

JUL 26 1991

URFO:GRK
Docket No. 40-8958
Docket No. 40-8981
SUA-1540, Amendment No. 3
04008958050E
04008981030E - *no fee*
04008981050E

Pathfinder Mines Corporation
North Butte ISL Operations
HC 33 Box 204
Shirley Basin, Wyoming 82615

Gentlemen:

Our office is in receipt of your amendment request dated July 10, 1991. It is our understanding that Pathfinder Mines Corporation (PMC) would like to combine all currently proposed solution mining activities under a single license. This effort would involve consolidating the current license requirements for the Ruth ISL (Source Material License SUA-1539) and North Butte ISL (Source Material License SUA-1540) into a single document that would be administered under Source Material License SUA-1540. This licensing action would result in redefining the PMC solution mining operations as the North Butte ISL Operations with the Ruth site representing a satellite facility. Involved with this licensing action would be the termination of Source Material License SUA-1539. Because all radiological, financial, and environmental issues associated with Source Material License SUA-1539 have been incorporated into Source Material License SUA-1540, a final finding of no significant impact regarding the termination has been issued.

A review of your proposal indicates that the two solution mining licenses that currently exist indeed represent a single operation. Due to this the license modifications that you have requested are being implemented. You will note that several license conditions have had their requirements named to a specific site. This procedure will avoid future confusion.

Therefore in consideration of your July 10, 1991 amendment request as well as pursuant to Title 10, Code of Federal Regulations, Part 40, Source Material License SUA-1539 is being terminated as stated in the enclosed Federal Register Notice and Source Material License SUA-1540 is hereby amended by deleting License Condition No. 46 and revising License Condition Nos. 2, 8, 9, 10, 11, 12, 15, 16, 21, 23, 24, 25, 28, 29, 31, 32, 36, 37, 38, 39, 40, 41, 42, 45, and 52 to read as follows:

PM: URFO *GRK*
GRKonwinski/db
07/25/91

[Signature]
DD: URFO
EFHawkins
07/26/91

[Signature]
D: URFO: RIV
REHall
07/24/91

OFFICIAL DOCKET COPY

9108150129 12 pp.

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URFO:GRK
Docket No. 40-8958
Docket No. 40-8981
SUA-1540, Amendment No. 3
04008958050E
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Pathfinder Mines Corporation
North Butte ISL Operations
HC 33 Box 204
Shirley Basin, Wyoming 82615

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A review of your proposal indicates that the two solution mining licenses that currently exist indeed represent a single operation. Due to this the license modifications that you have requested are being implemented. You will note that several license conditions have had their requirements named to a specific site. This procedure will avoid future confusion.

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PM: URFO *GRK*
GRK Konwinski/db
07/25/91

[Signature]
DD: URFO
EF Hawkins
07/26/91

[Signature]
D: URFO: RIV
RE Hall
07/26/91

OFFICIAL DOCKET COPY

~~9108150129~~ 12 pp.

1. Pathfinder Mines Corporation.
[Applicable Amendments: 1, 2]
2. North Butte ISL Operations
HC 33 Box 204
Shirley Basin, Wyoming 82615
[Applicable Amendments: 1, 2, 3]
3. SUA-1540, Amendment No. 3
4. December 31, 1995
5. 40-8981
6. Uranium
7. Unspecified
8. 1,300,000 pounds
[Applicable Amendments: 3]
9. The authorized place of use shall be the licensee's North Butte and Ruth facilities in Campbell and Johnson Counties, Wyoming. The licensee is also authorized to process, at the Ruth site, residual contaminated materials from previous research and development operations.
[Applicable Amendments: 3]
10. For use in accordance with statements, descriptions and representations contained in Sections 15, 16.1 to 16.4, 16.6 to 16.12, and 19 of the licensee's revised North Butte application submitted by cover letter dated March 7, 1989, and Sections 15, 16.1 to 16.4, 16.6 to 16.12, and 19 of the licensee's revised Ruth application submitted by cover letter dated October 3, 1988.

Notwithstanding the above, the following conditions shall override any conflicting statements contained in the licensee's applications and supplements.

[Applicable Amendments: 3]
11. The annual throughput of the North Butte facility shall not exceed a flow rate of 3,000 gallons per minute, exclusive of restoration flow resulting in a production rate not to exceed 700,000 pounds of U_3O_8 ; the annual throughput of the Ruth facility shall not exceed a flow rate of 1,000 gallons per minute, exclusive of restoration flow resulting in a production rate not to exceed 300,000 pounds of U_3O_8 .
[Applicable Amendments: 3]
12. Any significant changes in the process circuit as shown in Figure 15.21 of the North Butte application dated March 7, 1989, and Figure 15.19 of the Ruth application dated October 3, 1988, shall require approval by the NRC,

Uranium Recovery Field Office in the form of a license amendment. Three months prior to initiation of construction of the North Butte site detailed process flow diagrams shall be submitted to the NRC, Uranium Recovery Field Office, for review and approval.

