UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
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August 18, 2004

Mr. T. W. Hardgrove, Manager
Environmental & Regulatory Services
Pathfinder Mines Corporation
935 Pendell Blvd.
P.O. Box 730
Mills, Wyoming 82644

SUBJECT: NRC INSPECTION REPORT 040-06622/04-001

Dear Mr. Hardgrove:

On July 20, 2004, the NRC completed an inspection at your Shirley Basin Mill site in Carbon County, Wyoming. The enclosed report presents the results of that inspection.

The inspection consisted of a routine review of site status, decommissioning and reclamation activities, operations review, radiation protection, and environmental monitoring. During this inspection, no items of non-compliance or significant issues were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Ms. Judith Walker at 817-860-8299 or the undersigned at 817-860-8197.

Sincerely,

/RA/

Jack E. Whitten, Chief
Nuclear Materials Licensing Branch

Docket No.: 040-06622
License No.: SUA-442

Enclosure:
NRC Inspection Report
040-06622/04-001

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ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.	040-06622
License No.	SUA-442
Report No.	040-06622/04-001
Licensee:	Pathfinder Mines Company
Facility:	Former Shirley Basin Mill
Location:	Carbon County, Wyoming
Date:	July 20, 2004
Inspector:	Judith Walker, Health Physicist Nuclear Materials Licensing Branch
Approved By:	Jack E. Whitten, Chief Nuclear Materials Licensing Branch
Attachment:	Supplementary Inspection Information

EXECUTIVE SUMMARY

Former Shirley Basin Mill Site
NRC Inspection Report 040-06622/04-01

This routine, announced inspection included a review of the site status and decommissioning, management organization and controls, radiation protection, operations review, radioactive waste management, and environmental protection. In general, the licensee was conducting activities in accordance with the license and regulatory requirements.

Site Status and Decommissioning for Uranium Mill Sites

- Site decommissioning activities were reviewed and found to be conducted in accordance with applicable regulatory requirements (Section 1).

Management Organization and Controls

- The licensee's organization structure was found to be in compliance with license requirements. Adequate oversight had been provided for site activities. Procedures were reviewed and were deemed adequate for the work in progress (Section 2).

- The annual As Low As Reasonably Achievable (ALARA) audits were performed and reports were submitted timely with an exception of the 2001 audit. The licensee implemented the personnel training program as required by License Conditions 11 and 35 and Section 5.3.2 of the license application (Section 2).

Operations Review and Radioactive Waste Management

- Site operations were being conducted in accordance with license conditions. Site fences, gates, perimeter postings, and security were adequate. Pond levels were below freeboard requirements (Section 3).

- Observations of the licensee's 11e.(2) by-product disposal operations revealed that the material was handled in an orderly and controlled fashion (Section 3).

Radiation Protection

- The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20. The radiation protection program was found to be adequate. Personnel exposures during years 2002 and 2003 were well below limits (Section 3).

- Site fences were in good condition and perimeter postings were appropriate. No health or safety hazards were identified (Section 3).

Environmental Protection

- Review of the licensee's environmental protection and land use survey programs indicated that the licensee was in compliance with license requirements (Section 4).

- Sample results were reported to the NRC in the semi-annual effluent reports. The licensee submitted annual land use surveys to the NRC as required. All sample results were well below the applicable effluent concentration limits listed in 10 CFR Part 20, Appendix B, Table 2 (Section 4).

Report Details

1 Site Status and Decommissioning Inspection Procedure for Uranium Mill Sites (87654)

1.1 Inspection Scope

The site status and decommissioning activities were reviewed to determine if licensee activities were being conducted in accordance with the Shirley Basin Reclamation Plan.

1.2 Observations and Findings

Site Status

Since the last inspection, decommissioning and remediation activities were limited to 11e.(2) by-product disposal, groundwater corrective action program, and surveys of equipment for release offsite. Activities in progress during the inspection included reclamation of Tailings Impoundment 4, collection of groundwater monitoring samples, evaporation of excess pond water, implementation of the groundwater corrective action program, receipt and disposal of 11e.(2) by-product waste from in-situ leach facilities, and routine equipment maintenance.

At the time of this inspection, the only structures remaining at the site were the office and the shop/warehouse. Activities planned for the future included radon flux testing in five 150 x 150 ft plots on Tailings Impoundment 4 and continuation of groundwater cleanup activities using the two evaporation ponds. Elimination of tailings fluids and evaporation water are still necessary before the licensee can complete site reclamation. The licensee still has to install the radon barrier, final cover, and erosion protection on and around the tailings impoundments.

