



Hamlet of Paulatuk
P.O. Box 98
Paulatuk, NT
XOE 1N0
Phone: (867) 580- 3531
Fax: (867) 580- 3703
Email: sao@paulatuk.ca



July 17, 2017

Bijaya Adhikari, PhD
Science and Regulatory Coordinator
Inuvialuit Water Board
P.O. Box 2531
Inuvik, NT
XOE 0T0

Dear Mr. Adhikari:

Re: Hamlet of Paulatuk, Municipal Water Licence Annual Report 2016

In response to your letter of May 25, 2017 to Mayor Ray Ruben, attached is a completed Report for the year 2016 that I trust meets your requirements. I would like to point out that I succeeded Grant Scott as SAO for the Hamlet on May 9 and, hopefully, will be staying for a 3-year term. I regret that I did not respond sooner but I am still sorting out the position here; we should be able to meet reporting requirements in future.

Included with the Report is a Work Plan that we have contracted with Dillon Consulting to carry out starting this July that should lead to improvements in our management of both the Solid Waste Management Site and the Sewage Treatment Facility.

Yours truly,

John Holland
SAO
Hamlet of Paulatuk

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BOARD

Hamlet of Paulatuk

Water Licence Number: N7L3-1619

Municipal Water Licence

Annual Report for the Year 2016

Date Prepared: July 17, 2017

Municipal Water Licence Annual Report

**Hamlet of Paulatuk
Licence # N7L3-1619
Reporting year 2016**

1. Water Usage

Table 1: Monthly and annual quantities of fresh water obtained from all sources

Month	Volume from Source Litres	Volume from any other Source (m³ or L)
January	922,568	
February	892,231	
March	909,763	
April	974,545	
May	760,809	
June	1,048,338	
July	1,143,809	
August	1,259,549	
September	932,238	
October	1,036,379	
November	956,072	
December	1,109,947	
TOTALS	11,946,248	
ANNUAL TOTAL Litres	11,946,248	
% Increase or decrease from previous year	.3 % Increase	

Reasons for increase / decrease (if applicable):

Reasons for exceeding licensed withdrawal volumes (if applicable):

General information:

2. Sewage Disposal

Table 2: Monthly and annual quantities of sewage discharged to the sewage disposal facilities

Month	Volume of sewage discharged Litres
January	1,080,953
February	1,028,066
March	1,048,227
April	1,120,727
May	874,930
June	1,205,589
July	1,315,380
August	1,448,481
September	1,072,074
October	1,191,836
November	1,099,483
December	1,276,439
ANNUAL TOTAL Litres	13,738,185
% Increase or decrease from previous year	.3% Increase

3. Hazardous Waste Storage and Transportation

On Table 3, list the types of hazardous waste accepted into the facility including volumes.

Table 3: Monthly and annual quantities of hazardous waste stored on site and transported off site

Month	Type of hazardous waste accepted (Volume in m ³ or L)	Type of hazardous waste transported off site (Volume in m ³ or L)
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		
ANNUAL TOTAL (m³ or L)		
% Increase or decrease from previous year		

If hazardous waste has been transported off site this year, please describe how it was transported and the final destination:

None transported.

Please include treatment or disposal plans for the remaining quantities:

Products will be transported in plastic totes and transported off site by barge in September, 2017.

Please describe any changes or improvements to temporary hazardous waste storage areas:

4. Sewage Sludge Removal

Table 4: Monthly and annual quantities of sewage sludge removed from the sewage disposal facilities and disposal location

Month	Volume of sewage sludge removed (m ³ or L)	Disposal location
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		
ANNUAL TOTAL (m³ or L)	0	
% Increase or decrease from previous year	0%	

5. Problems, Modifications or Repairs Completed During the Year on Water Supply and Waste Disposal Facilities

Include any changes to infrastructure of all facilities completed during the year, including any changes, repairs and modifications. Please note any problems that occurred during the year. If there are no changes, make note of that also.

No changes.

6. SNP Data

A condition of the Water Licence is the Surveillance Network Program (SNP). The SNP outlines the sampling requirements and frequency at monitoring stations. *In table 5, insert the sites sampled during the reporting year and the sampling period (sampling date). Attach the complete Taiga Laboratory results, with your "Municipal Water Licence Annual Report" to the Inuvialuit Water Board.*

Table 5: Sampling station and sampling period

Sampling station	After break-up	Prior to freeze-up
Water Treatment Plant	ENR Completed	ENR Completed

7. Spills and Unauthorized Discharges

List any spills and unauthorized discharges, how and when they were reported, and clean up methods.

