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

February 11, 2000

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

SUBJECT: NRC INSPECTION REPORT 40-8964/00-01 AND NOTICE OF VIOLATION

Dear Mr. Freeman:

This refers to the routine inspection conducted on January 10-13, 2000, 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, and environmental monitoring. The inspection findings were discussed with your staff at the exit briefing on January 13, 2000. 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.

Based on the results of this inspection, certain licensed activities were in violation of NRC requirements, as specified in the enclosed Notice of Violation (Notice). The violation concerns eight separate occasions since July 1999, that personnel undertook contamination recovery activities involving source material without proper written guidance such as standard operating procedures or radiation work permits. As a result of these activities, the personnel did not properly evaluate if the contaminated areas met radiological release criteria.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements. For your consideration and convenience, NRC Information Notice 96-28, “SUGGESTED GUIDANCE RELATING TO DEVELOPMENT AND IMPLEMENTATION OF CORRECTIVE ACTION,” is enclosed.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be placed in the NRC Public Document Room (PDR).

Should you have any questions concerning this inspection, please contact Mr. Louis C. Carson II at (817) 860-8220 or Dr. Blair Spitzberg at (817) 860-8191.

Sincerely,

/RA Linda L. Howell Acting for/

Dwight D. Chamberlain, Director
Division of Nuclear Material Safety

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

Enclosures:
1. Notice of Violation
2. NRC Inspection Report
   40-8964/00-01
3. NRC Information Notice 96-28

cc w/Enclosures 1& 2:
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Wyoming Radiation Control Program Director

E-Mail report w\Enclosures 1 & 2 to Document Control Desk (DOCDESK)

bcc w\Enclosures 1 & 2 to DCD (IE07)

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ENCLOSURE 1

NOTICE OF VIOLATION

Rio Algom Mining Corp. Docket No.: 40-8964
Oklahoma City, Oklahoma License No.: SUA-1548

During an NRC inspection conducted on January 10-13, 2000, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600 the violation is listed below:

> License Condition 9.10 states, in part, that written standard operating procedures (SOP) shall be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. In addition, written procedures shall be established for non-operational activities to include in-plant and environmental monitoring.
>
> License Condition 10.12 states, in part, that for work where the potential for exposure to radioactive material exists and no SOP exists, a radiation work permit (RWP) shall be required.
>
> Contrary to the above, from July through December 1999, eight spill events occurred onsite involving 98,330 gallons of production or injection liquids containing low-levels of radioactive material. Without an SOP or RWP, workers repaired equipment; processed, stored, and transported radioactive material; and conducted environmental monitoring associated with all eight spill recovery operations.
>
> This is a Severity Level IV violation, (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, Rio Algom Corp., is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 11th day of February 2000

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	40-8964
License No.:	SUA-1548
Report No.:	40-8964/00-01
Licensee:	Rio Algom Mining Corporation
Facility:	Smith Ranch In-Situ Leach Facility
Location:	Converse County, Wyoming
Dates:	January 10-13, 2000
Inspectors:	Louis C. Carson II, Health Physicist Fuel Cycle/Decommissioning Branch
	John H. Lusher, Health Physicist Uranium Recovery and Low-level Waste Division of Waste Management Nuclear Materials Safety and Safeguards
	Judith L. Weaver, Health Physicist, (Inspector-In-Training) Fuel Cycle and Decommissioning Branch
Approved By:	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle/Decommissioning Branch

EXECUTIVE SUMMARY

Smith Ranch In-Situ Leach Facility
NRC Inspection Report 40-8964/00-01

This inspection included a review of site status; management organization and controls; site and in-situ leach operations; and the licensee's radiation protection, and environmental monitoring programs.

Management Organization and Controls

- The organizational structure and staffing levels were determined to be acceptable for the work in progress at the facility. The licensee's organization and management controls were found to be in compliance with the requirements of the license (Section 2).

