Water Resources
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

AANDC reference
CIDM# 953948

NWB reference
#2AM-MEL----

October 5, 2015

Phyllis Beaulieu
Manager of Licencing
Nunavut Water Board
Gjoa Haven, NU, X0E 1J0

Re: AANDC's Review of Agnico Eagle Mines Ltd.'s Application for a New Type A Water Licence for its Proposed Meliadine Gold Mine. Licence No. 2AM-MEL----

Dear Ms. Beaulieu,

Thank you for your email on August 27, 2015, concerning the above mentioned water licence application process.

A memorandum is provided for the Nunavut Water Board's (Board or NWB) consideration. Comments have been provided pursuant to the Department's mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

Please do not hesitate to contact me by telephone at 867-975-4282 or email at ian.parsons@aandc-aadnc.gc.ca for further comments or any questions.

Sincerely,

Ian Parsons, B.Sc
Regional Coordinator
Aboriginal Affairs and Northern Development Canada
P.O. Box 100
Iqaluit, NU, X0A 0H0

c.c.: Andrew Keim, A/Manager Water Resources, Nunavut Regional Office (NRO), AANDC
Erik Allain, Manager of Field Operations, NRO, AANDC

Memorandum

To: Phyllis Beaulieu, Nunavut Water Board

From: Ian Parsons, Regional Coordinator, Water Resources Division, AANDC

CC: Andrew Keim (AANDC)
Erik Allain (AANDC)
Christine Wilson (AANDC)
Karen Costello (AANDC)

Date: August 17, 2015

Re: AANDC's Review of Agnico Eagle Mines Ltd.'s Application for a New Type A Water Licence for its Proposed Meliadine Gold Mine. Licence No. 2AM-MEL----

Applicant:	Agnico Eagle Mine Ltd.
Project:	Meliadine Gold Project
Region:	Kivalliq

A. BACKGROUND

On August 27, 2015 the Nunavut Water Board (NWB or Board) provided notification to interested parties that Agnico Eagle Mines Limited Partnership (Agnico Eagle or the applicant) had completed submission of an application for a Type "A" water licence # 2AM-MEL---- for development work related to the mining of the Meliadine Gold Project.

Interested parties were asked to review the water licence application and provide technical comments by October 5, 2015

B. RESULTS OF REVIEW

On behalf of Aboriginal Affairs and Northern Development Canada's (AANDC) Water Resources Division, comments and recommendations are provided in the attached appendices for the NWB's consideration. These appendices include a memo prepared by ARCADIS on AANDC's behalf and a memo prepared by AANDC Water Resources staff.

Encl.
Internal Review Memorandum
ARCADIS memorandum

Internal Review Memorandum

Re: Aboriginal Affairs and Northern Development Canada's Technical Review of Agnico Eagle Mines Limited's Application for Meliadine Gold Project (New Application)
Type 'A' Water Licence No. 2AM-MEL

The following supplemental comments and information requests have been prepared as a part of the technical review for the above mentioned licence application. The following documents have been reviewed.

Nunavut Water Board (NWB 2AM-MEL)

- Main Application Document
- Landfill and Waste Management Plan
- Mine Plan
- Incineration Management Plan
- Hazardous Materials Management Plan
- Water Management Plan
- Explosives Management Plan
- Mine Waste Management Plan
- Preliminary Closure and Reclamation Plan
- Ore Storage Management Plan
- Environmental Management and Protection Plan
- Spill Contingency Plan
- Aquatics Effects Monitoring Program Design Plan
- Land farm Management Plan
- Quality Assurance / Quality Control Plan
- Roads Management Plan
- Public Engagement and Consultation
- Borrow Pits and Quarries Management Plan
- Risk Management and Emergency Response Plan

Comments and information requests are listed below.

