Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

Your file - Votre référence
3BM-YRB0308

August 19, 2016

Our file - Notre référence
IQALUIT-#1085863

Licensing Department
Nunavut Water Board
P.O. Box 119
GJOA HAVEN, NU, X0B 1J0

Sent via email:licensing@nwb-oen.ca

Re: Technical Review of Amendment and Renewal Application – Hamlet of Resolute Bay Airport Sewage Lagoon (Water Licence 3BM-YRB0308)

To Whom It May Concern,

Thank you for the Nunavut Water Board's July 19, 2016 notice of the above mentioned Water Licence amendment and renewal application. A memorandum is provided for the Nunavut Water Board's consideration. Comments and recommendations have been provided pursuant to Indigenous and Northern Affairs Canada'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 867-975-3877 or email at Amanda.Winegardner@aandc-aadnc.gc.ca for further information.

Sincerely,

Amanda Winegardner
Water Management Specialist
Water Resources Division
Resource Management Directorate
Indigenous and Northern Affairs Canada
P.O. Box 100
IQALUIT, NU X0A 0H0

Encl.

Cc. Scott Burgess, A/Manager, Water Resources - INAC, Nunavut Regional Office (NRO)
Andrew Keim, A/Manager, Field Operations – INAC, NRO

Canada

Memorandum

To: Licensing Department, Nunavut Water Board

From: Amanda Winegardner, Water Management Specialist, Indigenous and Northern Affairs Canada, Nunavut Regional Office (NRO)

Cc: Scott Burgess (INAC; NRO), Andrew Keim (INAC; NRO)

Date: August 18, 2016

Re: Technical Review of Amendment Application for Licence No. 3BM-YRB0308

Applicant: Todd McKay, Government of Nunavut Economic Development and Transportation
Applicant Representative: Bhabesh Roy, Government of Nunavut Community and Government Services
Project: Hamlet of Resolute Bay Airport Sewage Lagoon
Region: Qikiqtani

Comments:

A. Background

Water use and waste disposal (wastewater and sewage) for the Resolute Bay Airport and surrounding facilities are currently under the purview of an expired (in 2008) Type 'B' Water Licence, 3BM-YRB0308. This Licence was issued to Government of Nunavut, Department of Community Government and Transportation, now the Department of Economic Development and Transportation (GN-EDT). The Government of Nunavut Department of Community and Government Services (GN-CGS) are acting as the Licensee's representative for an application to amend and renew 3BM-YRB0308. The expired Water Licence authorizes water use of 600 m^3 annually from Strip Lake and deposit of wastewater and sewage to a sewage lagoon adjacent to the airport (hereafter referred to as the 'airport sewage lagoon'). In addition to its expiration, the water use conditions in 3BM-YRB0308 do not reflect current water use at the airport and neighbouring facilities. Withdrawal of water from Strip Lake ceased around 2004 due to the concern of contaminants in the lake. Since that time, water has been obtained by a third-party contractor from the Hamlet of Resolute Bay's Water Treatment Plant (Signal Hill) and delivered by truck to the airport/surrounding facilities. This same contractor removes wastewater and sewage from these same locations and deposits this waste in the airport sewage lagoon. It is important to note this trucked water is not delivered only to the airport, but all surrounding facilities that do not have access to water from the utilidor system. The source water for the Water Treatment Plant is Char Lake, and water is obtained under Water Licence 3BM-RUT1520 (Licensee is GN-CGS). Because the Licensee for 3BM-YRB0308 is no longer obtaining water from Strip Lake, they have opted to include an amendment within their renewal application. In addition to applying for renewal of 3BM-YRB0308 for a five year term, the Licensee requests that water use be removed from this Water Licence and that a renewed Water Licence only cover sewage disposal at the airport sewage lagoon.

Water Licence 3BM-YRB0308 is one part of a set of licences regulating water use and waste disposal for the Resolute Bay community and airport facilities.

- Water Licence 3BM-RUT1520 (GN-CGS) was recently renewed and covers water use and waste disposal to and from the utilidor system for the Hamlet of Resolute Bay.
- Water Licence 3BM-RES1520 (GN-CGS) received approval on an amendment application on August 2, 2016, adding a previously unlicensed waste site under its purview. This licence now covers waste disposal for the municipal landfill, a bulky metals waste site, as well as an additional unused dump site. Additionally, a landfill at the airport is licensed under 1BR-RBL1419 with Transport Canada as Licensee.

