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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI

Water Licence Application
Supplementary Questionnaire
for Municipalities

I. GENERAL

1. Date: **August 31, 2000**

2. Applicant: **Municipality of Iqaluit**
Municipality and Region

3. Contacts: **Matthew Hough**
Name of Contact

Director of Public Works and Engineering
Position

(867) 979-5633 Telephone #
(867) 979-5910 Fax #

4. Community Status: __ Village √ Town __ City
__ Hamlet __ Settlement Corporation

5. Indicate the status of the municipality's licence on the date of the application.
__ New Application
√ Renewal - Water Licence # **NWB31QA9900**

II. ATTACHMENTS

1. Attach current or up-to-date detailed map(s) showing the locations of the:
a. raw water intake;
b. water storage and treatment facilities;
c. fuel and chemical storage;
d. sewage treatment facilities (lagoon, honey bag pit, wetland);
e. wastewater treatment area and discharge outlets;
f. solid waste disposal areas and drainage patterns;
g. hazardous waste disposal area;
h. transportation access routes;
i. existing water bodies/courses and any changes to these water bodies/courses that have or may occur as a result of water use or waste disposal facilities, locations of environmental monitoring sites. (Outline drainage basin);
j. Traditional use areas outlined on site map and areas around the community used for recreation, camping, fishing, etc.;
k. abandoned and/or restored water treatment, sewage, and solid waste disposal facilities.

Are maps attached? __ Yes √ No
If no, please indicate when they will be available.

Facilities are all shown on two figures included in the March 1, 1999 Application. Maps will be provided as part of additional submissions prior to hearing.

III. WATER SUPPLY

Water Source

1. Type of source: √ Lake __ River __Well __ Other

2. Name of water source and alternative, if any.

Lake Geraldine	**none**
Primary Source	Secondary Source

3. Usual break-up & freeze-up period:

late-May	**October**
Break-up	Freeze-up

Water Intake

1. Please provide short descriptions for the following:

   a. Freshwater intake facility
   Lake Geraldine has been dammed to increase storage volume. The 360 m long raw water intake line is 250 mm diameter ductile iron, insulated with 50 mm of blown glass and a spiral gauge metal jacket. A 150 mm tempered water line injects water from the treatment plant into the intake system at the dam in order to prevent freeze up.

   b. Operating capacity of pumps used
   There are four pumps. Two are in continuous use.
   Two pumps are in reserve.

   c. Intake screen size
   No screen used.

Water Storage

1. Type of water storage facility. (check where applicable)
   _√_ Reservoir/Pond (untreated) _√_ Storage tank (treated) ___ None
   ___ Other _____Description:

2. If "reservoir" checked:

   Is the reservoir lined? ___ Yes _√_ No

   What type of liner? _____ When was it installed?

Water Treatment

1. Indicate the quality of the water.

Summer:	__√__ good	___ fair	___ poor
Fall:	__√__ good	____ fair	___ poor
Winter:	__√__ good	____ fair	___ poor
Spring:	__√__ good	____ fair	___ poor

2. Describe.

   Water quality results for 1999 can be found in the Annual Report dated April 2000.

3. Type of water treatment.
   - √ **Filtration and chlorination (pre-chlorination, pH control, settling tanks, filtration, fluoridation, backwash)**
   - ___ Chlorination only
   - ___ None
   - ____ Other

Water Use And Distribution

1. Volume of water use:

To date in 2000, water use has averaged approximately 1.1 million litres/day.

General Condition of the water supply facilities

1. General condition of the:

a. Water supply facility
   √ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

b. Storage facility

√ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

c. Distribution system

√ Satisfactory __Unsatisfactory

If unsatisfactory, explain.

Modifications

1. Are there any changes *planned* for the water supply system?

___ No √ Yes

If yes, please attach a copy of the plan, or describe changes. Provide information on the implementation schedule.

The Municipality of Iqaluit plans to retain a consultant to study and make recommendations on long-term water supply options. The current schedule is to retain the consultant by March 2001.

2. Does the community believe changes are needed to the water supply, storage or treatment facilities? Describe.

The Municipality of Iqaluit is aware that additional water will be required in the not-to-distant future. Council is committed to ensuring future water needs for the Municipality.