[Applicable Amendments: 3]

13. 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.
14. The results of effluent and environmental monitoring described in the submittal dated November 13, 1990, shall be reported in accordance with 10 CFR Part 40, Section 40.65, to the NRC, Uranium Recovery Field Office. The report shall also include injection rates, recovery rates and injection manifold pressures.
15. Six months prior to the construction of evaporation ponds, the licensee shall submit a design, in the form of a license amendment to the NRC, Uranium Recovery Field Office, for review and approval.
[Applicable Amendments: 3]
16. The licensee is authorized to dispose of process waters at the North Butte site, by way of deep well injection, in accordance with their submittal dated November 13, 1990. Additionally, the quantity of water injected shall be recorded.
[Applicable Amendments: 3]
17. 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 previously assessed or that is greater than that previously 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.
18. The results of the 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 the NRC regulations, all such documentation shall be maintained for a period of at least five years.
19. Standard operating procedures (SOPs) shall be established for all operational process activities involving radioactive materials that are handled, processed or stored. Standard operation procedures for operational activities shall enumerate pertinent radiation safety practices to be followed. Three months prior to the planned initiation of operations the SOPs shall be submitted to the NRC, Uranium Recovery Field

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Office in the form of a license amendment for review and approval. Additionally, written procedures shall be established for nonoperational activities to include in-plant and environmental monitoring, bioassay analyses and instrument calibrations. An approved current copy of each written procedure shall be kept in the process area to which it applies.

20. All written procedures for both operational and nonoperational activities shall be reviewed and approved in writing by the Radiation Safety Officer before implementation, whenever a change in a procedure is proposed, and at least annually, to ensure that proper radiation protection principles are being applied.
21. The licensee shall, six months prior to installation, submit a description of the emission control equipment for the yellowcake drying and packaging areas, at the North Butte site, that is at least 99 percent efficient as well as a commitment to have the RSO or trained assistant physically present during operation of the dryer. Additionally, annual throughput of the yellowcake dryer shall not exceed 1,000,000 pounds of U_3O_8 .
[Applicable Amendments: 3]
22. The licensee shall submit a detailed decommissioning plan to the NRC at least 12 months prior to planned final shutdown of mining operations. The decommissioning plan shall include a proposal to remove all buried process piping.
23. All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit, discharged to the solution evaporation ponds, disposed by way of NPDES permit, or injected via the deep well disposal program authorized at the North Butte site.
[Applicable Amendments: 3]
24. The licensee shall submit baseline water quality data for all mining units from wells established in the mining zone, the mining zone perimeter, as well as the upper and lower aquifers with the exception that the lower aquifer at the North Butte site shall not require baseline water quality data. All baseline data shall be submitted to the NRC, Uranium Recovery Field Office, for review and approval two months prior to mining. The data shall, at a minimum, consist of the sample analyses shown in Table 16.1 of the North Butte and Ruth license applications dated March 7, 1989, and October 3, 1988, respectively.
[Applicable Amendments: 3]
25. Prior to mining at the North Butte facility, baseline water quality for each mining unit shall be established at the following minimal density: all mining zone perimeter monitor wells, one upper aquifer monitor well per four acres of well field, and one production/injection well per acre. Prior to mining at the Ruth facility, baseline water quality for each mining unit shall be established at the following minimal density: all

mining zone perimeter wells, one upper and lower aquifer monitor well per four acres of well field, and one production/injection well per acre.
[Applicable Amendments: 3]

26. The licensee shall, two months prior to lixiviant injection, propose in the form of a license amendment, upper control limits (UCLs) for all monitoring wells utilized for excursion monitoring in each mining unit.

If two UCLs are exceeded in a well or if a single UCL value is exceeded by 20 percent, the licensee shall take a confirmation water sample within 48 hours and analyze it for chloride, conductivity and total alkalinity. If the second sample does not indicate exceedance, a third sample shall be taken within 48 hours. If neither the second or third indicate exceedance, the first sample shall be considered in error.

If the second or third sample indicates an exceedance, the well in question shall be placed on excursion status and the NRC shall be notified by telephone within 24 hours and within 7 days in writing from the time the confirmation sample was taken. Upon confirmation of an excursion, the licensee shall implement a corrective action and increase the sampling frequency for the excursion indicators to once every 7 days. An excursion is considered concluded when the concentrations of excursion indicators are below the concentration levels defining an excursion for three consecutive 1-week samples.

27. Upper control limits (UCLs) for specific conductivity and carbonate plus bicarbonate shall be the mean of the baseline wells plus five standard deviations. The UCLs for chloride shall be the mean of the baseline wells plus five standard deviations or the mean plus 15 mg/l whichever is greater.

28. A written report shall be submitted to the NRC, Uranium Recovery Field Office, within two months of excursion confirmation. The report shall describe the excursion event, corrective actions taken and results obtained. If the wells are still on excursion at the time the report is submitted, injection of lixiviant within affected portions of the well field on excursion shall be terminated until such time that aquifer cleanup is complete.

