

January 25th 2017

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

# Re: Water License 2AM-MEL1631 Part D, Items 1&2 - Submission of Final Design and Construction Drawings for the Freshwater Treatment Plant

Mr. Kharatyan,

Agnico Eagle Mines Limited is developing the Meliadine Project, a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8" N, 92°13'6.42"W) on Inuit Owned Land.

Facilities that are planned to be constructed for the operation of the future Meliadine Mine include a mill, power plant, maintenance facilities, tank farm for fuel storage, freshwater treatment plant, sewage treatment plant, and accommodation and kitchen facilities for 520 people.

In accordance with Water License 2AM-MEL1631, Part D, Items 1 and 2, please find enclosed with this letter, a copy of the final design and construction drawings for the Freshwater Treatment Plant.

Should you have any questions regarding this submission, please contact me.

Regards,

Agnico Eagle Mines Limited - Meliadine Division

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

cc: Ian Parsons, Indigenous and Northern Affairs Canada Luis Manzo, Kivalliq Inuit Association



# **Meliadine Freshwater Treatment Plant**

30-Day Notice to Nunavut Water Board In Accordance with Water License 2AM-MEL1631 (Part D, item 1)

> Prepared by: Agnico Eagle Mines Limited – Meliadine Division





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Appendix A: Freshwater Treatment Plant design drawings





#### 1 INTRODUCTION

#### 1.1 SITE LOCATION AND ACCESS

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8" N, 92°13'6.42"W) on Inuit Owned Land.

The area is accessible from the all-weather gravel road linking the existing exploration camp with Rankin Inlet.

#### 1.2 EXISTING AND FUTURE SITE FACILITIES

Current facilities at the Meliadine Project site include the exploration camp located on the shore of Meliadine Lake, approximately 3.5 km south-east of the future accommodations. The self-contained exploration camp consists of four wings of new trailers that can accommodate up to 200 people and includes kitchen facilities, complete with diesel generators. Power for the exploration camp is currently provided by diesel generators. Potable water for the exploration camp is pumped from Meliadine Lake.

Facilities that are planned to be constructed for the operation of the future Meliadine Mine include a mill, power plant, maintenance facilities, tank farm for fuel storage, freshwater treatment plant, sewage treatment plant, final effluent treatment plant, and accommodation and kitchen facilities for 520 people.

The Nunavut Water Board (NWB) has issued Type A Water License 2AM-MEL1631 to Agnico Eagle Mines Limited (Agnico Eagle) for the Meliadine Gold Project site authorizing the use of water and the disposal of waste required by mining and milling and associated uses.

This report includes the final design and construction drawings for the freshwater treatment plant (FWTP), as specified under Water License 2AM-MEL1631 Part D, Item 1.

Figure 1 shows the location of the future FWTP and pipeline between the freshwater intake in Meliadine Lake and the FWTP.



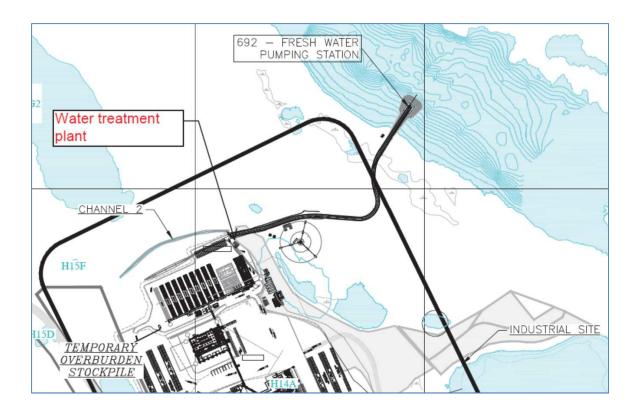


Figure 1 –Location of Meliadine Freshwater Treatment Plant and pipeline from Meliadine Lake



#### 2 DESIGN

#### 2.1 WATER MANAGEMENT STRATEGY

Major freshwater usages on site include potable use, fire suppression, portion of make-up for the mill, and other operational needs, such as drilling water if contact water from CP1 is not available and water for the truck shop. Freshwater will be sourced from Meliadine Lake through a freshwater intake and pump system.

#### 2.2 DESCRIPTION OF FRESHWATER TREATMENT SYSTEM

The camp area will have a Freshwater Treatment Plant (FWTP) for potable (domestic) water. The design flow rate for the potable water for the main camp and accommodations is 216 m³ per day. In the FWTP, the freshwater will first go through cartridge filters and then be pumped through ultraviolet units, and finally be treated with sodium hypochlorite (chlorine). The treated water will be stored within a potable water tank. Potable water will be monitored according to the Nunavut health regulations for total and residual chlorine and microbiological parameters. Treated potable water will be piped to areas in the process plant, service complex, and other facilities requiring potable water. The following sections describe in more detail each step of the treatment.

#### 2.2.1 Cartridge filters treatment

Physical treatments will be accomplished by withdrawing the suspended particles in raw freshwater. This will be achieved with cartridge filters which contain 4 pleated element cartridges that are able to trap debris, oils and other unwanted particles as water flows through it. The first cartridge filter will achieve 5 microns filtration and the second will achieve 1 micron filtration.

#### 2.2.2 Chemical treatment

Chemical treatments are accomplished by the injection of sodium hypochlorite (NaOCI), which is often used for water purification. Hypochlorite can be used to prevent algae growth and is effective against bacteria and viruses.

#### 2.2.3 Ultraviolet treatment

The water is then disinfected by two ultraviolet reactors installed in parallel. This treatment serves as sterilization which deactivates organic contaminants, such as pathogens, bacteria, parasites or viruses.





## 3 DESIGN DRAWINGS

Drawings of the new freshwater treatment plant are available in Appendix A.



**Appendix A: Freshwater Treatment Plant Design Drawings** 