In-Situ Leach Facilities and Environmental Protection

- Routine site activities were conducted in accordance with applicable license and regulatory requirements. Site fences were in good condition and perimeter postings were appropriate. Structures and operating equipment appeared to be in excellent condition. Process parameters were within the limits specified in the license. No significant health or safety hazards were identified (Section 3).

- A review of the spill management program revealed that when the licensee responded to contamination events during the period July through December 1999, the licensee failed to use standard operating procedures and radiation work permits during work activities involving radioactive material. This was identified as a violation of License Conditions 9.10 and 10.12 (Section 3).

- The licensee reported the spills to the State of Wyoming and NRC project management. Decommissioning records that were being maintained pursuant to 10 CFR 40.36(f) were found to be adequate (Section 3).

Radiation Protection

- The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license (Section 4).

Report Details

1 Site Status

A commercial license was issued during March 1992 to Rio Algom Mining Corporation to allow the company to recover 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 1, 3, and 4 were in service during the inspection. The yellowcake dryer and filter press had been placed in service and were being used to de-water, dry, and package the yellowcake product.

Wellfield 1 was in service with six operating mine units. No additional mine units are planned for this wellfield. Wellfield 2 was not in service, but was anticipated to be in production in about 2-3 years because of the low-yield ore zones. Wellfield 3 was originally placed into operation on August 10, 1998, with three operating mine units, and five additional mine units have since been placed in service. Wellfield 4 began production on September 9, 1999, when approval was granted by the State of Wyoming, with two header houses completed and four additional header houses under construction.

A satellite facility was completed in August 1998 which supports mining operations from Wellfield 3. The satellite facility will have sufficient capacity to support all mine units in Wellfields 3 and 4.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The organizational structure was reviewed to ensure that the licensee had established an effective organization with defined responsibilities and functions. The licensee's standard operating procedures were reviewed, and the implementation of these procedures was assessed to evaluate the effectiveness of such controls on site activities.

2.2 Observations and Findings

a. Management Organization

License Condition 9.13 states that any changes to the licensee's corporate organizational structure illustrated in Figure 9-4 of the March 31, 1988, application as amended by the submittal dated December 10, 1991, shall require approval of the NRC in the form of a license amendment. During this inspection, the licensee's functional organization was compared to the organization chart that is referenced in the license. The licensee's overall organization structure was in agreement with the conditions of the license.

Approximately 72 individuals were employed at the site during this inspection. 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. A new radiation safety technician was scheduled to start work on January 17, 2000.

b. Management Controls

License Condition 9.14 delineates the responsibilities and qualifications for the RSO and radiation safety technicians. All qualifications and required refresher training had been completed as specified in the license and Regulatory Guide (RG) 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As Reasonably Achievable," dated May 1983. In addition, the radiation safety technicians were shown to have full access to the RSO as required by the license.

License Condition 9.10 requires that standard operating procedures (SOPs) be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. In addition, written procedures shall be established for non-operational activities to include in-plant and environmental monitoring, bioassay analysis, and instrument calibration.

A large number of selected SOPs were reviewed and determined to contain an adequate level of detail for startup and normal operations for the systems. Up-to-date copies of the SOPs were identified in the plant, and all SOPs were reviewed by the RSO as required by License Condition 9.10. However, none of the procedures reviewed had any information on what to do if the systems were in an alarm condition. For instance, "SOP-10 Yellowcake Dryer Area Operations," included all information for normal startup and operations, but contained no information on what to do if a high temperature alarm for the oil heater was encountered, or what to do if a low vacuum alarm on the dryer shell and exhaust system was encountered during normal operations. The inspectors interviewed the manager of plant operations and determined that the dryer area operators were trained on how to respond to the different alarm conditions, although alarm response was not described in the SOPs. Nonetheless, licensee management stated further reviews of the SOPs would be conducted and additional procedures for alarm responses would be established.

c. Corrective Action Program

At the time of the inspection, the licensee was having problems with recurring wellfield spills. Since July 1999, eight spills had been identified and reported to the State of Wyoming Department of Environmental Quality and the NRC project manager. Two spills of considerable quantity (i.e., 50,000 and 25,000 gallons) in Wellfield 1 occurred within a week of each other. The licensee prepared a corrective action report that outlined actions to be completed before Wellfield 1 could be placed back in service. The issue of spill management and reporting is discussed further in Section 3 of this inspection report.

