

**TECHNICAL EVALUATION REPORT FOR PATHFINDER MINES CORPORATION'S
PROPOSED 2017-2018 SURETY ESTIMATE
FOR THE SHIRLEY BASIN MILL TAILINGS SITE**

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

DATE: May 3, 2018

FACILITY: Shirley Basin Mill Tailings Site

TECHNICAL REVIEWERS: Dominick Orlando, Reginald Augustus

PROJECT MANAGER: Dominick Orlando

SUMMARY AND CONCLUSIONS

By letter dated September 6, 2017, Pathfinder Mines Corporation (Pathfinder), submitted the 2017 surety estimate for its Shirley Basin uranium mill tailings site and a request that the U.S. Nuclear Regulatory Commission (NRC) amend Source Material License SUA-442 to incorporate the revised surety amount (Agencywide Documents Access and Management System (ADAMS) Accession Number ML17264B162). The NRC staff reviewed the 2017 estimate and determined that the decommissioning and reclamation activities are adequately described and reasonable cost estimates for each activity were provided. Appropriate cost estimates were also provided for contingencies and long-term maintenance and surveillance. The NRC staff determined that Pathfinder's method of increasing its cost estimate, based on: 1) Wyoming Department of Environmental Quality's Land Quality Division Guideline 12 (Guideline 12); 2) Contracted labor rates with Carr Construction Company, Inc.; and, 3) inflation, using the Urban Consumer Price Index (CPI), adequately demonstrates compliance with the requirements of 10 *Code of Federal Regulations* (CFR) Part 40, Appendix A, Criteria 9 and 10.

BACKGROUND

Pathfinder is the holder of NRC license no. SUA-442 for its former Shirley Basin conventional mill site in Wyoming. The site consists of two solid tailings impoundments and a tailings solution pond occupying approximately 323 acres. Uranium milling began on the site in 1971. The Shirley Basin site ceased active uranium recovery operations in 1992, has reclaimed approximately 90 percent of the tailings, and has discontinued groundwater restoration, per the NRC staff's approval of groundwater alternate concentration limits. Pathfinder intends to operate a disposal area for in-situ recovery (ISR) waste at the site for the foreseeable future.

TECHNICAL EVALUATION

Pathfinder's license was issued under 10 CFR Part 40, Domestic Licensing of Source Material. 10 CFR 40, Appendix A, Criterion 9, "Financial Criteria" require licensees to maintain an NRC-approved financial surety arrangement to cover estimated costs for decommissioning and decontamination activities at their sites. Criterion 9 requires that the cost estimates are calculated on the basis of a third party completing all decommissioning and decontamination activities and that the cost estimate must be updated annually. License Condition (LC) 27 of

Source Materials License SUA-672 also requires the licensee to maintain an NRC-approved financial surety arrangement to cover estimated costs for decommissioning and decontamination activities and that the estimate is updated annually, at least 3 months prior to December 15 of each year.

In addition, 10 CFR 40, Appendix A, Criterion 10, requires that a minimum charge of \$250,000 (1978 dollars) must be paid by each mill operator to the U.S. Treasury, or appropriate State agency, prior to uranium mill license termination, to account for costs associated with long-term surveillance and maintenance of the site.

The NRC staff reviewed Pathfinder's annual surety update using the guidance in NUREG-1620, Appendix C, Revision 1, "Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978," dated June 2003 (NUREG-1620, Rev. 1).

Pathfinder's 2017 surety estimate is \$2,412,633. The surety estimate reflects an increase of \$35,054 from the previous (2016) surety estimate, based on updated unit costs for all remaining work. Changes to the surety estimate were due to updates to unit costs based on inflation and an increase in costs for reseeding 54 acres of the site. Pathfinder provided an estimate based on a third party performing the remaining activities. In determining whether an adjustment to increase the surety amount based on Guideline 12, actual costs, and CPI would be adequate, the NRC staff evaluated several factors for adjusting the cost estimate, as outlined in 10 CFR 40 Appendix A, Criterion 9(f)(4) that included:

1. Spills, leakage or migration of radioactive material leading to additional contamination.

Pathfinder's Shirley Basin facility remains in a non-operational status with most of the reclamation activities completed, except for work designated as the second phase of reclamation, encompassing the ISR waste disposal site, adjacent ground needed for access, and related drainage features. There have been no recorded events of spills or leaks.

