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

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Your file Votre référence

Our file Notre référence
NWB3PEL9803

November 16, 2001.

Quinn Taggart
Senior Administrative Officer
Hamlet of Kugaaruk
General Delivery
Kugaaruk, NU X0E 1K0

July 6, 2001 Water Licence Inspection - Report

Firstly, I wish to thank Etienne Kakkianiun 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 6, 2001 inspection; various concerns were encountered. Accordingly, the following considerations were noted and will need to be addressed:

- **Water supply:** No concerns were noted at the well-kept water intake and supply facility. Further, the attached analytical results relating to a sample taken from the intake facility at Surveillance Network Program (SNP) station PEL-1 indicate that all tested parameters meet the *Guidelines for Canadian Drinking Water Quality*, save turbidity: recorded value of 1.9 Nephelometric Turbidity Units (NTU) versus the 5 NTU aesthetic objective.

- **Sewage disposal:** As recurring breaches have occurred in recent years at the sewage disposal facility (figure 1), the Licensee consequently raised the permeable retention berm (figure 2). However, this summer an event of excessive seepage, regarding which spill report 01-193 was filed, prompted the Licensee to fortify the base of the retention berm with the material at its crest. Therefore at the time of the inspection, the extent of seepage was found to be acceptable. Nonetheless, since the facility is practically emptied of its contents, adequate retention and treatment time is not likely to be provided to sewage effluent prior to its discharge to receiving waters. As such, the attached analytical results relating to a sample collected ten metres downslope of the berm (figure 3) indicate that levels of faecal coliform (264 000 CFU/100ml vs 10 000 CFU/100ml) potentially breach the effluent quality standards (part D, item 2) set under Water licence NWB3PEL9803. Also, concentrations of ammonia (40.2 mg/L vs 2.2 mg/L) and phenols (21 μg/L vs 4 μg/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 36.9%, whereas 50% and over is considered non-toxic.

In light of this, the Inspector trusts that Community Government and Transportation (CG&T) will respond to the Licensee's requests, and will be able to provide guidance and/or assistance in regards to an appropriate manner of addressing this outstanding issue.

- **Solid waste disposal:** Although combustible wastes are reportedly burnt/compacted regularly and covered on an annual basis, a considerable quantity of exposed waste was nevertheless noticeable at the solid waste disposal facility (figure 4). Furthermore, the frail fencing does not appear to efficiently contain windblown waste within the perimeter of the site. This being said, the attached analytical results relating to a leachate sample collected along the main vein of runoff from the facility (figure 5) reveal levels of ammonia (5.01 mg/L), phenols (12 µg/L), cadmium (1.0 µg/L vs 0.017 µg/L), copper (48 µg/L vs 4 µg/L), iron (2.52 mg/L vs 0.3 mg/L), and zinc (248 µg/L vs 30 µg/L) exceeding the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Regardless, the associated Microtox sample did not attribute toxicity to the leachate. In parallel, no flow of water could be observed in the vicinity of the well segregated bulky metal wastes disposal facility. In related matters, since signs of hydrocarbon contamination were noted at the waste oil storage site (figure 6), it was strongly suggested during the inspection that the Licensee see to utilizing its waste oil furnace now idle at the Hamlet garage.

- **Non-compliance of Act or Licence:** The Licensee has yet to submit an Annual Report (part B, item 1) since the issuance of Water licence NWB3PEL9803. Considering that these reports constitute the foremost source of information regarding municipal water use and waste disposal available to the Nunavut Water Board (NWB) and regulatory agencies, the Inspector stresses that the Licensee ought to see to their prompt submission. In addition, both the Operation and Management (O&M) plan for the municipal waste disposal facilities (part G, item 1) and the assessment of abandoned facilities (part H, item 5) are overdue. In this regards, INAC and other agencies can assist the Licensee back into compliance.

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, Cambridge Bay (Sherif El-Attar)
- Kitikmeot Health & Social Services, Cambridge Bay (Robert Phillips)
- EC Environmental Protection, Yellowknife (Anne Wilson)

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MUNICIPAL WATER USE INSPECTION FORM

Date: 2001/07/06 **Licensee Rep.** (Name/Title): Etienne Kakkianiun / acting-Foreman

Licensee: Hamlet of Kugaaruk **Licence No.:** NWB3PEL9803

WATER SUPPLY

Source(s): Kugurdjuk River **Quantity used:** meter @ 144 423 400 L

Owner:/Operator: GN/Hamlet

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

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

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

Comments: No concerns noted at the well-kept water intake and supply facility. Chlorination in use.

