

**MEMO**

To Mount Polley Mine
Attention: Colleen Hughes
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From Ward van Proosdij

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AMEC File No. VM00560B

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Date 28 July 2014

Reviewed by Dan Emerson, P.Geo.

Subject Mount Polley Mine TSF Expansion

1.0 INTRODUCTION AND BACKGROUND

AMEC was requested by Mt. Polley Mining Corporation (MPMC) to do a review of the existing monitoring well network in the Tailings Storage Facility (TSF) area in view of a planned TSF expansion. A planned raise of the TSF will result in an expanded footprint putting some of the existing monitoring wells at risk of being destroyed. MPMC requested that AMEC review the location and existing database of the monitoring well network and determine which wells will require moving and which well should be retained.

The following information has been provided by MPMC:

- Appendix F, MPMC 2013 Annual Environmental and Reclamation Report,
- The 1996 and 2012 well installation borehole logs and tables, and
- 1996 through 2012 groundwater well water level graphs.

The monitoring wells in question are all directly adjacent to the TSF, and have been strategically placed to allow for water level and water quality monitoring of the local groundwater, Figure 1. At each well location both a shallow and deep well has been installed in drilling programs performed in 1996 and 2000. Water level measurements and water quality sampling have been performed on a bi-annual basis. The water quality bi-annual or annual analysis has been focused on nine parameters of concern; Hardness, Sulphate, Nitrate, Aluminum, Arsenic, Cadmium, Copper, Molybdenum, and Selenium.

The question to be addressed in this memo is; should any of the monitoring wells should be moved to a new location due to the planned expansion of the TSF; and secondly if the monitored groundwater quality results warrant a modification of the current program, either

through replacing existing monitoring wells or incorporating monitoring well protection in the tailings expansion design.

2.0 DATA ANALYSIS

The proposed TSF footprint expansion was reviewed, together with all available relevant information related to groundwater monitoring well installation, measured groundwater levels and water quality analysis. The following observations can be made:

- Wells GW00-1A/B, GW00-2A/B, GW00-3A/B, and GW96-4A/B are all very close to the proposed stripping limits and well GW96-3A/B is near an existing pond that will likely be decommissioned as part of the expansion.
- Monitoring well GW00-1A/B is the only well with a strong upward trend in some parameters suggesting some influence from the TSF.
- Monitoring wells GW96-2B and GW96-4B each show some indication of upward trend in some parameters.

3.0 RECOMMENDATIONS

Expansion of the TSF to positions very near existing monitoring wells does not compromise the quality of data collected from the wells, barring any logistical issues or physical damage to the well. Technically none of the wells need to be moved. The following modifications are proposed for your monitoring network:

- GW96-3A/B is close to the seepage recovery pond which will likely need to be moved putting this monitoring well pair within the construction area. This pair should be relocated downgradient as shown on Figure 1.
- GW00-1B and GW96-4B each show some indication of impact from the TSF. Each of these wells should be retained and additional wells constructed downgradient to measure the extent of the impact, Figure 1. Water quality should be monitored in both the existing and new wells for a period of one year. The existing wells can be abandoned after that.
- GW00-2A/B and GW00-3A/B do not indicate any impact from the TSF. These two well pairs can be replaced by a single well pair as shown on Figure 1.
- GW96-5A/B has been decommissioned. This well served as an upgradient monitoring well. Upgradient monitoring wells are important in the interpretation of water quality trends in monitoring wells surrounding the TSF. Consideration should be given in replacing this well pair at a location upgradient of the TSF (Figure 1).

Any new monitoring well pairs should be located considering the maximum anticipated extent of the TSF to avoid any logistical issues for construction. Monitoring wells close to the toe of the embankment may experience shear due to small lateral movements of foundation soils.

4.0 CONCLUSIONS

All of the existing monitoring wells are close to the limits of the tailings facility expansion. Only one should be retained with some focussed effort, GW00-1A/B due to water quality trends. One well will require moving due to proximity to expected construction efforts, GW95-3A/b. All other wells can theoretically be retained. There is a danger in retaining any of these wells during construction that they will be damaged. The construction contractor may have significant complaints in retaining these monitoring wells and it may increase the cost of construction. There is no technical reason to retain these remaining wells and all can be replaced if required for logistical reasons in tailings expansion construction, Figure 1.

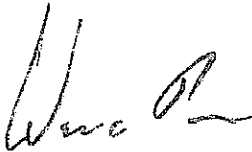
5.0 CLOSURE

AMEC thanks you for this opportunity to have been of service. Should you have any questions, please contact the undersigned.

Respectfully submitted,

**AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited**

Reviewed by:



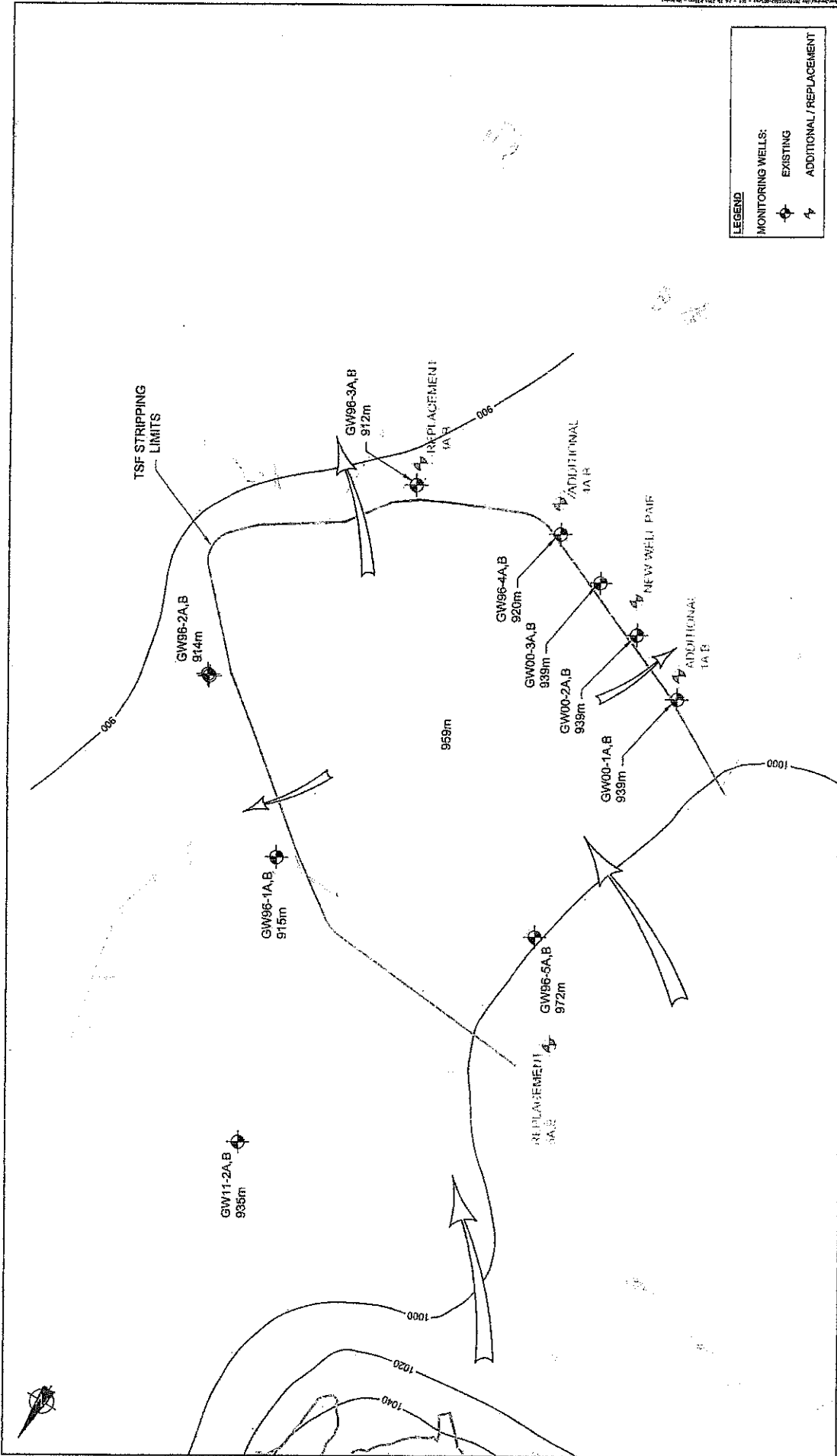
Ward van Proosdij, M.Sc., Ing.
Associate Water Scientist



Dan Emerson, P.Geo.
Senior Associate Hydrogeologist

Attachment: Figure 1 – Map of the Location TSF and Existing/Future Groundwater Monitoring Wells

FIGURE 1
MAP OF THE LOCATION OF THE MOUNT POLLEY MINE



LEGEND
 MONITORING WELLS:
 ◉ EXISTING
 ↗ ADDITIONAL / REPLACEMENT

DATE: JULY 2014 PROJECT NO: 00105960 REV: 02		PROJECT: MT. POLLEY TITLE: MONITORING WELL REVIEW	
DRAWN BY: [blank] CHECKED BY: [blank] DATE: [blank]		PROJECT: MOUNT POLLEY MINING CORPORATION AMEC Environment & Infrastructure 500 West 42nd Street, Suite 1000 Denver, CO 80202-1300, USA TEL: 303.733.1400 FAX: 303.733.1404 	
CLIENT LOGO: Imperial 		PROJECT: MOUNT POLLEY MINING CORPORATION AMEC Environment & Infrastructure 500 West 42nd Street, Suite 1000 Denver, CO 80202-1300, USA TEL: 303.733.1400 FAX: 303.733.1404 	
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NOTE: THE DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC ENVIRONMENT & INFRASTRUCTURE REPORT NO. WAD080 DATED JULY 2014.

DRAFT

PROJECT: MOUNT POLLEY
 TITLE: MONITORING WELL REVIEW
 GENERALIZED GROUNDWATER HEADS AND FLOW DIRECTIONS WITH TSF STRIPPING LIMIT

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