No spills or unauthorized discharges.

8. Spill Response Training and/or other Operator Training

Please provide a description of any Spill Response Training and/or other operator training carried out during the year.

No training.

9. Closure and Reclamation

Include a description of any closure, remediation and/or reclamation activities completed during the year and an outline of any work anticipated for next year.

No closure, remediation or reclamation activities completed during the year.

Work to be carried out in 2017 subject to completion of Dillon Consulting Work Plan as attached.

10. Studies Requested by the Board that Relate to Water Use, Waste Disposal or Closure and Reclamation

If the Board has requested that specific studies be completed or have asked for specific information be included in the annual report, include these details in this section. Include a summary report of the study completed and the results. Include as attachments with the submission of the Annual Report. Include details of any upcoming studies that will be completed by the Hamlet.

No studies requested or completed.

Dillon Consulting Ltd. contracted to carry out the attached Work Plan in the summer/fall of 2017.

11. Updates or Revisions to Approved Plans

Include details on any changes to approved plans such as the Solid and Sewage Waste Disposal Facilities Operating and Maintenance Plan (O&M Plan) or any other plans specific to your Water Licence.

- **Spill Contingency Plan**
- **Solid Waste Disposal Facilities Operation and Maintenance Plan**
- **Sewage Disposal Facilities Operation and Maintenance Plan**
- **Hazardous Waste Management Plan**
- **Closure and Reclamation Plan**

12. Inspection of Dams, Berms, Dykes and Control Structures

Include results of any inspections of all dams, berms, dykes and control structures related to the water intake facilities, solid waste disposal facilities, sewage disposal facilities and/or any other specific to your water licence.

No inspections.

13. Inspections on all Water and Waste Disposal Facilities

Include results of regular staff inspections on all water and waste disposal facilities authorized under this licence and any corrective actions taken, as necessary.

14. Correspondence between the Inspector and the Licensee

Include all correspondence between the Inspector and the Licensee with your annual report.

15. Other Information

Include any other details on waste disposal requested by the Board by November 1, of the year being reported. In this section you may include non-compliance items identified in the inspection reports and how the Hamlet is addressing them. If there are any contaminated soil piles currently in use, please list the details of containment, remediation, and progress in this section. Ongoing issues with compliance can be identified here. If the IWB is aware of ongoing problems with the licence, discussions can occur to find a resolution.

Dillon Consulting Ltd

Work Plan

Item	Description	Milestone Date	Fees and Disbursements
1	<p>Project initiation.</p> <ul style="list-style-type: none"> • Conduct initial telephone meeting with the Hamlet to finalize work plan and schedule. • Plan on site meeting and site investigation timing • Finalize contract details • Solicit any remaining documentation the Hamlet may have. • Dillon to record minute to the meeting for distribution. 	<p>Within 1 week of authorization to proceed.</p>	<p>Fees \$1,500 Disbursements \$0</p> <p>Total Task = \$1,500</p>
2	<p>Site investigation</p> <ul style="list-style-type: none"> • Make all arrangement for sampling equipment • Make all travel arrangements • Meet with hamlet staff and administration while in the community • Complete the following tasks; • Site inspection of both eh SWM facility and the STF. • Complete sampling related to work items; SWM 6, SWM 10 and STF 3 • Complete site survey for work items; SWM 1, SWM 2, STF 1, and STF 2 (includes bathymetric measurements of sludge in lagoon) • Conduct a community meeting related to the potential selection of a new SWM facility location. Related to SWM 2 • Collect any additional documentation that the Hamlet may have related to the development of the required documents for the water board and water licence. Related to SWM 1, SWM 9, SWM 10 and STF 3 	<p>Within 3 weeks of authorization to proceed</p>	<p>Fees = \$15,000</p> <p>Disbursements;</p> <ul style="list-style-type: none"> • Flights \$2,000 per person • Accommodation and meals \$250 per person per day • Equipment changers \$350 per week • Truck rental \$125 per day • Sample and analysis \$1,500 • Total = \$8,950 <p>Total Task = \$23,950</p>
3	<p>Development of required documentation for water licence compliance;</p> <ul style="list-style-type: none"> • SWM facility - management/closure plan for the cell 	<p>Completion by September 15, 2017</p>	<p>Fees = \$9,500</p>

