

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. Rio Algom Mining Corp.

2. La Sal Route
Moab, Utah 84532

3. License number

SUA-1119, Amendment No. 5

4. Expiration date September 30, 1989

5. Docket or
Reference No. 40-80845. Byproduct, source, and/or
special nuclear material

Natural Uranium

7. Chemical and/or physical
form

Any

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

Unlimited

9. Authorized place of use: The licensee's uranium milling facilities located in San Juan County, Utah.
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 5.1.1., 5.1.3, 5.1.4, 5.2, 5.3, 5.4, 5.5.1, 5.5.2, 5.5.3, 5.5.4, 5.5.5, 5.5.9, and Appendices 5.5.2, 5.5.3.3, and 5.5.5 of the licensee's renewal application dated December, 1982 as modified by the supplement submitted by letter dated May 30, 1984 and supplements dated August and September, 1984; except where superseded by license conditions below.

In addition, the licensee shall comply with Section 6.0 of the renewal application as modified in the supplement submitted by letter dated May 31, 1985, except that specific names and telephone numbers shall be updated as necessary. Such updates shall not require an amendment to this license.

Whenever the word "will" is used in the above referenced sections it shall denote a requirement.

12. The mill production per calendar year shall not exceed 900 metric tons of U_3O_8 .
13. Any changes in the mill circuit, as illustrated and described in Figure 3.1-2 of the licensee's renewal application, shall require approval of the USNRC in the form of a license amendment.

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14. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within the mill, provided that all entrances to the mill are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "Any area within this mill may contain radioactive material."
15. The results of sampling, analyses, surveys and monitoring; the results of calibration of equipment; reports on audits and inspections; all meetings and trainings courses required by this license; and any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in USNRC regulations, all such documentation shall be maintained for a period of at least five (5) years.
16. The licensee shall maintain effluent control systems as specified in Section 5.5.8 of the licensee's renewal application with the following additions:
- A. Operations shall be immediately suspended in the affected area of the mill if any of the emission control equipment for the yellowcake drying or packaging areas is not operating within specifications for design performance.
 - B. The licensee shall, during all periods of yellowcake drying operations, assure that the scrubber is operating within the manufacturer's recommended ranges for water flow and air pressure differential necessary to achieve design performance. This shall be accomplished by either (1) performing and documenting checks of water flow and air pressure differential approximately every four hours during operation or (2) installing instrumentation which will signal an audible alarm if either water flow or air pressure differential fall below the manufacturer's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily.
 - C. Air pressure differential gauges for other emission control equipment shall be read and the readings documented once per shift during operations.
17. All liquid effluents from mill process buildings, with the exception of sanitary wastes, shall be returned to the mill circuit or discharged to the tailings impoundment.
18. Release of equipment or packages from the restricted area shall be in accordance with Attachment No. 1 to SUA-1119, "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 USNRC 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,

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including borrow areas to be used for reclamation cover. These surveys must be submitted to the USNRC and no such disturbance shall occur until the licensee has received authorization from the USNRC 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 USNRC.

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 five miles (8 km) of any portion of the restricted area boundary and submit a report of this survey to the USNRC, Uranium Recovery Field Office. This report shall indicate any differences in land use from that described in the last report.
22. The results of all effluent and environmental monitoring required by this license shall be reported in accordance with 10 CFR 40, Section 40.65 with copies of the report sent to the USNRC, Uranium Recovery Field Office. Monitoring data shall be reported in the format shown in the Attachment No. 2 to SUA-1119, "Sample Format for Reporting Monitoring Data."
23. The licensee shall have in operation, within four (4) months of issuance of this license, instrumentation to detect ruptures of the tailings discharge and solution return lines when these lines are being utilized. Indications of a possible rupture of these lines shall result in activation of an alarm in an occupied area of the mill. The instrumentation shall be tested daily, and testing documented, to ensure proper operation.
24. The licensee shall immediately notify the USNRC, Uranium Recovery Field Office, 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.
25. Before engaging in any activity not previously assessed by the USNRC, 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 USNRC in the form of a license amendment.
26. The licensee shall implement a program to minimize dispersal of dust from the ore stockpile area(s). This program shall include written operating procedures. The effectiveness of the control method used shall be evaluated weekly by means of a documented inspection.
27. The licensee shall maintain a USNRC approved surety arrangement adequate to cover tailings stabilization and reclamation, mill decommissioning and mill site reclamation. The licensee shall submit for USNRC review and approval a proposed

