

**City of Iqaluit**  
**2013 Annual Water License Report**  
**Executive Summary**

Under Water License 3AM-IQA0611 (the License), the City of Iqaluit (the City):

- Extracts water from Lake Geraldine for municipal use,
- Manages its solid waste at the West 40 Landfill, and
- Manages its wastewater at the West 40 Wastewater Treatment Plant and backup Sewage Lagoon.

This License was issued by the Nunavut Water Board (NWB) in 2006 and expired on July 15, 2012. On October 2, 2012, the City submitted its Application for Water License Renewal. In compliance with requirements of Schedule B of the License, this Annual Water License Report summarizes the activities conducted by the City in 2013.

*Monthly Monitoring Program*

In 2013, the City implemented a Monthly Monitoring Program and completed the development of a Quality Assurance/ Quality Control Plan and Monthly Report template.

*Water Supply*

In 2013, the City used 930,360 m<sup>3</sup> of water from the Lake Geraldine, which is below the quantity of water not to be exceeded under the License (1,100,000 m<sup>3</sup>). In August 2013, a Dam Safety Review (DSR) was completed on Lake Geraldine Dam. In 2013, the City completed the development of a Water Balance study for Lake Geraldine watershed and also undertook the development of a Supplementary Water Supply Plan and Preliminary Design, which is expected to be completed in 2014.

*Wastewater Treatment*

In 2013, the City began the development of the 5-year Capital Plan which will lay out the steps required to upgrade the Wastewater Treatment Plant to secondary treatment. In August 2013, a Sewage Lagoon Dam Safety Inspection was completed.

*Solid Waste Management*

The City continues to manage its solid waste at the West 40 Landfill, which is nearing capacity. Landfill runoff continues to be managed through on-site detention ponds and an off-site retention pond. Run-off in the off-site retention pond is filtered through a Geotube before being discharged. In 2013, the City began the development of a 5-year Capital Plan which will include further treatment options for landfill run-off. In 2013, warrantee work on the 2011 perimeter berm upgrade was completed. In 2013, work also continued on the Iqaluit Waste Management Project. This project will be completed in 2014 and includes:

- the development of a new Solid Waste Management Plan,
- the identification of a new solid waste management site, and
- the development of a Decommissioning Plan for the West 40 Landfill.

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Water License No. 3AM-IQA0611  
**2013 Annual Report**  
 City of Iqaluit

In July of 2006, the City of Iqaluit (City) was issued Water License number 3AM-IQA0611 (the License) by the Nunavut Water Board. This license was issued for a five-year period commencing on May 15, 2006. On June 17, 2011, the Nunavut Water Board amended the License expiry date to July 15, 2012. On October 2, 2012, the City submitted its Application for Water License Renewal. A requirement of the License is an annual report due March 31 of each year summarizing activities governed by the License for the previous calendar year. In accordance with Schedule B of the Water License, this Annual Water License Report summarizes the activities conducted by the City of Iqaluit in 2013.

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

Table 1 summarizes the monthly and annual quantities of water drawn from Lake Geraldine, the City of Iqaluit's raw water source. The total water usage for 2013 was 930,360 m<sup>3</sup>, which is below the maximum allowable usage of 1,100,000 m<sup>3</sup>.

**Table 1. Raw Water Drawn  
from Lake Geraldine Reservoir (2013)**

Month	Volume (m <sup>3</sup> )
January	78,490
February	71,670
March	81,120
April	80,700
May	85,950
June	77,740
July	74,670
August	74,050
September	75,380
October	79,170
November	74,560
December	76,860
<b>Total</b>	<b>930,360</b>

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

Table 2 summarizes the monthly and annual quantities of discharge from the City of Iqaluit's Wastewater Treatment Plant (WWTP) during 2013.

**Table 2. Discharge from the Wastewater Treatment Plant (2013)**

Month	Volume (m <sup>3</sup> )
January	73,147
February	63,699
March	72,853
April	72,104
May	76,129
June	77,223
July	78,644
August	71,795
September	73,001
October	85,644
November	70,422
December	71,636
<b>Total</b>	<b>886,299</b>

During periods when the WWTP was shutdown for maintenance, raw sewage was diverted to the backup sewage lagoon. The knife gate valve that diverts the sewage to the sewage lagoon is not equipped with a monitoring device; therefore, there were no measurements taken to determine the amount of discharge for the days that the WWTP was not operational. As a result, the amount of discharge for the duration of each shutdown was calculated using average daily discharge rates. The average daily total was determined by dividing the total volume of discharge from the WWTP recorded for the month that the shutdown occurred by the number of days the WWTP was operational that month. The dates of each shutdown can be found in Section F.

