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November 30, 2012

DCN: NMED-2012-28

Mr. David Cobrain
NMED - Hazardous Waste Bureau
2905 Rodeo Park Dr. East
Building One
Santa Fe, NM 87505

RE: Draft Technical Review Comments on the Corrective Measures Evaluation Report for Materials Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50, provided by Los Alamos National Laboratory, Dated September 2012

Dear Mr. Cobrain:

Attached please find draft technical review comments on Los Alamos National Laboratory's (LANL) "Corrective Measures Evaluation Report for Materials Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50," dated September 2012. The report provides the assessment of corrective measure alternatives for the Area C hazardous and radiological waste landfill at Technical Area 50 at LANL.

Overall the CME Report for MDA C is adequate, and is similar in format to other CME Reports prepared for landfill waste disposal sites at MDAs G, H, and L. There are portions of the MDA C document that include new content in comparison to previous CME Reports, and it appears that LANL has been responsive to our previous concerns raised for the other sites. We agree that a functional ET cover is the preferred alternative, and we recognize that the Permittee will defer the design details to the CMI design. Also similar to the other CME Reports, we find that the estimated costs for landfill cover alternatives appear inflated.

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
AQS Senior Scientist and Project Lead

Enclosure

cc: Ben Wear, NMED (electronic)
Kent Friesen, Wyoming Environmental (electronic)
Joel Workman, AQS (electronic)

The contents of this deliverable should not be evaluated as a final work product.

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Draft Technical Review Comments on the Corrective Measures Evaluation Report for Materials Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, provided by Los Alamos National Laboratory
Dated September 2012

GENERAL COMMENTS

The following general comments are presented for NMED's information, and therefore are not necessarily recommended as comments for LANL.

1. The format and content of the MDA C CME Report are largely similar to the latest versions of the previously submitted CME Reports for MDAs G, H, and L. The following portions of the MDA C CME Report, however, were noted to be significantly different from the previous CME Reports:
    - The description of the "Soil Barrier" technology (a subset of Surface Barriers) presented in Section 6.2.1.4 is mostly new text. This technology was combined with Natural Attenuation in Section 7 as a stand-alone alternative for evaluation. This Alternative 2 Soil Barrier and Natural Attenuation was retained for MDA C for additional evaluation, although this alternative was not evaluated in other CME Reports (i.e., MDA G). Overall we agree with this approach for MDA C, since Alternative 2 represents an intermediate level of effort between No Action and engineered covers with SVE.
    - In Section 6.3.1, Soil Barrier and Biointrusion Barrier were included as retained containment technologies. In Section 6.3.2, Natural Attenuation was retained as an in situ treatment technology. In Section, 6.3.4, Elementary Neutralization was added as an ex situ treatment technology.
    - In Section 9.2, the last paragraph in this section appears to be new, and endeavors to validate the selected remedy in light of DOE's 1000 year requirements. This is a useful addition to the document.
    - In Appendix J, Sections J-1.0 and J-2.0, and many portions of Section J-3.0, provide new text description of the ET cover conceptual design, which is also a useful addition to the document and the path forward towards CMI design.
2. The Appendix D description of the characteristics of the TCE vapor plume represents a nice piece of work, and overall provides a valuable and clear description of the subsurface soil vapor plume. We agree with the evaluation of the entire data set, rather than separating the data into stratigraphic zones (as described in Section D-2.2, 2nd paragraph). The temporal trend analysis provided for each data point also was useful and provides a good summary of the TCE data. The text Section 3.2.4 Tier II screening criteria discussion was relatively complex, and frankly, was not thoroughly evaluated.

SPECIFIC COMMENTS

1. **Pg. 23, Section 3.2.4.2 Tier II screening.** We concur that the Tier II screening evaluation indicates areas with TCE exceedances are bounded by non-exceeding sample locations. This indicates that TCE in soil vapor presents a potential risk to groundwater, which is subsequently addressed by SVE in the remedial alternatives. We caution against conceding

to LANL's proposed Tier II levels as the basis of discontinuing SVE treatment in the future (per Appendix H).

2. **Pg. 30, Section 4.6 Receptors and Risks, first bullet at top of page.** Occupational risk standards should not be the only consideration regarding vapor intrusion into buildings, given the existing state of the practice with regards to modeling or measuring indoor air concentrations of VOCs for risk assessment. A similar comment has been provided for other CME Reports. Also, regarding "under future conditions" on the same page, second bullet, the citing of OSHA standards "as long as institutional controls are maintained" is obviously inconsistent with the preceding statement (in the introductory text paragraph) that institutional controls are assumed to cease for future conditions.