Work Plan

Item	Description	Milestone Date	Fees and Disbursements
4	<ul style="list-style-type: none"> • Outstanding Annual reports submissions <p>Assessment and recommendations related to the solid waste management site development</p> <ul style="list-style-type: none"> • Determination if the existing site can be expanded through proper management and/or removal of the bulky metals and hazardous materials from site. • Selection of a new site if the existing site cannot be used to meet the hamlet's future needs. 	Completion by September 15, 2017	<p>Total Task = 9,500</p> <p>Fees = \$17,500</p> <p>Disbursements = \$0</p>
5	<p>Assessment and recommendations related to the sewage lagoon</p> <ul style="list-style-type: none"> • Assessment of the lagoon capacity • Determination of the impact of spring run-off on the lagoon operations • Conceptual design of drainage works improvements to remove seasonal run-off from entering the lagoon. • Cost estimates 	Completion by September 15, 2017	<p>Total Task = \$17,500</p> <p>Fees = \$22,300</p> <p>Disbursements = \$0</p>
6	<p>Reporting on Solid waste management site and sewage lagoon</p> <ul style="list-style-type: none"> • Completion of a draft report • Presentation to the hamlet • Finalization of the reporting 	Completion by October 15, 2017	<p>Total Task = \$7,500</p> <p>Disbursements;</p> <ul style="list-style-type: none"> • Flights and accommodations for presentation • Total = \$2,500 <p>Total Task = \$10,000</p>
Total			<p>Fees = \$73,300</p> <p>Disbursements = \$11,450</p> <p>Total = \$84,750</p>

Solid Waste Management Facility Remedial Actions

Work Item	Concern	Description	Remedial Actions	Action by
SWM 1	Active landfill cell is full.	The active landfill cell is filled considerably higher than the surrounding berm height.	The waste within the landfill cell should be compacted and covered to close the cell. A professional engineer should be retained to provide a proper management/closure plan for the cell.	Hamlet Dillon
SWM 2	Need for additional solid waste storage space.	The current solid waste landfill cell appears to be overfilled and new landfill cells are required.	The services of a professional engineer should be retained to assist with the selection and design of a new landfill site or expansion of the existing site.	Dillon
SWM 3	Potential for hazardous waste spills or site contamination.	Some hazardous materials are being stored in the bulky waste area including used vehicle batteries and waste oil.	A new Spill Prevention Plan has been developed for Paulatuk which should be followed. The Solid Waste Operations and Maintenance Manual provides directions for properly disposing of hazardous wastes. An on-site lined area surrounded by a berm should be constructed for storage of hazardous materials.	Hamlet
SWM 4	Processing and removal of hazardous components in ELVs and white goods.	Most white goods and ELVs in the bulky waste area have not had hazardous components and fluids removed. Barrels have not been properly cleaned.	White goods and ELVs should have hazardous components and fluids removed and barrels should be cleaned as per Solid Waste Operations and Maintenance Plan. Hazardous materials should be stored as per the Solid Waste Operations and Maintenance Plan.	Hamlet
SWM 5	Fence disrepair and incomplete perimeter fencing.	Chainlink fence to the north of the facility along the access road is in disrepair in some sections and does not surround the entire site perimeter.	Downed sections should be repaired and perimeter fence completed to reduce illegal dumping, nuisance animals and windblown litter.	Hamlet
SWM 6	Standing water on site in bulky waste sorting area.	There are several low lying areas in the bulky waste area where surface water runoff collects.	Test water for contamination and treat/pump out as required by regulatory authorities. Once water has been removed, backfill, compact and grade low lying areas to provide proper drainage and reduce standing water on site.	Dillon to complete water testing
SWM 7	Limited vegetation for erosion control.	The surrounding native brush vegetation is slow growing and sparse, providing limited erosion control.	Regular inspection of the landfill cell cap material should be performed to monitor the condition of the cap once the current landfill cell has been closed. Remedial cap repairs should be undertaken as required.	Hamlet

