



June 20th, 2016

Manager of Licensing, Nunavut Water Board
P.O Box 119
Gjoa Haven, NU X0B 1J0

Re: 2AM-MEA1525 – Agnico Eagle response Vault Pit Modification Review

Madam, Sir,

As requested, the following information and comments are intended to address the comments and recommendations outlined by ECCC and INAC in letters dated May 25th, 2016. The letters were prepared in response to Agnico Eagle Mines' Notice of Modification to Nunavut Water Board Water Licence No. 2AM-MEA1525, Vault Pit and Ancillary Works.

Should you have any questions or require further information, please contact Manon Turmel, Erika Voyer or Ryan Vanengen.

Regards,

Agnico Eagle Mines Limited – Meadowbank Division

Manon Turmel
manon.turmel@agnicoeagle.com
819-759-3555 x8025
Senior Environmental Compliance Technician

Ryan Vanengen
ryan.vanengen@agnicoeagle.com
819-651-2974
Environment Superintendent - Permitting
and Regulatory Affairs Nunavut

Erika Voyer
erika.voyer@agnicoeagle.com
819-759-3555 x6980
Senior Environmental Coordinator



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1.0 Indigenous and Northern Affairs

1.1 Water Management Report and Plan, March 2016

Comment 1: Water Quality Analytical Test Results for Monitoring Stations ST-10, ST-23, and ST-25 (Final Effluent to Wally Lake, Vault Pit Sump, and Vault Attenuation Pond)

Table 5-1 of the March 23, 2016 SNC Lavalin Technical Note, Meadowbank Water Quality Forecasting Update for the 2015 Water Management Plan, compares the average concentration of certain parameters sampled from the Vault Pit Sump (ST-23), Vault Attenuation Pond (ST-25) and Vault Attenuation Pond prior to discharge through the Wally Lake Outfall Diffuser (ST-10) with Canadian Council of Ministers of the Environment (CCME) Guidelines for Protection of Aquatic Life. The table confirms that in 2014 and 2015, Arsenic (As), Copper (Cu), iron (Fe), Molybdenum (Mo), Lead (Pb), Selenium (Se), Ammonia (NH₃), Fluoride (F), Nitrate (NO₃) exceeded the CCME guidelines. Although in 2014 and 2015, the concentrations of these parameters were below Metal Mining Effluent Regulations and water licence criteria, it is possible that exceedances may occur in the future.

Depending on future concentrations of the above referenced and other parameters in water, additional treatment may be required in the future. The current water treatment plant (Actiflo) is capable of removing total suspended solids (TSS) only.

Section 1.2 of the SNC Lavalin Technical Note states that,

“For the Vault pit, no treatment is expected when re-flooding the pit. This is largely due to the fact that there is no tailings disposal facility at the Vault site. The Vault Attenuation Pond only receives mine pit and freshet water. This will be confirmed through regular monitoring required by the Type A Water License from 2014 - 2018. The first values of this monitoring campaign were analyzed and are presented in section 5.0.”

Section 2.1.3 of the 2015 Water Management Report and Plan states that,

“Discharge from the Vault attenuation pond to Wally Lake may require treatment at the Vault Water Treatment Plant if the water quality does not meet discharge criteria. The Actiflo treatment plant is designed to remove total suspended solids.”

Section 3.1.9.3 of the Technical Note states that,

“In 2015, the Vault Water Treatment Plant (WTP) was not required to remove TSS as the water met discharge criteria stated in the Water License as well as MMER criteria.”

Section 5.0 of the Technical Note states that, “A review of the chemical analysis for water samples collected in the Vault area was undertaken by SLI in order to identify contaminants that were currently either above the discharge criteria or present in significant concentration. The discharge criteria applied to mining effluents discharged to the environment in this case is the Water License (Nunavut Water Board License, 2008). The CCME guidelines were also used as a guide to identify potential parameters that may become a problem,



should they be discharged to the environment without appropriate treatment and dispersion in the receiving environment.”

Section 5.1.1 of the Technical Note to Table 5-1 and states that,

“The yellow cells represent the concentrations not meeting CCME guidelines for Protection of Aquatic Life.”