During the month of December 1999, the Rio Algom corporate staff conducted an International Standards Organization (ISO) 14000 “Environmental Management Systems,” audit of the Rio Algom Smith Ranch Project. One finding was the lack of a corrective action program at the site. During the exit meeting on January 13, 2000, the licensee management indicated that they planned to have a corrective action program and appropriate SOPs in place within 3-6 months.

2.3 Conclusions

The organizational structure and staffing levels were determined to be acceptable for the work in progress at the facility. The licensee's organization and management controls met the requirements of the license. Qualified individuals had maintained oversight of licensed activities.

3 In-Situ Leach Facilities (89001) and Environmental Monitoring (88045)

3.1 Inspection Scope

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

3.2 Observations and Finding

a. Process Plant Tour and Operations

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 the workers and members of the general public.

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 9.16. The licensee had completed construction on a new office complex. The mill and related components were operational and properly maintained. No equipment misalignments were identified, and no process flow, level, or pressure indications were found outside required parameters. Housekeeping was adequate with no loose trash or debris on the floor. The licensee dried the yellowcake product using two vacuum chamber dryers. During the site tour, the dryers were not in operation, but to limit uranium uptake in workers, housekeeping controls were in effect. Very little yellowcake product was observed on the floor of the Central Processing Plant, confirming that the licensee's in-plant contamination control program was adequate.

License Condition 10.1 states that commercial processing plant operations shall not exceed an average monthly flow rate of 6000 gallons per minute (gpm), and that the annual yellowcake production shall not exceed 2 million pounds. At the time of the site

tour, the production flow rate was 4437 gpm. The inspectors determined that the 1999 yellowcake production was below the 2 million pounds.

License Condition 10.8 provides restrictions for the control of liquid effluents. Liquid effluents were being returned to the process circuit, disposed of via deep-well disposal, or discharged to the evaporation ponds. During the site tour, no evidence of improper process fluid releases was observed. Output flow to the deep-well disposal system was 70 gpm.

License Condition 11.1 states, in part, that during wellfield operations, injection pressures shall not exceed the integrity test pressure of 100 pounds per square inch (psi) at the injection well heads. Well injection fluid pressure in the pipe exiting the Satellite Building was only 90 psi. Additionally, License Condition 11.1 states that the flow rates in each injection and recovery well, and manifold pressures on the entire system, shall be measured and recorded daily. The licensee had developed and implemented a monitoring program for measuring and recording process flow rates and pressures on a daily basis.

In summary, the licensee was noted to be operating the plant in accordance with the conditions of the license. Housekeeping was adequate, and no abnormal leakage was observed. No health or safety hazard was identified during the plant tours.

b. Management of Spills

(1) Spill Incidents in 1999

Since July 1999, the licensee has had eight spills of radioactive material in the wellfields from production and injection fluid line breaks. The volume of these releases ranged from 930 gallons to 50,000 gallons and totaled 98,330 gallons. The amount of land affected by the spills ranged from 750 ft^2 to 36,340 ft^2 (83 percent of an acre). The primary radioactive contaminants in the licensee's wellfield fluids were radium-226 and natural uranium. In injection fluid, the average radium-226 concentration was 3.3E-6 microcuries/milliliter (µCi/ml), and the average natural uranium concentration was 2.7E-6 µCi/ml. In production fluid, the average radium-226 concentration was 3.4E-6 µCi/ml, and the average natural uranium concentration was 5.3E-5 µCi/ml.