3. **Pg. 37, Section 6.2.1.4, Compacted Clay Cover.** Regarding the "Mulder and Haven, 1995" reference, this reference is a California Integrated Waste Management Board report. Suggest providing a more robust or widely distributed reference for generally recognized potential problems with clay covers in arid climates.

4. **Pg. 48, Section 7.2.3, 5th bullet.** Please verify if 50% slope is accurate; this appears extreme and does not seem to be supported by the grades shown on Figure 7.2-1. Please reconcile with the statement on Pg. 51, 2nd to last paragraph, indicating "cover has little slope."

5. **Pg. 48, Section 7.2.3, 8th bullet on page.** Respondents should provide additional verbiage concerning the potential extraction and off gas emission of tritium during SVE. The explanation in Appendix G, pg. G-6, 3rd paragraph indicates that the tritium concentrations in SVE emissions are predicted to be very low and therefore not require permitting. However, other portions of the report suggest tritium emissions could be an issue; therefore, we suggest providing additional reference to this Appendix G conclusion. For example, page 48, Section 7.2.3, second set of bullets, third bullet indicates that off gas from the SVE unit will be treated with granular activated carbon; please discuss the possible need for tritium removal. Appendix E, pg. E-8, paragraph E-4.5, first sentence indicates that "the primary vapor-phase contaminants beneath MDA C are TCE and tritium." P. G-4, 2nd paragraph, last sentence, "...tritium results show consistently elevated levels at several locations..." Pg. G-5, 2nd paragraph, 2nd sentence, indicates that "... (tritium) detections above Tier II screening levels... were consistent with distribution of VOCs above Tier II screening levels." Pg. G-6, 2nd paragraph indicates that the tritium removal efficiency is expected to be very low with SVE.

6. **Pg. 51, Section 7.2.4.** In the 2nd full paragraph, fifth sentence, we agree that moisture monitoring will need to be performed under the ET cover.

7. **Pg. 59, Section 8.2.3.5 Cost (Multilayer Cover).** *As previously discussed for MDAs G, H and L,* costs for the multilayer cover appear inflated. Direct capital cost for the cover is $14.6 million for the 11 acre cover, which is over $1 million per acre. Other sources (ITRC, 2003) publish comparable costs for a RCRA Subtitle C Cover of about $150,000 per acre, so that LANL's estimate is much greater compared to published sources.

8. **Pg. 61, Section 8.2.4.5 Cost (ET Cover).** *As previously discussed for MDAs G, H and L,* costs for the ET cover appear inflated. Direct capital cost for the cover is $13.8 million for the 11 acre cover, which is over $1 million per acre. That is considerably more than the

<$50K to $375K per acre encountered in published sources (such as ITRC, 2003; AFCEE, 1999; EPA, 2011). Therefore, LANL's estimate is much greater than published sources.

9. **Pg. 69, Section 10.2.2 Cover Soil**. The ET cover soil layer is arguable the most critical portion of the cover design. The suitability of local materials (such as crushed tuff) for an ET cover at MDA C has not yet been demonstrated. Site-specific testing of the borrow material to be used (as amended if needed) will be required prior to approval of the CMI design.
10. **Figure 3.2-2**. In Section C-C', it appears that the Qct Cerro Toledo interval has been mistakenly labeled as Qbtt Tsankawi Pumice.
11. **Table 2.4-2 Monitoring Plan:** Please add a definition for the "T" designation under Explosive Compounds for wells PCI-2 and R-17.
12. **Appendix H, Pg. H-6, Section H-2.8 Shutdown Parameters**. We agree that there is value in discussing the exit strategy for the SVE system. We recognize that asymptotic removal rates can be used as a basis for future decisions to temporarily or permanently cease operations of the SVE system in conjunction with attainment of agreed-upon soil vapor remediation standards.
13. **Appendix J, Pg. J-5, Section J-3.3.1, 2nd to last paragraph.** Since the modeled cover thickness (6.6 ft) for TA-61 soils is greater than the modeled thickness (5 ft) from the Rosetta "sandy loam soil", and since the TA-61 borrow area soils are presumably the source for cover material, it is still apparent that an appropriate source of soil material for the ET cover reservoir layer has not been demonstrated. Any amendments proposed for use within the ET cover soil materials must also be evaluated using site-specific testing. A pre-design work plan should be submitted that describes the potential soil borrow sources, and proposed soil sampling and testing, to be performed for this demonstration. The CMI should include re-evaluation of an appropriate hydrologic model using site-specific parameters, as well as post-construction performance monitoring of moisture infiltration through the cover.
14. **Page J-17, Table J-1.0-1, Subgrade.** Prior to covering, the compacted subgrade layer must also be graded to slope towards the cover edges, thereby avoiding potential drainage accumulations of moisture infiltrating through the ET cover. This measure will provide a contingency for potential failure of the cover resulting in excess infiltration.