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Date: February 20, 2009
Refer To: EP2009-0107

James P. Bearzi, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Submittal of the Los Alamos Canyon Low-Head Weir Ecological Risk Screening

Dear Mr. Bearzi:

The Los Alamos National Laboratory (the Laboratory) received an approval with modifications from the New Mexico Environment Department (NMED) on January 7, 2009, on the Laboratory's recommendation (included in the Supplemental Interim Measures Work Plan to Mitigate Contaminated Sediment Transport in Los Alamos and Pueblo Canyons, LA-UR-08-6588) to place excavated material currently impounded behind the Los Alamos Canyon low-head weir onto the adjacent embankment. The NMED's letter requested a comparison of detected analytes in the sediment behind the weir to ecological screening levels (ESLs) so NMED could make its determination on placement of the excavated material onto the embankment.

The Laboratory is submitting this letter and the comparison in response to NMED's requirement. The approach used for the analysis is consistent with the ecological risk assessment methods documented in existing NMED-approved canyons biota investigation plans and investigation reports. This general process was used to evaluate potential ecological risks in Los Alamos and Pueblo Canyons ("Los Alamos/Pueblo Surface Aggregate Report — Record of Communication" [Katzman 2002, Memorandum ER2002-0690]), Mortandad Canyon ("Mortandad Canyon Biota Investigation Work Plan" [LANL 2005, LA-UR-05-2231]) and Pajarito Canyon ("Pajarito Canyon Biota Investigation Work Plan" [LANL 2006, LA-UR-06-4106]).

The approach used for the Los Alamos Canyon weir analysis included use of depth-integrated samples collected through the entire thickness of sediment because they most represent the mixed condition of excavated sediment. The data were first compared with the sediment background values (BVs) or detection limits (for organic chemicals), and those values that exceeded BVs and detected organic chemicals (chemicals of potential concern [COPCs]) were then compared with the ESLs (see Table 1).

The following is a summary of the assessment:

- 51 analytes were detected
- 26 detected analytes were identified as COPCs
- 3 COPCs (copper, cyanide, and lead) were greater than ESLs

Consistent with the screening methodology, COPCs greater than the ESL are carried forward in the assessment because they have the potential for causing ecological risk. The approach taken in this assessment and in previous canyons biota investigation plans was to compare measured concentrations for a given COPC with those evaluated in previous canyons investigations. For example, the concentrations measured in Pajarito Canyon reaches were compared with Los Alamos/Pueblo Canyons and Mortandad Canyon (see Table D-2.2-10 in the Pajarito Canyon Biota Investigation Work Plan).

Table 2 lists the specific endpoints potentially at risk from concentrations of copper, cyanide, and lead, which are all avian receptors. As shown in Table 2, the concentrations of copper, cyanide, and lead in reaches previously evaluated for potential ecological risk to these receptors are greater than concentrations measured at the Los Alamos Canyon weir for these analytes. Thus, the studies and conclusions of no risk to avian receptors in the investigation reports for Los Alamos/Pueblo Canyons, Mortandad Canyon, and Pajarito Canyon are also applicable to the sediment currently impounded behind the weir and planned for land application on an adjacent embankment. In summary, although there are several COPCs identified as exceeding ESLs, there is no indication that these concentrations would pose an unacceptable ecological risk based on previous studies and assessments.

Table 2 Summary of COPCs with maximum concentrations greater than ESLs

Analyte	Depth-Integrated Samples (mg/kg)	ESL (mg/kg)	Assessment Endpoints where Los Alamos Canyon Weir Sample Is Greater Than the ESL	Los Alamos/ Pueblo Avian Reach Max (mg/kg)	Mortandad Avian Reach Max (mg/kg)	Pajarito avian reach max (mg/kg)
Copper	32.6	15	robin	31.5	**119**	**98.1**
Cyanide (Total)	2.21	0.1	kestrel, robin	no detects	0.377	**6.52**
Lead	22	14	robin	**76.5**	**36.2**	**77.2**

Note: Values in bold exceed maximum Los Alamos Canyon weir concentrations

The Laboratory proposes that the NMED approve the Laboratory's request to begin excavation of the sediment behind the weir and be granted approval to spread the material onto the adjacent embankment in accordance with the approach described in the Supplemental Interim Measures Work Plan to Mitigate Contaminated Sediment Transport in Los Alamos and Pueblo Canyons.

If you have any questions, please feel free to contact Danny Katzman at (505) 667-6333 (katzman@lanl.gov) or Nancy Werdel at (505) 665-3619 (nwerdel@doeal.gov).