1.3 Conclusions

Site activities were reviewed and found to have been conducted in accordance with applicable license and regulatory requirements.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The licensee's organizational structure and management controls were reviewed to determine: (1) whether functional responsibilities and personnel qualifications had been clearly established and fulfilled in accordance with license conditions, and (2) what controls were in place to ensure compliance with NRC requirements.

2.2 Observations and Findings

a. Management Organization and Staff

The onsite staff consisted of six individuals; a manager of reclamation operations who also served as the radiation safety officer(RSO), a safety/personnel manager, a technical services manager, and two reclamation service mechanics and one electrician. Offsite personnel included a general manager.

b. Standard Operating Procedures

License Condition 33 requires that standard operating procedures (SOPs) be established for non-operational activities to include environmental monitoring, instrument calibrations, and bioassay analyses. The inspector reviewed selected site procedures during the inspection. Overall, the site procedures that had been established were adequate for the work in progress at the site. Records indicated site procedures had been reviewed on an annual basis by the RSO. The RSO had performed the annual SOP review for calender year (CY) 2003. The inspector reviewed several SOPs and determined that the licensee had maintained procedures as needed to implement the requirements of License Condition 33.

c. As Low As Reasonably Achievable (ALARA) Reviews

10 CFR 20.1101(c) states that the licensee shall periodically (at least annually) review the radiation protection program content and implementation. License Condition 36 states that the licensee shall submit a copy of their audit report to the NRC. The inspector reviewed the licensee's 2001, 2002 and 2003 audit reports. The 2001, 2002 and 2003 ALARA audit reports were submitted to the NRC and met the intent of the license.

d. Training

License Condition 11 requires, in part, that the licensee conduct operations in accordance with the statements, representations, and conditions contained in Sections 4 and 5 of the license application dated November 30, 1994, except where superseded by license conditions.

License Condition 35 requires that in addition to the training program outlined in Section 5.3 of the license application, the licensee conduct and document the attendance at the bi-monthly safety meetings for all restricted area facility employees.

Section 5.3.2 of the license application requires that all employees receive annual radiation safety refresher training, and that employees are given a written examination at the conclusion of the refresher training.

The inspector reviewed the licensee's "Tool Box Safety Meeting Reports" for 2003 and 2004. These safety reports covered both radiological and industrial safety issues. The licensee conducted and documented attendance at the bi-monthly safety meetings at the frequency prescribed by License Condition 35.

The inspector also reviewed the licensee's annual radiation refresher training records. Annual refresher training was conducted in 2002 and 2003. The 2004 training is scheduled for the Fall.

2.3 Conclusions

The annual ALARA audits were performed and reports were submitted timely with an exception of the 2001 audit. The licensee implemented the personnel training program as required by License Conditions 11 and 35 and Section 5.3.2 of the license application.

3 Operations Review (88020) and Radioactive Waste Management (88035)

3.1 Inspection Scope

The objective of this portion of the inspection was to verify that site activities were being conducted in accordance with applicable regulations and the conditions of the license, and to ensure that operational controls were adequate to protect the health and safety of the workers and members of the general public.

3.2 Observations and Findings

a. Site Tour

Buildings, fences, gates, and operating equipment were observed during the site tours. The access gates were functional and the fences were adequately posted as required by 10 CFR 20.1902. No health or safety hazards were identified during the site tours, and the inspector determined that licensed material was adequately secured within the site property as required by 10 CFR 20.1801.

There were three tailings impoundments at the site. Tailings Impoundment 3 initially held only tailings solutions and no solids. This pond is currently being used for disposal of byproduct material from offsite sources. All of Tailings Impoundment 4 has been covered with an interim cover, with an exception of a small area (less than one-half acre). Re-grading of Tailings Impoundment 4 is the primary activity on-site. Once Tailings Impoundment 4 is completely re-graded then the radon barrier will be placed on, subsequent to the erosion protection placement. Tailings Impoundment 5 has been dewatered since 1996, and an interim cover had been placed over the tailings material.

License Condition 37 states that the licensee shall maintain a minimum of 3 feet of freeboard in Tailings Impoundment 4 and a minimum of 4.5 feet of freeboard in Tailings Impoundment 5. These two ponds were observed during the site tour and the inspector noted that the actual pond levels were well below the freeboard limits. The licensee routinely measured the pond levels and reported these values in the semi-annual effluent reports.

b. License Compliance Review

License Condition 46 authorizes the licensee to dispose of 11e.(2) byproduct material generated either onsite or at other licensed facilities. The licensee receives at least 5-6 shipments a week from four offsite in-situ leach facilities. The licensee received and disposed of 88 shipments in 2003, and over 300 shipments so far in 2004. The volume of 11e.(2) byproduct material being disposed of was within licensed limits. During the site tour, the inspector observed the current waste disposal pit and observed the receipt of an incoming shipment. The inspector observed licensee staff performing radiological surveys on a transport vehicle to assure that release limits were being met. The pit was located in Tailings Impoundment 3. The pit was a long, narrow trench that contained several recent waste shipment disposals. The licensee planned to cover the waste material with soil when the trench was completely full.

