



**City of Iqaluit 2006 Annual Report
Water Licence 3AM-IQA0611**

Submitted to:

Nunavut Water Board

**Department of Engineering
April 2007**



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March 31, 2007

Nunavut Water Board
P.O. Box 119
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Attention : Phillip di'Pizzo

Dear Sir :

Water Licence No. 3AM-IQA0611 – 2006 Annual Report

Enclosed please find the City of Iqaluit's 2006 Annual Report in accordance with the City's Water Licence requirements.

Best Regards,

Geoff Baker, C.E.T.
Director of Engineering
City of Iqaluit

Encl.

Water Licence No. 3AM-IQA0611
2006 Annual Report
City of Iqaluit

In July of 2006 the City of Iqaluit was issued Water Licence Number 3AM-IQA0611 by the Nunavut Water Board. This licence was issued for a five year period commencing on May 15, 2006 through May 15, 2011. A requirement of the licence is an annual report due March 31 of each year summarizing activities governed by the licence. The following comprises the 2006 annual water licence report as required.

A. The monthly and annual quantities in cubic meters of water obtained from Lake Geraldine.

The following table summarizes the annual quantity of water drawn from Lake Geraldine, the City's raw water source, during 2006 to meet the municipal water needs of the community.

**Table 1.Raw Water Drawn
from Lake Geraldine Reservoir**

Month	Volume (m³)
January	59,950
February	58,840
March	60,700
April	60,540
May	63,710
June	59,060
July	57,120
August	58,430
September	59,320
October	61,560
November	59,510
December	62,940
Total	721,680

B. The monthly and annual quantities in cubic meters of any discharge from the Wastewater Treatment Facilities.

The following table summarizes the annual quantity of sewage flow through the City's mechanical wastewater treatment plant during 2006. Please note that no data exists from January 1 to May 23 of 2006 as the mechanical plant was commissioned in March 2006 and no prior data is available from the sewage lagoon.

**Table 2. Sewage Flow through
Mechanical Wastewater Treatment Facility**

Month	Volume (m³)
January	Unavailable
February	Unavailable
March	Unavailable
April	Unavailable
May	19,025
June	53,848
July	57,234
August	63,342
September	65,706
October	68,041
November	61,531
December	60,982
Total	449,710

C. The monthly and annual quantities in cubic meters of sludge removed from the Wastewater Treatment Plant.

The following table summarizes the annual quantity of sewage sludge (biosolids) removed from the City's mechanical wastewater treatment plant during 2006 and deposited at the West 40 Landfill - Sludge Management Facility. Please note that no data exists from January 1 to May 23 of 2006 as the mechanical plant was commissioned in March 2006.

**Table 3. Sludge (Biosolids) Removed from
Mechanical Wastewater Treatment Facility and Deposited to the West 40 Sludge Management
Facility**

Month	Volume (m³)
January	N/A
February	N/A
March	N/A
April	N/A
May	14
June	41
July	48
August	54
September	58
October	68
November	54
December	54
Total	391

D. A summary report which includes all data and information generated under the Monitoring Program, including the QA/QC program, in an electronic and printed format acceptable to the Board.

The City is currently in the process of developing Monitoring Programs and a QA/QC program for the monitoring of 'water' associated with the water supply and treatment, Wastewater Treatment and Solid Waste Management, including the Sludge Management Facility. The monitoring program and QA/QC program is being developed by Earth Tech Canada Inc. and will be completed by May 31, 2007 in draft form with final draft submission to the Nunavut Water Board by August 2007. It is expected the draft document will allow the City to move forward with water quality and quantity monitoring during the summer of 2007.

In October of 2006 representatives from the City of Iqaluit accompanied Mr. Andrew Keim (Water Inspector) and Ian Rumbolt of Indian and Northern Affairs Canada on an inspection of the water supply, wastewater treatment facilities and west 40 landfill site. Copies of the certificates of analysis, results and custody records are being submitted to the NWB as a separate document in electronic format along with this report.

E. A summary of construction activities conducted.

Expansion of Raw Water Storage

The work for the dam expansion generally included the expansion of the spillway, dam and existing berms by approximately two meters and the construction of two new berms with concrete cut off walls. The construction of the dam raising and berm reinforcement started near July 1, 2006 and was completed in mid October 2006. A copy of the final design drawings and the as-built drawings are being submitted to the NWB as a separate document in electronic format along with this annual report.

Sewage Lagoon Upgrades

In 2006 the City upgraded the West berm at the sewage lagoon. The upgrades will provide enhanced erosion protection on the downstream face of the west berm and prevent overtopping to ensure continued slope stability. A copy of the final design drawings and the daily site inspection reports are being submitted to the NWB as a separate document in electrical format along with this annual report.