Recommendation 1: The Licensee should provide analytical test results (reports) prepared by an accredited laboratory for water samples collected from the Vault Pit Sump (ST-23), Vault Attenuation Pond (ST-25) and Vault Attenuation Pond prior to discharge through the Wally Lake Outfall Diffuser (ST-10). Depending on analytical test results, a treatment plan may be required for the discharge of water from the Vault Attenuation Pond to Wally Lake. This treatment plan should include details on contaminant removal efficiency of the system(s) and equipment(s) to be provided.

Agnico Eagle’s Response:

Water from the Vault Pit Sump (ST-23) and Vault Attenuation Pond are sampled monthly during open water as per NWB water license 2AM-MEA1525 and are submitted to an accredited laboratory. Water from the Vault Pit Sump is pumped to the Vault Attenuation Pond. As required by Part F, Item 4 of the NWB Water License 2AM-MEA1525 and MMER Regulations, the effluent discharged from the Vault Attenuation Pond (ST-25) to the Wally Lake Outfall Diffuser (ST-10) is sampled prior to discharge. If the results provided by an accredited laboratory meet the NWB water license and MMER effluent quality limits, the effluent is discharged into Wally Lake receiving environment. During discharge, the effluent is sampled weekly as per water license 2AM-MEA1525 and MMER Regulations. Should the results not meet effluent quality limits, the discharge will be stopped and contaminant removal efficiency will be evaluated to ensure licensed discharge limits are met. If required, the water from the Vault Attenuation Pond can be treated for TSS or adapted to treat other contaminants using the Actiflo Water Treatment Plan prior to discharge to Wally Lake.

Comment 2: SNC Lavalin Technical Note – Meadowbank Water Quality Forecasting Update for the 2015 Water Management Report and Plan – Professional Signature and Stamp

Rationale: The Licensee has provided the report entitled “Meadowbank Water Quality Forecasting Update for the 2015 Water Management Plan” prepared by SNC Lavalin.” The report has not been signed and stamped by a qualified professional.

Recommendation 2: The Licensee should provide the consultant’s report approved by a qualified professional.

Agnico Eagle’s Response:

The SNC Lavalin Technical Note – Meadowbank Water Quality Forecasting Update for the 2015 Water Management Report and Plan has been signed by two professional



engineers from Quebec, Canada, on p.2 of the PDF document (page following the cover page). The reviewer of the SNC Technical Note is also registered as professional engineer in NWT and Nunavut. The SNC Lavalin Technical Note is in appendix of the 2015 Water Management and Plan, which has been signed by a professional engineer from NWT and Nunavut, from the Meadowbank Engineering Department. As recommended by INAC, the next Water Quality Forecasting Update will be signed and stamped by NWT and Nunavut professional engineer.

Comment 3: Flooding of Vault and Phaser Areas

The Licensee must ensure that the transferring of water from basin to basin within the Vault and Phaser areas during reflooding activities (at closure) will not impact the environment because exceedances to Canadian Council of Ministers of the Environment guidelines for Protection of Aquatic Life have already been noted in 2014 and 2015 (see INAC Comment No. 1 above).

The Licensee states that,

“The Vault pit area is composed of many basins in the former lake and different pit elevations that are all linked together. The flooding of Vault and Phaser (once approved) is more complex and requires water transfers from basin to basin ... The final elevation of the re-flooding will be 139.9 masl for Phaser and Vault Lake. At this point the Vault dike will be breached provided the water meets CCME criteria and/or site specific criteria for parameters not included in the CCME Guidelines.”

Recommendation 3: The Licensee should provide details on what measures will be taken to prevent the release of water that may exceed discharge criteria (depending on accredited laboratory test results) to surrounding water sources (e.g., Wally Lake) during transfers. If certain parameters exceed discharge criteria, a water treatment plan/strategy should be submitted to the NWB for review and approval.

Agnico Eagle’s Response:

The water management strategy for the Meadowbank Mine is reviewed weekly, is reported annually to the NWB and ensures that transfers will be discharge in accordance with the Type A water license. Please refer to Appendix B of the 2015 Water Management Report and Plan – General Water Movement, which presents the flow charts of the Water Management plan 2015. It is important to note that no transfers of water are planned from the pit area (Phaser lake, Phaser pit, Vault pit, Vault lake, Vault Attenuation Pond) to Wally Lake after mining operations, as this period consists of a flooding period. During this period, water will be pumped from Wally Lake to the pit area for reflooding and no water will be discharged to Wally Lake.