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/Hamlet

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

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

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

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

Dams, Dykes: U **Freeboard:** U **Spills:** 01-193

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

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

Comments: Sewage disposal facility reportedly overflowed last year; downslope retention berm then raised. Excessive seepage noted this spring/summer; upper berm material packed along the outer toe of the retention berm. Sewage disposal facility almost emptied of contents at time of inspection; signs of prior seepage of larger scale. No more housing units rely on honeybags. Solid waste disposal facility is fenced, but frail fencing appears inefficient at preventing windblown waste. Considerable amount of exposed waste despite the fact that the wastepile is reportedly burnt/compacted regularly and covered yearly. Minor hydrocarbon spillage at the waste oil storage site; idle furnace at the Hamlet garage. Leachate trickles along the roadside, but mainly seeps through the site's containment berm. Batteries observed at the metal wastes disposal site although supposed to be segregated and stored at the Hamlet garage.

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 reported

INAC: raw water (PEL-1), dump leachate (PEL-2) sewage discharge (PEL-3)

Signs Posted **SNP:** none **Warning:** yes @ water intake and bulky metal wastes disposal site

Records & Reporting: Annual Reports not submitted; SNP sampling apparently not undertaken

Geotechnical Inspection: not applicable

Non-Compliance of Act or Licence: Outstanding 1998, 1999 and 2000 Annual Reports. Effluent quality standards (part D, item 2) potentially breached. Operation and Maintenance (O&M) plan for the waste disposal facilities, and an assessment of abandoned municipal waste disposal sites not yet submitted; respectively due since 1999/05/01 and 1999/09/01. SNP samples apparently not collected.

Philippe Lavallée

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

figure 1. Sewage disposal facility from the truck dumping point; 2001/07/06.

figure 2. Downslope retention berm of the sewage disposal facility; 2001/07/06.

figure 3. Main vein of seepage from the sewage disposal facility; 2001/07/06.

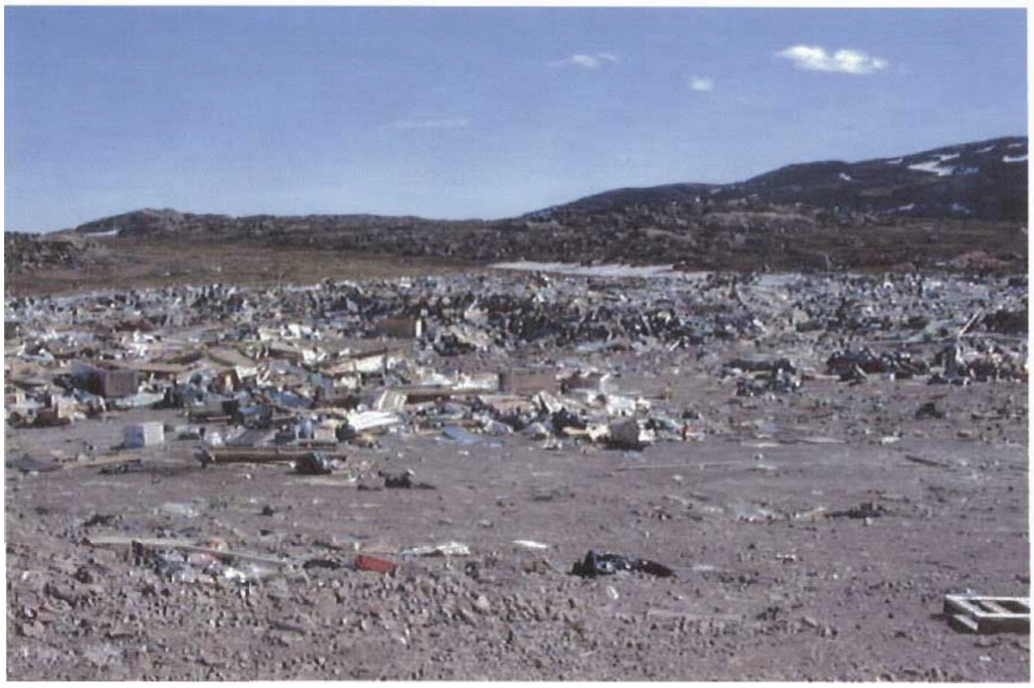

figure 4. Solid waste disposal facility; 2001/07/06.

figure 5. Leachate runoff from the solid waste disposal facility; 2001/07/06.

figure 6. Hydrocarbon contamination at the waste oil storage site; 2001/07/06.

