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PATHFINDER

February 24, 2017

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
Mailstop T8-F5
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: License SUA-442, Docket No. 40-6622
Annual ALARA Report for 2016
Certified Mail: 7015 1660 0000 7308 2761

Dear Deputy Director,

Please find behind this cover the Annual ALARA report for your records.

If you have any questions regarding this submittal, please feel free to contact me at our Casper office.

Regards,

Mr. John W. Cash
President

Cc: Mr. Dominick Orlando, U.S. NRC via email
Mrs. Theresa Horne, Ur-Energy Littleton Office

Annual ALARA Audit For 2015-2016 PATHFINDER MINES CORPORATION Shirley Basin Mine Source Material License SUA-442

December 7, 2016

A. Introduction

An annual ALARA audit of the radiation safety program at the Shirley Basin site was conducted November 28 thru December 6, 2016 by John Cash, President of Pathfinder Mines Corp. The audit was conducted in fulfillment of License Condition 36 of NRC License Number SUA-442. This audit covers the period November 2, 2015 through December 6, 2016. The audit entailed a review of the radiation safety records and an evaluation of conformance with requirements of the license for this period. The audit also included a site visit on December 6, 2016.

B. Review of By-Product Material Shipping and Disposal Records

A total of 13 truckloads of ISL byproduct waste were received at the Shirley Basin Site during the period. A spot check of the shipping and disposal manifest records showed them to be complete (all required forms filed).

C. Personnel Dose Records

No doses were assigned during the period. The mill has been decommissioned, and the tailings area has been reclaimed for a number of years now, eliminating most sources of personnel exposure at the site. The remaining un-reclaimed portion of the tailings area consists of approximately 25 acres in the Pond 3 basin dedicated to the licensed disposal of byproduct waste material from ISL licensees. This disposal activity has been ongoing for over sixteen years, and the historical exposure/dose records for the site have demonstrated *very* low exposure potential due to the manner in which the incoming wastes are handled.

There continues to be only one worker (contractor) on site on a part time basis. Over the period, the site Radiation Safety Program has been overseen by the Radiation Safety Officers (RSO), of Pathfinder Mines Corporation. The RSO visited the site periodically when disposal activities were occurring. The lack of recent exposure records is consistent with the requirements of 10 CFR 20.1502 since individual exposure monitoring is required if the external exposure is greater than 500 mrem, or if the internal exposure is greater than 10% of the applicable ALIs from Appendix B to 10 CFR 20. Historic individual TLD monitoring had indicated zero external dose for over a ten years prior to 2008, and the highest recorded average individual annual ALI for the previous nine years was 0.7 uCi Rn 222 with daughters, well below the 10 uCi threshold that requires monitoring. Other previously monitored radionuclides such as Unat and Ra-226 measured zero or near-zero intake for years prior to 2008.

D. Bioassays

No bioassay samples were taken during the period. The NRC license does not require routine

urinalyses, and no measurable intakes were indicated for bioassays done prior to 2008 for a number of years.

E. Inspections

During the period there was an NRC inspection on September 21, 2016. No violations or open items were noted in the resulting inspection report issued on September 19, 2016.

F. Radiological Surveys and Sampling Data

Surveys of equipment (primarily ISL waste *delivery* trucks) prior to release from the restricted area were reviewed. They were found to be well documented with no significant concerns noted. Typical surface alpha and gamma levels were at or near background levels. Besides ISL waste delivery trucks, various items, namely personal vehicles, were also released with documented surveys demonstrating that residual surface alpha and gamma levels were well below release limits. The truck drivers are routinely monitored by Ken Hurley for alpha contamination prior to leaving the property. No other radiological surveys or sampling were done during the period, consistent with the site status.

G. Equipment Used for Exposure Control

Overall, the radiation safety instrumentation program is in order. A review was made to determine that all instruments were in appropriate calibration and usable status. Calibration records for all instruments were reviewed and they were determined to be current.

H. Reports on Overexposures

There were no overexposures during the period.

I. Standard Operating Procedures Review

The records with the SOPs documented that the required annual review of all active SOPs by the RSO was concluded on June 2, 2016.

J. Radiation Work Permits

There were no radiation work permits (RWP's) issued during the period.

K. Annual Land Use Survey and Semi-Annual Effluent Reports

In accordance with License Condition 21, the Annual Land Use Survey records show that the survey was completed on August 17, 2016 with the results submitted to the NRC. Since there is no effluent monitoring pursuant to 10 CFR 40.65, letters were submitted to NRC stating no data had been collected (February 15, 2016 and August 17, 2016).

L. Annual Surety Update

In accordance with License Condition 27, the annual surety update was submitted to the NRC on September 12, 2016.

M. Semi-Annual Groundwater Monitoring Report

Semi-Annual Groundwater Monitoring Reports were submitted to the NRC on January 26, 2016 and September 1, 2016 as required. The water quality trends remain below the approved ACLs with no trends of concern.

N. Field Audit

On December 6, 2016 Mr. Cash visited the site in order to ensure compliance with regulatory and license commitments. The weather was overcast and cold (1-degree F) with several inches of snow on the ground.

It was observed that an open trench was more than 100 feet from the dam. Material within the trench had been covered as required.

O. Recommendations on Ways Maintain Compliance with the NRC License and Further Reduce Personnel Exposures

1. Revise the regulatory schedule to include annual refresher training for the site contractor and other radiation workers.
2. Consider purchase of modern, more reliable, instrumentation. Current instruments are calibrated and functioning but their age could begin to affect reliability.
3. Empty byproduct containers should be returned to the sender as "Empty" if they are below the interior and exterior DOT release limits.
4. Continue to emphasize good housekeeping and personal hygiene practices as a means to avoid contamination problems, particularly in conjunction with ISL waste shipments delivery and dumping into the disposal cell.
5. Continue to conduct bi-monthly safety meetings during times of operation.
6. Continue careful attention to calibration due dates for survey instrumentation.

P. Summary/Conclusions

During period radiation doses were likely at background levels with only one-part time contractor and/or company employee on site to handle the limited ISL waste shipment deliveries and disposal operations. In summary, the radiation safety program at Shirley Basin conforms to the requirements of NRC License Number SUA-442 and it is appropriate for the kind and level of activity at the site.

2/23/17

John Cash, President

Chris Pedersen, RSO