UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 2, 1999

Mr. T. W. Hardgrove, Manager
Environmental and Regulatory Services
Pathfinder Mines Corporation
935 Pendell Boulevard
P.O. Box 730
Mills, WY 82664

SUBJECT: WINDBLOWN TAILINGS CLEANUP COMPLETION - AMENDMENT NO. 57

Dear Mr. Hardgrove:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of Pathfinder Mines Corporation's (PMC's) windblown tailings cleanup completion report (CR) for its Lucky Mc, Wyoming, uranium mill, submitted by letter dated February 16, 1999. Based on its review of the information provided by PMC, NRC staff concludes that the CR is acceptable.

NRC staff has amended Condition 29 of the Lucky Mc Source Material License SUA-672, reflecting its concurrence in the CR. The reissued license and the staff technical evaluation report that documents this licensing action are enclosed. If you have any questions regarding this action, please contact the NRC Project Manager, Mohammad Haque, at (301) 415-6640.

Sincerely,

King Stablein

N. King Stablein, Acting Chief
Uranium Recovery and
Low-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-6659

Enclosures: As stated (2)

cc: G. Beach, DEQ, WY
R. Chancellor, DEQ, WY
M. Moxley, DEQ, WY

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2259
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TAC No. L51784 (closed)
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cc: G. Beach, DEQ, WY
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TECHNICAL EVALUATION REPORT
LUCKY MC, WYOMING, URANIUM MILL SITE WINDBLOWN TAILINGS CLEANUP COMPLETION REPORT

DATE: March 30, 1999

LICENSE NO.: SUA-672

DOCKET NO.: 40-2259

LICENSEE: Pathfinder Mines Corporation

FACILITY: Lucky Mc Uranium Mill, Gas Hills, Wyoming

PROJECT MANAGER: Mohammad Haque

TECHNICAL REVIEWER: John Lusher, Health Physicist

SUMMARY AND CONCLUSIONS:

By letter dated March 2, 1998, Pathfinder Mines Corporation (PMC) submitted a windblown tailings cleanup completion report (CR). Based on the U.S. Nuclear Regulatory Commission (NRC) staff's review comments, PMC revised the CR by providing additional data and information. The revised CR was submitted by PMC's letter dated February 16, 1999. The windblown tailings contaminated soils cleanup activity occurred from May to November, 1996. Some additional cleanup was performed in support of the verification of the windblown area cleanup. The soil verification activity was completed in November 1997.

Any residual contamination west of the windblown tailings outline will be removed and the area verified, using NRC-approved procedures in conjunction with reclamation of the solution ponds. The solution ponds lie north of the tailings piles and west of the haul road.

Based on its review of the information presented in the revised CR, submitted by letter dated February 16, 1999, NRC staff concludes that the cleanup of the windblown tailings area was performed in accordance with the requirements of criterion 6(6) of 10 Code of Federal Regulations (CFR) Part 40, Appendix A.

BACKGROUND:

The Lucky Mc uranium mill site is located in the Gas Hills area of Wyoming about 45 miles east of Riverton, Wyoming. The tailings and former mill site are covered, but the evaporation ponds have yet to be decommissioned. Structures remaining at the site are an office building, fire and rescue station, and two storage buildings used for managing the soil cleanup and groundwater restoration programs.

The cleanup of the off-pile areas was complicated by ore outcrops, mine drainage through the site, and an ore haul road upwind of the windblown tailings area. These complicating factors were considered during the cleanup but, in most cases, cleanup beyond what may have been required was done to assure that residual contamination that currently exists is not due to licensed byproduct material.

The Lucky Mc mill went into production in February 1958 and processed ore until 1988. The mill facilities were decommissioned in 1993-1994 in accordance with the NRC-approved Decommissioning Plan. The mill facilities were razed and the mill debris placed in the tailings piles along with any process residues. The most highly contaminated surface soils within the mill yard area, Moly Pond, and ore pads were removed and placed with the tailings. The engineered tailings pile cover has been extended over these areas.

A haul road currently exists just east of the tailings piles on which much of the ore mined prior to the startup of the Lucky Mc mill was hauled to Riverton, Wyoming. The use of the haul road by some companies continued well into the 1970s. The typical ore truck carried the maximum load without any cover in place, leaving the load vulnerable to spillage, particularly in the Lucky Mc area which was near the beginning of the transport route. Frequent ore hauling on this road caused an abundance of spilled ore and ore dust along the road.

