INAC, Nunavut District Office
P.O. Box 100
Iqaluit, NU
X0A 0H0

tel.: (867) 975-4275
fax.: (867) 979-6445

Your file Votre référence

Our file Notre référence

unlicenced

November 16, 2001.

Robert Sheaves
Senior Administrative Officer
Hamlet of Grise Fiord
General Delivery
Grise Fiord, NU X0A 0J0

July 20-21, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank yourself for the much appreciated time and assistance provided during the tour of the Hamlet's water use and waste disposal facilities. Attached for your records is the Municipal Water Use Inspection Report pertaining to the July 20-21, 2001 inspection; considering the relatively limited resources at the Hamlet's disposal, its water use and waste disposal facilities appear efficiently managed. Nevertheless, the following considerations were noted:

- **Water supply:** Given the seasonal nature of the municipal water source, all efforts should be taken in order to ensure that the Hamlet possesses adequate water storage structures. However, as the commission of the additional storage tank is reportedly proceeding at a very slow pace, the Hamlet will once again be faced with the possibility of a water shortage prior to springtime. Accordingly, the Inspector trusts that the parties responsible for the work will see to its prompt completion. This being said, the attached analytical results relating to a sample collected from the catchment basin (figure 1) reveal that all tested parameters meet the *Guidelines for Canadian Drinking Water Quality*, save for a slight exception: a field pH value of 8.9 which rests above the 6.5-8.5 aesthetic objective.

- **Sewage disposal:** At the time of the inspection, the annual decant of the sewage disposal facility was to begin shortly since limited freeboard remained (figure 2). In this regards, it was mentioned that it may be advisable to restrict the flow of discharge by using a decanting line of smaller diameter, thus spreading the effluent release over a longer period of time in order to maximize aerobic decomposition and secondary biological treatment. It must also be noted that veins of seepage were noticeable along the downslope berm of the facility (figure 3), even if the extent of the seepage was minimal and did not permit sampling. In related matters, the Inspector acknowledges the partial reclamation of both the old sewage lagoon cell and the honeybag pit.

- **Solid waste disposal:** A considerable amount of segregation is undertaken at the solid waste disposal facility, as wood, hazardous materials, and bulky metal wastes are separated from the combustible household wastes. Further, it was mentioned that the Hamlet was diligently attempting to find southern end-users for its stockpiled scrap metal (figure 4). Regardless, a path of runoff from the solid waste disposal facility was observed during the inspection. As such, the attached analytical results relating to a leachate sample taken 30 metres downslope from the toe of the dump (figure 5) indicate that ammonia (3.62 mg/L vs 2.2 mg/L), cadmium (0.6 μg/L vs 0.017 μg/L), and iron (857 μg/L vs 300 μg/L) exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Nevertheless, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), did not attribute toxicity to the leachate.

Also of note are the numerous drums of 'unknown' contents stored alongside the solid waste disposal facility (figure 6). Since these cannot be disposed of at the Hamlet's waste oil furnace due to their unidentified nature, the Inspector acknowledges that the hamlet plans to see to their eventual placement on a sealift backhaul. Lastly, it was recognized that when the Hamlet's resources allow such undertakings, the erection of a perimeter fence around the solid waste disposal facility and the securing of a sealift container for the storage of hazardous materials would both significantly reduce the likelihood of waste being deposited into waters.

- **Non-compliance of Act or Licence:** The Hamlet does not currently hold the licence it requires under the *Northwest Territories Waters Act* and the *Nunavut Land Claims Agreement* for its municipal water use and waste disposal. Consequently, a licence application form was provided during the inspection, and the Inspector points out that INAC and/or other agencies can provide assistance in order to facilitate its submission to the Nunavut Water Board.

Please feel free to contact me at (867) 975-4298 or lavalleep@inac.gc.ca should any questions/comments arise.

