ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

June 3, 2003

Mr. Tom McLaughlin
Mail Stop T-7F27
U.S. Nuclear Regulatory Commission
Division of Waste Management
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: ANALYTICAL RESULTS FOR SOIL SAMPLES FROM THE BUILDING 9 FOOTPRINT AT THE MOLYCORP, INC., YORK FACILITY, YORK, PENNSYLVANIA (DOCKET NO. 040-08794, RFTA NO. 03-007)

Dear Mr. McLaughlin:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) collected ten soil samples from the Building 9 Footprint area on April 29, 2003. These samples were collected from five locations and included a 0 to 1 meter (m) depth sample and a 1 to 2 m depth sample from each location. ESSAP personnel chose the locations and used the on-site Geoprobe® to collect the samples. The use of the Geoprobe® was a deviation from the ORISE Survey Procedures Manual; this deviation was documented in the site log book and was approved by the NRC site representative (ORISE 2003a). Two additional soil samples, previously collected by the Pennsylvania Department of Environmental Protection (PADEP) site representative, were also provided to ESSAP for analyses.

The primary contaminants at the Molycorp facility are natural thorium and radium with limited quantities of natural uranium. The site-specific soil guidelines, as presented in the York Facility Decommissioning Plan, are as follows (RSI 2000 and NRC 1981 and 1983):

Radionuclide	Soil Concentration Above Background (pCi/g)
Natural uranium	10
Total thorium	10
Radium-226	5
Excess uranium	30
Excess Th-230	14.3

In order to confirm compliance with the release criteria, the unity rule was used to determine that the sum of each radionuclide divided by its site release criteria is less than or equal to one. ESSAP used the same "sum-of-fractions" calculation method as provided by the licensee (MACTEC 2003).

The samples were analyzed by gamma spectroscopy (Procedure CP1, Revision 12) to determine the presence and concentration of natural uranium, total thorium, and radium-226, if present, in the samples (ORISE 2003b). The ESSAP analytical results support the licensee's conclusion that the soil pile that was placed in the Building 9 Foundation met the site's unrestricted release criteria.

If you have any questions, please direct them to me at (865) 576-0065 or Tim Vitkus at (865) 576-5073.

Sincerely,

Wade C. Adams

Wade C. Adams
Project Leader/Health Physicist
Environmental Survey and
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WCA:ar

Enclosures

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Distribution approval and concurrence:	Initials	Date
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ORISE TABLE 1

RADIONUCLIDE CONCENTRATIONS IN SOIL SAMPLES
BUILDING 9 FOOTPRINT
MOLYCORP, INC.
YORK, PENNSYLVANIA

Sample Number	Sample Location[a]	Depth (m)	Radionuclide Concentrations (pCi/g)									
			U-238	U-235	Ra-226	Total U[b]	Excess U[c]	Excess Ra[d]	Th-232	Th-228	Total Th[e]	SOF[f]
850S001	Scoop # 46	---[g]	3.05 ± 0.80[h]	0.13 ± 0.13	2.01 ± 0.16	6.23	1.05	-1.05	2.29 ± 0.29	2.23 ± 0.16	4.51	0.73
850S002	Scoop # 32	---	2.64 ± 0.98	0.19 ± 0.15	2.91 ± 0.26	5.46	-0.27	0.27	1.73 ± 0.28	1.74 ± 0.14	3.47	0.45
850S003	A8, B	0-1	2.51 ± 0.66	0.23 ± 0.12	2.33 ± 0.20	5.25	0.17	-0.17	1.98 ± 0.25	2.09 ± 0.15	4.07	0.44
850S004	A8, B	1-2	1.51 ± 0.65	0.14 ± 0.14	1.32 ± 0.13	3.16	0.19	-0.19	1.84 ± 0.23	1.66 ± 0.12	3.50	0.22
850S005	A11, B	0-1	1.54 ± 0.61	0.07 ± 0.11	1.87 ± 0.17	3.15	-0.33	0.33	1.67 ± 0.22	1.68 ± 0.13	3.35	0.23
850S006	A11, B	1-2	1.82 ± 1.09	0.23 ± 0.14	1.43 ± 0.16	3.87	0.39	-0.39	1.78 ± 0.28	1.74 ± 0.14	3.52	0.29
850S007	A13, D	0-1	1.64 ± 0.56	0.04 ± 0.10	1.82 ± 0.16	3.33	-0.18	0.18	1.74 ± 0.22	1.67 ± 0.12	3.40	0.23
850S008	A13, D	1-2	1.31 ± 0.73	0.06 ± 0.14	1.49 ± 0.16	2.68	-0.18	0.18	1.90 ± 0.28	1.76 ± 0.14	3.66	0.20
850S009	A15, D	0-1	1.93 ± 0.84	0.18 ± 0.23	1.89 ± 0.19	4.04	0.03	-0.03	1.57 ± 0.27	1.72 ± 0.14	3.29	0.22
850S010	A15, D	1-2	1.40 ± 0.79	0.20 ± 0.18	1.61 ± 0.16	2.99	-0.21	0.21	1.91 ± 0.28	1.82 ± 0.14	3.73	0.22
850S011	D14, D	0-1	2.40 ± 0.77	0.16 ± 0.12	2.39 ± 0.21	4.97	0.02	-0.02	1.90 ± 0.24	1.85 ± 0.14	3.76	0.38
850S012	D14, D	1-2	3.07 ± 0.98	0.02 ± 0.13	1.90 ± 0.19	6.15	1.17	-1.17	1.82 ± 0.27	1.84 ± 0.15	3.66	0.66

[a]Scoop samples collected by PADEP; ESSAP collected samples at the grid locations as marked by MACTEC.
[b]Total U calculated by doubling the U-238 and adding the U-235 concentrations.
[c]Excess U calculated by the subtracting the Ra-226 from the U-238 concentration.
[d]Excess Ra calculated by the subtracting the U-238 from the Ra-226 concentration.
[e]Total Th calculated by adding the Th-228 and Th-232 concentrations.
[f]SOF calculated per MACTEC "Technical Basis Document: Derivation and Application of the 'Sum-of-Fractions' Calculation", Molycorp's York, PA Site; February 2003.
[g]Depth not measured.
[h]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

REFERENCES

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