UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

July 26, 2001

Mr. Marvin Freeman, Vice President
Rio Algom Mining Corporation
6305 Waterford Blvd., Suite 325
Oklahoma City, Oklahoma 73118

SUBJECT: NRC INSPECTION REPORT 40-8964/01-02

Dear Mr. Freeman:

This refers to the routine inspection conducted on July 10 - 11, 2001, at your Smith Ranch in-situ uranium processing facility in Converse County, Wyoming. The inspection consisted of a routine review of management organization and controls, site operations, radiation protection, radioactive waste management, environmental monitoring, and followup of an open item. The inspection findings were discussed with your staff at the exit briefing on July 11, 2001. The enclosed report presents the results of that inspection. Overall, the inspection determined that you had continued to operate the uranium production facility in a safe and effective manner.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Louis C. Carson II at (817) 860-8221 or the undersigned at (817) 860-8186.

Sincerely,

/RA/

Charles L. Cain, Chief
Nuclear Materials Licensing Branch

Docket No.: 40-8964
License No.: SUA-1548

Enclosure:
NRC Inspection Report
40-8964/01-02

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	40-8964
License No.:	SUA-1548
Report No.:	40-8964/01-02
Licensee:	Rio Algom Mining Corporation
Facility:	Smith Ranch In-Situ Leach Facility
Location:	Converse County, Wyoming
Dates:	July 10-11, 2001
Inspectors:	Louis C. Carson II, Health Physicist Nuclear Materials Licensing Branch
	John H. Lusher, Health Physicist Uranium Recovery Section Fuel Cycle Licensing Branch Division of Fuel Cycle Safety and Safeguards Office of Nuclear Material Safety and Safeguards
Approved By:	Charles L. Cain, Chief Nuclear Materials Licensing Branch

EXECUTIVE SUMMARY

Smith Ranch In-Situ Leach Facility
NRC Inspection Report 40-8964/01-02

This inspection included a review of site status, management organization and controls, in-situ leach operations, environmental protection/radioactive waste management programs, radiation protection, and followup of an open item.

Management Organization and Controls

- The organization structure and staffing levels were determined to be acceptable for the work in progress at the facility. The licensee had an organization and procedures in place for implementing the performance-based license including a Safety and Environmental Review Panel (Section 2).

In-Situ Leach Facilities

- Routine site activities were conducted in accordance with applicable license and regulatory requirements. No yellowcake product spills were observed. Plant process parameters were within license limits. Site fences were in good condition, and perimeter postings were appropriate (Section 3).

Radiation Protection

- The licensee had implemented a radiation protection program that met the requirements in 10 CFR Part 20 and the conditions of the license. Survey instrument calibrations and radiation surveys were being performed as required (Section 4).

Environmental Protection and Radioactive Waste Management

- A review of the environmental monitoring and radioactive waste management programs revealed that the licensee was in compliance with the license and regulatory requirements. Records indicated that no effluents had been released into the environment exceeding regulatory limits. Reports related to groundwater and environmental monitoring programs had been submitted to the NRC as required (Section 5).

Report Details

1 Site Status

In March 1992 a commercial license was issued to Rio Algom Mining Corporation for recovery of uranium through in-situ leach operations at the Smith Ranch facility. Full scale construction of the central processing plant began in January 1996, and commercial operations began on June 20, 1997. Wellfields 3 and 4 were in service during the inspection. The yellowcake dryer and filter press were operational for drying and packaging the yellowcake product.

Wellfield 2 was not in service and is currently under development and drilling. Wellfield 3 was originally placed into operation on August 10, 1998, with eight operating mine units in service. Wellfield 4 began production on September 10, 1999, with six operating mine units. A satellite facility was completed in August 1998, which supports mining operations from Wellfield 3. The satellite facility has sufficient capacity to support all mine units in Wellfields 3 and 4.

2 Management Organization and Controls (88005)

2.1 Organization and Staff

The licensee's corporate organization structure is illustrated in Figure 9-5 of the September 27, 2000, application. During this inspection, the licensee's functional organization was compared to the organization chart as referenced in the license application. The licensee's overall organization structure was in agreement with the license application.

Approximately 64 individuals were employed at the site during this inspection, which included 5 well drillers. The general manager remained the highest ranking official on site, and the radiation safety officer (RSO) continued to report directly to the general manager. In summary, the licensee had fully staffed the site to support commercial operations.

2.2 As Low As is Reasonably Achievable Controls

License Condition 9.7 requires that the licensee follow the requirements of Regulatory Guide (RG) 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As is Reasonably Achievable [ALARA]," for the responsibilities and qualifications for the RSO and radiation safety technicians. The licensee had completed personnel qualifications and required refresher training as specified in the RG by April 26, 2001.

