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Mr. David Cobrain  
New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive, Building One  
Santa Fe, New Mexico 87505

**NMED  
Hazardous Waste Bureau**

RE: Soil Performance Standards and Selection of Soil Screening Levels, Human Health Risk Assessment Memo, Fort Wingate Depot Activity (FWDA), New Mexico

Dear Mr. Cobrain:

Attached please find comments on the above-reference document. Overall, there are many concerns with the assumptions as discussed and in particular, issues with the evaluation of the beef ingestion pathway. Comments were provided based on the methodology contained in the memo. However, we do not agree with the assumptions and methodology as described in the memo. For the beef ingestion pathway, we would recommend evaluating this on a site-specific basis rather than trying to assess the impact across FWDA. The methodology as provided is based on limited data, limited Parcels, and artificially over estimates risk/hazard.

If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at [paigewalton@msn.com](mailto:paigewalton@msn.com).

Thank you,

Paige Walton  
AQS Senior Scientist and Program Manager

Enclosure

cc: Neelam Dhawan, NMED (electronic)  
Joel Workman, AQS (electronic)

**Technical Review Comments on the Soil Performance Standards and Selection of Soil Screening Levels, Human Health Risk Assessment Memo, Fort Wingate Depot Activity (FWDA), New Mexico**

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1. General. A traditional residential scenario is proposed in the memo. However, the land at FWDA is to be handed over to the Tribes upon completion of corrective actions and closure. As noted in Section 1.2.1 of the NMED Soil Screening Guidance, all land uses and exposure scenarios must be evaluated and if needed, the exposure pathways listed in the Soil Screening Guidance should be modified or augmented accordingly. There is no discussion in the memo on whether any discussions have occurred with the Tribes that may result in other land use scenarios (e.g., hunting, gardening/farming, Native uses, etc.). Justification should be provided that a standard residential scenario will be protective based on potential Tribal uses.
2. General. The introduction allows that an ecological risk memo will also be derived. It is unclear why another ecological memo is needed. Several site visits, meetings, and conference calls have previously been held to discuss how to conduct the ecological screening assessments. It was understood at the July 2015 that questions regarding the ecological screening process had been resolved. As such, there does not appear to be any value added in reviewing another summary of this process. In addition, and as discussed more in Comment No. 6, there does not appear to be any value added for development of a groundwater memo, as the FWDA permit (and New Mexico regulations) is very prescriptive in how groundwater is to be evaluated.
3. Part A.3, Soil-to-Groundwater. Under the discussion of current use, it is stated that the soil-to-groundwater pathway is incomplete as groundwater does not discharge to the surface nor is groundwater used for drinking. These two examples have no impact on whether the soil-to-groundwater pathway is complete. This pathway assesses the likelihood of the potential for contamination in soil to migrate to groundwater; an assessment of the potential for future impacts to groundwater. Current uses of groundwater and surface discharge have no relevance on whether there is a source(s) for contamination. Regardless of current use of groundwater, surface discharge or quality of groundwater, the soil-to-groundwater pathway must be evaluated to either assess potential for impact (pre-remediation) or to confirm source removal and protection of the resource (post remediation).
4. Part A.3, Soil-to-Groundwater. While the soil-to-groundwater pathway will be included for future exposure, the use of groundwater has no relevance on if this is a complete pathway. As noted above, the soil-to-groundwater pathway must be evaluated to either assess potential for impact (pre-remediation) or to confirm source removal and protection of the resource (post remediation). Current uses of groundwater and surface discharge have no relevance on whether there is a source(s) for contamination.
5. Part A.3, Soil-to-Groundwater. The memo states that the soil-to-groundwater pathway will not be evaluated using the soil-to-groundwater screening levels (SSLs) but rather groundwater data will be used to determine impacts. Sufficient lines of evidence have not been provided to support this position, especially for the FWDA as a whole. It is

acknowledged that the default SSLs are conservative and may not be representative of a facility's site geology/hydrogeology. However, the SSLs are a screening tool to assess if contamination in soil could post a threat to groundwater. The SSLs may be refined to reflect site-specific conditions. In addition, the NMED Soil Screening Guidance includes a tiered approach and allows for lines of evidence to address exceedances (e.g., source removals and vertical delineation of confirmation data). Monitoring well data, if wells are adequately placed immediately downgradient of a source does provide useful information on historical and current status with regards to whether contamination has leached to groundwater. In addition, upon source removal, and combined with other lines of evidence, groundwater monitoring may be adequate. However, during the investigation process, comparison to SSLs is required, to help assess the need for corrective action and to help assess if contamination has been adequately removed to protect groundwater.

