Part 2 - Other Issues

The Review Board identified a number of areas where additional information would be helpful in assessing the likelihood of significant impacts on the environment. The Developer should provide any additional information that is available on the items listed below. The remainder of this section provides the relevant sections of the terms of reference and the Review Board's questions in relation to those sections.

IR Number: 1-2-9

Source: *Mackenzie Valley Review Board*
To: *Tyhee*
Issue: ***Accidents and Malfunctions***

Terms of Reference - Section 3.5 Accidents and Malfunctions

4. Emergency response measures that will include... (d) failures of the Tailings Containment Area, including worst case scenarios such as catastrophic failure of the dyke, as well as tailings spills...

Request

1. Please describe management actions that Tyhee would take in response to a failure of the TCA dyke.

Tyhee NWT Corp Response

1) In developing the emergency response measures associated with a potential, developing, or imminent TCA dyke failure, the designers will consider the potential modes of failure of the facility and their likely consequences. The most likely potential modes of failure include overtopping by water due to poor pond management and internal erosion (piping). Slope instability is a less likely mode of failure given the use of well-constructed downstream rockfill shells in the TCA and the foundation preparation plans.

Overtopping is not expected to lead to outright failure of the dams given the use of relatively erosion-resistant, compacted rockfill in the downstream shells, and the long crest length over which water would flow (leading to shallow and low-velocity overtopping flows). The surface water outlet into Narrow lake would be closed such that the flows would be contained between the TCA and pit and within the pit, resulting in the event becoming a pit evacuation issue followed by subsequent clean-up and dam crest restoration. Seepage through the dam will be monitored for any increasing rates and cloudiness to evaluate the potential for piping. Emergency planning will include stockpiling of materials on-site for use in an emergency and the response will include placing them into any areas of local erosion or collapse to temporarily remediate the situation. Pit evacuation followed by more permanent repairs would follow.

Tyhee will develop and institute an overall dam safety management system for operations and closure of the TCA, consistent with guidelines published by the Canadian Dam Association (CDA) and the Mining Association of Canada (MAC). These guidelines are expected to include CDA's Dam Safety Guidelines, MAC's Guide to the Management of Tailings Facilities, and MAC's publication, "Developing an Operation, Maintenance, and Surveillance Manual for Tailings and Water Management Facilities." This system will include the Tyhee NWT corporate dam safety policy, plans and procedures, roles and responsibilities for implementing the system, the required documentation, training requirements of personnel, review and corrective actions of deficiencies or nonconformance, and a dam safety review program. It will include an emergency management process with emergency response procedures for the dam operator and site staff, and emergency preparedness procedures for external stakeholders/response agencies. Documentation of the dam safety management system will be contained in the project operation, maintenance, and surveillance manual (OMS Manual), emergency response plan (ERP), and emergency preparedness plan (EPP).

The dam safety management system will be implemented to (1) monitor performance of the TCA and appurtenant facilities during operations and closure to preclude tailings spills or failure of the dyke(s), and (2) allow Tyhee to take action in case that the emergency response plan (ERP) or emergency preparedness plan (EPP) components require implementation. The ERP and EPP will be designed to alert and involve appropriate project stakeholders (Tyhee NWT site personnel, Tyhee NWT corporate personnel, third-party stakeholders/response agencies as needed) to conditions related to the TCA that have the potential to impact public and environmental safety, thus allowing for prompt and timely action to be taken. The intent with such programs is to keep the risks as low as reasonably practicable, consistent with CDA and MAC guidelines.

Along with implementation of the OMS Manual and regular testing of and updates to the ERP and EPP, dam safety reviews of the TCA and appurtenant facilities will be conducted periodically. The frequency of these reviews will be based on the dam classification, project-specific hazards, results of the periodic inspections included in the OMS Manual, and demonstrated performance of the structures.