The renewal process for 3BM-YRB0308 was first initiated upon expiry of this licence in 2008. However, due to uncertainties regarding the construction of a new wastewater treatment plant in the community, a decision was made by the Nunavut Water Board (NWB) to proceed with the renewal of 3BM-RUT1520 separately of 3BM-YRB0308. A submission from Indigenous and Northern Affairs Canada (INAC) during the 2009 renewal process did not recommend renewal of the Water Licence at that time, due to several compliance issues as well as missing information in the application.

The airport sewage lagoon has been a major point of non-compliance under 3BM-YRB0308. The lagoon does not have the necessary capacity for the current waste input. The lagoon overtops regularly during the winter months, the result being raw sewage freezing into a surrounding wetland. During the ice-free season, discharge during decanting of the sewage lagoon flows through a natural wetland and discharges to the marine environment. Any overtopping of the lagoon that occurs during the ice-free season also results in effluent flowing through the wetland to the marine environment.

A 2015 letter of direction from an INAC Water Resources Officer found that several obligations under 3BM-YRB0308 were not being met by the Licensee and that the airport sewage lagoon required upgrades or modifications in order to bring it into compliance with Water Licence conditions. The Licensee has responded to this letter and has also provided materials with their 2016 renewal/amendment application that state that they are unable to invest financially in upgrading the airport sewage lagoon, and will likely be decommissioning the site upon the completion of a new wastewater treatment plant for the community (expected between 2020 and 2022). The Licensee has submitted a compliance plan and has shown efforts to address areas of non-compliance through the submission of requested plans, manuals and annual reports as well as the preparation of interim sewage treatment scenarios for discussion with regulators.

Results of review

On behalf of INAC's Water Resources Division, the following comments and recommendations are provided for consideration:

1. **Water source for Resolute Bay airport and surrounding facilities**

Source:

1) 031123NWB3YRB0308 Signed Licence
2) 3BM-YRB0308 Revised Application for Renew-Amend, Block 13: Quantity of Water Involved
3) 3BM-YRB0308 Project Proposal for Resolute Airport Sewage Lagoon
4) 3BM-RUT1520 Renewal Licence
5) 3BM-YRB0308 Plan for Compliance of the Resolute Airport Sewage Lagoon
6) 3BM-RUT1012 2011 Annual Report
7) 3BM-RUT1012 2012 Annual Report
8) 3BM-RUT1012 2013 Annual Report

9) 3BM-RUT1012 2014 Annual Report
10) 3BM-RUT1520 2015 Annual Report

Comment: Water for the airport and surrounding facilities is no longer withdrawn directly from Strip Lake. Water is instead obtained via a third-party contractor (ATCO) through a trucked water service. The amount of trucked water delivered to the airport and associated facilities have been in excess of the 600 m^3 annual water use limit under the expired 3BM-YRB0308 (5000 m^3 for some years). Additionally, the trucked water is being obtained from the Hamlet's water treatment plant, and is licensed under 3BM-RUT1520. Water Licence 3BM-RUT1520 includes an allowable water use of 126,020 m^3 annually and a maximum use of 345 m^3 per day for the Hamlet's utilidor system. Annual reports for 3BM-RUT1520 since 2011 (then RUT1012) show that water use has generally increased through time to 2015, when a total use of 428,472 m^3 was reported (including the utilidor as well as trucked water to the airport facilities). Trucked water delivery to the airport facilities in 2015 accounted for approximately 1% of total water use under 3BM-RUT1520, and was approximately seven times higher than that allowed under 3BM-YRB0308. It is unclear whether trucked water delivery was included in total water use reporting for years prior to 2015. INAC notes that while the water use by the airport facilities is a small proportion of the total water use licensed under 3BM-RUT1520; it may contribute to water use exceedances under 3BM-RUT1520. Water use exceedances of 3BM-RUT1520 to such a large magnitude as shown in 2015 (~300,000 m^3 above water use limit) are of concern and may need to be addressed separately from the renewal/amendment for 3BM-YRB0308.

The 2016 renewal and amendment application for 3BM-YRB0308 states that water obtained from the Hamlet's water treatment plant is sourced from Char Lake, which is in line with the conditions under 3BM-RUT1520. However, the application also mentions South Lake as a potable water source, though it is unclear in what way this is source is used.

Recommendation 1: INAC recommends that water use conditions, as they pertain to water withdrawals from Strip Lake, should be removed from a renewed/amended Water Licence as water is no longer sourced from this lake and ongoing concerns regarding contamination will likely exclude this source in the future. INAC also recommends that the Licensee clarify any activities relating to the identification of contaminants in Strip Lake and appropriate remediation.

