



Water Resources Division  
Nunavut Regional Office  
Iqaluit, NU  
X0A 0H0

NWB File: 3AM-ARV1015  
CIDMS #: 453778

Apr 1, 2011

**Re: 3AM-ARV1015 – Operation and Maintenance Plan and Reports –  
Hamlet of Arviat**

**3AM-ARV1015 – Old Sewage Lagoons Abandonment and Restoration Plan  
3AM-ARV1015 – Solid Waste Management Report  
3AM-ARV1015 – Sewage Disposal Facility Report**

Please be advised that Indian and Northern Affairs Canada (INAC) have completed a review of all the Operation and Maintenance Plan and Reports for 3AM-ARV1015 prepared by Nunaburnside for the Hamlet of Arviat. The Nunavut Water Board (NWB) circulated the Operation and Maintenance Plan and Reports for comments on February 21, 2011. All documents related to the Operation and Maintenance Plan and Reports posted on the NWB ftp site under 3AM-ARV1015 were included in my review (See attached Technical Review Memo).

Should you have any questions or comments, please do not hesitate to contact me at (867) 975-4282 or by email at [Ian.Parsons@inac.gc.ca](mailto:Ian.Parsons@inac.gc.ca).

Sincerely,

*Original signed by*

Ian Parsons  
Regional Coordinator

Cc. Jim Rogers, Manager of Water Resources – Indian and Northern Affairs  
Canada, Nunavut Regional Office  
Peter Kusugak, Manager of Field Operations – Indian and Northern Affairs  
Canada, Nunavut Regional Office



## **Technical Review Memorandum**

To: Phyllis Beaulieu – Manager of Licensing, Nunavut Water Board

From: Ian Parsons – Regional Coordinator, Indian & Northern Affairs Canada.

---

**Re: 3AM-ARV1015 – Operation and Maintenance Plan and Reports –  
Hamlet of Arviat**

3AM-ARV1015 – Old Sewage Lagoons Abandonment and Restoration Plan  
3AM-ARV1015 – Solid Waste Management Report  
3AM-ARV1015 – Sewage Disposal Facility Report

### **Background**

The Hamlet of Arviat is situated along the Western Shore of Hudson Bay in the Territory of Nunavut. It is located 225 km South of Rankin Inlet, Nunavut and 265 km North of Churchill, Manitoba. During the winter of 2010-2011, the community lost containment in its larger of two constructed water storage ponds. As of late February 2011, Arviat had only a short term water storage pond remaining. The Canadian military flew drinking water up in 10 litre jugs from Winnipeg while the community of Arviat was trucking household water from Landing Lake north north-west of the community.

Landing Lake water is considered potable but not palatable due to the concentration of dissolved solids by spray from the nearby Hudson Bay and from ice formation. As a short term measure, the Government of Nunavut will first construct an ice road to Goose Lake, about 13 km north west of Arviat, and use the water until spring melt and at the same time buy and locate in Arviat a reverse osmosis water treatment unit to produce about 500 litres per minute of drinking water from the sound on the Hudson Bay. The Government of Nunavut presumes that the liner in the larger water storage pond can be repaired in the summer with sufficient time remaining in the open water season to still store enough water for next winter.

### **Recommendations/Comments**

After reviewing the Operation and Maintenance Plan and Reports for the Hamlet of Arviat 3AM-ARV1015 prepared by Nunaburnside, INAC would like to make a few recommendations/comments.



## **Old Sewage Lagoons Abandonment and Restoration Plan**

INAC notes that the proponent has indicated that the old sewage lagoons are within a 450 meter setback area of the current lagoon being used and as per the Public Health Act this 450 meter setback area indicates that the land within this area can not be used for any other reason other than sewage disposal.

Therefore the proponent has indicated that they will only drain the old lagoons and leave the structure of the old lagoons for a possible future expansion of the current facility. INAC recommends decommissioning, and filling old lagoons and scarifying the land to its natural topography. Over time, the lagoon berms will naturally deteriorate and re-vegetation thus require re-building if the lagoon area is expanded.

INAC also recommends that the proponent control the release of effluent from the old sewage lagoons into the wetland area, such that the release doesn't cause erosion to the berm or to the wetland area. The flow of effluent from the old sewage lagoons to the wetland area should be slowed to the point where it doesn't create a flow path through the wetland area and reduce the amount of effluent treatment by the wetland.

## **Solid Waste Management Report**

### Solid Waste Disposal Facility

INAC notes that a new solid waste disposal site location has been selected; is awaiting approval from the Hamlet and is, conservatively, estimated to open in 2015.

