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ENTERED
560 Golden Ridge Road, Suite 130
Golden, CO 80401
(303) 763-7188
(303) 763-8889 FAX
www.techlawinc.com

October 26, 2005

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303



Reference: Work Assignment No. 06110.290.0002; State of New Mexico Environment Department, Santa Fe, New Mexico; Human Health and Ecological Risk Assessment Support; Review of Appendix E of the CU 19-001-99 Remedy Completion Report, Los Alamos National Laboratory, New Mexico, Task 2 Deliverable.

Dear Mr. Cobrain:

Enclosed please find the deliverable for the above-referenced work assignment. The deliverable consists of review comments on Appendix E of the "CU 19-001-99 Remedy Completion Report" for Los Alamos National Laboratory, New Mexico, dated July 2005. As noted in the submittal memorandum from Ms. Darlene Goering, the review was to focus on the human health and ecological risk assessments and whether there was sufficient site characterization data to complete these analyses.

For the human health risk assessment, data up to a depth of six (6) feet below ground surface (ft bgs) was used. As noted in the attached deliverable, there is concern that adequate characterization of the subsurface soil/tuff has not been conducted. When reviewing the data provided in Section 4.2-5, there is a trend of increasing concentration with depth for some of the metals, in particular, chromium and cobalt. As the maximum detected concentrations occur at six (6) and 5.5 ft bgs, there is uncertainty as to the extent of contamination. In addition, the report indicates that some of the releases to the soil/tuff were from a sewer/septic system and drainline. Therefore, at a minimum, samples should have been collected to a depth of 10 ft bgs. If clean closure of the site is the intended outcome, then the residential scenario should be based upon a depth of ten (10) feet below ground surface. It appears that additional data may be warranted and that the risk assessment may need to be revised to incorporate this data.

For the ecological risk assessment, typically a depth of 0-10 feet is evaluated. However, a more shallow soil interval may be appropriate if deeper burrowing animals are not present. The report (Section E-1.2) indicated that the Ecology Group did not identify any



deep burrows or activity suggesting that deeper burrowing animals are present at the site. In addition, the presence of the tuff may limit the depth of burrowing. Therefore, additional subsurface soil data (to a depth of at least 10 feet) would probably not impact the ecological risk assessment as much as the human health evaluation. Thus, the ecological assessment was deemed acceptable based upon the current data set.

It is noted that screening levels were applied from a variety of sources, including the Soil Screening Levels (SSLs) for NMED and the Environmental Protection Agency (EPA) Region 6 SSLs. It is noted that the most conservative SSL was not always applied. However, a comparison to both the NMED and Region 6 SSL indicated that the exposure point concentrations were below both values. A comment has been drafted indicating that the more conservative of the Region 6 or the NMED SSLs should be used.

None of the constituents of concern (COCs) carried forward in the risk assessment were identified as volatile organic compounds (VOCs). VOCs are a concern when comparing site data to SSLs, as SSLs, typically do not incorporate the inhalation of VOCs from soil into indoor or outdoor air. Since none of the COCs were VOCs, there were no concerns for the exclusion of this pathway in the screening evaluation.

The document is formatted in Word. The deliverable was emailed to you on October 26, 2005 at David_Cobrain@state.nm.us to Ms. Darlene Goering at Darlene_Goering@state.nm.us. A formalized hard (paper) copy of this deliverable will be sent via mail. If you have any questions, please call me at (303) 763-7188 or Ms. Paige Walton at (801) 451-2978.

Sincerely,



June K. Dreith
Program Manager

Enclosure

cc: Darlene Goering, NMED
Ms. Paige Walton, TechLaw

TASK 2 DELIVERABLE

**REVIEW COMMENTS ON APPENDIX E
OF THE CU 19-001-99 REMEDY COMPLETION REPORT,
LOS ALAMOS NATIONAL LABORATORY, NEW MEXICO
DATED JULY 2005**

Human Health and Ecological Risk Assessment Support

Submitted by:

**TechLaw, Inc.
560 Golden Ridge Road
Suite 130
Golden, CO 80401-9532**

Submitted to:

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

In response to:

Work Assignment No. 06110.290

October 26, 2005

**REVIEW COMMENTS ON APPENDIX E
OF THE CU 19-001-99 REMEDY COMPLETION REPORT,
LOS ALAMOS NATIONAL LABORATORY, NEW MEXICO
DATED JULY 2005**

