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MINISTRY OF ENERGY AND MINES

Mines and Mineral Resources Division

REPORT OF GEOTECHNICAL INSPECTOR

(Issued pursuant to Section 15 of the Mines Act)

Name of Property: Mount Polley Mine **Permit No.: M-200**

Mine Manager: Dale Reimer

Company: Mount Polley Mining Corporation
Address: PO Box 12, Likely BC, V0L 1N0

Persons Contacted: Dale Reimer
Ryan Brown
Derek Moritz
Cal Conlin
Richard Goodwin

Copies To: Al Hoffman, Chief Inspector of Mines
Diane Howe, Deputy Chief Inspector of Mines, MEM
Stephen Rothman, Health & Safety Inspector, MEM
John Cox Health & Safety Inspector, MEM
George Warnock, Manager, Geotechnical Engineering, MEM
Heather Narynski, Sr. Geotechnical Inspector, MEM

Date of Inspection: December 4, 2014

In this document, "Code" means the Health Safety and Reclamation Code for Mines in British Columbia

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Introduction

A Geotechnical inspection of the Mount Polley Mine was conducted on December 4, 2014 by Michael Cullen, P.Eng of Michael Cullen Geotechnical Ltd. accompanied by Steve Rothman, Joe Nickolson and John Cox of MEM. Mr. Cullen completed this inspection on behalf of the Ministry of Energy and Mines. The inspection included a field review, review of technical reports, and technical discussions with Mine staff.

The purpose of this inspection was as follows:

- To assess if the Mine is meeting the intent of the geotechnical requirements of the Health Safety and Reclamation Code for Mines in B.C. (HSRC)
- To assess if the Mine is meeting the intent of geotechnical conditions in its Mine Permit.
- To assess if geotechnical practices at the Mine are consistent with generally accepted engineering practices at mines in British Columbia.
- To provide general comment on geotechnical conditions at the mine.

The following technical reports were reviewed:

- Cemented Rock Fill Design for the Mount Polley Mine" dated February 2014 by Rockland
- "Review of the Boundary Zone Underground Mine Blasting Effects on Wight Pit Slope Stability" dated January 7, 2014 by Golder Associates
- "Fill Fence Drawings for Underground Mining at Mount Polley" dated April 16, 2014, by Golder Associates
- Annual Inspection Report – Review of Ground Control Aspects of Underground Mining" dated November 11, 2013, by Rockland
- "Review of Cariboo Pit Slope Design" dated January 13, 2014 by Golder
- "Wight Pit Stability Trigger Action Response Plan" March 2014 by Mount Polley

OBSERVATIONS COMMENTS AND INSPECTION ORDERS

Location: Underground

Observations and Comments:

Underground mining was temporarily halted in August 2014. It is understood that mining could resume as early as January 2015.

Most of the active underground travel ways were reviewed; for the most part ground support conditions were considered good. Several locations where the screen was ripped were noted, and several locations were excessive bagged screen were identified. The Mine has switched to using 12ft Dywidag bolts in the intersections to make it easier to identify if the appropriate support has been installed; this practice is endorsed.

The first blast hole stope (812A 782A) has been mined. Conditions in the mined stope appear to be good with only minor over break. Bulkheads consistent with the recommendations of Golder are being constructed on 812 Level.

It is understood that the Mine is considering using a paste backfill rather than cemented rock fill. Operationally we see no concerns with this; however, the bulkheads were designed for low pressure exerted by the CFF. Paste fill will exert greater hydraulic pressure such that the bulk head or barricade design will need to be revised.

It is understood that the west wall of the Wight Pit continues to move but that the movement is within accepted limits. It is also understood that Golder completed a full review of the pit Stability in October 2014 and that they had no immediate concerns and that their comments will be presented in the 2014 annual pit slope review report. The trigger action response plan was discussed with the underground crew; they were not aware of the details, only that monitoring was being done.

Based on our observations and the information reviewed we consider that the underground is being designed and operated in general conformance with the requirements of the geotechnical components of the HSCR, Permit M-200, and accepted engineering practices. No hazardous, unusual, or areas of immediate geotechnical concern were noted.

I**nspection Orders:**

Pursuant to Permit M-200, prior to re-commencing mining the Mine shall ensure that the Mine Plans are up to date and consistent with the requirement of Permit M-200 Section C.1(c) Amendment March 25, 2013.

