Assessment Guidance for Site Investigations and Remediation* (Guidance) dated March 2017. Comment 4 in the NMED's *Disapproval for Final RCRA Facility Investigation Report Parcel 7*, dated August 7, 2017 indicated that the most current guidance (2017) should be used for the risk assessment unless a risk assessment was already underway; in this case, older guidance was allowed. However, the comment specifically states, "[a]s such, the risk assessments should have been conducted following the 2017 guidance." The risk assessments were updated to follow the methodology in the 2017

guidance, but the 2017 residential soil screening levels (SSLs) were not incorporated into the updated assessment of risk and hazard based on direct contact exposures. Section 2.6.1, *Regulatory History,* states that NMED did not require a response to Comment 4; thus, the current risk SSLs were not used for evaluating direct contact pathways. The 2017 SSLs should have been incorporated into an updated assessment of risk and hazard via direct contact pathways. Use of the methodology in the 2017 Guidance requires use of the 2017 Guidance SSLs. The Permittee cannot use more than one assessment guidance document. Specific constituents where use of the 2017 SSLs would have resulted in lower estimates of risk include arsenic (2017 SSL is 7.07 mg/kg compared to 2012 SSL of 3.9 mg/kg) and polycyclic aromatic hydrocarbons (PAHs) (2017 SSL for benzo(a)pyrene is 1.12 mg/kg compared to 2012 SSL of 0.148 mg/kg). Since refined assessments resulted in acceptable risk levels, the use of the 2017 SSLs would not have changed the overall results of the assessments. However, use of the current SSLs would have resulted in less costly assessments since the refinements and justifications needed to address uncertainties would likely have been less extensive. Revise the Report accordingly.

5. Soil-to-Groundwater Screening Analyses

NMED Comment: For the soil-to-groundwater screening analyses, risks were calculated using constituent-specific concentrations in the subsurface and the generic soil-to-groundwater screening levels (SLs) for a dilution attenuation factor (DAF) of 20 taken from the 2017 Guidance. The estimated risks are presented in the discussions and tables for all sites evaluated in Parcel 7. The soil-to-groundwater SLs address the potential leaching of contaminants from the vadose zone to groundwater and incorporate chemical and physical properties of the constituents. The soil-to-groundwater SLs are not truly risk-based numbers; therefore, estimations of risk for soil-to-groundwater should not be conducted and should not be included in cumulative risk/hazard estimates; comparison to target risk levels is not applicable to the soil-to-groundwater pathway. Rather than estimating risk, soil contaminant concentrations must be compared directly to the soil-to-groundwater SLs to determine if the subsurface soil contamination has the potential to act as a source of contamination for groundwater. If the site concentration is greater than the appropriate soil-to-groundwater SL (e.g., a ratio greater than one), additional investigation is necessary to evaluate potential leaching and migration to groundwater in excess of NMED groundwater protection criteria. Refinements of the soil-to-groundwater pathway do not include evaluation on a target organ-specific basis; again, the soil-to-groundwater SLs are not evaluated as risk-based numbers; and comparison of risk by target organ is inappropriate. Section 4.3 of the 2017 Guidance allows the use of the least conservative soil-to-groundwater SL for the initial soil-to-groundwater SL evaluation (this may be based on a water quality parameter, a contaminant limit, or drinking water standard). Revise all text and associated tables in the Report, removing all estimates of risk/hazard for the soil-to-groundwater pathway. In addition, revise each site-specific discussion of the soil-to-groundwater screening in terms of point comparisons and the identification of constituents that exceed the corresponding soil-to-groundwater SLs. Where soil-to-groundwater SLs are exceeded, additional evaluation following Section 4.3 of the 2017 Guidance is required.

6. 95 Percent Upper Confidence Level (95% UCL) of the Mean Calculation

NMED Comment: As part of the refinement process for exposure point concentrations (EPC) in the risk assessment, a 95 percent upper confidence level (95% UCL) of the mean was calculated. In the event there were three or fewer detects, the median concentration was applied as the EPC. With three or fewer results, calculation of a median is not an acceptable approach. The Guidance clearly states that if sufficient data are not available to calculate a 95% UCL, the maximum detected concentration should be retained as the EPC. A review of EPA risk assessment guidance and recommendations was conducted, and no documentation could be found to justify the use of the median. It is noted that this appears to have been applied when calculating risks for the soil-to-groundwater pathway only which, as indicated in Comment 5, is an incorrect methodology for this pathway. Revise the Report to remove the use of median concentrations for EPCs.

7. Field Method Description

NMED Comment: A required description of sampling methods utilized in the field was not provided in the Report. References to work plans or standard operating procedures are not sufficient. Provide detailed descriptions of all activities actually performed in the field in the revised Report.

8. Electronic Database

NMED Comment: The Permittee failed to include an electronic database that includes all historical data for Parcel 7 in the Report. For all documents that include analytical data, the Permittee must include a searchable electronic file with all historical data included in a format acceptable to the NMED. Provide the searchable electronic data in the revised Report.

9. ProUCL Output Data Files

NMED Comment: The Permittee provided hard copies of many ProUCL output data files. Hard copies of these files are unneeded and cumbersome. ProUCL output files should be submitted in electronic format only. Remove all hard copy ProUCL output files from the revised Report and include them in electronic version only.

10. Analytical Laboratory Reports

NMED Comment: The Report includes Level IV reports from the analytical laboratories. This has resulted in over 42,000 pages of laboratory reports for this Report. These reports are rarely needed and cumbersome. NMED requests that only Level II analytical laboratory reports be included with all submittals. Revise the Report by removing Level IV analytical reports and including the Level II analytical reports. In addition, for large appendices such as the 34,210-page Appendix F where multiple analytical and quality assurance/quality control reports are included, the Permittee must include descriptive bookmarks indicating where each new report begins.

11. Sample to Analytical Laboratory Report Link

NMED Comment: The Permittee provided large quantities of data with no cross-reference between a specific sample and a specific analytical laboratory report. For this document alone, the Permittee provided over 42,000 pages of analytical laboratory reports with no reference to where a particular sample can be located. For every document that includes analytical data, provide a cross-reference for each specific sample to a specific lab report filename (if multiple files are provided) or to a page number in the appendix where the specific lab report can be found (if multiple lab reports are combined into one large file). In this Report, the lab reports are combined into several large files; therefore, the Permittee must provide page numbers for the beginning of the laboratory report that contains the sample. This information can be provided in a new table or in the analytical data electronic database.

