

## **APPENDIX K-7: Paste Tailings for Johnny Lee Mine**



# Memo

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**To:** Bob Jacko  
**From:** Kevin Connolly  
**cc:** Kim Huether  
**Date:** 02 September 2016  
**Re.** Paste Tailings for Johnny Lee Mine,  
Tintina Resources

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This memo is to confirm our conversation regarding expected bleed water (or free water) from cemented tailings in the underground mine and in the surface cemented tailings facility

## 1. Cemented Paste Tailings for Underground Mine Backfill

The cemented paste tailings placed as Underground Mine Backfill is a critical safety component of the mining operation. The paste backfill needs to develop the required compressive strength for safe ground support. To ensure adequate strength, it is critical the paste backfill maintains the proportions of tailings, 4% binder and water to achieve a 7"-9" slump paste consistency. Too much water, or too little binder would adversely affect the compressive strength.

The underground paste backfill is placed in a warm environment, by pumping cemented paste into large, enclosed stopes, with dry ventilation air. The binder hydration process consumes water from the paste and generates heat.

These conditions all combine to reduce any tendency for the paste backfill to discharge bleed water, and to cause wet, exposed paste surfaces to evaporate water. Bleed water from the paste backfill is expected to be below 1% by weight and, therefore, it would be difficult to measure bleed water from the cemented paste backfill.

## 2. Cemented Paste Tailings for the surface Cemented Tailings Facility

The cemented paste tailings placed in the surface Cemented Tailings Facility is spread in thin layers on the surface and is not required to achieve compressive strength for support. The addition of binder (0.5% - 2.0%, by weight) for cemented paste tailings is intended to ultimately change the pumpable paste into a dry, consolidated material.

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In order to pump the cemented paste through the long, horizontal pipelines, water is added to achieve a 9" slump paste consistency, which is easily pumpable, and avoids plugging of the pipelines.

The conditions for placing the cemented paste tailings in the surface Cemented Tailings Facility, include: pumping cemented paste tailings into a large, open impoundment (forming wide spread, thin layers); ambient outdoor temperatures with air conditions of ambient humidity, and occasional rain/snowfall. The reduced binder content of the cemented paste tailings for surface consumes less water from the surface paste (vs paste backfill), and any heat from binder hydration is lost to the outdoors.

These conditions at the Cemented Tailings Facility all combine to increase the tendency for the cemented paste tailings to discharge bleed water and reduce the tendency for the wet paste surfaces to evaporate water. Bleed water for cemented paste tailings on surface will be higher than the mine backfill and is expected to be in the 3%-5% range, by weight. This bleed water may be noticeable for a few days, until cemented paste tailings are consolidated.

Please contact me, if you have any questions.

Regards,

**Kevin Connolly, PEng**

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