Following the construction of Vault Dike, the Vault Lake was dewatered to allow the development of the Vault Pit. The same principle will apply for dewatering Phaser Lake. As stated in the 2015 Water Management Report and Plan, the water is to be directed from Vault pit/Vault Lake and Phaser pit/Phaser Lake to the Vault attenuation pond



and discharged into Wally Lake during operations. AEM will monitor discharge results according to the Type A water licence.

The reflooding process of Vault and Phaser area can be described as followed. Vault pit (lake), Phaser pit (lake) and Vault Attenuation Pond constitute three isolated basins close to each other that all required to be flooded to 139.9masl to match Wally lake natural elevation. Topography features connecting the basins at different elevations are all below elevation 139.9masl. During the reflooding process, once one basin is flooded, the water will naturally flow to the other one until all the basins are flooded to 139.9masl in 2029. Only Vault pit (lake) is considered separate for ease of building the Water Balance for the volumes of flooding, however in reality, water will flow from the pit to the adjacent attenuation pond from 134.3masl for example. Vault pit and lake will be flooded with water pumped from Wally Lake and natural run offs until 2025 inclusively. From 2025, only natural run off will contribute to the reflooding process to reach 139.9masl in 2029. Phaser pit and lake will be flooded exclusively by natural surface run off water (considered Phaser Lake from 2024) until 2027. Drainage inflows from Phaser will naturally flow to Vault Attenuation Pond area reaching 139.9masl by 2029. The Vault Attenuation Pond will be flooded with water from Wally Lake.

No water from the Vault and Phaser area is expected to be transferred to Wally Lake after mining operations cease in Q3 2018 at Vault. As mentioned above, the Vault and Phaser water basins will rise together from 2018 to 2029 to reach elevation 139.9masl. The Vault dike will be breached when the water quality from Vault and Phaser area will meet CCME for the protection of Aquatic Life, baseline concentrations or appropriate site specific water quality objectives as per conditions of the Type A Water Licence Part F Item 7.

Comment 4: Vault Pit Nitrate Sample

Section 5.2.4 of the SNC Lavalin March 23, 2016, Meadowbank Water Quality Forecasting Update for the 2015 Water Management Plan, states that, "Only one water sample was analyzed for nitrate in the Vault Pit."

Recommendation 4: The Licensee should provide analytical test results (report), prepared by an accredited laboratory, for water samples.

In its 2016 Annual Report submission, the Licensee should provide an update on Vault Pit nitrate concentrations based on water quality samples collected in 2016.

Agnico Eagle's Response:

Agnico Eagle intends to present in the 2016 Water Quality Forecasting Update as part of the 2016 Annual Report an update on Vault Pit nitrate concentrations based on water quality samples collected in 2016. Agnico Eagle will sample the Vault Pit sump monthly during open water (when water is present) for nitrate as part of NWB Water



License 2AM-MEA1525. These additional analyses, completed by accredited laboratory, will be included in the next modelling for water quality forecast.

Comment 5: Ammonia Discharge to Wally Lake

Section 2.2 of the March 21, 2016 SNC Lavalin Inc. memorandum to the Licensee regarding ammonia loadings in the Portage and Vault areas states that,

“Water from the pits and ponds in the mining infrastructure at Vault are currently collected in the Vault Attenuation Pond, directed to the water treatment plant (WTP) and then discharged to Wally Lake. The water treatment plant is designed to reduce only the concentration of total suspended solids. Therefore, it is assumed that the WTP will not reduce significantly the concentration of ammonia in the water pumped from the Vault Attenuation pond. Water discharge to Wally Lake (and treatment if required) is performed each summer from 2013 until 2018.”

Section 5.0 of this memorandum states that,

“The updated model for the Water Quality Forecasting Update 2015 estimates that approximately 12,300 kg as N of ammonia (15,300 kg as NH₃) will be discharged to Wally Lake during the life of mine of the Vault area, while approximately 1,200 kg as N of ammonia (1,450 kg as NH₃) will remain in the Vault Attenuation Pond.”