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

Table 3 summarizes the estimated monthly and annual quantities of sewage sludge removed from the City of Iqaluit's WWTP and deposited at a designated area in the West 40 Landfill.

**Table 3. Sewage Sludge Removed from the Wastewater Treatment Facility and Deposited at the West 40 Landfill (2013)**

Month	Volume (m <sup>3</sup> )
January	54.4
February	47.6
March	51
April	51
May	51
June	51
July	51
August	51
September	51
October	44.2
November	51
December	54.4
<b>Total</b>	<b>608.6</b>

The sludge that is removed by the Salsnes Filter in the WWTP falls into a trailer in a room below the primary treatment room. The trailer that is used to catch the sludge from the Salsnes Filter has 3.4 cubic meters of storage and is approximately 100% full each time it is unloaded. The trailer is unloaded at the West 40 Landfill every second day including weekends and holidays. The difference in volume from month to month is due to two different factors: 1) every month doesn't have the same number of days, and 2) during the shutdowns there is no sludge produced because the raw sewage was diverted to the lagoon.

**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**

In 2013, the City completed the development Quality Assurance/ Quality Control Plan (Please see Appendix A) to help complete the Monitoring Program requirements.

The City completed the 2013 Monitoring Program based on the requirements outlined in Schedule C of the Water License. Sample bottles were ordered from an accredited laboratory in Ottawa and shipped to Iqaluit. Samples were taken by City staff and sent back to the laboratory the same day. Please see Appendix B for a summary of the samples taken and a copy of all of the sample reports provided by the laboratory. Some test results could not be obtained for certain months due to errors by the laboratory or the shipping company. Monthly Monitoring Reports were completed for each month that samples were taken as well as an Annual Monitoring Report that summarizes the Monthly Monitoring Reports. Please see Appendix C for the Monthly Monitoring Reports and Annual Monitoring Report. The City has not been able to find a laboratory that can complete the required chlorinated paraffin analysis in wastewater samples taken from the Wastewater Treatment Plant. The City asked for a laboratory recommendation from the NWB but they were unable to identify a laboratory that could complete the required chlorinated paraffin analysis. Therefore, this test has not been included in the 2013 Monitoring Program schedule.

**E. A summary of construction activities conducted**

Landfill Water Management Upgrade Warrantee Work

In September of 2013, the City completed the warrantee repairs on the Landfill Berm. The berm was inspected by the engineering firm managing the project and it was determined that the berm was functioning satisfactorily as a water retaining structure (see Appendix D for a copy of the inspection report). Survey information was not completed in 2013 therefore as-built drawings are unavailable. As-built drawings will be produced in 2014 and submitted to the NWB.

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

Wastewater Treatment Plant

The following maintenance work was carried out at the WWTP in 2013:

**February 13, 2013:** The filter in the Salsnes Filter was replaced.



<b>March 21 - 22, 2013:</b>	Repairs to the Salsnes Filter were required.
<b>April 8, 2013:</b>	Repairs to the Salsnes Filter were required.
<b>July 27 - 29, 2013:</b>	The filter in the Salsnes Filter was replaced.
<b>October 1 - 7, 2013:</b>	Repairs to the Salsnes Filter were required.

During the above listed maintenance work, the WWTP was shut down and the sewage was diverted to the sewage lagoon.

#### West 40 Landfill

In 2013, hazardous waste from the West 40 Landfill was shipped south for recycling or disposal.

- 14 Quatrex bags of batteries (approximately 350 batteries) were shipped to Qikiqtaaluk Environmental in Brossard, Quebec facility for recycling.
- 20 barrels of unknown waste were shipped to Solva Rec Environnement in St. Jean Sur Richelieu, Quebec and disposed of properly.
- 61 chlorine cylinders were shipped Brenntag Canada in Montreal, Quebec for recycling.

Documentation on the transportation and disposal of the batteries, chlorine cylinders and unknown waste can be found in Appendix E.

### **G. A summary of all work carried out under the Managements Plans in accordance with this License**

#### Lake Geraldine Dam Safety Review

In July 2013, a Dam Safety Review (DSR) was performed on Lake Geraldine Dam. The DSR report can be found in Appendix F.

