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Your file Votre référence

Our file Notre référence
NWB3IGL9803

September 21, 2001.

Nicolas Arnatsiaq
Senior Administrative Officer
Municipality of Igloolik
P.O. Box 30
Igloolik, NU X0A 0L0

July 12, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank David Haulli for the much appreciated time and assistance provided during the tour of the Municipality's water use and waste disposal facilities. Attached for your records is the Municipal Water Use Inspection Report pertaining to the July 12, 2001 inspection; overall, water use and waste disposal facilities appeared quite efficiently managed. However, the following considerations were nonetheless noted and will need to be addressed:

- **Water supply:** No concern was noted at either of the water use facilities. Further, the attached analytical results relating to a sample collected from South Lake indicate that the raw water meets the *Guidelines for Canadian Drinking Water Quality*, save for a slight exception: a field pH value of 8.6, which rests faintly above the 8.5 aesthetic objective.

- **Sewage disposal:** During the inspection it was mentioned that, apprehending overflow from the sewage lagoon cells this past winter/springtime, the municipality had restructured the municipal water delivery calculation in order to decrease the volume of water use, and therefore waste disposal. The Inspector commends the Licensee for taking such a proactive stance, and shares its concerns relating to the impact the high fluid level may have on the integrity of the sewage lagoon berms. Indeed, undeniable signs of erosion were observed along the outer berms of two of the three sewage lagoon cells. As such, cracking of the inner face of cell 3 (figure 1), and slumping of the outer face of cell 2 (figure 2) were noted. However, the berms of cell 1 seemed intact, and seepage along the toe of its berm (figure 3) was the most effective of the three sewage lagoon cells. Accordingly, sewage effluent was sampled along the main discharge path from cell 1 (figure 4). The attached analytical results relating to a sample taken roughly 10 metres from the outer berm reveal that although pH, biological oxygen demand (BOD_5), and total suspended solids are well within licenced thresholds, the concentration of faecal coliform (63 000 CFU/100ml) potentially breaches Water licence NWB3IGL9803 effluent quality standards (10 000 CFU/100ml), set at a station just prior to entering the ocean.

In addition, levels of ammonia (52.5 mg/L vs 2.2 mg/L) and iron (1.43 mg/L vs 0.3 mg/L) exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Moreover, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), shows that half of light-producing bacteria were inhibited by a sample concentration of 23.3%, whereas 50% and over is considered non-toxic.

This being said, it was related that plans were underway to build an additional sewage lagoon cell before freeze up, and that an engineer from Community Government and Transportation (CG&T) was expected during the summer pertaining to sewage disposal considerations. At the time of the inspection, the Inspector outlined the need for the Licensee to inform the Nunavut Water Board (NWB) as soon as possible when major water use or waste disposal works are planned; even though the Licensee was told by CG&T officials that their department would handle the work and the dealings with the NWB. The Inspector acknowledges that the Licensee has since notified the NWB, and trusts that in light of the Licensee's generally conscientious approach to waste management, the application can be processed in a timely manner and thus avoid possible complications next winter/springtime.

- **Solid waste disposal:** Other than the installation of a perimeter fence which would minimize the extent of windblown garbage, no obvious improvement appeared necessary at the very adequately managed solid waste disposal facility (figure 5). In parallel, should the Licensee wish to proceed with its plan to bury some of the bulky metal wastes (figure 6) along the roadside to the cemetery area, notification ought to be provided to the NWB so as to ensure that leachate prevention measures are sufficiently assessed.

- **Non-compliance of Act or Licence:** As was pointed out during the inspection, the Licensee has not provided the NWB with an Operation and Maintenance (O&M) plan for municipal the waste disposal facilities, nor 1998, 1999, and 2000 Annual Reports.

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: 2001/07/12 **Licensee Rep.** (Name/Title): David Haulli / Director, Municipal Public Works

Licensee: **Municipality of Igloolik** **Licence No.:** **NWB3IGL9803**

WATER SUPPLY

Source(s): South Lake / Reservoir **Quantity used:** recorded @ truck delivery

Owner:/Operator: GN/Municipality

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

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

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

Comments: No concerns with the water intake facility and the well-kept truckfill station. No freeze up problems since recharging the reservoir earlier (August). Warning sign installed at the reservoir, but not at South Lake. Chlorination in use, but fluoridation discontinued in recent years.