3.4 Conclusions

Site operations were being conducted in accordance with the conditions of the license. Site fences, gates, and postings were adequate. Site security was also adequate. No health or safety hazard was identified during the tour. Observations of the licensee's 11e.(2) disposal operations revealed that the material was handled in an orderly and controlled fashion.

4 Radiation Protection (83822)

4.1 Inspection Scope

This portion of the inspection effort was to determine if the licensee's radiation protection program was in compliance with the license and 10 CFR Part 20 requirements.

4.2 Observations and Findings

a. Inspection Radiation Surveys

The inspector observed the licensee performing radiological surveys using a microRoentgen meter. Background radiation measured 0.020-0.025 millirems per hour (mr/hr). The highest exposure rate reading, 0.5 mr/hr was observed near Tailings Impoundment 3, which also serves as the 11e.(2) byproduct material disposal site. The exposure rate near Tailings Impoundment 4 measured 0.2 mr/hr. Overall the site radiation levels remained unchanged since the previous inspection.

b. Occupational Exposure Monitoring

The licensee's exposure monitoring program was reviewed to ensure that no worker had exceeded the occupational dose limits specified in 10 CFR 20.1201. The program consisted of issuance of thermoluminescent dosimeters (TLDs) to site workers, collection of air particulate samples, and collection of bioassay samples. The inspector reviewed the licensee's records for calendar years 2002 and 2003, and the inspector concluded that no individual exceeded NRC's annual dose limits. TLDs issued to site workers during 2002 and 2003 had been processed by an accredited National Voluntary Laboratory Accreditation Program. Three individuals were monitored during 2002 and 2003. The licensee's TLD records indicated that the individuals received no measurable exposure (0 millirems) during the last 2 years.

The licensee had obtained air samples for determination of natural uranium, thorium-230, and radon daughter concentrations. These sample results were used to determine internal occupational exposures based on the amount of time a worker spent in a particular area of the site with known radioactive material concentration levels. Based on the air sample results, the licensee assigned occupational doses to site workers that varied from 0.5 to 0.3 rems during 2002 and 2003. The assigned doses were mainly from exposure to thorium-230. The licensee attributed the lower doses in 2003 to the results of a re-evaluation of the contribution of different radionuclides to the dose. The licensee performed a sampling program for a period of 17 weeks and determined that thorium-230 had a lower contribution to the over internal dose.

The licensee assigned the annual occupational doses to site workers based on the TLD and air sample results. Since the doses measured from the TLDs were zero, no deep dose equivalent values were assigned to the workers. Therefore, the total effective dose equivalents that were assigned to the workers were based exclusively from internal doses. These values were well below the NRC's total effective dose equivalent limit of 5 rems listed in 10 CFR 20.1201.

As a check for intake of radioactive materials, the licensee collected bioassay samples from selected site workers. Under the current license, bioassay samples are required only at the discretion of the RSO. During 2002 and 2003, urine samples were collected from site workers involved with the disposal of 11e.(2) byproduct material from offsite facilities and analyzed for natural uranium concentrations. All sample results were less than the detectable limit of 5 micrograms of uranium per liter of uranium.

c. Contamination Control

License Condition 18 states that the release of equipment or packages from the restricted area shall be in accordance with the document entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials." The inspector reviewed the equipment release survey records for 2003 - July 2004. The licensee's records indicated that equipment had been released for restricted use at other licensed facilities and for unrestricted use.

The licensee surveyed vehicles that had been released from the site during the last 2 years. Equipment was surveyed prior to being removed from the restricted area for maintenance. No equipment had been released from the site with residual contamination in excess of the limits contained in the NRC's guidelines.

d. Instrument Calibrations

License Condition 34 states that radiation monitoring equipment shall be calibrated after repairs and at least semi-annually or at the manufacturer's suggested interval, whichever is sooner. The licensee's instrument calibration records were reviewed. The records indicated that the licensee's radiological survey meters, environmental air samplers, and low volume air samplers had been calibrated at the frequency specified in the license.

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the conditions of the license. A radiological survey was conducted by the inspector, and low ambient gamma exposure rates were observed in most areas of the site. Occupational exposures were well below the NRC's annual dose limits.

