#### U. S. NUCLEAR REGULATORY COMMISSION

## REGION IV

#### URANIUM RECOVERY FIELD OFFICE

NRC Inspection Report: 40-8084/89-01

License: SUA-1119

Docket: 40-8084

Licensee: Rio Algom Mining Corporation ATTN: R.S. Pattison, Manager La Sal Route Moab, Utah 84532

Facility: Lisbon Uranium Mill

Inspection At: San Juan County, Utah

Inspection Conducted: April 24-26, 1989

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Inspectors:

S.R. Grace, Project Manager Team Leader

Scovill, Project Manager

Date

May 25, 1989

Date

Approved By:

Fedward F. Hawkins, Branch Chief Uranium Recovery Field Office Region IV

Inspection Summary

Inspection Conducted on April 24-25, 1989 (Report 40-8084/89-01)

Areas Inspected: Routine unannounced inspection of uranium milling operations and radiation safety program including. Management Organization and Controls/Operations Review; Operator Training and Retraining; Maintenance, Surveillance and Testing; Radiation Protection; Radioactive Waste Management; Transportation; and Emergency Preparedness.

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The inspection involved a total of 40 inspector hours on site by two NRC inspectors.

8905310368 890526 REG4 LIC40 SUA-1119 PDF PDR Results: Within the seven areas inspected, five apparent violations were identified. The apparent violations are as follows:

(1) failure to review and approve the written standard operating procedure for minimizing blowing tailings; (2) failure to maintain 11 feet of freeboard in the lower tailing pond since May 1, 1989; (3) failure to read and record water levels in the lower tailings pond weekly; (4) failure to provide appropriate vehicle placarding during transport; and (5) failure to calibrate radiation survey instruments semiannually.

While several violations of NRC requirements appear to have occurred since the previous inspection, most occurred during the shut down phase in December 1988 and January 1989. The licensee has generally maintained a strong health and safety program in the past and remains committed to a strong health and safety program.

### DETAILS

## 1. Persons Contacted

\*Robert Pattison, Manager \*B.K. Reveau, Radiation Safety Officer \*Frank Fossey, Assistant Radiation Safety Coordinator \*John Chacon, Laboratory Technician

\*Denotes those present at the exist interview.

## 2. Management, Organization and Controls/Operations Review

The licensee described the organizational structure and specifically, the organization of the radiation safety staff. The Radiation Safety Officer (RSO) now reports directly to the Manager, who has overall responsibility for all activities onsite. The inspectors determined that the organizational structure and qualifications of personnel with responsibility to implement the radiation safety program were in accordance with guidance provided in Regulatory Guide 8.31.

The Lisbon Mill has been shut down since January 1989. All operations within the mill are currently conducted under a Radiation Work Permit (RWP). The mill work force currently consists of 18 salaried technical personnel and maintenance personnel.

Required inspections and audits performed by the radiation safety staff were reviewed by the inspectors and determined to be in order. Daily inspections of all mill areas have been performed by a member of the radiation safety staff as required by the license. The routine monthly reports by the RSO, documenting the status of radiation safety programs and trends in exposure and other data, were performed as required. The routine monthly reports were reviewed and initialed by the Manager. The inspectors determined that the frequency and content of the semiannual ALARA audits were appropriate.

The inspectors reviewed the RWPs issued since the last inspection. The review documented the involvement of the radiation safety staff and mill management in implementation of the safeguards required by the permits. All work activities requiring an RWP were continuously monitored by a member of the radiation safety staff. RWP records maintained by the licensee included a record of the respirator fit test performed prior to the initiation of work and the calculated exposure. The records were well maintained and represented an acceptable RWP program.

The inspectors reviewed the Standard Operating Procedures (SOPs) established for mill operations and determined that, with the exception of the windblown tailings SOP they had been reviewed and approved by the RSO within the past year. The inspectors noted that the licensee's written program to minimize dispersal of blowing tailings, required by License Condition No. 32, had not been reviewed and approved annually as required

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by License Condition No. 33. This is an apparent violation of License Condition No. 33. (40-8084/8901-04) It was also determined that each mill operator had received a personal copy of the mill procedures related to his job and that procedures were available to the worker within his assigned work area.

One apparent violation was identified by the NRC inspectors.

## 3. Operator Training and Retraining

In lieu of annual refresher training, employees received 1 hour of safety training monthly. The inspectors concluded that the frequency and content of the safety meetings/refresher training was acceptable.

