

February 25, 2003

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

**SUBJECT: LETTER REPORT—CONFIRMATORY SURVEY TRIP NO. 5 RESULTS  
FOR BUILDING FOUNDATIONS AND FOOTERS AT THE MOLYCORP,  
INC., WASHINGTON FACILITY, WASHINGTON, PENNSYLVANIA  
(DOCKET NO. 040-08778, RFTA NO. 03-002)**

Dear Mr. McLaughlin:

The Molycorp, Inc., Washington Site is located in southwestern Pennsylvania on the outskirts of Washington County approximately 56 kilometers [km (35 miles)] southwest of Pittsburgh. The site consists of approximately 8 hectares [ha (20 acres)] which represents the fenced portion of the 24 ha parcel of land owned by Molycorp that lies entirely within Canton Township at 300 Caldwell Avenue, Washington, Pennsylvania. The site is bounded by two dedicated streets in Canton Township—Caldwell Avenue and Weirich Avenue. The site is also transversed by Chartiers Creek that flows south to north through the property. The property is served by the CSX Railroad via two lines that were formerly owned by Tylerdale Connecting Railroad Company and the Baltimore and Ohio Railroad (MACTEC 2002).

The facility was primarily used for the production of molybdenum products—the plant also produced ferro alloys such as ferrocolumbium and tungsten. The raw material for this ferrocolumbium operation, columbite ore, contained significant concentrations (1 to 1.5%) of natural thorium which required Molycorp to possess a U.S. Nuclear Regulatory Commission (NRC) Source Material License (SMB-1393, Docket No. 040-8778). Operations that used thorium-containing ores were discontinued around 1970—however; some of the thorium bearing slag was used as fill material over portions of the site (RSI 2001).

Molycorp's decontamination and decommissioning contractor, MACTEC, Inc. (MACTEC), has performed the decommissioning activities at the Washington Facility. These decommissioning activities have included the remediation of various buildings/structures and concrete pads and the demolition and removal of those buildings/structures and concrete pads after remediation activities. With the exception of the paved roadway areas, all other structures and concrete slabs have been demolished leaving only exposed soil areas. Those remediation activities were performed under the Decommissioning Plan for the Washington, Pennsylvania Facility which implements final status survey (FSS) guidance from draft NUREG/CR-5849 (RSI 1999 and NRC 1992a).

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The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) performed confirmatory survey activities on the remaining building slabs, foundations and footers and on the Building 39 Shack at the MolyCorp, Inc. Washington Facility in Washington, Pennsylvania during the periods of October 28 through 30 and November 18 through 20, 2002. Survey activities consisted of alpha, beta and gamma surface scans, total surface activity measurements and soil sampling. These activities were conducted in accordance with site-specific survey plans, submitted to and approved by the NRC, and the ORISE/ESSAP Survey Procedures, Quality Assurance, and Laboratory Procedures Manuals (ORISE 2002a and b, 2000 and 2002c and d). Specifically, ESSAP personnel performed confirmatory survey activities on the Building 2W East Concrete Ramp; the Acid Tank Retainer Wall; the Building 39 Shack; and the footers, slabs, and/or foundations of Buildings 14, 19, 21, 22, 23, 25, 26, 28, 33, 35, 36, 38, 39, and 42. ESSAP also performed confirmatory survey activities on the footers/slab/foundation of the Acid Tank Storage Pad, the Heat Exchanger Tank, and the Electrical Switch Yard. ESSAP also reviewed the electronic FSS data packages that were made available for most areas for which ESSAP performed confirmatory survey activities.

Alpha plus beta scan coverage for the Building 39 Shack was up to 10% of the interior and exterior walls. Gamma scan coverage for the foundations/footers/slabs was up to 75% of the exposed surfaces and/or building footprints; alpha plus beta scan coverage for the foundations/footers/slabs was up to 25% of the exposed surfaces. Scans were performed using gas proportional and NaI scintillation detectors coupled to ratemeters or ratemeter-scalers with audible indicators. Locations of elevated radiation were marked and identified for further investigation. The MACTEC site representative was notified of any findings that were inconsistent with the FSS data package results.

ESSAP personnel performed direct measurements for alpha and beta surface activity at a minimum of 10 locations for each area surveyed. Direct measurements were performed using gas proportional detectors coupled to ratemeter-scalers. Prior results from the site determined that smear samples, for determining removable gross alpha and gross beta activity levels, were not required. Figures for documenting measurement locations were not required since the majority of the materials were in piles and were to be removed from the site. Soil samples were collected at two locations.