Regulatory Authority:	Nunavut Water Board	Information Request No.	**AANDC 1**
Information Request From:	Aboriginal Affairs and Northern Development Canada		
Information Request for:	Agnico Eagle Mines Limited (Meliadine Gold Project)		
General Issue:	Water management associated with Waste Rock Storage Facilities		
References:	• Section 7.1.1- Water Management associated with Waste Rock Storage Facilities (WRSFs) (page no. 30) • Section 7.1.2- Water Management associated with Tailings Storage Facility (TSF) (page no. 31)		
Issue/Concern or Information Deficiency:	The details on water treatment technology (Water Treatment Plant-WTP) and its contaminant removal efficiency are not available.		
Rationale:	In section 7.1.1, the proponent states that, 'Seepage and runoff from the WRSFs during construction and operation phases will be managed using the water management system described below: • Seepage and runoff from WRSF1 within the catchment of Pond H17 will be diverted to CP1 via Channels 1, 7 and 8 (see Figure 5.6); • Seepage and runoff from WRSF1 within the catchment of Pond A54 will be diverted to CP5 via Channels 5 and 6 (See Figures 5.6 and 5.11); • Seepage and runoff from WRSF1 within the catchment of Lake B7 will be diverted and collected in CP4 via Channel 4 (See Figures 5.7); • Seepage water and runoff from WRSF2 within the catchment of Pond H17 will be diverted to CP1 via Channel1 and Channel7 or directly flow into CP1 (Figure 5.10); • Seepage water and runoff fromWRSF2 within the catchment of Pond A54 will be diverted to CP5 via Channel 6 (Figure 5.10); • Seepage and runoff fromWRSF3 will directly report to CP6 (See Figures 5.10); and • The water collected in CP4, CP5, and CP6 will be pumped to CP1, where the contact water will be treated by the WTP prior to discharging to outside environment.' In section 7.1.2, the proponent states that, 'The TSF is located within the catchment of Lake B7 with a small portion straddling the catchment of Pond H17 as shown in Figure 5.1. Water sources from the TSF during construction and operation will be managed as follows: • Seepage and runoff from the TSF within the catchment of Pond H17 will be diverted to the CP1 using Channel 1 (see Figure 5.6); • The seepage and runoff from the TSF within the catchment of Lake B7 will be diverted and collected in CP3 via Channel 3 (see Figure		

	5.7); and • The water collected in CP3 will be pumped to CP1, where the contact water will be treated by the WTP prior to discharging to outside environment. A commitment has been made by the proponent to treat the collected water by a water treatment plant (WTP) before discharging it to the environment but the details on the treatment system (s) have not been provided.
Information Request:	Please provide the details on the proposed water treatment technology to be used (Water Treatment Plant-WTP) and its contaminant removal efficiency. A detailed description of the management processes that will be in place to help ensure environmental protection in a pro-active manner is also requested.

Regulatory Authority:	Nunavut Water Board	Information Request No.	**AANDC 2**
Information Request From:	Aboriginal Affairs and Northern Development Canada		
Information Request for:	Agnico Eagle Mines Limited (Meliadine Gold Project)		
General Issue:	Chemical stability of tailings storage facility and waste rock storage facilities		
References:	Section 2.2 – Climate (page 7)		
Issue/Concern or Information Deficiency:	Supporting document and details on the impact of precipitation on mining waste are not available. The information is required to analyze the chemical stability of tailings storage facility (dry staking of tailings) and waste rock storage facilities.		
Rationale:	The proponent states: 'Mean annual precipitation at the mine site, based on the hydrological year from 1 October to 30 September, is estimated to be 411.7 mm after accounting for rainfall and snowfall under catch. Approximately 51% of precipitation occurs as rain (207.1 mm) and 49% occurs as snow (199.1 mm).' The proponent should analyze the impact of precipitation on dry-staked tailings (metal leaching and acid drainage). Such analysis can ensure the chemical stability of tailings storage facility. The proponent should also analyze the impact of precipitation on waste rock storage facilities for the chemical stability of waste rock storage facilities.		
Information Request:	Please provide details on chemical stability of tailings storage facility and waste rock storage facilities in light of the precipitation data and also provide supporting documents for the precipitation data.		

