

Municipal Water Licence Annual Report

Town of Hay River

Licence #: MV2009L3-0005

Reporting year: _____

Expires: May 30, 2020

The Licensee shall file an Annual Report with the Board not later than March 31st of the year following the calendar year reported which shall contain the following information:

a) Water Use

Licensed Water Volume Withdrawal: 750,000 m³ annually

Approximate total volume of water used for reporting year: _____m³

Table 1: Monthly and annual water quantities obtained from Great Slave Lake raw water intake at the Intake House (SNP 0053-1)

Month	Volume from main source (m ³)	Volume from any other source (m ³)	TOTAL Volume (m ³)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
TOTALS			
% Increase/decrease from previous year			

Reasons for increase/decrease in water withdrawn:

Reasons for exceeding licensed withdrawal volumes (if applicable):

Name and location of other water source used (if any), and reason for its use:

General information (e.g. information regarding any modifications to the water withdrawal procedure or facilities) should be included here. If necessary please attach any relevant reports as an appendix to this report.

b) Waste Disposal

i) Solid Waste

Approximate total yearly volume of solid waste deposited: _____ m³

Table 2: Monthly and annual quantities of solid waste deposited at the Hay River Solid Waste Disposal Facilities

Month	Volume of solid waste deposited (m³)
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
TOTALS	
% Increase/decrease from previous year	

GNWT – MACA has provided a standard formula for estimating the amount of solid waste deposited into a Solid Waste Facility in the absence of a metered Garbage Truck. The following can be used: Volume per person per day X number of days X population

e.g. $0.015 \text{ m}^3 \times 30 \text{ days} \times 860 \text{ people} = 387 \text{ m}^3$ of domestic trash deposited into Solid Waste Facility in a 30 day month

Reasons for increase / decrease: (e.g. an industrial project close to the Town of Hay River, or a large influx of people into town)

General information:

Information regarding any agreements with outside organizations to be a waste receiving facility should be outlined here along with an estimate of the amount and type of waste to be received.

ii) Sewage

Table 3: Monthly and annual quantities of sewage deposited at Hay River Sewage Disposal Facilities

Month	Volume of sewage waste deposited (m ³)
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
TOTALS	
Is this an estimated volume? (yes/no)	
% Increase/decrease from previous year	

To calculate monthly sewage waste deposited to the Primary Lagoon, please provide the above information if metered information is available. If metered information is not available, please fill in the table using the corresponding TOTAL water volumes from Table 1. This provides estimation only and equals water in/sewage out.

Reasons for increase / decrease: (eg.: an industrial project close to the Town of Hay River, or a large influx of people into town)

Has any sludge been removed from the primary sewage cells during this reporting year? If so, what volume of sludge was removed? What testing was completed on the sludge and where it was disposed of? Please provide documentation for testing and ENR Water Licence Inspector approval of placement.

Was there any decanting this reporting year? Please provide dates. What was the decant duration and the approximate volume decanted? As this is a Surveillance Network Program site (SNP station 0053-3), the resulting testing is to be presented as part of the tabular SNP data to be provided as per the Water Licence (see Appendix A).

iii) Contaminated Soil accepted at the Biotreatment Pad

Table 4: Monthly and annual quantities of contaminated soil deposited at the Hay River Biotreatment Pad

Month	Volume of contaminated soil deposited (m³)
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
TOTALS	
Is this an estimated volume? (yes/no)	
% Increase/decrease from previous year	

iv) Other Waste Sources

Are there any other types or sources of waste that are being deposited at the Town of Hay River's Waste Disposal Facilities? Please list the type/source, where it is being deposited, and monthly/annual volume for each waste below.

c) Waste removed from Waste Disposal Facilities

Please list in the table below wastes removed from Waste Disposal Facilities (e.g. recyclables, tires, household hazardous waste, scrap metal, and other wastes that are periodically shipped out.)

Table 5: Monthly and annual quantities of waste removed from the Waste Disposal Facilities by Type

Month	Waste type 1 (fill in type)	Waste type 2 (fill in type)	Waste type 3 (fill in type)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
TOTALS			
Is this an estimated volume? (yes/no)			
% Increase/decrease from previous year			

d) Waste Volume Comparison for Solid Waste Disposal Facility

Table 6: Waste Volume Comparison for Solid Waste Disposal Facility

Waste volume deposited (m ³)	Remaining storage volume (m ³)

Please comment here on the remaining storage volume at the Solid Waste Disposal Facility.

e) Waste Volume Comparison for Biotreatment Pad

Table 7: Waste Volume Comparison for Biotreatment Pad

Waste volume deposited (m ³)	Remaining storage volume (m ³)

Please comment here on the remaining storage volume at the Biotreatment Pad.

f) Volume of treated soil removed from Biotreatment Pad and analytical results for soil chemistry and particle size analysis

Volume of treated soil removed from Biotreatment Pad: _____ m³

Attach analytical results for soil chemistry and particle size analysis as Appendix B to this report.

g) Leachate testing and analysis

Please provide a description of how leachate is discharged or stored (this includes leachate from the Biotreatment Pad and landfill).

