



PATHFINDER

RECEIVED

OCT 14 2008

DNMS

October 10, 2008

Mr. Keith I. McConnell, Deputy Director
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management and
Environmental Protection
Office of Federal and State Materials and
Environmental Management Programs
U. S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, Maryland 20852-2738

Ref: Docket No. 40-6622, Source Material License No. SUA-442

Dear Mr. McConnell:

Enclosed please find two copies of an annual radiation safety ALARA audit report covering year 2007 for the Shirley Basin mill and tailings site as required by condition 36 of Source Material License No. SUA-442. I apologize for the lateness of this submittal. We have been very busy on a number of tasks.

Sincerely,

T. W. Hardgrove
Operations Manager

Enclosure

Cc: D. B. Spitzberg, USNRC, Region IV

Annual ALARA Audit

For 2007

PATHFINDER MINES CORP.

Shirley Basin Mine

Source Material License SUA-442

Prepared By

L. Arbogast

October 3, 2008

A. Introduction

An annual ALARA audit of the radiation safety program at the Shirley Basin Mine was conducted during the third week of June, 2008. The audit was conducted in fulfillment of condition 36 of the license. The audit entailed a review of 2007 radiation safety records and an evaluation of conformance with requirements of the license.

B. Personnel Dose Records

Attachment 1 is a summary of the annual Pathfinder (PMC) employee radiation doses for 2007. CEDEs were assigned to the two PMC hourly employees. The highest PMC annual CEDE was 0.06 rems or <1% of the annual limit of five rems. The hourly employees were not issued TLD badges. Therefore, all doses were due to internal committed effective dose. The annual doses have been in a downward trend for a number of years (see Attachment 2). This trend is most likely due to the progressive covering of tailings and declines in PMC personnel hours actually spent directly on the tailings.

C. Bioassays

No bioassay samples were analyzed during 2007. Bioassays are not required by the approved radiation safety program at Shirley Basin.

D. Inspections

There were no NRC inspections during 2007.

E. Training

The required annual refresher radiation safety training was given to two PMC hourly employees in December, 2007. Contractor employees were given an introductory presentation on radiation hazards and appropriate conduct to minimize exposure, including personal cleanliness and avoidance of food consumption while working directly on tailings. The training program is adequate for the level and type of activities at this site.

F. Safety Meetings

Documented routine safety meetings were held with Pathfinder employees on a bimonthly basis. Safety meetings are often utilized as a means of re-enforcing the radiation safety refresher training. Such meetings were documented, including topics discussed.

G. Radiological Surveys and Sampling Data

See Attachment 3 for a 2007 summary of values resulting from routine area surveys for airborne particulates. The overall alpha particulate levels remained generally low. Attachment 3 provides the overall annual average airborne concentrations for U, Ra226, and Th230, and the corresponding percentages of the applicable DAC's. Th230 remains the radionuclide of greatest concern with the average annual concentration at < 1 % of the DAC.

Radon with daughters monitoring was done quarterly (see Attachment 3). Measured working levels (WL) remained low, averaging less than one percent of the DAC. The highest measured WL was less than one percent of the DAC. Overall, radon with daughters was lower than in 2006.

Area gamma levels were consistently low with the highest reading of 0.08 mR/hr at the ISL burial trench. Other sites were 0.06 or less mR/hr, and the mill shop sample sites were 0.03 mR/hr. Ponds 4 and 5 were 0.02 mR/hr. Background gamma levels adjacent to the office are around 0.02 mR/hr.

Surface alpha contamination levels were consistently low and well below the action level. Checks were made quarterly, appropriate for the low alpha levels observed. The highest reading was 13.2 dpm/100 cm² on the shop bench during the first quarter. Personnel alpha contamination survey records were examined; there were no cases of contamination necessitating decontamination and re-monitoring. Site workers monitor out if they have been working on ISL waste shipment receipts. ISL waste shipment truck drivers were also checked routinely for alpha contamination, and no problems were evident. The drivers do not come in contact with the byproduct waste, making it highly unlikely they would incur any contamination. Note that exit contamination personnel surveys are not specifically required by the license and approved radiation safety program at this site.

Surveys of equipment (primarily ISL waste delivery trucks) prior to release from the restricted area are well documented with no problems apparent. Spot checks of small vehicles used within the restricted area indicated no problems with surface contamination. Typical surface alpha and gamma levels were at or near background levels.

H. Equipment Used for Exposure Control

Radiation detection instrument calibration records were examined and found to be in order. Acceptable documentation of instrument function checks was noted. Breathing zone air pump samplers were found to be calibrated and so documented in a timely manner.

I. Reports on Overexposures

There were no overexposures during 2007.

J. Standard Operating Procedures Review

The records with the SOPs documented the required annual review of all SOPs by the RSO.

K. Radiation Work Permits

There were no radiation work permits (RWP) issued during 2007. Measured doses from RWP have been trivial for a number of years.

L. Recommendations on Ways to Further Reduce Personnel Exposures

- Continue to emphasize good housekeeping and personal hygiene practices as a means to avoid contamination problems, particularly in conjunction with ISL waste shipments delivery.

M. Concluding Comment

During 2007 radiation doses continued the pattern of decline that has been evident during recent years. The radiation safety program at Shirley Basin conforms with the requirements of the license and is appropriate for the kind and level of activity at the site. There are no upward trends in doses to the limited number of PMC site personnel. It is anticipated that the already low doses will continue to decline now that tailings site is capped and reclaimed (exclusive of the ISL waste burial site).



Larry Arbogast
Radiation Safety Officer
COGEMA Mining, Inc.

