

Rio Algom

Rio Tinto

PLEASE REPLY TO Moab, Utah OFFICE

September 7, 1976

Mr. E. Morris Howard, Director
Region IV
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76012

Re: License No. SUA-1119
Docket No. 40-8084

Dear Sir:

This will acknowledge your letter of August 24th regarding the inspection made by Mr. J. B. Baird at our property on August 4 and 5, 1976.

The items listed in the enclosure to your letter are dealt with individually as follows:

1. An individual's badge did show that he received a whole body dose of 1.45 rems during the period January 1 through March 31, 1976.

There was no indication that he, at any time during that period, was exposed to counts that would account for that reading. We did not notice that his badge showed this anomaly when we received the results from the sampling agency as we were in the process of training a new technician when the results were received.

An investigation into this high reading showed that the man, an operator, had not been hanging his badge on the board during off hours, but had left it in his locker with his dirty clothes. His badge was, therefore, exposed to contaminated air for nearly four times the time that he was exposed to contaminated air.

In addition, Section 10 CFR 20.101(b) also permits an individual in a restricted area to receive a dose to the whole body greater than that permitted in 10 CFR 20.101(a) provided that section (1), (2) and (3) of paragraph (b) are met.

- i. "During any quarter the dose to the whole body from radioactive material and other sources of radiation in the licensee's possession shall not exceed 3 rems;
- ii. The dose to the whole body, when added to the accumulated occupational dose to the whole body shall not exceed 5 (N-18) rems where 'N' equals the individual's age in years at his last birthday, and

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- iii. The licensee has determined the individual's accumulated occupational dose to the whole body on Form AEC-4, or on a clear legible record containing all the information required in that form; and has otherwise complied with the requirements of Section 20.102. As used in paragraph (b), "Dose to the whole body" shall be deemed to include any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye."

On this basis, the individual's allowable lifetime exposure was computed to be

$$5 (N-18) = 5 (27-18) = 45 \text{ rems}$$

where N equals the individual's age in years at his last birthday.

This lifetime dose when compared to the individual's accumulated dose shown in the alternative form AEC-4 indicates that his actual lifetime exposure is less than 45 rems, thus permitting a dose up to 3 rems as specified in 10 CFR 20.101(b)(1).

2. Our interpretation of 10 CFR 20.103 is that the limits in Appendix B, Table 1 are based on a forty (40) hour period. Paragraph (b) of this section states:

"The limits given in Appendix B, Table I of this part based upon exposure to the concentrations specified for forty hours in any period of seven consecutive days. In any such period where the number of hours of exposure is less than forty, the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is greater than forty, the limits specified in the table shall be decreased proportionately."

On the basis of a forty hours in any period of seven consecutive days and the computed MPC value for time spent in Mill and Crusher categories, calculations in Appendix A show that:

Case A

The individual was exposed to 9.62×10^{-11} uCi/ml during a three day period, 2 to 4 September (a 24 hour period) or 3.21×10^{-11} uCi/ml on a daily basis which compares to a computed MPC value of 13.88×10^{-11} uCi/ml for the hours and work area involved. Thus it was interpreted that the individual was well under the MPC.

Case B

This case was treated separately in the Appendix because the individuals had different work assignments throughout the week.

The first individual tested was exposed to 15.11×10^{-11} uCi/ml during a four day period (32 hours) or 3.78×10^{-11} uCi/ml on a daily basis which compares to a computed MPC value of 10.94×10^{-11} uCi/ml for the hours and work area involved.

Similarly, the second individual was exposed to 16.67×10^{-11} uCi/ml during a five day period (40 hours) or 3.33×10^{-11} uCi/ml on a daily basis which compares to a computed MPC value of 9.0×10^{-11} uCi/ml for the hours and work area involved.

Thus it was interpreted that the two individuals cited on November 11, 1975 for over exposure were well under the MPC.

