

TECHNICAL MEMORANDUM



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TO: Cam Scott – SRK Consulting Inc. **DATE:** March 25, 2004
FROM: John Cunning, Mike Jefferies **JOB NO:** 03-1413-080
EMAIL: JCUNNING@GOLDER.COM
RE: **ROSE CREEK TAILINGS IMPOUNMENT**
GEOTECHNICAL ISSUES RELATED TO COVER VIABILITY

Following the February 25, 2004 telephone conference call between SRK, DIAND and Golder, DIAND requested that Golder present a discussion on geotechnical issues related to the placement and long term integrity of a cover placed over the Rose Creek Tailings Impoundment. This technical memorandum presents our draft comments and forms Addendum #2 to our February 9, 2004 Draft Rose Creek Tailings Impoundment Site Characterization and Seismic Stability Assessment Report. Following review this is planned to be incorporated into our final report.

GEOTECHNICAL ISSUES RELATED TO COVER VIABILITY

We understand that a cover is being considered over the Rose Creek Tailings impoundment. Some of the objectives of placing a cover over the tailings could include:

- Physical isolation of tailings from human and wildlife,
- Reduction of the contact of the tailings and surface waters; and,
- Reduction of the oxygen available to the tailings.

Independent of the objectives, the cover will need to be constructability and will be required to maintain the design integrity over the long term.

The following presents a number of geotechnical issues which relate to this integrity of a tailings cover. The comments are based on inferred tailings properties from the CPT investigation.



- Constructability of a cover over the entire tailings area will be an issue. Generally, the tailings have a variable thickness upper crust of drier, slightly stronger tailings which are underlain by very soft and weak tailings. Construction equipment operating on the tailings surface to place the cover may or may not be supported by this upper tailings zone.
- Repeat truck traffic on the tailings surface could increase pore pressure at finer tailings zones with depth and if not dissipated, could trigger static liquefaction.
- Any cover placed at the surface of tailings should be expected to result in a highly variable surface profile. Due to the heterogeneous nature of the tailings deposit, large differential settlements can be expected and this will result in an uneven cover surface following construction.
- Any cover placed on the tailings surface will result in an increase in the degree of consolidation of the underlying tailings. During the consolidation process, excess tailings pore water will be released from the deposit either into underlying foundation or at surface and will require the appropriate water quality considerations.
- Depending on grain size distribution of cover and type of construction traffic on the cover material, there could be substantial mixing of the cover material and the upper tailings materials.
- Substantial zones of the fine tailings are expected to be triggered into liquefaction under a moderate seismic loading. A review of some of the finer tailings zones such as at SCPT03- 21 and SCPT03-32 indicated that peak ground acceleration in the range of 0.05 to 0.1 g could trigger liquefaction. This acceleration is much lower than expected for the 1 in 10,000 year seismic loading and thus has a higher likelihood of occurrence.

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