Identification

Are there signs identifying drinking water sources presently used by the municipality ?

√ Yes __ No

IV. SEWAGE DISPOSAL

1. What type(s) of sewage treatment does the community have?

√ Lagoon
___ Mechanical system
___ Wetland
___ Honey bag
√ Combination/Other: describe

Construction of a new sewage treatment plant has been completed, but the plant cannot be commissioned because of construction deficiencies. The Municipality is presently involved in negotiations with the contractor's bonding company regarding access to the performance bond. This will provide the funds to correct the deficiencies. If the funds become available soon, it is still possible to commission the new sewage treatment plant before the end of this year.

Lagoon *(if applicable)*

1. Has there been any operating problems with the lagoon?
   _√_ Yes ___ No
   If yes, describe

   As a result of seepage through the west dyke in 1997, the Municipality retained a consultant, who recommended that the lagoon level be lowered. The level continues to be closely monitored. Previous washout problems occurred in 1987 and 1991.

Mechanical System *(if applicable)*

1. Describe (type, specifications, operation and maintenance program for the mechanical wastewater treatment system).

   Zenon Filtration System (not yet in operation)

2. Are sludges produced ?
   _√_ Yes __ No **(once plant is operational)**

If yes, describe how the sludges are disposed of:

Sludges will be stored and composted at the solid waste site.

Wetland*(if applicable)*

1. Describe the Wetland wastewater treatment system.
   N/A

Honey Bag Pit

1. Does the municipality use a honey bag pit?
   ___ Yes _√_ No

If yes, describe the location, drainage, and operation/maintenance of the site:

Commercial, Industrial and/or Hazardous Wastes

1. Are there any sources of commercial or industrial *liquid* waste being discharged or deposited to the wastewater treatment system that may affect the quality of the effluent or leachate produced? *(The municipality should be aware that any commercial or industrial discharge has to be approved by the municipality)*

___ Yes ___√___ No

If yes, indicate sources, types and quantities.

Sewage Discharge

1. Are fish, shell fish and other wildlife harvested in or near the discharge area ?

___ Yes ___√___ No

If yes, indicate species harvested, and level of harvest.

General Condition of the sewage treatment facilities

1. General condition of the:

a. Sewage collection system

___√___ Satisfactory ___ Unsatisfactory

If unsatisfactory, explain

b. Discharge control system

___√___ Satisfactory ___ Unsatisfactory

If unsatisfactory, explain.

c. Dams, diversion dykes, berms

___√___ Satisfactory ___ Unsatisfactory

If unsatisfactory, explain.

Modifications

1. Are there any changes *planned* in the sewage treatment facilities?

___ No ___√___ Yes

If yes, please attach a copy of the plan, or describe changes. Provide information on the implementation schedule.

A new sewage treatment plant has been constructed but is not yet operational due to construction deficiencies.

2. Does the municipality or residents believe changes are needed to the sewage treatment facilities? Describe.

Yes, the new plant will address the need for changes.

Abandonment and Restoration

1. List and describe abandoned or restored sewage treatment facilities.
Refer to original attachment maps.

An abandonment and restoration plan for the existing lagoon will be submitted to the Board prior to commissioning of the new Sewage Treatment facility.

Identification

Are there signs identifying past and present sewage disposal sites ?
_√_ Yes __ No

V. SOLID WASTE DISPOSAL

1. Briefly describe how solid wastes are collected and delivered to the disposal area.

Solid waste is picked up by the Municipality in 25 cubic yard compaction trucks two times week for residential users and five times per week for commercial users. Residents and contractors may also deliver waste directly to the disposal area during prescribed hours.

2. Is the solid waste site fenced? √ Yes __ No

3. Is the fence adequate? _√_ Yes __ No

If no, describe

Waste Reduction

1. Does the municipality burn garbage ?
_√_ Yes __No
If yes, describe how and when this is done.

Controlled burning takes place under favourable conditions as a means of volume reduction. The combustion area is kept reasonably small and is monitored by the operator throughout the day. A 5m buffer zone is maintained around the combustion area. Burning only occurs when the wind is from the north or the south and the air temperature is below 15°C. A

burn is not started if the wind is blowing towards the Town. If the wind shifts toward Town during burning, attempts are made to reduce the size of the burn, but the fire is not extinguished. Burning also does not take place when tanks in the tank farm are being filled, a spill occurs at the tank farm or there is venting of the tanks during high wind.