As stated in the License Condition No. 11, referencing Section 5.2 of the licensees November 1985 renewal application (Page 5-11), the RSO is encouraged to attend refresher training every two years. Contrary to this, the RSO has not received refresher training since September 1981. Because of the word "encouraged", the inspector recommended retraining of the RSO as soon as possible.

No apparent violations or deviations were identified by the NRC inspectors.

## 4. Maintenance/Surveillance Testing

Access to the restricted area in which the mill processing area is located is controlled by the perimeter fence. All traffic to the mill site is guided to the main mill office where visitors and contractors are required to check in prior to mill entry. The NRC inspectors examined the perimeter fences and noted that they were in good repair and appropriately posted.

Preventive maintenance measures were observed at the time of the inspection. The mill process building was in good repair and all entrances to the building were locked and posted.

The inspectors examined the condition of storage areas. There was a significant reduction of scrap within the facility grounds, and that which was there had been arranged neatly. Filled yellowcake barrels were stored within a fenced and locked storage area within the restricted area, providing security for the product. The inspectors observed that all the pallets on which the product barrels were set were in good repair and none of the stacked barrels were leaning in an apparently unsafe manner, as noted in the previous inspection.

No apparent violations or deviations were identified by the NRC inspectors.

## 5. Radiation Protection

## a. Air Sampling

The NRC inspectors reviewed the licensee's program for in-plant air sampling prior to shutdown. This program determined the airborne natural uranium concentrations to which employees are exposed. The routine program consisted of low volume general air samples taken on a weekly basis from 10 locations in the "soluble" uranium areas and on a monthly basis from 18 "insoluble" uranium areas. Routine breathing zone samples had been obtained daily for dryer operators. In addition, nonroutine breathing zone samples had been obtained during work covered by radiation work permits. All air samples had been analyzed fluorometrically. For determination of radon working levels, the licensee had obtained low volume air samples quarterly at 11 mill locations and had analyzed the samples using the modified Kusnetz method. Routine in-plant sampling has been discontinued during shutdown.

The NRC inspectors reviewed the records of air sampling results since the last inspection, and noted that the sampling and analysis had been performed at the proper frequencies. The only area which occasionally exceeded 25 percent of MPC was the yellowcake packaging enclosure. All radon daughter concentrations were less than 10 percent of MPC.

Low volume air sampler calibrations had been performed every 2 months against a dry test meter standard at four flow rates. Routine sampling flow rate was 25 liters/minute. Breathing zone samplers had been calibrated at the same frequency using a 1 liter bubble tube. The NRC inspectors reviewed the procedures for performing air sampler calibrations and the records of calibrations. The procedures and records of calibration were noted to be adequate.

## b. Exposure Determination

Internal exposures had been derived by the licensee for weekly yellowcake and quarterly ore dust exposures as required by 10 CFR 20.103. Results were expressed in  $\mu$ Ci-hrs/ml and percent MPC. The NRC inspectors reviewed records of internal exposures since the last inspection. All calculated exposures to yellowcake and ore dust were noted to be less than 25 percent of the maximum permissible exposure.

#### c. Respiratory Protection

The NRC inspectors reviewed the licensee's use of respiratory protection equipment during routine and nonroutine work. The license renewal application committed the licensee to a respiratory

protection program which is in keeping with the guidance contained in Regulatory Guide 8.15, "Acceptable Program for Respiratory Protection," which allows for the use of protection factors (PFs). The licensee has implemented a documented program for the issuance, maintenance, cleaning, and survey of all respiratory protective equipment used at the mill site.

Full-face respirators are required for routine work in the packaging enclosure and the dryer area. Maintenance or special work within specified areas of the mill, such as the dryer or within the packaging room, are performed under a RWP and require the use of an airline respirator. Fit testing was performed prior to all required respirator usage.

The NRC inspectors reviewed the records associated with respiratory protection training. Training had been conducted in-house and was found to be adequate. Documentation of fit testing was also reviewed and found to be adequate.

### d. Bioassay

The licensee had conducted a bioassay program consisting of routine urine samples obtained every two weeks for the dryer and precipitation operators and monthly for other mill workers. Baseline data was available for all personnel, including newly hired employees. Nonroutine samples had been obtained during work covered by RWPs. Action levels of 15  $\mu$ g/l and 30  $\mu$ g/l had been established by the licensee.