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 PEL-1 **Taiga Sample ID:** 211439

Arsenic	<1.0	µg/L	1.0	13-Jul-01
Cadmium	<0.3	µg/L	0.3	19-Jul-01
Chromium	<3	µg/L	3	19-Jul-01
Cobalt	<1	µg/L	1	19-Jul-01
Copper	14	µg/L	2	19-Jul-01
Iron	73	µg/L	30	17-Jul-01
Lead	3	µg/L	1	19-Jul-01
Manganese	2	µg/L	1	19-Jul-01
Mercury	<0.01	µg/L	0.01	10-Jul-01
Nickel	<1	µg/L	1	19-Jul-01
Zinc	12	µg/L	10	19-Jul-01

Report Date: October 19, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: raw water PEL-1 **Taiga Sample ID:** 211439

Client Project: **Sample Type:** freshwater **Received Date:** 06-Jul-01

Location: Kuugaruk **Sampling Date:** 06-Jul-01

Report Status: **Amended** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	5		5	09-Jul-01
Solids, Total Dissolved	97	mg/L	10	22-Jul-01
Turbidity	1.9	NTU	0.1	09-Jul-01
Nutrients				
Ammonia as N	<0.005	mg/L	0.005	16-Jul-01
Biological Oxygen Demand	<2	mg/L	2	07-Jul-01
Nitrate+Nitrite as N	<0.008	mg/L	0.008	10-Sep-01
Major Ions				
Chloride	7.4	mg/L	0.2	21-Jul-01
Potassium	0.55	mg/L	0.03	11-Jul-01
Sodium	3.19	mg/L	0.02	11-Jul-01
Sulphate	4	mg/L	3	13-Jul-01
Microbiology				
Coliforms, Fecal	<1	CFU/100mL	1	07-Jul-01
Metals, Total				

Field Data (01/07/06) PEL-1
Temperature: 15.0 °C
Conductivity: 91 µS/cm
pH: 7.6 Time: 11:06

Report Date: October 19, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: dump leachare PEL-2 **Taiga Sample ID:** 211440

Client Project: **Sample Type:** sewage **Received Date:** 06-Jul-01

Location: Kuugaruk **Sampling Date:** 06-Jul-01

Report Status: **Amended** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Solids, Total Suspended	15	mg/L	3	25-Jul-01
Nutrients				
Ammonia as N	5.01	mg/L	0.005	16-Jul-01
Nitrate+Nitrite as N	0.046	mg/L	0.008	10-Sep-01
Major Ions				
Calcium	118	mg/L	0.05	11-Jul-01
Magnesium	9.50	mg/L	0.02	11-Jul-01
Potassium	9.06	mg/L	0.03	11-Jul-01
Sodium	29.3	mg/L	0.02	11-Jul-01
Sulphate	263	mg/L	3	13-Jul-01
Organic				
Phenols	12	µg/L	2	19-Jul-01
Metals, Total				
Arsenic	1.2	µg/L	1.0	13-Jul-01
Cadmium	1.0	µg/L	0.3	19-Jul-01

Report Date: October 19, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: dump leachare PEL-2 **Taiga Sample ID: 211440**

Chromium	<3	µg/L	3	19-Jul-01
Cobalt	4	µg/L	1	19-Jul-01
Copper	48	µg/L	2	19-Jul-01
Iron	2520	µg/L	30	17-Jul-01
Lead	4	µg/L	1	19-Jul-01
Manganese	1280	µg/L	1	19-Jul-01
Mercury	0.04	µg/L	0.01	10-Jul-01
Nickel	11	µg/L	1	19-Jul-01
Zinc	248	µg/L	10	19-Jul-01

Field Data (01/07/06) PEL-2
Temperature: 16.0 °C
Conductivity: 725 µS/cm
pH: 7.3 **Time:** 10:34

Report Date: October 19, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: raw water **Taiga Sample ID:** 211441

Client Project: **Sample Type:** sewage **Received Date:** 06-Jul-01

Location: Kuugaruk **Sampling Date:** 06-Jul-01

Report Status: **Amended** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Solids, Total Suspended	43	mg/L	3	25-Jul-01
Nutrients				
Ammonia as N	40.2	mg/L	0.005	16-Jul-01
Biological Oxygen Demand	88	mg/L	2	07-Jul-01
Nitrate+Nitrite as N	0.032	mg/L	0.008	10-Sep-01
Major Ions				
Calcium	25.6	mg/L	0.05	11-Jul-01
Magnesium	8.64	mg/L	0.02	11-Jul-01
Potassium	23.7	mg/L	0.03	11-Jul-01
Sodium	64.1	mg/L	0.02	11-Jul-01
Sulphate	28	mg/L	3	13-Jul-01
Microbiology				
Coliforms, Fecal	264000	CFU/100mL	1	07-Jul-01
Organic				
Phenols	21	µg/L	2	19-Jul-01

Report Date: October 19, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: raw water **Taiga Sample ID:** 211441

Field Data (01/07/06) PEL-3
Temperature: 14.0 °C
Conductivity: 1 778 µS/cm
pH: 7.4 **Time:** 10:08

Report Date: October 19, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Kuqaaruk Lagoon Discharge PEL-3**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 06, 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: **TOXIC - IC_{50} Concentration: 36.9%** **(Toxic 0 to 50%)**

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

TEST SUBSTANCE/CONDITIONS

pH of Sample: 7.5 (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 / 01:24 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

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Kugaaruk Dump Discharge**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 06, 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: 7.4 (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 / 02:14 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