Recommendation 5: The Licensee should provide an ammonia management strategy to ensure that discharges from the Vault Attenuation Pond to Wally Lake, and the eventual reflooding of the Vault and Phaser Pits, will not impact water quality. Details on what treatment methodology will be followed for the removal of ammonia in terms of contaminant removal efficiency may be required.

Agnico Eagle's Response:

The ammonia management strategy is outlined in the Ammonia Management Plan which was submitted by Agnico Eagle to the NWB as part of the 2015 Annual Report submission, as an appendix to the 2015 Water Management Report and Plan. It outlines the current best practices at Meadowbank to control ammonia byproducts. Monitoring and controls are in place during operation to ensure effluent from the Vault Attenuation Pond to Wally meets water license and MMER criteria, including ammonia.

At closure, the Vault and Phaser pits will be reflooded with water from Wally Lake and natural runoff water. The Vault dike will be breached, allowing Phaser and Vault lake to be connected to Wally Lake, when the water quality from Vault and Phaser area will meet CCME for the protection of Aquatic Life, baseline concentrations or appropriate site specific water quality objectives as per conditions of the Type A Water Licence Part F Item 7. No treatment is for now expected for Vault Attenuation Pond as no tailings or process water will be used to reflood the Phaser/Vault pits area.



1.2 Mine Waste Rock and Tailings Management Report and Plan, March 2016

Comment 6: Waste Rock Geochemical Test Results

The March 2016 Updated Mine Waste Rock and Tailings Management Report and Plan Executive Summary states that,

“Waste rock from the vault pit mining operations is stored in the Vault Waste Rock Storage Facility (VRSF)... To date, through the Acid Rock Drainage testing program it has been determined that approximately 87% of the waste rock generated is NPAG.”

Table 6.1 of this Management Report and Plan states that,

“Vault Rock Storage Facility contains 95% Non-Acid Generating (NAG) waste rock and 5% Potentially Acid Generating (PAG) waste rock.”

Recommendation 6: The Licensee should provide waste rock geochemical test results (report) signed and stamped by a qualified professional to confirm that:

- a) 87% of the waste rock generated is Non Potentially Acid Generating (NPAG), and
- b) 95% material at Vault Rock Storage facility is Non-Acid Generating (NAG).

Agnico Eagle's Response:

As mentioned in the 2015 Annual Report, in the FEIS, Vault waste rock was found to be 100% Intermediate Volcanic (IV). Agnico Eagle's characterization of the Vault waste rock found that it is mostly comprised of IV group rocks, however a small portion is also iron formation. Ultimately, the FEIS was functionally accurate as the IV provides a high buffering capacity, low leachability and is considered NPAG. Data collected for internal control during operations at Vault was compared to the Vault geochemical FEIS (Golder, 2005). The Vault database from Agnico Eagle included results to date for 18,393 samples analyzed at the on-site laboratory for total sulphur, buffering capacity (NP), acid potential (AP), the ratio of NP to AP (NRP) and total carbon. Starting at the end of 2014, Agnico Eagle sent quarterly samples to an accredited laboratory to validate Agnico Eagle internal determination. The FEIS prediction said that the ARD from Vault rock will be low which was consistent with Agnico Eagle findings. In the FEIS, it was determined that 14% of the rock will be PAG, 11% uncertain and 75% NPAG. Analysis from Agnico Eagle's internal determination shows that in 2015, 8% is PAG, 10% uncertain and 82% is NPAG. Ultimately, there is a higher ratio of NPAG versus what was initially predicted. The same results were obtained in 2014. As a mitigative measure any PAG or uncertain waste rock material is placed in the middle of the Vault Waste Rock Storage Facility while NPAG material is placed on the perimeter to



encapsulate the PAG material. Runoff or seepage water monitoring analysis will confirm the effectiveness of this abatement measure. To date water monitoring analysis from run off indicates no concerns related to ARD.

Operational data from the Vault deposit (results from onsite lab testing) and NPR from the SGS confirmatory samples and static test database collected during the startup of the project (Golder, 2005) were compared to test the fit of the data sets and to determine the total sulphur content at which material may be considered as potentially acid generating per MEND (2009). The datasets correlate and in general, material with a total sulphur content below 0.2% reports a CaNPR > 2 (carbonate neutralization potential ratio) and thus, is designated as NPAG. This verifies the previously recommended use of S<0.2% as an identifier of NPAG rock (Golder, 2005).