DESCRIPTION OF LICENSEE'S REQUEST:

By its letter dated February 16, 1999, PMC submitted a revised windblown tailings cleanup completion report for NRC approval in accordance with the requirement of Condition 29 of the Lucky Mc Source Material License, SUA-672. The CR summarizes the cleanup of windblown tailings and other radiologically contaminated soils at the site.

In the CR, the licensee notes that any residual contamination west of the windblown tailings outline will be removed and the area verified using NRC-approved procedures in conjunction with reclamation of the solution ponds. The solution ponds lie north of the tailings piles and west of the haul road.

TECHNICAL EVALUATION:

The NRC staff based its evaluation on the information provided in the CR submitted by letter dated March 2, 1998, the revised CR submitted by letter dated February 16, 1999, and inspection reports dated January 30, 1997, and November 25, 1997.

The licensee provided soil verification survey and sampling data through the use of Global Positioning System (GPS)-based gamma surveys. The plan called for the use of the GPS to identify areas requiring cleanup. Gamma action levels were determined by correlation studies in the windblown areas. The studies were completed, with the data supporting the use of the gamma action level of 50,000 counts per minute (cpm).

The plan was based on removal of surface soils having Ra-226 concentrations that exceed 5 pCi/g above background, or 9.5 pCi/g averaged over a layer with thickness 15 cm and an area of 100 m^2. For subsurface layers of 100 m^2 area, the cleanup criterion is 15 pCi/g above background, or 19.5 pCi/g. Heavy earth moving equipment was used to remove the surface

soils to a depth of 15-30 cm (6-12 inches). The areas were re-surveyed and areas requiring additional removal were identified. This iterative procedure was used until all areas were below the action level, or it was determined that the elevated readings resulted from natural background radionuclide concentrations.

The licensee collected 170 verification samples and had them analyzed using radiochemical methods. From the 170 samples analyzed, 12 samples ranged from 9.8 to 15.4 pCi/g Ra-226. The licensee performed further cleanup in the areas of the 12 samples. After re-sampling, there were 5 samples that ranged from 9.8 to15.4 pCi/g. The licensee then determined that these areas were from natural background radionuclide concentrations.

Additionally, the licensee provided information, maps, and justification of the naturally mineralized area where the mill site was located, spillage of uranium ore and dust from open ore haul trucks on the haul road which passed through the mill site area, and discharge of mine water down Fraser Draw. The licensee also provided Quality Assurance data through inter-laboratory comparisons of Ra-226, natural Uranium, and Th-230 sample results.

The staff determined that adequate sampling and surveying was performed for the areas requiring the cleanup and the 250 foot buffer zone. The staff determined that the findings provided in the CR support the staff conclusion that the cleanup of the windblown tailings area is in accordance with the requirements of criterion 6(6) of 10 CFR Part 40, Appendix A.

Any residual contamination west of the windblown tailings outline will be removed and the area verified using NRC-approved procedures in conjunction with reclamation of the solution ponds. The solution ponds lie north of the tailings piles and west of the haul road. Furthermore, the status of radiological contamination of Reid Draw is being evaluated by the NRC staff under a separate licensing action. The draw is located downgradient of the Lucky Mc tailings system.

RECOMMENDED LICENSE CHANGE:

The staff recommends that Condition 29 of the Source Material License SUA-672, for the Lucky Mc uranium facility, be amended to reflect NRC concurrence in the windblown tailings cleanup completion report submitted by PMC's letter dated February 16, 1999.

ENVIRONMENTAL IMPACT EVALUATION:

In accordance with the categorical exclusion contained in Paragraph (c)(11) of 10 CFR 51.22, an environmental assessment is not required for this licensing action. Therefore, an environmental report, as required by 10 CFR 51.60(b)(2), is not necessary.

REFERENCES:

Pathfinder Mines Corporation (PMC), 1998a. Submittal, titled "Lucky Mc Mill Site Completion Report, February 1998," by letter dated March 2, 1998.

PMC, 1998b. Submittal, titled "Proposed Sample Locations for Radon Barrier Flux Tests," by letter dated August 14, 1998.

PMC, 1998c. Submittal, titled "Environmental Report - Remediation of Reid Draw Near the Lucky Mc Mill Site," by letter dated August 28, 1998.

PMC, 1999. Revised submittal, titled "Lucky Mc Mill Site Completion Report, February 1999," by letter dated February 16, 1999.

