Appendix J

Building 39 Area Shack Data Package

Molycorp Washington, PA

November, 2002

Building 39 Area Shack Data Package

This data package contains final status survey information for Building 39 area meal storage shack, Molycorp, Washington, PA site.

Field data collection forms, survey report forms, statistical test results, and comparisons to release limits are provided in this appendix.

Summary

One anomaly was reported during the survey of the Building 39 Area Shack. Elevated levels of background radiation, from soil radioactivity, were present during survey activities and were the cause of elevated micro-R readings on the shack's steel walls.

Results from the final status survey of Building 39 Area Shack provides evidence that release criteria have been met, demonstrates that residual radioactivity is below the unrestricted use criteria, and confirms that the Building 39 Area Shack (shell) is suitable for unrestricted use.

	DDO-138 Radiation Protection Survey Report	Site: Molycorp / Washington, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
11-19-02	1600	Bldg #39 Area	02-1437
RWP Number: NA	Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☐ Other		Page 1 of 3

Survey Title: FSS Bldg #39 Area Shack

1 minute statics taken ON concrete

	Bkg	MDA
β	144	244
α	8	81

1 minute statics taken ON metal Panels

	Bkg	MDA
β	27	112
α	2	48

Bkgd Readings 20-24 μR/h

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13	NA	NA
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

Legend:

00 = mRem/h gamma | 00 C = mRem/h gamma contact | ① = Smear Location | ▽ = Air Sample Location | -X-X-X- = Rope, Boundary, or Barrier

00 β = mRem/h beta | 00 βC = mRem/h beta contact | –①– = Large Area Wipe | □ = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN.	Cal Due Date	Probe Model/SN	Cal Due Date	Detector Eff: β-(cpm/dpm)	α	MDA: β-	α	Other β- Bkg	α
2350-1/126190	1-16-03	43-106/128914	2-2-03	.240	.195	861	43	479	.8
2929/115563	6-14-03	43-10/79980	2-20-03	.255	.312	117	14.7	65	.22
12S/~~126741~~ 126741	11-12-03	NA	NA	NA		NA		NA	

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded.	Date and Time.
	☐ Yes ☐ No ☒ Not Required	11-19-02 1600
Radiation Safety Officer (Print Name & Sign): Mike McDonald		Date and Time 11-19-02 1630

Radiological Survey Results - Survey Location Indicator

Survey # 02-1437

Survey Area Information:

	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
Instrument Data								

	Print Name	Signature	Date
Performed By:			

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
Floor 1	556	5	502	362	4	20	-.9	47
2	510	9	481	332	7	20	2.3	-51
3	582	8	563	425	6	22	-.9	63
4	571	6	542	381	5	22	-.9	12
5	557	9	538	380	7	20	-.9	Ø
6	508	9	478	347	7	20	-.9	16
7	527	6	511	352	4	22	-.9	-27
8	510	7	489	344	5	22	-.9	12
9	435	6	401	328	5	24	-.9	-63
10	487	7	468	293	5	24	-.9	-12
Wall Inside 11	925	3	884	788	1	28	-.9	-39
12	877	2	844	781	1	28	-.9	8
13	1113	3	1078	967	2	28	-.9	51
14	941	3	905	847	2	26	-.9	39
15	923	2	870	796	1	24	-.9	-71
16	895	3	869	740	2	22	-.9	20
17	881	2	875	736	1	20	2.3	63
18	795	2	750	695	1	20	2.3	27
Wall outside 19	584	27	526	468	16	40	-.9	17
20	810	7	788	627	5	40	-.9	-31
21	577	30	642	560	24	50	-.9	8
22	691	36	652	480	29	50	-.9	8
23	908	9	856	747	7	40	-.9	-17
24	860	8	806	804	7	40	-.9	39
25	800	19	778	748	15	40	-.9	-20
26	730	14	695	657	11	40	-.9	-20
NA								

Radiological Survey Results - Survey Location Indicator Survey # 02-1437

Survey Area Information:

	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
Instrument Data								

	Print Name	Signature	Date
Performed By:			

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
ceiling 27	648	5	611	586	2	30	-.9	-27
28	877	7	840	792	5	30	-.9	9
29	701	6	674	633	4	24	-.9	Ø
30	1020	5	1001	949	3	24	-.9	10
	NA	NA	NA	NA	NA	28	NA	NA
Roof	↓	↓	↓	↓	↓	28	↓	↓
						23		
						22		

Results of Surface Scans

Molycorp - Area 39 Shack Survey Unit

Shell of Structure

Location	Beta Scan gross cpm	Beta Scan net cpm
W1	925	446
W2	877	398
W3	1113	634
W4	941	462
W5	923	444
W6	895	416
W7	881	402
W8	795	316
W9	589	110
W10	810	331
W11	577	98
W12	691	212
W13	908	429
W14	860	381
W15	800	321
W16	730	251
C1	648	169
C2	877	398
C3	701	222
C4	1020	541