Pursuant to Section 6.25.2 of the Code prior to re-commencing mining the Mine shall inspect work places, travel ways and other areas that may be frequented by mine personnel, and repair all damaged screen or excessively bagged screen.

Pursuant to Permit M-200 within 3 months of re-commencing mining the Mine shall be inspected by a qualified geotechnical engineer as per Permit M-200 Section C.1(c) Amendment March 25, 2013. The report of this inspection shall be submitted to MEM for review.

The proposed cemented rock fill meets the requirements of Permit M200 subject to the following conditions

- *A quality control and testing program shall be implemented to confirm that the rockfill properties are as per design. The results from this QC/QA program shall be made available to MEM for inspection.*
- *Deformation monitoring shall be completed on the first few barricades installed to confirm that they are performing as expected.*
- *If the barricade designs are modified then calculation of strength and factor of safety may be required.*
- *The barricade designs are not approved for use in stopes that will employ uncemented rock fill, paste fill or hydraulic fill.*
- *Barricade designs for stopes employing fill other than cemented rock fill shall be submitted to MEM for review prior to any fill being placed.*

<u>Location</u>: Springer Pit

Observations and Comments:

Mining in the Springer pit was temporarily halted in August 2014. It is understood that tailings may be temporarily stored in the pit and that mining may not resume for some time.

The pit was mostly snow covered at the time or review such that observations were limited. No hazardous, unusual, or areas of immediate geotechnical concern were noted. It is understood that Golder completed a full review of the pit Stability in October 2014 and that they had no immediate concerns and that their comments will be presented in the 2014 annual pit slope review report.

Inspection Orders:

none

Location: Cariboo Pit

Observations and Comments:

Mining in the Cariboo pit was temporarily halted in August 2014. It is understood that mining may recommence as early as January 2015.

The pit was mostly snow covered at the time or review such that observations were limited. No hazardous, unusual, or areas of immediate geotechnical concern were noted.

It is understood that the northeast wall of the pit has experienced some movement and tension cracks have opened that are similar in character to those experienced in other pits. Prisms have been installed on the pit walls. It is understood that Golder completed a full review of the pit Stability in October 2014 and that they had no immediate concerns and that their comments will be presented in the 2014 annual pit slope review report.

The Mine reports that it is not able to clean loose rock off rockfall catch benches on account of safety concerns. However Section 6.23.2 of the Code states that:

> *Where a surface mine is worked in benches*
> *(1) each catchment berm shall be designed so that its final width will not be less than 8 m,*
> *(2) notwithstanding section 10.5.8, loose rock and soil shall not be allowed to accumulate on a bench or catchment berm in a manner that endangers any person working on a lower bench, and*
> *(3) where loose rock accumulates and where access cannot be gained to clean the catchment berm, and a danger exists to a person working below, a safe working procedure shall be developed.*

Inspection Orders:

Pursuant to Permit M-200 and Section 6.23.2(3) of the Code, prior to re-commencing mining the Mine shall develop a safe working procedure for locations where loose rock accumulates and where access cannot be gained to clean the catchment berm, and a danger exists to a person working below. A copy of the Safe Work Procedure shall be submitted to MEM for review.

Location: Waste Rock Dumps

Observations and Comments:

At the time of our review material was being reclaimed from a NAG dump by excavating at the toe. The resulting excavation face is oversteep.

Inspection Orders:

Pursuant to Section 6.23.3, 6.23.4 and 6.23.5 of the Code, the excavated faces shall not exceed a 60 degree angle, shall not overhang, and shall be recontoured to a stable angle once reclaim work is completed.

CLOSURE

Under Section 15 (6) of the Mines Act, a written response is required from the Mine Manager within 15 days of the receipt of this Inspection Report. Please address response to undersigned with copies to Steve Rothman, John Cox, George Warnock, and Heather Narynski. In addition, Section 30 (1) of the Mines Act requires this Inspection Report to be posted in a conspicuous location at the mine site for 30 days.

Please feel free to contact the undersigned with any questions or comments.

Signed and sealed on original file copy

Michael Cullen, P. Eng.
Ministry of Energy and Mines

Dated: December 5, 2014