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Mr. James Bearzi
Mr. Dave Cobrain
Hazardous Waste Bureau
2905 Rodeo Park Dr. E/Bldg 1
Santa Fe, NM 87505

RE: Draft Evaluation of the Human-Health and Ecological Screening Assessment for the Technical Area 16 Burn Ground, Revision 2, Proposed Exhibit HHH.

Dear Mr. Bearzi and Mr. Cobrain:

This letter addresses Los Alamos National Laboratory's (LANL) Revision 2 to the Human Health and Ecological Risk Assessments conducted to support the permitting of the Open Burning Treatment Units at Technical Area 16 (TA-16-388 and TA-16-399). As part of this review, it was assumed that all the data collected to support this evaluation have been reviewed, validated, and deemed acceptable for use in a risk assessment.

LANL concluded that there are no potential unacceptable risks to human and ecological receptors at the TA-16 burn ground due to past site activities. This conclusion was reached through an assessment of surface soil data (31 samples for inorganic chemicals and 36 soil samples for organic chemicals). The following comments outline concerns with the revised assessment and conclusions.

In the previous version of the LANL risk assessment (Revision 0, dated December 2009), a map showing the analytical results for metals detected above background reference values was not provided. In Revision 1 (dated January 8, 2010), maps for the constituents of potential concern (COPCs) barium, cadmium, and silver were provided, in addition to a map presenting the soil results for 2,3,7,8-TCDD toxic equivalent (dioxin/furan congener TEQ). The maps for barium, silver, and 2,3,7,8-TCDD TEQ indicate higher depositional concentrations to the north and to the east/southeast of both TA-16-388 and TA-16-399. Cadmium concentrations appeared to be more evenly dispersed across the site than the other COPCs. In order to understand these soil data distributions, a review of LANL's air dispersion modeling was conducted (*Los Alamos National Laboratory Technical Area 16 Burn Ground Air Pathway Assessment Report, Revision 0*, August 2007). The LANL air modeling appears to have focused on TA-16-388. In reviewing the maximum lofting and depositional flux maps contained within this report, there is a clear pattern of dominant lofting and deposition: the model predicted primary deposition would occur to the north and east/southeast of TA-16-388. Given the close proximity of TA-16-399 to TA-16-388 and location in similar terrain, it could be assumed that the depositional patterns from

historical burning activities at TA-16-399 would mimic those for TA-16-388. The data from the soil sampling conducted by LANL confirms the depositional predictions of their modeling.

LANL indicates in the summary of the risk assessment that elevated concentrations at the site (the TA-16 burn ground) could likely be due to historic operations at the site. LANL also indicates that that the higher levels of 2,3,7,8-TCDD TEQ may be due to other sources [solid waste management units (SWMUs) and/or areas of concern (AOCs)] to the east of the burn ground. Given that predicted depositional areas from the LANL air modeling were confirmed with actual soil data, it appears that the TA-16 burn ground has been impacted by historical burning activities and potential soil contamination from other sources is not likely. Furthermore, prior to selecting locations for soil samples, LANL mapped out areas that were thought to be impacted by other operations. The figures provided with the risk assessment show these SWMUs and AOCs in blue and green. LANL selected the locations of soil samples outside of these SWMU and AOC boundaries. As LANL selected the soil sample locations as being representative of TA-16 activities, the conclusion that other sites may have influenced the area is unsubstantiated.

LANL indicates that they have been conducting small animal biota studies to include potential impacts of 2,3,7,8-TCDD TEQ in Los Alamos, Pueblo, and Pajarito Canyons. LANL indicates that similar 2,3,7,8-TCDD TEQs are present in these other canyons where the conclusions from these biota studies are that no adverse impacts have been observed in small animals. LANL further states that while the risk assessment may indicate moderate risk, biota studies indicate no observable adverse impact. However, a quantitative analysis demonstrating that the data from Los Alamos, Pueblo, and/or Pajarito Canyon are not significantly different has not been provided. In addition, concentrations of dioxin/furan congeners in the dominant area of deposition at TA-16 are between one and several magnitudes higher than these comparative canyons. Therefore, no conclusion can be made that the results of the biota studies are appropriate and applicable to TA-16. Further, based on a preliminary read of the *Nest Box Monitoring Plan for the Upper Pajarito Canyon Watershed*, Los Alamos National Laboratory, dated December 2009, sufficient tissue samples to date have not been obtained to analyze for dioxins/furans, only metals. Therefore, on-going investigation, data, and evaluations appear to be needed to adequately evaluate the effect of dioxins/furans in Pajarito Canyon, at least for the nest box studies.

Per suggestion in previously submitted comments, LANL provided a more refined analysis of ecological risk using the lowest observed adverse effect level (LOAEL). There are some discrepancies with the data:

- The LOAEL-based hazard quotient presented in Table 2.2-6 for the TCDD[2,3,7,8-] equivalent for the area east of 16-0399 for the Montane shrew is listed as 0.004. However, it appears the result should be listed as 0.4. LANL should review the calculation and results accordingly. Note that this also pertains to Section 2.2.7 of the report.

- Section 2.2.7 of the report lists the LOAEL-based hazard quotient for the TCDD[2,3,7,8-] equivalent for the area east of 16-0399 for the Montane shrew as

0.03. The value should be listed as 0.3, consistent with the result provided in Table 2.2-6.

It is noted that if the TA-16 burn unit is permitted, the volume and type of waste streams will be decreased from past operations and donor material (fuel) will be cleaner burning (propane versus kerosene). In addition, limitations on treatment of chlorine-bearing wastes, as well as optimized thermal conditions (maintaining temperatures above 1400 F), will also reduce the potential for formulation and emission of dioxins/furans. These changes in waste streams and operating parameters will result in changes in chemical emissions and subsequently changes in the amount and type of chemicals ultimately deposited on soil. However, this information is not provided in the risk assessment. If the risk assessment is intended to both demonstrate that past activities have not resulted in adverse risk as well as be used as a predictive assessment to demonstrate that continued operations would be protective, discussion on future operating conditions should be provided and a discussion of how changes in operations and waste streams could affect risks should also be addressed in the Uncertainty Analysis.

It is recommended that if the unit is permitted, an aggressive soil monitoring program be in place to evaluate annual conditions from operation of the TA-16 burn units. Analysis of samples should include a full suite of potential constituents (organics and inorganics), as this risk assessment only evaluated risk to those chemicals predicted to be risk drivers based on results of the air modeling. It is likely that organics are present in soil and may contribute to overall risk to both human and ecological receptors. An annual update to the human health and ecological risk assessments should be conducted using soil compliance data. In addition, a trend analysis is also recommended to see if there are detectable increases in soil concentrations and risk. It is also recommended that permit conditions be in place that allow for immediate termination of the TA-16 burn unit by NMED and initiation of closure activities and corrective action in the event that compliance monitoring indicates increasing contaminant trends in soil and/or adverse impacts to human health or the environment.

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

Thank you,

Paige Walton

Paige Walton
AQS Senior Scientist and Project Lead

cc: Joel Workman, AQS (electronic)