Regulatory Authority:	Nunavut Water Board	Information Request No.	**AANDC 3**
Information Request From:	Aboriginal Affairs and Northern Development Canada		
Information Request for:	Agnico Eagle Mines Limited (Meliadine Gold Project)		
General Issue:	Chemical stability of tailings storage facility and waste rock storage facilities		
References:	Golder, 2014 SD 6-3 Geochemical Characterization of Waste Rock, Ore, Tailings and Overburden, Meliadine Gold Project, Nunavut, Canada. A Technical Report Submitted to Agnico Eagle Mines Ltd. by Golder Associates, April 2014. (page no. 76)		
Issue/Concern or Information Deficiency:	The proponent should re-evaluate the geochemical chracteiraction program results since the mining plan is considered to be finalized.		
Rationale:	The proponent's consultant has recommended that, 'Upon modification or finalization of the mine plan, the geochemical characterization program results should be re-evaluated according to the chosen mining technique, development sequence and new pit outlines.'		
Information Request:	Please provide re-evaluation of characterization program test results for waste rock and tailings in light of consultant's (Golder's) recommendation.		

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MEMO

To:
Ian Parsons – AANDC

Copies:
Karen Costello - AANDC

From:
Charles Gravelle

ENVIRONMENT

Date:
September 24, 2015

ARCADIS Project No.:
702388-000

Subject:
Review of New Type A Water Licence Application by Agnico Eagle Mining Ltd.
Meliadine Mine, Rankin Inlet Nunavut

Enclosed herein are our comments regarding the New Water Licence Application by Agnico Eagle Ltd (AEM) for the development of the Meliadine Mine located near Rankin Inlet, Nunavut. Our review of the application included a review of the documents listed below. For ease of review comments have been provided on the respective plans and reports under separate headers. For the purposes of this review the evaluation of the RECLAIM cost estimate will be provided under separate cover.

Type A Water Licence Application Main Document

The Type A Water Licence Application main document, as presented by Agnico Eagle Mining Ltd (AEM), is a very thorough document with no major issues identified as reviewed. Some minor comments should be addressed in future amendments to select plans as listed in the Type A Water Licence cover letter.

Mine Plan

This plan prepared by AEM provides a detailed outline of the processes that will be undertaken at the site as part of the Phase I site development program and addresses the concerns and issues identified by the Nunavut Water Board (NWB) in their document entitled *Guide 4 – Completing and Submitting a Water Licence Application for a New Licence* and the *Supplemental Information Guide for Mining and Milling* (SIG-MM3 Guide).

We have no major concerns with this draft of the Mine Plan, as prepared in support of the New Water Licence application, with the understanding that as the mine development enters into later stages of design and construction some of the components of the Mine Plan may change and/or require amendment. Notwithstanding AEM's comment in the Mine Plan that this document will not be amended, it is understood that any changes to the Mine Plan would need to be documented and presented to the NWB for review prior to their implementation.

Some minor issues that should be clarified or addressed in the final version of the Water Licence Application:

1. On the basis of observations within the underground mine workings there is the potential for groundwater to enter into the open pit mine operations via the discontinuities in the host rock where the ore deposit is located. If the groundwater entering the underground workings at higher elevations is consistent with the results of groundwater testing at depth the groundwater entering the open pit may be saline (5 to 6% salt content) and not controlled by the permafrost as envisioned in the Mine Plan. Allowances should be made in the Mine Plan to address this potential concern with groundwater seepage into the open pits.
2. Some of the figures mix French and English text (for example Figures 2.9 and 2.10). For clarity all figures in the Mine Plan should be in English as the application is being made in English.
3. On Page 41 there is a reference to the location of the paste lines (a magenta and yellow line) however these lines are not clearly visible on Figure 2.11.

Project Screening Report

This Golder report does a good job linking the information provided in the Final Environmental Impact Statement (FEIS), incorporating stakeholder comments and explaining how the re-phasing of the mine development work will impact the local environment. In general the specific Terms and Conditions listed in the Screening Report, sourced from the Nunavut Impact Review Board (NIRB) review of the FEIS, have been addressed within various amended site plans as part of the Water Licence application. Term and Condition #90 regarding the risk of a temporary closure of the mine and how this will impact the local community is not explicitly addressed in the Screening Report and it is not clear to the reviewer where this specific concern is addressed in the various plans appended to the Water Licence application.