2. Has the municipality considered measures for waste reduction such as recycling or reuse?

   _√_ Yes __ No

   If yes, describe

   At the current time, a local contractor operates a recycling program for aluminum cans. The Municipality has now completed a Solid Waste Management Plan, which recommends programs for diverting waste from disposal. A Solid Waste Steering Committee has now been formed and has been given the responsibility for designing and implementing waste reduction, reuse and recycling programs.

Animal Carcasses Pit

1. Does the municipality have an area for the disposal of animal carcasses ?

   __ Yes _√_ No

   If yes, describe the location, drainage and operation/maintenance of the site

   Animal carcasses are burned.

Waste Oil Pit

1. Describe the waste oil storage area.

   There is no waste oil storage area managed by the Municipality of Iqaluit.

Bulky Scrap Metal Waste Disposal Area

1. Does the municipality have a scrap metal or bulky waste disposal area?

   _√_ Yes __ No

   If yes, briefly describe its location and operation plan.

   The bulky waste area is located on the south side of the landfill area. Cars, empty barrels, appliances and other bulky metals that cannot be salvaged are stacked and collapsed.

Commercial, Industrial and/or Hazardous Wastes Disposal Area

1. Are there any commercial or industrial waste being discharged or deposited in the solid waste disposal area? *(The municipality should be aware that any discharge of commercial or industrial waste has to be approved by the municipality)*

   _√_ Yes ___ No

   If yes, please indicate sources, types and quantity.

   Commercial waste from hotels, restaurants, retail stores, contractors and other private businesses, (ie. food waste, cardboard, paper, construction materials, cans, other metal, plastic and rubber).

2. Will the municipality use a hazardous waste disposal area?

   _√_ Yes ___ No

If yes, describe its:

a. Location

   Inside the fenced Solid Waste Facility on the northeast side.

b. Structure

   Steel, locked Sea Lift Containers.

c. Operation and maintenance (describe special handling/disposal methods for these wastes)

   - **HHW collection program twice per year**
   - **HHW may also be brought directly to the facility**
   - **Hazardous waste is neutralized or recycled**
   - **Every 2-4 years, hazardous wastes that cannot be neutralized or recycled re shipped south for proper disposal.**

General Condition of the Solid Waste Disposal Area

1. Comment on the general conditions of the:

a. Solid waste disposal area

   _√_ Satisfactory __ Unsatisfactory

   If unsatisfactory, explain.

Modifications

1. Are there any changes planned for the solid waste disposal area?

   __ No _√_ Yes

   If yes, attach a copy of the plan, or describe changes. Provide information on the implementation schedule.

   The current waste disposal site will be closed when a new waste disposal system, (incinerator plus engineered landfill), is implemented in accordance with the recommendations of the Solid Waste Management Plan. Site

selection and design of the new facilities will take place over the next eight months in preparation for construction in the summer of 2001.

2. Are changes needed to the solid waste disposal area? Describe.

Yes, a new facility is being planned.

Abandonment and Restoration

1. List and describe abandoned or restored solid waste facilities. Indicate their location on a map.

See UMA Figure 1 in the march1, 1999 Application.

Identification

Are there signs identifying past and present solid waste disposal sites ?

__√__ Yes __ No

Current site only.

VI. INSPECTION AND MONITORING

1. When were municipal facilities inspected by:

__√__ Indian and Northern Affairs Inspector	Date: August 2000
____ Municipal and Community Affairs	Date: does not inspect
__√__ Baffin Regional Health	Date: monthly

2. Is there a system in place for reporting spills?

__√__ Yes ___ No

If yes, describe.

The Spill Contingency Plan is currently undergoing revision.

3. Is there a contingency plan for clean up of spills?

__√__ Yes ___ No

If yes, describe.

The Spill Contingency Plan (is currently undergoing revision.

4. Have any spills occurred in the past five years?

__√__ Yes ___ No

If yes, describe and show on a map the locations of the spills. What action has been taken to clean the affected areas?

See Annual Report submitted April 2000.

