

November 18, 2021

Re: 3AM-ARV1016 Effluent Parameters

The 3AM ARV1016 effluent parameter limits are set as BOD/TSS of 80/100 mg/L. The current lagoon is permeable through an exfiltration berm and allows uncontrolled discharge throughout the non-frozen months. In this scenario, a large portion of effluent is discharged during freshet, where it has the opportunity to mix with snowmelt in the area.

By the time samples are taken in the spring, a significant proportion of contaminants have left the wetland treatment area and entered the marine environment with minimal biological treatment. Furthermore, samples taken in the spring and early summer may appear to be achieving the current effluent limits due to dilution, rather than actual treatment of the effluent.

The new lagoon will be designed using best practices for passive wastewater treatment systems, to hold 10-12 months of wastewater with a manual decant, designed to take place later in the summer once the wetland has had opportunity for maximum development. Runoff from the watershed will be diverted around the lagoon. The effluent will no longer be able to rely on dilution and quick passage through the wetland to meet its treatment objectives. As such, the Licensee is requesting that the effluent parameter limits be changed to cBOD/TSS of 100/120 mg/L in the upcoming licence amendment. The change in effluent parameters will not impact the use of best practices for design and operations of a passive lagoon-wetland system but is selected to be in line with the most comprehensive wastewater research completed in Nunavut to date.

The Dalhousie University Centre for Water Resources Studies managed a Nunavut Wastewater Treatment Program study between 2010 and 2017. The results are summarized in the *Recommendations for the Development of Nunavut Municipal Wastewater Management Standards* (exp, 2018). The results demonstrated the effectiveness of the lagoon wetland treatment system in Nunavut and that a treatment objective of cBOD/TSS of 100/120 mg/L could be reliably achieved and preserve the health of the receiving marine environment. The Government of Nunavut Department of Community and Government Services has participated in several discussions with members from Environment and Climate Change Canada, Crown-Indigenous Relations and Northern Affairs Canada, and the Nunavut Water Board on this matter.