12. Inaccuracies/Discrepancies

NMED Comment: The Report contains multiple inaccuracies and discrepancies. A partial list is provided below:

a. In the *Executive Summary; ES.2 Scope of Investigation,* lines 24-26, page ES-1, the Permittee states, "[a] summary of field investigations is included in Table ES-1 and discussed in the individual sections for the parcel 7 SWMUs and AOCs within this RFI Report." Table ES-1 is not included in the Report. Include Table ES-1 in the revised Report.

b. In Section 3.6.8, *Uncertainty Discussion,* lines 30-31, page 3-23, the Permittee states, "[t]he remaining 29 analytes are comprised of two Aroclors, three explosives, 12 SVOCs and 10 VOCs having LOQs and LODs greater than the groundwater protection SSL." This totals 27 analytes. Confirm the number of samples and correct the statement in the revised Report as necessary.

c. In Section 4.4.2, *Investigation Trenching,* lines 5-6, page 4-4, the Permittee states, "[t]hree trenches each approximately 50 feet in length were excavated using a rubber tire backhoe equipped with a 12-inch wide bucket." Figure 4-3, *SWMU 25 – Features 1 and 2 – Soil Sampling and Trenching Locations*, depicts the locations of the trenches. Each trench appears to be approximately 300 feet in length according to the scale provided in Figure 4-3. Resolve the discrepancy in the revised Report.

d. Section 4.6.6.2.3, *Refinement 3 – Lines-of-Evidence Discussion (Quantitative Revision)*, line 10, page 4-16 starts with "SWMU 9 SS07-SS10 Area – Soil to Groundwater Pathway." The discussion in Section 4.6.6.2.3 is pertinent to SWMU 25. SWMU 9 is the POL Waste Discharge Area and is not related to SWMU 25. Correct the statement in the revised Report.

e. In Section 4.7.9, *Uncertainty Discussion,* lines 28-31, page 4-54, the Permittee states, "NMED does not provide LOAEL-based TRVs and/or Effect Concentrations for multiple VOCs and SVOCs that were detected at SWMU 9 so the potential hazard from these analytes was not quantified." The discussion in Section 4.7.9 is related to SWMU 25. The statement references SWMU 9. Revise the statement to reference SWMU 25 and verify that the uncertainty as copied from the SWMU 9 evaluation applies to SWMU 25 in the revised Report.

f. Table 4-2A, *SWMU 25 – Trash Burning Ground Property Disposal Office Sample Result Detections (August 2014) – Direct Contact Screening,* page 4-T93 and Table 4-2B, *Trash Burning Ground Property Disposal Office Sample Detections (August 2014) – Soil to Groundwater and Ecological Screening,* page 4-T229, appear to contain typographical errors. Sample ID 0725F5SS003-0.5-1.0DSOA must be corrected by deleting "A"; otherwise, provide an explanation for differentiating the sample ID from others in the revised Report.

g. Table 5-4A, *AOC 43 – Railroad Classification Yard, Cumulative Hazard/Risk Calculations for Detected Analytes, Residential Receptor,* page 1 of 3, indicates that the maximum detected arsenic concentration did not exceed the background value. However, the maximum detected arsenic concentration is shown as 6.60 mg/kg while the background value is shown as 5.60 mg/kg in the table. The soil-to-groundwater SL, rather than background value, must be used to assess the soil-to-groundwater pathway for arsenic. Refer to Comment 21 below.

h. In Figure 4-3, the designation of soil samples collected from SWMU 25 – Feature 1 begins with 0725F1F1SS while the designation of soil samples collected from SWMU 25 – Feature 2 begins with 0725F1F2SS. However, in Table 4-2A and Table 4-2B, the designations of soil samples collected from Feature 1 and Feature 2 begin with 0725F1SS and 0725F2SS, respectively. The designation of the samples is not consistent. Resolve the discrepancies in the revised Report.

i. Figure 4-4, *SWMU 25 – Feature 5 – Soil Sampling Locations*, shows each soil sampling location for SWMU 25 – Feature 5 while Figure 4-5, *SWMU 25 – Additional Sampling Areas – Soil Sampling Locations*, shows each sampling location for SWMU 25 near the Property Disposal Office Area. The designations for sample locations 0725F5SB001, 0725F5SB002, 0725F5SB003, 0725F5SB004, 0725F5SB005, and 0725F5SB006 are identical in Figure 4-4 and Figure 4-5. The sample identification (ID) numbers must be different since these samples are collected from different areas. Revise the Report, accordingly.

j. In Figure 4-4, the designations of soil samples collected from SWMU 25 – Feature 5 begin with 0725F5SB. However, in Table 4-2A and Table 4-2B, the designations of soil samples begin with 0725F5SS. If these samples are the same, the sample ID must be the same. Resolve the discrepancy in the revised Report.

k. In Figure 4-5, the designations of soil samples collected from the Property Disposal Office Area begin with 0725F5SB. However, in Table 4-2A and Table 4-2B, the soil sample IDs begin with 0725F5SS. If these samples are the same, the sample IDs must be the same. Resolve the discrepancy in the revised Report.

l. In Appendix A, *NMED Correspondence, Response to August 22, 2017 Disapproval Letter*, the letter is titled as "Response to August 22, 2017 Disapproval Letter, Final RCRA Facility Investigation Report Parcel 7." The letter text states, "[t]his letter is in response to your comments presented in the Disapproval Letter dated August 7, 2017..." NMED's Disapproval letter is dated August 7, 2017. It appears that the title of the letter contains a typographical error. Correct the typographical error in the revised Report.

The Permittee has presented a document with many inaccuracies and discrepancies. It appears that a quality assurance review was not conducted on the document. Identifying, researching, confirming, and documenting inaccuracies extends review times. Extended review times can result in delays in the review of other documents, as well as delays in the overall corrective action progress at the facility. Ensure that a quality assurance review is conducted on future submittals as this is a recurring issue.

SPECIFIC COMMENTS

13. Response to NMED's August 7, 2017 Disapproval Comment 1

Permittee Statement: "In subsequent discussions between NMED and the Army, it was agreed that it was not necessary to sample for white phosphorus. The correspondence between NMED and the Army is included in Appendix P of the report. Appendix P also contains documentation supporting this decision."

NMED Comment: In Appendix P, *Correspondence and Documentation Regarding White Phosphorus*, the September 5, 2017 email from Mr. Ben Wear of the NMED to Mr. Steve Smith of the U.S. Army Corps of Engineers (USACE) is provided. The email states, "[t]he justification letter from DJ looks sufficient. Please include this information in the text of the revised report, as well as in the response to comments. NMED prefers that reports include "Deviations" section that details any deviations from the approved work plan and includes justification for said deviations." The justification letter was included in Appendix P; however, the justification and deviation were not discussed in the Report. Revise the Report to include the information that justifies omission of white phosphorus analysis in the "Deviations" section of the Report.

14. Response to NMED's August 7, 2017 Disapproval Comment 8

Permittee Statement: "Railroad ties are not tinted with green suggesting [chromium, copper, and arsenic] CCA was not used to preserve the ties in the RCY."

NMED Comment: When the Permittee uses an acronym/abbreviation first time in the

statement, the acronym/abbreviation must be spelled out unless it is listed in the *List of Acronyms and Abbreviations* in the Report. "CCA" was listed in the *List of Acronyms and Abbreviations*; however, "RCY" was neither listed or spelled out. List the abbreviation "RCY" in the *List of Acronyms and Abbreviations* or spell out the acronym in the revised Report.

15. Section 2.6.7.2.2, Application of the FWDA Metals Background Studies, lines 36-40, page 2-14

Permittee Statement: "The 2010 Shaw background study provides an unbiased, adequate, and reasonable representation of background conditions at FWDA and can be utilized when evaluating both discrete and incremental sampling methodology (ISM) metals analyses for soil. Consequently, FWDA background study results can be applied to both discrete and ISM samples during the risk evaluation process."

