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DCN 06280.100.ID.014

February 4, 2008

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

MAR 10 2008

Reference: Work Assignment No. 06280.100.0002; State of New Mexico Environment Department, Santa Fe, New Mexico; LANL Risk Assessment Support; Technical Evaluation of the Response to the Notice of Disapproval for the Consolidated Units 16-007(A)-99 and 16-008(A)-99 at Technical Area 16 Los Alamos National Laboratory (LANL) EPA ID No: M0890010515, HWB-LANL-07-038, Los Alamos, New Mexico dated January 21, 2008; Task 2 Deliverable.

Dear Mr. Cobrain:

Enclosed please find the deliverable for the above-referenced work assignment. The deliverable consists of a technical evaluation of the Response to the Notice of Disapproval for the Consolidated Units 16-007(A)-99 and 16-008(A)-99 at Technical Area 16 Los Alamos National Laboratory (LANL), Los Alamos, New Mexico dated January 21, 2008. TechLaw Inc. (TechLaw) also reviewed the redlined version of Investigation Report for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16, Revision 1.0 dated January 2008 and Appendix J, Risk Assessment, to determine if information provided in the response document was incorporated into the report and/or the accompanying appendix. Further, LANL submitted spreadsheet files containing output data (i.e., exposure point concentrations) from the ProUCL model. TechLaw performed spot checks of the output values to ensure that the expected values were extracted from the output for use in the risk analyses. As directed by NMED, TechLaw limited its evaluation to responses provided on the human health and ecological risk assessment comments (i.e., technical review comments 6 through 17).

As a result of the evaluation, it was determined that:

- The issues raised in technical review comments 8, 12 through 15, and 17 were adequately addressed by the facility responses;
- The issues raised in technical review comments 6, 7, 9, 10, and 16 were partially addressed by the facility responses; and
- The issue raised in technical review comment 11 was not addressed by the facility response.



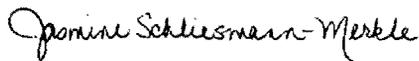
Mr. Dave Cobrain
February 4, 2008
Page 2

According to the response to technical review comment 11, LANL has chosen to exclude the requested receptor-specific ecological risk characterization summaries. In their response, LANL correctly states that the requested integration of receptor-specific lines of evidence into receptor-specific risk characterizations is not necessary to conclude that no potential ecological risk is present. However, the current presentation is unclear and challenges the reader to assemble information from a myriad of locations in order to follow the flow of the text. For example, major refinements to the risk results are presented in the uncertainty analysis (e.g., comparison of concentrations to background levels, application of area use factors) and are not clearly described in the text. Further, Section J-5.6, Interpretations, offers no discussion of the results and merely states that all chemicals of potential ecological concern (COPECs) at both consolidated units were eliminated in the analysis. The additional discussions requested in the original comment were intended to provide readers with a comprehensive summary that integrated the lines-of-evidence used in developing risk estimates for ecological receptor populations with those estimates. If LANL chooses to exclude the requested risk characterization summaries from the revised version of Appendix J, several key references should be provided to assist the reader in locating important information. To promote clarity and transparency in the presentation of information related to the ecological risk assessment, the response evaluation recommends that additional references to Attachment J-1 be included in Section J-5.2 and that Section J-5.6 be revised to reference the separate sections of Section 5.0 used to support the elimination of all 18 COPECs identified at the two consolidated units.

Where other concerns remain, the response evaluations identify the outstanding issues and provide instruction on how they should be addressed.

The document is formatted in MS Word. The deliverable was emailed to you today at dave.cobrain@nmenv.state.nm.us and to Ms. Neelam Dhawan at neelam.dhawan@.state.nm.us. A formalized hard (paper) copy of this deliverable will be sent via U.S. Mail. If you have any questions, please call me at (770) 752-7585, extension 105 or Ms. Claire Marcussen at (352) 332-0669.

