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Mr. David Cobrain
New Mexico Environment Department (NMED)
Hazardous Waste Bureau
2905 Rodeo Park Dr. E, Building 1
Santa Fe, NM 87505



RE: Evaluation of the Final Risk Assessment for SD-27 Pad 9 Drainage Pit (SWMU 141),
Holloman Air Force Base, July 2016

Dear Mr. Cobrain:

Attached please find technical review comments on the Final Risk Assessment for SD-27 Pad 9 Drainage Pit (SWMU 141), Holloman Air Force Base dated July 2016. The objective of this risk assessment was to re-evaluate existing data to see if previously proposed removals were still needed or if the site meets corrective action complete (CAC) without controls. Overall, the report was a little difficult to follow and did not provide sufficient explanatory text. In addition to risk calculation issues, there are concerns regarding whether extent of contamination has adequately been defined. These issues are addressed in more detail in the attached comments.

Soil data for the South exposure unit included results for total chromium. It is not clear why the NMED SSL for total chromium was not applied; rather the laboratory results were broken into representative concentrations for trivalent and hexavalent chromium. However, the carcinogenic risk calculated for this review using the total chromium screening level is equivalent to the cancer risk in Table 4-2(b). Thus, no comment was deemed warranted.

An ecological risk assessment was not conducted for this site. As the depth of contamination is greater than 6.5 feet below ground surface (ft bgs), exclusion of non-burrowing receptors is acceptable. The NMED Soil Screening Guidance only requires an ecological assessment to non-burrowing receptors exposed to contamination in the upper five feet of soil. Burrowing receptors must be evaluated for the soil exposure interval of 0-10 ft bgs. A comment has been included to request a qualitative discussion of potential burrowing receptors as well as plant toxicity.

The risk assessment concludes that the site meets CAC without controls and recommends groundwater monitoring be terminated. In reviewing the groundwater data, there appears to be an increasing trend of concentrations peaking with the 2013 sampling events. However, sufficient groundwater monitoring data are not available post 2013 to evaluate if there is an

overall decrease in groundwater concentrations. From review of the site history, it is not clear what would have occurred in 2013 to change the trend in groundwater data (the sump sediments were removed in 2006). Without a better understanding of the groundwater at this site, a clear determination that additional groundwater is not required cannot be made. Further a conclusion that no source(s) remain in soil could not be made. There is concern that the drain line has not been evaluated and could contain contamination leaching into groundwater. A comment has also been drafted to request additional evaluation of the groundwater data, to include a trend analyses. It is possible additional groundwater sampling may be needed although a less frequent sampling schedule could also be considered (annual at peak water levels).

If you have any questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,



Paige Walton
AQS Senior Scientist and Program Manager

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

Enclosure

Technical Review Comments
Final Risk Assessment for SD-27 Pad 9 Drainage Pit (SWMU 141)
Holloman Air Force Base
July 2016

1. In reviewing the summaries of the past investigations, there is no information provided on the discharge pipe from the Pad 9 wash rack to the drainage pit. What is the material of the pipe – vitrified clay? Also, discuss whether a camera survey or any other sampling has been conducted to confirm the integrity of the pipe between the wash rack and the pit. If the pipe is clay, it is likely there are cracks resulting in contaminated soil underlying the pipe. Samples SB27-05 and SB27-04 are located within 25 feet of the pipe, but there does not appear to be any specific rationale for the locations of these samples and the samples do not necessarily represent soil beneath the pipe. Borings SB27-06 and SB27-07 did not have any soil samples collected and only radiological constituents were included for analyses of soil at BH-27-01. Further, no samples were collected at either the inlet (at the connection with the drainage trough) or outlet (into the drainage pit) locations. It appears that there are possibly several data gaps with respect to the discharge pipe. Clarify what investigations have been done to date with respect to this feature and discuss any potential data gaps.
2. The Northern Exposure Unit primarily consists of the Pad 9 wash rack. There are only three samples to define nature and extent of contamination for this feature. Sample SB27-01 was collected post removal of the sump sediments and replaces the data associated with SD27-01 (pre-removal sediment data). Samples SB27-05 and SB27-04 are located within 25 feet of the discharge pipe but the rationale for these samples is unclear – how were these sample locations determined to be representative of the site? Discuss whether there is any history of overflow of the wash rack and whether additional samples around the outer edge of the concrete pad are warranted to define extent. While Section 1.2.2 allows that the pad is in fairly good shape with only a few cracks and fractures, discuss whether any biased samples associated with the cracks are needed to assess potential contamination beneath the concrete pad.
3. The risk assessments do not follow the intent of the initial screening assessment based on the NMED Soil Screening Guidance (SSG). Site maximum concentrations were compared to the NMED soil screening levels (SSLs), as noted in Section 4.2.1 of the report. This procedure is based on NMED SSG Section 2.7.6, which allows this type of comparison to determine initial COPCs for site characterization purposes only. However, for purposes of determining COPCs for risk screening, the comparison should not be a point comparison but include calculation of cumulative risk include all potential risk-COPCs. Further, for the screening level assessment, risks across all pathways must be evaluated.

