

MBS Environmental
4 Cook Street
WEST PERTH WA 6005

Ref: WRS-J4014
Order No: Kristy Sell
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Attn: Michael Dufty

Territory Iron Ltd – Frances Creek Mine

With respect to our initial comments on the radiation aspects of the proposed mine at Frances Creek and subsequent discussion with Mr Ian Martin, we recommend that the following actions be considered during the dry season.

1. Gamma Monitoring

The uranium values vary so as to increase with distance to the north of the project with values recorded up to 75 ppm with a median of 12 ppm. These values would result in an estimated exposure effective dose rate of 0.057 (mSv/a) milliSievert per annum. This is well below the maximum recommended dose rate for members of the public of 1mSv/a. If the high grade uranium values are mixed with lower grades during processing and stockpiling, it would present a lower exposure to personnel, which would be in compliance with the principle of ALARA (as low as reasonably achievable), economic and social factors being taken into account. This estimated exposure may be increased if potassium and thorium are present in the ore at more than trace values. It is recommended that background values of gamma radiation be measured at both high and low ore grade areas prior to commencement of full scale mining. It is recommended that living accommodation for personnel be situated in a low gamma background area. It is generally accepted that activity of materials less than 1 Becquerels per gram (Bq/g) for normal exposure situations, the concept of exclusion applies. For 75ppm uranium the calculated activity is 0.93 Bq/g, which is borderline if possible thorium activity is present. However, mixing of the ores could reduce the average activity below 1 Bq/g. The relevant authority in the Northern Territory would need to approve the exemption.

2. Transport and export

The Northern Territory may require a plan for transport and storage at the port to be presented prior to approvals being completed. The uranium content of the ore is less than the recognised uranium ore grade of 200 ppm. Under the provisions of the National Directory for Radiation Protection, radionuclides of the natural decay chains, except potassium can be present at up to 10 Becquerels per gram (Bq/g) to be exempt under the Transport Code.

3. Radon gas and Dust Exposures

Radon gas exposure should not present under normal atmospheric conditions, but could show a marked increase during nocturnal radiation inversions in the atmosphere. The overall impact from such night time exposures is unlikely to contribute sufficient exposure above background to exceed the member of the public limit in a calendar year. Background radon exposure should be measured for three-month averages to establish pre-operational data and once during the 'dry' to confirm the overall averages are consistent. Dust exposure is unlikely to be a problem and can be controlled by normal dust suppression measures. As a precaution, it is recommended that some personal dust monitors be used during mining of the higher uranium ores to confirm that exposures to uranium in dust are minimal.

4. Ore handling and storage

No special handling facilities are required, but ore should be stored in the open where possible. Provision should be made for dust control if required at the port.

5. Summary and Recommendations

The concentrations of uranium in the ore are such as to apply for exemption from the requirements of the Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing. Discussions should take place with the relevant authority of the Northern Territory: The CHIEF EXECUTIVE OFFICER, DEPARTMENT OF BUSINESS, INDUSTRY AND RESOURCE DEVELOPMENT, GPO BOX 3000, DARWIN NT 0801. The contact for Radiation Protection is: Russell Robinson, Radiation Protection Officer, NT Department of Health.

Recommendation 1: Background data should be collected to present to the relevant authority as evidence to support an application for exemption in accordance with the National Directory for Radiation Protection - Protocol for Application of Exemption Provisions for Radioactive Materials.

Recommendation 2: Provision be made for collecting data with regard to storage of ore in the port storage area.

Recommendation 3: Potable water and saline water used for dust suppression should be tested for radioactivity content to eliminate a possible source of activity in dust. Samples tested by Western Radiation Services in March were close to normal environmental levels of activity. WRS Report J4104 refers.

Recommendation 4: Check with clients for possible requirements for certification of radioactivity content and radionuclide identification. Note that uranium decay product Bismuth-214 has a gamma peak close to that of Caesium-137 and detectors normally

used at smelters cannot differentiate between the two.

Recommendation 5: Check for presence of thorium in ore and ratio of u/th to calculate total activity.

References

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