(2) Spill Reports and Regulatory Requirements

License Condition 12.6 states that until license termination, the licensee shall maintain a log of all significant solution spills. Also, the licensee is required to notify the NRC by telephone within 48 hours of the event of any spill that may have a radiological impact on the environment and follow the notification with a written report within 7 days. License Condition 9.1 requires that notifications made by the licensee pursuant to 10 CFR 20.2202 and 10 CFR 40.60 be made to the NRC's Operations Center by telephone and to the Uranium Recovery and Low-Level Waste Branch(URLLW) by written notice.

License Condition 9.3 authorizes the licensee to operate in accordance with statements and representations contained in the license application dated March 31, 1988.

Section 7.7.2 of the license application addresses pipeline failures and states the following:

> "If the volume and concentration of the solutions released in such an accident did constitute an environmental concern, the area would be surveyed and the contaminated soils would be removed and disposed of in accordance with regulations."

Maintaining spill records are also required by the decommissioning recordkeeping requirements of 10 CFR 40.36(f). Under 10 CFR 40.36(f) licensee records of spills must identify the known radionuclides, quantities, forms, and concentrations involved in the contamination event. The inspectors reviewed the latest spill records to ascertain whether the licensee reported any spills to the NRC in accordance with license requirements or other regulatory requirements. The licensee had maintained spill records for all solution spills as required by 10 CFR 40.36 and License Condition 12.6. The spill records contained information that was important to decommissioning. However, the licensee had not consistently included the specific location and amount of property impacted by the spill. The licensee had determined that the amount of radium-226 and natural uranium involved in the contamination events were less than the immediate reporting criteria found in 10 CFR 20.2202 and 10 CFR 40.60(a). However, the licensee's records did not provide the total amount of radium-226 and natural uranium activity involved in a contamination event in order to determine reporting compliance with 10 CFR 40.60(b).

The licensee determined that none of the spills were environmentally significant such that the events had to be reported to the NRC's Operation Center or URLLW pursuant to License Conditions 9.1 and 12.6. However, the licensee notified the NRC of the spill events and sent all eight spill reports to URLLW anyway. Based on the inspectors' discussions with licensee management, the following was revealed:

- A spill of environmental concern were those spills that had to be reported pursuant to License Condition 12.6 as clarified by an NRC letter dated April 8, 1998, "Guide on Reporting of "Significant" Solution Spills."

- Radium-226 was the only isotope that had to be analyzed for decontamination pursuant to 10 CFR 40, Appendix A, Criterion 6(6). This criterion allows residual radium contamination to remain in-place if the radioactivity in the top 6 inches of soil is less than 5 pCi/gm above background.

- The licensee did not usually require or establish personnel access, work, or radiological controls to the contaminated area. The licensee did not establish access control to the spill areas in excess of 24 hours pursuant to 10 CFR 40.60 (b)(2)(i).

- The licensee had not determined if the total radioactivity released during a spill event was in excess of the five times the lowest Annual Limit on Intake (ALI) for a radioisotope pursuant to 10 CFR 40.60 (b)(2)(ii).

- The licensee had not determined the concentration of natural uranium contamination in the soil at a spill area, information necessary to determine if the area would need remediation.

- The licensee did not routinely collect soil samples for determining the concentration of contamination in the soil because the licensee had developed a calculation based on soil sample analyses performed in late 1997.

Using some of the licensee's spill information, the inspectors estimated the level of natural uranium contamination that had occurred on some of the site property. The table below represents the level of environmental contamination caused by three spills. The spills included injection and production fluids and the primary contaminants were natural uranium or radium-226.