License Condition 12.2 requires that the licensee conduct an annual ALARA review. The inspector reviewed a report of the licensee's Year 2000 Annual ALARA Review, which was submitted to the NRC on March 30, 2001. The most current ALARA review was found to be thorough and comprehensive.

2.3. Safety and Environmental Review Panel

The licensee was issued a Performance-Based License (PBL) on May 8, 2001. License Condition 9.4 of the PBL requires the licensee to establish a Safety and Environmental Review Panel (SERP). The SERP is required to ensure that changes to the facility and procedures, and tests or experiments which have not been reviewed by the NRC do not have adverse affects on systems, structures, components, and the operation of the facility. The licensee had established an Operational Review Committee (ORC) for pre-screening of work orders/radiation work permits and to determine if SERP action is required for proposed changes. The inspector reviewed 8 work orders that had been reviewed by the ORC. One work order was determined to require a SERP review. The inspector determined that licensee's implementation of the PBL and SERP was adequate.

2.4 Conclusions

The organization structure and staffing levels were determined to be acceptable for the work in progress at the facility. The licensee had an organization and procedures in place for implementing the performance-based license including the Safety and Environmental Review Panel.

3 In-Situ Leach Facilities (89001)

3.1 Inspection Scope

A site tour was performed to verify that site activities were being conducted in accordance with applicable regulations and the conditions of the license and to ensure that operational controls were adequate to protect the health and safety of workers and members of the general public.

3.2 Observations and Finding

A site tour was performed to verify that site activities were being conducted in accordance with applicable regulations and license conditions. During the site tour, plant buildings, equipment, fences, and gates were observed. Site fences were in good condition and were properly posted in accordance with License Condition 9.8. The facility and related components were operational and properly maintained. Within the plant control room, no equipment misalignments were identified, and no process flow, level, or pressure indications were found outside required parameters. During the site tour, yellowcake dryer operations were in progress. The inspectors toured the yellowcake dryer area while the dryer was operating. No yellowcake product was observed on the floor of the central processing plant.

The inspectors also toured the chemistry laboratory within the central processing plant. Laboratory personnel were noted to be wearing dosimetry.

3.3 Conclusions

Routine site activities were conducted in accordance with applicable license and regulatory requirements. No yellowcake product spills were observed. Plant process parameters were within license limits. Site fences were in good condition, and perimeter postings were appropriate.

4 Radiation Protection (83822)

4.1 Inspection Scope

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

4.2 Observations and Findings

a. Personnel Monitoring and Surface Contamination Control

Section 9.11 of the license application requires that process workers shower or monitor themselves with an alpha survey instrument prior to exiting the restricted area. Should the results of monitoring exceed an action level of 1000 disintegrations per minute per 100 square centimeters (dpm/100 cm^2), employees shall decontaminate themselves to less than the action level. Also, this license condition states that the licensee shall perform spot surveys for alpha contamination at least quarterly on all workers leaving the facility. A review of the licensee's records indicated that site employees were monitoring themselves with an alpha survey meter prior to exiting the restricted area and no individual had left the site (after self-monitoring) with contamination above the action level. During the site tour, the inspectors observed site workers scanning themselves prior to exiting the restricted area.

Section 9.10 of the license application requires the licensee to perform monthly alpha contamination surveys of the facility laboratory and offices and weekly surveys of eating areas and change rooms. The licensee had performed weekly and monthly surveys on a routine basis during this inspection interval. Sample results confirmed that contamination was below the respective license limits and action level.

b. Routine Ambient Gamma Surveys

Section 9.11 of the license application requires the licensee to perform specified quarterly gamma radiation surveys in enclosed areas and to conduct spot checks to confirm the adequacy of the gamma radiation monitoring plan. The gamma radiation survey records for this inspection interval were reviewed and found to be adequate. The inspectors observed the radiation safety technician taking contamination swipes and radiation measurements at one of the satellite facilities.

The inspectors' review of records verified that the licensee had performed the required routine surveys and spot checks as specified by the license. The licensee had not identified any unexpected radiation levels during their surveys. During the site tours, ambient radiation levels were measured by the inspector using an NRC microRoentgen meter (Serial Number 36514, calibration due date August 16, 2001). Readings taken within the central process plant measured 100 µR/hr at the ion exchange columns, 10 µR/hr in the control room, and 50 µR/hr in the laboratory. The administrative offices measured 20 µR/hr. Surveys were taken in the yellowcake drum storage area. Measurements ranged from 1,000 - 4,500 µR/hr in the yellowcake drum storage area. The licensee's RSO stated that particular attention is paid to the placement of yellowcake drums to assure that "Radiation Areas" do not exist.