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revision to the surety arrangement within six (6) months of USNRC approval of a revised reclamation plan. The revised surety shall be in effect within three (3) months of written USNRC approval. Furthermore, the licensee shall submit for USNRC review any proposed revision or annual update to the surety arrangement at least two (2) months prior to the proposed effective date. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the cost basis for tailings stabilization and reclamation, mill decommissioning, and mill site reclamation.

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 Utah), 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 Utah.
29. In addition to the representations contained in Section 5.5.9 of the licensee's renewal application, the licensee shall submit a detailed decommissioning plan to the USNRC at least twelve (12) months prior to planned shutdown of mill operations.
30. 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 airborne ore dust and yellowcake samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Non-routine ore dust and yellowcake samples shall be analyzed and the results reviewed by the RSO within two working days after sample collection.
31. The tailings impoundment area shall not be expanded by raising the heights of the present dams or constructing a new dam except as authorized by this license.
32. The licensee shall implement an interim stabilization program for all tailings not covered by standing water. This program shall include written operating procedures and shall minimize dispersal of blowing tailings. The effectiveness of the control method used shall be evaluated weekly by means of a documented tailings area inspection.
33. Standard written operating procedures (SOP's) shall be established for all operational process activities involving radioactive materials that are handled, processed, or stored. Standard operating procedures for operational activities shall enumerate pertinent radiation safety practices to be followed. Additionally, written procedures shall be established for nonoperational activities to include in-plant and environmental monitoring, bioassay analyses, and instrument calibrations. An up-to-date copy of each written procedure shall be kept in the mill area to which it applies.

All written procedures for both operational and nonoperational activities 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

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principles are being applied. In addition, the RSO shall perform a documented review of all existing operating procedures at least annually.

34. The licensee shall submit to the USNRC, Uranium Recovery Field Office, for review and approval in the form of a license amendment a proposed radiation safety program for the future acid circuit at least three (3) months prior to the planned initiation of operations in the acid circuit.
35. Processing of waste material from the Allied Chemical Company shall be in accordance with the statements, representations and conditions contained in the licensee's submittal dated July 16, 1982. Processing of waste material from Mallinckrodt, Inc. shall be in accordance with the statements, representations, and conditions contained in the licensee's submittal dated August 24, 1983. Additionally, the licensee shall establish and implement documented in-plant procedures for the handling and slurring of the waste materials. Radiation safety aspects of the procedures shall be reviewed and approved by the mill Radiation Safety Officer prior to implementation.
36. Disposal of waste from Westinghouse Electric Corporation's Bingham Canyon ion exchange facility shall be in accordance with the licensee's submittal dated March 20, 1984. The location of the disposal site shall be as shown on Figure 1 submitted by letter dated March 21, 1984. The licensee shall establish and implement procedures for the handling and disposal of the waste material, and radiation safety aspects of the procedures shall be reviewed and approved by the mill Radiation Safety Officer prior to implementation.
37. The licensee is authorized to release barrels which do not meet the decontamination limits specified in Condition No. 18 of this license to a facility authorized to possess the barrels under a specific source material license issued by the State of Utah. All waste material resulting from decontamination of the barrels shall be returned to the Lisbon Mill for disposal in the tailings ponds.

Prior to releasing contaminated barrels to a facility, the licensee shall provide documentation to the Uranium Recovery Field Office, USNRC, to verify that the facility possesses a source material license authorizing possession of the barrels. In addition, all releases of barrels and receipt of waste material authorized under this condition shall be documented.