NMED Comment: The statement regarding comparison of mixed datasets allows that because the background reference values are based on "unbiased, adequate, and reasonable representations of background conditions", comparison of incremental sample (IS) data to the 2010 discrete data in the 2010 Shaw study is acceptable. IS methodology is designed to reduce variances and small-scale variability. Therefore, IS data are more a reflection of the mean of a dataset rather than the upper tolerance limit (UTL). Comparison of IS data to a UCL would be more appropriate than comparison to a UTL. Intuitively, comparison of a "mean" to an UTL seems conservative and likely to result in decision errors that result in stricter regulation. However, as the data are statistically incomparable, comparisons should be limited to a qualitative discussion at best. While some one-tailed statistical tests might be applied, the level of uncertainty would be high. Thus, NMED does not agree that discrete and IS data may be quantitatively compared at this time and disagrees with the statement. The Permittee must collect IS background data for comparison to the proposed IS data. The comparison of the discrete background data to site IS data may be used as a qualitative line of evidence but may not be used to eliminate an inorganic constituent as a potential constituent of concern. The position of the NMED remains unchanged. If IS are to be used, background IS collection must be conducted to obtain results suitable for quantitative comparison to site IS data.

State and Federal regulatory authorities, as well as the developers of ProUCL and IS applications, are aware that at many sites, a large amount of discrete onsite and/or offsite background data are already available which cannot be directly compared with newly collected IS data. In order to provide a tool to compare the existing discrete background data with actual field onsite or background ISM data, a Monte Carlo Background Incremental Sample Simulator (BISS) module is being developed and evaluated for incorporation into ProUCL. It is noted that BISS will require a large existing discrete background data set. From this background database, it is understood that the BISS module will simulate incremental sampling methodology based on equivalent background incremental samples. The availability of a large discrete background data set collected from areas with geological conditions comparable to the decision units (DUs) of interest is a pre-requisite for successful

application of this module. For now, the BISS module has been blocked for public/general use as this module is awaiting adequate guidance and instructions for its intended use on discrete background data sets. As noted in Section 4.4.3.2 of the ITRC Guidance for IS, comparing or combining discrete data and IS data, conceptually, can only be done when specific conditions are met. Furthermore, the guidance allows that one must be very cautious in how information is compared or combined since it is likely that one or more of the conditions presented in the bulleted items below will be violated to some degree. Note that NMED's preliminary evaluation of the currently available information regarding each condition at the Facility is also provided.

The discrete background sample locations were based on ecozones with specific locations chosen in the field. The sample locations were random-biased but not statistically determined. Further, the background data set is comprised of samples collected across various ecozones at the Facility versus specific soil types. Based on the locations and discussion of the discrete background data as provided by the Permittee, there are only five data points available representing Parcel 7. Additional justification is needed that these five samples were statically located and are of sufficient number for comparison to IS data. The Permittee must demonstrate that the entire database is appropriate for use in Parcel 7.

The background data collected as part of the 2010 effort used field screening of samples with a No. 4 screen (4.76 mm). However, Method 8330B uses a No. 10 mesh screen (2 mm). The inclusion of larger particles in the discrete data is likely to result in differences. Further, the discrete data were not ground prior to analyses, but Method 8330B will include grinding of the aliquots before collecting a subsample for analysis. Grinding of the samples will likely result in greater concentrations of metals compared to the discrete data.

Given the differences in sample collection methods and processing of the data, there is a potential that the IS data will result in higher metals concentrations compared to the discrete background data.

The 2010 background data were based on ecozones rather than soil type. A case will need to be made that the ecozones reflect soil types and conditions. As noted above, there are differences in sample preparation, specifically grinding of samples, that could result in differences in concentrations and add a layer of uncertainty to the comparison of discrete to IS data. The proposed analytical methods must be similar/consistent.

This comment has been provided to the Permittee multiple times, yet the practice is continued. Failure to abide by NMED's comments constitutes non-compliance.

16. Section 2.6.7.2.5, Conduct Statistical Evaluation, lines 21-33, page 2-15

Permittee Statement: "Metals with maximum concentrations greater than background levels and the essential nutrient SSLs from discrete-depth samples may undergo additional evaluation. The additional evaluation may include a comparison of the maximum concentration in the sample set to the maximum concentration in the background data set,

comparison of the range of concentrations in the sample data set to the range of concentrations in the background data, comparison of the 95% UCL to the maximum concentration in the background data set, or may proceed to a more robust statistical evaluation as described in Section 2.8.3.2 of the NMED risk guidance using ProUCL statistical software (version 5.1). The more robust statistical evaluation, if performed, includes conducting a two-sample hypothesis test for data sets consisting of at least eight samples and at least five detections, conducting a point-by-point comparison to background levels for data sets that are smaller, and preparation of graphical displays to provide further rationale to determine if metals concentrations are consistent with background levels or elevated above background levels."

NMED Comment: If the maximum detected concentration exceeds the background reference value, the Permittee states that additional evaluation may include a comparison of the maximum concentration in the sample set to the maximum concentration in the background data set, a comparison of the range of concentrations in the sample data set to the range of concentrations in the background data, or a comparison of the UCL to the background range. If data fail the statistical analysis (or there are insufficient data), additional lines of evidence that are appropriate include site history and percentage of non-detects. With the exception of the special case for arsenic at the Facility, NMED does not allow screening of inorganics in either of these two manners. In accordance with the Guidance, if the maximum fails the initial step, then a statistical evaluation is required. As noted in Section 2.8.3.2 of the Guidance, a "simple comparison to a range of data or quartiles are not acceptable lines of evidence" to drop a constituent from the risk assessment. Comparisons of maximums/UCLs and ranges may be only provided in the Uncertainties discussion of the risk assessment. Remove the comparison of the maximum concentration in the sample set to the maximum concentration in the background data set, comparison of the range of concentrations in the sample data set to the range of concentrations in the background data, and the use of the UCL from the site attribution analysis as a means to drop a constituent from the risk assessment. Revise the risk assessments in the Report accordingly.

17. Section 2.6.7.2.6, Present Additional Lines of Evidence, lines 12-24, page 2-16

Permittee Statement: "Arsenic is commonly detected at levels greater than its background level and in some cases greater than the maximum concentration in the arsenic background data set. Therefore, the toxicological profile for arsenic was reviewed to determine if its uses might be associated with historical FWDA operations. Arsenic has been used in a wide range of applications, including wood preservatives, agricultural chemicals, as an alloying element in ammunition and solders, as anti-friction additive in bearings, semi-conductors for telecommunications, and medicinal uses (Agency for Toxic Substances and Disease Registry [ATSDR], 2007a). Its use in wood preservatives and ammunition means there is the potential for arsenic to be site-related. However, wood preserved with arsenicals was most commonly used in residential applications, and it would take a large volume of ammunition to lead to large-scale arsenic contamination. In cases where only a small number of arsenic results exceed the published background level and are consistent with the range of arsenic

concentrations in the background data set, arsenic will be identified as not site-related."