Sincerely,



Jasmine Schliesmann-Merkle
Vice President

Enclosure

cc: Ms. Neelam Dhawan, NMED
Ms. Claire Marcussen, TechLaw
Mr. Michael S. Smith, TechLaw

TASK 2 DELIVERABLE

**TECHNICAL EVALUATION OF THE
RESPONSE TO THE NOTICE OF DISAPPROVAL FOR THE
CONSOLIDATED UNITS 16-007(a)-99 AND 16-008(a)-99 AT TECHNICAL AREA 16
LOS ALAMOS NATIONAL LABORATORY (LANL)
EPA ID No: NM0890010515, HWB-LANL-07-038
LOS ALAMOS, NEW MEXICO**

JANUARY 21, 2008

LANL Risk Assessment Support

Submitted by:

**TechLaw, Inc.
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Alpharetta, GA 30004**

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. 06280.100.0002

February 4, 2008

**TECHNICAL EVALUATION OF THE
RESPONSE TO THE NOTICE OF DISAPPROVAL FOR THE
CONSOLIDATED UNITS 16-007(a)-99 AND 16-008(a)-99 AT TECHNICAL AREA 16
LOS ALAMOS NATIONAL LABORATORY (LANL)
EPA 1D No: NM0890010515, HWB-LANL-07-038
LOS ALAMOS, NEW MEXICO**

JANUARY 21, 2008

TECHNICAL REVIEW COMMENTS

6. Appendix J, Risk Assessment, Section J-2.2, Investigation Sampling and Determination of Chemicals of Potential Concern, Page J-4

The discussion on Page J-4 indicates that the exposure scenarios addressed in the human health risk evaluation utilized analytical results between 0 and 11 feet (ft) below ground surface (bgs). How will LANL ensure that potential receptors are not exposed to contamination at depths greater than 11 feet bgs? For example, what controls will be implemented to prevent excavations deeper than 11 feet bgs in these areas?

LANL Response 6. The construction worker and residential scenarios typically assess contamination in the 0–10-ft-depth interval. This depth interval is based on NMED technical guidance (NMED 2006, 092513). The depth interval may be below 10 ft if the sampling interval started less than 10 ft and ended greater than 10 ft. LANL has several processes in place to protect future construction or utility workers from exposure to potential site contamination below 11 ft. Both the excavation permit process and the permits and requirements identification (PR-ID) process ensure that anyone conducting ground-breaking activities in the vicinity of a solid waste management unit or an area of concern is notified about any potential risks and that proper controls are put in place to prevent potential exposures. Contaminant data for sites undergoing construction are evaluated during the safety planning for the construction activity.

Evaluation of LANL Response 6 The response is partially adequate. The information provided in LANL Response 6 addresses the concern raised in the original comment. However, the information has not been incorporated into Appendix J of the Investigation Report (IR). Please revise Section J-2.2 of Appendix J to include the following text from LANL Response 6:

LANL has several processes in place to protect future construction or utility workers from exposure to potential site contamination below 11 ft. Both the excavation permit process and the permits and requirements identification (PR-ID) process ensure that anyone conducting ground-breaking activities in the vicinity of a solid waste management unit or an area of concern is notified about any potential risks and that proper controls are put in place to prevent potential exposures. Contaminant data for

sites undergoing construction are evaluated during the safety planning for the construction activity.

7. Appendix J, Risk Assessment, Section J-3.3, Exposure Point Concentrations, Page J-10

Section J-3.3 indicates that ProUCL 4.0 was used to calculate the majority of the exposure point concentrations (EPCs) used in the human health risk evaluation. However, the ProUCL input and output files were not included with the IR. Please submit electronic copies of the ProUCL 4.0 input and output files used in estimating EPCs to the New Mexico Department of the Environment (NMED). This information is needed to review the application of ProUCL 4.0 and confirm the reported results.