[Applicable Amendments: 3]

29. The licensee shall perform well integrity tests on each injection, production, and monitor well before the wells are utilized and on wells that have been serviced. At the North Butte facility, the integrity test shall pressurize the well to 168 pounds per square inch (psi) or 90 percent of the formation fracture pressure, if higher than 140 psi. At the Ruth facility, the integrity test shall pressurize the well to 240 psi. A well shall have passed the test if it maintains 90 percent of the test pressure after 10 minutes. At the licensee's option, a single point resistance test may be utilized. Any well casing failing the

integrity test that cannot be repaired, shall be plugged and abandoned according to the State of Wyoming standards. Each well utilized for mining or monitoring shall be retested every five years.

Additionally, flow rates on each injection and recovery well and manifold pressures on the entire system shall be measured and recorded daily. During well field operations, injection pressures shall not exceed the integrity test pressure at the injection well heads.

[Applicable Amendments: 3]

30. The license shall utilize sodium carbonate/bicarbonate as the lixiviant with an oxygen or hydrogen peroxide oxidant. Any variation from this combination shall require a license amendment.
31. The solution evaporation ponds at the Ruth site shall have three feet of freeboard. Additionally, the licensee shall, at all times, maintain sufficient reserve capacity in the evaporation pond system to enable the transfer of the contents of a pond to other ponds. In the event of a leak and subsequent transfer of liquid, the freeboard requirements shall be suspended during the repair period.
[Applicable Amendments: 3]
32. The licensee shall perform and document, at the Ruth site, monthly visual inspections of the evaporation pond embankments, fences, and liners, as well as measurements of pond freeboard and checks of the leak detection system. Any fluid detected in the standpipes shall be analyzed for chloride, TDS, sodium, uranium, and radium-226. Should analyses indicate that the pond is leaking, the NRC, Uranium Recovery Field Office, shall be notified by telephone within 48 hours of verification and the pond level lowered by transferring its content into an alternate cell. Standpipe water quality samples shall be analyzed for the above parameters once every seven days during the leak period and once every seven days for at least two weeks following repairs.

A written report shall be filed with the NRC, Uranium Recovery Field Office, within 30 days of first notifying the NRC that a leak exists. This report shall include analytical data and describe the mitigative action and the results of that action.

[Applicable Amendments: 1, 2, 3]

33. The licensee shall maintain a log of all significant solution spills and notify the NRC, Uranium Recovery Field Office, by telephone within 48 hours of any failure which may have a radiological impact on the environment. Such notification shall be followed, within seven days, by submittal of a written report detailing the conditions leading to the failure or potential failure, corrective actions taken and results achieved. This requirement is in addition to the requirement of 10 CFR Part 20.

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34. The licensee shall maintain an area within the restricted area boundary for storage of contaminated materials prior to their disposal. Prior to lixiviant injection the licensee shall submit a waste disposal agreement to the NRC, Uranium Recovery Field Office, in the form of a license amendment for review and approval. All contaminated wastes and evaporation pond residues shall be disposed at a licensed radioactive waste disposal site.
35. At least three months prior to termination of uranium recovery in a mining unit, the licensee shall submit to the NRC, Uranium Recovery Field Office, in the form of a license amendment, a plan for ground-water restoration and at least 12 months of post-restoration monitoring consisting of at least 9 sampling events. The goal of restoration shall be to return the ground-water quality, on a mining unit average, to baseline concentrations.
36. At least three months prior to operation of the yellowcake dryer at the North Butte site, the licensee shall submit to the NRC, Uranium Recovery Field Office, in the form of a license amendment, a respiratory protection program, for NRC review and approval.
[Applicable Amendments: 3]
37. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated costs, if accomplished by third party, for completion of the NRC-approved site closure plan including: above-ground decommissioning and decontamination, the cost of offsite disposal of radioactive solid process or evaporation pond residues, and ground-water restoration. Within three months of NRC approval of a revised closure plan and cost estimate, the licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly-approved site closure plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within three months of written NRC approval.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criterion 9, shall be provided to the NRC at least 3 months prior to the anniversary of the effective date of the existing surety instrument. If the NRC has not approved a proposed revision 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing arrangement, prior to expiration, 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, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure. The licensee shall also provide the NRC with copies of surety related correspondence submitted to the State of Wyoming, a copy of the State's surety review, and the final approved surety arrangement. The licensee must also ensure that the surety, where authorized to be held by

the State, expressly identifies the NRC-related portion of the surety and covers the above-ground decommissioning and decontamination, the cost of offsite disposal, soil and water analyses, and ground-water restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan, or the NRC-approved revisions to the plan. The reclamation/decommissioning plan, cost estimates, and annual updates should follow the outline in the attachment to this license entitled, "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates."

The licensee's currently approved surety for the Ruth facility, Irrevocable Letter of Credit No. [REDACTED], issued by the Bank of the West in favor of the State of Wyoming, shall be continuously maintained in an amount of not less than \$200,939.00 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by both the State and the NRC.