NMED Comment: Arsenic is ruled out as being site related based on site use as defined in the toxicological profile. However, arsenic is retained and evaluated in the risk assessments, which appears to contradict the statement. As arsenic is retained for risk evaluation, the statement must be removed. If applicable, the discussion may be included in the uncertainty analyses. However, it should be noted that arsenic is not a risk driver for SWMU 9 and AOC 43 (maximum detections are either less than background or less than the 2017 NMED SSL of 7.07 mg/kg). For SWMU 25, while the maximum detection drives risk, the UCL for arsenic is significantly below the NMED SSL of 7.07 mg/kg.

18. Section 2.6.7.3, Cumulative Risk Evaluation (Part 3), lines 3-6, page 2-18

Permittee Statement: "The 95% UCLs calculated for the direct contact pathway to evaluate residential receptors were used to evaluate the soil to groundwater pathway because these two exposure scenarios use the same exposure interval (0 to10 feet)."

NMED Comment: Lines of evidence (LOE) have not been provided to demonstrate the spatial distribution of contaminants indicating that there is no trend or pattern to areas exhibiting the highest levels of contamination. In addition, subsurface distribution has not been discussed to show vertical trends and depth of contamination relative to groundwater. Without the above lines of evidence to show that data are sporadic with no areas of localized significance, using the UCL results in the amount of contamination being diffused over a larger area, masking smaller areas of elevated contamination that could impact groundwater. The 2002 *Supplemental Soil Screening Guidance* allows for the use of a mean concentration for comparison to soil-to-groundwater SLs for surface soil only; however, when evaluating subsurface data, only data collected from within a single boring may be used to estimate the mean. The 2002 *Supplemental Soil Screening Guidance* further allows that as contamination in these deeper soils is unlikely to be characterized to the same extent as contamination in surface soils, the maximum measured concentration of each contaminant in these borings should be used as a conservative estimate of the mean contaminant concentration for purposes of the initial soil screening evaluation. Surface and subsurface data from across the SWMU may not be combined for a UCL to evaluate potential impacts to groundwater. As the data used to evaluate the soil-to-groundwater pathway includes subsurface soil data (sample interval was 0-10 feet), the initial screening must be based on the maximum detected concentration. In the event that the maximum detection results in an exceedance of the SSL, additional evaluations may be conducted in accordance with the 2017 Guidance. Revise the Report accordingly.

19. Section 3.4.2, Visual Delineation of Impacted Soil at POL [Petroleum, Oils and Lubricants] Area, lines 17-23, page 3-3

Permittee Statement: "The first pothole was excavated with a backhoe north of sample location 0709POLSS009; the backhoe was then moved eastward with the final test pit located south of sample location 0709POLSS010. A test pit was excavated near sample

location 0709POLSS008 to a depth of 5.25 feet. The test pit identified asphalt material to a depth of approximately 0.8 foot, staining and strong petroleum odor to a depth of approximately 3.5 feet, and slight petroleum odor to the total depth of the test pit (5.25 feet)."

NMED Comment: Provide a map that shows the locations of test pits in the revised Report. The Permittee should have collected soil samples from the test pits for analyses of TPH-DRO-extended and lead at a minimum. Conduct laboratory analyses on samples collected during future soil investigations at the site. The petroleum odor was identified from the soils at the deepest point of the excavation (5.25 feet); therefore, vertical extent of the contamination is not delineated. In Section 3.8, *SWMU 9 Conclusions and Recommendations,* the Permittee states, "[a] separate work plan will be prepared to discuss the proposed approach to further evaluate the extent of impacted soil in this area and subsequent removal actions." In the work plan, the Permittee must propose to evaluate both vertical and lateral extents of soil contamination associated with TPH-DRO-extended and lead. Furthermore, installation of monitoring well MW34 was proposed to assess the potential groundwater impact associated with the dark stained area southeast of SWMU 9 in the *Final Groundwater Supplemental RCRA Investigation Work Plan Revision 4,* dated March 23, 2018. Propose to investigate potential impacts to groundwater in the vicinity of the dark stained area in the upcoming Phase 2 Investigation work plan. Include the analytical suite specified in the August 7, 2017 *Disapproval* Comment 6 for the groundwater samples collected from monitoring well MW34.

20. Section 3.4.2, Visual Delineation of Impacted Soil at POL Area, lines 24-27, page 3-3

Permittee Statement: "To determine the lateral limit on the western margin, five boreholes were hand augured on September 4, 2014. The lateral limit of the affected area was flagged when no tar, odor, or staining was observed. After delineating the area with flags, the perimeter was recorded using the GPS unit."

NMED Comment: Provide a figure that shows the boring locations in the revised Report. Explain why the western margin of the affected area was investigated differently from the northern, southern, and eastern margins of the contaminated area. The Permittee should have collected soil samples for the analyses of TPH-DRO-extended and lead at a minimum. Refer to Comment 19. A visual or olfactory investigation is not an appropriate for determining the nature and extent of contamination. Section 3.8, *SWMU 9 Conclusions and Recommendations,* states that a separate work plan will be prepared to discuss the proposed approach to further evaluate the extent of impacted soil in this area. In the Work Plan, propose step-out samples at five to ten feet intervals from the locations where contamination was identified to define the lateral extents of contamination. Propose deeper samples at the locations where contamination was identified to determine the vertical extent of contamination. Submit the Work Plan that proposes to evaluate the lateral and vertical extents of soil contamination.

21. Section 3.6, Human Health Risk Evaluation, lines 30-34, page 3-4

Permittee Statement: "Screening levels are the NMED SSLs for the soil to groundwater pathway, published in March 2017, except for arsenic which is the site-specific background level of 5.6 mg/kg. When an NMED SSL is not published, the USEPA Soil RSL from November 2017 was used in the evaluation. When neither an NMED SSL nor USEPA RSL is published, a surrogate compound was selected and used in the evaluation."

NMED Comment: The soil-to-groundwater SL for arsenic is based on the background concentration. The 2017 NMED SL for arsenic is 5.83 mg/kg based on a DAF of 20. This SL rather than background must be used to assess the soil-to-groundwater pathway for arsenic. Revise the Report and update applicable tables, accordingly. This comment also applies to the *Human Health Risk Evaluation* in Sections 4.6 and 5.6.

22. Section 3.6.1 Data Used in the Evaluation & Identification of COPCs, lines 35-36, page 3-5

Permittee Statement: "August 2014 – Samples were collected from two areas associated with SWMU 9 – POL Discharge Area as follows: [within the footprint of the POL Discharge Area and an area of stained soils located approximately 100 feet southeast of the POL Discharge Area]."

NMED Comment: The area within the footprint of the POL Discharge Area was apparently unrelated to the disposal of waste oils. The majority of data points used for risk evaluation was collected from the unrelated area where contamination was not detected; therefore, the risk evaluation is not representative of the actual area where petroleum, oil, and lubricants were disposed. The risk must be reevaluated once the actual POL disposal area is fully characterized. The reporting direction is provided in the last paragraph of this letter.