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Pathfinder Mines Corporation Lucky Mc Uranium Mill	3. License Number SUA-672, Amendment No. 57
2. Post Office Box 831 Riverton, Wyoming 82501	4. Expiration Date Until terminated [Applicable Amendments: 23, 29]
	5. Docket or Reference No. 40-2259

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License
Natural Uranium	Any	Unlimited

9. Authorized place of use: The licensee's Lucky Mc Mill located in Fremont County, Wyoming.

[Applicable Amendments: 29, 36]

10. The licensee is hereby authorized to possess byproduct material in the form of uranium waste tailings generated by the licensee's milling operations authorized by this license.

11. For use in accordance with statements, representations and conditions contained in Sections 5.3, 5.4, 5.5, 6.4, and 7.6, and Figures 2-3 and 5-2 of the license renewal application dated December 1982, except where superseded by license conditions below. Whenever the word "will" is used in the above referenced sections, it shall denote a requirement.

The site organizational structure and position responsibilities shall be in accordance with the submittal dated September 25, 1991. Site security shall be provided by site personnel during regular business hours, but shall consist of limiting access by means of locked gates at times when site personnel are not present. Radiation survey requirements shall be as specified in Table 2 of the submittal dated February 27, 1995. No change room facility on a routine basis shall be required.

[Applicable Amendments: 7, 29, 45]

12. DELETED by Amendment No. 29.

13. DELETED by Amendment No. 29.

14. DELETED by Amendment No. 45.

15. The results of sampling, analyses, surveys and monitoring; the results of calibration of equipment; reports on audits and inspections; all meetings and training courses required by this license; and any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in NRC regulations, all such documentation shall be maintained for a period of at least 5 years.

16. DELETED by Amendment No. 29.

17. DELETED by Amendment No. 45.

18. Release of equipment or packages from the restricted area shall be in accordance with the attachment to this license entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials" dated September, 1984.

19. Mill tailings other than samples for research shall not be transferred from the site without specific prior approval of the NRC in the form of a license amendment. The licensee shall maintain a permanent record of all transfers made under the provisions of this condition.

20. In order to ensure that no disturbance of cultural resources occurs in the future, the licensee shall have an archeological and historical artifact survey of areas of its property, not previously surveyed, performed prior to their disturbance, including borrow areas to be used for reclamation cover. These surveys must be submitted to the NRC and no such disturbance shall occur until the licensee has received authorization from the NRC to proceed.

    In addition, all work in the immediate vicinity of any buried cultural deposits unearthed during the disturbance of land shall cease until approval to proceed has been granted by the NRC.

21. The licensee shall conduct an annual survey of land use (private residences, grazing areas, private and public potable water and agricultural wells, and non-residential structures and uses) in the area within 5 miles (8 km) of any portion of the restricted area boundary and submit a report of this survey to NRC. This report shall indicate any differences in land use from that described in the last report.

    [Applicable Amendments: 42, 44]

22. The results of all effluent and environmental monitoring shall be reported in accordance with 10 CFR 40.65 with copies of the report sent to NRC. Monitoring data shall be reported in the format shown in the attachment to SUA-672 entitled, "Sample Format for Reporting Monitoring Data."

    [Applicable Amendments: 11, 12, 19, 42, 44]

23. DELETED by Amendment No. 29.

24. The licensee shall immediately notify the NRC Operations Center at (301)951-0550, by telephone and telegraph, of any failure to the tailings dam or tailings discharge and solution return system which results in a release of radioactive material and/or of any unusual conditions which if not

corrected could lead to such a failure. This requirement is in addition to the requirements of 10 CFR 20.

[Applicable Amendments: 42]

25. Before engaging in any activity not previously assessed by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not assessed or that is greater than that assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval of the NRC in the form of a license amendment.

26. DELETED by Amendment No. 55.

27. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, reclamation of any tailings or waste disposal areas, ground water restoration as warranted and the long-term surveillance fee. Within 3 months of NRC approval of a revised reclamation/decommissioning plan, the licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within 3 months of written NRC approval.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criteria 9 and 10, shall be submitted to the NRC at least 3 months prior to the anniversary date which is designated as December 15 of each year. If the NRC has not approved a proposed revision to the surety coverage 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing surety arrangement for 1 year. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15 percent contingency fee, changes in engineering plans, activities performed and any other conditions affecting estimated costs for site closure. The basis for the cost estimate is the NRC approved reclamation/decommissioning plan or NRC approved revisions to the plan. The attachment entitled, "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates", outlines the minimum considerations used by the NRC in the review of site closure estimates. Reclamation/decommissioning plans and annual updates should follow this outline.

