PATHFINDER

October 24, 2005

Mr. Gary Janosko, Branch Chief
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, Maryland 20852

Ref: Docket No. 40-2259, Source Material License No. SUA-672

Dear Mr. Janosko:

Enclosed please find two sets of a revision to the Lucky Mc Mine Tailings Reclamation Project Completion Report, April, 2005. The revision incorporates additional radon flux testing and attendant surface gamma radiation measurements that were completed during August, 2005 on the No. 4 evaporation pond area. Included in this revision are one modified text page, Table E-1, Exhibit E-1, and the laboratory report for the additional radon flux data. The additional data did not change the overall site average radon flux or gamma level as presented originally in the completion report. Please insert the replacement or additional items in the report.

Sincerely,

Tom Hardgrove

T. W. Hardgrove
Manager, Reclamation Operations

Enclosure

Cc: J. Whitten, USNRC Region IV w/o encl.
M. Plessinger, S.M. Stoller
D. Wichers, Pathfinder Mines Corporation

PATHFINDER Mines Corporation
935 Pendell Blvd., P.O. Box 730, Mills, WY 82644 - Tel. : (307) 234-5019 - Fax : (307) 473-7306

lifts was iterative with a final confirmation of final lift placement before any subsequent material placement, it was suspected that some limited problems with the survey data base were falsely indicating deficiencies. Confirmatory test holes were drilled in the questioned areas, and the sample sites are designated as "RB Sample_" with the verified clay thicknesses on Exhibit 8.0-2. Test holes were drilled beyond the design depths but not necessarily all the way through the clay interval. In all cases the clay thickness was demonstrated to exceed the TRP requirements.

Each lift of placed clay was tested for compaction and percent moisture content consistent with the QA/QC program of the TRP. Acceptable compaction and moisture content had to be demonstrated before the placement of any new material on top of a given clay lift. See Appendix D for the summary reports for each construction season of the radon barrier compaction, moisture content, and Atterberg Limits testing.

Radon Barrier Flux Testing

Upon completion of the final clay lift for an area, the area was ready for radon flux testing. Typically, the radon flux testing was conducted when sufficiently large areas were available to allow placement of a number of LAAC canisters at one time. The radon flux field tests were conducted by PMC personnel, utilizing equipment and analytical services provided by Energy Laboratories, Casper, Wyoming. At the time of radon flux testing, an unshielded gamma radiation reading was taken at each flux test location using a calibrated Ludlum Model 19 uR meter. After completion of the radon flux testing, an area was available for placement of the balance of the cover system, be it filter bed/rock or topsoil. One significant exception to this was the No. 4 evaporation pond which was completed in November-December, 2004. Because of the late date of completion it was impossible to conduct the flux tests before rock placement (overnight temperatures were typically below 32 degrees F). These tests (an additional six) were conducted on August 8-9, 2005. Appendix E of this report contains a summary of the data, a sample location map showing the flux value for each sample site, and the laboratory reports for the radon flux testing. A total of 194 tests were conducted on completed radon barrier. The overall average radon flux from the completed barrier was <0.8 pCi/m²/sec. Note that most of the measured radon flux values were less than the detection limit of 0.5 pCi/m²/sec. To calculate an average the <0.5 values were conservatively entered as 0.5. Also illustrated on the sample location map are the gamma values recorded at the flux test sites. The overall average gamma reading was 10 uR/hr. Site background gamma radiation is 10-20 uR/hr, depending upon location (peripheral to the tailings system). The additional six tests for radon flux and surface gamma radiation on the No. 4 evaporation pond did not alter the overall site average values for radon flux and gamma radiation as reported in the original completion report submittal.

Also presented in Appendix E are laboratory reports of Ra-226 levels for the Cody shale radon barrier material and a representative sample of the limestone filter bed material utilized in the TRP construction. Ra-226 levels of the materials were acceptably low.