As recommended by INAC, Agnico Eagle will include in the next version of the Updated Mine Waste Rock and Tailings Management Report and Plan to be presented with the 2016 Meadowbank Annual Report, a comprehensive section discussing of the PAG/NPAG rockfill proportion generated at Vault Pit and stockpiled at Vault RSF. This management report will be signed by a Professional Engineer registered in NWT and Nunavut, as per the previous plan presented with the 2015 Annual Report.

1.3 Water Quality and Flow Monitoring Plan, March 2016

Comment 7: Waste Rock Geochemical Test Results

The Licensee is proposing water quality and flow monitoring at three new monitoring stations: ST-27 (Phaser Pit Sump); ST-28 (BB Phaser Pit Sump); and ST-29 (Phaser Pit Lake). Provided below is a summary of the proposed monitoring program for the new monitoring stations that is presented in Table 3-1 of the March 2016 Water Quality and Flow Monitoring Program.

For comparison purposes, the licensed monitoring program for similar monitoring stations associated with the Vault Pit is as follows.

In order to ascertain the technical adequacy of the proposed monitoring stations, details concerning the choice of selected parameters and frequency of sample collection should be provided. The proposed monitoring program for the Phaser and BB Phaser Pit Sumps (ST-27 and ST-29) is different from the monitoring program required for the Vault Pit Sump (ST-23) in terms of the group of monitored parameters and the lack of reporting effluent discharge volumes.



Recommendation 7: The Licensee should explain why it is not implementing the same monitoring program requirements for the Phaser, BB Phaser, and Vault Pit Sumps.

Large scale and more detailed plans showing elevations should also be provided to support the selection of the monitoring station locations.

Agnico Eagle's Response:

Consistent with the mine site sump monitoring that is ongoing at Meadowbank, Phaser and BB Phaser sumps will be sampled monthly during open water for Group 1 parameters. Water will be collected from the sumps and pumped to the Vault Attenuation Pond. Should the water quality from the Attenuation Pond not meet water license and MMER criteria, the effluent will not be discharged. This is similar to the monitoring program conducted at Portage and Goose Pit sumps where water is sampled and pumped to the Portage Attenuation Pond prior to be discharged.

Agnico Eagle will record and report volumes of water pumped from the Phaser Pit and BB Phaser Pit Sumps to the Vault Attenuation Pond.

Prior to pumping and sampling water out of Phaser and BB Phaser Pit Sumps, Agnico Eagle will establish the locations and GPS coordinates of Monitoring Stations ST-27 and ST-29 with the Inspector as per water license 2AM-MEA1525 part I Item 5.

The above information will be updated in the next revision of the Water Quality and Flow Monitoring Plan.

1.4 Closure and Reclamation Planning

Comment 8: Closure and Reclamation Activities Associated with Phaser Pit and BB Phaser Pit

The Licensee's February 18, 2016 notice of modification does not provide details on how the planned modification to the Vault Pit and ancillary works (Phaser Pit and BB Phaser Pit) will result in changes to the Meadowbank Gold Mine's 2014 Interim Closure and Reclamation Plan and 2014 Reclamation Cost Estimate. Anticipated closure activities include pit reflooding, water quality monitoring, ground contouring, and scarifying disturbed areas.

Recommendation 8: The Licensee should explain what changes will be required to its 2014 Interim Closure and Reclamation Plan and 2014 Reclamation Cost Estimate as a result of the planned modification to the Vault Pit and ancillary works.