RAW water from this source is being tested twice annually to determine the degree of contamination in order to take further step. The proposed testing of raw water of the strip lake will be done under the potential renewed Licence issued to replace Licence # 3BM-YRB 0308.

Recommendation 2: INAC recommends that while water use conditions for Strip Lake no longer apply, the Licensee should still be required to monitor their daily and annual water use carefully in order to ensure that water use at the airport facilities is reported accurately and is included in total water use for the Hamlet.

In the Signal Hill Water Treatment Plant, Water is being metered /recorded during filling the tank of the Truck of the Contractor ATCO and the extraction quantity is being invoiced to the Hamlet.

The proposed testing of raw water of the Strip Lake will be done under the potential renewed Licence issued to replace Licence # 3BM-YRB 0308.

Recommendation 3: INAC recommends that the Licensee clarify the use of South Lake as a potable water source. It is likely that South Lake is an alternative name for Char Lake, however if this is not the case, then water use provisions for water withdrawal from South Lake need to be included in an

amended Water Licence.

South Lake is the main Potable water source. This lake has no second name. But Water Truck extracts treated water from the Signal Hill Water Treatment Plant, not directly from the South Lake. The South Lake is under the Utilidor Licence. Yes, this lake also can be considered as the source water of the renewed/amended Water Licence.
The proposed testing of raw water of the Strip Lake will be done under the potential renewed Licence issued to replace Licence # 3BM-YRB 0308.

2. Outstanding concerns from INAC's 2009 submission regarding renewal of 3BM-YRB0308

Source:

1) 3BM-YRB0308 Renewal INAC Comments

Comment: An INAC review of renewal application materials in 2009 resulted in a recommendation of non-renewal for this Water Licence as well as an extensive list of recommendations. Recommendations fell under the following categories:

- Annual reports
- Environmental Assessment of the airport sewage lagoon
- Uncertain information and discrepancies relating to a solid waste disposal facility
- Uncertain information and discrepancies related to a soil remediation facility (land farm)

The Licensee has indicated that there is a former airport landfill that was closed and decommissioned in the late 1990s, as well as a landfill currently operated by Transport Canada and licensed under 1BR-RBL1419 (also scheduled reportedly for decommissioning). However, INAC's 2009 submission references inspectors' reports from as late as 2008 that report new material in a landfill apparently under the auspices of this licence as well as a land farm not covered by any other licence.

INAC notes that the Licensee has regularly submitted annual reports since 2012. INAC encourages the Licensee to continue with this practice.

Recommendation 1: INAC notes that a full Environmental Assessment, as suggested by INAC in 2009, for the airport sewage lagoon has not been undertaken. However, INAC notes that a summary regarding sewage treatment options have been developed for discussion with regulators. If the option to treat sewage within the lagoon and adjacent wetland is chosen, INAC notes that the Wetland Assessment in Recommendation #8 would satisfy the condition of an Environmental Assessment.
Right now extended Monitoring program of the sewage effluent in the wetland is planned to determine the wetland efficiency.
Recommendation 2: INAC recommends that the Licensee clarify whether there are any solid waste facilities or land farms operating under the purview of this Water Licence, as well as whether there are any solid waste facilities or land farms operating at the airport that are unlicensed. This information will be essential in determining whether a renewed Water Licence can be issued that includes only waste deposit at the airport sewage lagoon.
Solid waste and Land farm facilities are excluded from the Licence renewal application because Federal Agencies are the owner of those facilities. The new licence will only cover Airport Sewage Lagoon. It is confirmed that the renewed Water Licence can be issued that includes only waste deposit at the airport Sewage Lagoon.

Recommendation 3: INAC recommends that if a waste site or land farm are found to be operating under this Water Licence, that the amendment application be updated accordingly and that INAC's 2009 recommendations regarding solid waste disposal and land farms be addressed by the Licensee. If the Water Licence is to include a waste site or land farm, INAC recommends that the Licensee submit a survey of each facility to show the historical and present boundaries of each facility.
No. The waste site and land farm are not included in the proposed renewal application.

3. Outstanding concerns from Compliance Plan

Source:
1) 3BM-YRB0308 Plan for Compliance of the Resolute Airport Sewage Lagoon
2) 3BM-YRB0308, 2016 File Recap

Comment: The Licensee has submitted a 2016 compliance plan for addressing the terms and conditions of the expired licence. Additionally, the NWB highlighted several terms and conditions of the expired licence in their '2016 File Recap' that require attention by the Licensee.