Sewage Lift Station No. 1 Upgrades

The City is in the process of upgrading its Sewage Lift Station No. 1 with "state of the art" sewage pumping and control systems. Construction of the upgrades is currently on-going. The design drawings are being submitted to the NWB as a separate document in

electronic format along with this annual report. As-built drawings and Operations and Maintenance documentation will be submitted to the NWB as the lift station is commissioned and they are available. It is anticipated these documents will be available prior to October 31, 2007.

Primary Wastewater Treatment Plant

The City commissioned a primary wastewater treatment plant in 2006. The design drawings and as-built information are being submitted to the NWB as a separate document in electronic format along with this annual report.

Solid Waste Site Expansion and Drainage Improvements

The 2006 Capital Works at the landfill site include the construction of a new perimeter berm around the expansion area, installation of new chain link fencing, construction of 3 runoff control ponds and a retention pond, road improvements on the expansion site and the installation of 3 test wells. The design drawings and as-built information are being submitted to the NWB as a separate document in electronic format along with this annual report.

Upgrading Water and Sewer Mains

The City continued its annual water and sewer main upgrades program.

F. A summary of any modifications and/or major maintenance work and/or demolition work carried out and any associated structures.

See section E.

G. A summary of all work carried out under the Management Plans in accordance with the Licence.

See section D.

H. A progress report and revisions (if applicable) to any studies requested by the Board that relate to waste management, water use or reclamation and a brief description of any future studies planned by the Licencee including, an executive summary in terms understandable to the general public, translated into Inuktitut.

Lake Geraldine Water Balance

The City is moving forward with the installation and operation of two hydrometric gauging stations at the Lake Geraldine Reservoir through contracted services with the Water Survey of Canada, a division of Environment Canada. The data acquisition portion of the project will begin, subject to Council approval, in April of 2007 and carry through

December 2010. This will provide the City with the quality controlled discharge and water level data required to complete a water balance for Lake Geraldine.

Assessment of Recharge Needs for Long Term Water Demands

The City, in conjunction with Natural Resources Canada, will be undertaking a bathymetric survey of Lake Geraldine in 2007. This information will be fundamental in assessing the recharge requirements for Lake Geraldine.

In the report titled “City of Iqaluit Raw Water Supply and Storage” completed by Trow Associates in August 2004 stated “Raising of the dam by 2 meters will provide sufficient storage through to the year 2023 based on a demand of 400 l/c/d (conservative).

Dam Safety Inspection (DSI) – Sewage Lagoon

A DSI was undertaken in August of 2006. A copy of the DSI is being submitted to the NWB as a separate document in electronic format along with this annual report.

Dam Safety Review (DSR) – Lake Geraldine

A DSR was undertaken during the period of October through December 2006. A copy of the DSR is being submitted to the NWB as a separate document in electronic format along with this annual report.

Final Assessment of Sludge Management Facility

A key component of the successful completion of the City’s Sludge Management Program is the acquisition of a specialized loader bucket known as an “Allu Bucket”. The City expects delivery of the bucket prior to May 31, 2007. This bucket allows the sludge, following the freeze-thaw cycle to be mixed and placed in windrows to facilitate the drying and composting processes.

The City, in completing its 2006 Landfill Expansion, developed a cell dedicated to sludge (biosolids) management. The landfill expansion was subject to delays in 2006 which resulted in the project not being substantially completed until October 31, 2007. Thus, the sludge management facility will be completed and formalized in the 2007 construction season.

It is anticipated a full report (operations and sampling) will be provided to the NWB by October 31, 2007 as a summary of the operation and performance of the facility.

Long Term Solid Waste Management Plan

The City will be initiating a detailed Long Term Solid Waste Management Plan in late 2007. All options for solid waste management will be considered, including, but not limited to, landfill, modified landfill, compact and cover, incineration, plasma

technology, etc. The preferred option will consider strategies to reduce the volume of waste in the waste stream (for example reduce, reuse, recycle strategies, specific measures to collect hazardous wastes and measures to address the handling of readily reusable waste materials, composting etc.). The Plan will provide acceptable Abandonment and Restoration (A and R) Plans for those Solid Waste Disposal sites which are the responsibility of the Municipality, including the current West 40 site and Sludge Management Facility.

I. Any addendums to the approved Contingency plans and the approved Operations and Maintenance Manuals.

The following Spill Contingency Plans and Operations and Maintenance Manuals will be updated and submitted to the Nunavut Water Board by October 31, 2007:

- Sewage Lift Station Spill Contingency Plan
- City of Iqaluit Spill Contingency Plan
- Sewage Lagoon Spill Contingency Plan
- Sewage Lift Station Operations and Maintenance Manual
- Sewage Treatment Plant Operations and Maintenance Manual
- Sewage Lagoon Operations and Maintenance Manual
- West 40 Landfill Operations and Maintenance Manual
- Sludge Management Facility Operations and Maintenance Manual

J. A list and description including volumes, Spill Report Line Identification Number of all unauthorized discharges, spills and summaries of follow-up action taken.

The following table summarizes all unauthorized discharges and spills incurred by the City of Iqaluit.