LANL Response 7. Per discussions with NMED representatives on January 8, 2008, this information has not been required or provided as part of previous IRs. An electronic copy of the ProUCL input and output files is provided on the CD included with this NOD response.

Evaluation of LANL Response 7 The response is partially adequate. ProUCL files were provided for review. A spot check of the ProUCL files for the residential and construction scenarios revealed several discrepancies with the EPCs shown in Table J-2.2-3, Exposure Point Concentrations for Consolidated Unit 16-007(a)-99 for the Residential and Construction Worker Scenarios (0-11 ft bgs depth). For example:

- ProUCL recommended a value of 4.909 milligrams per kilogram (mg/kg) for fluoride. However, Table J-2.2-3 lists a fluoride EPC of 4.807 mg/kg.
- In the majority of cases, a 95% upper confidence level (UCL) calculated by ProUCL is used as the EPC in the risk assessment, even in cases where ProUCL recommends the use of a 99% UCL. However, it was noted that a 99% [KM(Chebyshev)]UCL is listed in Table J-2.2-3 for Amino-2,6-dinitrotoluene[4-]. It is not clear why the 99% UCL was used in this case.

Please ensure that Table J-2.2-3 reflects the EPC value used in the risk and hazard calculations. Where that value differs from a value calculated by ProUCL (typically ProUCL calculates multiple EPCs for a data set), the IR should acknowledge and explain the difference. Please revise the IR to address these issues.

8. Appendix J, Risk Assessment, Section J-4.1, Soil Screening Levels, Page J-11

The first paragraph of Section J-4.1 states "For COPCs for which no NMED value is available, EPA Region 6...or EPA Region 9...screening values were used and adjusted to the 1×10^{-5} target level." The text neither identifies the chemicals of potential concern (COPCs) adjusted nor illustrates the calculation method used to effect the adjustment. Please revise Section J-4.1 to include a list of COPCs for which no NMED screening level was available and an alternate screening level was taken from another source and adjusted to a 1×10^{-5} target risk. Further, revise the text to include a numerical example illustrating the calculation method employed in adjusting the target risk. The example should delineate each parameter

in the calculation of the alternate screening value and then show how the target risk was shifted to 1×10^{-5} to obtain the value used by LANL.

LANL Response 8. Text indicating how screening values were adjusted has been added to Section J-4.1. Sources of screening levels are footnoted in the appropriate tables called out in Section J-4.2 (i.e., Tables J-4.2-1, J-4.2-2, J-4.2-3).

Evaluation of LANL Response 8 The response adequately addresses the issue raised in the original comment.

9. Appendix J, Risk Assessment, Section J-4.3.2, Exposure Evaluation, Page J-13

The last paragraph of Section J-4.3.2 indicates the EPCs for inorganic COPCs are similar to background concentrations. The discussion continues that if aluminum and manganese were removed from the hazard index (HI) calculation based on background considerations, the calculated HIs for the construction worker would fall below the NMED target HI of 1.0 for both 16-007(a)-99 and 16-008(a)-99. The text offers no other information supporting this claim. It is recommended that Section J-4.3.2 be revised to refer the reader to a quantitative analysis within the IR that demonstrates detected concentrations of inorganic COPCs are indistinguishable from background concentrations.

LANL Response 9. The text in Section J-4.3-2 has been revised to include a comparison of EPCs for some inorganic COPCs to background concentrations to demonstrate the similarity of EPCs to background.

Evaluation of LANL Response 9. The response is partially adequate. The revision to Section J-4.3-2 of Appendix J provides some additional background values (e.g., maximum background concentration for manganese in tuff of 752 mg/kg) and expands the argument to include iron. However, the source of the background values or a summary of how they were determined is not provided. Please revise the discussion in Section J-4.3.2 to reference project documents describing how the cited background levels were determined and list the referenced documents in Section J-8.0, References.