#### Sewage Lagoon Dam Safety Inspection

In July 2013, a Dam Safety Inspection (DSI) was performed on the Sewage Lagoon. The DSI can be found in Appendix G.

#### Solid Waste Management Plan

In 2011, the City began the Solid Waste Management Project, which involved extensive public consultation and technical analysis to develop a new solid waste management plan and identify a new solid waste management site. The Project

also involved the development of a decommissioning plan for the West 40 Landfill and update its operation and maintenance manual.

In 2013, work continued on the Solid Waste Management Project. A final newsletter and public meeting were held in June 2013, to give the public an opportunity to provide feedback on the recommended program. Please see Appendix H for the final newsletter. The Solid Waste Management Project will be brought to City Council for approval early in 2014 and will be submitted to the NWB.

#### Lake Geraldine Dam Emergency Preparedness Plan

In 2013, work on the Emergency Preparedness Plan (EPP) continued, including the:

- Definition of hazards posed by the dam;
- Identification of roles and responsibilities; and,
- Completion of inundation mapping.

The EPP is a requirement from the 2011 Dam Safety Inspection and is expected to be completed in 2015.

#### **H. A progress report and revisions 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 Licensee including, an executive summary in terms understandable to the general public, translated into Inuktitut**

##### Water Balance

In 2013, the City completed the development of a Water Balance study for Lake Geraldine watershed. The Water Balance Report with assessment of recharge needs was submitted to the NWB on August 30, 2013. Please see Appendix I for a copy of the Water Balance Study.

##### Supplementary Water Supply Plan

The City's 2010 General Plan identifies Apex River as a potential supplementary water source for the City. In 2013, the City undertook the development of a Supplementary Water Supply Plan and Preliminary Design. This work included a feasibility study to confirm that Apex River is a suitable source. An Executive Summary of for this project can be found in Appendix J. When this plan is completed, it will be submitted to the NWB along with the necessary Application for Amendment.

#### **I. Any addendums to the approved Contingency Plans and the approved Operation and Maintenance Manuals**

In 2013, no addendums were made to the approved Contingency Plans and Operation and Maintenance Manuals.

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

Table 4 provides a summary of all spills and un-authorized discharges that occurred in 2013, including volumes, Spill Report Line Identification Number and summaries of the follow-up actions taken. Copies of the spill reports and a map showing all spill locations can be found in Appendix K.

**Table 4: Summary of all spills and unauthorized discharges in 2013**

Spill Report ID Number	Date (m/d/y)	Location	Description	Volume (m <sup>3</sup> )	Cause	Follow up Actions
2013035	02/01/2013	Building 107	Sewage	2.0	Sanitary sewer was clogged	The sanitary sewer was blasted until the blockage was removed and the situation was resolved with no further problems. The City of Iqaluit Roads Crew cleaned the sewage from the affected area.
2013058	02/15/2013	Manhole #32A	Sewage	2.0	Sanitary sewer was clogged	A sewage truck was used to pump out the manhole and the sanitary sewer was blasted until the blockage was removed. The City of Iqaluit Roads Crew cleaned the sewage from the affected area.
2013059	02/15/2013	Sewage Lagoon	Sewage	0.8	Failure of the Salsnes Filter in the WWTP	The Salsnes filter drum let go on the filter drive causing the Salsnes Filter to malfunction. The Utilidor Department repaired the filter drive. Sewage was diverted to the sewage lagoon during the repairs to the Salsnes Filter.
2013063	02/18/2013	Access Vault #25A	Sewage	2.0	Sanitary sewer was clogged with grease/oil	A sewage truck was used to pump out the manhole and the sanitary sewer was blasted until the blockage was removed. The City of Iqaluit Roads Crew cleaned the sewage from the affected area. The building next to AV25A is a local country food store, it is suspected that the collection of country food grease/oil was accumulating in the sanitary sewer next to AV25A.
2013084	03/11/2013	Access Vault #300-301	Sewage	2.0	Sanitary sewer was clogged with rags	A sewage truck was used to pump out the access vault and the sanitary sewer was blasted until the blockage was removed.