Pathfinder Lucky Mc's currently approved surety, Irrevocable Letter of Credit issued by Credit du Nord S.A. and confirmed by Advised Confirmed Irrevocable Standby Letter of Credit issued by Banque Paribas, New York Branch, in favor of the NRC, shall be continuously maintained in an amount not less than $12,363,362 for the purpose of complying with 10 CFR 40, Appendix A, Criteria 9 and 10, until a replacement is authorized by the NRC.

[Applicable Amendments: 14, 16, 21, 24, 26, 30, 33, 40, 42, 43, 47, 49, 54]

28. Prior to termination of this license, the licensee shall provide for transfer of title to byproduct material and land, including any interests therein (other than land owned by the United States or the State of Wyoming), which is used for the disposal of such byproduct material or is essential to

ensure the long term stability of such disposal site to the United States or the State of Wyoming, at the State's option.

29. The licensee shall decommission the Lucky Mc Uranium Mill in accordance with the proposed plan submitted by letter dated March 30, 1992, as modified by letters dated December 23, 1992; July 20 and 23, 1993; and January 12, March 21, May 9, and May 13, 1996. Standard Operating Procedures included in the March 30, 1992, submittal shall be reviewed and revised in accordance with Condition No. 33 of this license.

All decommissioning activities shall be documented. Within 90 days following the completion of mill demolition and disposal activities, the licensee shall submit to the NRC a report documenting the activities and providing summaries of all data generated as part of the radiation safety program for mill decommissioning. In addition, within 90 days following the completion of the soil cleanup and verification program, the licensee shall submit to the NRC a report documenting the cleanup activities and providing the results of all soil sampling and gamma surveys conducted to verify the adequacy of cleanup.

The licensee's windblown tailings cleanup completion report submitted by its letter dated February 16, 1999, is considered acceptable.

[Applicable Amendments: 29, 39, 46, 57]

30. Occupational exposure calculations shall be performed and documented within 1 week of the end of the regulatory compliance period as specified in Table 2 of the submittal dated February 27, 1995.

[Applicable Amendments: 45]

31. The tailings impoundment area shall not be expanded by raising the height of the present dam or constructing a new dam except as authorized by this license.

32. The licensee shall implement an interim stabilization program which consists of the placement of a soil cover over all exposed tailings. The effectiveness of the soil cover shall be evaluated by means of a monthly documented inspection of all tailings areas. Written procedures which address the monthly inspections and the corrective actions to be taken in response to inspection findings shall be established.

[Applicable Amendments: 27, 37]

33. Standard written operating procedures (SOPs) shall be established for nonoperational activities to include environmental monitoring, and instrument calibrations. All written procedures shall be reviewed and approved in writing by the RSO before implementation and whenever a change in procedure is proposed to ensure that proper radiation protection principles are being applied. In addition, the RSO shall perform a documented review of all existing operating procedures at least annually.

[Applicable Amendments: 29, 45]

34. The licensee shall implement the embankment inspection program specified in Section 5.5.7.8 of the license renewal application, with the exceptions that embankment settlement surveys shall be conducted at least semiannually, and that daily dam inspections need not be conducted on company holidays and weekends when personnel are not present onsite. All embankment inspections shall be documented. The monitored piezometers and the settlement monuments shall consist of those presented in the licensee's submittal by letter dated November 9, 1998.

[Applicable Amendments: 29, 41, 45, 55]

35. The RSO shall have the following education, training and experience:

A. Education: A bachelor's degree in the physical sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent combination of training and relevant experience in uranium mill radiation protection. Two years of relevant experience are generally considered equivalent to one year of academic study.

B. Health physics experience: At least 1 year of work experience relevant to uranium mill operation in applied health physics, radiation protection, industrial hygiene, or similar work. This experience should involve actually working with radiation detection and measurement equipment, not strictly administrative or "desk" work.

C. DELETED by Amendment No. 45.

D. Specialized knowledge: A thorough knowledge of the proper application and use of all health physics equipment used in the restricted area, the chemical and analytical procedures used for radiological sampling and monitoring, and methodologies used to calculate personnel exposure to uranium and its daughters.