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:** limited **Trench:**

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

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

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

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

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

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

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

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

Comments: Signs of erosion, slumping and cracking, were noticeable along the outer berms of two of the three sewage lagoon cells. Sewage effluent seeps through the base of the lagoon berms and flows overland. The honeybag pit is satisfactory condition; a single house still relies on honey buckets. Considerable waste segregation occurs at the unfenced solid waste disposal site. Household wastes are burnt and compacted regularly, covered once to twice per year. Hazardous materials are stored in a sealift container, while waste oil is disposed of via the municipal garage's furnace; an additional furnace has been ordered. The bulky metal wastes disposal facility covers a relatively broad area. No flow of leachate was noted below the dump or metal dump, although pooled water and signs of previous runoff were present. An Operation and Maintenance (O&M) plan for the municipal waste disposal facilities has not been submitted.

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

INAC: raw water @ South lake (IGL-1), sewage lagoon cell 1 discharge @ berm

Signs Posted **SNP:** none **Warning:** yes

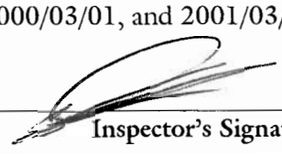
Records & Reporting: no O&M plan, no 1998, 1999, 2000 Annual Reports

Geotechnical Inspection: CG&T engineer expected during the summer

Non-Compliance of Act or Licence: O&M plan, 1998, 1999 and 2000 Annual Reports not submitted; respectively due by 1999/04/01, 1999/03/31, 2000/03/01, and 2001/03/01.

Philippe Lavallée

Inspector's Name



Inspector's Signature

figure 1. Erosion along the inner face of sewage lagoon cell 3; 2001/07/12.

figure 2. Seepage and erosion along the outer face of sewage lagoon cell 2; 2001/07/12.

figure 3. Seepage along the outer face of sewage lagoon cell 1; 2001/07/12.

figure 4. Effluent discharge from sewage lagoon cell 1; 2001/07/12.

figure 5. Solid waste disposal facility; 2001/07/12.

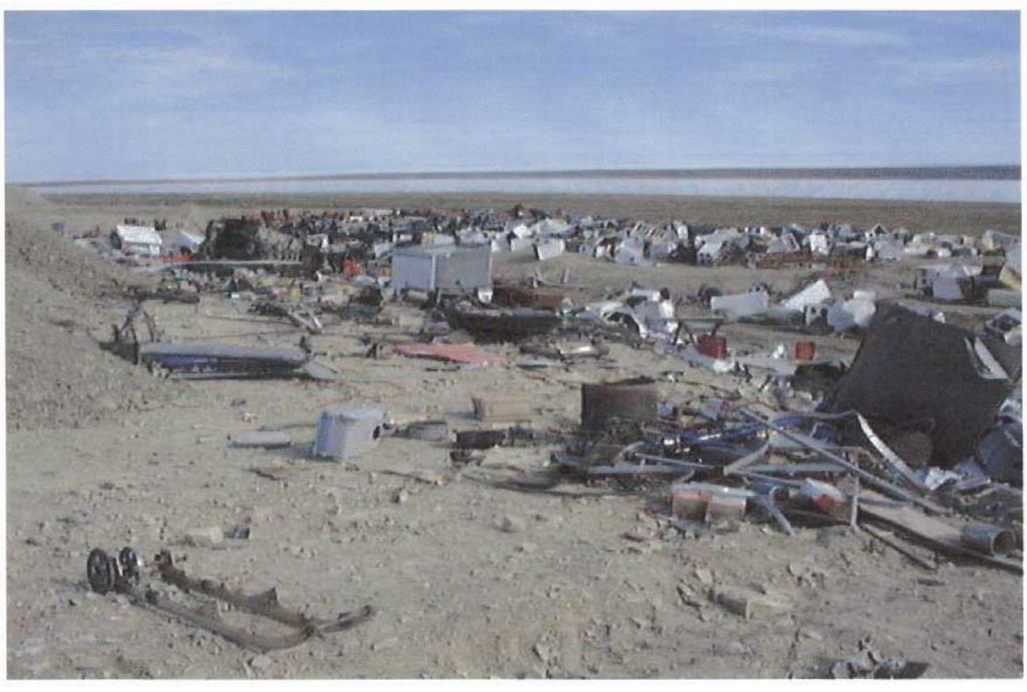


figure 6. Bulky metal wastes, solid waste disposal facility; 2001/07/12.