Spill Report ID Number	Date (m/d/y)	Location	Description	Volume (m <sup>3</sup> )	Cause	Follow up Actions
2013087	03/15/2013	Access Vault #301	Sewage	2.0	Sanitary Sewer was clogged with rags	A sewage truck was used to pump out the access vault and the sanitary sewer was blasted until the blockage was removed.
2013107	04/02/2013	Access Vault #301	Sewage	2.0	Sanitary sewer was clogged	A sewage truck was used to pump out the access vault and the sanitary sewer was blasted until the blockage was removed.
2013205	06/13/2013	Access Vault #301	Sewage	2.0	Sanitary sewer was clogged with rags	A sewage truck was used to pump out the access vault and the sanitary sewer was blasted until the blockage was removed. The City of Iqaluit Roads Crew cleaned the sewage from the affected area.
2013215	06/19/2013	Access Vault #301	Sewage	3.0	Sanitary sewer was clogged with rags	A sewage truck was used to pump out the access vault and the sanitary sewer was blasted until the blockage was removed.
2012220	06/24/2013	Lift Station #1	Sewage	Unknown	Power Outage	A power outage caused the failure of the electrical systems within Lift Station #1. Sewer trucks were used to pump the adjacent manhole until the electrical systems within Lift Station #1 were repaired.
2013230	06/28/2013	Access Vault #301	Sewage	3.0	Sanitary sewer was clogged with rags	A sewage truck was used to pump out the access vault and the sanitary sewer was blasted until the blockage was removed.
2013347	10/14/2013	Lift Station #1	Sewage	Unknown	Sewage lift pumps lost prime	Sewer trucks were used to pump sewage while the Utilidor Department repaired the pumps.

**K. Any revisions to approved Closure and Reclamation Plans**

In 2013, no revisions were made to approved Closure and Reclamation Plans.

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

In 2013, no closure and reclamation work was undertaken. No closure or reclamation work is anticipated for 2014.

**M. A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector****Water License Inspection July 4, 2013**

**A large area of hydrocarbon contaminated soils was found adjacent to the winter truck discharge location and where snow had been piled from the previous winter. The Licensee was to have filed a spill report and undertaken a cleanup of these soils before the period of the next inspection in October 2013**

The hydrocarbon contaminated soils were removed by the City of Iqaluit and disposed of by Nunatta Environmental. A spill report was not submitted.

**Sewage Sludge facility at the West 40 Landfill is not contained on a liner**

The Operation and Maintenance Manual for Sewage Sludge Composting does not require that the sewage sludge facility at the West 40 landfill be contained on a liner. The run-off in the West 40 Landfill, including the sewage sludge area, is managed and collected using berms and on-site detention ponds.

**During the period of Inspection it was noted that the City of Iqaluit has not yet fully implemented all of the conditions of the monitoring program. This remains an issue for the Inspector and is to be addressed in the coming month's sampling. The Licensee is to conduct all required sampling as outlined in the issued now expired License**

At the time of the inspection, the City of Iqaluit completed all samples required for the Monitoring Program that was developed based on the requirements outlined in Schedule C of the Water License.

**The Licensee has yet to provide a report on treatment options for contact waters transferred from the Waste management facilities and contained**

**within the Retention Berm. This is a requirement of the license and is to be completed prior to the next inspection in October 2013**

A report discussing treatment options was sent to the inspector and the Nunavut Water Board on September 21, 2011. An email was provided by the inspector acknowledging receipt of the report on September 21, 2011.

**On March 5, 2013 in response to issues of Non-compliance Aboriginal Affairs and Northern Development of Canada (AANDC) and Environment Canada (EC) issued directions to the City of Iqaluit**

The City of Iqaluit has made a commitment to completing the requirements of the directions. To ensure that the directions are being met, the City, AANDC and EC have been having quarterly meetings to discuss the progress of completing the directions.

**Water License Inspection October 23, 2013**

**One of the two UV light filters was found not to be functional at the time of inspection; however, there is a plan in place to address this issue if the working UV filter goes down**

The UV light filter that was not functioning at the time of inspection is still not functioning properly. The City is in contact with the manufacturer to determine how to repair the UV light filter.

**At the time of inspection, some of the chemicals were not contained within the secondary containment system. It is noted that these chemicals were recently delivered on the sealift and in the process of being properly stored. It is expected these will be properly stored immediately**

These chemicals have been moved into the secondary containment system.

**The chemicals within the secondary containment system were stacked two high and pose a risk of falling. It is recommended that these barrels be secured immediately with straps as soon as possible to prevent any accidents and spills**

The barrels have not been secured with straps, however, the Public Works Department is planning on securing the barrels in early 2014.