23. Section 3.6.1, Data Used in the Evaluation & Identification of COPCs, lines 21-33, page 3-6

Permittee Statement: "Total chromium – Trivalent chromium was selected because hexavalent chromium is not known to be present at SWMU 9. The following lines of evidence support that hexavalent chromium is not expected to be present:

- o Hexavalent chromium is not stable in the environment in the presence of oxidizable organic matter and readily converts to trivalent chromium (ATSDR, 2012a).
- o Chromium is a component in stainless steel products, alloys, metal finishes, tanning products, and pigments, with hexavalent chromium used primarily in metal finishes and tanning products. The primary uses of chromium are in the metallurgical, refractory, and chemical industries, none of which occurred at FWDA (ATSDR, 2012a). It is possible that some metals products containing chromium were disposed at FWDA, but the lack of metal products in soil and the preference for hexavalent chromium to convert to trivalent chromium indicates the low likelihood that hexavalent chromium is present."

NMED Comment: The lines of evidence (LOE) are not sufficient to make the determination that all chromium detected in total chromium analyses is chromium III. Until the Permittee provides analytical laboratory speciation data indicating that all of the total chromium exists as chromium III versus chromium VI, the screening levels for total chromium must be used for exceedance evaluation and risk assessment. This applies to all sections of the report where total chromium is discussed. Revise the Report to use the appropriate screening levels for total chromium in all screening level comparison tables and risk assessments.

24. Section 3.6.6.2.4, Refinement 4 – Lines of Evidence Discussion, lines 36-40, page 3-16

Permittee Statement: "Given that lead is found at levels largely consistent with background conditions, has a preference to sorb to soil under the alkaline conditions found at SWMU 9, and that regional weather conditions limit the amount of precipitation that could contribute to leaching, the likelihood that lead concentrations in soil at the SWMU 9 Boundary Exposure Area are contributing to degraded water quality is low."

NMED Comment: The highest lead concentration was reported as 1,190 mg/kg, significantly higher than the background lead concentration of 12.4 mg/kg. The detected lead concentrations were not consistent with background conditions. Remove the inaccurate statement from the revised Report. In addition, the site's generic soil condition (alkaline condition) may not be representative of the soil conditions where petroleum, oils, lubricants, and solvents were disposed. The disposal practice may have altered the physical, chemical, and microbiological properties of soils; subsequently, the preference to sorb lead may have been altered. The sorption capacity of lead in the contaminated soils, rather than clean native soils, must be demonstrated if the line of evidence is pursued. The factors that affect the sorption capacity also appear to be more complex than soil pH alone. The Permittee must demonstrate that lead detected in soils at the actual POL site is not mobile and will not leach into groundwater or they must remove the LOE from the revised Report. If the Permittee elects to demonstrate the sorption capacity of lead in the contaminated soil, a detailed plan for the demonstration (e.g., bench-scale study) must be included in the Work Plan required by Comment 3.

25. Section 3.6.6.3, Vapor Intrusion Pathway Evaluation, lines 4-5 and 8-10, page 3-20

Permittee Statements: "The vapor intrusion pathway is considered potentially complete at SWMU 9 because volatile analytes were detected and are potentially toxic through inhalation."
and,
"Therefore, the qualitative discussion below presents the lines of evidence to support why the Army believes the vapor intrusion pathway does not require further evaluation at SWMU 9."

NMED Comment: VOCs were detected at SWMU 9. LOE were provided to address potential exposure via the vapor intrusion pathway. Most of the soils impacted by VOCs are proposed for removal according to Section 3.8, *SWMU 9 Conclusions and Recommendations*.

A re-evaluation of this pathway must be conducted using post-removal data. Modify the comment in the revised Report accordingly.

26. Section 3.6.8, Uncertainty Discussion, lines 1-3, page 3-26

Permittee Statement: "All of the analytes listed above do not have uses relevant to historical operations at SWMU 9. The Army believes it was appropriate to eliminate these analytes as COPCs and proposes no further action relating to compounds discussed in this section."

NMED Comment: The rational for elimination from the risk assessment is that all of the analytes listed do not have uses relevant to historical operations at the Facility. This is not accurate. For SWMU 9, waste operations included the dumping of waste oils and solvents. While it is acknowledged that some of the compounds may not be site related, many of the constituents listed are solvents or indicator compounds for total petroleum hydrocarbons. Since there is uncertainty regarding the presence of these constituents at levels above SLs but below levels of quantification, it is possible that they are present and could contribute to groundwater contamination. These compounds must be retained as COPCs and evaluated in the SL comparison. Revise the Report accordingly.

27. Section 4.1.1, Location, Description, and Operational History, lines 24-25, page 4-1

Permittee Statement: "Based on the available historical information, the approximate use of this area can be traced back to sometime between 1935 and 1948 and it appears inactive by 1973."

NMED Comment: Asbestos-containing materials (ACM) have been found at other sites where buildings were constructed during a similar time frame. An inspection for ACM must be conducted during the investigation in accordance with Permit Section VIII.A.1.e. If ACM is found, the soil must be analyzed for the presence of asbestos. Propose to submit a work plan to investigate the presence of ACM in SWMU 25, where applicable, in the revised Report.

28. Section 4.4.1, Soil Characterization, lines 26-29, page 4-3

Permittee Statement: "Two proposed sample locations within Feature 5, 0725F5SB017 and 0725F5SB019, were relocated at the request of NMED to locations where dark areas were observed on historical aerial photographs. Correspondence documenting this agreement with NMED is included in Appendix A."

NMED Comment: Appendix A does not include the NMED's specific request for relocating sample locations 0725F5SB017 and 0725F5SB019. Include the correspondence in the revised Report. Nevertheless, sample locations 0725F5SB017 and 0725F5SB019 were not relocated to the dark stained area according to Figure 4-4. Comment 5 in the January 31, 2014 *Approval with Modifications* directs the Permittee to conduct an investigation that is

more inclusive of the total scarred earth. Only one soil sample (0725F5SS003) was collected from the dark stained area according to Figure 4-4. Although the dark stained area is easily visible from the aerial images, the Permittee did not collect a sufficient number of samples from the dark stained area. Rather, the Permittee collected seven soil samples outside the boundary of Feature 5, at locations seemingly unrelated to soil contamination. The soil data collected outside the boundary of Feature 5 may cause an underestimation of risk. Submit the Work Plan required by Comment 3 to advance three soil borings within the footprint of the dark stained area. Collect two surface soil samples per boring location (total of six surface soil samples); the surface soil sampling method must be consistent with the 2014 investigation (one for 0.0 to 0.5-foot and the other for 0.5 to 1.0-foot depth intervals). Each soil boring must be advanced to depths of ten feet bgs with samples collected at five and ten feet bgs; the subsurface soil sampling method must be appropriate for the target analytes. These soil samples must be analyzed for TAL metals, pesticides, herbicides, DRO, PCBs, SVOCs, VOCs, explosive compounds and dioxins/furans. Revise the Report accordingly.

29. Section 4.4.2, Investigation Trenching, lines 6-7 and 10-11, page 4-4

Permittee Statements: "All trenches were excavated to a depth of approximately 5 feet bgs."
and,
"Photographs 4-1 through 4-6 document the trenching activity."