5 Environmental Monitoring (88045)

5.1 Inspection Scope

The environmental monitoring program was reviewed to assess the effectiveness of the licensee's programs and to evaluate the impact, if any, of site activities on the local environment.

5.2 Observations and Findings

a. Environmental Monitoring

License Condition 38 states that the licensee shall implement the environmental and effluent monitoring program as specified in Table 5.8 and Figure 2-2 of the amended application dated November 1994. Further, License Condition 22 states that the results of all effluent and environmental monitoring required by the license shall be reported in accordance with 10 CFR 40.65. The inspector reviewed the licensee's semi-annual effluent reports for January to July 2003. The semi-annual reports were submitted to the NRC in a timely manner. No effluent or environmental monitoring was done during the third or fourth quarters of 2003, consistent with license Amendment 52 (dated February 13, 2003) which eliminated the environmental/effluent monitoring requirements.

The licensee performed air particulate, radon, surface water, soil, vegetation, and ambient gamma radiation monitoring around the site. The stations included a background and a nearest resident station.

Airborne radioactivity concentrations were sampled at the four stations. The air sample filter composites were analyzed quarterly for their natural uranium, thorium-230, radium-226, and lead-210 concentrations. The inspector compared sample results for the first quarter of 2002 to the effluent concentration limits provided in 10 CFR Part 20, Appendix B, Table 2. All sample results were well below the applicable effluent concentration limits listed in 10 CFR Part 20, Appendix B, Table 2.

Environmental TLDs were used to measure the ambient gamma exposures at the four sample stations. The TLDs were exchanged on a quarterly frequency. The inspector reviewed sample results for the first quarter of 2003. The exposure rates at the nearest resident sample Station 7R were below background levels.

LC 47 requires the licensee to implement a groundwater compliance monitoring program. Also, the licensee is required by LC 47 (D) to submit a groundwater corrective action report to the NRC, annually. The 2003 reports were submitted to NRC by letters dated August 28, 2003, and February 25, 2004. Results indicated that the licensee had obtained groundwater samples and analyzed the samples at the required frequency.

Surface water samples were obtained on a semi-annual basis at eight stream locations. The samples were analyzed for a number of chemical and radiological constituents. The sample results for 2003 were comparable to the previous year.

b. Annual Land Use Survey

License Condition 21 requires that the licensee conduct an annual survey of land use in the area within 5 miles of the mill and submit a report of this survey to the NRC each year. The Land Use Survey Report describes significant land use changes by private residences, nonresidential structures, grazing areas, and potable water and agricultural wells. The inspector reviewed the licensee's 2002 and 2003 Land Use Survey Reports that were submitted to the NRC. The land use around the site had not changed appreciably in years. The inspector concluded that the licensee's 2002 and 2003 Land Use Survey Reports met the intent of License Condition 21.

5.3 Conclusions

The licensee had implemented the environmental and effluent monitoring programs at the site. Site operations had no measurable radiological impact on the nearest resident.

Sample results were reported to the NRC in the semi-annual effluent reports. The licensee submitted annual land use surveys to the NRC as required.

6 Followup (92701)

6.1 (Closed) Violation 40/6622/0201-01: Failure to implement the personnel training as required by License Conditions 11 and 35.

In its reply to the violation dated October 4, 2002, the licensee committed to providing annual refresher radiation safety training and to scheduling, performing and documenting bi-monthly safety meetings.

The inspector reviewed the licensee's "Tool Box Safety Meeting Reports" for 2003 and 2004. These safety reports covered both radiological and industrial safety issues. The licensee conducted and documented attendance at the bi-monthly safety meetings at the frequency prescribed by License Condition 35. The inspector also reviewed the licensee's annual radiation refresher training records. Annual refresher training was conducted in 2002 and 2003, and 2004 training is scheduled for the fall. The inspector considered this item closed.

7 Exit Meeting Summary

The inspector presented the inspection results to the representatives of the licensee at the conclusion of the inspection on July 20, 2004. Licensee representatives acknowledged the findings as presented. The licensee did not identify any information reviewed by the inspector as propriety information.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Hardgrove, Manager, Environmental & Regulatory Services/Radiation Safety Officer
K. Hurley, Manager, Personnel & Safety

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

Closed

40-6622/0201-01	VIO	Failure to implement the personnel training as required by License Conditions 11 and 35.

Discussed

None

LIST OF ACRONYMS USED

ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
mr/hr	millirems per hour
PDR	Public Document Room
RSO	radiation safety officer
TLD	thermoluminescent dosimeter