Fortune Minerals Public Hearing

Closure Concepts

Tłı̨chǫ Government Presentation

Tłı̨chǫ Ndek'awoo

Tłı̨chǫ Government

Geographical and Cultural Context of the Review

Tłı̨chǫ Ndek'awoo

Tłı̨chǫ Government

- The proposed NICO Mine will lie within the heart of Tłı̨chǫ owned lands along a corridor of significant traditional use that remains spiritually and culturally important to the Tłı̨chǫ People and their way of life.

- Fortune itself recognized some of the traditional uses of the area, including hunting, trapping, berry gathering, summer and winter travel, gravesites and other cultural sites.

- With a proposed mine life of only 18 years, the legacy of the mine will depend primarily on the success of the closure plan. That legacy will impact primarily the Tłı̨chǫ People living in the four traditional communities surrounding the proposed mine site.

Current Position of the Tłı̨chǫ Government

Tłı̨chǫ Ndek'awoo
Tłı̨chǫ Government

- The Tłı̨chǫ Government accepts that constructed wetlands offer great potential but the successful use in cold climates is very uncertain.
- Uncertainties include the following:
    - Operational challenges (e.g., low biochemical reaction rates; freezing of wetland media causing solution by-pass)
    - Hydrology considerations – the highest volume of water occurs during freshet when frozen conditions may still persist.
    - On-going care and maintenance – seasonal treatment with collection and storage of water during cold months is a potential solution but will require on-going care and maintenance and as such would not be passive.
    - Seepage quality – Design requirements for wetlands are uncertain at this time because seepage quality is uncertain and will not be known until actual operations begin.
    - Long term performance – wetland performance in extreme cold conditions us unknown and requirements for reconstruction, operation and maintenance are simply undefined.

BACKGROUND

Current Position of the Tłı̨chǫ Government Continued

- The use wetlands has merit and is supported, but given the uncertainties, there is significant risk that the wetlands could fail and that perpetual care is required.
- Appropriate and sufficient contingency plans need to be in place until such time that the wetlands prove to be functioning appropriately and for the long term.
- The contingency plans need to be backed by just more than a promise. The contingency plans need to be formally developed as closure alternatives and corresponding financial assurance put in place.

RECOMMENDATIONS #1 AND #2
Closure Contingencies

Tłı̨chǫ Ndek'awoo
Tłı̨chǫ Government

1. To address the uncertainties associated with the use of wetlands as the primary closure option, the Report of EA should require Fortune to formally include alternative closure options, such as reverse osmosis, in any conceptual closure plan prepared for the site until such time that a final closure plan is accepted by the Tłı̨chǫ Government and the regulators.
2. The Report of EA should require that any financial assurance such as a security deposit required through a water license cover alternative closure options until such time that the primary closure concept is proved feasible.

RECOMMENDATION #3
Synthetic Cover for the CDF

Tłı̨chǫ Ndek'awoo
Tłı̨chǫ Government

- **Primary Issue** – Long term seepage quality from the CDF remains uncertain due to CDF performance uncertainties and waste rock characterization questions.

- **Potential Solution** - Use of an impermeable cover on the CDF will essentially eliminate seepage in the long term.
  - Added benefit of using a synthetic cover is that it has the potential to be considered an alternative contingency to perpetual mechanical treatment if wetlands fail.

- **Recommendation #3** – The Report of EA should require an undertaking of a costs/benefits analysis be carried out to determine whether a synthetic cover is a viable option as compared with the proposed clay or other cover options.

Recommendation #4: Waste Classification 0.3% S

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Tłı̨chǫ Government

Primary Issue

- Fortune considers waste rock with <0.3% sulphur benign (i.e. cannot produce acidity or contaminated drainage)
- Fortune's own data show this is false.
- Random use of this "benign" waste could result in placement of contaminated rock outside the CDF. Fortune's expectation is that this is unlikely to be a major issue.

Fortune's Response – classification will be reviewed.

Conclusion - Response is not adequate as it simply fails to recognize a potential issue.

- This is not a fatal flaw but SENES would be more comfortable if the cutoff was lowered to ~ 0.1% sulphur.

RECOMMENDATION #5
CDF Management and Peer Review

Tłı̨chǫ Ndek'awoo
Tłı̨chǫ Government

- **Primary Issue** – Uncertainties with CDF performance remain because:
  - Co-disposal as proposed by Fortune is new technology for Canada's north
  - Thickener performance is key to the success of CDF performance and must be monitored carefully

- **Potential Solution** – Continual monitoring and assessment of thickener and CDF performance could be achieved through the establishment of a peer review committee to oversight.
  - have become commonplace at minesites and are a useful "checks and balance" mechanism.
  - they serve to generate solutions to challenges by bringing together experts with extensive experience in a number of areas.
  - One directly relevant example is the oversight body established for the Island Copper Mine.

RECOMMENDATION #6

CDF Management and Peer Review Continued

Tłı̨chǫ Ndek'awoo

Tłı̨chǫ Government

- **<u>Oversight of Island Copper Mine (1971-1995)</u>**
  - Due to its unique location, unconventional tailings disposal methodologies were required (i.e. submarine tailings disposal)
  - The novelty of the tailings disposal methodologies and the potential for unforeseen risks resulted in the company being required "to retain an independent scientific advisory committee to assist in establishing a comprehensive monitoring program, outlining procedures for sampling and establishing reliable analytical results, and preparing assessment reports…".
  - The permit only required an independent oversight committee for the first 10 years but the company opted to keep the committee, which lasted for over 30 years.

- **<u>Recommendation #4</u>** – The Report of EA should require that a peer review committee be established prior to the commencement of mining operations to carefully monitor thickener and CDF performance.

RECOMMENDATION #7
Waste Rock Management

Tłı̨chǫ Ndek'awoo
Tłı̨chǫ Government

Primary Issue

- No suitable protocols for waste rock characterization have been developed (e.g., sampling method and frequency, analytical tests, number of samples, classification criteria), although waste rock will be managed based on its geochemical properties (sulphide sulphur, arsenic and bismuth contents).
- Since some of the infrastructure constructed of "benign" rock will remain on site following closure, managing waste rock during operations is critical for ensuring no subsequent acid rock drainage or metal leaching issues occur in the long term

Recommendation #5 – The Report of EA should require that prior to any rock excavation, suitable protocols for waste rock characterization be developed and approved by the MVLWB.

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RECOMMENDATION #8
Thiosalts Monitoring

Thịchǫ Ndek'awoo
Thịchǫ Government

Primary Issue

- Thiosalts are formed during milling of sulphidic ores and, when dumped into tailings ponds, they oxidize and form acid. This can impact on seepage quality and tailings water quality.
- Thiosalts do not appear to be assessed in any of the testing provided in the DAR or subsequent documentation and as such their level and effects are unknown.

Recommendation #6 – The Report of EA should require that the monitoring, assessment and management of thiosalts be included as part of mine waste management plan that is reviewed and approved by the MVLWB prior to the start of milling.

SUMMARY

Tłı̨chǫ Ndek'awoo
Tłı̨chǫ Government

- The Tłı̨cho Government has made recommendations for eight measures related to closure to be included in the Report of EA.
- We require these measures to be addressed.