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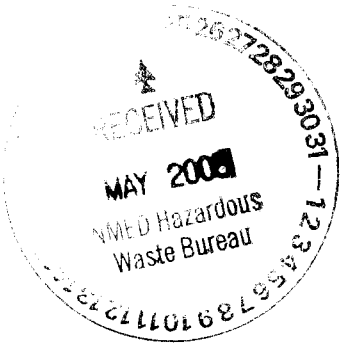
TechLaw
560 Golden Ridge Road, Suite 130
Golden, CO 80401
(303) 763-7188
(303) 763-8889 FAX
www.techlawinc.com

May 19, 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 the Supplemental RCRA Facility Investigation (RFI) Report SWMU #19 McGregor Range Camp Oxidation Pond, Task 2 Deliverable.

Dear Mr. Cobrain:

Enclosed please find the deliverable for the above-referenced work assignment. The deliverable consists of risk assessment review comments on the "Supplemental RCRA Facility Investigation (RFI) Report SWMU #19 McGregor Range Camp Oxidation Pond" dated February 2005.

It appears that while the report under review is a summary of several previous investigations, the primary focus was to estimate potential ecological risks. However, several comments were noted concerning information not directly related to the ecological risk assessment. While these issues may have been adequately addressed in other reports, the attached deliverable contains on the entire report. Some other concerns were noted that TechLaw thought NMED may wish to consider in more detail and determine whether the comment is warranted. These comments are not provided in the attached deliverable, but are summarized in the following bullets.

- The report indicated that previous subsurface investigations and vadose zone modeling indicated that there is no significant threat to groundwater from the oxidation pond (Tetra Tech). Additional justification that groundwater could not be impacted was provided indicating that the pond was lined and that the area does not received significant amounts of precipitation. Thus, there is no mechanism for contaminants transport. However, the report also indicates that the integrity of the liner has been compromised in several locations. Therefore, it is possible that contaminants in surface water could migrate downward, potentially into the shallow aquifer. It is not clear whether this was taken into consideration for the soil to

groundwater analysis. It is also not clear whether a comparison of site sediment and subsurface soil concentrations to soil-to-groundwater screening levels (SSLs) based upon a dilution attenuation factor (DAF) of 20 was conducted. Clarify how it was determined that groundwater could not be impacted.

- There is a continuing problem with selection of reporting limits that are greater than screening benchmarks. This is not acceptable. Prior to sending samples to the selected laboratory, the data quality objectives (DQOs) should have been set. As part of defining the DQO process, the screening levels should have been reviewed to ensure that the laboratory could meet appropriate reporting limits. As screening levels are above reporting levels for several constituents, there is considerable uncertainty in the data and conclusions. There is no way to determine whether contamination is present at levels between the screening benchmarks and the reporting limits. In addition, reporting limits for the tissue samples were elevated due to too small a sample being collected. The facility should have determined prior to sampling what the required sample volume is for each type of tissue to be collected. Overall, it appears that proper planning was not conducted prior to implementing the sampling plan; the data do not have integrity; and the conclusions of this report as suspect.

- It is not clear if the information concerning human health risks provided in this report is supposed to represent a human health screening assessment. If this is true, then the information provided in the report is grossly inadequate and the report must be revised to provide a more thorough and complete evaluation of risk.

It is assumed that this RFI does not address the Imhoff tanks and that these structures are or will be addressed under a separate report. Therefore, no comments have been drafted concerning this issue. However, there may be risk issues related to these structures.

The document is formatted in Word. The deliverable was emailed to you on May 19, 2005 at david_cobrain@nmenv.state.nm.us and to Ms. Kathryn Chamberlain at Kathryn_chamberlain@nmenv.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

June K. Dreith
Program Manager

Enclosure
cc: Ms. Kathryn Chamberlain, NMED
Ms. Paige Walton, TechLaw

TASK 2 DELIVERABLE

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT REVIEW COMMENTS ON THE SUPPLEMENTAL RCRA FACILITY INVESTIGATION (RFI) REPORT SWMU #19 MCGREGOR RANGE CAMP OXIDATION POND FEBRUARY 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

May 19, 2005

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
REVIEW COMMENTS ON THE
SUPPLEMENTAL RCRA FACILITY INVESTIGATION (RFI) REPORT
SWMU #19 MCGREGOR RANGE CAMP OXIDATION POND
FEBRUARY 2005