10. Appendix J, Risk Assessment, Section J-4.4, Interpretation, Page J-15

The interpretation of the human health risk evaluation for Consolidated Unit 16-007(a)-99 notes that the HI for the construction worker (reported as 8.7 in Section J-4.3.2, Exposure Evaluation) was above the NMED target HI of 1.0. The discussion further notes that the HI is reduced to approximately 1.0 "...based on the uncertainty analysis..." presented in Section J-4.3. While Section J-4.3 identifies and discusses various sources of uncertainty inherent in the human health risk evaluation, sufficient information to support a decrease in the calculated HI is not provided. Neither is sufficient information furnished in Section J-4.4. Please revise the interpretation of the HI for the construction worker at Consolidated Unit 16-007(a)-99 to include or reference the location within the IR of a quantitative analysis, based on site data, demonstrating that the EPCs for aluminum and manganese are indistinguishable

from background concentrations. If such a presentation cannot be provided, present the HI of 8.7 for the construction worker as a final result of the human health risk analysis.

The interpretation of the human health risk evaluation for Consolidated Unit 16-008(a)-99 notes that the HI for the construction worker (reported as 3.8 in Section J-4.3.2, Exposure Evaluation) was above the NMED target HI of 1.0. The discussion further notes that the HI is reduced to approximately 0.2 "...based on the uncertainty analysis..." presented in Section J-4.3. While Section J-4.3 identifies and discusses various sources of uncertainty inherent in the human health risk evaluation, sufficient information to support a decrease in the calculated HI is not provided. Neither is sufficient information furnished in Section J-4.4. Please revise the interpretation of the HI for the construction worker at Consolidated Unit 16-008(a)-99 to include or reference the location within the IR of a quantitative analysis demonstrating that the EPCs for aluminum and manganese are indistinguishable from background concentrations. If this cannot be provided, present the HI of 3.8 for the construction worker as a final result of the human health risk analysis.

LANL Response 10. The text in Section J-4.4 has been revised for both consolidated units to refer to Section J-4.3.2 of the uncertainty analysis for a quantitative analysis demonstrating that the EPCs for inorganic COPCs are within the range of background concentrations. See the response to specific comment 9.

Evaluation of LANL Response 10 The response is partially adequate. Once the remaining issues surrounding specific comment 9 are resolved, the issues raised in specific comment 10 will be adequately addressed.

11. Appendix J, Section J-5.0, Ecological Risk Screening Evaluations, Page J-15; and J-5.5.6 Population Area Use Factors, Page J-21

Terrestrial receptors were the focus of the entire ecological risk screening effort to determine site ecological risk conditions. However, the risk conclusions do not thoroughly describe any receptor-specific lines of evidence that characterize realistic considerations typically described within the risk characterization (e.g. exposure pathway completeness to subsurface soil, size of area in relation to habitat or home range, etc.). The only receptor specific considerations used in the document are the use of population area use factors (AUFs) as part of the hazard quotient process. However, there is no supporting narrative within the text that incorporates these lines of evidence into the risk characterization. It is recommended that a summary risk characterization be written for each receptor evaluated. These summary descriptions should describe the realistic exposure settings, the uncertainties identified in the characterization process and a summary of any risk concerns.

LANL Response 11. The ecological risk screening evaluations (Section J-5.0) are organized and presented consistently with previous risk screening assessments. Per the January 7, 2008, discussion with NMED representatives, the summary risk characterizations requested in the comment have not been required in previous investigation reports and are not necessary to conclude that no potential ecological risk is present. Each receptor and chemical of potential ecological concern (COPEC) is

evaluated in the HI analysis, and the results are presented in the tables and text. Specific receptors are discussed if the HIs are above 1.0, as is the case in Section J-5.5.6. The receptors and screening methods are as described in LANL guidance (LANL 2004, 087630), which has been approved by NMED and is consistent with Consent Order requirements. The current level of discussion has been acceptable to NMED for the ecological risk screening evaluations in numerous reports.

