



March 23, 2010

**Via: Email**

Mr. Wayne Thistle, C.E.T.  
Regional Projects Manager  
Department of Community & Government Services  
Kivalliq Region, Government of Nunavut  
PO Bag 002  
Rankin Inlet, NU X0C 0G0

Dear Mr. Thistle:

**Re: New Type 'A' Water Licence Application  
For the Hamlet of Arviat  
Response to Comments  
File No. N-O15746**

**1.0 Introduction**

At the request of the Government of Nunavut (GN), Community and Government Servicing (CGS) on behalf of the Hamlet of Arviat, we provide herein responses to comments from review agencies regarding the new Type 'A' Water Licence Application for the Hamlet of Arviat.

It is recognized there may be a lack of information and/or detail to address all of the issues raised and in some cases additional study and engineering activities may be required for issues that cannot be addressed in the short term. Many of these issues were identified in the application and supporting documents such as the Operation and Maintenance Plans (O&M Plans). We recommend they be included as "Conditions" in the new licence.

**2.0 Department of Environment (DOE)**

We have reviewed the comments provided by the Government of Nunavut Department of Environment (DOE) in a letter dated February 24, 2010 under the headings of General, Solid Waste and Spill Contingency Planning. The comments will be addressed by revising the Environmental Emergency Contingency Plan and the Operations and Maintenance Plan (O&M Plan) for the Solid Waste Management Facility.

**3.0 Fisheries and Oceans Canada (DFO)**

We have reviewed the comments provided by Fisheries and Oceans Canada (DFO) outlined in a letter dated February 24, 2010.

The following sections include our responses to the comments provided by DFO.

*Based on the above information and in conjunction with the review currently being undertaken by the NWB, DFO is in the opinion that the proposal could result in impacts to fish and fish habitat and requires additional information for further review. Of particular concern is draw down of the Wolf River and the intake fish screen.*

*In order to provide our advice with respect to the impact to fish and fish habitat or determine our potential role related to this Type "A" Water Licence, we require, at a minimum, the following additional information on impacts to fish and fish habitat:*

- *A detailed assessment of the proposed volume of water to be withdrawn from Wolf River against total annual recharge and the potential ramifications of draw down*
- *A detailed description of the proposed water intake. Refer to the Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995), which is available at [www.mpo.gc.ca/library/223669.pdf](http://www.mpo.gc.ca/library/223669.pdf).*

As outlined in the application submission there is limited information available regarding Wolf Creek and the fish habitat.

There are several issues that require the acquisition of field data during the late summer when reservoir filling occurs. For the purpose of addressing the above noted issues, we suggest that DFO's requirements be added as "Conditions" to the licence to be fulfilled by December 31, 2010. Should engineering and construction be required to achieve compliance with DFO requirements, we suggest that they be required to be completed by December 31, 2011.

#### **4.0 INAC Technical Review**

We have reviewed the comments provided by INAC in a letter dated February 18, 2010. The following sections include our responses to the comments provided by INAC.

*1. The following items remain outstanding and were required as part of a complete application:*

*a) Operating capacity of pump used and intake screen size used.*

No documents were found detailing this information in the Hamlet office or in CGS files, we will follow up with Hamlet staff to conduct a visual check of the equipment and include this information in the application.

*b) Conditions applying to the monitoring Program of the water licence; water sampling is required. (see Part H of the licence).*

The Water Supply Facility O&M Plan, the Environmental Monitoring Program and QA/QC Plan outline the monitoring.

- c) Monthly and annual data for water use and waste disposal is based on water delivery records (water delivered equals effluent waste disposal) INAC considers this an adequate record.*

The O&M Plan outlines the record keeping process.

- d) Items under Part B Item #1 of the water license remain outstanding. These include i) tabular summaries of all data generated under the Monitoring Program. ii) a summary of modifications and major maintenance work carried out on water supply and waste disposal facilities. iii) list of unauthorized discharges. iv) a summary of abandonment and restoration work completed and any work anticipated for the next year.*

As outlined in the application, the monitoring program conducted to date was very limited. All available information from the Hamlet files and CGS files was provided. There were no major renovations to the water supply and waste disposal facilities between 2007 and 2009. Prior to these years, very few records were found. There are no records found of unauthorized discharges.

