Appendix 13

Meadowbank MDRB Report No 25A

December 15th, 2019

Mr. Luc Chouinard
General Manager
Agnico–Eagle Mines, Meadowbank Division
Baker Lake Office

Email: luc.chouinard@agnico-eagle.com

Dear Mr. Chouinard,

Report No 25A
Meadowbank Mine Dike Review Board
Meetings September 9-11 and November 26, 2019

1.0 INTRODUCTION

The 2019 meeting of the Dike Review Board was held on site as planned from September 9th to 11th and subsequently in Montréal on November 26th. The Board is now comprised of two members, Mr. D. W. Hayley and Mr. D. A. Rattue. Both members attended these meetings.

The objectives were to review the status of the operation of water and tailings retention structures at Meadowbank and the construction and operation of the new dikes at Amaruq. In September, the time was spent primarily on the site visit. The formal presentations by AEM staff and consultants were deferred to the November meeting. This report covers the observations relating to the site visit and the discussions of the Meadowbank facilities. The contents of a preliminary report transmitted in September have been incorporated into this document. A companion report presents the observations pertaining to the Amaruq project.

The agenda for the November meeting and the list of participants are included in Attachments A and B respectively.

The Board made a field visit, by vehicle and on foot, to observe conditions at the In-Pit tailings disposal in the Bay-Goose Pit, the Bay-Goose and East Dikes, Central Dike, Stormwater Dike, and the Saddle Dams.

A selection of photographs taken during the visits are included in Attachment C.

The subject matter is presented in this report in the same order as the site visit. The recommendations are underlined in the text.

2.0 IN-PIT TAILINGS DISPOSAL

Since February, 2019, tailings have been discharged from the top of the eastern high wall of the Bay-Goose pit. See photos Nos. 1 and 2. With a composition of approximately 55% water and 45% solids. Water was also pumped from the seepage pond (photo No. 4) at Central Dike, the resulting tailings deposit is entirely sub-aqueous. The Board suggests that bathymetric surveys be conducted on a regular basis in order to determine the in-situ density and topography. At meeting No. 24 (2018), there was discussion pertaining to the consolidation rate of the sub-aqueous tailings and its effect on permeability that that would control seepage through the deposit. A bathymetric survey would add to the database and improve long term understanding of in-situ conditions.

For the coming winter season, it is understood that a second pipeline will be laid on the access ramp to permit discharge from a lower bench and thus reduce the potential ice accumulation on the wall.

Reclaim water is being pumped from the Bay-Goose Pit to Pit A (photo No. 3), where additional settling may take place before transfer to the process plant.

There was a brief mention of the in-pit disposal during the November presentations. The Board understands that the bathymetric surveys have begun but additional calibration with a second survey is required to obtain reliable information on the in-situ densities.

3.0 TAILINGS STORAGE FACILITY

The Board is pleased that the in-pit disposal was accepted and the parallel operation will permit strategic placement of tailings in the North and South ponds of the existing Tailings Storage Facility (TSF) under suitable weather conditions to enhance the formation of a uniform sloped drainage surface. The beach at Central Dike has reached its final elevation (photo no. 5). Note that closure details for the TSF and the spillway configuration are yet to be finalized. Placing of the rockfill cover on the North Cell is advancing as seen in photo no. 6.

Temperature measurements in the tailings deposits of the North and South cells are desirable to determine the freeze back of the deposits and the foundation. The Board endorses all efforts to enhance the knowledge of the evolution of temperatures.

The November presentations included information on the sequence of spigotting points and the strategy behind the disposal geometry over the preceding twelve-month period. The Board considers the facility to have been well managed. Additional room for disposal in the North Cell is available and the Board recommends that design for closure be advanced to the point permitting the final geometry to be determined. As Non-PAG rock may be in short supply, the optimal distribution of the available material could be usefully established once the desirable surface topography is known.

4.0 BAY-GOOSE AND EAST DIKES

Some instrument data was transmitted to the Board in advance of the visit. No adverse condition has been noted and the dikes continue to serve their intended purpose of retaining the water of

the Second and Third Portage Lakes. The November presentations confirmed the satisfactory performance.

It is to be noted that the period of in-pit deposition of tailings and the period for attaining a geochemical equilibrium that will satisfy the regulatory requirements at mine closure will extend the required life of these dikes for another 8 or 9 years. Consequently, the surveillance and maintenance still constitute important components of the work. The Board recommends that AEM and the designer, Golder Associates, carry out a review of the instrumentation in order to identify the critical installations and to determine the scope of instrumentation that has to be maintained functional for this time frame.