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

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39. Notwithstanding the inspection program specified in Section 5.1.3 of the renewal application, the licensee shall comply with the following:
- A. The RSO or his designate shall conduct documented walk-through inspections of all work and storage areas on days of mill operations to ensure implementation of good radiation safety practices.
 - B. The RSO or his designate, if the RSO is unavailable, shall conduct weekly, documented inspections of all work and storage areas to observe general radiation control practices.
- A summary of inspection results shall be included in the monthly report prepared by the RSO as discussed in Section 5.1.3 of the renewal application.
40. A copy of the report documenting the semiannual ALARA audit committed to in Section 5.1.4 of the renewal application shall be submitted to the USNRC, Uranium Recovery Field Office, within one (1) month of completion of the report.
41. All mill process workers shall be provided on-the-job training on the radiation safety aspects of the job to be performed prior to beginning work activities and annually thereafter. The on-the-job training, as well as all other training committed to in Section 5.3 of the renewal application, shall be documented.
42. The licensee shall comply with the following additions to the bioassay program committed to in Section 5.5.4 of the renewal application:
- A. Baseline urinalysis shall be performed for all new employees prior to start of work activities.
 - B. In-vivo counting shall be performed every two years for ore crusher operators as well as yellowcake dryer-packaging operators.
 - C. Laboratory surfaces used for bioassay analyses shall be decontaminated to less than 25 dpm alpha (removable)/100 cm² prior to analysis of samples.
 - D. Anytime an action level of 15 ug/l uranium for urinalysis or 9 nCi uranium for an in-vivo measurement is reached or exceeded, the licensee shall provide documentation to the USNRC, Uranium Recovery Field Office, indicating what corrective actions have been performed to satisfy the requirements of Regulatory Guide 8.22. This documentation shall be included and submitted with the semiannual 10 CFR 40.65 report.
 - E. Anytime an action level of 30 ug/l uranium for four 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 provide documentation within 30 days to the USNRC, Uranium Recovery Field Office, indicating what corrective actions have been performed to satisfy the requirements of Regulatory Guide 8.22.

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43. The licensee shall perform and document weekly checks of the alpha survey meters used in the personnel and surface contamination control program using a radiation check source.
44. The licensee shall implement the inspection programs for the upper and lower tailings embankments and the Bisco Lake embankment as specified in their March 19, 1981 and May 17, 1984 submittals, subject to the following modifications and additions:
- A. Embankment piezometers shall be read monthly. On a quarterly basis, the piezometers shall be examined and tested for proper functioning. The available records and reading of these instruments shall also be reviewed quarterly to detect any unusual performance or distress in the structure.
 - B. The maintenance of operating facilities and features (such as pumps and valves) that pertain to the safety of the retention system shall be examined to determine the adequacy and quality of the maintenance procedures followed in maintaining the dam and facilities in safe operating condition.
 - C. The professional responsible for the technical evaluation shall ensure that field inspectors are trained to recognize and assess signs of possible distress or abnormality.
 - D. The results of piezometer and pond level measurements shall be maintained in graphical form.
 - E. A copy of each annual technical evaluation report shall be submitted to the USNRC, Uranium Recovery Field Office, within one (1) month of completion of the report.
45. The licensee shall comply with the following:
- A. For the upper tailings pond, the licensee shall maintain at least 2.75 feet of freeboard between the embankment crest and the maximum pond operating level.
 - B. For the lower tailings pond, the licensee shall maintain at least thirteen (13) feet of freeboard between the maximum pond operating level and the Stage I dam crest elevation of 6651 feet msl and at least ten (10) feet of freeboard between the maximum pond operating level and the Stage II dam crest elevation of 6661 feet msl.
 - C. Water levels in the upper tailings pond shall be read and recorded weekly. Water levels in the lower tailings pond shall be read and recorded monthly until tailings discharge into the lower pond begins, at which time the frequency shall be weekly.

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D. The licensee shall, within six (6) months of beginning tailings discharge into the lower pond, establish and maintain at least 100 feet of beach between the crest of the lower tailings dam and the ponded water.

46. Construction, maintenance, and operation of the upper tailings retention system shall be in accordance with the specifications, representations, recommendations and commitments contained in:

"Report of Geotechnical Evaluation to Support The Request For A Five-Foot Dam Raise, Upper Tailings Pond--Embankment System," Dames and Moore, August 22, 1980.