No abandonment and restoration work has been undertaken in the past few years. A new landfill site has been proposed which would require the abandonment and restoration of the existing site, however it is likely to be at least two years for a new site to be commissioned.

- e) Hazardous waste management plans, procedures and protocols should be adopted.*

The O&M Plan for the Solid Waste Management Facility outlines the protocol. It is noted that some of the required facilities (i.e. Hazardous Waste Storage Facility) have not yet been constructed. The conceptual design for the new landfill site (location not yet approved) includes these facilities.

*2. Items requiring further clarification or discussion:*

- a) Water supply filtration changes are mentioned in the license application and should be included in the Operation and Maintenance plan.*

The O&M Plan will be updated to reflect the changes.

- b) The Operation and Maintenance (O and M) plan for the solid waste facility states: that the Hamlet burns combustible waste as a way to reduce volumes of wastes. This however contradicts the water license application where it is stated that burning of combustible waste does not take place.*

The application will be amended to reflect the reality that burning of combustibles does occur as outlined in the O&M Plan.

- c) *It is stated in the O & M Plan that “seven hundred and fifty cubic meters of contaminated soil was reportedly removed from the N.W.T. Power Corporation (NWTPC) tank farm and brought to the Bulky Waste site for landfarming. Some of the soil has been spread over the former landfill with approximately 300 m<sup>3</sup> still in piles. The soil is believed to be contaminated with diesel. The proposed new landfill site will have an area set aside for bulky metals and a landfarm. It is proposed that the contaminated soil at the bulky metals site be evaluated and handled according to regulations. No time table has been set to address this issue.” Nuna Burnside. Standard operating procedures should be provided to indicate how the contaminated material and any run off will be minimized including appropriate timelines and future activities.*

It is unlikely this issue can be addressed in the near future, therefore we suggest the requirements be included as “Conditions” in the License, with the requirement to conduct an environmental assessment of the soil and submit the results with a workplan and timeline to address the issues by December 31, 2010.

- d) *Runoff from the solid waste disposal site is required to be prevented and controlled from moving into the environment. As of the last INAC inspection this has not been done. Use of contaminated soil as cover material may accelerate existing runoff from landfill.*

The O&M Plan for the site includes methodology for applying cover and controlling run-off. It also addresses the acceptance and handling protocol for non-municipal waste materials.

- e) *Under the Environmental Emergency Contingency Plan, section 1.4 heading states Hamlet of Whale Cove. This Heading should be changed to say Hamlet of Arviat.*

This will be changed.

### 3. Sewage lagoon:

- a) *In the Operation and Maintenance plan of sewage lagoons it states that the lagoon continuously seeps sewage through the berm to the wetland area. The O and M Plan states that the seepage out of the lagoon equals input into the lagoon as the level of the lagoon remains constant. The O and M plan also calculates retention time in lagoon as 149 days, but this calculation does not consider seepage amounts.*

There is no record of any studies conducted as part of the design of the lagoon as to how it was to operate. There are also no studies or documentation as to the actual seepage pathway through the berm and into the wetland prior to discharge in the ocean approximately 100 m away. The retention times calculated were based simply on the time it would take (during unfrozen conditions) for sewage discharged into the lagoon to move through the standing volume by being displaced by the next volumes

of sewage discharged after it. Obviously this is not a real world condition, but it does provide a rough estimate of residence time in the lagoon. In this way, the calculation does include seepage as it is the only reported process of lagoon discharge.

*b) There is no decanting/discharge schedule provided in the submission. However, in the supplemental Questionnaire to the water license application the proponent states that there is a seasonal discharge of sewage to the wetland area of 3-4 weeks in June and again in September if necessary. No discharge should take place without advising an INAC Inspector first as per water license. Decant operations should also be included in the O and M Plan of the Sewage Treatment Facility.*

This will be amended. There is no seasonal discharge or decanting of the lagoon. Apparently the lagoon discharge via seepage matches the rate of input.

*c) There are two discontinued sewage lagoons that are no longer in use. As a result there should be an abandonment and restoration Plan.*

We suggest the licence include "Conditions" to assess the lagoons first and appropriate abandonment plan. Site visits in 2009 indicated the lagoons had reverted to a natural pond state and may not require further work. However, that needs to be determined.

