



Aboriginal Affairs and
Northern Development Canada
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Affaires autochtones et
Développement du Nord Canada
<http://www.aadnc-aandc.gc.ca>

North Mackenzie District
P.O. Box 2100
Inuvik, NT X0E 0T0

Telephone: 867-777-8900
Fax: 867-777-2090

September 22, 2011

Gwich'in Land and Water Board
P.O. Box 2018
Inuvik, NT X0E 0T0

Attn: Robert Alexie, Executive Director

**RE: Municipal Water Licence G03L3-001
CLASS B - MUNICIPAL**

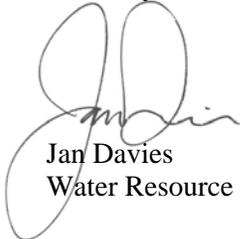
Dear Mr. Alexie,

Please find the enclosed Inspection Report for your review and records.

An electronic copy (un-editable Adobe pdf.) has also been provided by e-mail.

If you have any questions or concerns regarding the enclosed, and/or if additional information is required please contact me at (867) 777-8909.

Sincerely,



Jan Davies
Water Resource Officer

Cc: Conrad Baetz, District Manager, North Mackenzie District, Inuvik, NT

Enclosure: Municipal Water Licence Inspection Report and Cover Letter (8 pages)



North Mackenzie District
P.O. Box 2100
Inuvik, NT X0E 0T0

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September 22, 2011

Hamlet of Fort McPherson
P.O. Box 57
Fort McPherson, NT X0E 0J0

Attn: Knute Hansen

**RE: Municipal Water Licence G03L3-001
CLASS B - MUNICIPAL**

Dear Mr. Hansen,

An inspection was conducted of the Municipal Water Supply and Waste Disposal Facilities on August 19, 2011 by Water Resource Officer Jan Davies. Enclosed is a copy of the Municipal Water Licence Inspection Report.

The efforts by the staff of the Hamlet of Fort McPherson are to be commended for the continued improvements to the Solid Waste Disposal Facilities. There are some long standing problems and issues that are being worked on. Unfortunately, there were a number of violations as depicted on page five of the Inspection Report. Many of the violations relate to administrative compliance and can be dealt with promptly. Please review and address the concerns throughout the Report.

Progress is being made, however, there are persistent violations and concerns that upon review of the previous Inspection Reports, are consistent with those issues in previous years. Please address the aforementioned items as non-compliance with the Water Licences is a serious matter.

A copy of this report will be sent to the Gwich'in Land and Water Board for their review and public records. If you have any questions/concerns regarding the enclosed, and/or if additional information is required, please do not hesitate to contact me at (867) 777-8909.

Sincerely,

Jan Davies
Water Resource Officer

Cc: Conrad Baetz, District Manager, North Mackenzie District, Inuvik, NT

Enclosure: Municipal Water Licence Inspection Report (6 pages)



MUNICIPAL WATER LICENCE INSPECTION FORM

LICENCE #:	G03L3-001	EXPIRY DATE:	August 31, 2013
LICENCEE:	Hamlet of Fort McPherson	PREVIOUS INSPECTION:	September 17, 2010
COMPANY REP:	Senior Administrative Officer	INSPECTION DATE:	August 19, 2011

WATER SUPPLY

Source:	Deep Water Lake	Quantity Used:	41,030 m ³
Owner/Operator:	Hamlet / GNWT Dept. of Public Works	Meter Reading:	N/A

Indicate: **A - Acceptable** **U - Unacceptable** **N/A - Not Applicable** **N/I - Not Inspected**

Intake Facilities	A ^{1,2,3}	Storage Structures	A	Treatment Systems	N/I	Recycling	N/A
Flow Meas. Device	A	Conveyance Lines	A	Pumping Stations	A ^{1,2,3}	Chem. Storage	N/I
						Modifications	N/A

Water Supply Comments:

Concerns:

- Intake line at the Deep Water Lake Intake Facility (DWLIF) has a small crack that shows through the gravel cover, about 1/3 of the way up from the lake. This is a possible inlet for water freezing, erosion and further problems.
- In the past the generators at the DWLIF have had issues with leaking oil and fuel on the floor. Drip trays are present in addition to spill pads which at times have been soaked with oil. Larger drip trays are recommended to provide more coverage and to prevent fluids from by-passing trays. Still evidence of oil on metal skids in the back of the generator shed that has gone along the generator room floor and dripped outside. It is difficult to determine if this is old staining but if the area is cleaned and monitored it can be determined if oil is still dripping outside on the skids. Please note that this oil is a potential contaminant to the environment and the Hamlet's water supply.
- Potential source of leakage and evidence of contamination was noticed at the fuel storage tank at the DWLIF. (See Fuel Storage Section)

Notes:

- Intake Facility/Pump Station looked good, turn around pad is much better since gravel all filled in and no more huge erosion cracks on the end of the pad where the water truck turns around. Monitoring will need to continue to ensure erosion is managed and controlled.
- Only inspected the outside of the Water Treatment Plant as it was locked and the staff were not available. Everything looked okay. Fuel tank has been replaced. (see Fuel Storage Section)
- There have been concerns for a variety of stakeholders for Deep Water Lake and its associated Water Supply Facilities in regards to recreational use. Education is the key when ensuring protection of the water by all users.

WASTE DISPOSAL

Well Waste:	Off-Site Removal	N/A	Drilling Sump	N/A	Downhole	N/A	Land spread	N/A
Solid Waste:	Open Dump	N/A	Landfill	A	Burn & Bury	Conditionally acceptable	Under ground	N/A
	Owner / Operator	Hamlet of Fort McPherson	Sludge Disposal	N/A	Other	N/A		
Tailings:	Tailings Pond	N/A	Natural Lake	N/A	Under ground	N/A		
Sewage:	Sewage Treat. System	Primary	Camp Sump	N/A	Natural Water Body	Piped system leading to Sewage Lake	Wetland Treatment	Sewage Lake, outflow from sewage lagoon
	Continuous Discharge	Piped system leading to Sewage Lake	Inter. Discharge	N/A	Seasonal Discharge	Decant - Late Fall and/or Spring	Trench	N/A



MUNICIPAL WATER LICENCE INSPECTION FORM

Indicate: **A - Acceptable** **U - Unacceptable** **N/A - Not Applicable** **N/I - Not Inspected**

Discharge Quality	A ³	Construction	A ¹¹	Disch. Meas. Dev.	A	Freeboard	A ¹
Decant Structures	U ¹	O&M Plan	U ^{6,7,8,10} 12, 13	Dams, Dykes	A	Seepages	U ¹
Dyke Inspections	N/I	A&R Plan	N/A	Erosion	N/A	Spills	U ^{4,9}
Conveyance Lines	N/A	Pond Treatment	N/A	Runoff Diversion	N/A	Sump Treatment	N/A
Sump Liners	N/A		SNP Samples Collected		Unknown		
Periods of Discharge	Late Fall and/or Spring		Effluent Discharge Rate		By volume of water used		

Waste Disposal Comments:

Concerns:

1. Decant structure valve was closed at the time of inspection. There is seepage of sewage past the decant structure, it is flowing in a very small stream (see Figure 1). This has been consistent since the recent construction on the culvert/decant structure. The sewage lagoon was high and there may be bypassing wastes around the closed decant structure. This problem needs to be assessed to see if the decant structure/culvert is secure otherwise repairs will need to occur. There should not be any decanting material unless samples have been taken to confirm compliance with discharge criteria.

2. It is recommended for the sewage lagoon to be decanted because it looked close to its 1.0 metre freeboard limit as per the Water Licence. Due to the increased amount of rain it seems that a decant will be needed soon. Also the Hamlet of Fort McPherson should apply to the Gwich'in Land and Water Board to have the modification of the Water Licence such that there can be a constant discharge of the sewage lagoon in a controlled small amount year round.

3. In the September 17, 2010 Inspection it was noticed there were two sheens on the north end of the sewage lagoon, one by the sewage discharge chute amongst garbage and another located in the northwest corner past the discharge chutes. It was unclear what the source of the sheen was but please note that if a sheen is detected a sample needs to be taken to determine the source. Please note that only grey water and sewage from domestic origins is to be discharged into the sewage lagoon.