In addition, whenever the word "should" appears in the section of the above document entitled "Design Recommendations", it shall denote a requirement.

47. Construction, maintenance and operation of the lower tailings pond embankment, with a Stage I crest at 6651 feet above mean sea level and a Stage II crest at 6661 feet above mean sea level, shall be in accordance with the specifications, representations, recommendations and commitments contained in the following documents:

- A. "Report of Geotechnical Engineering Study, Proposed Raise of Lower Tailings Pond Embankment System to Maximum Crest Elevation of 6661 Feet, Lisbon Mine and Mill, LaSal, Utah" by Dames & Moore, dated March 17, 1981.
- B. "Tailings Dam Improvement and Flood Control Structures, Lisbon Valley Operations, Near Moab, Utah, for Rio Algom Corporation" by Dames & Moore, dated October 14, 1981, transmitted by letter from Rio Algom Corporation to Ross A. Scarano, USNRC, dated November 4, 1981.

Notwithstanding conflicting information in the submittals referenced above, embankment fill material shall be compacted on the dry side of the optimum moisture content as determined by AASHTO T-180 (-3 percent to +1 percent).

48. The licensee shall submit a set of construction specifications to the USNRC, Uranium Recovery Field Office, for review and approval prior to placement of embankment fill for the final stage of the two-staged raise of the lower tailings pond embankment. The specifications shall include a quality assurance soils testing program detailing frequencies of tests to be performed during the embankment construction.
49. The licensee shall notify USNRC, Uranium Recovery Field Office, at least three weeks prior to the following construction features of the two-staged lift of the lower tailings pond embankment to provide adequate time for on-site inspections by the NRC:
- A. During Stage II embankment fill placement at approximately 10 percent and 80 percent stages of completion.

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- B. After completion of Stage II construction and prior to placement of tailings above the Stage I maximum operating level.

The licensee shall submit to the USNRC, Uranium Recovery Field Office within six months of completion of construction of the Stage II lift, a construction report summarizing construction equipment used, construction procedures, problems encountered, methods used to resolve these problems, and quality control procedures and test results for embankment fill material.

50. Construction and maintenance of the flood diversion structures shall be in accordance with the specifications, representations, recommendations, and commitments contained in:
- A. "Supplementary Information for Flood Control and Diversion Structures, Rio Algom Uranium Mining Facility, LaSal, Utah" by Dames & Moore, August 26, 1981.
 - B. "Report on the Design of Flood Control and Diversion Structures, Rio Algom Uranium Mining Facility, LaSal, Utah" by Dames & Moore, September 8, 1981.
51. The licensee shall conduct an environmental monitoring program as specified in Section 5.5.6.1 and Table 5.5-5 of the renewal application with the following modifications:
- A. Radon monitoring shall be conducted continuously using passive monitoring devices which are exchanged and read at least quarterly.
 - B. The licensee shall implement a ground water monitoring and seepage control program as specified in the submittal dated September 21, 1984. In addition, water level data in the form of potentiometric contours shall be included with the submittals required by Condition No. 22.
 - C. The licensee shall implement a surface water monitoring program as specified in the submittal dated September 21, 1984. In addition, sediment samples shall be collected at the surface water sampling sites.
 - D. The lower limits of detection (LLD) to be utilized for sample analysis shall be as specified in the submittals dated September 29 and December 16, 1981, with the exception that the LLD for analysis of Pb-210 in water shall be 2.0 E-9 uCi/ml .
 - E. Continuous air samplers shall be calibrated and the calibration documented at least quarterly.
52. The licensee shall submit to the USNRC, Uranium Recovery Field Office, by September 30, 1985, a detailed reclamation plan which includes the following:

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- A. A stabilization plan which details methods to prevent blowing, ponding, and recharge of the tailings;
- B. A plan to dewater and/or consolidate the tailings;
- C. Plan and cross-sectional views of the final reclaimed area which detail the location and elevations of tailings and cover materials;
- D. Detailed plans for placement of rock or vegetative cover on the final reclaimed tailings pile;
- E. A proposed implementation schedule for items A through D above;
- F. An analysis to show that the proposed type and thickness of soil cover is adequate to provide appropriate attenuation of radon;
- G. An erosion analysis to show that the proposed cover materials will provide long-term isolation of tailings.
53. The licensee shall implement a ground water detection monitoring program to ensure compliance to 40 CFR 192.32(a)(2) which includes the following elements:
- A. The licensee shall monitor at the point of compliance and background wells for the following indicator parameters: Arsenic, Selenium and pH. The licensee shall utilize analytical techniques capable of providing lower limits of detection of 0.005 mg/l and 0.001 mg/l for arsenic and selenium, respectively. Measurements of pH shall be reported to the nearest 1/10 standard unit.
- B. The determination of compliance shall be based on sampling Wells H-49(a), H-55 and H-56.
- C. The determination of background levels for the parameters specified in subsection (A) shall be defined by sampling Well MW-5.
- D. The licensee shall sample for those parameters specified in subsection (A) at those wells designated in subsections (B) and (C) on a monthly basis for a period of one (1) year and at least twice annually thereafter. The first monthly sample shall be taken within 30 days of the date of this Order. All semiannual samples shall be taken at least four months apart.
- E. The licensee shall, within 60 days of collection of the last of the twelve monthly samples, propose for USNRC review and approval in the form of a license amendment background levels for indicator parameters and a statistical procedure for identifying significant changes (95% confidence level) between data from the wells specified in subsections (B) and (C).
- F. The licensee shall report the data required by subsection (D) semiannually along with those data required by License Condition No. 22 in accordance to the reporting format, Attachment No. 3 to SUA-1119, "Sample Format for

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Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 52.

- G. The licensee shall report at least annually in accordance to reporting requirements specified in subsection (F) the rate and direction of ground water flow under the tailings impoundment.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Dated:

JUL 19 1985

BY

/s/
R. Dale Smith, Director
Uranium Recovery Field Office
Region IV

OFC :	URFO :	URFO :	RIV :	ELD :	:	:
NAME :	HPettengill :	RDSmith :	WBrown :	KCyr :	:	:
DATE :	85/07/19 :	7/19/85 :	RMartin :	SBurns :	:	:

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MEMORANDUM FOR: Docket File No. 40-8084

By letter dated November 2, 1984, Rio Algom submitted the details of their proposed detection monitoring program in response to URFO's July 10, 1984 letter outlining the staff's criteria for an acceptable detection monitoring program as detailed in 40 CFR 192. The July 10 letter informed Rio Algom that their existing groundwater monitoring program at that time did not appear to meet Criteria 6 and 7. The purpose of this memorandum is to review Rio Algom's proposed detection monitoring program against the staff-developed acceptance criteria and make recommendations for licensing action to implement this program.

The program must be reliable in indicating the presence of hazardous constituents in the uppermost aquifer under the impoundment. Reliable indication shall be based on the analyses of ground water samples for specified chemical-physical parameters, waste constituents, or reaction products that are reliable indicators of the leakage of hazardous constituents disposed in the impoundment.

Rio Algom currently monitors 14 ground water parameters. These parameters include highly mobile ions which are used in the mill circuit for the extraction of uranium, are very concentrated in the tailings pond

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liquor and are therefore reliable indicators of the presence of seepage. A review of this water quality data indicates that wells hydrologically downgradient of the tailings management system show elevated levels of these very mobile ions. This situation has occurred for several years and is evidence of tailings pond seepage in the surficial aquifer. In response to this, Rio Algom has installed a series of recovery wells which, with the exception of the most recently installed well, recovered only a very small portion of the estimated seepage.

In their submittal, Rio Algom did not propose to monitor any specific indicator species. In subsequent discussions with the mill, a staff agreement was reached on reasonable indicator species. In accordance with the previous generic review document, arsenic, selenium and pH will constitute the monitored indicator species at this mill. A limited data base exists for these species as shown in Table 1. The values in the table consist in quarterly averages of an unknown quantity of samples.