The primary contaminants at the MolyCorp facility are natural thorium with limited quantities of natural uranium. MACTEC used the more restrictive limits for thorium for surface activity release. The applicable NRC guidelines established for license termination or release for unrestricted use for surface contamination in effect for this site, are as follows (NRC 1987):

#### Natural Thorium

1,000 dpm/100 cm<sup>2</sup>, averaged over a 1 m<sup>2</sup> area  
3,000 dpm/100 cm<sup>2</sup>, maximum in a 100 cm<sup>2</sup> area  
200 dpm/100 cm<sup>2</sup>, removable

### Natural Uranium

5,000  $\alpha$  dpm/100 cm<sup>2</sup>, averaged over a 1 m<sup>2</sup> area  
15,000  $\alpha$  dpm/100 cm<sup>2</sup>, maximum in a 100 cm<sup>2</sup> area  
1,000  $\alpha$  dpm/100 cm<sup>2</sup>, removable

Natural thorium emits both alpha and beta radiations, therefore, either alpha or beta activity may be measured for determining residual thorium surface activity. As interpreted by the NRC, the average 1,000 dpm/100 cm<sup>2</sup> and maximum 3,000 dpm/100 cm<sup>2</sup> guidelines should apply independently to both alpha and beta measurements for surface contamination involving natural thorium (NRC 1992b). ESSAP's experience has shown that beta measurements typically provide a more accurate evaluation of thorium contamination on structure surfaces due to problems inherent in measuring alpha contamination on rough, porous, and/or dirty surfaces. For the thorium series in secular equilibrium, the beta activity level corresponding to 1,000 alpha dpm/100 cm<sup>2</sup> is 670 beta dpm/100 cm<sup>2</sup>. Therefore, a beta activity measurement that is greater than 670 dpm/100 cm<sup>2</sup> or 2,000 dpm/100 cm<sup>2</sup> would exceed the alpha average or maximum activity guideline for thorium, respectively.

Total surface activity levels for each building foundation/slab/footer are presented in Table 1; Building 39 Shack surface activity levels are presented in Table 2. The following summarizes the surface activity levels for each confirmatory survey area.

Survey results for the following surveyed areas did not indicate any areas of residual contamination above guidelines: Building 2W East Concrete Ramp, Building 33 Footer/Ramp, Building 36 Footer, Building 38 Slab, Acid Tank Storage Pad Footer and Slab, Heat Exchanger Tank Foundation, Electrical Switch Yard Slab, and the Acid Tank Retainer Wall. Surface activity for those areas ranged from -8 to 48 dpm/100 cm<sup>2</sup> for alpha and -390 to 650 dpm/100 cm<sup>2</sup> for beta.

Survey results for the following areas indicated several areas where residual contamination levels were slightly above the average but below the maximum guidelines for beta surface activity: Building 14 Slab/Footer, Building 19 Slab, Building 21/22 Footer, Building 23 Footer, Resurvey of Building 25 Slab, Building 26 Rubble, Building 28 Slab, Building 33 Footer (Additional Material), Building 35 Footer, Building 39 Slab, Building 42 Footer, and the Building 39 Shack. Surface activity for these areas ranged from -16 to 140 dpm/100 cm<sup>2</sup> for alpha and -690 to 1,900 dpm/100 cm<sup>2</sup> for beta.

Survey results for the following areas indicated several areas where residual contamination levels were above average and/or above maximum guidelines for beta surface activity: Building 22 Footer, Building 25 Footer, Building 26 Slab, and Building 26 Footer. Surface activity for these areas ranged from 0 to 150 dpm/100 cm<sup>2</sup> for alpha and -26 to 7,300 dpm/100 cm<sup>2</sup> for beta.

Two surface (0-15 cm) soil samples were collected—one each from the footprints of Buildings 25 and 26—from locations of elevated gamma radiation detected by surface scans. The radionuclide concentrations for these samples are presented in Table 3 and ranged as follows:

1.96 to 27.2 pCi/g for Th-228, 1.97 to 25.5 pCi/g for Th-232, 3.93 to 52.7 pCi/g for total thorium, 0.76 to 3.78 pCi/g for U-235, 9.0 to 46.0 pCi/g for U-238, and, 18.76 to 95.78 pCi/g for total uranium. When compared to typical background concentrations of 1 to 4 pCi/g for these radionuclides (ORISE 2003), these levels demonstrate that soil contamination is present on the surface of the soil just underneath and in contact with the building foundations for Buildings 25 and 26.

