TECHNICAL MEMORANDUM

Golder Associates Ltd.
500 – 4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone: 604-296-4200
Fax Access: 604-298-5253

TO:	Louise Grondin	**DATE:**	July 27, 2007
	Meadowbank Mining Corp.	**DOC. NO.:**	499
FROM:	Willy Zawadzki / Christine Bieber	**JOB NO:**	06-1122-386/2000
EMAIL:	dchorley@golder.com		
CC:	Valérie Bertrand, Dan Walker, Craig Goodings		
RE:	**UPDATED PREDICTIONS OF BRACKISH WATER UPWELLING IN OPEN PITS WITH MINING RATE OF 8500 TPD, MEADOWBANK PROJECT, NUNAVUT**		

1.0 INTRODUCTION

The following technical memorandum presents updated predictions of brackish groundwater upwelling in open pits at the Meadowbank Project in Nunavut. Previously upwelling predictions were provided in March 2007 (Golder, 2007b) and were based on the mine plan presented in Golder (2005). The updated predictions are based on the new mine plan that assumes an accelerated mining rate of 8500 TPD.

In the 8500 TPD mine plan, the Goose Pit reaches its ultimate depth in Year 4 of mine life while mining in the Portage Pit is completed in Year 5. The planned deposition of tailings has also been revised based on the accelerated mining rate. These changes in the mine schedule were simulated in the groundwater model developed for the site (Golder 2004, Golder 2006). Except for the changes in mine schedule, no modifications were made to model input parameters that were used in previous predictions. The updated predictions of groundwater inflows quantity and quality for the 8500 TPD mine plan are presented below.

2.0 PREDICTED GROUNDWATER INFLOW QUANTITY AND QUALITY

2.1 Base Case – 8500 TPD Mine Plan

Predicted groundwater inflow quantity and quality for the Base Case scenario are presented in Table 1.

TABLE 1: Summary of predicted groundwater inflow – base case

Year	Portage Pit (m^3/day)	Goose Pit (m^3/day)	Drainholes (m^3/day)	Total Flow (m^3/day)	Average TDS (mg/l)
Year 1	1600	800	0	2400	1000
Year 3	1300	1600	300	3200	1500
Year 4	1300	1000	900	3200	2300
Year 5	1500	1000	100	2600	2100

The model-predicted inflows and average concentration of total dissolved solids (TDS) in water are for groundwater inflow only: from seepage through competent bedrock and the Bay Zone and Second Portage faults below dikes, pit wall depressurization holes, and storage and flow from shallow sediments. The current estimate does not consider dilution by direct precipitation in the pit or leakage through the dike above the cut-off wall in the native till. Seepage modelling performed during dike design (Golder, 2007a) has indicated that the component of flow occurring through the dike above the cut-off wall installed in the native till is relatively low (<100 m^3/day) throughout mine life. Direct precipitation is accounted for separately in the site-wide water quality model (the GoldSim model). The TDS concentration and quantity of the water at the discharge to the lakes are later calculated using the GoldSim model by summing the various inflow components.

2.2 Sensitivity – 8500 TPD Mine Plan

A sensitivity analysis was conducted to assess the effects of assumed values of hydraulic conductivity and TDS on predictions of water quality and water quantity. These analyses involved a review of the results of previous sensitivity simulations at the Meadowbank Site and one additional simulation where the hydraulic conductivity of all fractured rock zones (enhanced permeability zones) in the model was increased by a factor of three.

Results of previous sensitivity simulations carried out at the Meadowbank project (Golder, 2006) indicate that changes in the TDS concentration at all depths in the profile are directly related to the changes in the predicted TDS of mine inflows. For example, if the TDS at all depths in the profile were increased by a factor of three than the TDS of mine inflows would also increase by three times. This result suggests that the TDS of mine inflows could be up to three times higher than the base case if the actual TDS of groundwater at the site is three times greater.

Results of a sensitivity run where the hydraulic conductivities of all fault zones were increased by a factor of three are summarized below. In this simulation all other model input parameters were left unchanged from the ones used in the base case model.

TABLE 2: Summary of predicted groundwater inflow - sensitivity

Year	Portage Pit (m^3/day)	Goose Pit (m^3/day)	Drainholes (m^3/day)	Total Flow (m^3/day)	Average TDS (mg/l)
Year 1	1800	900	0	2700	1200
Year 3	1700	2300	300	4200	2300
Year 4	1800	1800	1000	4600	3500
Year 5	2300	1200	100	3600	3100

The results of this sensitivity simulation indicate that if the hydraulic conductivities of the Second Portage and Bay Zone Faults are increased by approximately three times, groundwater inflows to the mines could be up to 40% greater than in the Base Case Scenario and the predicted average TDS could be up to 50% higher than the Base Case.

3.0 REFERENCES

Golder Associates Ltd. 2004. *Predictions of Brackish Water Upwelling in Open Pits, Meadowbank Project, Nunavut*, submitted to Cumberland Resources Ltd. March 8, 2004

Golder Associates Ltd. 2005, *Alternative Waste and Water Management Plan Meadowbank Gold Project, Nunavut*, submitted to Cumberland Resources Ltd. March 7, 2005

Golder Associates Ltd. 2006, *Update to Predictions of Brackish water Upwelling in Open Pits Meadowbank Project, Nunavut*, submitted to Cumberland Resources Ltd. December 6, 2006.

Golder Associates Ltd. 2007a, *Final Report Detailed Design of Dewatering Dikes, Meadowbank Gold Project*, submitted to Cumberland Resources Ltd. March 13, 2007.

Golder Associates Ltd. 2007b, *Revised Predictions of Brackish water Upwelling in Open Pits Meadowbank Project, Nunavut*, submitted to Cumberland Resources Ltd. March 26, 2007.

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