Monitoring Program

1. Is water sampling and analysis done ?
   √ Yes ___No

   If Yes, answer the questions a to e

a. Briefly describe how samples are taken and sent to the laboratory.

Sampling, sample preservation and analyses are conducted in accorance with methods prescribed in the current edition of "Standard Methods for the Examination of Water and Wastewater".

b. Briefly describe any monitoring done for wastewater effluent and leachate.

Monitoring is carried out in accordance with the requirements of the Surveillance Network Program.

c. Who is responsible for water sampling ?

Name: **Chris Freda**

Position: **Utilidor Foreman**

Telephone # **(867) 979-5648**

Fax # : **(867) 979-5910**

Level of training: **Level 1 Water Treatment Plant Operator**

d. Recognized laboratories performing analysis of samples.

Name:	**Enviro-Test Laboratories**	**Taiga Environmental Laboratory**
Address:	**9936-67th Avenue Edmonton AB T6E 0P5**	**Box 1500, 4601-52nd Avenue Yellowknife, NWT XIA 2R3**
Telephone #:	**(780) 413-5227**	**(867) 669-2788**

Fax : **(780) 437-2311** **(867) 669-2718**

e. Are any changes planned in the water quality monitoring program?
___ Yes √ No
If yes, describe.

VII. PUBLIC CONCERNS

1. What concerns does the municipality or residents have regarding the municipal water supply or waste disposal facilities? List the concerns and describe what steps have been taken to address those concerns.

Concern	Action
Inadequate sewage treatment.	**New sewage treatment plant.**
Smoke from open burning at Solid Waste Site.	**Long-term solution is replacement of facility. In the interim, the Municipality is taking all reasonable steps to reduce impacts from burning.**

VIII. PUBLIC HEALTH *(To be filled by the Regional Environmental Health Officer)*

1. Date: **September 11, 2000**

2. Municipality: **Iqaluit**

3. Contact: (Environmental Health Officer Contact) **Bonnie Segal**

   Telephone #: **867-979-7654**

   Fax #: **867-979-7659**

4. Have there been any problems or health/environmental concerns with drinking water?
   ___ Yes _*__No

   If yes, describe

5. Have there been any problems or health/environmental concerns with sewage disposal/treatment?

___ Yes __*_ No

If yes, describe

6. Have there been any problems or health/environmental concerns with solid waste disposal?
_*_ Yes ___ No

If yes, describe

Burn piles are often large, sometimes up to 20 meters in length, and difficult to control. There is little control on what enters the site and ends up in the burn pile. Separation of waste is minimal and the burn pile often contains materials that are not acceptable for burning (e.g. metal containers, plastic, insulation from construction sites).

Public are permitted on site during the day to scavenge, including times that burning of waste is occurring. This is a safety concern as these people may not be aware of the dangers associated with waste disposal sites.

Environmental Health has received complaints about smoke blowing into town.

The present site is filling up quickly and may not be adequate for the time it will take to implement a new waste management plan. No contingency plan addressing this concern has been suggested.

Monitoring Program

1. Does the Regional Health Board perform water quality sampling?
___No _*_If yes, answer questions (a) to (e)

a. Briefly describe the sampling methodology.

Water samples from water trucks and the water treatment plant are collected in 200 mL bottles containing sodium thiosulphate. Membrane filtration method is used to test for total coliform and E. coli. Testing by Environmental Health is done on a monthly basis.

b. Briefly describe any monitoring of wastewater effluent and leachate.

Not done by Environmental Health

c. Who is responsible for sampling?
Name:

Position: **Environmental Health Officer**

Telephone #: **867-979-7654/7656**

Fax #: **867-979-7659**

Level of training:

d. Recognized laboratory performing analysis of samples.

Name: **Environmental Health Office**

Address: **P.O. Bag 200, Iqaluit, NU X0A 0H0**

Telephone #: **867-979-7654**

Fax #: **867-979-7659**

e. Are any changes planned in the water quality monitoring program?
__ Yes _*_No
If yes, describe.