Location (Date)	Cause	Spill Report ID No.	Volume (m ³)	Follow-up action taken
WWTP (June 25, 2006)	Power (Phase) failure	06-260	90	VSD adjusted to operate on 2 phase.
Lift Station 1 (February 4, 2007)	Power Failure (Under voltage)	07-036	10	Adjusted Transfer Switch settings Verified VFD trip settings were set at appropriate levels.
Lift Station 2 (February 4, 2007)	Power Failure	07-037	4 – 5	Currently investigating back-up power provision for LS2
Main Line (February 21, 2007)	Main Blockage	07-068	2	Currently implementing on a pilot basis an enzyme

				injection program in to Sewage Collection System.
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K. Any revisions to approved Closure and Reclamation Plans.

N/A

L. A summary of any closure and reclamation work undertaken and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.

There was no closure or reclamation work undertaken in 2006. None anticipated for 2007.

M. A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an inspector.

The City has received one Municipal Water Use Inspection Report from Indian and Northern Affairs Canada as indicated on the Nunavut Water Board's FTP site.

Municipal Water Use Inspection Report – October 11, 2006

Water Supply

Concern was noted during the inspection undertaken on October 11, 2006 related to the secure and safe storage of chlorine and other chemicals required for the safe treatment of Iqaluit's domestic water supply.

Action Taken: A small supply of operationally required chemicals are kept on sight. The on site storage area consists of a concrete berm structure on the bottom floor of the water treatment plant. The remaining supply of chemicals has been relocated to a secure sea can adjacent to the plant.

Waste Disposal

Sewage Treatment

Concern was noted regarding the discharge quality at the Wastewater Treatment Plant. The City's Wastewater Treatment Plant currently provides primary treatment (sludge removal) only. The City's discharge quality will remain in non-compliance with the City's water licence until funds have been allocated to providing secondary sewage treatment. See item O for further information.

Concern was noted regarding the absence of a discharge measuring device at the wastewater treatment plant. The City does meter flow through the sewage treatment plant. The meter is located after the lift station pumps and provides an accurate account of all wastewater flow through the plant.

Concern was noted regarding Operations and Maintenance documentation for the wastewater treatment plant. One copy of the operations and maintenance documentation for the wastewater treatment plant are kept at the plant and a second copy is kept on file at the City's engineering office.

Concern was noted regarding abandonment and restoration documentation. The City will provide abandonment and restoration documentation as per the licence requirements for the West 40 landfill prior to December 31, 2007.

Concern was noted regarding the City's Surveillance Network Program (SNP) and the absence of signage at some locations. The City, in 2007 will procure and erect signage at the SNP sites as per the terms and conditions of the City's licence.

N. Update on implementation of recommendation(s) from any Dam Safety Inspection and/or Review.

The City of Iqaluit undertook a Dam Safety Inspection of the Sewage Lagoon as per the terms and conditions of the City's water licence on August 31, 2006. The recommendations were as follows:

1. Preparation of the required Operation and Safety Manual, Logbook and Permanent File remains incomplete, however, the City has authorized this work to proceed this year.

The City awarded the contract in 2006 to complete the compilation of the City of Iqaluit Sewage Lagoon Permanent Record File. The file contains the following:

- Annual update pages
- Operations and Surveillance Manual
- Permanent Log Book
- 2002 to present DSR's and DSI's
- As-Built Drawings

A copy of the file is retained at the City of Iqaluit's engineering department.

2. Undertake the next DSI prior to October 2007.

The City will undertake Dam Safety Inspections of the sewage lagoon as per the terms and conditions of the licence.

3. The capacity of the sewage lagoon should be confirmed and sludge removal undertaken if required.

The sewage lagoon is monitored on a daily basis by the City's public works department. There are no current plans to undertake a lagoon sludge removal program. The Bill Mackenzie Humanitarian Society (BMHS) undertook a survey of the sewage lagoon in 2006 which should provide the City with sludge volumes in the lagoon. More information will be provided to the board once the report is provided by the BMHS.

4. Preventative Maintenance

The sewage lagoon (including dump station, lagoon levels, and discharge device) is monitored on a daily basis by the City's public works department. Maintenance is performed as required.

A Dam Safety Review was undertaken on the Lake Geraldine Dam during the period of October through December 2006. The City is currently reviewing the recommendations with the consultant who completed the DSR and will provide further information once this review is complete.

Future DSI's and DSR's will be undertaken by the City as per the terms and conditions of the licence.

O. A brief update on the implementation plan of all facilities within the scope of this Licence including, projected implementation and status of Phase II of the Wastewater Treatment Plant.

The City will continue to seek funding sources to allow for the completion of Phase II of the City's wastewater treatment plant. The engineering design of Phase II is complete.

The City is intent on issuing a contract in late 2007/early 2008 (budget approved) to develop a long term solid waste management plant which will include the selection of a new site for solid waste disposal.

P. Any details on water use or waste disposal requested by the Board by November 1st of the year being reported.

N/A