Criterion 2

The program must provide samples representative of the ground water passing under the impoundment at the point of compliance. Representative samples shall be determined by the sufficiency in number of sampling wells and the adequacy of their locations, including depths, with respect to the uppermost aquifer and its direction(s) of flow. Point of compliance is specified to provide prompt indication of leakage from the impoundment should it occur.

Rio Algom does not currently have in place true point of compliance wells. As seepage has already been detected at the site and mitigative measures are underway, the staff has concluded that true point of compliance wells are not necessary at this time. Temporary point of compliance wells will therefore be designated.

Rio Algom has several wells ideally suited for temporary point of compliance wells. A staff review of available data indicates that Wells H-49, H-55 and H-56 would make adequate temporary point of compliance wells. There is a necessity for more than one well due to the ground water divide which exists at the site and the two major directions of ground water flow. These wells monitor the flow in the complex fracture pattern which exist at this site. However, the staff was advised by Rio Algom personnel that sloughing has occurred in Well H-49, making it

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DATE :	:	:	:	:	:	:

DATE : 85/04/19 : : : : :

TABLE 1, RIO ALGOM LISBON MILL WATER QUALITY DATA

<u>H-49(a) - Temporary Point of Compliance Well</u>				<u>H-55 - Temporary Point of Compliance Well</u>				<u>H-56 - Temporary Point of Compliance Well</u>			
<u>Date</u>	<u>Indicator Species</u>			<u>Date</u>	<u>Indicator Species</u>			<u>Date</u>	<u>Indicator Species</u>		
	<u>As(mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>		<u>As(mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>		<u>As(mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>
	NO DATA AVAILABLE			1284	*	*	9.1	1284	*	.149	9.5
				0684	*	*	9.9	0684	*	.150	9.7
				1283	*	.072	9.6	1283	*	.089	9.3
				0683	*	.034	9.8	0683	*	.034	9.5

* Indicates that no sample was taken for this indicator species on the date specified.

TABLE 1, RIO ALGOM LISBON MILL WATER QUALITY DATA (Cont)

<u>MW-5 Background Well</u>			
<u>Date</u>	<u>Indicator Species</u>		
	<u>As(mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>
1284			
0684	*	-.001	7.4
1283	*	.001	7.3
0683	*	.008	7.6
1282	*	.006	8.0
0682	*	.001	*

* Indicates that no sample was taken for this indicator species on the date specified.

- When a concentrations is preceded by a -, this indicates that the indicator species was undetectable at this lower limit of detection.

difficult to obtain a good sample. The licensee therefore installed a new well, designated H-49(a), approximately 25 feet from Well H-49. Well H-49(a) should be an acceptable temporary point of compliance well. The staff therefore finds that Wells H-49(a), H-55 and H-56 represent adequate temporary point of compliance wells.

Criterion 3

The program must include sampling locations suitable to determine background levels of monitored parameters and constituents and to detect leakage of hazardous constituents from the impoundment should it occur. Suitability of sampling locations shall be determined by the placement of sampling wells upgradient (background) and downgradient (leakage) of the surface impoundment.

In their submittal, Rio Algom did not propose a background well. However, Rio Algom has an adequate background well - Well MW-5. This well has been used for background concentrations since milling began. Due to this, it has a rather well developed data base for the indicator species with the exception of arsenic. However, many of their sample results were reported as a quarterly average of an unknown number of samples. Due to this, the data base is statistically rather poor. The staff does however agree that this well represents background water quality and should be used as a background well.

Criterion 4

The program, to be fully operational, must have available reliable data on background levels of monitored parameters and constituents, or a procedure implemented for determining background levels of monitored parameters and constituents.

As indicated in the staff review under Criteria 1 and 3, Rio Algom has a limited data base that consists of quarterly averages of an unknown sample population. The data base consists of several years of sampling for selenium and pH; however, no samples for arsenic. Due to this, an adequate data base cannot be developed for the indicator species at this time. Although Rio Algom currently monitors on a quarterly frequency, the staff recommends that sampling for arsenic, selenium and pH be done on a monthly frequency for the initial year of sampling in order to establish baseline levels of the indicators in a reasonably short time.