4. There is a large amount of spilled oil in the Waste Oil Storage Area (see Figure 2). Waste oil has been consolidated and put in large tanks on site. One tank with a metal berm was used previously at the Water Treatment Plant. While this is a method to store oil it needs to be decided what to do with the oil once it is put in the large storage tanks. Ultimately the oil needs to be disposed of and can only be stored for so long as there is a tremendous risk of further uncontrolled leaks/spills and even vandalism.

The metal berm for the one storage tank is now full of water and oil due to spillage while filling the tank with smaller containers. This is a further environmental issue to deal with (see Figure 3). The storage tank/berm also needs to be covered to prevent water/precipitation from entering. Covering with metal has been used in other places.

It is recommended for the ease of transportation and disposal that the oil is stored in secure, strong drums that can be sealed when full. The storage of oil in the larger tanks has created another problem and a plan is needed to empty it for proper disposal which would consist of shipping out for disposal or burning in local waste oil burners.

The remaining contaminated soil needs to be cleaned up, contained and properly disposed of. The Hamlet needs to ensure there is a proper procedure to maintain the organization and cleanliness of the waste oil storage area. When there has been spillage, make sure the soil and waste oil is cleaned up, contained and properly disposed of. Further, ensure that the hazardous waste storage area is regularly inspected, maintained and materials stored properly. This will ultimately keep the area clean and encourage the public to segregate waste properly.

5. While on inspection, waste at the Solid Waste Disposal Facility (SWDF) was being burned. You can burn approved materials in a designated area such as paper products, paperboard packaging and untreated wood wastes in accordance with the guideline Municipal Solid Wastes Suitable for Open Burning, developed by the GNWT Department of Environment and Natural Resources.

It was stated by Carson Greenland this was paper/cardboard related products. The fire is in a specific area and monitored but then as time went on surrounding exposed domestic waste at the SWDF waste cell all caught on fire (see Figure 4). A fire truck and bulldozer were needed to put the fire out. In this instance it would be wise to have a specifically designated area for burning approved waste, like an incinerator or a contained area. The Community of Tsiigehtchic uses a very large tall culvert with a screen on top to burn their paper, cardboard, and wood waste.

6. Demolition/building waste in greater quantity is being disposed in the area of the SWDF behind the honey bag pit on the north side of the sewage lagoon. It is recommended that this waste can be further segregated as there is clean wood present that could either be burned or reused as noted above.

7. Solid waste segregation is improving and will need to be continually maintained to further increase public guidance and assistance. For example if waste is disposed of in the wrong area it should be moved before other waste accumulates there as well. Further waste segregation signage is needed in the SWDF at each specific area. Signage should be present for but not limited to the following: bulk metal waste, white metal waste (fridges, washers/dryers, etc.), hazardous waste (oil, fuel, batteries, drums), empty drums, fuel tanks, tires, vehicles/ATVs/ skidoos, honey bag pit, waste animal pit, domestic/household garbage, paper/wood/cardboard- designated burning area, green waste – shrubs, trees, grass etc. Segregation will aid in an organized site that residents will respect and help maintain. This will also keep costs down in the future when it is time to recycle waste or abandon and restore the site.

8. Honey bag pit area needs the sign re-installed so it is clear for public, and so the sign is utilized and not lost.

9. A reminder that waste vehicles need to be emptied of their fluids as this is a source of contamination. During past inspections there was evidence that this hasn't occurred as there appeared to be vehicular fluids that had been spilled. Now there is controlled access to the SWDF this will be a requirement that can be ensured and maintained.

10. There are many additional cells and storage areas that are not on the current Operation and Maintenance Plan. It is apparent that the current O&M Plan (1997) needs to be updated and to include these new cells and storage areas. A revised Operation and Maintenance Plan (O&M Plan) for the Sewage and Solid Waste Disposal Facilities was required by March 1, 2008. To date a revised

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MUNICIPAL WATER LICENCE INSPECTION FORM

O&M Plan has not been received and is a violation of Part I: Conditions Applying to Operation and Maintenance, Item 1, of the renewed Water Licence. Ensure the Hamlet Staff are aware of and follow the current O&M Plan to maintain consistency in how the Sewage Disposal Facility (SDF) and Solid Waste Disposal Facility (SWDF) are being operated.