**Improperly stored corrosive barrels of chemicals were noted in the basement loading dock. SWWTP staff commented that these barrels may contain other fluids than what is on the label. It is recommended that these chemicals be properly stored and labeled immediately to prevent any adverse effects to any persons, property or the environment.**

The Public Works Department is in the process of moving the barrels to the hazardous waste section in the Landfill.

**N. Update on implementation of recommendations from any Dam Safety Inspection and/or Review**

Lake Geraldine Dam Safety Inspections

See below the recommendations that were made in the 2013 Dam Safety Review (DSR) and the implementation of the recommendations:

- The addition of a remote surveillance camera is recommended.
  - The City will look into options to install a remote surveillance camera.
- The Permanent Record File, Logbook and Operation and Surveillance manual requires updating for 2014.
  - The City will update the Permanent Record File, Logbook and Operation and Surveillance Manual in 2014.
- The Emergency Preparedness Plan (EPP) reportedly prepared by others for the City should be reviewed and any incomplete items resolved and the document be added to the PDF.
  - The City is planning on completing the EPP in 2015.
- A Dam Safety Inspection (DSI) is required in 2014.
  - The City will complete a DSI in 2014.
- A new DSR will be required in 2018.
  - The City will complete a DSR in 2018.
- Consideration should be given to implementing a pore-water pressure monitoring program leading up to the next DSR in 2018, to assist with seepage and deformation assessments.
  - The City will consider implementing a pore-water pressure monitoring program prior to 2018.
- It is recommended that a Seismic Hazard Assessment (SHA) be conducted prior to the next DSR (2018).
  - The City will complete a Seismic Hazard Assessment prior to the next DSR in 2018.
- An underwater inspection of the submerged structures should be conducted in 2014.
  - The City will complete an underwater inspection of the submerged structures in 2014.
- It is recommended that supplementary ballast and rip-rap be installed at the south end of the north berm.



- The City will look into the requirements to install supplementary ballast and rip-rap at the south end of the north berm.
- Insufficient data exists on the berm construction. In conjunction with Item 8, above, invasive material testing and independent analysis should be conducted leading up to the 2018 DSR.
  - The City will consider completing an invasive material testing and independent analysis prior to the 2018 DSR.

#### Sewage Lagoon Dam Safety Inspection

See below the recommendations that were made in the 2013 Dam Safety Inspection (DSI) and the implementation of the recommendations:

- The Operation & Safety Manual, Logbook and Permanent Record File were updated in 2012; however, the documents require updating for 2013.
  - The City will update the Operation & Safety Manual, Logbook and Permanent Record File in 2014.
- The capacity of the sewage lagoon should be confirmed.
  - The City will look into confirming the capacity of the sewage lagoon
- A Dam Safety Inspection is required prior to October 2014.
  - A DSI will be completed in 2014

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

##### New Solid Waste Management Facilities

Iqaluit's new Solid Waste Management Plan will be completed and submitted to the NWB in early 2014. Based on this plan, work will begin on the engineering design for the new solid waste management facility.

##### Phase 2 Wastewater Treatment Plant Upgrade

On April 1, 2013, the City of Iqaluit and the Government of Nunavut signed a Capital Contribution Agreement where the Government of Nunavut has committed to provide the City \$17 million over five years. This \$17 million Block Funding contribution from the Government of Nunavut will allow the City to proceed with the projects that are required to achieve compliance its License including the Phase 2 WWTP upgrades.

In 2013, the City started a 5-year Capital Plan, which outlines the timeline and cash flow for the completion of its priority short-term capital projects, including

the required WWTP upgrades. The Capital Plan is projected to be completed in the spring of 2014.

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

There were no requests made by the Board after November 1, 2013.

## **Appendices**

Appendix A - Quality Assurance/ Quality Control Plan

Appendix B - Summary of Samples

Appendix C - Monthly and Annual Monitoring Reports

Appendix D - Landfill Water Management Final Inspection

Appendix E - Hazardous Materials Transportation Documentation

Appendix F - Lake Geraldine Dam DSR

Appendix G - Sewage Lagoon DSI

Appendix H - Solid Waste Management Facilities Project Newsletter

Appendix I - Lake Geraldine Water Balance

Appendix J - Supplementary Water Supply Executive Summary

Appendix K - Spill Reports