Appendix A contains a table that may be used to report a summary of results for Biotreatment Pad leachate (SNP station 0053-8). Attach results of any leachate testing and analysis in Appendix C.

h) Inspections of Dams, Berms, Dykes, and Control Structures

Describe the results from any inspection done to the dams, berms, dykes or control structures here. Inspection reports can be attached in Appendix D.

i) Updates or revisions to the approved Waste Disposal Facilities Operation and Maintenance Plan

Summarize the updates or revisions to approved Operation and Maintenance Plans here. Copies of revised Plans can be attached in Appendix E.

j) Updates or revisions to the Snow Disposal Plan

Summarize updates or revisions here. A copy of the revised Plan can be attached in Appendix E.

k) Updates or revisions to the approved Spill Contingency Plan

Summarize updates or revisions here. A copy of the revised Plan can be attached in Appendix E.

l) Modifications and/or maintenance work completed during the year on the Water Supply Facilities and Waste Disposal Facilities

Include any work done to infrastructure for all facilities completed during the year in this section. This includes any changes, repairs and modifications. If any problems occurred during the year, please note them here. If there are no changes, make note of that. If required please attach any as-built drawings or reports as Appendix F to this report.

m) Surveillance Network Program Data

Tabular summaries of all data generated under the Surveillance Network Program (SNP) should be included using the tables in Appendix A. All lab results should be included in Appendix G.

n) Surveillance Network Program Comparison

A comparison of the Surveillance Network Program data to the Water Licence regulated limits and sampling and analysis requirements (can be presented in graph form).

o) Groundwater Monitoring

Include an analysis of groundwater monitoring results for the Solid Waste Disposal Facilities. This may include comparison with any applicable guidelines, site-specific guidelines, and trend analysis. Appendix A contains a table that may be used to report a summary of results (SNP stations 0053-5a, 0053-5b, 0053-5c, 0053-5d, 0053-7a, 0053-7b, 0053-7c and 0053-7d). Lab results should be attached in Appendix G.

p) Abandonment and restoration

Summarize any abandonment and restoration work completed during the year, and outline any work anticipated for the next year. Attach any relevant as-built drawings or reports in Appendix F.

q) Studies requested by the Board

If the Board has requested that specific studies be completed, include details of the studies in this section with a summary of the outcome. Also include a brief description of any future studies planned. Include any attachments in Appendix H.

r) Unauthorized discharges

List any unauthorized discharges here including any spills, how and when they were reported, and how they were cleaned up. Please attach copies of spill reports, correspondence with the ENR Water Licence Inspector or any other pertinent documentation in Appendix I.

s) Inclusion of all correspondence between the Inspector and the Licensee

This includes discussions relating to recent inspections, compliance and any other issues. Attach in Appendix J.

t) Other Information

- Include any other details on Water Use or Waste disposal requested by the Board by November 1 of the year being reported;
- Include any other information here that may be valuable to the MVLWB;
- Include details on upcoming studies that will be completed;
- Please include any non-compliance items identified in the ENR Water Licence Inspection report and detail how the Town of Hay River is addressing them; and
- Please identify any on-going compliance issues for the Town of Hay River. This can facilitate discussions to resolve the issues.

Appendix A: Tabular summaries of all data generated under the Surveillance Network Program for Hay River (MV2009L3-0005)

Surveillance Network Program Lab Results Summary

Surveillance Network Program (SNP) information is to be summarized in a tabular format and shall indicate date of testing, parameters tested for and any other information requested by the GNWT Water Licence Inspector or the MVLWB. Summary tables have been provided below for your convenience. Laboratory analysis results may be appended in Appendix G.

1) SNP Lab Results Summary – Station number 0053-2a (Sewage Disposal Facilities point of discharge) – INACTIVE

2) SNP Lab Results Summary – Station number 0053-2b (Sewage Disposal Facilities point of discharge)

This station monitors final effluent quality before discharge to Great Slave Lake, and shall be sampled monthly during periods of flow.