In Section 3.3 of the screening report we would suggest that the management of water within lakes A9 and A38 be added to the document as these lakes will be impacted by the open pit operations during operations and post-closure (Tiriganiaq Pit 1 and 2).

Water Management Plan

In general the Water Management Plan (WMP) addresses how the various sources of water will be managed during the various phases of the mine development. Some minor points of clarification are suggested relating to the following:

1. The management of lakes A9 and A38 need to be added to the WMP.
2. It is unclear where water from the underground mine workings that can be stored below grade will be stored at surface (no specific reference provided in the WMP).

3. Are the retention dykes and channels to be lined with a geomembrane? During the open water season how will the potential for impacted water from the Tailings Storage Facility (TSF) and the Waste Rock Storage Facility (WRSF) adjacent to Lake B-7 be addressed if the water is allowed to infiltrate into the overburden.
4. Some dialogue regarding the potential for groundwater infiltration from the ore body, as observed within the underground workings during a recent site visit, should be discussed given the potential for this groundwater to be saline on the basis of groundwater analysis to date. How will the mixing of groundwater with freshwater from surface impact the work?
5. In section 4.4.10 (Sludge Management from Water Treatment Plant), has consideration been given to how sludge from the underflow (discharged during the last quarter of Year -1) may impact the CP-1 pond in the short or long term?
6. How will water from the Emulsion Area be transferred to the CP-1 pond.
7. Where is Culvert 1 on the site plan?
8. In Section 8.3 there is a reference to an email from Environment Canada regarding arsenic concentrations in CP-4 during the post closure phase of the program. The plan states " These arsenic concentrations (Golder, 2013a) are within the tolerance levels that have been deemed non deleterious by Environment Canada for the Project (Environment Canada 2014)." Can a copy of the email from Environment Canada be provided in the WMP report so that it is clear what was stated in the email?
9. The results of the arsenic testing to date suggest that there is the potential for seepage of arsenic-impacted water from the tailings and waste rock storage facilities (notwithstanding the email referenced above in Item #8) and as such a contingency plan should be included in the WMP .
10. Water monitoring locations need to be added to the overall plan so as to address discharge points post-closure. Monitoring stations are needed at the inlet to Lake A8 from the Open Pit 1 and 2 discharge flow paths and two monitoring stations are needed at the inlet to Lake B7 from the dyke D-CP-3 and D-CP-4 locations which will be breached as part of the post closure program.
11. For clarity we would recommend that the monitoring frequency be added to Table 9.1.
12. It is unclear to the reviewer which monitoring stations will be sampled as part of the water licence and how the reporting will be done as some locations are identified as "Regulatory" and others are "Verification". The WMP states that only "Regulatory" stations will be reported annually. We would suggest the results of all water testing be provided in the annual report for the site.

Mine Waste Management Plan

No major concerns with the MWM plan. A minor comment regarding the design detail shown on Figure 6.2; the detail does not have the overburden material extending down the sides of the Tailings Storage Facility (TSF). The concern is that the perimeter of the TSF is to be constructed of waste rock which is porous and would allow for the seepage of contact water contained within the TSF. The perimeter berm for the TSF is also not properly shown as described in the text. The detail should show a perimeter berm constructed of waste rock (currently the tailings are shown to extend to the limit of the TSF).

The results of the assessment work completed to date have determined that the overburden, waste rock and ore on site are considered non-potential acid generating and as such there are no issues from an acid rock drainage perspective, however as a contingency, if potentially acid generating (PAG) rock were encountered we recommend that this material be placed a minimum of 3 m below the base of the final cover.

Ore Storage Management Plan

No concerns with the plan.

Spill Contingency Plan

The SCP does a good job covering all phases of the Phase I mine development program and work areas that may be impacted by the development and operation of the mine. No concerns with the SCP. It is understood that the Oil Pollution Emergency Plan will be the governing document for the Itivia site.
Minor comments:

1. Speed limits were provided for the all-weather access road (AWAR) and bypass road but no mention of mine site roads.
2. No maximum amount of material provided for lead nitrate in Table 3-1.

