Appendix G – BGC Site Memo September 2004

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PROJECT MEMORANDUM

To:	**CanZinco Ltd.** **Box 225, Nanisivik, Nunavut, X0A 0X0**	**Fax No.:**	**N/A**
Attention:	**Mr. Murray Markle** **Site Manager – Nanisivik Mine**	**CC:**	**Jim Cassie, P.Eng.**
From:	**K. Wayne Savigny (Ext. 107)**	**Date:**	**Sept. 12, 2004**
Subject:	**Summary Recommendations from Site Visit – September 8 to 12, 2004**		
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I completed a site visit between September 8 and 12, 2004. The purpose was to address questions regarding rock stability in the vicinity of the West Open Pit (WOP) and East Open Pit (EOP). My preliminary observations and recommendations are below. A full report will be prepared after my return to Vancouver.

1.0 WEST OPEN PIT

General Description

The WOP is immediately southwest of the 00N and 01-10 portals. The area of interest is rib pillar 00-11/1 that separates the WOP highwall from the Main Ore Zone 00-11 stope.

No reliable map coverage showing the current topographic conditions and extent of underground workings was available and no detailed topographic surveys could be arranged during my visit. I therefore established a local reference system using existing steel drill rod posts supporting a fence along the top of the highwall and spanning the full length of the interest area. The posts average about 1.9m apart and are set back between 0.5m and 2m from the highwall. I numbered the steel posts from west to east and set orange flagging on every tenth post. In what follows I frequently refer to post numbers from this reference system.

Immediately before shut-down in July 2002, steel pipes were laid against the highwall for most of the distance between the 00N and 01-10 portals and a large volume of waste rock was piled against them. Several 5m long rings were blasted from rib pillar 00-11/1 and mucked from the 00-11 stope. It is not known how many were actually removed but it is assumed here three were taken, extending between posts 26 and 35 (~ a 15m long section). The steel pipes are not adequate support for backfill at mine closure, hence it is necessary to place material behind

them to avoid long-term subsidence as the steel degrades. It is also desirable to push a fill pillar under the back to provide supplementary support for the remaining 00-11/1 stope pillar.

The bench immediately above the highwall, which is also the crown pillar of the 00-11 stope, shows evidence of cracking. One, and at times two, more-less continuous cracks run the length of the bench, usually set back 2m to 4m from the highwall. In the vicinity of posts 58 to 68 these cracks extend more than 10m back into the natural slope above the upper most highwall bench. The highwall trends between 115° and 130° and a prominent subvertical joint set trends 138°. This configuration is conducive to toppling instability and I attribute the cracking to this mechanism.

Based on the foregoing observations, I have the following comments and recommendations:

00N Portal

The toppling mechanism and existing cracking are not considered threats to the safety of personnel moving through the 00N portal over the next 8 to 12 months. I recommend check scaling of slightly loosened rock on both sidewalls of the outer portal area – especially the east side where loosened joints have developed in sulphide rocks.

00-11/1 Rib Pillar

The key question is how to place material behind the steel pipes and waste rock that cover the stope? Rock slope instability related to toppling and the effects of blasting the rib pillar makes it unsafe for men and equipment to work off the waste pile between posts 26 and 35. Therefore, I recommend the following approach:

1. Trim the southwest edge of the crown pillar over approximately a 12m length. Drills should go no closer to the top of the highwall than 3m during blast hole drilling. The trim blast should be in a concave outward (i.e. southwest) configuration, extending far enough back into the crown pillar to be assured the fragmented rock falls easily into the stope. Fragmentation of the trimmed rock is important so that it falls freely into the stope. Thus an optimum combination of drill hole spacing, orientation, blast energy and delays should be chosen to accomplish this objective. At the same time, it is important that the trim blast not cause additional damage to the 00-11/1 stope pillar.
2. Check scale the southwest edge of the crown pillar after the trim blast.
3. Use a dozer to push a ramp across the waste rock and steel pipes to open access into the stope.
4. Push fill into the stope as far as possible without the operator passing under the crown pillar. The objective should be to push as much fill as possible into the stope and to create a fill pillar that will come into play if flexural movements cause the crown pillar to settle somewhat during closure.
5. Finally, ramp fill across the remaining high wall after completion of point 4.