TABLE E-1. - Lucky Mc Radon Flux Test Results and Gamma Readings on Completed Radon Barrier Revised 10/24/05

Site #	RnFlux (pCi/m2-sec)	Gamma uR/hr.	Site #	RnFlux (pCi/m2-sec)	Gamma uR/hr.	Site #	RnFlux (pCi/m2-sec)	Gamma uR/hr.	Site #	RnFlux (pCi/m2-sec)	Gamma uR/hr.
1	< 0.5	6	61	off barrier	—	121	< 0.5	9.5	181	not sampled	—
2	< 0.5	5	62	1	15.5	122	0.9	10	182	not sampled	—
3	< 0.5	7	63	not sampled	8	123	1	9.5	183	not sampled	—
4	< 0.5	10	64	< 0.5	10	124	< 0.5	9.5	184	< 0.5	9
5	< 0.5	11	65	0.6	5.5	125	0.9	9	185	not sampled	—
6	< 0.5	5.5	66	0.7	9.5	126	< 0.5	12	186	0.9	8
7	< 0.5	7	67	< 0.5	8	127	< 0.5	9	187	not sampled	—
8	< 0.5	6	68	< 0.5	8	128	< 0.5	9	188	< 0.5	7
9	< 0.5	11	69	< 0.5	8.5	129	0.5	9	189	not sampled	—
10	< 0.5	9.5	70	< 0.5	9	130	< 0.5	11	190	not sampled	—
11	1.3	6	71	< 0.5	10.5	131	< 0.5	12	191	< 0.5	6
12	< 0.5	6.5	72	< 0.5	10	132	< 0.5	14	192	not sampled	—
13	< 0.5	11.5	73	< 0.5	9.5	133	1.1	29	193	< 0.5	10
14	0.9	6	74	< 0.5	7	134	< 0.5	17	194	off barrier	—
15	< 0.5	5	75	< 0.5	8	135	< 0.5	18	195	0.6	9
16	< 0.5	5.5	76	0.7	25	136	10.8	11	196	off barrier	—
17	< 0.5	10	77	< 0.5	8	137	< 0.5	13	197	not sampled	—
18	< 0.5	9.5	78	2.7	10	138	8.6	33	198	not sampled	—
19	< 0.5	10	79	not sampled	6	139	< 0.5	13	199	off barrier	—
20	< 0.5	9.5	80	< 0.5	9	140	< 0.5	10	200	not sampled	—
21	< 0.5	11.5	81	< 0.5	10.5	141	1.7	11	201	< 0.5	7
22	< 0.5	6	82	< 0.5	11.5	142	6.6	12	202	not sampled	—
23	< 0.5	9	83	< 0.5	9	143	0.9	11	203	< 0.5	7
24	< 0.5	12	84	< 0.5	10	144	< 0.5	9	204	not sampled	—
25	< 0.5	5.5	85	0.8	11.5	145	0.8	21	205	not sampled	—
26	< 0.5	9.5	86	4.4	20	146	< 0.5	12	206	not sampled	—
27	< 0.5	10.5	87	< 0.5	10	147	< 0.5	13	207	not sampled	—
28	< 0.5	9	88	< 0.5	8.5	148	5.4	14	208	< 0.5	7
29	0.7	10	89	< 0.5	14	149	< 0.5	9.5	209	< 0.5	7
30	< 0.5	10	90	< 0.5	10.5	150	< 0.5	13	210	not sampled	—
31	< 0.5	10.5	91	< 0.5	10	151	< 0.5	9.5	211	< 0.5	8
32	1.4	13	92	< 0.5	9.5	152	< 0.5	11	212	0.9	8
33	< 0.5	7	93	< 0.5	10	153	< 0.5	11.5	213	< 0.5	7
34	< 0.5	5.5	94	0.9	11	154	< 0.5	21	214	< 0.5	7
35	< 0.5	6.5	95	1.3	13	155	< 0.5	8	215	< 0.5	7
36	< 0.5	9	96	1.1	14	156	0.8	12	216	not sampled	—
37	< 0.5	10.5	97	1.5	11	157	< 0.5	11	217	not sampled	—
38	off barrier	—	98	< 0.5	9	158	1.2	12	218	< 0.5	9
39	off barrier	—	99	1.7	15	159	3.8	13	219	not sampled	—
40	0.7	11	100	< 0.5	11	160	< 0.5	8	220	< 0.5	8
41	0.6	12	101	< 0.5	9	161	< 0.5	8	221	not sampled	—
42	< 0.5	11	102	< 0.5	15	162	< 0.5	8	222	< 0.5	7
43	< 0.5	9.5	103	< 0.5	10	163	1.3	12	223	not sampled	—
44	< 0.5	6.5	104	< 0.5	10	164	1.5	11	224	< 0.5	7
45	< 0.5	6	105	< 0.5	10.5	165	< 0.5	10	225	< 0.5	10
46	< 0.5	5	106	< 0.5	11	166	< 0.5	9	226	2.5	10
47	< 0.5	7	107	< 0.5	10	167	< 0.5	8	227	not sampled	—
48	< 0.5	10	108	< 0.5	10	168	< 0.5	10	228	not sampled	—
49	< 0.5	10.5	109	< 0.5	14	169	< 0.5	8	229	< 0.5	8
50	< 0.5	11	110	5	25	170	< 0.5	8	230	not sampled	—
51	< 0.5	9	111	0.6	7.5	171	< 0.5	10	231	not sampled	—
52	< 0.5	10.5	112	< 0.5	22	172	dam outslope	—	232	not sampled	—
53	< 0.5	6.5	113	0.9	9.5	173	dam outslope	—	233	< 0.5	9
54	< 0.5	5.5	114	< 0.5	10.5	174	dam outslope	—	234	not sampled	—
55	< 0.5	5	115	1.5	18.5	175	dam outslope	—	235	< 0.5	6
56	0.6	11	116	0.8	18	176	dam outslope	—	236	< 0.5	8
57	0.8	5.5	117	< 0.5	13	177	dam outslope	—	237	not sampled	—
58	< 0.5	13.5	118	< 0.5	11	178	< 0.5	9	238	not sampled	—
59	1.2	9.5	119	1.1	12	179	not sampled	—	239	< 0.5	8
60	0.7	12	120	3.2	9	180	< 0.5	8			