IX. TECHNICAL INFORMATION *(Assistance from the Regional Municipal and Community Affairs Office)*

1. Date: **September, 2000**

2. Municipality: **Iqaluit**

3. Contact: **Doug Sitland**
(Community Government and Transporation Representative)

Telephone # **(867) 975-5431**

Fax # **(867) 975-5330**

4. Population (according to most recent census results):

4,220 (1996 Census)
5,200 (current estimate)

5. Estimated growth rate over next 5 years:

See estimates in Solid Waste Management Plan.

6. Has any baseline data collection and evaluation been undertaken with respect to the physical, biological, and chemical characteristics of the main water bodies in the area?

_√_ Yes ___No

If yes, provide a summary of program details or site title, authors, cities, and dates:

See list of studies in March 1, 1999 Application.

If no, are such studies being planned?

___ No ___Yes (If yes, when and by whom):

7. Have Elders been consulted in the collection of baseline data on main water bodies in the area?

_√_No __Yes

If yes, specify.

8. Has any baseline data collection and evaluation been undertaken with respect to the various biophysical components of the environment potentially affected by the project?

___No √ Yes

If yes, provide details below.

See list of studies in March 1, 1999 Application.

If no, are such studies being planned?

__ No __Yes.

If yes, specify:

Attachments

1. Attach detailed plan or drawing(s) of the present *solid waste disposal area*. Include the following information:

a. details of pond size and elevation;

b. details of all retaining structures (dimensions, materials of construction, etc.);

c. details of the drainage basin, and existing and proposed drainage modifications;
d. details of all decant, siphon mechanisms etc., including sewage treatment facilities;
e. details regarding direction and path of wastewater flow from the area;
f. distance from watercourses and fish bearing waters;
g. location and construction of liners;
h. leachate and groundwater collection systems; and
i. control structures.

2. Attach detailed plan or drawing(s) of the present *sewage treatment system*. The drawing(s) should include the following:
a. details of all retaining structures (dimensions, materials of construction, etc.);
b. details of the drainage basin, and existing and proposed drainage modifications;
c. details regarding direction and path of wastewater flow from the area;
d. indications of the distance from watercourses and fish bearing waters;
e. all sources of seepage presently encountered near these areas, including volumes (m^3/day) and directions.
f. The volume of seepage flow (m^3 / day); and
g. The direction of each flow.

3. Are drawings for the solid waste disposal area and sewage treatment system attached?
___ Yes _√__No

If Yes, who has provided them ?
If no, indicate when they will be available.

Drawings were provided as part of the March 1, 1999 Application.

Hydrology

1. Effects on surface water flow:
Are any stream channels altered? √ Yes _ No
Is the natural storage or water level of any lake or pond changed? _√_ Yes __ No

Are there changes in water flow downstream of the project? _√_ Yes __ No
Is a storage reservoir created in a natural channel? ___ Yes _√_ No

If yes to any of the above, briefly describe the expected change in flow or storage:

All effects relate to facilities that have been in operation for many years.

2. Drainage Area:
What is the drainage area? __3.85__ km^2
What is the average elevation of the drainage basin? __110__ metres
Is the drainage basin outlined on an attached map? ___Yes _√__No

A plan and profile of Lake Geraldine was attached to the March 31, 1999 Application.

Describe the drainage basin characteristics, (vegetation, general soil type, lakes, swamps and permafrost areas, etc.)

A rolling terrain surrounds the community. The. Subsoil is made up of glacial drifts over a predominantly granite Precambrian bedrock. The layer of overburden, silty sand, gravel and boulders varies from 0 to 18 m thick and has numerous surface depressions, resulting in ponds during summer months. The depth of thaw in the permafrost ranges from 1 to 1.8 m. The water tale is very high. Segregated lenses may be found. Vegetation consists of lichens, mosses, hardy flowers and grasses.

3. Channel characteristics:
   Is the course of any channel changed? ___ Yes _√_ No

   If yes, describe measures to maintain stream bed and bank stability.

4. Will the cross-section of any watercourse be changed? __ Yes _√_ No
   If yes, describe the change and its effect on the flow capacity of the channel.