DATE	TOTAL VOLUME gallons	FLUID CONCENTRATION µCi/ml	AREA ft^2	TOTAL ACTIVITY µCi
07/21/99	15,300	3.97E-5 Unat	2,600	2,298 Unat
11/28/99	1,500	1.00E-5 Unat	850	575 Unat
12/04/99	50,000	4.06E-6 Unat	36,340	768 Unat

(3) Spill Remedial and Corrective Actions

The inspectors reviewed the licensee's remedial actions in response to the spills and the corrective actions taken to reduce the likelihood of future spills. The July 21, 1999, and November 28, 1999, spill reports stated that there was minimal impact to the environment, as the fluid was absorbed into the soil and did not effect a large area. However, the inspectors' review of the information in these spill reports revealed that the contamination may have been significant. The amount of uranium in production fluid and the potential residual contamination remaining in the soil may require future remediation during decommissioning of the site.

The December 4 and 11, 1999, spills contaminated 20,100 ft^2 and 36,340 ft^2 of land in the same vicinity with 25,000 and 50,000 gallons of injection fluid, respectively. Both spill reports stated that areas adversely affected by the spills would be seeded. Also, erosion control structures would be constructed, and affected soil would be contoured. On January 13, 2000, the licensee issued a report on the investigation of the two larger spills. The spills occurred at Wellfield 1, Header house 1-2 on December 4 and 11, 1999. According to the licensee's investigation, both spills occurred because the wellfield supervisor used aluminum connections on hoses instead of brass connections. The licensee had failed to identify all the aluminum connections to be replaced. After the second event, the licensee decided to shutdown Wellfield 1 operations, inspect all

hose connections, and replace all hose connections with polyvinyl chloride (PVC) piping. The report stated that the second event resulted in heavy damage to the injection header. After the second spill, the licensee determined that there was a major problem in the design of Wellfield 1 header house. The licensee determined that Wellfield 1 needed to be shut down and not restarted until all header houses had been modified to prevent further occurrences of spills in Wellfield 1. Header house 1-2 was not placed back into operation until January 2000, after work crews installed PVC piping. The licensee's investigation and corrective actions for repairing Header house 1-2 were adequate. However, the licensee's investigation did not adequately address the radiological impact to the environment from the two spills. The inspectors estimated that the two spills resulted in the release of 1,113 µCi of natural uranium and 935 µCi of Ra-226. The spill records required by 10 CFR 40.36(f) will be assessed by the NRC to determine whether soil remediation will be required prior to license termination.

(4) Spill Standard Operating Procedures and Radiation Work Permits

The inspectors reviewed the following SOPs:

- 33.5 Maintenance
- 39.2 Breaking Lines
- 49 Emergency Response Procedures
- 51 Byproduct Material Handling
- 210 Cutting and Gluing PVC Pipe
- 214 Digging in the Wellfield

When responding to the spills that occurred from July through December 1999, the licensee used portions of the above listed SOPs. The only SOP that mentioned recovering from a spill was found in the emergency response procedure SOP 49. Section 3.3 of SOP 49 stated, in part, that the first responder should contain the spill if it can be done without safety risk to the personnel. The inspectors determined the licensee did not have a SOP that specifically addressed wellfield solution spill response and reportabilty determinations. The inspectors also determined that the licensee did not use RWPs or any other formal work controls when responding to a spill. The inspectors found that none of the licensee's SOPs addressed details that would assure compliance with 10 CFR 40.36(f) and 40.60 and License Conditions 9.1, 9.3 and 12.6. The inspectors noted that the quantity of radium-226 and natural uranium spilled would have been reportable to the NRC under the 24-hour reporting criteria of 10 CFR 40.60 (b) if the licensee had established access control to the contaminated areas for at least 24 hours. The inspectors determined that the licensee had not established access controls in response to the eight spills that occurred since July 1999.

License Condition 9.10 states, in part, that written SOPs shall be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. In addition, written procedures shall be established for non-operational activities to include in-plant and environmental monitoring. License Condition 10.12 states, in part, that for work where the potential for exposure to radioactive material exists and no SOP exists, a RWP shall be required.