[Applicable Amendment: 45]

36. DELETED by Amendment No. 45.

37. The licensee shall conduct at least an annual ALARA audit of the radiation safety program and shall submit a written report to the corporate management. The ALARA audit report shall summarize at least the following data:

A. Employee exposure records (external and internal time weighted calculations)

B. Bioassay results

C. Inspection log entries and summary reports of daily, weekly and semimonthly inspections.

D. Documented training program activities

E. Radiation safety meeting reports

F. Radiological survey and sampling data

G. Reports on overexposure of workers submitted to NRC, Mine Safety and Health Administration (MSHA), or States

H. Operating procedures that were reviewed during this time period.

The report on the annual radiation protection and ALARA audit should specifically discuss the following:

1. Trends in personnel exposures for identifiable categories of workers and types of operational activities

2. Whether equipment for exposure control is being properly used, maintained, and inspected

3. Recommendations on ways to further reduce personnel exposures from uranium and its daughters.

A copy of the ALARA audit report shall be kept on site for examination by NRC staff.

[Applicable Amendments: 42, 44, 45]

38. The licensee shall be required to use a Radiation Work Permit (RWP) for work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedures already exist. The RWP shall be issued by the RSO or his designate and shall at least describe the following:

A. The scope of the work to be performed.

B. Any precautions necessary to reduce exposure to uranium and its daughters.

C. The supplemental radiological monitoring and sampling necessary before, during, and following completion of the work.

39. For the area sampling of airborne radioactivity, the sample volume and analysis shall be sufficient to achieve a lower limit of detection of 10 percent of the MPC listed in Table 1 of Appendix B to 10 CFR 20.

[Applicable Amendments: 32]

40. The licensee shall perform quarterly spot checks for surface contamination in eating rooms and offices when such facilities are being utilized by personnel during remaining site reclamation activities.

[Applicable Amendments: 29, 45]

41. The licensee shall conduct safety meetings at least semiannually when personnel are routinely working within the restricted area. The licensee shall maintain a record of attendees and subjects covered.

[Applicable Amendments: 29, 45]

42. DELETED by Amendment No. 45.

43. DELETED by Amendment No. 13.

44. The RSO shall conduct an investigation of the employee's work record and exposure history when an action level of 25 percent of the maximum permissible time weighted exposure for the week or quarter is reached depending on the material solubility. Any personnel exposure exceeding 25 percent of the maximum permissible external exposure in any calendar quarter shall also be investigated. Corrective action shall be promptly initiated.

45. DELETED by Amendment No. 29.

46. DELETED by Amendment No. 45.

47. The licensee shall follow the lower limits of detection contained in the attachment to this license entitled, "*Proposed Alternate Lower Limits of Detection for Environmental Monitoring* at Lucky Mc Mill," for analysis of samples collected pursuant to the environmental monitoring program required in License Condition No. 48.

[Applicable Amendment: 3]

48. The licensee shall implement the effluent and environmental monitoring program specified in Table 5.5.7.1 of the renewal application with the following modifications:

A. Annual vegetation samples shall be collected at each air monitoring location and analyzed for Ra-226 and Pb-210.

B. DELETED by Amendment No. 22.

C. DELETED by Amendment No. 22.

D. DELETED by Amendment No. 22.

E. The location of background site A-1 shall be as specified in the licensee's April 23, 1992, letter.

[Applicable Amendments: 6, 10, 20, 22, 31]

49. DELETED by Amendment No. 29.

50. The licensee is authorized to begin dismantling Dam No. 4, in accordance with its plan submitted by letters dated October 20, and November 9, 1998.

[Applicable Amendments: 29, 55]

51. DELETED by Amendment No. 29.

52. DELETED by Amendment No. 29.

53. DELETED by Amendment No. 55.

54. The licensee shall reclaim the tailings disposal area in accordance with Sections 3 through 7 and 10 through 11 of the July 21, 1992, submittal titled Lucky Mc Mine Tailings Reclamation Plan, Source Material License No. SUA-672, Volumes I and II, as modified by letters dated June 4, June 11, and June 21, 1993; April 7, December 16, and December 29, 1994; September 26, 1995; April 7, and December 17, 1997; May 6, May 29, and July 29, 1998; and March 11, 1999, except as stipulated below. Items A-K shall be submitted to the NRC for review and approval at least 90 days prior to initiation of construction. Items L-N shall be included in the licensee's quality control program and implemented during construction.