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: Igloolik Raw Water IGL-1 **Taiga Sample ID: 211514**

Client Project: **Sample Type:** sewage **Received Date:** 13-Jul-01

Location: Igloolik **Sampling Date:** 12-Jul-01

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

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Major Ions	Chloride	55.2	mg/L	0.2	21-Jul-01
	Sodium	31.0	mg/L	0.02	20-Jul-01
	Sulphate	12	mg/L	3	07-Aug-01
Microbiology	Coliforms, Fecal	<1	CFU/100mL	1	13-Jul-01
Nutrients	Ammonia as N	0.006	mg/L	0.005	25-Jul-01
	Biological Oxygen Demand	4	mg/L	2	13-Jul-01
	Nitrate+Nitrite as N	<0.008	mg/L	0.008	31-Jul-01
Physicals	Colour	<5		5	16-Jul-01
	Solids, Total Dissolved	256	mg/L	10	30-Jul-01
	Turbidity	0.8	NTU	0.1	16-Jul-01
Total Metals	Arsenic	<1.0	µg/L	1.0	30-Jul-01
	Cadmium	<0.3	µg/L	0.3	19-Jul-01
	Chromium	<3	µg/L	3	19-Jul-01

Report Date: August 9, 2001

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

Sample ID: Igloolik Raw Water IGL-1 **Taiga Sample ID: 211514**

Total Metals	Cobalt	<1	µg/L	1	19-Jul-01
	Copper	<2	µg/L	2	19-Jul-01
	Iron	63	µg/L	30	27-Jul-01
	Lead	<1	µg/L	1	19-Jul-01
	Manganese	3	µg/L	1	19-Jul-01
	Mercury	<0.01	µg/L	0.01	03-Aug-01
	Nickel	2	µg/L	1	19-Jul-01
	Zinc	<10	µg/L	10	19-Jul-01

Field Data (01/07/12) **IGL-1**
Temperature: 11.0 °C
Conductivity: 353 µS/cm
pH: 8.6 **Time:** 09:26

Report Date: August 9, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: Igloolik Lagoon Discharge IGL-3 **Taiga Sample ID: 211515**

Client Project: **Sample Type:** sewage **Received Date:** 13-Jul-01

Location: Igloolik **Sampling Date:** 12-Jul-01

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

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Major Ions	Calcium	54.7	mg/L	0.05	19-Jul-01
	Magnesium	19.8	mg/L	0.02	19-Jul-01
	Potassium	24.3	mg/L	0.03	20-Jul-01
	Sodium	105	mg/L	0.02	20-Jul-01
	Sulphate	46	mg/L	3	07-Aug-01
Microbiology	Coliforms, Fecal	63000	CFU/100mL	1	13-Jul-01
Nutrients	Ammonia as N	52.5	mg/L	0.005	17-Jul-01
	Biological Oxygen Demand	56	mg/L	2	13-Jul-01
	Nitrate+Nitrite as N	1.16	mg/L	0.008	31-Jul-01
Organic	Oil and Grease	3.5	mg/L	0.2	30-Jul-01
	Phenols	< 2	µg/L	2	19-Jul-01
Physicals	Solids, Total Suspended	18	mg/L	3	26-Jul-01
Total Metals	Cadmium	< 0.3	µg/L	0.3	19-Jul-01

Report Date: August 9, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: Igloolik Lagoon Discharge IGL-3 **Taiga Sample ID: 211515**

Total Metals	Chromium	4	µg/L	3	19-Jul-01
	Cobalt	4	µg/L	1	19-Jul-01
	Copper	23	µg/L	2	19-Jul-01
	Iron	1430	µg/L	30	27-Jul-01
	Lead	2	µg/L	1	19-Jul-01
	Manganese	116	µg/L	1	19-Jul-01
	Nickel	11	µg/L	1	19-Jul-01
	Zinc	14	µg/L	10	19-Jul-01

Field Data (01/07/12) **IGL-3**
Temperature: 12.5 °C
Conductivity: 1 153 µS/cm
pH: 7.8 **Time:** 10:16

Report Date: August 9, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Igloolik Lagoon Discharge**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 12, 2001

Date/Time Received: N/A

Date/Time Test Start: July 16, 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: **TOXIC - IC_{50} Concentration: 23.3% (Toxic 0 to 50%)**

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

TEST SUBSTANCE/CONDITIONS

pH of Sample: _N/A_ (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 16, 2001 / 03:45 PM

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

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Analyst: Ron Bujold

Date of Test: July 16, 2001

Reagent Lot #: ACV022-2

IC_{50} - 15 minutes mg/L: 7.6 mg/L

IC_{50} Confidence Range: 4.9 to 12.2 mg/L

TEST ANALYST: Ron Bujold **INITIAL:** RB