Based on the confirmatory survey results, it is ESSAP's opinion that alpha and/or beta activity, in excess of the guidelines, remains on various pieces of concrete within several of the surveyed areas. The ESSAP confirmatory survey results do not support the licensee's conclusion that all surveyed areas, as described in the licensee's FSS reports for those areas, meet the unrestricted release criteria. For the areas that did not meet the release criteria, MACTEC site personnel stated that they were going to resurvey and/or segregate the material and consider it as radiological waste and dispose of it accordingly.

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  
Project Leader/Health Physicist  
Environmental Survey and  
Site Assessment Program

WCA:ar

Enclosure

cc: G. Purdy, NRC/NMSS/TWFN 7F27  
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**TABLE 1**  
**SURFACE ACTIVITY LEVELS**  
**FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS**  
**MOLYCORP, INC.**  
**WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 2W East Concrete Ramp</b>		
1	0	-260
2	-- <sup>a</sup>	-110
3	--	-68
4	--	-230
5	--	-68
6	--	34
7	--	-11
8	--	-200
9	--	-180
10	--	-76
11	--	240
12	--	-83
13	--	-38
14	--	-72
15	16	310
<b>Building 14 Slab/Footer</b>		
1	48	680 <sup>b</sup>
2	--	1,000 <sup>b</sup>
3	--	1,200 <sup>b</sup>
4	--	1,100 <sup>b</sup>
5	--	1,200 <sup>b</sup>
6	--	820 <sup>b</sup>
7	--	770 <sup>b</sup>

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 14 Slab/Footer (continued)</b>		
8	--	-34
9	--	570 <sup>b</sup>
10	79	230
11	--	220
12	--	-87
13	--	1,500 <sup>b</sup>
14	--	-30
15	--	1,900 <sup>b</sup>
<b>Building 19 Slab</b>		
1	8	-110
2	--	410
3	--	110
4	--	-87
5	--	19
6	--	220
7	--	180
8	--	200
9	--	270
10	--	-30
11	48	220
12	--	49
13	--	280

**TABLE 1 (continued)**  
**SURFACE ACTIVITY LEVELS**  
**FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS**  
**MOLYCORP, INC.**  
**WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 19 Slab (continued)</b>		
14	--	360
15	40	11
<b>Building 19 Slab (second survey)</b>		
1	63	30
2	--	300
3	--	240
4	--	120
5	--	160
6	--	720
7	--	330
8	--	480
9	--	200
10	--	420
11	--	260
12	32	220
<b>Building 21/22 Footer</b>		
1	--	480
2	--	540
3	--	620 <sup>b</sup>
4	--	79
5	--	570
6	--	610
7	--	1,200 <sup>b</sup>

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 21/22 Footer (continued)</b>		
8	--	420
9	--	130
10	--	160
<b>Building 22 Footers</b>		
1	32	510
2	--	300
3	--	3,500 <sup>b</sup>
4	--	480
5	--	310
6	--	1,700 <sup>b</sup>
7	--	6,800 <sup>b</sup>
8	--	45
9	--	620
10	--	1,300 <sup>b</sup>
11	0	750 <sup>b</sup>
12	--	230
13	--	680 <sup>b</sup>
14	--	180
15	--	8
<b>Building 23 Footer</b>		
1	32	570
2	--	540
3	--	220



TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 23 Footer (continued)</b>		
4	--	600 <sup>b</sup>
5	--	-60
6	--	310
7	--	430
8	--	-110
9	--	-19
10	--	940 <sup>b</sup>
11	12	-60
12	--	160
13	--	-23
14	--	510
15	--	170
<b>Building 25 Footer</b>		
1	--	580 <sup>b</sup>
2	--	1,200 <sup>b</sup>
3	--	160 <sup>b</sup>
4	56	900 <sup>b</sup>
5	--	850 <sup>b</sup>
6	95	1,400 <sup>b</sup>
7	--	850 <sup>b</sup>
8	150	2,400 <sup>b</sup>
9	110	1,200 <sup>b</sup>
10	--	690 <sup>b</sup>

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 25 Footer (continued)</b>		
11	--	990 <sup>b</sup>
12	--	1,200 <sup>b</sup>
13	--	860 <sup>b</sup>
14	71	1,400 <sup>b</sup>
15	--	1,200 <sup>b</sup>
<b>Resurvey of Building 25 Slab</b>		
1	8	280
2	--	1,500 <sup>b</sup>
3	--	1,500 <sup>b</sup>
4	--	930 <sup>b</sup>
5	--	600
6	--	290
7	24	1,700 <sup>b</sup>
8	--	790 <sup>b</sup>
9	--	450
10	0	800 <sup>b</sup>
11	--	1,100 <sup>b</sup>
12	--	560 <sup>b</sup>
<b>Building 26 Slab</b>		
1	100	3,400 <sup>b</sup>
2	--	870 <sup>b</sup>
3	--	2,000 <sup>b</sup>
4	--	700 <sup>b</sup>