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The staff further concludes that sampling include sampling and analysis for arsenic, selenium and pH on the above frequency with a lower limit of detection for arsenic of 0.005 mg/l and 0.001 mg/l for selenium. Measurements of pH shall be to the nearest 1/10 standard unit.

Criterion 5

The program must provide for analyses of ground water samples from all monitoring wells at a frequency of at least twice each twelve month period, where the first and last samples at any wells are spaced at least four months apart in that twelve month period. All monitoring wells means all background (upgradient) and all leakage detection (downgradient) sampling locations.

Rio Algom currently monitors their wells on a quarterly frequency. The staff recommends that this frequency be upgraded to monthly monitoring for the initial year of sampling and twice annually thereafter for all wells in the detection monitoring system. This will not result in any increases in ground water sampling frequency beyond the initial one year period.

Criterion 6

The program must include determination of the rate and direction of ground water flow in the uppermost aquifer under the impoundment at a frequency of a least once each twelve month period.

In the original review of Rio Algom's detection monitoring, Criterion 6 was not adequately addressed. The staff therefore finds that Rio Algom should comply with Criterion 6 by determining rate and direction of ground water flow at least annually.

Criterion 7

The program must provide for the identification and reporting of statistically significant increases above background levels of monitored parameters and constituents in ground water samples. Statistically significant increases shall be based on factors such as: variability and values of background levels of monitored constituents and parameters, accuracy of analytical methods, limits of detection of analytical methods, and the number of samples.

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In the original review of Rio Algom's ground water monitoring program, Criterion 7 was not adequately addressed. In their November 2, 1984 submittal, Rio Algom proposed to use Cochran's Approximation to the Behrens-Fisher Students' t-test. The staff finds that this statistical procedure is not adequate in all cases. The staff therefore concludes that Rio Algom should review the data collected during the initial year of the detection monitoring program and propose background concentrations for indicator species based upon this data. The staff further concludes that Rio Algom should also propose a statistical procedure for identifying significant changes between data from the point of compliance well and the background well at a 95% confidence level.

Based upon the above discussion, the staff recommends that SUA-1119 be amended by adding a new License Condition No. 54 to read as follows:

54. The licensee shall implement a ground water detection monitoring program to ensure compliance to 40 CFR 192.32(a)(2) which includes the following elements:
 - A. The licensee shall monitor at the point of compliance and background wells for the following indicator parameters: Arsenic, Selenium and pH. The licensee shall utilize analytical techniques capable of providing lower limits of detection of 0.005 mg/l and 0.001 mg/l for arsenic and selenium, respectively. Measurements of pH shall be reported to the nearest 1/10 standard unit.
 - B. The determination of compliance shall be based on sampling Wells H-49(a), H-55 and H-56.
 - C. The determination of background levels for the parameters specified in subsection (A) shall be defined by sampling Well MW-5.
 - D. The licensee shall sample for those parameters specified in subsection (A) at those wells designated in subsections (B) and (C) on a monthly basis for a period of one (1) year and at least twice annually thereafter. All semiannual samples shall be taken at least four months apart.
 - E. The licensee shall, within 60 days of collection of the last of the twelve monthly samples, propose for USNRC review

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and approval in the form of a license amendment background levels for indicator parameters and a statistical procedure for identifying significant changes (95% confidence level) between data from the wells specified in subsections (B) and (C).

- F. The licensee shall report the data required by subsection (D) semiannually along with those data required by License Condition No. 22 in accordance to the reporting format, Attachment No. 3 to SUA-1119, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 52.
- G. The licensee shall report at least annually in accordance to reporting requirements specified in subsection (F) the rate and direction of ground water flow under the tailings impoundment.

/S/

Gary R. Konwinski, Project Manager
Licensing Branch 2
Uranium Recovery Field Office, RIV

Approved by: _____

/S/

Harry J. Pettengill, Chief
Licensing Branch 2
Uranium Recovery Field Office, RIV

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