General Comments

1. The report indicated that while tissue samples were collected, no comparison of the tissue concentrations was conducted. The rationale presented was that there are no readily available screening criteria for ecological tissue samples. However, this is not an entirely correct assumption. Typically when tissue samples of biota are collected, the results are statistically compared to an initial baseline concentration or reference site concentration. If the tissue results are above the baseline concentration, then there is reason to assume that bioaccumulation has occurred and that the tissue contain elevated levels of contaminants. The next step would be to compare the tissue data to screening levels for ecological receptors. Examples may be no-observed-effect-levels (NOELs) or lowest-observed-effect-levels (LOELs). If the tissue data are greater than the selected screening level, then there is reason to assume that there has been an unacceptable ecological impact and corrective measures may be required. Since tissue data were collected, a comparison following the above outline should have been conducted. It is not clear why the tissue data were not used. Revise the risk assessment to address the results of the tissue sampling.

2. Ingestion of pond water (surface water) was not addressed in the ecological risk assessment, with the justification that surface water concentrations were below Maximum Contaminant Levels (MCLs). However, MCLs are not solely risk-based numbers and as such are not appropriate for use in screening for a risk assessment. Therefore, sufficient justification for the exclusion of the drinking water pathway has not been provided. Revise the risk assessment to address ingestion of surface water.

3. Given that the oxidation pond has become an integral habitat for such a diversity of aquatic flora, it seems reasonable that a phytotoxity evaluation should have been conducted. Discuss why toxicity to the plant species in the vicinity of the pond was not conducted.

4. The receptor species selected for the risk assessment appear to all be of higher trophic levels (trophic levels 3 and 4). It does not appear that lower trophic level organisms (levels 1 or 2), such a plants and invertebrates were evaluated. Typically for an ecological risk assessment, at least one receptor species for each trophic level is selected. Note: larger species may not be justified for smaller areas, where the area of concern represents only a small fraction of the foraging range. Discuss the rationale for the selection of the receptor species and demonstrate how they are representative of the entire ecosystem.

5. The VEGA study indicated that there was potential for ecological risks, as evidenced by elevated hazard quotients (HQs). Discuss difference between the VEGA ecological risk assessment and the risk assessment contained within the supplemental RCRA Facility Investigation (RFI). In addition, discuss what differences in methodology may have been used. Based upon the results provided in the supplemental RFI, the RFI also concludes that there are elevated risks. However, justification, such as the conservativeness of the assumptions and the fact that this was a screening level analysis, was provided to conclude that the risks are within acceptable limits. Given this, what were the differences in magnitude of risk estimated in the VEGA study versus the RFI.

6. Given that some of the resulting HQs were well-above the target level of one, discuss why a more refined (or Tier 2) analysis was not conducted. Typically if a screening level analysis fails to meet target levels, a refined analysis using site-specific data and less conservative toxicity data is conducted. Based upon the magnitude of some of the HQs, it is not clearly evident that if less conservative assumptions were applied, the risks would drop to within acceptable levels. Provide additional analyses or justification to demonstrate that there are no unacceptable ecological risks.

7. Discuss why background was not determined (or applied) for the inorganic constituents of concern. In ecological risk assessments, if natural background levels are greater than the respective screening limit, the screening level is deemed inappropriate, and a comparison to ambient levels is conducted. This approach may be appropriate for arsenic.

8. Aluminum was included as a constituent of concern (COC) in the risk assessment. However, bioavailability of aluminum for plant uptake and ecotoxicity is associated with pH, and aluminum is biologically inactive in neutral to alkaline (pH 5.5-8.0) conditions. Therefore, aluminum should only be included as a COC if soil pH is less than 5.5. Discuss the pH of the soil/sediment at the oxidation pond and the appropriateness of the inclusion of aluminum as a COC.

9. There is concern that groundwater has not been adequately characterized. While the 1997 subsurface investigations conducted by Tetra Tech indicated that migration of contaminants to groundwater is not a concern, it appears that only the deeper aquifer was addressed. The shallow aquifer (50-60 feet below ground surface) does not appear to have been addressed. It is not clear what the water quality of this aquifer is and whether any off-site receptors utilize this water for irrigation/cattle purposes. Discuss these issues. Also, if warranted, conduct a soil-to-groundwater screening assessment to verify whether there is a potential threat for contaminants to migrate to this shallow aquifer.