6. Part A.3, Soil-to-Groundwater. The text states that site-specific dilution attenuation factors (DAFs) are not to be used in the southern portion of FWDA due to geology and topography. Clarify why the geology and topography prevent calculation of a site-specific SSL. The NMED Soil Screening Guidance specifically notes that geologic and hydrologic conditions at a site may not be readily represented by a single default parameter and that site-specific conditions may vary considerably from typical conditions represented by the values used to derive the default SSLs. The Guidance allows for derivation of site-specific SSLs to reflect site conditions. Further, for a large facility, a single SSL may not be appropriate for each SWMU/AOC. SSLs should be derived on a SWMU-specific basis to allow for spatial variation in geologic and hydrogeologic parameters.
7. Part A.3, Soil-to-Groundwater. A separate memo is not required for groundwater as the FWDA permit is prescriptive in how groundwater should be addressed. Unlike soil contaminants, a risk assessment is not typically conducted for groundwater, but rather groundwater is evaluated in accordance with the Water Quality Control Commission (WQCC) regulations. As outlined in Attachment 7.1 of the FWDA permit, the lessor of the contaminant limits listed in Parts 20.6.2.7.VV and 3103 of the New Mexico Administrative Code (NMAC) or the U.S Environmental Protection Agency's (EPA) maximum contaminant level (MCL) under 40 Code of Federal Regulations (CFR) Parts 141 and 143 is compared to the groundwater exposure point concentration. It is only if there is no WQCC standard or an EPA MCL that the tap water screening level is used for comparison. In all cases, a risk assessment is not conducted but rather a point comparison to the prescriptive level; cumulative impacts are not assessed under the WQCC regulations.

However, it should be noted that if a risk assessment for groundwater is to be conducted, a simple screening assessment to tap water screening levels may not be appropriate. Since FWDA is being transferred to the Tribes for unrestricted use, additional assessment may be required to evaluate all potential exposure pathways (dermal, showering, gardening use, etc.). As such, it is recommended that the approach as contained in Attachment 7 of the permit be applied.

In addition, revise Figure 1 to show potentially complete and incomplete exposure pathways for groundwater for each receptor.

8. Part A.4, Vapor Intrusion. If volatile organic compounds (VOCs) are detected, the memo states that lines of evidence analyses will be conducted to determine if the pathway will require evaluation. Note that the NMED Soil Screening Guidance clearly outlines when a site-specific evaluation must be conducted, to include:

- Very shallow groundwater sources [e.g., depth to water is less than five (5) feet (ft) below foundation level];
- Shallow soil contamination resulting in vapor sources (e.g., VOCs are found at significant levels within 10 ft of the base of the foundation);
- Buildings with significant openings to the subsurface (e.g., sumps, unlined crawlspaces, earthen floors) or significant preferential pathways, either naturally-occurring or anthropogenic (not including typical utility perforations present in most buildings);
- Vapor sources originating in landfills where methane is generated in sufficient quantities to induce advective transport into the vadose zone;
- Vapor sources originating in commercial or industrial settings where vapor-forming chemicals can be released within an enclosed space and the vapor density of a chemical may result in significant advective transport of the vapors downward through cracks and openings in floors and into the vadose zone; and/or
- Leaking vapors from gas transmission lines.

If none of the above conditions apply, and if all the following criteria are met during investigation sampling, the pathway is considered potentially complete and a qualitative discussion of the vapor intrusion pathway will be required:

- Detections of volatile and toxic compounds are minimally detected (e.g., once or twice) in site media (soil, soil gas, and/or groundwater);
- Concentrations are below screening levels;
- There is no suspected source(s) for volatile and toxic compounds; and
- Concentrations are decreasing with depth (for soil).

In addition, if volatile and toxic compounds were present at a site but the source(s) and associated contaminated soil have been removed and the following criteria have been met, only a qualitative assessment of the vapor intrusion pathway will be required:

- Confirmation sampling indicates removal of the source with minimal volatile and toxic compounds detected in soil/soil gas or groundwater data,
- Concentrations are below screening,
- No evidence to suggest dense/sinking vapors, and
- Concentrations decrease with depth.