From July through December 1999, eight spill events occurred onsite that involved 98,330 gallons of production or injection liquids containing low levels of radioactive material. Without an SOP or RWP, workers repaired equipment; processed, stored, and transported radioactive material; and conducted environmental monitoring during all spill recovery operations.

The licensee's failure to establish SOPs or RWPs for responding to radioactive material spills, controlling worker exposures from the spills during recovery operations, and conducting radiological surveys for assessing environmental impact was identified as a violation of License Conditions 9.10 and 10.12 (40-8964/0001-01). Based on the inspectors' findings, the licensee stated that SOPs would be established to incorporate steps to assure compliance with the intent of the license and regulations.

c. Control of Evaporation Ponds

License Condition 11.2 states that the licensee shall perform and document daily visual inspections of the evaporation pond embankments, fences, and liners, as well as measurements of pond freeboard and checks of the leak detection system. During the site tours, the licensee's two evaporation ponds were inspected. All pond liners, fences, and embankments were in good condition. Some minor surface erosion was noted around the pond embankments, but the erosion was only superficial. Also, the two leak detection system sumps were dry, indicating the ponds were not leaking. The observed pond levels were below the freeboard limits. During a review of the pond inspection records, the inspectors determined that the two ponds had not exceeded the freeboard limits.

3.3 Conclusions

Routine site activities have been conducted in accordance with applicable license and regulatory requirements. Plant process parameters were within the licensed limits, site fences were in good condition, and perimeter postings were appropriate. No health or safety concern was identified during the plant tour.

A review of the spill management program revealed that when the licensee recovered from contamination events during the period July through December 1999, no SOPs or RWPs were used during work activities involving radioactive material. This was identified as a violation of License Conditions 9.10 and 10.12.

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. Surface Contamination Control

License Condition 11.9 stipulates that the licensee shall perform monthly alpha contamination surveys of the facility laboratory and offices, and weekly surveys of eating areas and change rooms. The licensee had performed the weekly and monthly surveys on a routine basis during this inspection interval. In summary, all required sample results were obtained by the licensee, and the sample results were below the respective license and action level limits.

License Condition 10.16 specifies that eating shall be allowed only in administrative offices and enclosed lunch areas that are separated from the process areas. During the site tour, no individual was observed to be in noncompliance with this license condition. However, the lunchroom is inside the restricted area, and the only survey meter is at the exit of the restricted area. This means an individual would have to survey at the exit of the restricted area, then re-enter the area to get to the lunchroom. Although this is a potential for personal uranium contamination, no surveys or bioassays have shown a performance problem. The inspectors concluded that the licensee maintained positive control over surface contamination in the Central Processing Plant and site facilities.

b. Monitoring of Employees for Surface Contamination

License Condition 10.17 states that process workers shall 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 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. The licensee maintained an extensive number of log entries in this program area. A thorough check of the licensee's records indicated 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 release limit. During this inspection interval, the licensee had performed quarterly checks on most site personnel. The inspectors concluded that site workers were adequately decontaminating and scanning themselves prior to exiting the restricted area, because no contamination was found on personnel.

c. Release of Equipment for Unrestricted Use

In accordance with License Condition 9.9, 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." The licensee's equipment release records completed during this inspection interval were reviewed. The licensee maintained detailed records of equipment released from the site. No items had been released with contamination in excess of the fixed surface and removable contamination limits of 15,000 and 1000 dpm/100 cm^2, respectively.

d. Routine Ambient Gamma Surveys

License Condition 11.8 states that the licensee shall perform quarterly gamma radiation surveys in enclosed areas at the locations specified in the license application. In addition, the licensee shall 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.

During the site tour on January 13, 2000, ambient radiation levels were measured by inspectors using an NRC microRoentgen meter (serial number 33537). Readings taken within the central plant measured 200 microRoentgen per hour (µR/hr) at the ion exchange columns, 10 µR/hr in the control room, and 15 µR/hr in the laboratory. Wellfield header house 4-1 measured 100µR/hr and header house 1-5 measured 50 µR/hr. The administrative offices measured 20 µR/hr.