The O&M Plan stated the following:

"There is currently no information to demonstrate that the sewage treatment facility is providing adequate treatment to comply with the water licence criteria. As more information is available, the design and operation of the lagoons may need to be modified to meet the discharge criteria of the water licence."

We suggest the requirement to conduct an assessment of the entire sewage treatment system including lagoon, wetland treatment, and receiving marine environment be included as a "Condition" of the License, to be completed by December 31, 2010. Further work would be contingent on the findings and recommendations.

## **5.0 Environment Canada**

We have reviewed the comments provided by Environment Canada (EC) in a letter dated February 24, 2010.

In the following sections we outline our responses to the issues raised by EC.

*The Solid Waste Facility consists of an open dump that is managed by natural attenuation and burn and bury techniques. Although the Facility is separated from the surrounding environment by a berm and fence, the wet, marshy area is likely affected by leachate, especially given the absence of a liner and presence of pooled water onsite. The natural attenuation that the Facility is said to rely on has not been verified and, as such, the extent of environmental impact is unknown. Separate to this main Solid Waste*

*Facility site is a Bulky Metal and Contaminated Soil Site. This second landfill location was previously used as a domestic landfill 40 years ago, with some burial events on record. However, there is no active management of the bulky metal nor landfarming of the contaminated soil.*

*The Sewage Disposal Facility consists of a single engineered cell, discharging by seepage through the berm, with effluent flowing through a wetland prior to its marine discharge to Hudson's Bay. In the absence of design documents, it is unclear whether the effluent is intended to seep at the locations and rates that are described in the application documents. Adjacent to the current Sewage Disposal Facility are two abandoned lagoon cells. Although not in use, there has been no abandonment or restoration work on the old lagoon cells.*

### **General**

- *The Hamlet must ensure that any effluent discharged from a system's final discharge point is in compliance with Section 36(3) of the Fisheries Act. According to the Fisheries Act, Section 36(3), the deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water, is prohibited*
- *The application documents contain conflicting information on many matters, and clarification was sought in the letter previously submitted to the Nunavut Water Board (NWB) by Environment Canada as part of the Board's Completeness Check. Information that remains outstanding include:*
  - *Number of sewage lagoons currently in use, and status of those not in use, if any*
  - *Confirmation on the current sewage lagoon wetland flow path(s)*
  - *Sewage Lagoon discharge time, duration and method*
  - *Identification of SNP ARV-2 location*
- *EC recommends that design drawings be submitted to the Board for approval prior to construction of the new Solid Waste Facility. Furthermore, EC recommends that As Built Drawings be submitted for the new Sewage Lagoon and the new Solid Waste Facility when it is completed*
- *EC recommends that Abandonment and Restoration Plans be submitted to the Board for approval for the old Sewage Lagoons if not in use and the current Solid Waste Facility.*

We suggest the licence includes the condition to conduct an Environmental Assessment of the old lagoons and the development of an Abandonment and Restoration Plan by December 31, 2010. Until the lagoons are assessed, it is not possible to prepare an Abandonment and Restoration Plan.

## Monitoring

- *No water quality results have been provided with the application, and no sampling is known to have taken place in the community, though monitoring was required under the expired licence. With regards to sludge accumulation, the application indicates that "the sludge has not interfered with the efficiency of the lagoon," yet no water samples have been submitted to verify this statement. Furthermore, in the Supplementary Questionnaire, the wastewater wetland is described as utilizing "complex physical and biological processes to treat the wastewater," yet no work or sampling has been done to verify this statement. Therefore, EC recommends that a thorough lagoon discharge and wetland hydrology study which includes water samples be completed as one of the licence conditions to ascertain this information.*

We agree and the following recommendation was included in the O&M Plan:

"There is currently no information to demonstrate that the sewage treatment facility is providing adequate treatment to comply with the water licence criteria. As more information is available, the design and operation of the lagoons may need to be modified to meet the discharge criteria of the water licence."

We recommend that this be a condition of the license with a due date of December 31, 2010.