Evaluation of LANL Response 11. The response does not address the issue raised in the original comment. LANL states that the integration of receptor-specific lines-of-evidence into receptor-specific risk characterizations is not necessary to conclude that no potential ecological risk is present. While this assertion is correct, the current presentation is unclear and challenges the reader to assemble information from a myriad of locations in order to follow the flow of the text. For example, major refinements to the risk results are presented in the uncertainty analysis (e.g., comparison of concentrations to background levels, application of area use factors) and are not clearly described in the text. Further, Section J-5.6, Interpretations, offers no discussion of the results and merely states that all COPECs at both consolidated units were eliminated in the analysis. The additional discussions requested in the original comment were intended to provide readers with a comprehensive summary that integrated the lines-of-evidence used in developing risk estimates for ecological receptor populations with those estimates. If LANL chooses to exclude the requested risk characterization summaries from the revised version of Appendix J, several key references should be provided to assist the reader in locating key information. To promote clarity and transparency in the presentation of information related to the ecological risk assessment, it is recommended that Attachment J-1 be referenced as a source of receptor-specific information at the end of Section J-5.2, following the reference to the LANL ecological risk methodology document. Further, Section J-5.6, Interpretation, should be revised to reference the separate sections of Section 5.0 used to support the elimination of all 18 COPECs identified at Consolidated Unit 16-007(a)-99, 30s Line and all 26 COPECs identified at Consolidated Unit 16-008(a)-99, 90s Line.

12. Appendix J, Section J-5.2, Scoping Evaluation, Page J-16; and J-5.3, Assessment Endpoints, Page J-17

Each of these subsections needs to provide a concise statement describing the status of any threatened and endangered species associated with the sites. It is unclear if any species occur within or adjacent to the sites evaluated. Please provide a summary of the threatened and endangered species status, appropriate assessment endpoints if needed, and any supporting habitat maps that depict critical information describing their occurrence.

LANL Response 12. At Technical Area (TA) 16, the only threatened and endangered species is the Mexican spotted owl. The primary habitat for the Mexican spotted owl is forested canyons and not the open mesa top habitat found at Consolidated Units 16-007(a)-99 and 16-008(a)-99. Text has been added to Section J-5.2 and Attachment J-1. Habitat maps are not provided because of the sensitive nature of the location (LANL's ecology group does not provide such maps to the general public because of concerns over disturbance to threatened and endangered species).

Evaluation of LANL Response 12 The response adequately addresses the issue raised in the original comment.

13. Appendix J, Section J-5.5.6, Population Area Use Factors, Page J-21 and J-21

There are summary statements within each Consolidated Unit assessment that state that plant observations support the findings of no risk to this community. It is unclear if field observations and scientific studies were conducted to measure on-site phytotoxicity conditions. Please revise each of these subsections to provide the supporting field observation information or scientific studies that support the no risk conclusions for plants.

LANL Response 13. A visit and walkover of the site was performed as part of the ecological scoping for each site (Attachment J-1). Field observations were made and recorded on the ecological scoping checklist. No adverse effects to vegetation were observed. Text has been added to Section J-5.2, Scoping Evaluation, Section J-5.5.6, Population Area Use Factors, and Attachment J-1 (the ecological scoping checklist) stating that no effects on plants were observed.

Evaluation of LANL Response 13 The response adequately addresses the issue raised in the original comment.

14. Appendix J, Section J-6.0, Surface and Groundwater Comparison, Pages J-24 through J-25

This section provides an assessment of surface water and groundwater risk conditions by comparison of sample results to applicable criteria. This section relies in part upon the use of standards protective of aquatic life, yet as per the ecological risk screening approaches, aquatic life was not identified as being a suitable receptor population. Please revise the text within this subsection to revisit that aquatic life is not considered a receptor group of concern and that the use of the criteria within this section is strictly a tool to identify any chemicals requiring further evaluation.