Sincerely,

Philippe Lavallée
Water Resources Officer
INAC, Nunavut District

c.c. - Nunavut Water Board, Gjoa Haven
- CG&T, Iqaluit (Doug Sitland)
- Baffin Health & Social Services, Iqaluit (Shaun Mackie)
- EC Environmental Protection, Yellowknife (Anne Wilson)

Indian and Northern Affairs Canada | Affaires Indiennes et du Nord Canada

MUNICIPAL WATER USE INSPECTION FORM

Date: 2001/07/20-21 **Licensee Rep.** (Name/Title): Robert Sheaves / SAO

Licensee: **Hamlet of Grise Fiord** **Licence No.:** **unlicenced**

WATER SUPPLY

Source(s): Catchment area from glacier-fed runoff **Quantity used:** recorded @ truck delivery

Owner:/Operator: GN/Hamlet

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Intake Facilities: A **Storage Structure:** U **Treatment Systems:** A **Chemical Storage:** A

Flow Meas. Device: NA **Convey. Lines:** A **Pumping Stations:** NA

Comments: Improvements to the catchment basin planned for late summer, once the runoff stream will have dried up: dig to enlarge the pit, line, then cover. Aging water storage tank undersized for the community's needs; additional one still not erected. The required work, if at all undertaken by a this party this summer, will likely come too late in the year to allow for the testing/filling of the additional storage tank.

WASTE DISPOSAL

Sewage: **Sewage Treatment System** (Prim./Sec/Ter.): primary; discharge overland to ocean

Natural Water Body: **Continuous Discharge** (land or water):

Seasonal Discharge: x **Wetlands Treatment:** **Trench:**

Solid Waste: **Owner/Operator:** GN/Hamlet

Landfill: **Burn & Landfill:** x **Other:**

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Discharge Quality: NA **Decant Structure:** U **Erosion:** A

Discharge Meas. Device: none **Dyke Inspection:** NA **Seepages:** U

Dams, Dykes: NA **Freeboard:** U **Spills:** none reported

Construction: NA **O&M Plan:** NA **A&R Plan:** NA

Periods of Discharge: A **Effluent Discharge Rate:** not measured

Comments: The imminent decant of the sewage lagoon has been postponed; no discharge sample could be collected. Very little freeboard remains. Decant structure located in an impractical area, therefore annual decant is carried on via pump and line over the downslope berm; the use of a smaller diameter line was suggested in order to spread the discharge over time and maximize effluent treatment. Several veins of seepage noted along the toe of the downslope berm. Honeybuckets no longer relied upon; old lagoon cell has been filled with scrap metal, and the backfilling of the cell and the honeybag pit is planned. Wood, hazardous materials and bulky metal wastes are segregated from the combustible household wastes at the unfenced solid waste disposal facility. Waste oil is adequately disposed of at the Hamlet garage (furnace). Approximately 150 drums which cannot be burned due to their 'unknown' contents are stored and monitored at the dump; plans to ship out on sealift backhauls.

FUEL STORAGE

Owner/Operator:

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Berms & Liners: **Water within Berms:** **Evidence of Leaks:**

Drainage Pipes: **Pump Station & Catchment Berm:**

Pipeline Condition: **Not Applicable:** x **Condition of Tanks:**

SURVEILLANCE NETWORK PROGRAM (SNP)

Samples Collected **Hamlet:** none required; may be collected during lagoon decant

INAC: raw water @ catchment basin, dump leachate

Signs Posted **SNP:** not applicable **Warning:** yes @ waste disposal facilities

Records & Reporting: not applicable

Geotechnical Inspection: not applicable

Non-Compliance of Act or Licence: Community is unlicenced.

Philippe Lavallée

Inspector's Name **Inspector's Signature**

figure 1. Catchment basin for seasonal glacier-fed runoff; 2001/07/20.

figure 2. Limited freeboard at the sewage disposal facility; 2001/07/20.

figure 3. Veins of seepage from the sewage disposal facility; 2001/07/20.

figure 4. Bulky metal wastes section of the solid waste disposal facility; 2001/07/20.

figure 5. Path of leachate from the toe of the solid waste disposal facility; 2001/07/20.

figure 6. Storage area for drums of 'unknown' contents; 2001/07/20.