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 26 Slab (continued)</b>		
5	--	7,300 <sup>b</sup>
6	--	2,000 <sup>b</sup>
7	--	1,500 <sup>b</sup>
8	--	190
9	63	460
10	--	770
11	--	370
12	--	280
13	--	240
14	--	560
15	--	350
16	24	510
<b>Building 26 Footer</b>		
1	63	1,500 <sup>b</sup>
2	--	2,300 <sup>b</sup>
3	--	2,900 <sup>b</sup>
4	--	-26
5	--	1,600 <sup>b</sup>
6	--	790 <sup>b</sup>
7	--	920 <sup>b</sup>
8	--	1,100 <sup>b</sup>
9	--	1,600 <sup>b</sup>
10	79	1,700 <sup>b</sup>

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 26 Footer (continued)</b>		
11	--	1,800 <sup>b</sup>
12	--	2,500 <sup>b</sup>
13	--	1,000 <sup>b</sup>
14	--	1,800 <sup>b</sup>
<b>Building 26 Rubble</b>		
1	48	1,300 <sup>b</sup>
2	--	1,000
3	--	1,200
4	--	940
5	--	1,200
6	16	530
7	--	620
8	--	670
9	--	550
10	--	320
11	--	480
12	--	650
13	--	460
14	--	190
15	--	660

**TABLE 1 (continued)**  
**SURFACE ACTIVITY LEVELS**  
**FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS**  
**MOLYCORP, INC.**  
**WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 28 Slab</b>		
1	48	-420 <sup>b</sup>
2	--	580 <sup>b</sup>
3	--	860 <sup>b</sup>
4	3	-210
5	--	-110
6	--	38
7	--	520
8	--	560
9	--	140
10	--	420
11	--	-11
12	--	620
13	--	91
14	--	150
15	--	-34
16	--	45
17	--	530
18	--	83
19	--	190
20	--	1,100 <sup>b</sup>

TABLE 1 (continued)

SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 33 Footer/Ramp</b>		
1	0	110
2	--	440
3	--	150
4	--	210
5	--	76
6	--	0
7	--	100
8	--	68
9	--	650 <sup>b</sup>
10	--	620 <sup>b</sup>
11	--	53
12	32	220
13	--	210
14	--	230
15	--	79
<b>Building 33 Footer (Additional Material)</b>		
1	16	190
2	--	110
3	--	72
4	--	850 <sup>b</sup>
5	--	1,400 <sup>b</sup>
6	--	-49
7	--	-38

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 33 Footer (Additional Material - continued)</b>		
8	--	-87
9	--	-4
10	40	-42
<b>Building 35 Footer</b>		
1	--	-140
2	--	-57
3	--	270
4	--	-30
5	--	-690
6	--	-340
7	--	-440
8	--	-460
9	--	-220
10	--	920 <sup>b</sup>
11	--	570
12	--	950 <sup>b</sup>
13	--	870 <sup>b</sup>
<b>Building 36 Footer</b>		
1	32	-180
2	--	-94
3	--	170
4	--	-220
5	--	-220

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 36 Footer (continued)</b>		
6	--	-53
7	--	-26
8	--	-150
9	--	-15
10	--	-200
11	--	-220
12	40	34
13	--	0
14	--	-87
15	--	79
<b>Building 38 Slab</b>		
1	--	200
2	32	-230
3	--	570
4	48	160
5	--	160
6	--	130
7	--	220
8	--	180
9	--	11
10	--	94
11	--	38
12	--	130



TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 38 Slab (continued)</b>		
13	--	-140
14	--	91
15	--	79
<b>Building 39 Slab</b>		
1	95	170
2	--	-300 <sup>b</sup>
3	--	-160
4	--	210
5	--	110
6	--	-8
7	--	34
8	--	240
9	--	-83
10	140	690 <sup>b</sup>
11	--	900 <sup>b</sup>
12	--	170 <sup>b</sup>
13	--	-42
14	--	250
15	--	68
<b>Building 42 Footer</b>		
1	40	-34
2	--	-150
3	--	-34
4	--	-110