A. DELETED by Amendment No. 50.

B. The licensee shall submit data that substantiates that settlement is essentially complete prior to placement of the radon/seepage barrier. The term "essentially complete" is defined as the point in time when 90 percent of primary consolidation has occurred.

The licensee may proceed with final reclamation of Tailings Pond 1 and Pond 2, since it has presented acceptable evidence in its submittal dated April 7, June 4, and August 19, 1997, that the tailings in ponds 1 and 2 has achieved 90% of primary consolidation.

C. DELETED by Amendment No. 44.

D. DELETED by Amendment No. 44.

E. DELETED by Amendment No. 44.

F. DELETED by Amendment No. 44.

G. DELETED by Amendment No. 44.

H. DELETED by Amendment No. 44.

I. DELETED by Amendment No. 44.

J. DELETED by Amendment No. 44.

K. DELETED by Amendment No. 44.

L. DELETED by Amendment No. 44.

M. DELETED by Amendment No. 44.

N. DELETED by Amendment No. 44.

O. Before the nuclear density gauge (ASTM D-2622) can be used to determine the in place density of the fill, an acceptable correlation between the test results from the nuclear density gauge (ASTM D-2622) and the sand cone apparatus (ASTM D-1556) shall be established. The definition of an acceptable correlation and the procedure for determining that an

acceptable correlation exists shall be submitted to NRC for review and approval prior to use of the gauge in the quality control program.

P. A completion report including as-built drawings, verifying that reclamation of the site has been performed according to the approved plan, shall be provided within 6 months of the completion of construction. The report shall also include summaries of results of the quality assurance and control testing to demonstrate that the approved specifications were met.

Q. As committed in its letter dated November 7, 1997, upon placement of a suitable base layer that will support a drill rig, the licensee will collect samples at 20 locations. All samples will be analyzed for Ra-226 and Th-230. The licensee may select 20 of the samples for radon emanation coefficient measurements and use the mean value to model the flux; otherwise, the NRC default value of 0.35 shall be used.

As soon as the data and new radon flux calculations are available, the licensee shall submit these to the NRC. If the additional data indicate that a modified radon barrier design is appropriate, the new barrier design shall be submitted to the NRC for review and approval.

[Applicable Amendments: 29, 39, 44, 48, 50, 51, 52, 56]

55. DELETED by Amendment No. 29.

56. DELETED by Amendment No. 29.

57. DELETED by Amendment No. 28.

58. DELETED by Amendment No. 29.

59. The licensee is authorized to use protection factors for respirators not to exceed the values specified in Appendix A of 10 CFR 20 for the purpose of assigning an exposure to airborne radionuclides provided that the respiratory protection program specified in Standard Operating Procedure No. 02.100.00 and its attachments, submitted to the NRC on November 14, 1984 and modified by letter dated January 14, 1985, is implemented.

Further, the Radiation Safety Officer (RSO) shall perform qualitative fit tests using irritant smoke for all employees required to wear respirators prior to the initial use of a respirator and annually thereafter. During the annual fit test, the RSO shall assure that the employee is correctly performing negative pressure fit checks and shall instruct the employee that the fit check is to be performed each time a respirator is donned and prior to entering an area where respirators are required. The fit tests and fit check instruction shall be documented.

[Applicable Amendment: 1]

60. The licensee shall implement a compliance monitoring program containing the following:

A. Sample wells T1-2, T1-3, T1-6, T1-7, T1-8, T1-9, T1-11, T1-12, T1-14, T1-16, P-3, P-8 and P-9 on a quarterly frequency for chloride, nitrate, sulfate, pH, conductivity, and water level, and on a semiannual frequency for arsenic, beryllium, cadmium, chromium, nickel, combined radium-226 and 228, thorium 230, selenium, and uranium.

Additionally, the licensee shall sample wells T1-10, T2-1, C-1, C-3, C-5, C-6, R-2, R-4, T4-1, T4-2, and T4-3 on a quarterly frequency for chloride, nitrate, sulfate, pH, conductivity, and water level, and on an annual frequency for arsenic, radium-226, thorium-230, and uranium. The licensee shall also sample wells AL-1, AL-4, AL-5, AND AL-6 on a quarterly frequency for chloride, nitrate, sulfate, pH, conductivity, total dissolved solids, and water level, and on a semiannual frequency for arsenic, selenium, and uranium.