- *In order to monitor the whole effluent effect on the receiving environment, EC recommends including a Pass/Fail Bioassay Toxicity test at an appropriate sampling location prior to effluent discharge to the receiving environment. Toxicity testing provides an evaluation of effluent quality that integrates all the measured parameters, and provides the proponent with an indication of overall effluent characterization with respect to deleteriousness.*

This should be included as a condition on the license as part of the Sewage Treatment System Assessment.

## Solid Waste Facility

*Plans for a new Solid Waste Facility have been described in the application documents with commissioning planned for in the next few years. EC's Solid Waste comments herein apply to the current Solid Waste Facility that requires a Water Licence while it remains in use. EC recognizes that design, operational and management improvements are planned for the new Solid Waste Facility and commends to Hamlet for pursuing these improvements. However, for the purpose of this water licence renewal application, EC's comments seek to prevent pollution from the existing facility.*

- **Hazardous Waste Storage** - *Hazardous Waste is stored beside the Public Works Garage. Very little detail is provided about this site except the descriptions that "the area is not fenced or controlled" and that it "is out of compliance with regulations." EC recommends that the site be improved to control the access to the Hazardous Waste and that appropriate containment be in place to reduce spills or leaching into*

*the natural environment. Reference to appropriate management of Hazardous Waste can be found in the GN-DOE Environmental Guideline for General Management of Hazardous Waste.*

It was originally envisioned that the new landfill with Hazardous Waste Storage would be constructed in 2009/2010, however decisions on the location of a new site have delayed construction. This issue should be a condition of the license.

- **Bulky Metal Storage and Contaminated Soil Site** - *A separate Solid Waste site has been identified at 500m south of the community containing vehicles, heavy equipment, tires, appliances, snowmobiles, and 45 gallon drums as well as hydrocarbon contaminated soil. Leachate from this site is unmanaged. EC recommends that this site be captured by this new Type A water licence and require appropriate Bulky Waste management as well as landfarming and monitoring of the contaminated soil. EC recommends decommissioning and restoring this site as soon as an appropriately lined site becomes available. In the meantime, leachate sampling would provide useful information to identify the geographical extent of environmental impact.*

The site has been inspected on several occasions and no evidence of a significant environmental impact has been noted. A Bulky Metal Storage Area and a landfarm facility was part of the new Solid Waste Management Facility design, however the location remains to be approved by the Hamlet. The Hamlet has indicated they do not want to move the Bulky Metals Area.

#### **Comments on the Supporting Materials Documents**

##### ***Environmental Monitoring Program and Quality Assurance / Quality Control Plan (EMP and QA/QC Plan)***

*EC considers this document to be a detailed and complete plan to achieve the objectives of high quality sampling, sample transportation and best management practices. In order to ease the interpretation of sample data results, the Monitoring Station Name (ex. ARV-1, ARV-2) should be specifically identified on the sample label. EC suggests that the words "sample name" in section 4.1.7 be replaced with "Monitoring Station Name." The EMP and QA/QC Plan should be revised and resubmitted for approval upon issuance of a new Water Licence.*

These changes will be made to the Plan.

##### ***Environmental Emergency Contingency Plan (EEC Plan)***

*Environment Canada considers this Plan to be a comprehensive and well written plan. The EEC Plan should be revised and resubmitted for approval upon issuance of a new Water Licence.*

**Section 2.2.4, pg 5:** *This section should be revised to clarify whether or not spills from 'Other Hamlet Activities' are covered by this contingency plan. As this section is written, it could be understood that this EEC Plan, and those responsible for*



*implementing the plan, applies to any spill that occurs in the municipality, whether or not it is related to activities described in the Water Licence.*

It will be clarified that the plan specifically relates to activities in the License.

***Appendix A, Contact Information:*** *EC suggests that the Government of Nunavut, Department of Environment, Environmental Protection Division be added to this list.*

This will be addressed.