10. The report briefly addresses human health exposure to soil/sediment in the oxidation pond. However, it is not clear the intent of this discussion. Both residential and industrial levels are used in comparison to site levels. In addition, there does not appear to be any calculation of actual risk levels. Clarify whether this information is

supposed to justify that no human health risk exist or whether the information is background information. If the discussions are intended to represent a human health risk screen, the information is extremely deficient and must be revised.

11. There is an inconsistency in the number of surface sediment samples. The report refers to both 34 and 37 samples. Please clarify.

Specific Comments

1. Executive Summary, page ES-1. In the second paragraph, volatile organic compounds (VOCs) are not listed as analytes. Clarify the text that VOCs were included in the analytical suites.

2. Executive Summary, page ES-2. The report discussed the fact that arsenic was detected above soil screening levels of 3.9 mg/kg. However, there is no discussion of the arsenic levels related to background. In the West, it is often found that naturally high levels of arsenic are present in soil, and that the screening levels are often lower than background. In these cases, site-specific screening levels must be determined. Discuss the arsenic levels relative to background.

3. Section 1.3.1, 1997 RFI Investigation, page 1-2. The report discusses the comparison of concentrations in surface water to MCLs. MCLs are useful in guiding corrective action and assessing effectiveness of remediation, however, MCLs are not risk-based numbers but are developed using both toxicity information and industry standards. Therefore, use of MCLs is not an appropriate tool for assessing risk. A more appropriate screening level would be the NMED drinking (tap) water screening criteria.

4. Section 2.4.1, 1997 RFI, page 2-4. The third bullet indicates that lead present in the groundwater samples is indicative of natural levels. However, no comparison to background levels was conducted. Sufficient justification demonstrating that lead is representative of natural background levels has not been provided. Either provide additional lines of evidence to support this conclusion or revise the report to address potential lead contamination in groundwater.

5. Section 2.4.2, 1997 RFI Addendum, page 2-5. It is not clear why Region III screening levels were used in the evaluation of 4,4-DDT. It may be that Region VI and NMED had not yet published screening values. However, please clarify.

6. Section 2.4.5, 2004 Ecological Risk Assessment, page 2-6. Surface water was not addressed and not sampled for this risk assessment as the 1997 investigation indicated that surface water did not contain elevated concentration of contaminants. However, the rationale was that concentrations were below reporting limits. This does not provide adequate justification for not conducting additional sampling. The primary reason is that during that investigation there were several problems with elevated reporting limits compared to screening levels. Therefore, while the constituent may

have been below the reporting limit, there is no way to determine if the concentration was above a screening level. In addition, there is no discussion of whether the wastewater conditions have remained consistent over time. It is possible that wastewater concentrations vary with time and processes. The exclusion of surface water has not been justified and the risk assessment should be revised to address this exposure medium.

7. Section 2.4.5, 2004 Ecological Risk Assessment, page 2-6. Several chemicals (5 polychlorinated biphenyls, 13 pesticides, and 9 semi-VOCs) were identified as a contaminant of potential ecological concern (COPEC) and were said to have been addressed qualitatively. However, Appendix 2, Section 9, which discusses the uncertainties associated with the risk assessment, does not appear to address this issue. Clarify where in the report these COPECs are addressed. Also, this should be discussed in the uncertainties section of the report. Revise accordingly.

8. Section 2.5.1, Geological Framework, page 2-7. Discuss the water quality, flow direction, and hydraulic properties of the shallow aquifer.

9. Section 2.5.2, Nature and Extent of Contamination, page 2-8. The report indicates that the pond is fenced, clearly marked, and designated off-limits. It is not clear how this relates to restricting ecological access. It is assumed that this information is provided to show that human exposures are mitigated through institutional and engineering controls. Please clarify.

10. Section 2.5.3, Environmental Fate, page 2-8. The first paragraph indicates that water and sediment are confined to the pond. However, elsewhere in the report (Section 2.2.1 and Appendix 2) are discussions that the integrity of the liner of the pond has been compromised. This information appears to contradict this section. Please clarify.

11. Section 3.2.1, Human Health, pages 3-1 and 3-2. The discussion of human health risk only addresses a current scenario, and does not address any future or potential scenarios; for example, dredging of the pond, periods when the pond is dry and sediment may migrate off-site via dust re-suspension, etc. Risk assessments must address both current and future scenarios. Revise the discussion to address whether there could be any complete exposure pathways in the future. If so, address potential risks.