Recommendation 4: INAC recommends that the Licensee complete all outstanding items NWB's 2016 'File Recap' list. These should be completed in the timeframe set out in the submitted Plan for Compliance.

Yes, the Plan will be followed.

Recommendation 5: While INAC recognizes that there are plans for a new wastewater treatment plant, the completion date for this plant is still not finalized. INAC notes that the wastewater treatment plant is relied upon heavily in the compliance plan as the solution for issues brought forward under this Water Licence. INAC recommends that the Licensee work towards coming into compliance with 3BM-YRB0308 (as well as any renewed Water Licence) as early as possible.
Yes, we are working forward.

Recommendation 6: The winter overflow of the sewage lagoon is considered an unauthorized discharge of waste under Part B, 1-v of 3BM-YRB0308. The Licensee's compliance plan states that "The unauthorized discharge is treated in the wetland prior to discharge into the sea during summer". INAC notes that these unauthorized discharges are routine for this site and well-known, but are generally not reported in annual reports. INAC notes that the Licensee must report any unauthorized deposits of waste as per Section 12(3) of the *Nunavut Waters and Surface Rights Tribunal Act*. INAC also recommends that the Licensee discuss with the NWB whether the wetland adjacent to the sewage lagoon is considered part of the waste treatment system or is considered the receiving environment, as this will affect whether unplanned/accidental discharges from the lagoon to the wetland are considered unauthorized in the future or can be monitored within the treatment system (i.e. lagoon *and* wetland) itself. INAC notes that the expired 3BM-YRB0308 does reference the wetland adjacent to the sewage lagoon; however the regulated final discharge point does not appear to be at the end of the treatment wetland, rather the final discharge point appears to be within the treatment wetland.
Yes, the final discharge point is the YRB-3 which is about 300m from the lagoon and more than a km from the sea.

4. Sewage and wastewater treatment options

Source:

1) 3BM-YRB0308 Resolute Bay Interim Sewage Treatment Options
2) Chouinard, A., Yates, C.N., Balch, G.C., Jørgensen, S.E., Wootton, B.C., and Anderson, B.C. (2014a). Management of Tundra Wastewater Treatment Wetlands within a Lagoon/Wetland Hybridized Treatment System Using the SubWet 2.0 Wetland Model. Water 6: 439-454.
3) Chouinard, A., Balch, G.C., Jørgensen, S.E., Yates, C.N., and Wootton, B.C. (2014b). Tundra Wetlands: the treatment of municipal wastewaters- Companion Report. Centre for Alternative Wastewater Treatment. Available online: http://cawt.ca/wp-content/uploads/2014/08/RBC-short-overview1.pdf
4) Yates, C.N., Wootton, B.C., and Murphy, S.D. (2012). Performance assessment of arctic tundra municipal wastewater treatment wetlands throughout an arctic summer. Ecological Engineering 44: 160-173.

Comment: The Licensee has submitted a summary with three options to be considered for deposit of waste and sewage from the airport and surrounding facilities until the new wastewater treatment plant is built and commissioned. The three presented options are:

1) Continual use of the airport sewage lagoon as is.
2) Partial discharge of sewage and wastewater from the airport and surrounding facilities to the utilidor system, diverting some of the waste destined for the airport sewage lagoon and combining it with waste from the utilidor system that is ultimately discharged to the marine environment. Waste that is discharged through the utilidor system is macerated, but receives no further treatment. Waste is diluted with bleed water circulating through the utilidor system.
3) Discharge of all sewage and wastewater from the airport to the utilidor system.

The information presented in support of option 1 was based on research conducted by the Centre for Alternative Wastewater Treatment. The Licensee showed selected data for constructed and natural sewage treatment wetlands in Nunavut and estimated the percent reduction in Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD) that may be occurring in the wetland adjacent to the airport sewage lagoon. The data was presented in order to demonstrate that effluent discharged from the airport sewage lagoon, either during the planned decants or during winter overflow, may be undergoing treatment via natural wetland prior to discharge to the marine environment or migration to other inland bodies of water. The data presented shows firstly that the actual sewage lagoon provides little treatment for wastewater in terms of TSS, BOD or Faecal coliform concentration. Secondly, the information suggests that based on the average levels of both TSS and BOD entering the wetland from the sewage lagoon as well as treatment efficacy observed in other Nunavut wetlands, that the receiving wetland in this case is likely capable of lowering TSS, BOD and Faecal coliform to levels below Water Licence requirements. However, corroborating data of this assertion is not available, except for a single downstream wetland sample that may be erroneous due to its extremely low values for all tested parameters.