Three months prior to the expected commencement of site construction at the Ruth facility, the licensee shall submit a surety instrument acceptable to the State of Wyoming and the NRC in an amount no less than \$4,597,813. This surety shall be written in favor of the State of Wyoming or the NRC for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, and shall be continuously maintained until a replacement is authorized by both the State and the NRC. Site construction activities shall not be commenced until the NRC and the State accept the surety arrangement.

Three months prior to the expected commencement of site construction at the North Butte facility, the licensee shall submit a surety instrument acceptable to the State of Wyoming and the NRC in an amount no less than \$4,920,705. This surety shall be written in favor of the State of Wyoming or the NRC for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, and shall be continuously maintained until a replacement is authorized by both the State and the NRC. Site construction activities shall not be commenced until the NRC and the State accept the surety arrangement.

[Applicable Amendments: 3]

38. In addition to the inspection and audit programs described in Section 19.1.3 of the North Butte and Ruth applications, dated March 7, 1989, and October 3, 1988, respectively, the RSO or trained assistant shall document a daily walkthrough of the facilities to determine if radiation control practices are being implemented.

[Applicable Amendments: 3]

39. The licensee shall submit to the NRC, Uranium Recovery Field Office, a copy of the semiannual ALARA audit report containing the information specified in Section 19.1.3 of the North Butte and Ruth applications dated March 7, 1989, and October 3, 1988, respectively, within two months of the

end of the reporting period. The report shall also include a summary of the daily walkthrough inspections.

[Applicable Amendments: 3]

40. The licensee shall implement the radiological surveys described in Sections 19.1.7.2, 19.1.7.5, 19.1.7.6, and 19.1.7.8 at the locations specified in Figure 19.2 of the North Butte and Ruth applications dated, March 7, 1989, and October 3, 1988, respectively. Additionally, alpha surveys at the designated locations shall be conducted weekly and gamma surveys shall be performed monthly; representative air particulate monitoring shall be performed every time the dryer is utilized, when the dryer is not being used particulate monitoring shall be administered on a weekly frequency. [Applicable Amendments: 3]
41. The licensee shall, two months prior to initiation of operations, at the Ruth site, propose alpha survey locations in the resin transfer and filter areas. [Applicable Amendments: 3]
42. In addition to the bioassay program discussed in Section 19.1.7.4 of the North Butte and Ruth applications, dated March 7, 1989, and October 3, 1988, respectively, the licensee shall comply with the following:
 - A. Anytime an action level of 15 ug/l uranium for urinalysis is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22, dated January 1987. This documentation shall be submitted to the NRC, Uranium Recovery Field Office, as part of the semiannual report required by 10 CFR Part 40.65.
 - B. Anytime an action level of 35 ug/l for two consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in vivo measurement is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22. This documentation shall be submitted to the NRC, Uranium Recovery Field Office, within 30 days of exceeding the action level.
 - C. All in vivo measurements shall be performed in accordance with the recommendations contained in Revision 1 of Regulatory Guide 8.22.

[Applicable Amendments: 3]

43. Employees shall monitor themselves with an alpha survey instrument prior to exiting the restricted area. Should the results of monitoring exceed an action level of 1000 dpm/100 cm², employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the RSO for investigation. Additionally, the RSO shall perform and document unannounced quarterly spot checks of employees leaving the process areas. [Applicable Amendments: 3]

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44. All radiation and environmental monitoring sampling and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer or at least semiannually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source before each day's use.
45. Any changes to the organizational chart as illustrated in Figure 19.1 of the North Butte and Ruth applications, dated March 7, 1989, and October 3, 1988, respectively, shall require approval by the NRC, Uranium Recovery Field Office, in the form of a license amendment.
[Applicable Amendments: 3]
46. DELETED by Amendment No. 3.
47. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within the facility, provided that all entrances to the facility are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."
48. The licensee shall be required to use a special work permit (SWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedure exists. All SWPs shall be accompanied by a breathing zone air sample or an applicable air sample. The SWP shall be issued by the RSO or trained assistant, qualified by way of specialized radiation protection training, except when the work to be performed is in the drying and packaging area. The SWP for these areas shall be issued by the RSO. The SWP shall describe at least 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 prior to, during and following completion of the work.In addition, the RSO shall review and document all nonroutine work activities on a quarterly frequency.
49. Occupational exposure calculations shall be performed and documented within one week of the end of each regulatory compliance period as specified in 10 CFR 20.103(a)(2) and 10 CFR 20.103(b)(2). Routine radon or radon daughter and particulate samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Nonroutine samples shall be analyzed and the results reviewed by the RSO within 2-working days after sample collection.

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50. If any worker reaches or exceeds 25 percent of the maximum permissible exposure limits as specified in 10 CFR Part 20, based upon a calculated time weighted exposure for the week or the calendar quarter, dependent on the solubility of the material, the RSO shall initiate an investigation of the employee's work record and exposure history to identify the source of the exposure.

Necessary corrective measures shall be taken to ensure that future exposures are as low as is reasonably achievable. Records shall be maintained of these investigations and results furnished to the NRC, Uranium Recovery Field Office, in the semiannual report required by 10 CFR 40.65.