NMED Comment: The depth of the trenches looks to be less than five feet from the photographs. Confirm the depths of the trenches in the revised Report. If field notes recording the activity are available, include them in the revised Report. A test pit investigation is more appropriate at the dark stained area and the vicinity of boring OTB03, where an elevated copper concentration was detected at five feet bgs. Propose the excavation of test pits at the location of dark stained area and at the vicinity of boring OTB03 in Feature 5 in the Work Plan required by Comment 3.

30. Section 4.6.1, Data Used in the Evaluation & Identification of COPCs, lines 8-9, page 4-7

Permittee Statement: "[The surrogate analyte for the detected] Total chromium [is] Trivalent chromium[.] [Trivalent chromium] was selected because hexavalent chromium is not known to be present at SWMU 25."

NMED Comment: Refer to Comment 8 in NMED's August 7, 2017 *Disapproval.* The comment states that unless speciated data are available and/or sufficient LOE are provided to support an assumption of 100% trivalent chromium, the soil screening levels for total chromium should be applied in the risk assessments. Soil screening levels for total chromium and trivalent chromium are 96.6 and 117,000 mg/kg, respectively. The screening level for total chromium provides far more conservative value; therefore, is more protective of human health. Total chromium is not present in SWMU 25 at a level sufficient to drive the risk assessments at this time. However, the screening level for total chromium must be

used for risk evaluation. Revise the Report accordingly.

31. Section 4.6.3.2, Beef Ingestion, lines 34-37, page 4-8

Permittee Statement: "However, the physical characteristics of the water-bearing zones present at FWDA, and the limited volume encountered during historical groundwater monitoring and hydrogeological studies, suggest that insufficient groundwater is available to sustain human or animal use."

NMED Comment: There is a production well (Well 69) in Parcel 11 installed in the San Andres-Glorieta aquifer. The same aquifer is likely present beneath Parcel 7. If future residents elect to install a production well and use the groundwater for grazing cattle, the beef ingestion pathway is potentially complete. Evaluate the pathway in the revised Report. This comment also applies to Section 5.6.3.2.

32. Section 4.6.4.1, Historical Risk Screening Results, lines 33-34, page 4-9

Permittee Statement: "One metal, copper, was detected at a concentration of 4,100 mg/kg, exceeding the SSL of 3,130 mg/kg."

NMED Comment: The exceedance was detected from the soil sample collected from boring OTB03 at a depth of five feet bgs. The copper concentrations in the soil samples collected from the same boring OBT03 at the depths of one and ten feet bgs were recorded as 10 and 6.02 mg/kg, respectively, according to Table 4-1, *Summary of Detectable Concentrations for Previous Soil Sample Analyses at SWMU 25.* The exceedance appears to be limited to an approximate depth of five feet bgs at the location. The most elevated copper concentration among the shallow soil samples (0-1-foot bgs) collected from the vicinity of boring OBT03 was recorded as 20.4 mg/kg (0725F5SS016-0.5-1.0DSO-DUP) according to table 4-2A. The shallow soils in the vicinity of OBT03 appear to be unaffected. Waste/debris containing copper may have been buried beneath the ground surface. Propose the excavation of test pits in the vicinity of OBT03 in the Work Plan required by Comment 3. In addition, three soil borings must be advanced to ten feet bgs in the vicinity of OBT03 to determine the extent of elevated copper concentrations. The Permittee must also propose the installation of three soil borings in the vicinity of OBT03 to collect soil samples at depths of one, five and ten feet bgs in the Work Plan required by Comment 3. The soil samples (total of nine samples) must be analyzed for TAL metals, pesticides, herbicides, DRO, PCBs, SVOCs, VOCs, explosive compounds and dioxins/furans.

33. Section 4.6.6.2.1, Refinement 1 – Refined Exposure Concentration, lines 26-31, page 4-13

Permittee Statement: "The single elevated arsenic concentration is believed to be representative of background levels at SWMU 25 because there is no known source of arsenic in this area of Parcel 7. Arsenic is used in a wide range of applications, including wood preservatives, agricultural chemicals, as an alloying element in ammunition and

solders, as anti-friction additive in bearings, semi-conductors for telecommunications, and medicinal uses (ATSDR, 2007a)."

NMED Comment: Section 4.1.1, *Location, Description, and Operational History,* does not provide enough information to conclude that the elevated arsenic concentration is representative of background levels at SWMU 25. Although arsenic was not used in a manner described at the site, wood pieces treated with arsenic or metal containers containing arsenic residues may have been burned at the site. Propose to collect step-out samples five to ten feet in all directions at a depth that correlates to the contaminant detections in the Work Plan. Also, propose to collect a deeper sample at the same location at sample 0725F2SS009 in the Work Plan.

34. Section 4.6.6.2.1, Refinement 1 – Refined Exposure Concentration, lines 1-9, page 4-14

Permittee Statement: "The single elevated detection of copper could have resulted from disposal of materials containing copper at SWMU 25, since copper is used in a wide range of products, such as electrical, plumbing, automotive, telecommunications, air condition, industrial valves and fittings, agricultural fungicides and algicides, wood preservatives, electroplating, dye manufacture, and petroleum refining (ATSDR, 2004b). However, the production of products using copper did not occur at SWMU 25. The lack of widespread copper detections at levels above its screening level or significantly greater than the high end of copper's background range indicate there is no unacceptable noncancer hazard from exposure to copper at SWMU 25."

NMED Comment: Further investigation is warranted in the vicinity of boring OBT03 and the dark stained area. The risk assessment is not conclusive until further investigation is complete. Remove or revise the statement in the revised Report, as necessary.

35. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, line 37, page 4-17, lines 1-2, 35, page 4-18, lines 3-5, 11-13, page 4-19

Permittee Statements: "These estimated cancer risks were based on use of the maximum detected [pesticide] concentration as a result of the low frequency of detection (less than 2%) in the SWMU 25 data set of more than 200 samples."
and,
"However, this COPC [2-hexanone] was detected only once in more than 200 samples."
and,
"However, neither analyte [bromodichloromethane or dichlorobromomethane] was detected more than twice in more than 200 samples demonstrating that these COPCs are infrequently detected at SWMU 25, and these detections are not representative of concentrations across SWMU 25."
and,
"However, the estimated noncancer hazard was based on use of the maximum detected [antimony] concentration as a result of the low frequency of detection (less than 2%) in the SWMU 25 data set of more than 200 samples."

NMED Comment: While the detection of these constituents is rare, it should be noted that only one soil sampling location (0725F5SS003) was included in the dark stained area. The probability of detections may be underestimated due to numerous data points collected outside of the potential hotspot. An investigation of soils within the dark stained area is required. The LOE are not acceptable because the investigation was not conducted appropriately at SWMU 25. Remove or revise the statements in the revised Report.

36. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 25-29, page 4-18

Permittee Statement: "Review of laboratory reports indicates that methylene chloride was detected in equipment blanks, trip blanks, or lab blanks which provides evidence that it is introduced. The lack of variability in concentration[s] across SWMU 25 provides further evidence that this COPC is introduced via lab contamination and not as the result of a spill or release."