2. Waste inventory cost increase.

The site continues to accept off-site waste for disposal. However, this does not impact the cost of final reclamation of the disposal area because, while the inventory of waste increases the areal extent of the disposal area does not change. The cost for reclamation of the disposal area is based on capping the area once waste disposal activities cease, not the inventory of the waste disposed.

3. Waste disposal cost increases.

Waste disposal costs have been updated and included in the surety update as required by regulation.

4. Facility modifications.

There have been no facility modifications at the site which affect this surety update.

5. Changes to authorized possession limits

There have been no changes in authorized possession limits under License SUA-442 since the last surety update.

6. Actual remediation costs above previous cost estimate

Actual remediation costs have been updated and included in this surety update as required by regulation.

7. Any other conditions that affected the costs.

No other known conditions have been identified that affect the cost estimate.

8. Onsite Disposal.

There have been no onsite disposals of radioactive material.

Therefore, the NRC has determined that the increase to the cost estimate meets the requirements in 10 CFR 40 Appendix A, Criterion 9.

Pathfinder submitted its annual financial assurance update on September 6, 2017, which was more than 3 months prior to December 15. Therefore, NRC staff determined that the submittal meets the license requirement that the annual surety update is to be submitted at least 3 months prior to the December 15 anniversary date specified in LC 27.

In addition, the costs in the annual surety update are estimated based upon third party costs to reclaim, remediate, and decommission facilities and lands affected by past licensed operations. All unit costs, labor and equipment, and other fees were included. The licensee also included 15 percent for contingencies, as well as costs for long-term surveillance and maintenance based on \$250,000 (1978 dollars). Therefore, NRC staff determined that the cost estimate is based upon third party costs, includes an adequate contingency factor of 15 percent, and accounts for long-term surveillance fees as required by 10 CFR 40, Appendix A, Criterion 9 and 10. The long-term maintenance and surveillance fee was determined using CPI.

The cost estimate breakdown includes:

(1) Tailings Reclamation Activity:	
• Tailings	\$538,155
• Topsoil Placement	\$177,802
• Seeding	\$16,200
(2) License Termination, Legal Expenses, and All Other Activities:	
• Construction Management	\$181,758
• Engineering Design/Plan Changes	\$9,533
• Mobilization/Demobilization	\$92,288
• Legal Expenses	\$10,858
• Power (2017)	\$1,350
• Completion Report Preparation	\$18,059
• License Termination Activities	\$30,853

• Materials Testing	\$19,347
• Groundwater Restoration ¹	\$22,709
• Fencing	\$22,920
• Radiological Surveys	\$26,530
• Environmental Monitoring	<u>\$119,621</u>
Subtotal (1+2)	\$1,287,983
(3) Contingency(15%)	\$193,197
(4) Long-Term Care Fee (\$250,000 in 1978 dollars)	<u>\$931,454</u>
Total Estimated Costs	\$2,412,634

Note, the NRC staff's review resulted in a 2017 surety estimate of \$2,412,634. This was likely attributable to rounding of expenditures to whole dollars. However, the amended license should reflect the estimate calculated in this evaluation of \$2,412,634.

By letter dated July 6, 2017, Pathfinder submitted an updated, NRC-approved surety rider and amended standby trust agreement (STA) to demonstrate compliance with 10 CFR 40, Appendix A, Criterion 9 (ADAMS Accession Number ML17193A854). Upon approval of the current surety estimate update, Pathfinder must submit, within a reasonable amount of time, a finalized update to its surety bond and STA schedule A to reflect the new increased amount.

CONCLUSION

The NRC staff has determined that Pathfinder's annual surety update for its Pathfinder mill tailings site adequately reflects: the decommissioning activities; unit costs; contingency; long-term surveillance fees; and financial assurance mechanism as required by 10 CFR Part 40, Appendix A, Criterion 9, 10, and LC 27.

PROPOSED LICENSE AMENDMENT:

Revise License Condition 27 to change the required surety amount to: \$2,412,634.

¹ Groundwater restoration was completed at the site in November 2005. These costs are for well abandonment activities, including well plugging, equipment, material and labor costs.