LANL Response 14. Section J-5.2, p. J-16, states that aquatic receptors were not evaluated because no permanent aquatic communities are present at any of the sites. The comparisons of surface water and groundwater data to standards are required by the Consent Order and are strictly a tool to identify chemicals exceeding the appropriate water-quality standards.

Evaluation of LANL Response 14 The response adequately addresses the issue raised in the original comment.

15. Appendix J, Table J-2.2-4, Exposure Point Concentrations for Consolidated Unit 16-008(a)-99 for the Industrial Scenario (0-2 ft bgs depth), Page J-39

Cadmium was retained as a COPC for soil, fill, and tuff in Sections I-4.1.1, I-4.1.2 and Table I-2.0-1 of Appendix I, but was not included in the Table J-2.2-4. The detection limits for cadmium in samples collected for 16-008(a)-99 were above the background values. Revise Table J-2.2-4 and associated risk evaluation tables to include cadmium.

LANL Response 15. Cadmium was inadvertently omitted as a COPC. Cadmium has been added to the risk screening evaluations for all scenarios and ecological risk for Consolidated Unit 16-008(a)-99. Changes resulting from this addition have been incorporated in the revised report.

Evaluation of LANL Response 15 The response adequately addresses the issue raised in the original comment.

16. Appendix J, Risk Assessment, Table J-4.2-11, Comparison of Noncarcinogenic COPCs to SSLs for the Construction Worker Scenario at Consolidated Unit 16-008(a)-99, Page J-71

Table J-4.2-11 lists a Construction Worker Soil Screening Level (SSL) of $2.33\text{E}+04$ milligrams per kilogram (mg/kg) for Di-n-octylphthalate. According to footnote g, the value is for a surrogate, Di-n-butylphthalate. However, Table J-4.2-9, Comparison of Noncarcinogenic COPCs to SSLs for the Industrial Scenario at Consolidated Unit 16-008(a)-99, lists a value of $2.5\text{E}+04$ mg/kg based on the value available in the EPA Region 9 Preliminary Remediation Goal (PRG) Table. Revise footnote g of Table J-4.2-11 to explain why a surrogate was used instead of the value listed in Table J-4.2-9 for Di-n-octylphthalate.

LANL Response 16. Because NMED and U.S. Environmental Protection Agency (EPA) Region 6 do not have soil screening levels (SSLs) for di-n-octyl phthalate, EPA Region 9 screening values were used for the residential and industrial (outdoor worker) scenarios. EPA Region 9, however, does not provide SSLs for the construction worker scenario. As a result, di-n-butylphthalate, which does have a construction worker SSL from NMED guidance, was used as a surrogate for di-n-octyl phthalate for this scenario. The footnote to Table J-4.2-11 has been modified to clarify the use of this surrogate.

Evaluation of LANL Response 16 The response is partially adequate. The information provided in the LANL Response addresses the issue raised in the original comment. However, the information has not been fully incorporated into the footnotes for Table J-4.2-11 as indicated in the response. While the footnote has been relabeled, it provides no new information. Please augment the information provided in the footnote to include: "The EPA Region 9 PRGs do not provide a soil screening value for di-n-octyl phthalate under a construction worker scenario; thus, the NMED value for di-n-butyl phthalate was used as a surrogate."

17. Appendix J, Table J-6.0-1, Comparison of Chemical Concentrations with Water Quality Standards for 90s Line Pond Surface Water at 90s Line, Page J-90

According to text in Section 7.3.3, mercury exceeded the NMWQCC surface water wildlife habitat standard and lead exceeded the NMWQCC surface water livestock standard. Both mercury and lead should have been included in the Table J-6.0-1. Revise the table to include both mercury and lead.

LANL Response 17. Table J-6.0-1 has been revised to include mercury and lead as well as other constituents. See also the response to specific comment 2.

Evaluation of LANL Response 17 The response adequately addresses the issue raised in the original comment.