The information presented for option 2 suggests that partial discharges of airport wastewater into the utilidor system over a 12-hr period per discharge (with the help of a holding tank) may permit the final discharge of water from the utilidor system to remain within the Water Licence requirements of 3BM-RUT1520. The information for option 3 suggests that the discharge of all airport wastewater into the utilidor system may result in exceedances of 3BM-RUT1520 Water Licence requirements.

The Licensee has indicated their desire to discuss the three presented options with regulators, however they do not indicate in the briefing note which option is the preferred choice of the Licensee. It is unclear whether this discussion has occurred or whether the submission of an application for the licensing of the airport sewage lagoon indicates the selection of option 1 as the best choice.

Recommendation 7: INAC recommends that the Licensee confirm which of the interim sewage treatment options presented are feasible and preferred for the project. This information is required as monitoring requirements and Water Licence conditions may differ depending on the option chosen.
Option #1. Extending monitoring program in the wetland.

Recommendation 8: INAC is encouraged by the use of research by the Centre for Alternative Wastewater Treatment to investigate options for the interim treatment of sewage under the licence until a new wastewater treatment plant is built. While this does not satisfy INAC's 2009 recommendation of a full Environmental Assessment of the airport sewage lagoon, it does provide useful information regarding the potential for the wetland adjacent to the sewage lagoon to minimize downstream environmental impacts. The Licensee presented data on three sewage treatment wetlands from Nunavut, chosen as good comparison sites to the Resolute Bay wetland because they also receive wastewater without effective pre-treatment and receive wastewater in higher volumes than is expected at the Resolute Bay site. The source for this data is not provided, however the data appears comparable to both Chouinard et al. (2014b) and Yates et al. (2012). INAC notes that the (assumed) sources for this data, also included other wetland sites that did not show the same degree of wastewater treatment as the wetlands presented by the Licensee. Chouinard et al. (2014b) further reports that physical characteristics of treatment wetlands in northern regions likely impact their treatment capacity (e.g. wetlands with rocky substrate or steep slopes are likely to be less effective at wastewater treatment). INAC recommends that if the wetland is to be included in this licence, the Licensee be required to submit, to the NWB, a Final Wetland Assessment within a timeframe considered acceptable by the NWB. The Final Wetland Assessment should include wetland hydrology (including hydraulic residence times),
Slope, substrate and vegetation. The assessment will allow the Licensee to consider the comparability of the selected comparison wetlands to the Resolute Bay site.
It is the verbal agreement with the INAC field operations Manager Erik Allain with GN that the lagoon will be continued to be using as it is condition until the new WWTP is built and commissioned.

Recommendation 9: INAC recommends that the Licensee be required to confer with any relevant regulators to receive guidance on whether an assessment is needed to determine if the wetland is fish-bearing; as has been done with other municipal Water Licenses in Nunavut.
This wetland is dry in summer and the lower end is bounded by the Sea. Even during high tide, this area still becomes dry. Only sewage effluent, snowmelt or rainfall water is rolling down to the sea. Fish habitation is not expected in this wetland area,

Recommendation 10: INAC recommends that if use of the sewage lagoon and wetland for sewage treatment is chosen going forward, that decanting procedures are re-visited to ensure optimal use of the wetland for wastewater treatment. For example, Chouinard et al. (2014b) suggested that the efficacy of wetland treatment may be reduced during periods of high flow through a wetland, including periods of freshet or decanting. Yates et al. (2012) also suggested that lagoon/treatment wetland systems be constructed and operated so that slow exfiltration from lagoon to wetland occurs as opposed to end of summer decants.

Yes, these cells are exfiltration in nature. Basically pump is not required for decanting.