01-10 Portal – Ventillation Fans

The back of the main opening is presently stable and is not considered a threat to the safety of personnel attending to fans over the next 8 to 12 months. The highwall bench above the 01-10 portal and the sidewall pillars require attention to improve safety. The following recommendations should be implemented:

1. The protective fence above the portal opening as well as pipes and electrical cables on the bench are threatened by rock falls from the upper portion of the highwall and natural slope behind it. These facilities should be protected or relocated.
2. The pillar at the east side of the portal has experienced instability over the last few years. It appears that joint controlled rock columns have toppled over and required mitigative action to buttress the slope. This has been partially successful, however, some large rocks have broken through the wire mesh. This area threatens the transformer hut and men working in the area. I recommend that the hut be skidded at least 10m southwest and a rockfall protection berm be placed where the hut is presently located in order to mitigate the rolling rockfall threat.
3. The rockfall hazard described in point 1, above, is also a threat to the safety of personnel using the portal. After implementing recommendations 1 and 2, the upper highwall bench and the lowest 15m of the natural slope should be check scaled before men begin regular working schedules below. This should be repeated in the spring of 2005 as soon as snow melts from the surface.
4. After the trim blast of the 00-11/1 rib pillar, it is possible that an outward dipping wedge on the east end of the rib pillar (west edge of the portal) may become unstable. This should be inspected by a qualified rock engineer after the trim blast, and additional trim work, scaling, or installation of bolts/sets/mesh undertaken, as required, to stabilize the area.

2.0 EAST OPEN PIT

'Horseshoe Blast Area'

The 39 portal provided access to the 38-11 stope of the Main Ore Zone. During the last few months of operation, an attempt was made to seal the portal by blasting a portion of the crown pillar in what is locally known as the 'horseshoe blast'. The blasted portion of the crown pillar dropped into the portal and stope leaving approximately 60m of the stope exposed above the muck. It appears that the blast was simply a perimeter shot with no attempt to fragment the muck. As a result, the muck comprises a high percentage of large and tightly interlocked dolomite blocks. These will be difficult to move with remaining mine equipment. Indeed, there is limited requirement to move them because they are stable in their current configuration for closure purposes.

As with the WOP, no reliable maps could be found showing the current topographic configuration of the EOP and adjacent underground in the Main Ore Zone. I therefore established a local reference system using four orange traffic cones and a steel post with flagging. These were positioned around the scarp at the top of the crown pillar such that they were visible from a survey station on the muck below. I numbered them from 1 to 5 beginning at the north side. I assumed the number 1 traffic cone had an elevation of 100m. The survey station on the muck I referred to as A. A second survey station (B) was established even lower on the muck and out of view from the traffic cones and steel post. X, y and z control of these points was established using a steel tape, range finder and Brunton compass. Plan and cross-sectional drawings based on these surveys will be included in my final report.

The objective continues to be to seal off this opening. Following are my recommendations:

1. The exposed east-facing front of the crown pillar is unsafe to work under at this time. The portion between traffic cone 3 and the south end requires trim blasting to reduce the

slope. The trim holes should be drilled at 45° around this section. Drilling equipment should go no closer than 4m to the edge during blasthole drilling.

2. Scale the portion of the crown pillar where the trim was completed.
3. Scale the remaining steep face of the crown pillar between traffic cones 1 and 3. This may require small trim blasts.
4. Using a large Cat, open access to the top of the 'horseshoe blast' muck pile.
5. Import shale fill and push it as far into the stope as possible without the equipment operator passing under the crown pillar. Continue placing fill until the entire 'horseshoe blast' area and recently trimmed area are completely backfilled and sloped so as to conform approximately to the pre-existing natural slope.

In my opinion, the resulting fill pillar will provide adequate support for any flexural subsidence that may affect the remaining 38-11 stope crown pillar. As an added measure of assurance, however, I recommend that the portion of the backfill that covers the eastern face of the crown pillar, and extending 10m east and 20m west be ramped with an additional 1.5m of backfill.

EOP Area in General

I inspected other openings in the EOP area. I understand the present decommissioning plan is to push backfill as far into these as possible before backfilling the entire area with shale to levels at least 1.5m higher than the highest sulphide exposure. In my opinion this is an adequate closure plan.

CLOSURE

I trust the foregoing is adequate for your purposes at this time. Please do not hesitate to contact me if you require clarification or additional information prior to submission of my report.

Yours sincerely,
BGC Engineering Inc.

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