There are a few unexplained instrument readings which merit a detailed analysis in order to better understand the behaviour, given the anticipated remaining life span of these structures.

5.0 STORMWATER DIKE PERFORMANCE

Since the previous visit, tailings have been deposited in the South Cell at the toe of the Stormwater dike. This material effectively provides a buttress to the dike and eliminates the concerns that were expressed earlier about the integrity of the dike subsequent to the observation of cracks on the dike crest starting in 2016.

The presentation of the monitoring data confirmed the current satisfactory performance.

6.0 CENTRAL DIKE PERFORMANCE

AEM reports acceptable behaviour of this structure based on visual observation and, the Board agreed. The most recent instrument readings discussed at the November meeting enhanced this viewpoint. Most notable is the significant reduction in seepage inflow reporting to the downstream pond. This has been attributed to a blanketing effect of tailings deposited over the rock outcrops on the right bank of the South Cell. This was discussed with the board and there was agreement that deposition of tailings over the shallow fractured rock is likely the principal reason for this improvement.

The orange bacteria related coloration of the downstream pond was again noted this summer during the warmer weather periods. However, this has disappeared by the time of the visit (photo no. 4).

AEM has developed a preliminary program plan for replacement of some of the instruments that are noted to be defective. The boreholes will be located on the downstream berm in order to facilitate access and avoid damaging the geomembrane. The Board concurs with the decision to replace some instruments but recommends that a thorough review of the performance of the structure and the foundation to date be made to establish the questions that need to answered by the instruments, and the optimal location thereof. Not all instruments, and particularly piezometers situated in frozen ground need to be replaced. The central dike will have a role to play for several years and its integrity must be assured.

7.0 SADDLE DAM PERFORMANCE

No adverse behaviour has been noted in these structures over the preceding 12-month period and the visit revealed no specific observations.

8.0 WASTE ROCK STORAGE FACILITY

Thermal modelling of the Waste Rock Storage Facility (WRSF) is being carried out in preparation for closure planning. At this time, the primary goal is to establish the need for additional instrumentation. No details of the geothermal model adopted by the consultant or the input parameters were presented but it was mentioned that some apparent anomalies in the results have been noted. These pertain to the difference in temperature distributions on the north facing and south facing slopes. Clarification is required but the Board anticipates that the work will be presented at the next meeting.

Two climate change models have been considered to date: RCP4.5 and RCP6.0. The Representative Concentration Pathways (RCPs) are scenarios proposed by the Intergovernmental Panel on Climate Change (IPCC) with a view to ensuring that projections are employed consistently across the various branches of climate science. There are four scenarios with RCP2.6 and RCP8.5 bracketing the two mentioned above. The Board considers that RCP6.0 is likely to be an appropriate model going forward. However, it is recommended that Canadian Standards Association's (CSA) recent update of their guideline document: CSA Plus 4011:19 (June 2019) "Technical Guide: Infrastructure in Permafrost: A Guideline for Climate Change Adaptation" be consulted when selecting appropriate parameters for final closure of the Meadowbank site. The CSA guideline documents the standards pertaining to design of structures throughout northern territories in Canada and provides a new benchmark for review and acceptance of projects in regions of permafrost.

A copy of the CSA guideline Plus 4011:19 was provided to Thomas Lepine by Don Hayley for his review.

9.0 PERIODIC REPORTING AND OSM MANUALS

In advance of the November meeting, the Board was provided with copies of the latest quarterly reports for various structures and the most recent revisions of the Operation, Surveillance and Maintenance (OSM) manuals. The reports and the manuals are prepared primarily for internal use by personnel involved with the facilities and for the information of management but also for the Regulator. Although these documents were provided to the Board members for information, the Board has the following observations to make.

While the content is detailed, there is room for improvement in the quarterly reports to facilitate comprehension. The large table on instrument characteristics could be presented as an appendix. The graphical presentation of the instrument readings could include a time evolution and could usefully include the inter-annual tendencies as of the date at the end of the quarter, rather than being restricted to results of the three-month time frame.

The OSM manuals could better describe the roles and responsibilities under various scenarios. The alignment with regulator requirements and with the Mining Association of Canada (MAC) and Canadian Dam Association (CDA) guidelines could usefully be mentioned.

As the MDRB figures in the list of persons and bodies having a contribution, the Board would appreciate being a recipient of the OSM manual revisions.

10.0 NEXT MEETINGS

The Board anticipates that the next meeting will be held in early September 2020 and that any other participation will be through ad-hoc conference calls. The Board awaits instruction from AEM in this regard.