Two urine samples from one individual exceeded the 15  $\mu$ g/l action level. The initial results indicated uranium in urine concentrations of 196  $\mu$ g/l and 25  $\mu$ g/l. These samples showed 7.5  $\mu$ g/l and 6  $\mu$ g/l after extraction, which were verified by an independent lab. The high values are believed to be due to an organic interference because of the lack of proper preservation. Steps have been taken to avoid this problem in the future. The Nuclear Regulatory Commission was notified of this problem by telephone at the time of the incident, and a written report was submitted on October 20, 1988.

No other urine sample exceeded the first action level of 15 µg/l.

#### e. External Exposure Control

Determination of external radiation exposure is made through thermoluminescent dosimeters (TLDs) issued to all mill workers, including radiation safety and management personnel. The TLD badges are kept in a badge rack within the change room and are exchanged quarterly. A control badge which is also kept in the badge rack is submitted to the vendor for analysis at the same frequency as the employee badges. The inspectors determined that the external radiation exposure results were provided in a timely fashion. Licensee representatives indicated that high external exposure levels on any given badge or badges would be telephonically reported within 10 days of receipt of the shipment by the vendor. The highest quarterly exposure reported since the previous inspection was 450 mrem penetrating exposure.

Beta-gamma surveys were performed at 25 locations throughout the mill on an annual basis. The inspectors reviewed records of surveys and determined that the only area which regularly exceeds 0.5 mR/hr is the yellowcake storage buildings, which were posted as a "Radiation Area". The inspectors also reviewed records of calibration of instruments used to conduct these surveys. A review of the calibration records indicated that two instruments used to conduct radiation surveys had not been calibrated since early to mid 1988. License Condition No. 11 requires that instruments utilized to conduct radiation surveys be calibrated semiannually. This was identified as an apparent violation of License Condition No. 11. (40-8084/8901-05)

## f. Contamination Control

The NRC inspectors reviewed the records of monthly surveys for fixed and removable alpha contamination. The licensee had used a portable air proportional instrument for conducting the surveys. The contamination levels identified in the contamination surveys were less than the limit for removable contamination listed in Table 5.5-4 of the license application, which corresponds to Regulatory Guide 8.30 limit.

The NRC inspectors reviewed survey records of equipment released for unrestricted use. Contamination action levels were 1000 dpm/100 cm<sup>2</sup> removable and 5000 dpm/100 cm<sup>2</sup> total. The licensee's records were in accordance with license requirements and were determined to be complete.

#### g. Personnel Contamination Control

Contamination of personnel within the mill site has been mostly controlled with the utilization of protective clothing. The apparel is laundered onsite. Yellowcake workers are required to shower and monitor prior to leaving the mill, while self-monitoring only is required for all other workers. The NRC inspectors observed that a calibrated, operational alpha scintillation meter was available outside the change room for mill personnel to monitor themselves 8

prior to departing the main mill building. The inspectors determined that exit survey records demonstrates that workers surveyed as required by the license. Quarterly spot surveys by RSO staff as required by license condition were performed and documented.

One apparent violation was identified by the NRC inspectors.

#### 6. Radioactive Waste Management

The inspectors toured the tailings retention system during the inspection and noted that the tailings dams showed no signs of erosion and were generally in good repair. The inspectors noted that the water level in Bisco Lake was being lowered and the upper tailings impoundment had no standing surface water. Interim cover placement was observed on the upper impoundment and was approximately 40 to 60 percent completed.

During the inspection, blowing material from the tailings impoundments was observed. This material was primarily the raffinate (carbonate) crust from on top of the tailings. Blowing material was primarily due to the relocation of the sprinkler system from the upper pond to the lower pond. The licensee ceased sprinkling in the upper pond to facilitate placement of the interim cover. The newly configured sprinkler system was expected to be operational by the end of April.

Daily freeboard measurements were taken up to January 25, 1989 when the mill shut down. Thereafter, only irregular measurements were taken. This is an apparent violation of License Condition No. 45(C), which requires weekly readings when the ponds are not receiving wastes. The site records showed only one measurement of freeboard (8.8 feet) between January 25, 1989 and the beginning of the inspection. Minimum required freeboard during this period was 8.5 feet. Freeboard on the last day of the inspection was 9.4 feet (April 26, 1989). (40-8084/8901-03)

After April 30, 1989, minimum freeboard was required to be 11 feet. The inspectors informed the licensee that they were approaching the new freeboard requirement. On May 1, 1989, the licensee was called and reported the freeboard as 9.5 feet. This is an apparent violation of License Condition No. 45. (40-8084/8901-02)

License Condition No. 45 requires that a certain freeboard be maintained in the tailings ponds. The inspectors noted that the daily inspection forms recorded only the water level elevation of the pond levels. On these forms, there was no reference to freeboard and what elevation constituted the minimum freeboard or action level. The inspectors suggested that the inspection form show the actual elevation of the minimum freeboard and/or an action level so that field dam inspectors can note and take corrective actions when approaching minimum freeboard.

