

GIANT MINE Oversight Board



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GMOB Review of the Quantitative Risk Assessment Report (QRA) Version 1.0

Natalie;

The Giant Mine Oversight Board (GMOB) has reviewed the Quantitative Risk Assessment Report (QRA), Version 1.0, prepared by Wood and circulated by the Giant Mine Remediation Project Team on May 29, 2020. Board directors and staff also participated in the series of videoconferences held in June and July and hosted by the Project Team.

Overall, GMOB feels that the process to develop the QRA was comprehensive and provided good opportunities for interested parties to identify concerns and provide meaningful input. The analysis presented in the final QRA Report is transparent and seems to reflect all of the parties' input. The plain language summary of the report and the opportunity to ask questions during the videoconferences were also helpful. That said, GMOB has identified several points for consideration.

Risk Thresholds

The assessment divides risk into three categories: negligible, unacceptable, or as low as reasonably practicable (ALARP). The thresholds for these categories were established through engagement with interested parties. GMOB acknowledges the need to set thresholds for the purposes of evaluating results, but notes that discrete thresholds may not accurately reflect a consensus about risk acceptability. For example, if the threshold for acceptability is 1 in 100, then a probability of 1 in 101 would be considered ALARP while 1 in 100 would be considered unacceptable. However, the difference between 1 in 100 and 1 in 101 is very small, and would likely be viewed as effectively the same by all parties. In addition, while the assessment is necessarily based on assumptions regarding probability and consequence, this may lead to uncertainty in the calculated risk, and therefore in how precisely the risk can or should be compared to a threshold.

In consideration of these factors, GMOB recommends that scenarios that fall near the unacceptable boundary should be examined to identify whether there are practical actions that could be taken to reduce the risk further into the ALARP zone. In this regard, GMOB supports the recommendation in the QRA document for the GMRP to "... either demonstrate that risks have been mitigated to the extent practicable and cannot be practicably reduced further, or propose options for risk reduction."

Data Communication

The risk thresholds are logarithmic which makes communication of the level of risk and distance to thresholds less than intuitive for many readers. GMOB appreciates that the GMRP has developed graphics as a communication aid. However, depending upon the scale that is used in the presentation graphics (logarithmic or linear), a risk can appear much closer or further from a boundary. At minimum, presentation graphics should include a scale to aid in the interpretation of the results.

The QRA also includes information on the main contributors or drivers of risk (e.g. 94% crown pillar failure due to non-backfilled stope and 6% crown pillar failure due to movement of fill or inadequate fill for the fatality consequence). GMOB agrees that this is a useful way to present information, and provides insight into where additional design focus or oversight should be placed.

Perpetual Care

A breakdown in long term care and maintenance at the site was a significant contributor of risk to a number of scenarios including those related to the aquatic environment, terrestrial environment, socio economic tourism and financial stability. This result reinforces the importance of establishing a robust oversight and funding mechanism for the project.

A number of parties identified concerns with long term funding during the water licencing review process. Presently, funding is available for 15 years after which time the GMRP will need to renew the funding commitment. Given the importance of adequate long term stewardship to the overall project risk, GMOB continues to encourage the GMRP to investigate mechanisms that would guarantee adequate funding for the full project time frame.

Annualized Cancer Risk

The QRA uses cancer as a surrogate for "permanent illness/injury that stops daily activities", and assesses incremental cancer risk on an annual basis. GMOB notes that cancers can take many years to develop, and standard risk assessment practice is to consider cancer risk as an incremental risk over a lifetime, not annually.

GMOB does not have a specific recommendation regarding how the cancer risk should be considered nor whether a different approach would provide a better or more defensible result given the uncertainties in the underlying assumptions. However, GMOB believes that the approach used in the QRA should be clarified as not typical for risk assessment.

Soil Contamination

GMOB remains concerned with the level of contamination in soil that will be left unremediated outside the fence line. The QRA consequence related to soils was an increase of 10% over post-remediation concentrations in an area greater than 1 ha. GMOB is concerned that the level of contamination of these soils is already high, and already pose a level of risk that has not been incorporated into the QRA. This concern has also been identified in the QRA review by Slater Environmental Consulting and summarized with the quote: "Deterioration from existing conditions is not an effective threshold when the existing conditions already present a significant risk." GMOB concurs.

Baker Creek

The review by Slater Environmental Consulting also identifies that Baker Creek is not considered to have environmental value, i.e. the specific consequence for the aquatic environment relates only to changes in Yellowknife Bay. Impacts to Baker Creek would be considered localized, and not of high consequence.

GMOB notes that the fate of Baker Creek was raised by the City of Yellowknife, North Slave Metis Alliance and Yellowknives Dene First Nation during the water licence process. All of these parties expressed interest in the successful remediation of Baker Creek. This suggests to GMOB that Baker Creek has intrinsic value and impacts to the creek would be considered of consequence. Opportunities for minimizing risks to Baker Creek should be considered as remediation proceeds.

QRA Updates

A key assumption of the QRA is that the remediation is carried out as described in the Closure and Reclamation Plan (CRP). GMOB understands that the QRA will be reviewed at least every 20 years, or as the CRP design plans change. GMOB recommends that the QRA should be reviewed and revised when the remediation is complete to capture any changes to the CRP that may occur through the remediation process.

If you have any questions in the regard, please contact me through the GMOB office.

Sincerely,



David Livingstone

Chair, Giant Mine Oversight Board.

cc. Parties to the Environmental Agreement