The inspectors' review of records revealed that the licensee had performed the routine surveys and spot checks as specified by the license. The inspectors did not identify any unexpected radiation levels.

e. Licensee Site Inspections

License Condition 11.6 states that during commercial production, the RSO, the radiation safety technician, or a trained designee shall perform and document a daily walk-through inspection of all operating areas. The purpose of the inspection is to ensure that all radiation protection and monitoring requirements are being followed. A review of records confirmed these walk-through inspections were being performed documented on a daily basis by both the radiation protection and operations personnel. Problem areas for followup such as visible yellowcake material and housekeeping concerns were adequately documented.

f. Airborne Natural Uranium and Radon Progeny Surveys

License Condition 11.7 states that the licensee shall perform monthly surveys for natural uranium and radon progeny, and the licensee shall conduct spot surveys to confirm the adequacy of the yellowcake and radon progeny monitoring plan.

Airborne natural uranium sample results were reviewed, and one sample result was in excess of the Derived Air Concentration (DAC) value. This sample was contaminated with uranium that was collected during yellowcake handling operations. No other routine sample results exceeded any DAC value.

In accordance with the license application, the licensee is required to sample for radon progeny at nine locations in the central processing plant and at five locations in the pilot plant. The licensee's radon progeny sampling records for this inspection interval were reviewed. All required monthly samples were obtained, and the licensee routinely performed spot checks to confirm the adequacy of the sampling program. Fifteen samples this inspection interval were above the license condition limit of 0.08 working levels, but the licensee completed the required investigations and corrective actions, as

well as the required additional samples. The inspectors concluded that the licensee had effectively sampled for radon progeny and appropriately mitigated radon levels in the affected areas.

g. Respiratory Protection

The licensee's respiratory protection program was reviewed during the inspection. The licensee had established a program which included a written policy statement, training, and issuance of positive and negative pressure respirators. During the site tour, the licensee's respirator checkout log and respirators were reviewed.

The licensee's training program requirements were reviewed. The licensee provided annual respiratory protection training which included respirator function and fit checks. Physical examinations, including spirometer tests and physician evaluations, were conducted annually on all personnel. Individuals had their own dedicated masks, and each mask was inspected at least quarterly by the RSO or his representative.

In summary, the licensee had implemented a respiratory protection program that met the intent of 10 CFR 20.1703, "Use of Respiratory Protection Equipment."

h. Bioassay Program Review

The bioassay program was reviewed to determine compliance with License Condition 12.10. 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. Analyses were conducted by a local laboratory, and blank and spike samples were routinely included as quality control. All process operators and laboratory personnel were sampled on a monthly basis, while personnel involved in dryer operations were sampled weekly. Six samples exceeded the lowest action level of 15 ug/l since August 1999. The individuals involved were all dryer operators, and were counseled on proper use of respirators as well as proper radiological hygiene. The next higher action level was not exceeded in these cases.

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license. The licensee had positive oversight over the personal contamination control program because no person or item had been identified with contamination above the respective action limits either inside or outside of the restricted area.

A review of the licensee's ambient gamma survey, natural uranium, and radon progeny sampling programs showed all surveys had been performed by the licensee at the required frequencies, and that there were no radiation areas in the plant. The bioassay program was reviewed and found acceptable.

5 Followup (92701)

(Closed) IFI 40-8964/9901-02: SOPs for yellowcake dryer emergency shutdowns.

The licensee's SOP for yellowcake dryer emergency shutdowns and operations was not consistent with License Condition 10.3. A license amendment request was needed to close this matter.