Landfarm Management Plan

In general, no major concerns with the LMP. The plan relies on the recent experiences at the Meadowbank mine and with work done in this regard at the site during the exploration phase. The plan clearly states that any issues with the Itivia site are to be managed under the Oil Pollution Emergency Plan and as such is not part of this current Type A Water Licence application.

Minor comments:

1. If glycol/antifreeze are not to be managed in the landfarm they should not be included in the list of materials that could be managed.
2. It is not clear how oversized material (i.e. rock, not soil) that is impacted with petroleum hydrocarbons will be managed. We question the feasibility of wiping down the impacted rock with absorbent pads.
3. If sewage sludge is being used to augment the bio-treatment process then the treated soil will need to be relocated to the TSF as per the WMP for sludge.
4. Has the Government of Nunavut (GN) agreed that if the wildlife/agriculture standards for treatment have not been met then the industrial standards can be applied? It is understood that alternative approaches have been presented in the Contingency portion of the plan and as such this potential outcome may be addressed at a later date. Has the proponent had dialogue with the GN to confirm if their suggested approach is acceptable.
5. We would not recommend that any treated soils be used in the preparation of the final cover. The text suggests that the treated soils may be acceptable for this use. We would recommend that the treated soil be used for daily or interim cover only.
6. Recommend that analytical results from the treatment windrows be collected and analysed prior to any relocation of the treated soils. The use of screening tools to monitor the progress of the treatment is reasonable, however analytical work should be undertaken to confirm soil environmental conditions prior to making decisions on whether or not to relocate soils from within the landfarm.

Roads Management Plan

No concerns with the plan. Issues related to the closure and reclamation of the borrow pits are addressed in the Borrow Pits and Quarries Management Plan.

Borrow Pits and Quarries Management Plan

No concerns with the BPQM plan however the RECLAIM estimate did not include any costs for the closure of the borrow pits. It is unclear to the reviewer where the quantum of security is held for the reclamation of the respective borrow sources.

Landfill and Waste Management Plan

No major concerns with this plan. Minor comments:

1. On Figure 1.2 there is a reference to Liner Bedding Till. This suggests a liner is being installed, however the text does not refer to this and the design detail does not identify any liner material being used in the construction of the landfill.
2. No concerns with the asbestos material management plan, however it is unclear what the source of the asbestos containing material would be. Please clarify the type of asbestos materials that may be used during operations. If asbestos materials are to be used and placed into the landfill we would suggest that a designated portion of the landfill be set aside for its disposal.

Incineration Management Plan (including Dust Management Plan)

No concerns with the IMP plan, however the Dust Management Plan was not appended to this document as noted on the cover letter for the Type A Water Licence.

Hazardous Materials Management Plan

No concerns with the plan. One suggestion would be to incorporate some text on the sampling frequency proposed for the tailings as it relates to cyanide content post treatment and prior to placement within the TSF.

It is understood that the management of fuels at the Itivia will be managed under the Oil Pollution Emergency Plan (not part of this water licence submission).

Explosives Management Plan

No concerns identified with this plan, that have not already been mentioned in the review of related plans.

Preliminary Closure and Reclamation Plan

In general this plan is well presented and addresses the majority of concerns with the mine site during the closure and reclamation phase and incorporates how progressive reclamation will be done to minimize the impacts of the mine operations on the local environment. Minor amendments to the plan will be required to address previously identified concerns. Comments on the RECLAIM cost estimate will be provided under separate cover.

Environmental Management and Protection Plan

No concerns with this plan. Some suggested amendments to other plans (as previously listed) will need to be incorporated into this document (for example incorporating the frequency of water monitoring into the site monitoring program summary table).

Aquatics Effects Monitoring Program Design Plan

No concerns with the AEMP as it addresses the concerns raised by other stakeholders and is consistent with regulatory requirements.

Quality Assurance/ Quality Control Plan

No concerns identified with this QA/QC plan.

Public Engagement and Consultation Baseline Report

No concerns identified with this PECB report.

Risk Management and Emergency Response Plan

No concerns identified with this RMER plan with the exception of those that have already been mentioned previously. It is understood that the next plan amendment will include some minor revisions to address these modifications.