9. Part A, Conclusions. The beef ingestion pathway is not deemed incomplete. Based on the comments provided on Attachment 1 of this memo (see below), it appears this pathway does require further evaluation.
10. Part B, Background. The comparison of arsenic to a background value of 5.6 mg/kg is not a blanket approach. As noted in the cited *Evaluation of Background Levels for Arsenic in Soil* (NMED, 2013), the approach for arsenic is only appropriate if arsenic is not suspected to be site-related for a specific SWMU/AOC and no source(s) for arsenic have been identified through review of site history. If arsenic is suspected to be site related and/or there are possible sources of arsenic, then the traditional site attribution analysis that follows the methodology outlined in the NMED Soil Screening Guidance and site specific background data presented in USACE (2013) must be applied. The memorandum must include these caveats to indicate when the background screening to the arsenic level of 5.6 mg/kg is applicable.
11. Part C, SSLs. The screening levels listed in Table 1 of the memo are based on values current at the time the memo was drafted. As noted in Attachment 7 of the FWDA permit, the most current values must be used. As such, it is unlikely that the values listed in Table 1 will be current at the time all the assessments for FWDA are conducted. It is recommended that screening levels be obtained only at the time reports/assessments are conducted. It is noted that the Regional Screening Levels (RSLs) are updated every six months, and the NMED Soil Screening Levels are being evaluated and updated, with a new version to be released later this year.
12. Part C, Table 1. It is noted that there are discrepancies in Table 1. For example, no data are listed for di-n-octyl phthalate or trichloroethene even though data are available in the NMED Soil Screening Guidance and the RSL tables. If screening levels are to be tabulated, a thorough review of the data is required. In addition, a schedule for reviewing and updating the table (such as every six months) would also be required.
13. Part C, Table 1. Footnote 5 allows that calcium, magnesium, potassium, and sodium will not be assessed as they are considered essential nutrients. However, Table 5-1 of the NMED Soil Screening Guidance includes SSLs for essential nutrients, including those listed above. These elements may not be excluded from assessment and must be evaluated in accordance with Section 5.2 of the NMED Soil Screening Guidance.
14. Part C, Table 1. Using the most conservative screening level regardless of receptor is commonly applied as an action level to ensure laboratory detection limits are sufficient to meet defined data quality objectives. Using the mix and match approach is also a useful tool in assessing data to see if removals may be needed. However, it is not clear how the lowest screening level is to be applied at FWDA. It is not appropriate to mix and match screening levels for demonstration of a specific scenario (residential or industrial). As noted above, this may be a good internal tool but not for use in risk assessments. Using a construction worker screening level for a residential scenario creates a false and overly conservative and skewed estimate of risk. The exposure assumptions are not consistent. Based on the

information provided, it is unclear if the goal is to conduct just one assessment and state that the assessment is protective of all three receptors. The text should be revised to clarify that an assessment will be performed for each receptor population. On a side note, once you show excess risk, it is difficult to justify why the risk can be modified using a difference screening level; this is especially difficult to explain to the public. It is recommended that screening levels are not mixed between receptors.

15. Part D. Please note that the total petroleum hydrocarbon (TPH) section and the methodology for how TPH, mixtures, and aliphatic/aromatic hydrocarbons are to be evaluated in the NMED Soil Screening Guidance are being revised. Following Attachment 7 of the FWDA permit will ensure the most current NMED guidance is applied, which may influence future evaluations.
16. Part D. If a SSL cannot be developed, the constituent must be addressed in the uncertainties section of the risk assessment.