North Exposure Unit (EU)

For the North EU, the comparison of maximum detected concentrations to SSLs resulted in no soil COPCs (Table 4-7(a)). But, if cumulative risk is evaluated, and all chemicals listed in

Table 4-7(a) were carried forward, per the NMED SSG, the risk to the residential receptor would be $2.82E-09$ and the hazard index (HI) would be $1.49E-04$. While the risks are less than the NMED target levels of $1E-05$ and 1.0 , respectively, these risks would be added to the predicted inhalation risks from groundwater and soil vapor.

The screening assessment for groundwater eliminated both volatiles (methylene chloride and trichloroethylene) detected in groundwater associated with the North EU as the concentrations were less than the NMED vapor intrusion screening level (Table 4-10(a)). However, in accordance with the NMED SSG (Section 2.5.2.2), in order to eliminate the vapor intrusion pathway, the number of detections must be minimal, concentrations must be below VISLs, and no suspected source of volatiles should be present. In looking at the data in Table 4-5 for North EU groundwater, a case can be made that the detections of methylene chloride and trichloroethylene are minimally detected. A case could also be made that the source(s) has been removed in that the site is no longer being used and contaminated sediments in the sump have been removed. However, this type of qualitative discussion must be included in the report.

If the risks for direct/indirect contact with soil and the vapor intrusion risks from soil (Table 4-21(a)) are evaluated and added, the overall site risk to the residential receptor would be $2.82E-09$ (cancer risk) and $5.37E-04$ (HI); both are below target levels for clean closure.

Based on the evaluation above, the North EU does meet closure without controls for the residential receptor. However, the report must be clarified to include a qualitative discussion of the vapor intrusion pathway for soil and a complete screening assessment for both the residential and construction worker scenarios to demonstrate additional corrective action is not warranted for this area. Section 4.5 should also be modified to include the cumulative risk across all pathways for both receptors.

South EU

Similar concerns are noted with the risk screen for the South EU. For the South EU, the comparison of maximum detected concentrations to SSLs resulted in chromium being the only soil COPC (Table 4-7(b)). But, if cumulative risk is evaluated, and all chemicals listed in Table 4-7(b) were carried forward, per the NMED SSG, the risk to the residential receptor would be $1.03E-05$ and the hazard index (HI) would be $2.5E-01$. The soil risk is slightly above the target level of $1E-05$. Risk is driven by low level risk from chromium and ethylbenzene detected in soil. However, when the risk/HI in soil is added to the vapor intrusion risks (Table 4-21(c)), the overall site risk and HI are $1.05E-05$ and $1.04E+00$, respectively; both slightly above the target levels of $1E-05$ and 1.0 .

Based on the evaluation above, the South EU may meet closure without controls for the residential receptor with some additional evaluation and discussion. The report must be clarified to include a complete screening assessment for both the residential and construction worker scenarios to demonstrate additional corrective action is not warranted for this area. Section 4.5 should also be modified to include the cumulative risk across all pathways for

both receptors.

4. A site attribution analyses was not conducted, and inorganics were eliminated as COPCs if the maximum concentration was less than the background level established at Holloman Air Force Base (*Basewide Background Study Report*, for Holloman Air Force Base (HAFB) on December 28, 2011 and as corrected in March 2012). Inclusion of the metals, regardless of representation of background, is conservative. It is also noted that for the South EU, chromium would still be retained as a COPC due to the elevated concentration compared to background.
5. An ecological risk assessment was not conducted for this site. As the depth of contamination is greater than 6.5 feet below ground surface (ft bgs), exclusion of non-burrowing receptors is acceptable. The NMED SSG only requires an ecological assessment to non-burrowing receptors exposed to contamination in the upper five feet of soil. However, burrowing receptors must be evaluated for the soil exposure interval of 0-10 ft bgs. The report should include a qualitative discussion of the potential for burrowing receptors and deep rooted plants to be present at the site. If these receptors are or could be present, an ecological assessment is required per the NMED SSG.
6. A groundwater plume map has not been provided with the report. Please include this. Also, include a discussion of groundwater concentrations over time (trend analyses). It appears there is an increase in groundwater concentrations peaking in 2013. Discuss the cause (or potential causes) for increasing concentration, especially as the contaminated sump sediments were removed in 2006.