1. There is concern that adequate characterization of the subsurface soil/tuff has not been conducted. When reviewing the data provided in Section 4.2-5, there is a trend of increasing concentration with depth for some of the metals, in particular, chromium and cobalt. As the maximum detected concentrations occur at six (6) foot and 5.5 foot depths below ground surface (ft bgs), there is uncertainty as to the extent of contamination. In addition, the report indicates that some of the releases to the soil/tuff were from a sewer/septic system and drainline. Therefore, at a minimum, samples should have been collected to a depth of 10 ft bgs. If clean closure of the site is the intended outcome, then the residential scenario should be based upon a depth of ten (10) feet below ground surface. It appears that additional data may be warranted and that the risk assessment may need to be revised to incorporate this data.
2. This report provided a screening evaluation of human health and ecological risks to determine whether remedial action is warranted at the site. As part of an initial screening evaluation, the maximum detected site concentration is typically first used and not the 95% upper confidence level (95% UCL) on the mean. If the maximum detected site concentration exceeds a SSL, then additional analyses are conducted and the 95% UCL is then used as the exposure point concentration. It is noted that according to the "Screening-Level Ecological Risk Assessment Methods, Revision 2" (LA-UR-04-8246/ER2004-0519) either the maximum or the 95% UCL may be used, depending on sample size and spatial distribution. As there are concerns over the nature and extent of contamination at the site, a comparison of the site maximum detected concentrations to the SSL would be helpful in addressing uncertainties with characterization. Please provide a table comparing the maximum site concentrations to the appropriate SSLs. In addition, for future screening assessments, the site maximum detected concentrations are preferred as the first step in screening.
3. The report indicates that one of the land uses is for recreational activities. However, the report does not address comparison of site data to the Los Alamos National Laboratory recreational screening levels ("Draft Technical Approach for Calculating Recreational Soil Screening Levels for Chemicals" LA-UR-04-7743/ER2004-0610) nor does the report provide a comparison of recreational levels to residential levels. If a specific comparison to recreational levels is not to be conducted, then the report should provide a discussion indicating that the residential screening levels are more conservative than the recreational levels, and therefore, the risks to the recreationist would be less than those estimated for the resident. Please revise the report to provide this analysis and/or discussion.
4. It is noted that screening levels were applied from primarily two sources, including the Soil Screening Levels (SSLs) for NMED and the Environmental Protection Agency (EPA) Region 6 SSLs. It is noted that the most conservative SSL was not

always applied. For example, for polychlorinated biphenyls (PCBs), the Region 6 SSL is 2.22 mg/kg while the NMED SSL is 1.12 mg/kg. However, a comparison to both the NMED and Region 6 SSL indicated that the exposure point concentrations were below both values. However, the more conservative of the Region 6 or the NMED SSLs (or other screening levels applied) should be used. Please note this for future evaluations.

5. Section E-2.1, Historical Analytical Data, page E-5. The discussion of historical data indicates that Cesium-137 (Cs-137) and Europium-152 (Eu-152) were detected in soil and/or tuff. However, it is not clear that these radionuclides were evaluated in the risk assessment, as these radionuclides were not addressed in the tables or plots comparing site data to background. Please discuss the detected site concentrations in relation to background. If warranted, revise the risk assessment to address these radionuclides.
6. Table E-3.1-2 presents the carcinogenic screening evaluation for the constituents of concern. However, several chemicals with carcinogenic toxicity have been omitted, including beryllium, cadmium, and cobalt. Many chemicals exhibit both carcinogenic and noncarcinogenic toxicity, and both toxicities must be evaluated in a risk screen. Either provide justification for excluding these metals from the carcinogenic screening or revise the screening to include these metals.
7. Table E-3.1-3 presents the noncarcinogenic screening evaluation for the constituents of concern. However, several chemicals with noncarcinogenic toxicity have been omitted, including arsenic, chromium, bis(2-ethylhexyl)phthalate, isophrone, DDT, and dieldrin. Many chemicals exhibit both carcinogenic and noncarcinogenic toxicity, and both toxicities must be evaluated in a risk screen. Either provide justification for excluding these metals from the noncarcinogenic screening or revise the screening to include these metals.
8. Table E-3.1-3 lists the Soil Screening Level (SSL) for Uranium-235 (U-235) as 17 mg/kg. However, in reviewing "Derivation and Use of Radionuclide Screening Action Levels, Revision 1" (LA-UR-05-1849/ER2005-0127) the screening action level for U-235 is in units of pico Curie per gram (pCi/g) and not mg/kg. Therefore, the application of the SSL of 17 mg/kg is not correct. Using a basic conversion equation, 0.15 pCi/g of U-135 is equivalent to 1 mg/kg U-235. Therefore, the SSL in units of mg/kg should be 0.26 mg/kg. The 95% UCL for U-235 is listed as 0.26 mg/kg, which is essentially equal to the SSL. Therefore, U-235 does not appear to be present at levels above acceptable risk limits. However, please verify the SSL for U-235 and verify the units for the screening level.