

Beaverlodge Site Gamma Radiation Risk Evaluation

The radiation risk evaluation was completed to estimate potential risks to members of the general public from accessing the decommissioned Beaverlodge properties. Estimates were evaluated based on time spent at the properties, measured gamma radiation levels, and consideration of radiation exposure from country foods and other exposure pathways.

The assessment was used to inform potential remediation work at the licensed Beaverlodge properties, to achieve an acceptable level of radiation risk for transfer of the properties to the Government of Saskatchewan's Institutional Control (IC) Program.

A gamma survey of reasonably accessible and disturbed areas of the decommissioned Beaverlodge properties was completed in 2014. Properties that were not disturbed by previous mining/milling activities were not included in the survey as existing gamma levels were considered to be at natural background. Comparison of gamma measurements were made to the Saskatchewan Ministry of Environment (SMOE) dose criteria of 1 $\mu\text{Sv/h}$ above background, averaged over 1 hectare. If the gamma dose was below the dose criteria, further assessment was not required. For properties where residual measurements exceeded the guideline, an additional assessment was completed to evaluate the potential risks. For these properties, the additional assessment demonstrated the risk was acceptable.

In addition to comparison with the SMOE guidance document values, a dose (risk) evaluation was conducted taking into account International Commission on Radiological Protection (ICRP), Canadian Nuclear Safety Commission (CNSC), Health Canada (HC), United States Environmental Protection Agency (U.S. EPA) and International Atomic Energy Agency (IAEA) guidance.

Annual incremental doses were also assessed on a cumulative basis, by summing doses from potential exposures at all Beaverlodge properties. The evaluation demonstrated that conservative estimates of cumulative doses were well below the public dose criterion of 1 mSv/yr.

Overall, the evaluation found that from a risk (dose) perspective, the gamma radiation levels on the Beaverlodge properties were acceptable, and that additional remedial actions were not required.