11.0 ACKNOWLEDGMENTS

The Board wishes to thank the personnel of AEM for the organization of logistics and for their participation in the September visit and the November meeting. The Board also recognizes the contribution of the Golder Associates representative at the November meeting.

Signed:

Don W. Hayley, P. Eng D. Anthony Rattue, P. Eng.

ATTACHMENT A

AGENDA FOR BOARD MEETING NO. 25A

November 26th and 27th, 2019

Agnico Eagle Mines - Meadowbank Division
Meadowbank Dike Review Board
Meeting # 25 - November 26 to 27, 2019
Meeting Location : Fairfield Inn & Suites by Marriott Montreal Airport
AGENDA

DAY 1 - November 26	**Time allocated**	**Start**	**End**
P1 - Welcome, Review of the Agenda [AEM]	0:30	8:00	8:30
Review of Answers to MDRB Report #24	0:30	8:30	9:00
P2 - Overview of Meadowbank Dewatering Dike Performance [AEM]	1:00	9:00	10:00
Break	0:15	10:00	10:15
P3 - Tailings Management - Operations [AEM]	1:00	10:15	11:15
P4 - Closure Update TSF/WRSF [AEM]	0:45	11:15	12:00
Lunch	1:00	12:00	13:00
P5 - Tailings Management - Dike Performance and Instrumentation - North Cell / SWD [AEM]	1:30	13:00	14:30
P6 - Tailings Management - Dike Performance and Instrumentation - South Cell [AEM]	1:30	14:30	16:00
Break	0:15	16:00	16:15
Deliberation by Board Member (Day 1)	0:30	16:15	16:45
DAY 2 - November 27			
P7 - Summary of Whale Tail Project 2018-2019 Construction Season (WTD,WRSF,NE,MammothI) [SNC]	1:00	8:00	9:00
P8 - Whale Tail Dike Performance [AEM]	2:00	9:00	11:00
P9 - Performance of WRSF Dike [AEM]	1:00	11:00	12:00
Lunch	1:00	12:00	13:00
P10 - Performance of Mammoth and NE Dike [AEM]	1:00	13:00	14:00
P11 - Pre-Feasibility Study for Water Management Infra - Amaruq Phase 2 [SNC]	1:00	14:00	15:00
Break	0:15	15:00	15:15
Deliberation by the Board Members	0:45	15:15	16:00
Preliminary Report by the Board Members	1:00	16:00	17:00
Meeting Closure			

ATTACHMENT B

ATTENDANCE AT NOVEMBER 2019 MEETING
Held at the Fairfield Marriott Hotel, Dorval, Québec

Attendance		
Fredérick L. Bolduc	AEM	Geotechnical Coordinator
Jesse Clark	AEM	Geotechnical Coordinator
Yan Coté	AEM	Engineering Manager
Rebecca Cousineau	AEM	Geotechnical Engineer
Patrice Gagnon	AEM	Geotechnical Engineer
Éric Haley	AEM	Water & Tailings EIT
Alexandre Lavallée	AEM	Geotechnical Coordinator
Thomas Lepine	AEM	EoR – Technical Specialist, Env. Management
Bruno Lessard	AEM	Instrumentation Specialist
Pier-Eric McDonald	AEM	Geotechnical Engineer
Pascal Poirier	AEM	Water & Tailings Engineer
Christian Tremblay	AEM	Geotechnical Engineer
Yves Boulianne	GAL	Geotechnical Engineer
Don Hayley		Dike Review Board
Anthony Rattue		Dike Review Board

ATTACHMENT C

Photographs taken during the site visit.