INAC notes that in the interim the existing facility will still be used to deposit waste. INAC notes, as stated numerous times during the renewal of the Hamlet's Type A water license, that this facility is out of compliance with its water license. The site capacity will also be exceeded in the near future. As such INAC has the following recommendations:

- if at all possible, reducing and/or eliminating ponding of water within the Solid Waste Disposal Facility (SWDF).
- retaining all water accumulating inside the solid waste facility and treating any discharge. The water accumulating inside the solid waste facility should be tested and only released to the environment when it meets the requirements of Arviat's water license. Any water not meeting requirements of Arviat's licence should be treated before release. Any water release not meeting the water licence water quality guideline would be considered an unauthorized discharge and would make Arviat out of compliance with its water license.



If treatment is not possible, then INAC suggests the community and the Government of Nunavut seek an amendment from the Water Board to include the “leachate pond” (this pond is outlined in the SWDF report as receiving all the leachate and accumulated water from the SWDF) and “contaminated attenuation zone” (for the treatment of the leachate) which are both located outside the SWDF.

### Bulky Waste Facility

INAC discourages using the remaining contaminated soils at the bulky waste site as cover material in the landfill, since this activity may potentially cause more long term harm by providing hydrocarbon fuels to leach. In turn, these potential contaminants will reach the natural environment as the leachate is not contained within the SWDF and treated as mentioned above.

INAC recommends submitting an abandonment and restoration plan for the bulky waste facility to the NWB when the new SWDF is approved.

### Hazardous Waste Storage Area

INAC recommends improving the existing site conditions to include:

- Clean-up of the contaminated soils at the hazardous waste storage area. The contaminated soils could be added to the contaminated soil already located at the bulky waste facility. Treatment of the contaminated soils, such as through aeration and biological action should be considered by Arviat and the GN.
- Placement of an impermeable liner under the drums used to contain the hazardous waste.
- Use of secondary containment and berms to contain any accidental spills in the area.
- Restrict access to the area to limit accidental spills.
- Properly labelling the hazardous materials and properly shipping out the hazardous waste to an approved facility before the storage area reaches capacity. Arviat and/or the GN should indicate to the NWB whether removal of hazardous materials is being considered.

### **Sewage Disposal Facility Report (SDFR)**

INAC notes that the GN and Hamlet believe that daily exfiltration (output) of the berms of the lagoon equals the daily input into the lagoon. INAC is concerned about such a high rate of exfiltration through the berm and possible berm stability and loss of containment. This concern was highlighted during the licence renewal process and INAC still recommends that a geotechnical engineer, as per Part D Items 5 and 16 of the Water License, inspect the lagoon berms. The construction



inspector and the professional geoscientist, who inspected the berms for the purposes of the above mentioned report, should sign the report.

INAC recommends that exfiltration rates should be visually monitored monthly, (weekly during spring runoff) to possibly avoid against failure of the berms.

INAC also recommends yearly monitoring of sludge depth. INAC recommends that any sludge removed from the sewage lagoon should be test and properly disposed.

INAC notes that confusion (discrepancy) exists between the end sampling point (ARV-4) within the water license and within the SDFR. The water license states that sampling point ARV-4 is at the end of the sewage disposal facility (this is including the wetland area – thus at the end of the wetland), however in the SDFR ARV-4 is interpreted to be at the discharge point out of the lagoon (after exfiltration and before the wetland area). The SDFR explains that the water quality is poor at this location and subsequently takes/adds more water sampling sites at various locations (SL-1, 2 and 3) throughout the wetland area, with water quality improving all the way to the end point of the wetland at SL-3. However when reading the Water License this would be ARV-4 (ARV-4 = SL-3 – water license covers this sampling site). However, Environment Canada requires effluent sampling at the last point of control (man-made), thus sampling is required outside of the berm and before the wetland area.

INAC notes that as built drawings were not provided. INAC recommends that the licensee provide as built drawings to the Board over the next 2 years. INAC also recommends, in place of as-built drawings, the descriptions of the facilities listed here as well as in other documents along with current pictures be provided in the short time.

INAC also recommends that the Hamlet of Arviat along with the Government of Nunavut provide, to the NWB, a report detailing how the reverse osmosis water treatment facility works and what will happen with the wastes (i.e., salt, etc) and how will the wastes be deposited of associated with the facility.

INAC recommends that the applicant provide, to the NWB, all outstanding information pertaining to the operation and maintenance plan and facility reports for 3AM-ARV1015 before the plan and reports are considered for approval by the NWB.

Cc. Jim Rogers, Manager of Water Resources – Indian and Northern Affairs  
Canada, Nunavut Regional Office  
Peter Kusugak, Manager of Field Operations – Indian and Northern Affairs  
Canada, Nunavut Regional Office



Indian and Northern  
Affairs Canada

Affaires indiennes  
et du Nord Canada