Sincerely,

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,

David R. Gregory, Project Director
Environmental Operations
Los Alamos Site Office

MG/DG/PH/DK/SR:sm

Attachment: a/s

Cy: Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-OB, White Rock, NM
Tom Skibitski, NMED-OB, Santa Fe, NM
Keyana DeAguero, DOE-LASO (date-stamped letter emailed)
Nancy Werdel, DOE-LASO, MS A316
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Alison M. Dorries, WES-DO, MS M992
Kristine Smeltz, WES-DO, MS M992
EP-LWSP File, MS M992
RPF, MS M707
IRM-RMMSO, MS A150 (date-stamped letter emailed)

Table 1
Comparison of Maximum Detected
Concentrations in Depth-Integrated Samples to BVs and ESLs

Analyte	Units	Maximum Detected Concentration	Sediment BV	Maximum > Sediment BV or Detected Organic?	ESL	COPC Maximum > ESL?
Aluminum	mg/kg	3140	15400	No	na[a]	n/a[b]
Arsenic	mg/kg	3	3.98	No	6.8	n/a
Barium	mg/kg	57.6	127	No	110	n/a
Beryllium	mg/kg	0.752	1.31	No	2.5	n/a
Calcium	mg/kg	1880	4420	No	na	n/a
Chromium	mg/kg	4.86	10.5	No	2.3	n/a
Cobalt	mg/kg	1.91	4.73	No	13	n/a
Copper	mg/kg	32.6	11.2	Yes	15	Yes
Cyanide (Total)	mg/kg	2.21	0.82	Yes	0.1	Yes
Iron	mg/kg	6410	13800	No	na	n/a
Lead	mg/kg	22	19.7	Yes	14	Yes
Magnesium	mg/kg	689	2370	No	na	n/a
Manganese	mg/kg	301	543	No	220	n/a
Mercury	mg/kg	0.0465	0.1	No	0.013	n/a
Nickel	mg/kg	3.24	9.38	No	9.7	n/a
Potassium	mg/kg	596	2690	No	na	n/a
Silver	mg/kg	0.0904	1	No	2.6	n/a
Sodium	mg/kg	92.8	1470	No	na	n/a
Thallium	mg/kg	0.215	0.73	No	0.032	n/a
Vanadium	mg/kg	8.79	19.7	No	0.025	n/a
Zinc	mg/kg	52.7	60.2	No	48	n/a
Americium-241	pCi/g	0.635	0.04	Yes	44	No
Cesium-137	pCi/g	1.53	0.9	Yes	680	No
Plutonium-238	pCi/g	0.0584	0.006	Yes	44	No
Plutonium-239/240	pCi/g	0.569	0.068	Yes	47	No
Strontium-90	pCi/g	0.401	1.04	No	560	n/a
Thorium-228	pCi/g	1.84	2.28	No	43	n/a
Thorium-230	pCi/g	1.48	2.29	No	52	n/a
Thorium-232	pCi/g	1.69	2.33	No	6.2	n/a
Uranium-234	pCi/g	1.6	2.59	No	51	n/a
Uranium-235	pCi/g	0.119	0.2	No	55	n/a
Uranium-238	pCi/g	1.57	2.29	No	55	n/a
Acenaphthene	mg/kg	0.0162	na	Yes	0.25	No

Table 1 (continued)

Analyte	Units	Maximum Detected Concentration	Sediment BV	Maximum > Sediment BV or Detected Organic?	ESL	COPC Maximum > ESL?
Anthracene	mg/kg	0.029	na	Yes	6.8	No
Aroclor-1254	mg/kg	0.0155	na	Yes	0.041	No
Aroclor-1260	mg/kg	0.023	na	Yes	0.14	No
Benzo(a)anthracene	mg/kg	0.118	na	Yes	3	No
Benzo(a)pyrene	mg/kg	0.129	na	Yes	53	No
Benzo(b)fluoranthene	mg/kg	0.217	na	Yes	18	No
Benzo(g,h,i)perylene	mg/kg	0.101	na	Yes	24	No
Chloroform	mg/kg	0.000286	na	Yes	8	No
Chrysene	mg/kg	0.143	na	Yes	2.4	No
Fluoranthene	mg/kg	0.229	na	Yes	10	No
Fluorene	mg/kg	0.0182	na	Yes	3.7	No
Indeno(1,2,3-cd)pyrene	mg/kg	0.0651	na	Yes	62	No
Naphthalene	mg/kg	0.016	na	Yes	1	No
Phenanthrene	mg/kg	0.146	na	Yes	5.5	No
Pyrene	mg/kg	0.249	na	Yes	10	No
Toluene	mg/kg	0.00102	na	Yes	23	No
Total Petroleum Hydrocarbons Diesel Range Organics	mg/kg	38.3	na	Yes	na	No
Total Petroleum Hydrocarbons Gasoline Range Organics	mg/kg	0.0512	na	Yes	na	No

[a] na = Not available.

[b] n/a = Not applicable (analyte not a COPC).