The inspector's observations of header house bag filter maintenance in the Satellite Building revealed that radiation levels measured 4,500 - 5,000 µR/hr. Additionally, the inspector noted that radiation levels in some of the Wellfield No. 4 header houses were higher than the licensee had expected. One of the injection line bag filters at Header House 4-4 measured 20,000 µR/hr on contact. The last radiation surveys taken by the licensee at a header house was in September 2000, and the highest radiation level measured was 3,600 µR/hr at Header House 3-7. Consequently, the licensee initiated an investigation into the causes of the unexpected radiation levels and the impact to personnel exposures. The inspectors' review of dosimeter records since the previous inspection did not reveal any increased personnel exposures of workers who conducted bag filter maintenance.

c. Bioassays

The bioassay program was reviewed to determine compliance with License Conditions 11.2 and 11.3. Action levels were defined in accordance with Table 1 of Regulatory Guide 8.22, "Bioassay at Uranium Mills," Revision 1. Evaluations were performed when bioassay results exceeded any action level and pertinent corrective actions were implemented. Bioassay samples were analyzed by a vendor laboratory. All sample shipments included blank and spiked samples for quality assurance. All process operators and laboratory personnel were sampled on a monthly basis, while personnel involved in dryer operations were sampled weekly. Since the last inspection, no worker bioassay had exceeded the lowest action level of 15 µg/l.

d. Radiation Work Permits (RWPs)

License Condition 9.3 requires the licensee to implement Section 9.6 of the license application. The license application states that where the potential for exposure to radioactive materials exists and for which no standard operating procedure (SOP) exists, a RWP shall be required. The license condition further requires the RWPs to contain the following information: (1) the scope of the work to be performed, (2) any necessary precautions to reduce exposures, and (3) any supplemental radiological monitoring and sampling requirements. Ten RWPs had been written since the last inspection, and the inspector reviewed the RWPs and found them to be adequate.

e. Instrument Calibration

Section 9.6 of the license application requires the licensee to implement the license application dated November 15, 1999, which requires that all radiation monitoring, sampling, and detection equipment to be recalibrated after each repair as recommended by the manufacturer, or at least annually, whichever is more frequent. The inspectors reviewed the licensee's calibration records and determined that survey instruments had been calibrated routinely. Also, it was noted that instruments in use had current calibration stickers affixed. The inspector reviewed radiation instrument functional check records from May - July 2001 and determined that the licensee had complied with the license.

f. Release of Equipment for Unrestricted Use

Section 9.11 of the license application requires that the release of equipment or packages from the restricted area shall be in accordance with the NRC guidance document 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. The inspector reviewed the licensee's equipment release records completed since the last inspection. No items had been released with contamination in excess of the limits for fixed, average, and removable alpha contamination (15,000 dpm/100 cm^2, 5,000 dpm/100 cpm^2 and 1,000 dpm/100 cm^2, respectively).

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements in 10 CFR Part 20 and the conditions of the license. Survey instrument calibrations and radiation surveys were being performed as required.

5 Radioactive Waste Management (88035) Environmental Monitoring (88045)

5.1 Inspection Scope

The environmental and radioactive waste management programs were reviewed to assess the effectiveness of the licensee to control waste and monitor the effects of site activities on the local environment.

5.2 Observations and Findings

a. Semi-annual Effluent Reports

License Condition 12.2 requires that the results of effluent and environmental monitoring be reported to the NRC in accordance with 10 CFR 40.65. The semi-annual environmental monitoring report for the second half of 2000 was submitted to the NRC on February 28, 2001, and reviewed during this inspection. The semiannual report was

submitted to the NRC in a timely manner and provided relevant data for the facility. The environmental monitoring program consisted of air particulate, radon, groundwater, surface water, soil, and vegetation sampling. Measurements of ambient gamma exposure rates were also performed. All values reported were within acceptable limits.

b. Groundwater and Environmental Water Sampling

NRC inspectors reviewed groundwater monitoring well and effluent monitoring data. All required data was presented in the reports. Groundwater and surface water monitoring programs were found to have been implemented in accordance with Table 5.3 of the license application. The groundwater program consisted of sampling livestock or domestic wells within 1-kilometer of operating wellfields on a quarterly basis for natural uranium and radium-226.

The inspectors' review of data for the third and fourth quarters of 2000 indicated that the concentrations of natural uranium and radium-226 were below the 10 CFR Part 20, Appendix B, effluent concentration limits of 3.0 E-7 microcuries per milliliter(µCi/ml) and 6.0 E-8 µCi/ml for uranium and radium, respectively.

c. Environmental Air Sampling

The inspector noted that this facility is considered a zero gaseous and particulate effluent facility based on the design of the central process plant and the yellowcake dryer system. However, the licensee had continuously performed air particulate sampling at three locations around the site during 2000 and 2001. The samples were analyzed on a quarterly basis for their natural uranium, thorium-230, radium-226, and lead-210 concentrations. The air sample results indicated that these radionuclide concentrations were fractions of the 10 CFR Part 20, Appendix B, effluent concentration limits during year 2000 and so far in 2001.