Two violations were identified by the NRC inspectors.

## 7. Transportation of Radioactive Materials

Shipping papers prepared for shipment of yellowcake include a bill of lading, survey results, and a receipt log. Each 55-gallon barrel shipped has a sequential number, LSA designation, and gross weight painted on the exterior. All barrels are surveyed for removable surface contamination and total gamma. On January 3, 1989, one yellowcake shipment was made by Rio Algom in an exclusive use vehicle. A review of the records indicated that a "Radioactive" placard was not placed on the rear of the vehicle prior to release. This is an apparent violation of 10 CFR 71.5. This apparent violation occurred as a result of licensee's erroneous belief that the shipper was responsible for all vehicle placarding. (40-8084/8901-01)

One apparent violation was identified by the NRC inspectors.

## 8. Environmental Protection

The inspectors also reviewed all available environmental monitoring data compiled since the previous inspection. The licensee's records indicated that airborne concentrations of uranium-natural, thorium-230, radium-226, and lead-210 were all less than two percent of MPC (subtracting background), and concentrations of radon-222 were less than 20 percent of MPC (subtracting background). High volume air samplers are run continuously, and filters are changed weekly and composited for quarterly analysis. Routine sample flow rate was approximately 55 liters/minute. Analysis for U-nat was performed fluorometrically, thorium-230 and lead-210 was analyzed through chemical separation, and radon-222 was analyzed using a modified Kusnetz method.

High volume air sampler calibrations have been performed quarterly against a dry test meter standard of four flow rates. The dry test meter was calibrated annually.

Direct radiation measurements are made usion TLDs. The TLDs are analyzed quarterly by a commercial vendor. Direct radiation records were reviewed by the inspectors and the results indicate no significant exposure rates above background.

No apparent violations or deviations were identified by the NRC inspectors.

#### 9. Emergency Preparedness

The licensee's emergency response procedures and the May 17, 1988 underwriters' inspection report were reviewed by the inspectors and determined to be adequate. The underwriters' performed an inspection and identified no significant deficiencies. An ambulance is located onsite for emergencies. No apparent violations or deviations were identified by the NRC inspectors.

# 10. Exit Interview

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The NRC inspectors met with licensee representatives at the conclusion of the inspection on April 26, 1989. The inspectors summarized the purpose, scope, and findings of the inspection.