B. Comply with the following ground-water protection standards at point of compliance well T1-12 with background being recognized in well T1-6:

arsenic = 0.05 mg/l, beryllium = 0.05 mg/l, cadmium = 0.01 mg/l, chromium = 0.05 mg/l, nickel = 0.09 mg/l, combined radium-226 and 228 = 5 pCi/l, selenium = 0.01 mg/l, thorium-230 = 13.2 pCi/l and uranium = 0.11 mg/l.

C. Operate the corrective action program as depicted on Exhibit 1.0-1 of the December 15, 1992, report, subject to the following:

- Utilize the No. 8 well water injection system described in the December 15, 1992, submittal including the injection lateral to wells P-11 and T1-8, as well as direct injection into wells T1-1, T1-24, and sump PS-1.
- Operate the well No. 8 filtration and chlorination system as needed.
- Recover seepage from wells P-3, P-5, P-6, P-9, P-10, P-11, P-13, P-14, P-15, T1-8, and T1-19.
- Recover seepage from well P-4 and sump PS-2 when sufficient water is present.
- Dewater tailings pond 1 using wells CT-3, CT-4, CT-6, CT-8, CT-9, CT-10, and CT-11, as well as dewater tailings pond 2 and 2A using wells 2-1, 2-5, and wells 2A-2, 2A-3, 2A-4, 2A-7, and 2A-12, respectively.
- Operate the pond 3 and 4 enhanced evaporation system as weather allows.

The corrective action program shall have the objective of returning the concentrations of arsenic, beryllium, cadmium, chromium, nickel, combined radium-226 and 228, selenium, thorium-230, and uranium to the concentration limits specified in Subsection (B).

The licensee shall on a semiannual frequency, submit a ground-water monitoring report as well as submit an annual corrective action program review, on or before December 15 of each year that describes the progress towards attaining ground-water protection standards.

D. The licensee shall utilize the Behrens-Fisher Students t-test at the 95 percent confidence level or utilize the following threshold values where more than one-half of the data points are less than detection limits: arsenic = 0.0125 mg/l and selenium = 0.0025 mg/l, to determine

on a semiannual frequency if a significant change has occurred between the background values established for well T1-6 and well R-2. Should a significant change occur between the background well and well R-2, the licensee shall notify the NRC within 30 days.

[Applicable Amendments: 4, 5, 15, 17, 19, 22, 28, 35, 38, 41, 42, 44]

61. The licensee shall complete site reclamation in accordance with the approved reclamation plan and ground-water corrective action plan, as authorized by License Condition Nos. 54 and 60, respectively, in accordance with the following schedules.

A. To ensure timely compliance with target completion dates established in the Memorandum of Understanding (MOU) with the Environmental Protection Agency (56 FR 55432, October 25, 1991), the licensee shall complete reclamation to control radon emissions as expeditiously as practicable, considering technological feasibility, in accordance with the following schedule:

(1) Windblown tailings retrieval and placement on the pile - September 30, 1996.

(2) Placement of the interim cover to decrease the potential for tailings dispersal and erosion - April 30, 1993.

(3) Placement of final radon barrier designed and constructed to limit radon emissions to an average flux of no more than 20 $pCi/m^2/s$ above background - December 31, 2001.

B. Reclamation, to ensure required longevity of the covered tailings and ground-water protection, shall be completed as expeditiously as is reasonably achievable, in accordance with the following target dates for completion:

(1) Placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 CFR Part 40 - December 31, 2002.

(2) Projected completion of ground-water corrective actions to meet performance objectives specified in the ground-water corrective action plan - September 30, 2004.

C. Any license amendment request to revise the completion dates specified in Section A must demonstrate that compliance was not technologically feasible (including inclement weather, litigation which compels delay to reclamation, or other factors beyond the control of the licensee).

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: SUA-672, Amendment No. 57

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D. Any license amendment request to change the target dates in Section B above, must address added risk to the public health and safety and the environment, with due consideration to the economic costs involved and other factors justifying the request such as delays caused by inclement weather, regulatory delays, litigation, and other factors beyond the control of the licensee.

[Applicable Amendment: 53]

62. Notification to NRC under 10 CFR 20.2202, 10 CFR 40.60, and specific license conditions should be made as follows:

Required written notice to NRC under this license should be given to: Chief, Uranium Recovery and Low-Level Waste Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: 5/2/99

N. King Stablein, Acting Chief
Uranium Recovery and
Low-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards