

May 28th, 2010

Mr. Dennis Gourde, P.Eng.
General Manager
Agnico – Eagle Meadowbank Division
Baker Lake Office

Email: denis.gourde@agnico-eagle.com

Dear Mr. Gourde,

**Report No 6
Meadowbank Mine Dike Review Board
Meeting April 30th, 2010**

1.0 INTRODUCTION

The one day dike review meeting was held, in the Burnaby B.C. offices of Golder Associates Limited (GAL), to receive an up-date on the status of the project, to learn of responses to the previous report from the Board, and to review the site investigations and the design of the southern portion of the Bay-Goose dike. Additional items were presented for information.

The sequence of presentations and discussions followed the agenda as presented in Attachment A.

All three Board members were present at the meeting. A list of the persons participating in the discussions is presented in Attachment B.

Prior to and during the meeting, information packages were provided in electronic format. The presentations were made available in hard copy during the meeting and a compilation of the presentations was produced at the close. A list of the documents made available is included in Attachment C.

In the report which follows, the Board's recommendations are underlined.

2.0 RESPONSES TO RECOMMENDATIONS FROM REPORT NO 5

GAL transmitted responses to the comments and recommendations from the Board's previous report by way of a letter to AEM dated April 27, 2010. The responses were satisfactory and there are no outstanding issues.

3.0 BAY-GOOSE DIKE SOUTH PORTION

3.1. Geotechnical Investigations

A detailed presentation was made of the work undertaken during the past winter period. Field work has been completed but some laboratory testing is still underway. The programme was ambitious but very successful with high quality results being achieved. The data management is at a high level and the results

of the programme will provide an adequate basis for finalizing the design of this part of the works to “Issued for construction” level. Three depressions in the dike profile have been identified as Channels 1 to 3 from the NW to the SE of this portion. The Board notes that the low point in the rock profile in Channel 3 has not been adequately defined but this can be resolved by air-track soundings from the construction platform. It is also noted that no inclined holes, that may have better characterized the fault zone in this same depression, were included in this years programme. However, it is anticipated that adjustments can be made, if necessary, to the grout pattern during construction to deal with any higher permeability.

3.2. Design

3.2.1. Design modifications proposed:

- A minor change has been made to the alignment at the NW abutment.
- The mine now plans to use larger CAT 777 trucks instead of the 773 model and consequently the width of the haul road on the dike has been increased.
- In order to improve the sediment management, a causeway is being built on the lake side of the dike axis while there is still an ice cover on the lake. This embankment will reduce current velocities and provide a secure anchor for the silt curtains. It will be incorporated into the Bay-Goose dike. Though no incidents of instability have been reported during the construction, the deeper deposits of lakebed sediments (up to 6 m) as compared to the east dike and the adverse bed slope justify an evaluation of the potential risk to truck traffic.
- Some of the investigation boreholes encountered zones of rock with low RQD values. Moreover, mention was made in the documentation, that the set-back from the pit high wall may be tight in some areas. The Board suggests that a review of the set-back design be carried out. As the dike is of generous width, the set-back could be evaluated from the toe of a hypothetical minimum safe section.

3.2.2. Cross-sections

- Four typical sections have been proposed with improved cut-off details. The first is applicable to areas where the bedrock is at less than 5 m below the lake level, and the second for depths from 5 m to 6 m. Both will adopt a Soil-Bentonite cut-off. The third, for depths exceeding 6 m, employs a Cement-Soil Bentonite cut-off taken to rock. A fourth option where depths exceed the reach of the available equipment includes a cut-off, again of CSB, which will be anchored in firm till. The base width of the contact of the central zone of crushed rock on the till foundation increases progressively from the first to the fourth typical section. As was the case for the sections used in the northern portion of the Bay-Goose dike, no coarse filter is placed in contact with the foundation. Given the results of the investigations (no samples with less than 10% fines), the Board accepts the principle of the partial cut-off and concurs with the application the above mentioned typical sections.
- The Board notes that a large extended reach Komatsu PC 1250 excavator will be available to maximize the depth of cut-off construction to the degree practicable. The Board is pleased with this initiative as a

positive cut-off can be relied upon to a much greater extent than a grouted zone.

- The embedment of the cut-off in the till foundation will depend on a minimum excavation depth in till for the initial trench through sediments or the central crushed rock core zone and the maximum depth achievable for the cut-off. Consequently, the Board seeks clarification of the intended specifications for the control of these depths and of the approval process.
- The Board notes that the optimization of the densification methodology (vibro-densification and dynamic compaction) will be the responsibility of the sub-contractor and concurs with this approach.
- The Board also agrees with the proposal to determine the lateral extent of CSB and SB and to avoid the placing of CSB on SB.

3.2.3. Grouting

- For those lengths of the dike with only a partial cut-off, reliance is on the grouting to control piping (seepage) below the cut-off.
- The grouting in rock builds on the experience gained to date on the site. Improvements are being implemented in the northern portion; such as the change to thicker mixes at 240 litres rather than 400 litres of take.
- To date, the overburden treatment has been performed using a perforated pipe rather than true “Tube-à-Manchette” (TAM) methods. The Board notes that final control is now to be based on TAM and recommends that a three line treatment be carried out unless the cut-off embedment reduces the till window depth to less than 2 m.
- The Board recommends that jet grouting in the till and upper rock section be assessed as an alternative solution.
- The Board suggests that an analysis of the various methods be conducted to make a recommendation to AEM prior to the planned May 31st teleconference.
- The Board recommends that the “special washing” proposed prior to grouting in overburden be eliminated as it is an unproven method.
- As some concern has been expressed previously related to the use of air flush drilling techniques, the Board seeks clarification of the drilling methods that will be employed for the grouting works.
- The Board anticipates that the design and constructability considerations will honour the current mine plan; any departure would be considered as a mitigation activity.

3.2.4. Mitigation

- The Board accepts the role of expanded instrumentation for the partial cut-off sections, but cautions that instruments, while able to assist with the location of problem areas, may not give forewarning of an incipient piping condition; such as was the case at the East dike.
- Other more extreme efforts (remedial grouting, modified mine plan etc) will be evaluated on an as-needed basis in due course.

4.0 OTHER ISSUES

4.1 CPT studies

- A presentation was made of the re-interpretation of the CPT test results for the area of the East Dike sink hole. The study has been productive with some indication of the possible inclusion of pockets of granular material of higher permeability within the SB cut-off in this area. No further action is needed, but the Board anticipates presentation, at the July meeting, of a review of the dike performance.

4.2 Groundwater flow modelling

- Groundwater flow modelling has been carried out to assist with the design of the south portion of the Bay-Goose dike in channels 1 and 2. Relief wells were included as one option to control uplift pressures. However, the Board wishes to note that local hydraulic gradients may increase with such an installation and may not provide the intended protection against piping.

4.3 Frost heave studies

- A borehole has been put down at Stn 60+200 on the East dike in the vicinity of thermistor string BH185. Core samples from elevations: 133.0, 132.4 and 131.8 were recovered. The sampled zone brackets the depth of frost penetration according to the readings of thermistor TH185. The samples were examined for the presence of ice and measurements of water content were made. The quantity of ice observed was minor with no ice lensing perpendicular to the core (parallel to the freezing front). The Board suggests that the "Segregation Potential" of the SB material be determined and that further sampling be made in locations where the frozen/unfrozen boundary is fairly stable.
- Copies of a preliminary report on Seepage/Thermal modelling were distributed but time did not permit a presentation to be made on this subject. As the studies are ongoing, it is anticipated that the topic will be re-visited in July at the site meeting.

5.0 NEXT MEETINGS

The following meetings are proposed subject to confirmation by AEM:

- Teleconference call on May 31st (19h:30 Eastern Daylight Time) concerning the grouting design for the Bay-Goose dike;
- Site visit for July 26 to 29, 2010.

6.0 ACKNOWLEDGEMENTS

The Board once again wishes to thank the personnel of AEM and GAL for their participation in the meetings, and for the excellent documentation and presentations made by AEM and GAL which contributed to the efficiency and effectiveness of the proceedings.

The Board would also like to re-iterate their condolences to the GAL project team on the death of Rick Firlotte, the project sponsor who participated at the previous meeting in December.

Signed:

A handwritten signature in black ink, appearing to read 'N. R. Morgenstern', written above a horizontal line.

Norbert R. Morgenstern, P.Eng

A handwritten signature in black ink, appearing to read 'D. Anthony Rattue', written above a horizontal line.

D. Anthony Rattue, P.Eng.

A handwritten signature in black ink, appearing to read 'Andrew M. Robertson', written above a horizontal line.

Andrew M. Robertson, P. Eng.

ATTACHMENT A

AGENDA FOR BOARD MEETING NO. 6

April 30th, 2010

AGNICO-EAGLE MINES - MEADOWBANK DIVISION

MEADOWBANK DIKE REVIEW BOARD

Meeting #6 - April 30, 2010

**4th Floor Main Boardroom, Golder Associates Office
500-4260 Still Creek Drive, Burnaby**

AGENDA

- 8:30 Welcome** (Continental Breakfast served)
- 8:35 Agenda Review and Approval**
- 8:40 MDRB Report No. 5 Review**
- 9:00 2010 Geotechnical Investigation** (Golder)
Bay-Goose Summary
- 9:45 East Dike** (Golder)
Freeze/thaw testing update
CPT program update
- 10:15 Coffee Break*
- 10:30 Bay-Goose Dike South Portion** (Golder)
Design Basis
Design Concepts and cross-sections
- 12:00 Lunch*
- 12:30 Bay-Goose Dike South Portion Continued** (Golder)
Treatment of Soils Left in Place
Grouting
- 14:30 Coffee Break*
- 14:45 Bay-Goose Dike South Portion Continued** (Golder)
Design Mitigation options
Instrumentation
- 15:30 2010 Dike Construction Update** (AEM)
Construction Status Update
2010 Construction Schedule
- 15:50 TSF** (AEM/Golder)
Proposed Bedrock Approval Procedure
- 16:00 Deliberation by the Board Members**
- 17:00 Preliminary report by the Board Members**
- 17:30 Closure**
- 19:00 Dinner Reservation (TBC based on travel schedules)*

ATTACHMENT B

ATTENDANCE AT APRIL 2010 MEETING Held at the Golder Associates office, Burnaby, B.C.

Attendance		
Gaston Blanchette	AEM	Dike Superintendant
Eric Lamontagne	AEM	Mine manager
Yohan Jalbert	AEM	
Michel Julien	Golder Associates	Project Manager
Annie Beaulieu	Golder Associates	
Grant Bonin	Golder Associates	Grouting Specialist
Trevor Carter	Golder Associates	
Karine Doucet	Golder Associates	
Fiona Esford	Golder Associates	
Dan Walker	Golder Associates	
Lynn Wilson	Golder Associates	
Norbert Morgenstern	Self	Dike Review Board
Anthony Rattue	SNC Lavalin	Dike Review Board
Andrew Robertson	Robertson Geoconsultants	Dike Review Board

ATTACHMENT C

LIST OF FURNISHED DOCUMENTS

Golder Associates, 2010(a), "Response to report No. 5, Meadowbank Dike Review Board", April 2010.

Golder Associates, 2010(b), "Interim summary of 2010 geotechnical investigation, Bay-Goose Dike, Meadowbank Gold Project, Nunavut", April 2010.

Golder Associates, 2010(c), "Preliminary design for the south portion of the Bay-Goose Dike, Meadowbank Gold Project, Nunavut", April 2010.

Golder Associates, 2010(d), "Additional CPT analysis for the East Dike, Meadowbank Gold Project, Nunavut", April 2010.

Golder Associates, 2010(e), "Summary verification testing on cement-soil-bentonite mix design for the Bay-Goose Dike cut-off wall, Meadowbank Gold Project, Nunavut", April 2010.

Golder Associates, 2010(f), "Bay-Goose Dike project, groundwater flow modelling and sensitivity analysis to assess hydraulic head and gradient distribution under Bay-Goose channel 1 and channel 2, Meadowbank Gold Project, Nunavut", April 2010.

Golder Associates, 2010(g), "Coupled seepage-thermal analysis for the East Dike, Meadowbank Gold Project, Nunavut", April 2010.

Golder Associates, 2010(h), "Binder and electronic copy of PowerPoint presentations made on April 30th"