Water Supply

1. What is the rate of withdrawal from the source? **average of 1,200 m^3/day**.

2. Is water drawn from the source ___ intermittently _√_continuously

3. If it is drawn intermittently, during what month(s) is it drawn? ___n/a

4. For what period is it drawn (days/weeks/months)? _____n/a

5. What is the rate of flow of source (if river) or size (if lake)? **__25 ha**

6. At the intended rate of water usage, describe the effects on the river or lake from which water will be drawn.

   no effects

Water Intake

1. Please provide short descriptions of the following:

a. freshwater intake facility
Raw intake line is 360 m long 250 mm diameter ductile iron, insulated with 50 mm of blown glass and a spiral gauge metal jacket. A 150 mm tempered water line injects water from the treatment plant into the intake system at the damn in order to prevent freeze up.

b. operating capacity of the pumps

c. intake screen size
No screen used.

Water Storage

1. Is a dam or dyke being used to store or alter the flow of water? _√_Yes ___No

2. What are the dimensions of the dam or dyke?
Length: **117.3 m** Width: **1.63 m** Height: **8.14 m**
U/S slope: **2:1** D/S slope: **2:1**

3. Does the proposed dam create a reservoir in a natural watercourse?
_√_ Yes ___No
If yes, what is the storage capacity and surface area of the reservoir?
_____ m^3 **25** ha.

4. Will the dam or dyke affect fish migration or movement ?
___ Yes _√_ No
If yes, describe all measures for compensation of fish habitat lost due to the dam or dyke, and mitigation for fish migration or movement

Water Treatment

1. Indicate the capacity of the treatment facility. **900** L/min

2. What is the capacity of the water storage facility. **2280** m^3

3. Describe the method of water treatment (i.e., backwash, flocculation, sedimentation, chemicals used), and provide the results of the most recent bacteriological and chemical analysis. Attach a diagram, if possible.

Pre-chlorination, pH controls, settling tanks, filtration, fluoridation, backwash. Chemicals used are chlorine, fluoride and lime.

4. Are there any changes planned in the water treatment facilities?
_√__ No ___Yes
If yes, attach a copy of the plan or indicate changes and include an implementation schedule.
Include excerpt from MACA Capital Plan if available.

Sewage Disposal

1. Indicate the level of sewage treatment:
_√__ primary ___ secondary ___ tertiary
Pre-treatment (if applicable): ___ screening ___ maceration
Lagoons (if applicable): ___ anaerobic ___ aerobic _√__facultative

2. Indicate the capacity of the sewage treatment facility **_25,000_ m^3**

3. Based on current population projections, the facility will meet the needs of the community until
the year **__2000___** .

4. Average depth of the wastewater lagoon **__2.0___ m.**

5. What is the design freeboard? **__1.0__ m**.

6. Indicate the retention time of the sewage while in the treatment facility **_7_ days**.

7. Indicate the estimated rate of discharge of wastewater **_variable**

8. Indicate the location of the discharge point **_West Dyke at Koojesse Inlet**.
.

9. Is the discharge: ___seasonal _√__continuous

If the discharge is seasonal, during what month(s) is it done?
What is the duration of the discharge (days/weeks/months) ?

10. Are there any changes planned in the sewage disposal facilities?
___ No _√__Yes
If yes, attach a copy of the plan or indicate changes and include an implementation schedule.

New sewage treatment plant will be commissioned when construction deficiencies have been corrected.

Include excerpt from MACA Capital Plan if available.

Solid Waste Disposal

1. Indicate the capacity of the disposal area **44,000 m^3**.

2. The *average* depth of the solid waste disposal site **3.0 m.**

3. The current facility will meet community needs until the year **2001**.

4. Do any natural watercourse enter the solid waste disposal area? What methods are used to decrease the amount of runoff water entering these areas?

   No, a drainage ditch has been constructed to divert water around the facility.

5. Indicate the volume of water that may enter these areas from any source(s) and attach all pertinent details of the diversions.

Source	Volume
Snow melt during Spring run off	**not measured**

6. Please describe any diversions of watercourses:

   Flow has been diverted around the facility since the facility was constructed in 1995.

7. Are there any changes planned in the solid waste disposal facilities?
   ___ No _√_ Yes
   If yes, attach a copy of the plan or indicate changes and include an implementation schedule.
   Include excerpt from MACA Capital Plan if available.

   See Solid Waste Management Plan.

Other

1. Describe any additional details on the existing municipal facilities which should be considered by the Nunavut Water Board during its review.

   To be addressed at hearing.