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Date: February 22, 2005
Refer To: ER2004-0100

Ms. Darlene Goering, Project Leader
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

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FEB 2005
NMED Hazardous
Waste Bureau

SUBJECT: PHASE III RFI REPORT FOR SOLID WASTE MANAGEMENT UNIT 16-021(c)–99 REPLACEMENT PAGES 6-13 and 6-14

Dear Ms. Goering:

Please find attached two (2) replacement copies of pages 6-13 and 6-14 of the "Phase III RFI Report for Solid Waste Management Unit 16-021(c)-99" (LA-UR-03-5248), originally submitted to the New Mexico Environment Department (NMED) in September 2003. This is in response to your email request on February 17, 2005. This replacement page includes text that addresses Comment 22 of the Notice of Deficiency (NOD) on that document, which was inadequately addressed in the replacement pages submitted in December 2004.

If you have any questions, please contact Donald Hickmott at the Los Alamos National Laboratory, (505) 667-8753 or Lance Woodworth at the Department of Energy, (505) 665-5820.

Sincerely,

for David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

Sincerely,

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Operations

DM/DG/DH/ds

Attachments: as stated

6530

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The toxicity testing site below the confluence with Burning Ground Spring showed a moderate survival response of 68.5% which was not different from the reference site but was statistically different (in this case, less than) from the downstream site below MDA P. The sediment at this location had elevated levels of barium, copper, and lead. The site below MDA P had survival and growth responses similar to the reference site at Starmer's Gulch.

In 2002, a second round of toxicity testing was conducted for the sites that had shown reduced survival in 2001. The mortality responses of 2001 did not recur (Appendix L, Table L-13). These results indicate that the sediment in the canyon is heterogeneous with regard to potential toxic effects and contaminant concentrations. The variability in the toxicity testing results is important to the risk characterization because it helps to reconcile the lack of effects noted in benthic macro-invertebrate community data. If there are pockets of sediment that cause adverse effects in the aquatic community, these areas are likely to be small and avoidable by the benthic community.

The location of measured toxic effects in the stream relative to the sources of water to the canyon is important to the risk characterization. The SWSC Cut section of stream with the highest toxicity testing mortality is a slow flowing marshy area dominated by emergent vegetation at the head of the perennial reach. This is marginal to poor habitat for the sensitive aquatic invertebrate species associated with the canyon. Stream flow in this section of the perennial reach has diminished during the drought. If the drought continues, it is conceivable that this section may become dry. The two toxicity testing sites in Cañon de Valle that were not different from the reference site in Starmer's Gulch are down stream of SWSC Cut and are supported by flow from Burning Ground Spring. Thus far, this spring has shown persistent flow during the drought. If the stream does continue to recede due to the drought, refugia for the aquatic community will likely be in the reach from Burning Ground Spring down-canyon to below MDA P. Therefore, any drought induced habitat reduction will restrict the aquatic fauna to an area that has not shown significant contaminant effects via the toxicity testing.

6.2.2.3 Uncertainty Analysis

The major source of uncertainty associated with this assessment is that the terrestrial and sediment toxicity evaluations were conducted during a multi-year drought and within 1 year of the Cerro Grande fire of 2000. The results of the investigations may differ during wetter periods, but the potential impact of contaminants on the environment is not likely to be increased. Individual and population effects are typically the consequence of multiple stressors. The drought is one of those stressors and is likely to increase the potential of detecting an adverse effect that could be associated with contaminants. Fire effects often result in increased small mammal populations associated with increased ground vegetation. If contaminant uptake and food chain transfers were a source of population effects, then post-fire environments should increase the likelihood of these effects.

Ecological screening assessments are subject to uncertainties through the use of laboratory toxicology studies to develop NOAEL contaminant concentrations. These studies use chemical forms of contaminants and exposure mechanisms that are often conservative when compared to environmental conditions and foraging behaviors. Additionally, laboratory studies are often conducted with single contaminants. The consequences of combined contaminants for receptors is largely unknown. The results presented for Cañon de Valle are based upon field studies and laboratory toxicity studies combined with field-collected media from the canyon. This approach obviates the usual difficulties of extrapolating laboratory data to field settings.

The calculations of HMX and RDX exposure concentrations for the Mexican spotted owl were based on mammal toxicity reference values. This is because, at the time this work was conducted, data were not available in the literature for avian exposures to these chemicals. The Department of the Army has since

published results of exposure studies for RDX (Salice and Holdsworth 2001, 73780) and HMX (USACHPPM 2001, 73781) using Northern Bobwhite quail (*Colinus virginianus*). The toxicity reference value (TRV) for RDX is 8.7 mg/kg-d. This value is in agreement with the rat TRV of 10 mg/kg-d, indicating that the calculated Mexican spotted owl ESL for RDX is appropriate. The companion study for HMX did not publish a TRV because exposure of quail to HMX has not resulted in mortality or morbidity in subchronic studies with doses up to 10,000 ppm HMX in food. These results indicate that the mouse TRV of 75 mg/kg-d for HMX is a conservative proxy for avian effects and is protective of the Mexican spotted owl.

The relevance of this assessment for making decisions regarding Cañon de Valle is predicated upon the assumptions that the data accurately represent the contaminant signatures in the canyon and that the present-day contaminant concentrations will be diminished in the future through hydrologic processes. The data have been collected over three phases of RFI, each phase responding to the results of previous work. The elimination of facility discharges, the removal and closure of MDA P, the excavation of the silver outfall, the IM conducted at the 260 outfall, and the partial removal of MDA R all lend support to the assumption that contaminant sources have been reduced or eliminated, and that contaminant concentrations in the canyon are likely to decrease over time.

The silver concentrations for sediment in the canyon, from the SWSC Cut and above, run contrary to this conceptual model. In 2001 and 2002, six ecotoxicological samples were collected in support of toxicity testing, and the 2002 active channel sediment samples contained silver concentrations ranging from 85.5 to 167 mg/kg. The previous high value for silver in Cañon de Valle across 45 samples with 25 detections was 15.1 mg/kg. These high values in the channel, within 2000 ft of the silver outfall, indicate that post–Cerro Grande fire flooding or the removal action at the silver outfall mobilized silver downcanyon.

6.2.2.4 Summary of Ecological Risk

The ecological risk assessment for the terrestrial system in Cañon de Valle revealed some elevated metals concentrations in the small mammals but no values that were likely to cause adverse effects for the Mexican spotted owl. The numbers of species, population densities, and reproductive classes for those species indicated that the Cañon de Valle small mammal community is not being adversely affected by contaminants.

The ecological assessment of the aquatic system in the canyon found some differences between benthic macro-invertebrates in Cañon de Valle and reference canyons. These differences were attributed to relative sizes of the streams, with Cañon de Valle being the smallest, and reduced flows due to the ongoing drought. One of the two rounds of toxicity testing for sediment and water in the canyon resulted in reduced survival for a site near the 260 outfall and a site below Burning Ground Spring. These results were not replicated in a subsequent toxicity test, indicating a high variability in the contaminant signatures for this sediment. Because the toxicity test is designed to be an indicator of potential effects in an aquatic system but is not a substitute for field assessments, the presence of a viable benthic macro-invertebrate community in the canyon may be a more meaningful measure of the canyon's condition than the toxicity testing results.