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NRC FORM 786 A (11.61)	DOCKET NO. (8 digits) OR LICENSE NO. (8Y PRODUCT) (13 digits)	REPORT	MODULE NUMBER	1923
INSPECTOR'S REPORT	0408084	8901 A	VIOLATION BEVERITY OF DEVL	ATION BITE
(Continuation)		B	1 2 3 4 5 6	
Office of Inspection and Enforcement		0		-je of
VIOLATION OR DEVIATION (Enter up to \$400 characters for each 1	Nom. If the loxi exceeds this number, it will be necessary t	to peraphrase. Limit lines	s to 50 characters each.)	
2. Title 10 Code of Fode				
a lice deliver any li	al Regulations, Part 71.5(	a) requires	that no	
. complying with the appl	icable requirements of the	regulation	s appropriate	
5. 49 CFR Parts 170-189	tation of the Department o	f Transport	ation in	
6. transport vehicle be pla	acarded on each side and e	able 1, req	urres that the	
7. Contrary to the				
<ul> <li>vellowcake was released</li> </ul>	by the licensee on January	use vehicle	containing "Padioactive"	
s. placard was provided for	r the rear of the vehicle.	, and no	Rautuactive	
10. This is a Sevenity Lough	I IV violation (Sumlar	nt 1/1/40 000	04 (0007 07)	
11.	i iv violacion. (Suppremen	nt v)(40-808	54/8901-01)	
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NPC FORM 706 A (11.61)	DOCKET NO. (8 digita) ( NO. (8Y PRODUCT)	TA LACENSE	REPORT	GRIRIDIZIC	State State
	0468084	TITT	8901 A	VIOLATION BEVERITY OF DEVIATION	AITE
(Continuation)	27 2 0 - 01		B	1 2 3 4 5 6	RELATE
Office of Inspection and Enforcement			c		. 8 0
VIOLATION OR DEVIATION (Enter up to 2400 characters for such I	nom. If the text exceeds this number	R will be nocessary I	perephrase. Limit lin	es to 50 characters each.)	Binnen Gen
1.					B and all any raises
2 License Condition No.	45 requires a mi	nimum of e	eleven feet	t of freeboard -	
3 for the lower tailings	s impoundment aft	er April :	30, 1989.	_	
4.			stad talant	bonically that -	
6. Contrary to this requi	irement, the lice	feet.	ried terepi	nonically chac	
6. the treeboard on May .	1, 1909, 405 5.5	10001			
7. This is a Severity Lev	vel IV violation.	(Supple	ment VI)(40	0-8084/8901-02) -	
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4		Supplement I
NRC FORM 705 A (11-01)	DOCKET NO. (8 digits) OR LICENSE NO. (6Y PRODUCT) (13 digits)	REPORT MODULE NÚMBER
INSPECTOR'S REPORT	0408084	901 A VIOLATION BEVERITY OR DEVIATION B
(Continuation)		<u>5</u> 1 2 3 4 5 6
Office of Inspection and Enforcement		
VIOLATION OR DEVIATION (Enter up to 2400 characters for each I 1. 1	Nom. If the tax's exceede this number, it will be necessary to	peraphrase. Limit lines to 50 characters each.)
2		-le is the leven cond
License Condition No. 4	ded weekly unless the pone	is are receiving tailings
in which case water lev	els will be read and record	ded daily.
5. 0. 4. 444.	the linearer did not word .	and necound water lovels
in the lower pond week	v since cessation of tailis	ngs deposition and mill
shutdown on January 25,	1989.	
8. This is a Soverity Leve	I IV Violation (Supplement	nt VI)(40-8084/8901-03)
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MRC	FORM 708 A	T	000	KETN	10. (8 d	ligital	ORL	CENS	E	T		RE	POR	r	MO	DULE	NUM	BER	5		3.999	1.10
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	INSPECTOR'S REPORT	04	p	80	1819	4	++	-	+	1 13	2	210	4	B	-TT	T	T	EPET		.D.	Nor L	RELAT
0	(Continuation)	H		-		+	$^{++}$	+	+		+	+	t	C	++	2 3	V	5	6	Г	1 H	. 80
						1		1	I	11.	I	1	1	0	]		1	21		1.		7
1. 1	LATION OR DEVIATION (Enter up to 2400 characters for each M	orn. # tro	boxtox		s erris m	umbe	er, it we	W Die n	10041	LARITY BO	o par	sphra	186. (	.kmit kini	## #0 5K	1 chai	actors	0.00	:h.)			
2																						
3.	License Condition No. 33	req	luir	es	the	R	SO	to	pe	erfo	ori	n é	a c	locu	nen	tec	re	ev	iew			
	of all existing operating	ig pr	oce	aut	es	di	. 16	as	L	annu	ua	ity										
5	Contrary to the above, th	e wr	itt	en	ope	ra	tin	gp	oro	ced	iur	`e	fo	r ir	iter	im						
		atio	n o	fb	low	in	g t	ail	lin	igs	re	qu	ir	ed b	y l	ic	ens	e				
	established on October 19	Deel	n ri 84	evi	ewe	dI	by	the	R	150	51	nc	e	Itw	as	or	191	na	113	/		
		, 10,																				
	This is a Severity Level	IV v	iola	ati	on.	1	(Su	pp1	em	ent	V	(I)	(4	0-80	84/	89	01-	04	)			
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U.S. NUCLEAR REGULATORY COMMISSION

8/ FORM 200 A		REPORT	MODULE NUMBER
NG PORM 200 A 1-811 MC 0536	DOCKET NO. (6 digits) OR LICENSE NO. (6Y PRODUCT) (13 digits)	NO. SEQ.	51813181271
INSPECTOR'S REPORT	0408084	890/ *	VIOLATION SEVERITY OR DEVIATION SIT
(Continuation) Office of Inspection and Enforcement		C	
		D	
VIOLATION OR DEVIATION (Enser up to 2400 characters for each New	n. If the lost exceeds this number, it will be necessary	y to persprictate. Limit when	rec 50 characters each.)
License Condition No. 11	l requires that radiatio	n survey ins	truments, used
to conduct health and sa	afety surveys, be calibr	ated at leas	t semiannually
Contrary to this require	ement, as of April 26, 1	989, two rad	iation survey
instruments utilized to	conduct health and safe	ty surveys h	ad not been
	oo, a period in excess o	T SIX months	·
This is a Severity Level	I IV violation. (Supple	ment VI)(40-	8084/8901-05)
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