11. Work has started for preparing the new SWDF site which is the turnoff just before the current SWDF. Plans have been submitted for the new SWDF but have not been approved and the Hamlet is not able to move any infrastructure until authorized by the Gwich'in Land and Water Board. As per the Water Licence the Hamlet needs to comply with Part G: Conditions Applying to Abandonment and Restoration, Item 1, which states, "The Licensee shall submit to the Board for approval an Abandonment and Restoration Plan at least six (6) months prior to abandoning any sewage or solid waste facilities. The Plan shall include, but not be limited to:

- a) contaminated site remediation;
- b) leachate prevention;
- c) an implementation schedule;
- d) maps delineating all disturbed areas, borrow material locations, and site facilities;
- e) consideration of altered drainage patterns;
- f) type and source of cover materials;
- g) future area use;
- h) hazardous wastes;"

12. Windblown debris continues to be an issue, it is getting into the sewage lagoon and needs to be cleaned out. This is a violation of the Water Licence Part D: Conditions Applying to Waste Disposal, Item 8. There needs to be regular covering of domestic waste in the SWDF waste cell and fences installed. When the waste is not covered it creates a larger mess due to being blown around and the problem is further compounded. This ultimately creates large expense to clean up the debris.

13. The contaminated soil storage areas at the SWDF should not be for long term storage but allow for the remediation of soils and their permanent disposal. Contaminated soil while stored in bermed containment cells, still needs to be correctly remediated so it can be properly disposed of. There needs to be regular turning of soil/aeration, sampling, removal of soil for proper disposal. This will ultimately expose other layers of soil to the remediation process and create an efficient remediation program.

Notes:

- Shack now at entrance to the SWDF for Hamlet staff when site is in operation. The Hamlet is to be commend for their continued initiative to consolidate and control the activities at the SWDF which now has a controlled entrance/locked gate, a posted schedule, an after hours drop off box, and an attendant present during hours of operation. If required, part-time hours or reduced hours of operation might be required in slower periods like winter or summer months. Records should be kept of when public access the SWDF in order to plan the optimum schedule of hours to allow this program to continue.
- During the Inspection the new SWDF site was being prepared which will use their existing pit on site. There will be surface water management for the soil landfarm. With other soil contamination cleanup projects in the area there might be ways to work together to share cleanup and remediation costs like those associated with the operation of a landfarm.
- Appliances and other white metal waste have been organized in a designated area. It is recommended for Freon etc to be properly disposed of.
- Ensuring that waste is compacted and covered on a timely basis will assist with controlling windblown debris and making the site clean thus encouraging the public to properly segregate their waste. Fencing and other windbreaks will aid in providing more protection and catching debris.
- Construction waste continues to be piled on the North side of the bulk metal waste area and the sewage lagoon.
- Wood material in behind household waste area up top is filling in a small area with ponded water, in addition regular garbage.
- Part of the bulk metal waste area has been covered with fill material (see Figure 5).
- Contaminated soil areas by tire storage area were recently sampled by Dennis Wright – Hamlet and Gerald Enns – Hazardous Waste Specialist with GNWT. Test pits were dug and samples taken at various depths. Some results were positive and showed that about a metre worth of material off the top of middle surface of the north cell could be removed because it complied with coarse grained soil criteria for Industrial Land Use for the GNWT Guideline for Contaminated Site Remediation. It will be used as landfill cover material. Both containment cells will then be level and the soil turned and tested next summer.
- The Sewage Disposal Facility (SDF) needs to be upgraded to effectively address the high ammonia in sewage effluent as mentioned in the Fort McPherson Wetland Study (Ferguson Simek Clark, March 2005).
- The Sewage Disposal Facility should be upgraded with an application to the Gwich'in Land and Water Board to facilitate continuous discharge as opposed to decanting sewage effluent, for example the control valve remains open or the installation of a weir. This would allow a solution to having to decant in the spring and summer seasons. There could also be an application made to the Board in regards to discharging sewage directly to the Sewage Lake where the current piped sewage is entering the lake.