The licensee was required to sample for radon at three monitoring stations upwind and downwind from the site. Sampling was performed continuously using track etch detectors which were analyzed quarterly. During year 2000 the sample results indicated a radon concentration of 2.1 E-9 µCi/ml at the station nearest downwind residence. The fence line station measured 1.9E-9 µCi/ml, and the station at the farthest downwind station measured 1.2 E-9 µCi/ml during year 2000. All of the sample results were less than the radon-222 effluent concentration limit established in 10 CFR Part 20, Appendix B, which is 1.0 E-8 µCi/ml.

d. Environmental Exposure Rates

The licensee used environmental thermoluminescent dosimeters to monitor ambient gamma readings. The dosimeters were placed at seven locations as specified in Table 5.3 of the license application and were changed out quarterly. During year 2000, the highest ambient reading measured was 1.2 microRoentgen per hour (µR/hr) above background at the fence line restricted area boundary. The background station, Dave's Waterwell, measured 11.8 µR/hr during year 2000. During year 2000, ambient gamma exposure rates measured were well below the limits of 10 CFR 20.1301.

e. Soil/Vegetation

In accordance with Table 5.3 of the license application, the licensee is required to take soil and vegetation samples annually from the downwind air sampling station. The soil and vegetation samples are taken during the second half of the calender year and are analyzed for natural uranium, radium-226, and lead-210. The results were presented in the semiannual effluent report dated February 28, 2001.

f. Liquid Effluents

The inspector noted that this facility is considered a zero liquid effluent facility based on the design of the central process plant and License Condition 10.7, which provides restrictions for the control of liquid effluents. Based on the licensee's records, liquid effluents were being returned to the process circuit, disposed of via deep-well disposal, or discharged to the evaporation ponds. During year 2000, the licensee discharged 19.24 million gallons of liquid effluents into the deep-well disposal pit. During the first and second quarters of 2001, the licensee had discharged 11.53 million gallons of liquid effluents into the deep-well disposal pit. The inspector determined that the licensee was meeting regulatory requirements regarding liquid effluents.

5.3 Conclusions

A review of the environmental monitoring and radioactive waste management programs revealed that the licensee was in compliance with the license and regulatory requirements. No effluents had been released into the environment exceeding regulatory limits. Reports related to groundwater and environmental monitoring programs had been submitted to the NRC as required.

6 Followup (92701)

(Closed) IFI 40-8964/0101-01: Elevated Pb-210 Air Samples

During year 2000 the licensee found that lead-210 concentrations measured 122 percent above the limit at the background monitoring location. It was determined that if the increased lead-210 concentration continued during 2000, the licensee would exceed effluent concentration limits. An inspection Followup Item was opened to evaluate subsequent sampling at this location to determine if significant adverse trends may be occurring (IFI 40-8964/0101-01).

The licensee determined that the lead-210 values were elevated due to a nearby coal-fired power plant and active strip coal mine. The inspector determined that since the facility was a zero gaseous and particulate effluent facility, it may not be necessary to sample at that site. Licensee management stated that they would evaluate this matter using their PBL and SERP process. Based on the licensee's finding that a coal-fired plant cause the elevated lead-210 values and the facility is a zero release facility, the inspector determined that this matter had no regulatory significance and could be closed.

7 Exit Meeting Summary

The inspectors presented the inspection results to the representatives of the licensee at the conclusion of the inspection on July 11, 2001. Licensee representatives acknowledged the findings as presented. The licensee did not identify any material reviewed as proprietary.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Cash, Supervisor, Radiation Safety & Environmental Affairs
P. Drummond, Manager, Plant Operations
W. P. Goranson, Manager, Radiation Safety, Regulatory Compliance & Licensing
B. Ferdinand, General Manager
J. McCarthy, Radiation Safety Officer

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

None

Closed

40-8964/0101-01	IFI	Review of licensee's environmental air sampling data during the next inspection to determine if increased lead-210 concentrations represents a trend if any, at the site.

Discussed

None

INSPECTION PROCEDURES USED

IP 83822	Radiation Protection
IP 88005	Management Organization and Control
IP 88035	Radioactive Waste Management
IP 88045	Environmental Monitoring
IP 89001	In-Situ Leach Facilities
IP 92701	Followup

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
DAC	Derived Air Concentration
dpm/100 cm^2	disintegrations per minute per 100 square centimeters
µCi/ml	microcuries/milliliter
µR/hr	microRoentgen per hour
ORC	Operational Review Committee
PBL	Performance-Based License
PDR	Public Document Room
RG	Regulatory Guide
RSO	Radiation Safety Officer
SERP	Safety and Environmental Review Panel
RWP	Radiation Work Permit
SOP	Standard Operating Procedure
URS	Uranium Recovery Section