



ENTERED

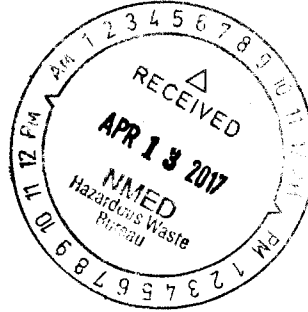
AQS, Inc.
2112 Deer Run Drive
South Weber, Utah 84405

(801) 476-1365
www.aqsnet.com

April 10, 2017

DCN: NMED-2017-17

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



RE: Draft Technical Review Comments on the "RCRA Facility Investigation at SD012, SD017, and SD020", Cannon Air Force Base, New Mexico, dated September 2016

Dear Mr. Cobrain:

Attached please find draft technical review comments on the *RCRA Facility Investigation at SD012, SD017, and SD020*.

No issues were noted with the additional arsenic and thallium data collected and used to derive updated background reference values. The data were evaluated using ProUCL and consistent with the methodologies in the NMED Soil Screening Guidance.

If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at walton@aqsnnet.com.

Thank you,

Paige Walton
AQS Senior Scientist and Program Manager

Enclosure

cc: Gabriel Acevedo, NMED (electronic)
Joel Workman, AQS (electronic)

**Draft Technical Review Comments on the RCRA Facility Investigation at SD012, SD017,
and SD020, Cannon Air Force Base, New Mexico, dated September 2016**

General Comments

1. The report allows that the only constituent of potential concern (COPC) for SD012, SD017 and SD020 is arsenic. The rationale provided was that previous investigations did not show site concentrations above the NMED risk-based soil screening levels (SSL) for any detected constituents but arsenic. As such, the risk screenings provided in Section 5.5 only addressed arsenic. In reviewing Tables 10-2(a and b), 10-3(a and b), and 10-4(a and b) from the "RFI Work Plan for Twelve Sites" (URS, 2014) the elimination of COPCs was based on a point to point comparison of the site maximum to background and the SSL. If the concentration was below the SSL, the constituent was not retained as a COPC. This is not a valid approach as it does not consider cumulative effects (risk/hazard). It is also noted that NMED comments on the Work Plan indicated that cumulative risk/hazard must be taken into account. The NMED Soil Screening Guidance (SSG) clearly states (Section 2.7.3 of the 2015 SSG) that if an organic is detected at least once, and there is site history indicating the constituent could be present, the chemical must be retained as a COPC and evaluated in the risk assessment. For inorganics, if the site concentrations are determined to be above background levels (either through comparison of the maximum concentrations to the background reference value or statistical evaluation), the constituent is retained as a COPC. In reviewing the 2014 Work Plan, most of the chemicals were eliminated as being a COPC based on the site maximum being less than the SSL; this point-to-point comparison does not allow for cumulative risk/hazard and is not an acceptable line of evidence to support dropping a chemical as a COPC. As a result of the comparison to SSLs, almost all chemicals were dropped from being carried forward to the risk assessment. The following revisions to the report are needed to support corrective action complete (CAC) without controls:
 - a. If the maximum detected concentration exceeds the background reference values and a statistical evaluation of site data to background data was/is not conducted, then the constituent must be retained as a COPC and evaluated in the risk assessment.
 - b. For SD012, arsenic, cadmium, chromium, lead, mercury, selenium and zinc should have been retained as COPCs through comparison of the site maximum to the background reference value. Barium, copper, iron and nickel had levels below the background reference values. In comparing the site maximums to the current (2017) NMED SSLs, it is likely that the site will meet residential hazard and may slightly exceed residential risk. It is likely use of a 95% upper confidence level of the mean (95UCL) as the exposure point concentration in lieu of the maximum detected concentration would resolve the cancer risk issues. However, in order to obtain CAC with no controls, the cumulative risk/hazard for SD012 (per Section 5.0 of the NMED SSG) must be completed and provided in the report.
 - c. For SD017, alpha chlordane, gamma chlordane, 2,4-D, 4,4-DDD, 4,4-DDE, 4,4-DDT, dieldrin, heptachlor epoxide, and toxaphene should have been retained as COPCs. Arsenic and mercury were below the background reference values. In comparing the

site maximums to the current (2017) NMED SSLs, it is likely that the site will meet residential risk and hazard. However, in order to obtain CAC with no controls, the cumulative risk/hazard for SD017 (per Section 5.0 of the NMED SSG) must be completed and provided in the report.