All scans performed with Ludlum Model 2350-1
No. 126190 with 43-106 No. 128914

Monitor Info:
Scan MDA Beta - 861 dpm/100cm^2
Scan Background Beta - 479 cpm
Detector Eff. Beta - .240

Elevated Results of Surface Scans

Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

No Elevated scan results were reported

Direct Measurements (Total Activity)

Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	884	788	96	27	69	288	91	112	575
W2	844	781	63	27	36	150	77	112	300
W3	1078	967	111	27	84	350	96	112	700
W4	905	847	58	27	31	129	75	112	258
W5	870	796	74	27	47	196	82	112	392
W6	869	740	129	27	102	425	102	112	850
W7	875	736	139	27	112	467	105	112	933
W8	750	695	55	27	28	117	74	112	233
W9	526	468	58	27	31	129	75	112	258
W10	788	627	161	27	134	558	112	112	1117
W11	642	560	82	27	55	229	85	112	458
W12	652	480	172	27	145	604	115	112	1208
W13	856	747	109	27	82	342	95	112	683
W14	806	804	2	27	-25	-104	44	112	-208
W15	778	748	30	27	3	13	62	112	25
W16	695	657	38	27	11	46	66	112	92
C1	611	586	25	27	-2	-8	59	112	-17
C2	840	792	48	27	21	88	71	112	175
C3	674	633	41	27	14	58	67	112	117
C4	1001	949	52	27	25	104	73	112	208

All direct measurements performed with Ludlum Model 2350-1 No. 126190
with 43-106 No. 128914

Monitor Info:
Direct MDA Beta - 112 dpm/100cm^2
Metal Background Beta - 27 cpm
Detector Eff. Beta - .240

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination.

Elevated Direct Measurements (Total Activity)

Molycorp - Area 39 Shack Survey Unit

Location	Direct Beta ($dpm/100cm^2$)	Direct Alpha ($dpm/100cm^2$)
W10	558	1117
W12	604	1208

All sheet metal with elevated direct measurement readings was identified and physically removed from the building shell. Sheet metal with elevated readings (above release limits) will be shipped off-site as radiological waste.

Removable Surface Activity Measurements

Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

Location	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA
W1	-39	25.5	117	-0.9	3.4	14.7
W2	8	13.6	117	-0.9	3.4	14 7
W3	51	28.8	117	-0.9	3.4	14.7
W4	39	25.5	117	-0.9	3.4	14.7
W5	-71	33.7	117	-0.9	3.4	14.7
W6	20	19.1	117	-0.9	3.4	14.7
W7	63	31.8	117	2.3	5 3	14.7
W8	27	21.7	117	2.3	5.3	14.7
W9	17	17.9	117	-0.9	3.4	14.7
W10	-31	23.0	117	-0.9	3.4	14.7
W11	8	13.6	117	-0.9	3.4	14.7
W12	8	13.6	117	-0.9	3.4	14.7
W13	-17	17.9	117	-0.9	3.4	14.7
W14	39	25.5	117	-0.9	3.4	14.7
W15	-20	19.1	117	-0.9	3.4	14.7
W16	-20	19.1	117	-0.9	3.4	14.7
C1	-27	21.7	117	-0.9	3.4	14.7
C2	9	14.1	117	-0.9	3.4	14.7
C3	0	8.0	117	-0.9	3.4	14.7
C4	10	14.7	117	-0.9	3.4	14.7

Ludlum 2929 No. 115563 with 43-10 No. 79980 Info:

	Beta	Alpha
Background (cpm)	65	0.22
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.255	0.312
MDA	117	14.7

Elevated Removable Surface Activity Measurements
Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

No elevated removable surface activity was reported above limits.

Exposure Rate Measurements

Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	28	4
W2	28	4
W3	28	4
W4	26	2
W5	24	0
W6	22	-2
W7	20	-4
W8	20	-4
W9	40	16
W10	40	16
W11	50	26
W12	50	26
W13	40	16
W14	40	16
W15	40	16
W16	40	16
C1	30	6
C2	30	6
C3	24	0
C4	24	0
Roof	28	4
Roof	28	4
Roof	23	-1
Roof	23	-1

Background dose rate: 20-24 uR/hr with Model 19, No. 126741

Summary of Building Surface Direct Reading (Total Activity) Results

Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

Beta				Alpha			
n	$\bar{x}$	s	μ_α	n	$\bar{x}$	s	μ_α
18	168	155.3	231.1	18	335	310.7	462.2

$t_{1-\alpha}$ 1.734

Guidelines/Conditions Satisfied?

Beta	Alpha
Yes	Yes

Summary of Exposure Rate Measurements

Molycorp - Area 39 Shack Survey Unit

Shell of Strtucture

n	$\bar{x}$	s	μ_α
16	1.4	3.3	2.8

$t_{1-\alpha}$ 1.746

Guidelines/Conditions Satisfied?

Yes