There are a number of different solutions that would provide efficiencies to the current sewage treatment system. As mentioned in the 2004 Annual Report and Study - Performance and Potential Improvements to Anaerobic Lagoon in Fort McPherson (Earthtech, N.W.T. May, 2004) it is suggested that "the sewage treatment "system" for the lagoon discharge could be expanded in the future to include the downstream wetland areas"

FUEL STORAGE

Owner:	Hamlet of Fort McPherson	Operator:	Department of Public Works	Condition of tanks:	Good ¹
Berms & Liners	N/A	Water within Berm:	N/A	Evidence of Leaks:	Yes ^{3,4}
Drainage Pipes	A	Pump Station and Catchment Berm	A	Runoff Diversion	N/A
Pipeline Condition	A ^{3,5}	Not Applicable:	N/A		

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MUNICIPAL WATER LICENCE INSPECTION FORM

Fuel Storage Comments:

Concerns:

1. The new fuel storage tank located outside the Water Treatment Plant (WTP) in the Hamlet has new flex pipe that appears stressed but it is straight. This should be monitored or even replaced as this can be a point of weakness and can be at risk for spillage in the future.
2. During the last Water Licence in September 17, 2010 the previous outside fuel tank at the Water Treatment Plant had less water within the berm. Compared to previous inspections pictures the water level within the berm was greatly reduced. There was a lot of debris present in the bottom of the berm. There was a distinct odour emanating from within the berm that smelled of hydrocarbons and a sheen that was present on the remaining water. The Hamlet of Fort McPherson needs to provide details of where the water was disposed of.
3. There was some staining on the ground noticed below the piping and the side of the fuel storage tank at the Deep Water Lake Intake Facility (DWLIF) (see Figure 6). There needs to be confirmation of the source and assurances that there is not any leaking pipes, connections etc. This staining was not noticed in previous Inspections.
4. During the September 25, 2008 Inspection it was noticed that the DWLIF gravel pad for the fuel storage tank (a double walled tank mounted on a wood platform) smelled of fuel mainly on the south side of the pad. Shane Debastien who was present mentioned that the south side of the tank with the pipe in the bottom was sunken originally and had to be repaired. During this time there might have been a leak and/or the tank at times has been overfilled. With the fuel/water draining off the tank the gravel area would smell of fuel. It is recommended that there should be an assessment and sampling to determine the hydrocarbon concentrations and the extent of contaminated gravel. If necessary the area should be excavated of contaminated gravel and properly disposed of as the presence of contamination is a potential risk to the Hamlet's water supply.
5. Please note the fuel storage tank at the DWLIF is a potential risk for a large volume fuel spill. The fuel supply line is connected to the bottom of the fuel storage tank and is susceptible to tank movement and subsequent leakage of fuel. Due to the position of the of the fuel line connection this is a possible source of leakage and contamination. A spill from this fuel tank would pose an immediate risk to the Hamlet's water supply. It is recommended that an alternate fuel tank is installed with fuel lines that connect to the top of the fuel tank.

Note:

- There is a new fuel storage tank located outside the WTP. Piping is in from the top. Much improved fuel storage system.

SURVEILLANCE NETWORK PROGRAM

Samples Collected Hamlet	Samples were collected in 2010. Initial sampling for a sewage decant occurred in Aug 30, 2011 and the samples were acceptable to initiate a decant. There has been sampling of SNP 1696-5 and 6 but it appears that 1696-3 has not been sampled yet. ^{1,2}		
Samples Collected DIAND	None		
Signs Posted: SNP	SNP 1696-3 Sewge Lagoon, 1696-1(b) Deep Water Lake Intake Facility, others not inspected.	Warning	Present for Solid Waste Disposal Facility, Sewage Disposal Facility, and Water Supply Facilities.
Record & Reporting	<ul style="list-style-type: none"> - 2010 Annual Report has been sent in. It was noted that the SNP information was missing. Upon notification by the Board staff some of that lab analysis was provided. - An action plan to maintain freeboard at Sewage Disposal Facilities was due May 30, 2008. - Terms of reference for a bio-physical assessment of the environment receiving sewage effluent discharges was due March 28, 2008. - A plan outlining steps to improve sewage treatment efficiency (trucked sewage system) including measures to reduce Ammonia Nitrogen in the waste water effluent stream to meet applicable water quality guidelines was due October 30, 2009. 		
Geotechnical Inspection	N/A - but an inspection of the bermed up area by the decant structure by an engineer after all these years would be proactive to ensure the sewage lagoon decant structure and the associated berms are sound.		