51. The licensee shall three months prior to initiation of operations propose in the form of a license amendment emergency procedures to be implemented in the event of natural disasters, equipment failure, facility damage, loss or theft of source material, and unauthorized discharge of radioactive materials, for review and approval by the NRC, Uranium Recovery Field Office.
52. Notwithstanding the above, the monitoring and reporting requirements for the North Butte facility stated in License Condition Nos. 10, 14, 18, 38, 40, 42, 43, 44, and 49 shall become effective concurrent with the commencement of lixiviant injection at the North Butte facility and the monitoring and reporting requirements for the Ruth facility stated in License Condition Nos. 10, 14, 18, 38, 40, 42, 43, 44, and 49 shall become effective concurrent with the commencement of lixiviant injection at the Ruth facility. [Applicable Amendments: 1, 2, 3]

The effect of this amendment is to incorporate the North Butte and Ruth solution mining sites under a single Source Material License (SUA-1540), as well as terminate the Ruth Source Material License (SUA-1539).

All other conditions of this license shall remain the same. The issuance of this amendment was discussed by Mr. Konwinski with your Mr. Sievers on July 25, 1991.

Sincerely,
Original Signed By:
R. E. HALL

Ramon E. Hall
Director

Enclosures:
Source Material License SUA-1540
Finding of No Significant Impact

cc:
R. Poyser, PMC
J. Hough, RCPD, WY
WDEQ (2)

JUL 26 1991

Cases Closed:

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L Docket File No. 40-8958

Docket File No. 40-8981

LFMB

PDR/DCS

URFO r/f

ABBeach, RIV

LLUR Branch, LLWM

OB: IMNS: NMSS

GRKonwinski

8958/8981/050/030/GRK/91/07/24

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, 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
[Applicable Amendments: 1, 2]

2. North Butte ISL Operations
HC 33 Box 204
Shirley Basin, Wyoming 82615
[Applicable Amendments: 1, 2, 3]

3. License number

SUA-1540, Amendment No. 3

4. Expiration date

December 31, 1995

5. Docket or
Reference No.

40-8981

Byproduct, source, and/or
special nuclear material

Uranium

7. Chemical and/or physical
form

Unspecified

8. Maximum amount that licensee
may possess at any one time
under this license

1,300,000 pounds
[Applicable Amendments: 3]

9. The authorized place of use shall be the licensee's North Butte and Ruth facilities in Campbell and Johnson Counties, Wyoming. The licensee is also authorized to process, at the Ruth site, residual contaminated materials from previous research and development operations. [Applicable Amendments: 3]
10. For use in accordance with statements, descriptions and representations contained in Sections 15, 16.1 to 16.4, 16.6 to 16.12, and 19 of the licensee's revised North Butte application submitted by cover letter dated March 7, 1989, and Sections 15, 16.1 to 16.4, 16.6 to 16.12, and 19 of the licensee's revised Ruth application submitted by cover letter dated October 3, 1988.

Notwithstanding the above, the following conditions shall override any conflicting statements contained in the licensee's applications and supplements.

[Applicable Amendments: 3]

11. The annual throughput of the North Butte facility shall not exceed a flow rate of 3,000 gallons per minute, exclusive of restoration flow resulting in a production rate not to exceed 700,000 pounds of U_3O_8 ; the annual throughput of the Ruth facility shall not exceed a flow rate of 1,000 gallons per minute, exclusive of restoration flow resulting in a production rate not to exceed 300,000 pounds of U_3O_8 . [Applicable Amendments: 3]
12. Any significant changes in the process circuit as shown in Figure 15.21 of the North Butte application dated March 7, 1989, and Figure 15.19 of the Ruth application dated October 3, 1988, shall require approval by the NRC, Uranium Recovery Field Office in the form of a license amendment. Three months prior to initiation of construction of

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1540, Amendment No. 3

Docket or Reference number

40-8981

JUL 26 1991

the North Butte site detailed process flow diagrams shall be submitted to the NRC, Uranium Recovery Field Office, for review and approval.
[Applicable Amendments: 3]

13. 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.
14. The results of effluent and environmental monitoring described in the submittal dated November 13, 1990, shall be reported in accordance with 10 CFR Part 40, Section 40.65, to the NRC, Uranium Recovery Field Office. The report shall also include injection rates, recovery rates and injection manifold pressures.
15. Six months prior to the construction of evaporation ponds, the licensee shall submit a design, in the form of a license amendment to the NRC, Uranium Recovery Field Office, for review and approval. [Applicable Amendments: 3]
16. The licensee is authorized to dispose of process waters at the North Butte site, by way of deep well injection, in accordance with their submittal dated November 13, 1990. Additionally, the quantity of water injected shall be recorded.
[Applicable Amendments: 3]
17. 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 previously assessed or that is greater than that previously 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.
18. The results of the 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 the NRC regulations, all such documentation shall be maintained for a period of at least five years.
19. Standard operating procedures (SOPs) shall be established for all operational process activities involving radioactive materials that are handled, processed or stored. Standard operation procedures for operational activities shall enumerate pertinent radiation safety practices to be followed. Three months prior to the planned initiation of operations the SOPs shall be submitted to the NRC, Uranium Recovery Field Office in the form of a license amendment for review and approval. Additionally, written procedures shall be established for nonoperational activities to include in-plant and environmental monitoring, bioassay analyses and instrument calibrations. An approved current copy of each written procedure shall be kept in the process area to which it applies.