NMED Comment: The Permittee must direct the analytical laboratory to take measures to minimize contamination associated with methylene chloride in all future investigations. In addition, provide a table that shows all detected methylene chloride concentrations in soil samples and blanks. Include the table to validate the LOE in the revised Report.

37. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 25-29, page 4-20

Permittee Statement: "Given that lead has a preference to sorb to soil, that soil pH conditions are alkaline at SWMU 25, and that regional weather conditions limit the amount of precipitation that could contribute to leaching, the likelihood that lead concentrations in soil at SWMU 25 are contributing to degraded water quality is low."

NMED Comment: The Permittee provided similar discussion regarding the elevated lead contamination in SWMU 9 (see Comment 24). If the Permittee elects to demonstrate the sorption capacity of lead in the contaminated soil, a detailed plan for the demonstration (e.g., bench-scale study) must be included in the Work Plan required by Comment 3.

38. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 37-38, page 4-20

Permittee Statement: "Contamination is Surficial – Past activity at SWMU 25 was limited to surface disposal of solvents."

NMED Comment: The copper concentration in the soil sample collected from boring OTB03 at a depth of five feet bgs exceeded the screening level. Therefore, the statement is not accurate; contamination is not limited to surficial soils. Also, the vertical extent of contamination was not investigated in the dark stained area. Remove the statement in the revised Report. Also, provide information regarding the solvents that were disposed at the

site (e.g., chemical names and if known, volumes) in the revised Report. Explain the nature of the disposal activity and whether containerized or liquid solvents were burned or directly drained on the ground surface at the site.

39. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 1-2, page 4-21

Permittee Statement: "Lack of Liquid Source – The presence of a liquid source, natural or man-made is required to mobilize analytes."

NMED Comment: The statement is not accurate. Rainwater and snowmelt are present at the site and may infiltrate the soils and mobilize the analytes to the aquifers. Refer to Comment 42 below. Remove the statement from the revised Report.

40. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 8-11, page 4-21

Permittee Statement: "Benzene was detected in only seven out of 201 samples (3%). This does not constitute an infinite source of benzene and demonstrates that benzene is not migrating vertically over a large portion of SWMU 25."

NMED Comment: The dark stained area was not investigated for benzene contamination. Since benzene contamination has not been fully investigated, the possibility of benzene migrating vertically is uncertain. This comment also applies to the discussions regarding dieldrin, heptachlor epoxide, naphthalene, antimony, and lead in Section 4.6.6.2.4. Remove the statements from the revised Report.

41. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 14-19, page 4-22

Permittee Statement: "The PAHs made of four or fewer aromatic rings (like naphthalene) may be degraded through microbial metabolism, photolysis and oxidation (ATSDR, 1995b). Studies suggest that the half-lives of PAHs in soil with three or fewer rings (like naphthalene) are generally less than 20 days, and the results for two ring PAHs (naphthalene is a two-ring PAH) indicate a half-life in soil of approximately 2 days."

NMED Comment: The burning activities ceased by 1973 while PAHs were still detected in 2014. The PAH concentrations in soil sample 0725F5SS003 collected from the dark stained area indicate that the initial estimated PAH concentrations at a time when disposal/burning activity occurred would significantly exceed the soil-to-groundwater screening levels based on their half-lives. Due to the severity of initial contamination associated with PAHs, the groundwater quality at SWMU 25 may have already been degraded. Propose to install a groundwater monitoring well to evaluate groundwater quality in the vicinity of the dark stained area in the Work Plan required by Comment 3. Propose to collect groundwater samples from the well in the Work Plan.

42. Section 4.6.6.2.4, Refinement 4 – Qualitative Lines of Evidence Discussion, lines 22-27, page 4-22

Permittee Statement: "Prevailing Weather Patterns – FWDA receives less than 12-inches of precipitation annually (www.usclimatedata.com/climate/gallup/new-mexico/united-states, accessed December 4, 2017). The high evaporation rates typical in a desert setting, coupled with low annual average precipitation and a depth to groundwater of approximately 50 to 70 feet bgs, indicate that it is extremely unlikely for analytes to be able to migrate vertically from surface soils to the water table at FWDA."

NMED Comment: The Permittee failed to include that the average annual snowfall is shown as 35 inches according to the website in the statement. Snow eventually melts and infiltrates the soil matrix. Revise the statement to include this fact. In addition, although total annual rainfall is low, rainfall often comes intensely in a short period of time in New Mexico (e.g., monsoon season). As a result, water on the surface may not evaporate immediately and the runoff may pool or follow the least resistant pathways and infiltrate into the subsurface. The intense rainfall may accelerate migration of contaminants from soils to groundwater. Contaminants have migrated from surface/shallow soils to the water table at various sites within FWDA. Reevaluate the risk and correct the statement in the revised Report.

43. Section 4.6.6.3, Vapor Intrusion Pathway Evaluation, lines 23-25, page 4-24

Permittee Statement: "Review of laboratory reports indicates that acetone, bromodichloromethane, dibromochloromethane, and methylene chloride were detected in equipment blanks, trip blanks, or lab blanks which provides evidence that these analytes are introduced [from laboratory]."

NMED Comment: The Permittee must direct the analytical laboratory to take measures to minimize contamination in all future investigations. In addition, provide a table that lists all detected VOC concentrations in soil samples and blanks. Include the table to support the LOE in the revised Report. Combine the information with the content of the table required by Comment 36.

44. Section 4.6.6.3, Vapor Intrusion Pathway Evaluation, lines 32-34, page 4-24

Permittee Statement: "SWMU 25 – Feature 2. The volatile analytes detected include two PAHs (benzo(a)anthracene and naphthalene) and one VOC (acetone) that meet the NMED criteria for volatility and toxicity through inhalation."

NMED Comment: The Permittee provides a discussion for acetone detection in the following paragraph in the Report; however, a discussion of the detected PAHs was not provided. Regardless, propose to reevaluate the vapor intrusion pathway once the investigation of the dark stained area is complete in the Phase 2 Investigation Work Plan and revise the risk evaluation in the following report.

45. Section 4.6.7, Risk Evaluation Summary, lines 8-10, page 4-26

Permittee Statement: "Of these four [aluminum, barium, beryllium and mercury], the 95% UCLs for each were less than the construction worker screening level, resulting in noncancer hazard contribution at levels less than the NMED target risk threshold of 1.0."

NMED Comment: As previously stated, only one sampling location (0725F5SS003) was included in the dark stained area. The highest level of contamination is potentially located in the dark stained area. The risks must be reevaluated after the Phase 2 Investigation is complete.

46. Section 4.7.1, Data Used in the Evaluation & Identification of COPCs, lines 28-30, page 4-36

Permittee Statement: "Samples collected in August 2014 were analyzed for TAL metals, pesticides, herbicides, DRO, PCBs, SVOCs (including PAHs), VOCs, and selected explosives. Selected samples were also analyzed for dioxins/furans."