Surveillance Network Program Comments:

Concerns:

1. In the 2010 Annual Report it states that samples were collected. Not all sample data was provided and it cannot be confirmed if the Hamlet is in compliance with the Surveillance Network Program (SNP) Part B: Sampling and Analysis Requirements, Item 2 and 3. Please note that it is the Hamlet's responsibility to be compliant with the SNP. Any samples being missed would be a violation of the Water Licence Part B: General Conditions, Item 2, which states, "The Licensee shall comply with the "Surveillance Network Program" annexed to this Licence....".
2. There was sampling at SNP 1696-5 and 6 back in July 13, 2011. It appears that SNP 1696-3 was not sampled. The SNP states in Part B: Sampling and Analysis Requirements, Item 2 and 3, for SNP 1696-3, 5, and 6, that they "shall be sampled two times per year, preferably in July and October". The Hamlet is encouraged to sample during these times so as to ensure adequate samples are taken. In the past samples have been missed due to low flows. Ensure samples are analyzed for all parameters required by the Water Licence in the SNP Section, in the past some parameters have been missed. Again any samples being missed would be a violation of the Water Licence as mentioned in Concern #1.

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MUNICIPAL WATER LICENCE INSPECTION FORM

NON-COMPLIANCE/VIOLATIONS OF ACT OR LICENCE

Part B: General Conditions, Item 9,

“The Licensee shall submit to the Board for approval, no later than May 30, 2008, an action plan outlining what steps will be taken to consistently maintain the specified freeboard at the trucked sewage disposal facilities...”

Part B: General Conditions, Item 10,

“The Licensee shall prepare, and submit to the Board and Fisheries and Oceans Canada for approval, no later than March 28, 2008, terms of reference for a bio-physical assessment of the environment receiving the sewage effluent discharges, namely Sewage Lake and the lake and wetlands downstream from the trucked sewage retention lagoon...”

Part B: General Conditions, Item 11,

“The Licensee shall submit to the Board for approval, no later than October 30, 2009, a detailed plan outlining what steps will be taken to improve sewage treatment efficiency (trucked sewage system). The plan shall include, but not be limited to, measures to reduce Ammonia Nitrogen in the waste water effluent stream to meet the applicable water quality guideline (CCME - Canadian Water Quality Guideline for the Protection of Aquatic Life)...”

Part D: Conditions Applying to Waste Disposal, Item 8.

“The Licensee shall maintain the Sewage Disposal Facilities to the satisfaction of an Inspector.”

Part I: Conditions Applying to Operation an Maintenance, Item 1,

“The Licensee shall, within six(6) months of the issuance of this Licence, submit to the Board, with a copy to the Inspector, for approval, a revised plan for the Operation and Maintenance of the Sewage and Solid Waste Disposal Facilities...”

Inspector's Signature:

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MUNICIPAL WATER LICENCE INSPECTION FORM

Inspection Images:



Figure 1

Decant structure valve was closed at the time of inspection. There is seepage of sewage past the decant structure, it is flowing in a very small stream.



Figure 2

There is a large amount of spilled oil in the Waste Oil Storage Area. The contaminated soil needs to be cleaned up, contained and properly disposed of. The Hamlet needs to ensure there is a proper procedure to maintain the organization and cleanliness of the waste oil storage area.



Figure 3

The metal berm for the one storage tank is now full of water and oil due to spillage while filling the tank with smaller containers. This is a further environmental issue to deal with.



Figure 4

Paper/cardboard related products were on fire in a specific area and monitored but then as time went on surrounding exposed domestic waste at the SWDF waste cell all caught on fire.



Figure 5

Part of the bulk metal waste area has been covered with fill material.



Figure 6

There was some staining on the ground noticed below the piping and the side of the fuel storage tank at the Deep Water Lake Intake Facility. There needs to be confirmation of the source and assurances that there is not any leaking pipes, connections etc. This staining was not noticed in previous Inspections.