Agnico Eagle's Response:

In the reclaim model presented in the Interim Closure and Reclamation Plan (Golder, 2014), the cost associated with the open pits closure are associated to the construction



of berms to control access and water management cost, mainly related to the cost of pumping water for reflooding the pit. Same elements are considered in the cost estimate produced with Reclaim 7.0 (Golder, 2014). As specified at in the Appendix I1, section 3.1.1 of the 2014 Interim Closure and Reclamation Plan (Golder 2014), no berms to control access are planned for Vault Pit. The same assumption can be applied to Phaser Pit. The reflooding of Phaser Pit is planned to be completed by natural runoff, therefore no use of pumping system is planned to be required. The waste rock generated by Phaser Pit will be stockpiled in the Vault Rock Storage Facility; no cover is expected to be required as the Phaser waste rock will be primarily NPAG. No additional buildings will be required for the Phaser Pit, therefore no additional demolition cost are associated with Phaser Pit. In summary, based on the assumptions used in the reclaim model, no major additional cost at closure are expected as a result of the planned modification to the Vault Pit and ancillary works.

2.0 Environment Canada

2.1 Water Management Report and Plan

Comment 1: Minor Errata

There are several instances where sections of the report and tables are incorrectly referenced, leading the reviewer to the incorrect information. The document should be reviewed for accuracy of section and table references.

Agnico Eagle's Response:

Agnico Eagle will review the Water Management Report and Plan and will ensure that sections and tables are accurately referred to. The updated document will be submitted with the 2016 Annual Report.

Comment 2: Updated Mass Balance Model (Section 3.0, Appendix C)

The report uses dissolved values for water quality forecasting, rather than the recommended use of total values. These predicted dissolved values are then directly compared to Canadian Council of Ministers of the Environment (CCME) guidelines, which are based on total values, and do not provide an accurate comparison. In modelling, the use of total values is preferred as it is a more conservative measure. It is recommended that all future water quality modelling use total metal concentrations in order to be more conservative and to allow accurate comparison to water quality guidelines.

Agnico Eagle's Response:

This is common practice in modeling. Agnico Eagle is confident that this is the correct approach; as stated in the assumptions of the updated mass balance model presented in the 2015 Water Quality Forecasting Update, because of the similarities between the



actual and dissolved forecasted concentrations, it is assumed that the suspended fraction should settle and not be mobile during the breaching of dikes. Therefore, the dissolved parameters are used again in the forecasting model this year, compared to the total parameters. Furthermore, the dissolved component is more readily bioavailable. As a result, this is common practice in modeling for water quality to ensure the protection of the receiving environment.

Comment 3: Water Quality Forecast Results (Section 4.0, Appendix C)

Several parameters are projected to exceed CCME and/or background/site specific levels upon mine closure, including copper, silver, total nitrogen, ammonia, and selenium. The report goes on to indicate that the overall water quality forecast is not of concern. Given water has already begun to be deposited in the Goose pit, and that closure objectives require that CCME guidelines be met within the pits before the dikes can be breached, it is important to understand the sources of these exceedances and how they may be handled to be reduced at source or treated. It is recommended that water quality samples be taken from the re-filling pits as soon as is safe to do so in order to provide real data to compare to modelling predictions. Options for treatment or source control should be identified as soon as possible.

Agnico Eagle's Response:

Agnico Eagle agrees that water quality samples will be taken from the re-filling pits, such as Goose pit, as soon as is safe to do so in order to provide real data to compare to modelling predictions. As presented in the 2015 Water Quality Forecast Update, options for treatment will continue to be developed with the updated model results, and source control will be identified and addressed if possible.

Comment 4: Treatment Requirements (Section 4.2.2, Appendix C)

It is noted in the report that one option for treating the increased levels of total nitrogen could include an alternative treatment method such as snow making. Snow making is not a proven technology for treatment of total nitrogen and would not be recommended for use in this instance.

Agnico Eagle's Response:

Snow making has been identified as a possible treatment option if high total nitrogen concentrations persist. Snow making is proposed only as a possible option among others such as mechanical aeration and in situ treatment in the TSF. As mentioned, possible and feasible technologies will be evaluated to determine if they are applicable to site and effluent conditions at Meadowbank.



Comment 5: Input Parameters (Section 3.4 and 5.0, Appendix C)

The water quality modelling that was completed for both the main site and Vault use average concentrations. Water quality modelling should be based on conservative but realistic measurements, and the use of the average has the potential to underestimate the range of concentrations that may be experienced. It is recommended that future modelling be completed using the 75th percentile of water quality concentrations in order to be more conservative.

Agnico Eagle's Response:

Agnico Eagle acknowledges Environment and Climate Change Canada's recommendation and will continue to use best practices for modeling.