September 9thth, 2019

Photo No. 1 Bay-Goose Pit

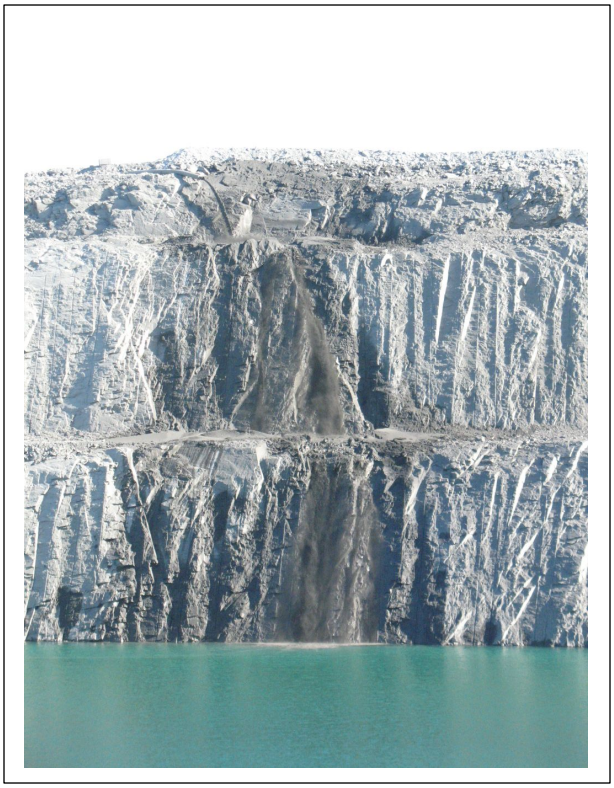

Photo No. 2 In-Pit Tailings deposition

Photo No. 3 Pit A, Settling Pond

Photo No. 4 Pond at toe of Central Dike

Photo No. 5 Tailings beach against Central Dike

Photo No. 6 Advance of rockfill cover over North Cell of the TSF

AGNICO EAGLE

To: D. Anthony Rattue and Don W. Hayley

From: Agnico Eagle Mines, Meadowbank, Nunavut Division

Date: January 29, 2020

RESPONSE TO COMMENTS, MEADOWBANK DIKE REVIEW BOARD No.25 – MEADOWBANK REPORT

The twenty-fifth meeting between the Meadowbank Dike Review Board (the Board) and Agnico Eagle Mines Limited (AEM) was held between November 26 and 27 2019 in Montréal. A separate visit to the Meadowbank and Amaruq mine site was conducted between September 9 and 11 2019.

The objective of the meeting was to have independent senior technical reviews on the design, construction and operation of water management structures and of the tailings management system at Meadowbank and Amaruq for the reference period of September 2018 to September 2019.

AEM Meadowbank Complex asked the Board to prepare two reports (one for the Meadowbank site and one for the Amaruq site) to reflect our operating licenses. On December 15 2019, the Board provided their reports (MDRB Meeting No 25 Meadowbank and MDRB Meeting No 25B Amaruq) with their recommendations. This letter provides the response from AEM related to the Board recommendations for the Meadowbank report. All Board recommendations related to Meadowbank are contained in the following table along with their location, action plan, current status, and anticipated completion date. This table will be used to follow up on each recommendation throughout the upcoming year and to update the Board when MDRB Meeting 25 is held.

Best Regards,

Frédérick L.Bolduc M.Sc.A, P.Eng. & Jesse Clark, P. Eng.
Geotechnical Coordinator
Meadowbank, Nunavut Division
Agnico Eagle Mine

MDRB25 Meadowbank Recommendations and Action Plan

AGNICO EAGLE

Location	Year [1]	Recommendation	Action Plan/Follow-up	Status	Completion Date
MDBK- Bay Goose Dike and East Dike	2019	It is to be noted that the period of in-pit deposition of tailings and the period for attaining a geochemical equilibrium that will satisfy the regulatory requirements at mine closure will extend the required life of these dikes for another 8 or 9 years. Consequently, the surveillance and maintenance still constitute important components of the work. The Board recommends that AEM and the designer, Golder Associates, carry out a review of the instrumentation in order to identify the critical installations and to determine the scope of instrumentation that has to be maintained functional for this time frame.	AEM will assess the current instrumentation setup for Bay Goose Dike and East Dike to determine if they will be adequate to monitor for at least 10 more years due to in-pit deposition. This work will be done with the dike designer and EOR. The critical installations that need to be maintained for this time frame will be identified. AEM will install additional instruments if necessary. This change in design basis for the structure will also be captured within the next revision of the OMS manual for the dewatering dikes.	Not Started	Q3 2020
MDBK- Bay Goose Dike and East Dike	2019	There are a few unexplained instrument readings which merit a detailed analysis in order to better understand the behaviour, given the anticipated remaining life span of these structures.	AEM will conduct a more detailed analysis on the unexplained instrument readings. These instruments will also be flagged and be followed more closely in the surveillance process.	Not Started	Q2 2020
MDBK- Central Dike	2018	Maintain current instrumentation coverage in case of defects and failures.	A strategy was developed for replacement of instruments at Central Dike in 2019 to maintain coverage. The campaign was schedulled for Q3 2019 but was postponed due to the need to allocate ressource at Amaruq due to water management issue. This campaign is now planned for Q3 2020.	Open	Q3 2020
MDBK- Central Dike	2019	The Board concurs with the decision to replace some instruments but recommends that a thorough review of the performance of the structure and the foundation to date be made to establish the questions that need to answered by the instruments, and the optimal location thereof. Not all instruments, and particularly piezometers situated in frozen ground need to be replaced. The central dike will have a role to play for several years and its integrity must be assured.	AEM will present the instrumentation replacement rationale to the designer and to the MDRB prior to installation to ensure that the instrument replacement location are optimal	Not Started	Q2 2020
MDBK- In-Pit Tailings Deposition	2018	Some concern noted with inadequate testing to determine hydraulic conductivity of tailings under high vertical confining pressure. More reliable finite strain consolidation modelling of tailings being placed at high rates is needed to understand fluxes from and through the deposit.	It is planned to conduct additional studies to validate model properties once in-pit deposition is fully initated and to use these data to update the deposition plan and hydrogeo model. The mains strategy to comply with this is to do bathymetric survey and re-assess deposition parameter.	Completed	Sep-20
MDBK- In-Pit Tailings Deposition	2019	The Board suggests that bathymetric surveys be conducted on a regular basis in order to determine the in-situ density and topography. At meeting No. 24 (2018), there was discussion pertaining to the consolidation rate of the subaqueous tailings and its effect on permeability that that would control seepage through the deposit. A bathymetric survey would add to the database and improve long term understanding of in-situ conditions.	AEM agrees with the Board on the usefulness of bathymetric surveys for the in-pit tailings deposition areas and plan to conduct them at a minimum frequency of twice per year during open water season. The bathymetric surveys are already used to determine the in-situ density and sub-aqueous topography which will improve the long term understanding of in-situ conditions. Due to the begining of tailing sdeposition in 2019 only one such survey was done and its reliability is questionable as it show a unrealistic high tailings density.	Ongoing	Summer 2020