#### Attachment 1, Beef Ingestion Pathway

17. Section 3.2.2. VOCs, Semi-volatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs) have been omitted as a potential constituent of concern (COC). However, the data used for the evaluation of the beef pathway as presented in this memo are based on a limited number of SWMUs/AOCs within a select few Parcels. The memo does not provide any discussion or justification that the data applied is appropriate for other areas yet to be investigated or for other Parcels. It is unclear how any determination of whether the beef pathway presents an undue risk can be made using such a limited dataset that does not account for all SWMUs/AOCs (refer to Attachment 8 of the FWDA permit) and Parcels. Discuss the representativeness of these data and applicability to all sites, including those yet to be investigated.
18. Section 3.2.3. Comments on the data extraction/reduction are as follows:
  - The memo allows that data from Parcels 7, 13, 21, 22, and 23 were combined. Clarify specifically which SWMUs/AOCs were included in the culling of data and also specify any SWMUs/AOC for which data were not used (or not available).
  - Discuss what Parcels and specifically which SWMUs/AOCs were not included in the dataset (e.g., Parcels 2, 3, 4, 6, 9, 11, 16, 15, 19, 20, 24 and SWMUs such as the open burn open detonation area, the rifle range, demolition areas, landfills/CAMU, etc.). Also, discuss data gaps associated with omission of these areas and the potential for under/overestimation of the risks associated with the beef pathway as currently assessed.
  - Inclusion of “U” qualified data as a zero value is not appropriate and results in a dilution of estimated soil concentrations. As noted in Section 2.7.7 of the NMED Soil Screening Guidance, non-detects (“U”) should be evaluated following the

appropriate methodology outlined in the most recent version of the US EPA's ProUCL Technical Guidance. Further, use of one-half the method detection limit (MDL) or sample quantitation limit or simple substitution (such as setting data equal to zero) are not considered appropriate methods for handling non-detects. Currently, the ProUCL Technical Guide indicated that the Kaplan-Meier (KM) method yields more precise and accurate estimates of decision characteristics than those based on substitution and regression on order statistics. The data must be re-evaluated accordingly.

- Discuss how the 95% upper confidence limits (UCL) were derived. Include all input (including all data) / output files for the statistical determination of the UCL.

19. Section 3.2.4. The area weighted EPC is based on an assumption that SWMUs/AOC comprise 8.5% of the land at FWDA and thus the EPC is weighted against a site percentage versus percent of the SWMU/AOC. This most likely overestimates risk. The risks associated with the beef pathway (Table 3) for carcinogens exceeds the NMED target level and the hazard index is slightly below the target level. However, the pathway may not be evaluated independently of other risk. As specified in Sections 2.6 and 5.0 of the NMED Soil Screening Guidance, once the beef ingestion risk and hazards are determined, these values should be added to the cumulative risk/hazards (see Equations 57 and 58 in the guidance). When looking at cumulative risk across all pathways, the beef ingestion route will drive cancer risks and there is a potential that the beef hazard could add to exceedances of noncancer hazard. If the position is still to assess this pathway across the entire FWDA, it is strongly suggested that weighted EPCs be determined on a site-specific basis and a weighted estimation be based on the area within the SWMU/AOC that is impacted. Using the SWMU/AOC specific EPCs, a weighted EPC could then be estimate for the FDWA as a whole. Not only will this result in a more realistic estimation of the EPC, but will provide a better estimation of exposure across the site.

However, there is concern that too much weight is being placed on this pathway. It is unclear why the pathway is not being evaluated on a SWMU/AOC-specific basis. Refining of EPCs for SWMUs/AOCs based on area of impact within the particular site will likely result in this pathway dropping from assessment (as area of impact may be below 2 acres) or contributing a lessor amount to overall risk.

20. Section 4.2. Uncertainties associated with the excess cancer risk included lack of consideration of source removals and uptake by plants. It is not clear how any determinations on the beef pathway can be made when site investigations are still underway and remediations are not complete. This evaluation is based on an incomplete dataset, likely results in an overestimation of risk that will drive cumulative estimates, and does not account for all sites (which could result in significant changes to the EPCs). It is not clear how any determinations on the significance of the beef pathway can be made at this time.
21. Section 4.2. It is agreed that as currently being derived, a few outliers could have significant impact on the EPC. Using a complete dataset and assessing EPCs on a SWMU/AOC-

specific basis will help mitigate the impact of outliers and should lessen overall estimates of risk across the FWDA.

22. Section 6.0. Section 6.0 asserts that “significant risk will result from the beef ingestion pathway and no further evaluation is required.” Based on the evaluation provided in this memo, it is agreed that significant risk could result from the beef ingestion pathway. Given this, it is not clear why additional evaluation is not required. It appears additional evaluation and refinement is required to meet the overall data quality objective of clean closure and land transfer to the Tribes.