Solid Waste Management Facility Remedial Actions

SWM 8	Direct tracking of solid waste generation and disposal quantities.	Solid waste generation rates are not directly tracked which limits the ability to project generation rates into the future and plan for new site requirements.	The Hamlet should track truckloads of waste to estimate uncompacted generation rates.	Hamlet
SWM 9	Annual report submission.	Municipal water licence annual reports for Paulatuk cannot be located for 2006-2009 and 2013-2014.	Annual reports should be submitted on time and completed as per Paulatuk's water licence. If Paulatuk does not possess the resources to compile and submit reports, additional support should be sought to assist.	Dillon
SWM 10	Concern of potential leachate into Old Water Lake	Hamlet staff have expressed concern about the potential for leachate getting into Old Water Lake.	The updated Solid Waste Operations and Management Plan has proposed a new sampling location between the solid waste management facility and Old Water Lake to monitor for potential contamination. This is subject to regulatory approval by the Inuvialuit Water Board.	Dillon

Sewage Treatment Facility Remedial Actions

Work Item	Concern	Description	Remedial Actions	Action By
STF 1	Unknown lagoon and sludge depth of Lake A (sewage lagoon).	The actual depth of the Lake A is not known, nor is the depth of accumulated sludge layer known.	Lagoon and sludge depths should be measured at various locations within the lagoon to determine actual capacity of the lagoon and the amount of accumulated sludge within the lagoon. Sludge monitoring should also be performed annually as per the Sewage Lagoon Operations and Maintenance Plan.	Dillon
STR 2	Overflowing of sewage lagoon during spring runoff and high precipitation events.	Overflowing of the sewage lagoon occurs periodically potentially causing effluent to spread overland outside of the bounds of the lagoon.	Modifications in order to better control sewage treatment and discharge into the environment should be considered. See text below this table for recommendations.	Dillon
STF 3	Collection and reporting of effluent quality according to water licence requirements.	Sampling requirements for assessing the effectiveness of the sewage treatment process as outlined in the hamlet's water licence are not being completed.	Samples should be collected, analyzed and reported as per water licence requirements.	Dillon
STF 4	Deterioration of the discharge chute infrastructure and erosion of slope.	The discharge chute is in poor condition and in need of repair to reduce erosion of the slope and failure of the discharge chute and truck pad.	The discharge chute should be replaced and mounted with properly anchored supports. A splash pad should be incorporated underneath the discharge chute to reduce erosion effects on the lagoon slope.	Dillon
STF 5	Accumulation of litter along the banks of the lagoon.	Windblown litter from the municipal solid waste site is entering the lagoon.	Begin application of cover material to waste disposed in the municipal solid waste cell on a regular basis.	Hamlet

The main concern is whether the lagoon has sufficient capacity to meet the needs of the community. Based on information provided by the Hamlet with respect to the lagoon overflowing during spring runoff and high precipitation events, it is anticipated that the lagoon collects a large amount of surface runoff, lessening the amount of space available for storage/treatment of sewage effluent.

It is also difficult to determine whether sewage effluent is receiving sufficient primary treatment prior to discharging into the wetland. First sampling of effluent has not been completed on a regular basis and secondly, dilution of effluent with surface runoff will affect sampling results.

Therefore obtaining accurate data related to treatment effectiveness would be difficult due to variations in surface water volumes throughout the year.

In order to better assess and provide sufficient capacity and treatment of the collected sewage effluent, the following steps are recommended:

1. Complete a survey of the lagoon and sludge depths collecting measurements in a grid pattern across the entire lagoon.
2. Collect wastewater effluent samples from the discharge point of the lagoon into the wetland and from the discharge point from the wetland into Darnley Bay. As per the current water licence, these samples must be collected twice annually, once after break-up and once before freeze-up. To provide a better understanding of the treatment efficiency within the lagoon, it is recommended that for at least one treatment season, these samples be collected once per month.
3. Based on the information collected from Step 1 and Step 2, consider and assess the following options for modifications to the system:
 - a. Determine how much volume will be available within the lagoon if the accumulated sludge is removed and if this will provide enough space and treatment capability for the community.
 - b. Determine if mechanical pump-out of effluent can be used based on sampling results and treatment capability of the existing lagoon to improve the system.
 - c. Determine the feasibility of constructing a berm around the existing lagoon to reduce the amount of surface water entering the lagoon, reduce overflow of the lagoon and provide sufficient treatment capability.
 - d. If the above are not feasible or will not provide for sufficient volume and treatment capabilities, determine the feasibility for the Hamlet to construct a new sewage lagoon.