MDRB25 Meadowbank Recommendations and Action Plan

Location	Year [1]	Recommendation	Action Plan/Follow-up	Status	Completion Date
MDBK- OMS Manuals	2019	The OSM manuals could better describe the roles and responsibilities under various scenarios. The alignment with regulator requirements and with the Mining Association of Canada (MAC) and Canadian Dam Association (CDA) guidelines could usefully be mentioned. As the MDRB figures in the list of persons and bodies having a contribution, the Board would appreciate being a recipient of the OSM manual revisions.	AEM agrees with the OMS manual improvements suggested by the Board and will implement them during the next update of the documents planned for March 2020. AEM will provide the updated OMS manuals to the Board once they are complete.	Ongoing	Q1 2020
MDBK- Periodic Reports	2019	While the content is detailed, there is room for improvement in the quarterly reports to facilitate comprehension. The large table on instrument characteristics could be presented as an appendix. The graphical presentation of the instrument readings could include a time evolution and could usefully include the inter-annual tendencies as of the date at the end of the quarter, rather than being restricted to results of the three month time frame.	AEM agrees the improvements suggested by the Board will improve the quarterly reports and will implement them. In particular, showing the time evolution of readings beyond the quarter will assist greatly with trend interpreation.	Ongoing	Q1 2020
MDBK- TSF	2019	Temperature measurements in the tailings deposits of the North and South cells are desirable to determine the freeze back of the deposits and the foundation. The Board endorses all efforts to enhance the knowledge of the evolution of temperatures.	AEM agrees with the Board that temperature measurements in the TSF are important for examining the freeze back. AEM will develop a plan to gather more temperature evolution data as per the closure strategy.	Not Started	Q1 2021
MDBK- TSF	2019	Additional room for disposal in the North Cell is available and the Board recommends that design for closure be advanced to the point permitting the final geometry to be determined. As Non-PAG rock may be in short supply, the optimal distribution of the available material could be usefully established once the desirable surface topography is known.	AEM will be advancing the closure plans in the upcoming year. Determining the final geometry of the North Cell will be of high priority to ensure enough NPAG rock is available. Closure work timeline will be reviewed in 2020	Closed	-
MDBK- WRSF	2019	The Board considers that RCP6.0 is likely to be an appropriate model going forward. However, it is recommended that Canadian Standards Association's (CSA) recent update of their guideline document: CSA Plus 4011:19 (June 2019) "Technical Guide: Infrastructure in Permafrost: A Guideline for Climate Change Adaptation" be consulted when selecting appropriate parameters for final closure of the Meadowbank site. The CSA guideline documents the standards pertaining to design of structures throughout northern territories in Canada and provides a new benchmark for review and acceptance of projects in regions of permafrost.	The CSA guideline document indicated by the Board will be consulted when selecting parameters for final closure of the Meadowbank site, including the WRSF.	Closed	-

1 : Previous year recommendations are kept only if they are outstanding