NMED Comment: Table 4-2A and Table 4-2B do not identify which soil samples were analyzed for dioxins/furans as the tables only list detected constituents. Identify the samples that were analyzed for dioxins/furans in the revised Report.

47. Section 4.6.8, Uncertainty Discussion, lines 25-26, page 4-29 and lines 19-20, page 30

Permittee Statements: "Fifty of the 77 analytes were eliminated as COPCs based on the lines of reasoning presented below,"
and,
"The remaining 25 analytes are comprised of three explosives, 12 SVOCs and 10 VOCs having LOQs and LODs greater than the groundwater protection SSL."

NMED Comment: Uncertainty discussion was provided for 75 analytes whose LOQs are greater than the screening levels. No discussion is provided for the remaining two analytes. Clarify the discrepancy or provide uncertainty discussion for the remaining two analytes in the revised Report.

48. Section 4.6.8, Uncertainty Discussion, lines 26-29, page 4-32

Permittee Statement: "All of the analytes listed above do not have uses relevant to historical operations at FWDA or are not known to have been used at FWDA. It is appropriate to eliminate them as COPCs. The Army believes it was appropriate to eliminate these analytes as COPCs. The Army proposes no further action relating to compounds discussed in this section."

NMED Comment: The rational for elimination from the risk assessment states that all of the analytes listed do not have uses relevant to historical operations at FWDA. However, at

SWMU 25, waste operations included the burning of trash. No other description has been provided to justify what was considered trash. Based on historical operations from military installations, burning operations often included an array of items. While it is acknowledged that some of the compounds addressed in Section 4.6.2 may not be site related, some of the constituents listed are common by-products of burning (PAHs) and are indicator compounds for petroleum hydrocarbons or are related to explosives (hexachlorobenzene). While the operations consisted of burning, there is no discussion on whether liquids were burned and/or used as accelerants (e.g., hydrocarbon-based fuels). As there is uncertainty as to presence of these constituents at levels above SSLs but below levels of detection, it is possible that they are present and could contribute to groundwater contamination. The uncertainty analysis must include a discussion of the physical-chemical properties as another LOE to support the elimination of these compounds as COPCs. As noted in Comment 5, risk and/or hazard is not to be calculated for the soil-to-groundwater screening pathway. Therefore, retaining these compounds as COPCs for the soil-to-groundwater SL evaluation does not impact risk, but rather provides evaluation of the potential for these compounds to impact groundwater. Revise the Report accordingly.

49. Section 5.6.8, Uncertainty Discussion, lines 9-12, page 5-26

Permittee Statement: "While no individual congener was detected at a concentration greater than a screening level, the highest calculated dioxin/furan [toxic equivalent] TEQ did exceed the 2,3,7,8-TCDD screening level. The dioxin/furan TEQ was further evaluated in the risk evaluation and found not to contribute to unacceptable cancer risks."

NMED Comment: It is not clear how the exceedance of dioxin/furan TEQ does not contribute to unacceptable cancer risks. Explain how the conclusion was drawn in the revised Report. In addition, the exceedance was detected at sampling location 0743RCYSS010 according to Figure 5-3, *Railroad Classification Yard – Exceedance Area Map*. The extent of contamination is not delineated at sample location 0743RCYSS010. Propose to collect step-out and deeper soil samples to assess the lateral and vertical extent of dioxin/furan TEQ contamination along the railroad tracks in the Work Plan required by Comment 3.

50. Section 5.8, Conclusions and Recommendations, lines 38-40, page 5-35

Permittee Statement: "The Navajo Nation and the Pueblo of Zuni have expressed an interest in continuing the use of the railyard for its intended purpose and for this reason, the Army recommends no further action."

NMED Comment: NMED has not received a confirmation for continuing use of the railyard from the Navajo Nation or the Pueblo of Zuni or of acceptance of properties where cleanup is incomplete. Therefore, the Army's basis for recommending no further action at the site is premature. Revise the statement as necessary.

51. Table 3-2A, SWMU 9 – POL Waste Discharge Area Sample Result Detections (August 2014) – Direct Contact Screening, p 3-T9 and Table 4-2A, SWMU 25 - Trash Burning Ground Property Disposal Office Sample Result Detections (August 2014) - Direct Contact Screening, p 4-T13, etc.

NMED Comment: Tables 3-2A, 4-2A, and others list detections for all analytes. This is a departure from the standard practice of presenting data in tables based on the analytical group (e.g., a table for VOCs, a table for SVOCs, a table for metals, etc.). Presenting data for all analytes in one table increases review time for a document based on the difficulty of finding a specific analyte for a specific sample in a single 135-page table (Table 4-2A). Revise the Report to present data in tables specific to analyte groups as has been performed in the past. This applies to all tables where data is presented in this and all future documents.

52. Table 3-3A, SWMU 9 - POL Discharge Area - Quantitation Limits Compared to Human Health Soil Screening Levels - Direct Contact, p 3-T25 and Table 3-3B, SWMU 9 - POL Discharge Area - Quantitation Limits Compared to Human Health Soil Screening Levels - Groundwater Protection, p 3-T29, etc.

NMED Comment: According to Tables 3-3A and 3-3B, there were 14 analytes with quantitation limits that exceeded the residential soil screening levels and 67 analytes with quantitation limits that exceeded the NMED soil-to-groundwater soil screening level. Quantitation limits that exceed screening levels make it impossible for the Permittee to demonstrate, or for NMED to defend, that contamination is not present at unacceptable concentrations at the facility. The Permittee must make a demonstrated effort to identify analytical laboratories that can achieve appropriate quantitation limits below the screening levels.

53. Figure 3-2, SWMU 9 - POL Waste Discharge Area - Previous Sample Locations, p 3-F2

NMED Comment: The location of well FW26 appears to have moved. Figures provided in the *2013 Final RCRA Facility Investigation Work Plan and Historical Information Summary Document Parcel 7* (2013 Work Plan) indicate that well FW26 is located approximately 30-feet outside of the SWMU 9 boundary. Figures provided in the Report indicate that well FW26 is located inside the SWMU 9 boundary. No discussion was provided regarding well FW26. Resolve the discrepancy and provide a discussion of why the well location was moved on maps (if the current Report maps are correct) in the revised Report.

54. Appendix B – Data Validation Reports, p B-1

NMED Comment: The Permittee has provided Appendix B, Data Validation Reports. However, multiple data validation reports are included in other appendices, such as Appendices F and N. Include data validation reports in the Data Validation Reports appendix in the revised Report.

The Permittee must submit a Phase 2 Investigation Work Plan required by Comments 3, 19, 20, 28, 29, 32, 33, 41, and 49 in this Disapproval no later than **September 5, 2019**. The Permittee must submit a revised Report that addresses all comments contained in this Disapproval. In addition, the Permittee must include a response letter that cross-references where NMED's numbered comments were addressed. The Permittee must also submit an electronic redline-strikeout version of the revised Report showing all changes that have been made. The revised Report must be submitted no later than **April 30, 2019**.

Should you have any questions, please contact Michiya Suzuki of my staff at (505) 476-6059.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
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File: FWDA 2018 and Reading, Parcel 7, FWDA-17-003