Case A - September 4, 1975

Individual - C. Atwood

Job Assignment: Crusher House - Cleaning Collector Bags

| Date | Concentration | Exposure Concentration | % Time of Exposure | Computed Concentration |
|---------|---------------|------------------------|--------------------|------------------------|
| 31 Aug. | Off | - | - | - |
| 1 Sept. | Off | - | - | - |
| 2 Sept. | 1.46 | - | 100.0 | 1.46 |
| 3 Sept. | .64 | - | 100.0 | .64 |
| 4 Sept. | 7.52 | 105.30 | 6.25 | 6.58 |
| | | 1.0 | 93.75 | .94 |
| 5 Sept. | Off | - | - | - |
| 6 Sept. | Off | - | - | - |

Total Actual Concentration in 3 days 9.62×10^{-11} uCi/ml

No Over Exposure

Case B - November 12, 1975 (Note error in date of citation.)

Individual - K. Denney

Job Assignment: Crusher - Shaking Mechanism

| Date | Concentration | Exposure Concentration | % Time of Exposure | Computed Concentration |
|---------|---------------|------------------------|--------------------|------------------------|
| 9 Nov. | Off | - | - | - |
| 10 Nov. | Off | - | - | - |
| 11 Nov. | 4.46 | - | 100.0 | 4.46 |
| 12 Nov. | 6.43 | .75 | 6.25 | .047 |
| | | 6.81 | 93.75 | 6.38 |
| 13 Nov. | 0.6 | - | 100.0 | 0.6 |
| 14 Nov. | 4.16 | - | 100.0 | 4.16 |
| 15 Nov. | Off | - | - | - |

Total Actual Concentration in 4 days 15.65×10^{-11} uCi/ml

No Over Exposure

Case B - November 12, 1975

Individual - R. LaFond

Job Assignment: Crusher - Shaking Mechanism

| Date | Concentration | Exposure Concentration | % Time of Exposure | Computed Concentration |
|---------|---------------|---------------------------|-----------------------|---------------------------|
| 9 Nov. | Off | - | - | - |
| 10 Nov. | 2.56 | - | 100.0 | 2.56 |
| 11 Nov. | 2.56 | - | 100.0 | 2.56 |
| 12 Nov. | 6.43 | .75 | 6.25 | .047 |
| | | 6.81 | 93.75 | 6.38 |
| 13 Nov. | 2.56 | - | 100.0 | 2.56 |
| 14 Nov. | 2.56 | - | 100.0 | 2.56 |
| 15 Nov. | Off | - | - | - |

Total Actual Concentration in 5 days 16.67×10^{-11} uCi/ml

No Over Exposure

3. As explained in #1 and #2, there appears to have been no over exposures under 10 CFR 20.101(a) nor 20.103(a) and, therefore, no over exposure reports were made.
4. It is stated that 'Airborne Dust and Radioactivity Survey' as described in Section 4 had not been implemented.

In Rio's application dated August 26, 1971 Section 4, it was stated that radon daughter surveys would be conducted every 2nd month in the initial stages and the results would be reviewed to determine if frequency could be changed.

In 1972 and 1973, the area was sampled for Radon every month and results showed readings generally too low to count. In 1974 the interval was reduced to six monthly. Still no increase in values. Last samples were taken December, 1975 and August, 1976 and values are still generally too low to count.

6. This was taken care of immediately, and necessary flagging of calendars has been done to obviate the annual reporting date slipping by unnoticed.
7. Signs covered by 10 CFR 20.203 were posted in all necessary areas and the additional signs containing the words "Any area within this mill may contain radioactive material" have been installed at entrances to the restricted area and plant.

Talks have been held with all persons required to wear dosimeter badges to ensure that they place their badges on the boards provided when

Mr. E. Morris Howard, Director

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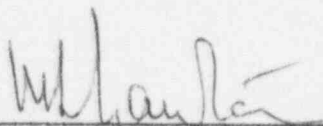
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they go off shift. These boards will be changed to ensure the shift foreman can check that every man on his shift has returned his badge to its "off-shift" location.

Radioactivity Surveys have been carried out and we will continue to carry them out at six-monthly intervals to ensure that no build-up occurs in any area.

Better flagging of calendars will be carried out to ensure that the annual statement of source material inventory is submitted by the due date.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'M. D. Lawton', written over a horizontal line.

M. D. Lawton
Manager

MDL:tw