AVG. Rn FLUX = <0.8 pCi/m2-sec.
AVG. GAMMA = 10 uR/hr.

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Large Area Activated Charcoal Cannister (LAACC) Radon Flux Report

Project:	Pathfinder Mines Corp.	Date Set:	08-08-05
Location:	Gas Hills	Date Remove:	08-09-05
Report Date:	8/10/05	Date Counted:	08-10-05
Weather:	Clear, no precipitation, ~50°		

Method: Pathfinder employees placed and retrieved LAACC units. EPA Method 115 per 40 CFR 61 (NESHAPs). Radon Flux results have been corrected for instrument & charcoal background counts.

Lab ID		LAACC #	Cannister #	Location	08-08-05 Time Set	08-09-05 Time Remove	Radon Flux pCi/m²s
C05080436	1	1	1	212	9:01	9:16	0.9
C05080436	2	2	2	213	9:03	9:18	<0.5
C05080436	3	3	3	214	9:05	9:20	<0.5
C05080436	4	4	4	215	9:07	9:21	<0.5
C05080436	5	5	5	225	9:10	9:23	<0.5
C05080436	6	6	6	226	9:12	9:22	2.5
C05080436	6	Lab Dup	6	226	9:12	9:22	2.3
C05080436	TB-1	TB-1	TB-1	TB-1	12:00	12:00	<0.5
C05080436	TB-2	TB-2	TB-2	TB-2	12:00	12:00	<0.5

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Large Area Activated Charcoal Cannister (LAACC) Radon Flux Quality Assurance Report

Project:	Pathfinder Mines Corp.	Date Set:	08-08-05
Location:	Gas Hills	Date Remove:	08-09-05
Report Date:	8/10/05	Date Counted:	08-10-05
Weather:	Clear, no precipitation, ~50°		

Blank Charcoal cpm	Standard Number 1 cpm	Standard Number 2 cpm
86	1683	3338

Replicate Lab ID		Date Counted	Radon Flux pCi/m²s*	Recovery Decimal
C05080436	6	08-10-05	2.3	0.915

Average of recoveries: **0.940**

Minimum Radon Flux for PMC:	<0.5 pCi/m²s
Maximum Radon Flux for PMC:	2.5 pCi/m²s
Average Radon Flux for #1-6:	1.7 pCi/m²s

* Note: ELI's Radon Flux Practical Quantitative Limit (PQL) is 0.5 pCi/m²s.
Minimum temperature under 35 degrees Fahrenheit not acceptable.