During the previous inspection, licensee management explained that the yellowcake dryer was a later model and the language in License Condition 10 and the license application was not changed to reflect present operations. The licensee submitted a license amendment request to the NRC on May 20, 1999, with the appropriate safety evaluation information and the manufacturer's recommended operating parameters. Licensee Amendment 14 was approved and issued on July 8, 1999. The NRC agreed with the licensee that immediate shutdowns were not an appropriate shutdown measure and that License Condition 10 had to be amended to reflect a safer operational state.

During the inspection, the inspector and the manager of radiation safety, regulatory compliance and licensing found that there had been a mistake made in the license amendment submittal. The operating parameters for the vacuum dryer of 15-20 inches of mercury had been established by Rio Algom Mining Corporation's engineers in consultation with the manufacturer and other vacuum dryer operators. The manufacturer's test on the vessel was to 98 psi hydrostatic pressure and 450°F maximum temperature. The licensee indicated that a letter would be sent to the NRC correcting the statement that dryer operating parameters had been established by the manufacturer. Additionally, the licensee sent a letter dated January 24, 2000, confirming the above information and correcting the error. The licensee also committed to install a third vacuum pump by June 2000 that could be used on either vacuum dryers A or B, and maintain a vacuum in case of an vacuum pump failure. With the license amendment 14, corrected information, and commitment of a third vacuum pump this item is considered closed.

(Closed) IFI 40-8964/9901-02: Adequacy of the licensee's corrective actions to prevent contaminated bioassay samples.

During the review of the licensee's 1998 Annual ALARA Review, the inspector noted that three workers had bioassay results that measured 115 µg/l, 136 µg/l, and 168 µg/l. License Condition 12.10(b) required the licensee to investigate and take corrective actions on all bioassay results that were in excess of 15 ug/l in accordance with RG 8.22. According to the licensee's 1998 ALARA Review, some bioassay samples were inadvertently contaminated by workers poorly handling their samples. Corrective actions included Annual Refresher Training, which reiterated proper hand washing, sampling with bioassay kits, use of Racal visor, and decontamination.

The 1999 ALARA Review was not completed at the time of the inspection; however, bioassay data was available from the draft 1999 ALARA report. The inspectors reviewed four workers' bioassay results that measured 22 µg/l, 16.0 µg/l , 19 µg/l and 28.0 µg/l. Based upon this review, inspectors determined that the licensee's corrective actions were effective in preventing contaminated bioassay samples as reported in the 1998 ALARA review.

6 Exit Meeting Summary

The inspector presented the inspection results to the representatives of the licensee at the conclusion of the inspection on January 13, 2000, Licensee representatives acknowledged the findings as presented. The licensee identified that annual yellowcake production rate figures presented to the inspector for review were proprietary. Consequently, the inspector did not remove the proprietary information from the site, and the information was not incorporated into the NRC report.

ATTACHMENT 1

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

Opened

40-8964/0001-01	VIO	The license failed to use SOPs and RWPs during remedial actions associated with recovering from eight spill events that occurred from July to December 1999.

Closed

40-8964/9901-01	IFI	Licensee's SOP for yellowcake dryer emergency shutdowns and operations is not consistent with License Condition 10.3. A licensee amendment request is needed to close this matter.
40-8964/9901-02	IFI	Adequacy of the licensee's corrective actions to prevent contaminated bioassay samples.

Discussed

None

INSPECTION PROCEDURES USED

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

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ALI	Annual Limit on Intake
CFR	Code of Federal Regulations
DAC	Derived Air Concentration
dpm/100 cm^2	disintegrations per minute per 100 square centimeters
gpm	gallons per minute
ISO	International Standards Organization
µCi/ml	microcuries/milliliter
µg/l	micrograms/liter
µR/hr	microRoentgen per hour
pCi/l	picocuries per liter
PDR	Public Document Room
psi	pounds per square inch
RG	Regulatory Guide
RSO	Radiation Safety Officer
SOP	Standard Operating Procedure
URLLW	Uranium Recovery and Low-Level Waste Branch