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20. All written procedures for both operational and nonoperational activities shall be reviewed and approved in writing by the Radiation Safety Officer before implementation, whenever a change in a procedure is proposed, and at least annually, to ensure that proper radiation protection principles are being applied.
21. The licensee shall, six months prior to installation, submit a description of the emission control equipment for the yellowcake drying and packaging areas, at the North Butte site, that is at least 99 percent efficient as well as a commitment to have the RSO or trained assistant physically present during operation of the dryer. Additionally, annual throughput of the yellowcake dryer shall not exceed 1,000,000 pounds of U_3O_8 . [Applicable Amendments: 3]
22. The licensee shall submit a detailed decommissioning plan to the NRC at least 12 months prior to planned final shutdown of mining operations. The decommissioning plan shall include a proposal to remove all buried process piping.
23. All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit, discharged to the solution evaporation ponds, disposed by way of NPDES permit, or injected via the deep well disposal program authorized at the North Butte site. [Applicable Amendments: 3]
24. The licensee shall submit baseline water quality data for all mining units from wells established in the mining zone, the mining zone perimeter, as well as the upper and lower aquifers with the exception that the lower aquifer at the North Butte site shall not require baseline water quality data. All baseline data shall be submitted to the NRC, Uranium Recovery Field Office for review and approval two months prior to mining. The data shall, at a minimum, consist of the sample analyses shown in Table 16.1 of the North Butte and Ruth license applications dated March 7, 1989, and October 3, 1988, respectively. [Applicable Amendments: 3]
25. Prior to mining at the North Butte facility, baseline water quality for each mining unit shall be established at the following minimal density: all mining zone perimeter monitor wells, one upper aquifer monitor well per four acres of well field, and one production/injection well per acre. Prior to mining at the Ruth facility, baseline water quality for each mining unit shall be established at the following minimal density: all mining zone perimeter wells, one upper and lower aquifer monitor well per four acres of well field, and one production/injection well per acre. [Applicable Amendments: 3]
26. The licensee shall, two months prior to lixiviant injection, propose in the form of a license amendment, upper control limits (UCLs) for all monitoring wells utilized for excursion monitoring in each mining unit.

If two UCLs are exceeded in a well or if a single UCL value is exceeded by 20 percent, the licensee shall take a confirmation water sample within 48 hours and analyze it for chloride, conductivity and total alkalinity. If the second sample does not indicate exceedance, a third sample shall be taken within 48 hours. If neither the second or third indicate exceedance, the first sample shall be considered in error.

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If the second or third sample indicates an exceedance, the well in question shall be placed on excursion status and the NRC shall be notified by telephone within 24 hours and within 7 days in writing from the time the confirmation sample was taken. Upon confirmation of an excursion, the licensee shall implement a corrective action and increase the sampling frequency for the excursion indicators to once every 7 days. An excursion is considered concluded when the concentrations of excursion indicators are below the concentration levels defining an excursion for three consecutive 1-week samples.

27. Upper control limits (UCLs) for specific conductivity and carbonate plus bicarbonate shall be the mean of the baseline wells plus five standard deviations. The UCLs for chloride shall be the mean of the baseline wells plus five standard deviations or the mean plus 15 mg/l whichever is greater.
28. A written report shall be submitted to the NRC, Uranium Recovery Field Office, within two months of excursion confirmation. The report shall describe the excursion event, corrective actions taken and results obtained. If the wells are still on excursion at the time the report is submitted, injection of lixiviant within affected portions of the well field on excursion shall be terminated until such time that aquifer cleanup is complete. [Applicable Amendments: 3]
29. The licensee shall perform well integrity tests on each injection, production, and monitor well before the wells are utilized and on wells that have been serviced. At the North Butte facility, the integrity test shall pressurize the well to 168 pounds per square inch (psi) or 90 percent of the formation fracture pressure, if higher than 140 psi. At the Ruth facility, the integrity test shall pressurize the well to 240 psi. A well shall have passed the test if it maintains 90 percent of the test pressure after 10 minutes. At the licensee's option, a single point resistance test may be utilized. Any well casing failing the integrity test that cannot be repaired, shall be plugged and abandoned according to the State of Wyoming standards. Each well utilized for mining or monitoring shall be retested every five years.

Additionally, flow rates on each injection and recovery well and manifold pressures on the entire system shall be measured and recorded daily. During well field operations, injection pressures shall not exceed the integrity test pressure at the injection well heads.