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Building 42 Footer (continued)</b>		
5	--	290
6	--	-120
7	--	130
8	--	45
9	--	-49
10	--	760
11	48	210
12	--	120
13	--	76
14	--	1,100 <sup>b</sup>
15	--	930 <sup>b</sup>
<b>Acid Tank Storage Pad Footer</b>		
1	-8	-120
2	--	-280
3	--	-200
4	--	-260
5	--	-42
6	--	-91
7	--	-200
8	--	-68
9	--	-38
10	--	-340
11	--	-380
12	--	-240

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Acid Tank Storage Pad Footer (continued)</b>		
13	--	-38
14	--	-210
15	8	-230
<b>Acid Tank Storage Pad Slab</b>		
1	0	-110
2	--	-190
3	--	-49
4	--	-170
5	--	-270
6	--	-64
7	--	-100
8	--	110
9	--	-160
10	--	-170
11	--	-19
12	--	-290
13	--	-34
14	--	110
15	40	-120
<b>Heat Exchanger Tank Foundation</b>		
1	32	340
2	--	45
3	--	8
4	--	380

**TABLE 1 (continued)**

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

<b>Location</b>	<b>Total Alpha Activity (dpm/100 cm<sup>2</sup>)</b>	<b>Total Beta Activity (dpm/100 cm<sup>2</sup>)</b>
<b>Heat Exchanger Tank Foundation (continued)</b>		
5	--	250
6	--	-110
7	--	-19
8	--	-30
9	--	23
10	24	-19
<b>Electrical Switch Yard Slab</b>		
1	8	-210
2	--	-49
3	--	-390
4	--	68
5	--	91
6	--	180
7	--	530
8	--	60
9	--	-130
10	--	72
11	32	390
12	--	34
13	--	130
14	--	130
15	--	-79
16	16	180

TABLE 1 (continued)

**SURFACE ACTIVITY LEVELS  
FOUNDATIONS/SLABS/FOOTERS/RETAINING WALLS  
MOLYCORP, INC.  
WASHINGTON, PENNSYLVANIA**

Location	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
<b>Acid Tank Retainer Wall</b>		
1	32	-230
2	--	-300
3	--	-150
4	--	-360
5	--	-160
6	--	-190
7	--	-300
8	--	-230
9	--	-220
10	--	-190
11	--	-370
12	--	-250
13	--	-330
14	16	-260

<sup>a</sup>Measurement not performed.

<sup>b</sup>Due to elevated ambient gamma radiation from contaminated soil and/or adjacent contaminated areas, these measurements were calculated by determining the difference between unshielded and shielded beta activity measurements with Net Count Rates determined as follows:

$$\text{Net Count Rate} = (\text{Surface Counts}_{\text{unshielded}} - \text{Surface Counts}_{\text{shielded}}) - (\text{BKG Counts}_{\text{unshielded}} - \text{BKG Counts}_{\text{shielded}}).$$

**TABLE 2**  
**SURFACE ACTIVITY LEVELS**  
**BUILDING 39 SHACK**  
**MOLYCORP, INC.**  
**WASHINGTON, PENNSYLVANIA**

Location	Surface	Total Alpha Activity (dpm/100 cm <sup>2</sup> )	Total Beta Activity (dpm/100 cm <sup>2</sup> )
1	Lower Wall	-- <sup>a</sup>	-15
2	I-Beam	--	130
3	I-Beam	-16	94
4	Lower Wall	--	68
5	Upper Wall	--	160
6	Lower Wall	--	230
7	Lower Wall	--	360
8	Door	--	94
9	Floor	0	320
10	Floor	--	-68
11	Floor	--	98
12	Door	--	-4
13	Lower Wall	--	800
14	Lower Wall	--	570
15	Lower Wall	--	400
16	Lower Wall	--	510

<sup>a</sup>Measurement not performed.

**TABLE 3**  
**RADIONUCLIDE CONCENTRATIONS IN SOIL SAMPLES**  
**MOLYCORP, INC.**  
**WASHINGTON, PENNSYLVANIA**

Location	Radionuclide Concentration (pCi/g)					
	Th-228	Th-232	Total Thorium <sup>a</sup>	U-235	U-238	Total Uranium <sup>b</sup>
Building 25	1.96 ± 0.15 <sup>c</sup>	1.97 ± 0.26	3.93 ± 0.30	0.76 ± 0.23	9.0 ± 1.0	18.76 ± 2.01
Building 26	27.2 ± 1.7	25.5 ± 2.0	52.7 ± 2.6	3.78 ± 0.73	46.0 ± 4.0	95.78 ± 8.03

<sup>a</sup>Total thorium calculated by Th-228 + Th-232.

<sup>b</sup>Total uranium calculated by (2 x U-238) + U-235.

<sup>c</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

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