5. Monitoring program

Source:

1) 3BM-YRB0308 Project Proposal for Resolute Airport Sewage Lagoon
2) 031123NWB3YRB0308 Signed Licence, Part D: Conditions Applying to Waste Disposal
3) 3BM-YRB0308, 2016 File Recap
4) Canadian Council of Ministers of the Environment (2014). Canada-wide strategy for the management of municipal wastewater effluent: 2014 progress report.
5) 3AM-ARV1015 Type A Licence and Decision Final
6) 3BM-COR1521 Renewal Licence
7) 3BM-CHE1523 Renewal-Amendment
8) 3BM-WHA1520 Amendment Renewal
9) 3BM-BAK1526 Amendment Renewal Licence

Comment: The monitoring program specified under the expired Water Licence includes three monitoring stations: YRB-1, YRB-2, and YRB-3. Monitoring station YRB-1 is at the freshwater intake for source water in Strip Lake. YRB-2 is sampled from the effluent from the sewage truck before it is discharged into the sewage lagoon. YRB-3 is labelled as "effluent discharge from the final discharge point of the sewage facilities". In Figure 1 of the Project Proposal for Resolute Airport Sewage Lagoon, YRB-3 is shown as located within the wetland, part way between the sewage lagoon and the ocean. The Licensee has discontinued sampling at YRB-1 because water is no longer withdrawn from Strip Lake. The Licensee is proposing that the original YRB-1 be replaced with a new YRB-1, located between YRB-3 and the ocean.

INAC notes that there are several NWB licences with conditions and monitoring requirements specific to the inclusion of a wetland as part of the lagoon treatment process, e.g. 3AM-ARV1015, 3BM-BAK1526, 3BM-CHE1523, 3BM-COR1521, 3BM-REP1520, and 3BM-WHA1520. For example, 3AM-ARV1015 and 3BM-CHE1523 set sewage effluent discharge criteria for a monitoring station located at the end of a treatment wetland adjacent to sewage disposal facilities, as opposed to at the discharge point from a lagoon to wetland.

Effluent quality standards for YRB-3 are regulated in the expired Water Licence based on 'Maximum Average Concentration'.

Recommendation 11: INAC echoes the recommendation of the NWB that there should be consistent monitoring and naming of samples within a Water Licence in order to ensure that sampling results are comparable.

Yes, this must be followed.

Recommendation 12: INAC notes that the latest project proposal from the Licensee includes geo-references for both YRB-2 and YRB-3. From the location of YRB-3 depicted in the project proposal, INAC understands that YRB-3 is meant to characterize effluent post-sewage lagoon as well as after the effluent has spent some time passing through the wetland, meaning that the location of YRB-3 has been estimated as the point in the wetland where the majority of the treatment of the effluent has occurred. INAC agrees with the Licensee's suggestion of adding another monitoring station prior to the ocean. In fact, INAC recommends that the final discharge point for this license occur as effluent is discharged from the treatment wetland (if the adjacent wetland is considered as part of the treatment system as

opposed to the receiving environment). INAC also recommends an additional sampling point as effluent is discharged from the sewage lagoon to the treatment wetland, in order to confirm the efficacy of the wetland. INAC recommends, however that any new stations are named YRB-4 and then in ascending numerical order, and that the use of YRB-1 as a name be discontinued. This will minimize confusion when comparing monitoring results through time.

Yes, YRB-2, YRB-3 and YRB-4 are the new monitoring stations will be at the ground.

Recommendation 13: INAC recommends that the Licensee consider additional monitoring at the edges of the wetland, to ensure that effluent is not migrating beyond the borders of the wetland/treatment area.

The Monitoring station YRB-3 is the lower station. Beyond that, the operator is not accessible.

Recommendation 14: INAC recommends that recent research regarding TSS in sewage treatment wetlands be considered when setting Water Licence conditions for this parameter. Depending on flow rate of effluent discharge and the hydraulic residence time of the wetland (as should be determined in the Final Wetland Assessment), TSS may remain high at certain points in the wetland.

Supported. TSS can be considered as one of the chemical parameters of the proposed licence.

Recommendation 15: INAC recommends that the northern-specific performance standards being developed as part of the CCME's Strategy for the Management of Municipal Wastewater be incorporated into this Water Licence as they become available.

Yes, if this lagoon is still required to operate.

Recommendation 16: INAC recommends that effluent quality limits in a renewed Water Licence be regulated based on 'Maximum concentration of any grab sample'. This change from the current requirement of 'Maximum Average Concentration' would bring this Water Licence in line with other NWB licences with treatment wetlands as well as other licences issued for Resolute Bay. The change would also be more protective to aquatic life.

Supported this recommendation.

B. Conclusion

INAC acknowledges the efforts on behalf of the Licensee to bring operations of the Resolute Bay airport sewage lagoon into compliance with 3BM-YRB0308. However, confirmation of which of the three interim sewage treatment options presented by the Licensee is the chosen option is needed before INAC can make a recommendation as to amendment and renewal of this Water Licence, as well as the suggested Water Licence term.

OPTION # 1 including extending sampling program in the wetland to determine the effluent quality.