ATTACHMENT 1

FULL YEAR 2007 - SHIRLEY BASIN

NAME	AREA	HOURS	CONC.		U (uCi-hr/ml)	DOSE (rem)	INTAKE (uCi)	Ra (uCi-hr/ml)	DOSE (rem)	INTAKE (uCi)	Th (uCi-hr/ml)	DOSE (rem)	INTAKE (uCi)	Rn (uCi-hr)	DOSE (rem)	INTAKE (uCi)	CEDE (mrem)
			SOL U	CONC.													
Employee 1	REST. AREA	370	4.19E-13	0.0000	2.37E-10	0.001	0.0000	2.47E-11	0.001	0.0000	1.21E-13	0.060	0.0000	0.0007	0.003	0.0000	55.04
Employee 2	REST. AREA	690	4.19E-13	0.0000	2.70E-10	0.001	0.57E-11	0.801	0.0001	2.12E-13	1.30E-10	0.037	0.0000	0.0007	0.003	0.0000	62.76

ATTACHMENT 2. Summary of Doses for the Last Nine Years at Shirley Basin Mine

<u>YEAR</u>	<u>Annual CEDE in rems</u>		10/3/2008
	<u>Employee 1</u>	<u>Employee 2</u>	
1999	0.4	0.5	
2000	0.7	0.8	
2001	0.6	0.7	
2002	0.4	0.5	
2003	0.3	0.3	
2004	0.2	0.3	
2005	0.2	0.2	
2006	0.1	0.1	
2007	0.1	0.1	

**Note: Zero dose penetrating radiation from TLDs for the period 1999-2006.
No TLDs were issued in 2007.**

ATTACHMENT 3

Area Airbornes - 1st Quarter 2007

	Th230	U-Nat	Ra-226
01/10/07	8.85E-14	1.74E-13	4.27E-14
01/10/07	1.88E-13	3.11E-13	7.65E-14
01/10/07	1.26E-13	2.49E-13	6.11E-14
02/20/07	6.95E-14	1.37E-13	3.35E-14
02/20/07	1.54E-13	3.03E-13	7.44E-14
02/20/07	-3.04E-15	-5.97E-15	-1.47E-15
02/20/07	-9.51E-15	-1.87E-14	-4.59E-15
03/19/07	7.69E-14	1.51E-13	3.71E-14
03/19/07	1.34E-14	2.62E-14	6.45E-15
03/19/07	8.95E-14	1.76E-13	4.32E-14
03/19/07	3.96E-13	7.79E-13	1.91E-13

Area Airbornes - 2nd Quarter 2007

	Th230	U-Nat	Ra-226
04/17/07	2.73E-13	5.37E-13	1.32E-13
04/17/07	3.43E-13	6.73E-13	1.65E-13
04/17/07	1.51E-13	2.96E-13	7.27E-14
04/17/07	4.47E-14	8.78E-14	2.16E-14
05/10/07	2.08E-13	4.08E-13	1.00E-13
05/10/07	-1.27E-14	-2.50E-14	-6.14E-15
05/10/07	2.27E-13	4.46E-13	1.09E-13
05/10/07	2.47E-13	4.86E-13	1.19E-13
06/11/07	1.09E-13	2.14E-13	5.25E-14
06/11/07	2.43E-13	4.78E-13	1.17E-13
06/11/07	4.64E-13	9.12E-13	2.24E-13
06/11/07	2.02E-13	3.98E-13	9.77E-14

Area Airbornes - 3rd Quarter 2007

	Th230	U-Nat	Ra-226
07/06/07	3.60E-14	7.07E-14	1.74E-14
07/06/07	2.98E-13	5.86E-13	1.44E-13
07/06/07	2.71E-13	5.32E-13	1.31E-13
08/16/07	2.25E-13	4.43E-13	1.09E-13
08/16/07	3.36E-13	6.60E-13	1.62E-13
08/16/07	-1.39E-13	-2.74E-13	-6.72E-14
08/16/07	-9.01E-14	-1.77E-13	-4.35E-14
09/18/07	1.67E-13	3.27E-13	8.04E-14
09/18/07	1.31E-13	2.57E-13	6.32E-14
09/18/07	5.18E-13	1.02E-12	2.50E-13
09/18/07	1.16E-13	2.29E-13	5.62E-14

Area Airbornes - 4th Quarter 2007

	Th230	U-Nat	Ra-226
10/30/07	1.58E-13	3.10E-13	7.61E-14
10/30/07	8.73E-13	1.72E-12	4.21E-13
10/30/07	1.38E-12	2.72E-12	6.67E-13
10/30/07	1.62E-13	3.19E-13	7.83E-14
11/14/07	2.00E-13	3.93E-13	9.66E-14
11/14/07	8.29E-14	1.63E-13	4.00E-14
11/14/07	7.96E-14	1.57E-13	3.84E-14
11/14/07	3.18E-15	6.24E-15	1.53E-15
12/06/07	3.30E-13	6.49E-13	1.29E-13
12/06/07	6.23E-13	1.22E-12	3.01E-13
12/06/07	8.74E-14	1.72E-13	4.22E-14

Radon Daughters - 1st Quarter 2007

	WL Off Tails	WL On Tails
01/10/07	0.0005	
03/20/07	0.000987	0.000141
03/20/07	0.000705	0.000423
03/20/07		-0.0014

Radon Daughters - 2nd Quarter 2007

	WL Off Tails	WL On Tails
06/19/07	0.00134	-0.00035
06/19/07	0.001058	-0.00063
06/19/07	0.001058	

Radon Daughters - 3rd Quarter 2007

	WL Off Tails	WL On Tails
09/24/07	0.00014	0.001535
09/24/07	0.002652	-0.00098
09/24/07	0.00014	

Radon Daughters - 4th Quarter 2007

	WL Off Tails	WL On Tails
12/07/07	0.000701	0.002943
12/07/07	0.001541	0.00042
12/07/07	0.001261	