- d. For SD020, JP-4, acetone, 2-butanone, ethylbenzene, methylene chloride, toluene, xylene (total), 2-methylnaphthalene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, aluminum, barium, cadmium, calcium, chromium, cobalt, copper, iron lead, magnesium, manganese, mercury, nickel, selenium, sodium, and zinc should have been retained as COPCs. Arsenic, beryllium, potassium, silver, and vanadium concentrations are below the background reference values. In comparing the site maximums to the current (2017) NMED SSLs, chromium appears to drive cancer risk. Additional evaluation, to include calculation of the 95UCL may be needed to show the site meets residential cancer risk levels. For site hazard, it is likely that the hazard index will be above the target level of one as driven by several metals; it is possible that mitigation of the excess hazard may be determined through use of the 95UCLs for the exposure point concentrations. In order to obtain CAC with no controls, the cumulative risk/hazard for SD017 (per Section 5.0 of the NMED SSG) must be completed and provided in the report.
 - e. The site maximum detected concentration for JP-4 exceeds the NMED SSL for petroleum hydrocarbons at SD-020. In reviewing the 2014 Work Plan and this report, JP-4 was detected in four of 13 samples. Information was not included to show the locations of the four detections or a table summarizing the range of detections. As such, it is not clear whether there is a hot spot or any trend in the data. It is unclear whether the highest detected concentration was co-located with the other maximum detections for organics. In addition, a discussion of whether sampling at these locations showed detections of the underlying constituents (e.g., BTEX) should be provided. As such, additional discussion of the JP-4 detections is needed in order to obtain CAC without controls.
2. It is noted that in previous comparisons of site data to the NMED SSLs, the total chromium data were compared to the trivalent chromium screening level. It is not clear, but it appears that no speciation of chromium was conducted as part of the 1997 background study and that the background data for chromium represents total chromium. As such, site concentrations of chromium should be compared to the NMED SSLs for total chromium. Comparison to the trivalent SSL will likely result in an underestimation of risk. If background chromium data has been speciated and results indicate background levels of chromium are primarily due to trivalent chromium, the trivalent chromium SSLs may be applied.
 3. The 1992 RFI Addendum provided an ecological risk assessment that included SD020. The assessment grouped four sites (RAA3): SD017, SD020, SWMU 101 and SWMU 102. The assessment included metals and organics and evaluated impacts to the deer mouse, with results indicating no adverse impact. However, in looking at the COPCs included in the RAA3 assessment, the volatile organic compounds and semivolatile organic compounds detected at SD020 (listed on Table 2-9 of the current report) were not included as COPCs.

As such, additional justification is needed to demonstrate that there is no ecological risk at SD020. It is recommended that the methodology in Volume II of the 2017 NMED SSG be applied in assessing ecological risk for the site.

4. Several volatile organics (VOCs) were detected at SD020. In accordance with the NMED SSG, detection of VOCs renders the vapor intrusion pathway as potentially completed and an evaluation of the vapor intrusion pathway is required. Since the VOCs were minimally detected, there is no continual source for the chemicals, and the concentrations decreased with depth, only a qualitative discussion is required.

Specific Comments

1. Section 2.2.2.2, 1990 Remedial Investigation (Walk Haydel 1990). The 1990 Remedial Investigation for SD012 concluded there were no metals (selenium) above background and that an ecological risk assessment was not completed. An ecological risk assessment must be provided to justify CAC with no controls.
 - a. Since the time of this document, additional data have been collected for the site. As listed in Tables 10-2 (a and b) of the RFI report, several metals have site (maximum) concentrations above background. Unless additional analyses are conducted to demonstrate that these metals are not statistically different from background, there are several COPCs that should be retained for the ecological screening assessment.
 - b. Table 2-5 lists a 2009 ecological screening level (ESL) for arsenic. The NMED SSG provides ESLs that should have been used. Given the size of SD012, the deer mouse, horned lark and plants should have been evaluated as potential receptors. The current Tier 1 ESL for arsenic is 9.45 mg/kg. It is recommended that the methodology in Volume II of the 2017 NMED SSG be applied in assessing ecological risk for the site.
 - c. Cumulative risk (hazard) to each ecological must include all COPCs. Simple point to point comparisons are not acceptable for eliminating ecological risk. In reviewing the data, it is likely that a more refined screening assessment may be needed, to include determination of 95UCLs and use of Tier 2 methods. It is recommended that the Volume II of the 2017 NMED SSG Tier 2 methodology be applied in assessing ecological risk for the site.
2. Section 2.3, RI for 18 SWMUs (W-C 1992). The 1992 RFI Addendum provided an ecological risk assessment that included SD017. The assessment grouped four sites: SD017, SD020, SWMU 101 and SWMU 102. The assessment included metals and organics and evaluated impact to the deer mouse, with results indicating no adverse impact. Given the size of SD017 (less than 10 square feet) the overall impact to ecological populations would be minimal as the area of SD017 is less than 10% of the home range for either the deer mouse or the horned lark. It is agreed that additional ecological screening is not required for SD017 to demonstrate CAC with no controls.

3. Section 3.5.3, Comparison of Arsenic Concentrations to Background Levels. A comparison of site concentrations to background levels was conducted using a tiered approach. If the site maximum detected concentration was greater than the background reference value, a comparison to the range of background was conducted. In the event that the maximum concentration fell above the range of background, a statistical comparison was done. The NMED SSG does not allow for comparison of site data to the range of background. As noted in Section 2.8.3.2 of the SSG, if the maximum site concentration is greater than the background reference value, a two-sample hypothesis test should be used to compare the data distributions. Under certain circumstances, comparison to the range may be applicable. NMED will allow the comparison to the background dataset range for the identification of COPCs if nature and extent has been defined and only when sufficient samples are not available to conduct a statistical analysis. The comparison must be coupled with multiple lines of evidence to include looking at the number of detections versus total number of samples, history of the site (as best known), and locations (to define any spatial variation or trend). If there is site history to suspect the constituent to be present from site activities, then it would be possible that the constituent could be present from historical activities at low levels (in the high range of background). In these cases, the constituent still must be carried forward as a COPC and retained in the risk assessment (it will likely not be a risk driver). For sites SD-012, SD-017, and SD-020, arsenic was the only identified COPC. Data were compared to the background reference value (revised) followed by a statistical evaluation to eliminate arsenic from further evaluation in the risk assessment. Since arsenic was not eliminated using the Tier 2 process, the site attribution analyses for arsenic are acceptable.
4. Section 5.6, Site Conceptual Exposure Model. This section appears to present a revised exposure model based on the results of the risk screening. The risk screenings provided in this report do not adequately address all COPCs nor do they evaluate cumulative risk/hazard. As noted in General Comment 1, the risk assessments must be re-evaluated in order to meet CAC with no controls for SD012, SD017, and SD020. The revised site conceptual models will require modification upon completion of the revised assessments.