Report Approved By: T. A. Seaburg **Reviewed By:**

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Starting ID 1
Starting LAACC# 1
Project: Pathfinder Mines Corp.
Location: Gas Hills
Report date: 8/10/05
Weather: Clear, no precipitation, ~50°

	Average	Average	Average(1,2)
Std1	1683	1683	1683
Std2	3338	3338	3338
Bkg	86	86	86

Data 1

Date Set	8/8/2005		λ	2.10E-06
Date Removed	8/9/2005		Area	0.051
Date Counted	8/10/2005		K	0.037
			Eff.	0.00787
Std Counts	1676			
Bkg Counts	86			
DPM, pCi	18210	2.22	dis/pCi	
Count Time, min	5			

Data 2

Date Set	8/8/2005		λ	2.10E-06
Date Removed	8/9/2005		Area	0.051
Date Counted	8/10/2005		K	0.037
			Eff.	0.00787
Std Counts	1676			
Bkg Counts	86			
DPM, pCi	18210	2.22	dis/pCi	
Count Time, min	5			

Lab ID	QA	LAACC #	Can ID	Field ID	Gross Counts	Net Counts	Net CPM	Time Set	Time Removed	t1, sec	Time Count Start	t2, sec	t3, sec	pCi 222Rn m-2 s-1	Run #	Count Date	Int 1	Int 2	Int 3	Int 4
001		1	1	212	343	257	51	9:01	9:16	87300	9:10	173340	173640	0.87	1	08-10-05	0.000	0.17	0.83	0.83
002		2	2	213	207	121	24	9:03	9:18	87300	9:15	173520	173820	<0.5	1	08-10-05	0.000	0.17	0.83	0.83
003		3	3	214	186	100	20	9:05	9:20	87300	9:20	173700	174000	<0.5	1	08-10-05	0.000	0.17	0.83	0.83
004		4	4	215	163	77	15	9:07	9:21	87240	9:25	173880	174180	<0.5	1	08-10-05	0.000	0.17	0.83	0.83
005		5	5	225	224	138	28	9:10	9:23	87180	9:30	174000	174300	<0.5	1	08-10-05	0.000	0.17	0.83	0.83
006	D1	6	6	226	826	740	148	9:12	9:22	87000	9:35	174180	174480	2.51	1	08-10-05	0.000	0.17	0.83	0.83
006		6	6	226	763	677	135	9:12	9:22	87000	9:40	174480	174780	2.30	1	08-10-05	0.000	0.17	0.83	0.83
TB-1		TB-1	TB-1	TB-1	107	21	4	12:00	12:00	86400	9:45	164700	165000	<0.5	1	08-10-05	0.000	0.17	0.85	0.85
TB-2		TB-2	TB-2	TB-2	94	8	2	12:00	12:00	86400	9:50	165000	165300	<0.5	1	08-10-05	0.000	0.17	0.85	0.85
														1.69						

7.3 FIELD NOTES FORM

SO[illegible]-C-50-907-01

LARGE AREA ACTIVATED CHARCOAL CANISTER (LAACC) FIELD NOTES

Page 1 Of 1

Client: Pathfinder Mines Corp. Location: Gas Hills

Weather Condition: clear Precip: -0- Min Temp: ~50°F

Inst.: _____ Eff: _____ Tech: _____

Inst. Back: _____

Charcoal Back: _____ Lot: _____

Standard: _____ Count: _____

LAACC Unit #	Charcoal Can #	Location I.D. / Station	Mo/Day/Yr 24 hr time set	Mo/Day/Yr 24 hr time removed	Site Personnel Initials	Lab Sample Number	Date/Time Start	Count Min	Gross Counts	Comments
1	1	212	08-08-05 0901	8-9-05 0916	TWH	C05080436 001	8-10-05 9:30	5	343	
2	2	213	8-08-05 0903	0918	TWH	002	9:35	↓	207	
3	3	214	8-08-05 0905	0920	TWH	003	9:40	All EWN	186	
4	4	215	8-08-05 0907	0921	TWH	004	9:45		163	
5	5	225	8-08-05 0910	0923	TWH	005	9:50		224	
6	6	226	8-08-05 0912	0922	TWH	006	9:55		826	763
		TB #1				007	—		107	
		TB #2				008	—		94	
		STD 1							1683	
		STD 2							3338	
		BLANK							86	

NOTE CAN#'s 7-12 were not used.

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THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:

EXHIBIT E-1

"RADON FLUX TEST PROGRAM"

WITHIN THIS PACKAGE

D-01