[Applicable Amendments: 3]

30. The license shall utilize sodium carbonate/bicarbonate as the lixiviant with an oxygen or hydrogen peroxide oxidant. Any variation from this combination shall require a license amendment.
31. The solution evaporation ponds at the Ruth site shall have three feet of freeboard. Additionally, the licensee shall, at all times, maintain sufficient reserve capacity in the evaporation pond system to enable the transfer of the contents of a pond to other ponds. In the event of a leak and subsequent transfer of liquid, the freeboard requirements shall be suspended during the repair period.
[Applicable Amendments: 3]

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32. The licensee shall perform and document, at the Ruth site, monthly visual inspections of the evaporation pond embankments, fences, and liners, as well as measurements of pond freeboard and checks of the leak detection system. Any fluid detected in the standpipes shall be analyzed for chloride, TDS, sodium, uranium, and radium-226. Should analyses indicate that the pond is leaking, the NRC, Uranium Recovery Field Office, shall be notified by telephone within 48 hours of verification and the pond level lowered by transferring its content into an alternate cell. Standpipe water quality samples shall be analyzed for the above parameters once every seven days during the leak period and once every seven days for at least two weeks following repairs.

A written report shall be filed with the NRC, Uranium Recovery Field Office, within 30 days of first notifying the NRC that a leak exists. This report shall include analytical data and describe the mitigative action and the results of that action.

[Applicable Amendments: 1, 2, 3]

33. The licensee shall maintain a log of all significant solution spills and notify the NRC, Uranium Recovery Field Office, by telephone within 48 hours of any failure which may have a radiological impact on the environment. Such notification shall be followed, within seven days, by submittal of a written report detailing the conditions leading to the failure or potential failure, corrective actions taken and results achieved. This requirement is in addition to the requirement of 10 CFR Part 20.
34. The licensee shall maintain an area within the restricted area boundary for storage of contaminated materials prior to their disposal. Prior to leachant injection the licensee shall submit a waste disposal agreement to the NRC, Uranium Recovery Field Office, in the form of a license amendment for review and approval. All contaminated wastes and evaporation pond residues shall be disposed at a licensed radioactive waste disposal site.
35. At least three months prior to termination of uranium recovery in a mining unit, the licensee shall submit to the NRC, Uranium Recovery Field Office, in the form of a license amendment, a plan for ground-water restoration and at least 12 months of post-restoration monitoring consisting of at least 9 sampling events. The goal of restoration shall be to return the ground-water quality, on a mining unit average, to baseline concentrations.
36. At least three months prior to operation of the yellowcake dryer at the North Butte site, the licensee shall submit to the NRC, Uranium Recovery Field Office, in the form of a license amendment, a respiratory protection program, for NRC review and approval. [Applicable Amendments: 3]
37. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated costs, if accomplished by third party, for completion of the NRC-approved site closure plan including: above-ground decommissioning and decontamination, the cost of offsite disposal of radioactive solid process or evaporation pond residues, and ground-water restoration. Within three months of NRC approval of a revised closure plan and cost

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estimate, the licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly-approved site closure plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within three months of written NRC approval.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criterion 9, shall be provided to the NRC at least 3 months prior to the anniversary of the effective date of the existing surety instrument. If the NRC has not approved a proposed revision 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing arrangement, prior to expiration, 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, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure. The licensee shall also provide the NRC with copies of surety related correspondence submitted to the State of Wyoming, a copy of the State's surety review, and the final approved surety arrangement. The licensee must also ensure that the surety, where authorized to be held by the State, expressly identifies the NRC-related portion of the surety and covers the above-ground decommissioning and decontamination, the cost of offsite disposal, soil and water analyses, and ground-water restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan, or the NRC-approved revisions to the plan. The reclamation/decommissioning plan, cost estimates, and annual updates should follow the outline in the attachment to this license entitled, "Recommended Outlines for Site Specific Reclamation and Stabilization Cost Estimates".

The licensee's currently approved surety for the Ruth facility, Irrevocable Letter of Credit No. [REDACTED], issued by the Bank of the West in favor of the State of Wyoming, shall be continuously maintained in an amount of not less than \$200,939.00 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by both the State and the NRC.

Three months prior to the expected commencement of site construction at the Ruth facility, the licensee shall submit a surety instrument acceptable to the State of Wyoming and the NRC in an amount no less than \$4,597,813. This surety shall be written in favor of the State of Wyoming or the NRC for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, and shall be continuously maintained until a replacement is authorized by both the State and the NRC. Site construction activities shall not be commenced until the NRC and the State accept the surety arrangement.

Three months prior to the expected commencement of site construction at the North Butte facility, the licensee shall submit a surety instrument acceptable to the State of Wyoming and the NRC in an amount no less than \$4,920,705. This surety shall be written in favor of the State of Wyoming or the NRC for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, and shall be continuously maintained until a replacement is authorized by both the State and the NRC. Site construction activities shall not be commenced until the NRC and the State accept the surety arrangement.