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: raw water **Taiga Sample ID:** 211657

Client Project: **Sample Type:** raw water **Received Date:** 22-Jul-01

Location: Grise Fiord **Sampling Date:** 20-Jul-01

Report Status: **Preliminary** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	<5		5	25-Jul-01
Solids, Total Dissolved	20	mg/L	10	21-Aug-01
Turbidity	0.5	NTU	0.1	25-Jul-01
Nutrients				
Ammonia as N	0.076	mg/L	0.005	06-Sep-01
Nitrate as N	0.043	mg/L	0.008	01-Aug-01
Major Ions				
Chloride	2.4	mg/L	0.2	01-Aug-01
Sodium	1.80	mg/L	0.02	26-Jul-01
Sulphate	<3	mg/L	3	08-Aug-01
Metals, Total				
Arsenic	<1.0	µg/L	1.0	30-Jul-01
Cadmium	<0.3	µg/L	0.3	26-Jul-01
Chromium	<3	µg/L	3	26-Jul-01
Cobalt	<1	µg/L	1	26-Jul-01

Field Data (01/07/20) **raw water**
Temperature: 12.0 °C
Conductivity: 44 µS/cm
pH: 8.9 **Time:** 13:44

Report Date: October 19, 2001

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: raw water **Taiga Sample ID:** 211657

Copper	< 2	µg/L	2	26-Jul-01
Iron	94	µg/L	30	27-Jul-01
Lead	< 1	µg/L	1	26-Jul-01
Manganese	1	µg/L	1	26-Jul-01
Mercury	< 0.01	µg/L	0.01	03-Aug-01
Nickel	< 1	µg/L	1	26-Jul-01
Zinc	< 10	µg/L	10	26-Jul-01

Report Date: October 19, 2001

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: Grise Fiord **Taiga Sample ID:** 211658

Client Project: **Sample Type:** Sewage **Received Date:** 22-Jul-01

Location: Grise Fiord **Sampling Date:** 20-Jul-01

Report Status: **Final** *Approved by:*

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Nutrients	Ammonia as N	3.62	mg/L	0.005	01-Aug-01
Organic	Oil and Grease	0.9	mg/L	0.2	07-Aug-01
Physicals	Solids, Total Suspended	10	mg/L	3	02-Aug-01
Total Metals	Arsenic	<1.0	µg/L	1.0	30-Jul-01
	Cadmium	0.6	µg/L	0.3	26-Jul-01
	Chromium	<3	µg/L	3	26-Jul-01
	Cobalt	<1	µg/L	1	26-Jul-01
	Copper	<2	µg/L	2	26-Jul-01
	Iron	857	µg/L	30	27-Jul-01
	Lead	<1	µg/L	1	26-Jul-01
	Manganese	1	µg/L	1	26-Jul-01
	Mercury	<0.01	µg/L	0.01	03-Aug-01
	Nickel	<1	µg/L	1	26-Jul-01
	Zinc	<10	µg/L	10	26-Jul-01

Report Date: August 9, 2001

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: Grise Fiord **Taiga Sample ID: 211658**

Field Data (01/07/20) dump
Temperature: 11.0 °C
Conductivity: 867 µS/cm
pH: 7.5 **Time:** 14:20

Report Date: August 9, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Grise Fiord Dump Leachate**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 20, 2001

Date/Time Received: N/A

Date/Time Test Start: July 24, 2001

Sample Type: Elutriate
Sampling Method: Grab

Method: ***Environment Canada Laboratories SOP#830.0 Revision 1, for Microtox Testing in Compliance with November 1992: Biological Test Method: Toxicity Test Using Luminescent Bacteria Photobacterium phosphoreum), November 1992, EPS 1/RM/24.***

RESULTS: **NON TOXIC at 45% Concentration**

TEST ORGANISMS:
Species: Vibrio fisheri (Photobacterium phosphoreum)
Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: 8.0 (No pH adjustment)

Sample Appearance: Clear, no colour adjustment

Lot # of OAS: OSA007
(Osmotic Adjusting Solution)

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: July 24, 2001 / 11:45 PM

Test Method: Basic 45% Test, 15 minute incubation.

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Analyst: RB

Date of Test: July 24, 2001

Reagent Lot #: ACV023-3

IC_{50} - 15 minutes mg/L: 2.7 mg/L

IC_{50} Confidence Range: 1.8 to 3.9 mg/L

TEST ANALYST: Ron Bujold

INITIAL: RB