### **Solid Waste Facility Operation and Maintenance (O&M) Plan**

*EC considers this document to contain pertinent information and references. The Solid Waste O&M Plan should be revised and resubmitted for approval upon issuance of a new water licence.*

#### **3.3 Landfill Operation (Burning)**

*In the Water Licence Application, it is stated that “the Hamlet does not conduct burning.” However, the O&M Plan explains that “Burning is used to reduce volumes of waste and is uncontrolled with no segregation of combustible material from non-combustible materials.” Furthermore, explicit directions on conditions and methods of burning are provided in the O&M Plan.*

*If burning is not a practice at this landfill, EC recommends that all reference to burning should be removed from the O&M Plan. If burning is indeed occurring as a management measure at the Solid Waste Facility, the following comments are provided:*

- In order to provide clear operational instruction regarding material suitable for burning, EC recommends including lists of material that are suitable or non-suitable for open burning*
- A reference should be made in this section to the Government of Nunavut Department of the Environment (GN-DOE) Policy entitled “Municipal Solid Wastes Suitable for Open Burning.”*

Burning does occur and the practice will continue. The O&M Plan will be amended to reflect this and the comments provided will be included.

#### **Section 3.4 Hazardous Waste**

*In order to provide clear operational instruction regarding Hazardous Waste, EC recommends including a list of typical Hazardous Wastes as well as a reference to the location of the Hazardous Waste Disposal Area. Furthermore, the GN-DOE Environmental Guideline for General Management of Hazardous Waste should be referenced in this section.*

There is no Hazardous Waste Disposal Area only a Hazardous Waste Storage Area. As noted in the O&M Plan, the storage area needs to be significantly upgraded. The new Solid Waste Management Facility originally scheduled to be constructed in 2009/2010

was to include a Hazardous Waste Storage Area. The Hamlet has not yet approved the location of a new site. The comments will be included in the Plan.

### **Section 3.9 Reuse Recycle**

*This section contains one paragraph relating to a Reuse Recycle Area followed with a section relating to Hazardous Waste. EC recommends moving the Hazardous Waste information to Section 3.4 Hazardous Waste.*

This will be done.

### **Landfarming of Contaminated Soil**

*The application documents indicate that 750 m<sup>3</sup> of diesel contaminated soil is present at the Bulky Metals Sites. However, no operational instruction is given on the proper handling of hydrocarbon contaminated soil. EC recommends including landfarming methods, containment, and sampling as part of this O&M Plan. Please find attached EC's Landfarming Recommendations for your consideration.*

This issue will require time to resolve. There is also other contaminated soil in the community. For the purposes of this licence application we suggest an inventory and assessment of all contaminated soil in the Hamlet be conducted with a recommended plan for the treatment/disposal of the impacted soil by December 31, 2010.

A landfarm was included in the design of the new Solid Waste Management Facility, however the Hamlet has not yet approved its location.

The landfarming documents will be appended to the O&M Plan.

### **Sewage Treatment Facility Operation and Maintenance (O&M) Plan**

*EC considers this document to contain pertinent information and references. The Sewage Treatment Facility O&M Plan should be revised and resubmitted for approval upon issuance of a new water licence.*

#### **Section 3.1.2 Lagoon Storage Capacity**

*This section indicates that sludge removal should be considered starting in 2014. Prior to sludge removal, sludge blanket thickness will need to be assessed. EC recommends including details on how to monitor or assess sludge thickness as part of the O&M Plan.*

This will be done.

Most of the main issues of concern noted by the reviewers, relating to the sewage treatment system and the landfill, and related waste handling issues, were previously identified.

The waste issues were addressed in the design of the new Solid Waste Management Facility, however construction of the facility has been delayed until the Hamlet has completed its planning process and approves a location.

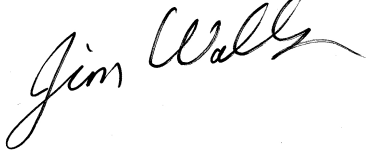
There is no record of how the sewage lagoon was supposed to operate. An environmental assessment is needed to determine the effectiveness of the system, and the current and potential future impacts to the environment.

These issues cannot be resolved in the near future. We suggest that they be added as "Conditions" to the license, with timelines to have studies and recommendations completed by December 31, 2010, and engineering and construction (if required) to commence in 2011.

The issues can be discussed in greater detail at the Technical Meeting and Pre-hearing Conference as they include a number of stakeholders including the Hamlet and GN-CGS that will have to work within the conditions of the license.

Yours truly,

**Nuna Burnside Engineering and Environmental Ltd.**

A handwritten signature in black ink, appearing to read "Jim Walls", written in a cursive style.

Jim Walls, P.Geo.

cc: Mr. Elwood Johnston, Interim SAO, Hamlet of Arviat

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