[Applicable Amendments: 3]

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38. In addition to the inspection and audit programs described in Section 19.1.3 of the North Butte and Ruth applications, dated March 7, 1989, and October 3, 1988, respectively, the RSO or trained assistant shall document a daily walkthrough of the facilities to determine if radiation control practices are being implemented.
[Applicable Amendments: 3]
39. The licensee shall submit to the NRC, Uranium Recovery Field Office, a copy of the semiannual ALARA audit report containing the information specified in Section 19.1.3 of the North Butte and Ruth applications dated March 7, 1989, and October 3, 1988, respectively, within two months of the end of the reporting period. The report shall also include a summary of the daily walkthrough inspections.
[Applicable Amendments: 3]
40. The licensee shall implement the radiological surveys described in Sections 19.1.7.2, 19.1.7.5, 19.1.7.6, and 19.1.7.8 at the locations specified in Figure 19.2 of the North Butte and Ruth applications dated, March 7, 1989, and October 3, 1988, respectively. Additionally, alpha surveys at the designated locations shall be conducted weekly and gamma surveys shall be performed monthly. Representative air particulate monitoring shall be performed every time the dryer is utilized, when the dryer is not being used particulate monitoring shall be administered on a weekly frequency.
[Applicable Amendments: 3]
41. The licensee shall two months prior to initiation of operations at the Ruth site, propose alpha survey locations in the resin transfer and filter areas.
[Applicable Amendments: 3]
42. In addition to the bioassay program discussed in Section 19.1.7.4 of the North Butte and Ruth applications, dated March 7, 1989, and October 3, 1988, respectively, the licensee shall comply with the following:
- A. Anytime an action level of 15 ug/l uranium for urinalysis is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22, dated January 1987. This documentation shall be submitted to the NRC, Uranium Recovery Field Office, as part of the semiannual report required by 10 CFR Part 40.65.
 - B. Anytime an action level of 35 ug/l for two consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in vivo measurement is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22. This documentation shall be submitted to the NRC, Uranium Recovery Field Office, within 30 days of exceeding the action level.
 - C. All in vivo measurements shall be performed in accordance with the recommendations contained in Revision 1 of Regulatory Guide 8.22.

[Applicable Amendments: 3]

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43. Employees shall monitor themselves with an alpha survey instrument prior to exiting the restricted area. Should the results of monitoring exceed an action level of 1000 dpm/100 cm², employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the RSO for investigation. Additionally, the RSO shall perform and document unannounced quarterly spot checks of employees leaving the process areas. [Applicable Amendments: 3]
44. All radiation and environmental monitoring sampling and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer or at least semiannually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source before each day's use.
45. Any changes to the organizational chart as illustrated in Figure 19.1 of the North Butte and Ruth applications, dated March 7, 1989, and October 3, 1988, respectively, shall require approval by the NRC, Uranium Recovery Field Office, in the form of a license amendment. [Applicable Amendments: 3]
46. DELETED by Amendment No. 3.
47. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within the facility, provided that all entrances to the facility are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."
48. The licensee shall be required to use a special work permit (SWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedure exists. All SWPs shall be accompanied by a breathing zone air sample or an applicable air sample. The SWP shall be issued by the RSO or trained assistant, qualified by way of specialized radiation protection training, except when the work to be performed is in the drying and packaging area. The SWP for these areas shall be issued by the RSO. The SWP shall describe at least 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 prior to, during and following completion of the work.
- In addition, the RSO shall review and document all nonroutine work activities on a quarterly frequency.
49. Occupational exposure calculations shall be performed and documented within one week of the end of each regulatory compliance period as specified in 10 CFR 20.103(a)(2) and 10 CFR 20.103(b)(2). Routine radon or radon daughter and particulate samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Nonroutine samples shall be analyzed and the results reviewed by the RSO within 2-working days after sample collection.

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50. If any worker reaches or exceeds 25 percent of the maximum permissible exposure limits as specified in 10 CFR Part 20, based upon a calculated time weighted exposure for the week or the calendar quarter, dependent on the solubility of the material, the RSO shall initiate an investigation of the employee's work record and exposure history to identify the source of the exposure.

Necessary corrective measures shall be taken to ensure that future exposures are as low as is reasonably achievable. Records shall be maintained of these investigations and results furnished to the NRC, Uranium Recovery Field Office, in the semiannual report required by 10 CFR 40.65.

51. The licensee shall three months prior to initiation of operations propose in the form of a license amendment emergency procedures to be implemented in the event of natural disasters, equipment failure, facility damage, loss or theft of source material, and unauthorized discharge of radioactive materials, for review and approval by the NRC, Uranium Recovery Field Office.

52. Notwithstanding the above, the monitoring and reporting requirements for the North Butte facility stated in License Condition Nos. 10, 14, 18, 38, 40, 42, 43, 44, and 49 shall become effective concurrent with the commencement of lixiviant injection at the North Butte facility and the monitoring and reporting requirements for the Ruth facility stated in License Condition Nos. 10, 14, 18, 38, 40, 42, 43, 44, and 49 shall become effective concurrent with the commencement of lixiviant injection at the Ruth facility. [Applicable Amendments: 1, 2, 3]

FOR THE NUCLEAR REGULATORY COMMISSION

Date: 7-26-91

Ramon E. Hall, Director
Uranium Recovery Field Office
Region IV