12. Section 3.2.2, Ecological, page 3-2. In the last paragraph, the test states that actual risk from COPECs identified in tissue samples are not expected to be present based on the HQ calculations. This is not clear, as data from the tissue samples were not evaluated. It is assumed that the intent of this information is to show that the since the HQs are acceptable, the resulting tissue data would verify this conclusion. Please clarify.

13. Appendix 1, Table 1 – Summary of Residential Soil Benchmarks. Several comments were noted concerning this table, as follows:

    - The 2000 residential data from the New Mexico Environment Department's (NMED) "Technical Background Document for Development of Soil Screening Levels" were applied as soil benchmarks. However, NMED updated these criteria and released the revised document in October 2004. As the date on Table 1 is February 2005, the updated values should have been used in the risk assessment.

    - The NMED soil screening level for trivalent chromium was applied. This is the least conservative approach. Discuss whether site data indicated that all chromium present was in the form of trivalent chromium. If total chromium data was obtained, then a screening level for total chrome should have been applied. Discuss the uncertainty and potential for underestimation of risk if hexavalent chrome could be present at the site.

    - Some of the data presented in the table are extrapolated from the Region 9 Preliminary Remediation Goal (PRG) table. It is noted that beginning with 1,1-biphenyl, the conversion of the data to be based on a 1E-05 risk was not conducted. (The datum for methoxychlor was correctly adjusted.) Thus, Table 1 presents data based on both a 1E-05 and a 1E-06 risk. Correct those data obtained from the Region 9 PRG table accordingly.

14. Appendix 1, Tables 2 through 4 – Screening Against Residential Soil Standards. The tables (Tables 2 through 4) list the sampling data results. For those data that exceeded the NMED soil screening level, the values were bolded and boxed. However, there does not appear to be any calculation of a 95% upper confidence level for each constituent, which would be compared to the screening level, and an actual risk estimated. Clarify where the actual risk determinations for human receptors were calculated.

    In addition, the screening levels are an amalgamation of values based on either carcinogenic or noncarcinogenic risk or a saturation limit. It is not clear since neither Table 1 nor these tables clarifies the corresponding health effect how the risks were estimated.

15. Appendix 2, Executive Summary, page ES-1. As noted in previous comments, the use of MCLs cannot be used to screen out contaminants in a risk assessment. The evaluation of surface water constituents should be re-conducted using appropriate risk-based data.

16. Appendix 2, Executive Summary, page ES-3. The last bullet on this page indicates that HQs for all chemicals are below one when calculated using LOAEL-based toxicity reference values (TRVs). However, in reviewing Table 9-1 of Appendix 2, this is not true. The HQs for the White-faced Ibis, American Coot, and the Northern

Shoveler are greater than one for dibenz(a,h)anthracene. In addition, elevated HQs resulted for the raccoon for vanadium, arsenic, barium, and aluminum (see general comment concerning aluminum). However, there does not appear an estimation of LOAEL-based HQs for the raccoon. Provide the evaluation of LOAEL-based TRVs for the raccoon. Also, clarify the text accordingly.

17. Appendix 2, Section 3.2, Sediment Sampling (2003), page 3-3. Sediment was only thick enough to collect two of the proposed samples. The other 20 samples were collected at another site for geotechnical analysis. Clarify what at which site these samples were collected. Also, discuss how geotechnical analyses of soil at another site relate to the risk assessment and the data quality objectives outlined for this study.

18. Appendix 2, Section 6.1.1, Sediment, page 6-2. Methodologies outlined in EPA 1992 were applied in determining the 95% upper confidence level (UCL) of the mean. The UCL was then applied as the exposure point concentration. However, when the data set showed neither a lognormal nor a normal distribution, the maximum 95% UCL between the UCLs estimated for a lognormal and a normal distribution was used. This is not good science. If the data set did not exhibit a set distribution, then non-parametric statistics should have been used to estimate the UCL (for example bootstrapping). The UCLs should be re-calculated, as there is significant concern over the integrity of the values. It is suggested that the following guidance be reviewed: "Calculating Upper Confidence Limits for Exposure point Concentrations at Hazardous Waste Sites" OSWER 9285.6-10, December 2002, and the associated ProUCL software, which determines data set distributions and run appropriate statistical tests.

19. Appendix 2, Table 7-2, TRV Calculations for the Raccoon. Toxicity information was listed as not available for beryllium. However, the Agency for Toxic Substances and Disease Registry (ASTDR) provides toxicity information for beryllium. A NOAEL of 3.10E+01 mg/kg/day (based on a two-year diet study on rats) is provided. Revise the assessment to include toxicity information for beryllium.