Water Licence Parameters	Effluent Quality Criteria	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
pH									
CBOD									
BOD ₅	20 mg/L (MAC) 30 mg/L (MGS)								
Total Suspended Solids	20 mg/L (MAC) 40 mg/L (MGS)								
Faecal Coliforms	1000 FC/100ml (MAC)								

	2000 FC/100ml (MGS)								
Faecal Streptococci									
Oil and Grease	No visible sheen								
Conductivity									
Temperature									
Dissolved Oxygen									
Total Organic Carbon									
Total Ammonia									
Nitrate-Nitrogen									
Total Kjeldahl Nitrogen									
Total Dissolved Phosphorus									
Total Phosphorus									
Ortho Phosphorus									
Calcium									
Chloride									
Magnesium									
Sodium									
Alkalinity									

Sulphate									
Fluoride									
Potassium									
Total Dissolved Solids									
Total Hardness									

Note: MAC = Maximum Average Concentration, MGS = Maximum Grab Sample

3) SNP Lab Results Summary – Station number 0053-3 (Sewage Disposal Facilities Point of Discharge to Wetland)

This station monitors water quality prior to discharge into the wetland sewage treatment system, and shall be monitored monthly during periods of flow.

Water Licence Parameters	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
pH								
CBOD								
BOD₅								
Total Suspended Solids								
Faecal Coliforms								
Faecal Streptococci								

Oil and Grease								
Conductivity								
Temperature								
Dissolved Oxygen								
Total Organic Carbon								
Total Ammonia								
Nitrate-Nitrogen								
Total Kjeldahl Nitrogen								
Total Dissolved Phosphorus								
Total Phosphorus								
Ortho Phosphorus								
Calcium								
Chloride								
Magnesium								
Sodium								
Alkalinity								
Sulphate								
Fluoride								
Potassium								

Total Dissolved Solids								
Total Hardness								

Note: MAC = Maximum Average Concentration, MGS = Maximum Grab Sample

4) SNP Lab Results Summary – Station number 0053-5a (Solid Waste Disposal Facilities Runoff or Seepage)

This station monitors water quality associated with runoff or seepage from the Solid Waste Disposal Facilities at monitoring well BH01, and shall be monitored monthly during periods of flow.

Water Licence Parameters	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
pH								
Conductivity								
Temperature								
Dissolved Oxygen								
BOD ₅								
Nitrate and Nitrite								
Total Phenols								
Arsenic								
Iron								
Faecal Coliform								
Oil and Grease								
Copper								
Mercury								
Total Petroleum Hydrocarbons: F1								

Total Petroleum Hydrocarbons: F2								
Total Petroleum Hydrocarbons: F3								
Total Petroleum Hydrocarbons: F4								
Aluminum								
Beryllium								
Boron								
Cadmium								
Chromium								
Cobalt								
Lead								
Manganese								
Molybdenum								
Nickel								
Selenium								
Silver								
Strontium								
Vanadium								
Zinc								
Calcium								
Chloride								
Magnesium								
Sodium								
Alkalinity								
Total Dissolved Solids								
Sulphate								
Fluoride								

Potassium								
Total Hardness								
Groundwater Level								

5) SNP Lab Results Summary – Station number 0053-5b, c, and d (Solid Waste Disposal Facilities Runoff or Seepage)

This station monitors Groundwater quality associated with the Solid Waste Disposal Facilities at monitoring wells BH02, BH03, BH 04, and shall be monitored monthly during periods of flow for the first year of sampling, and then twice annually (once after spring thaw and once before fall freeze-up).

Station 0053-5b: Year One

Water Licence Parameters	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
pH								
Conductivity								
Temperature								
Dissolved Oxygen								
BOD ₅								
Nitrate and Nitrite								
Total Phenols								
Arsenic								
Iron								
Faecal Coliform								
Oil and Grease								
Copper								
Mercury								

Total Petroleum Hydrocarbons: F1								
Total Petroleum Hydrocarbons: F2								
Total Petroleum Hydrocarbons: F3								
Total Petroleum Hydrocarbons: F4								
Aluminum								
Beryllium								
Boron								
Cadmium								
Chromium								
Cobalt								
Lead								
Manganese								
Molybdenum								
Nickel								
Selenium								
Silver								
Strontium								
Vanadium								
Zinc								
Calcium								
Chloride								
Magnesium								
Sodium								
Alkalinity								
Total Dissolved Solids								

Sulphate								
Fluoride								
Potassium								
Total Hardness								
Groundwater Level								

Station 0053-5c: Year One

Water Licence Parameters	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
pH								
Conductivity								
Temperature								
Dissolved Oxygen								
BOD ₅								
Nitrate and Nitrite								
Total Phenols								
Arsenic								
Iron								
Faecal Coliform								
Oil and Grease								
Copper								
Mercury								
Total Petroleum Hydrocarbons: F1								
Total Petroleum Hydrocarbons: F2								

Total Petroleum Hydrocarbons: F3								
Total Petroleum Hydrocarbons: F4								
Aluminum								
Beryllium								
Boron								
Cadmium								
Chromium								
Cobalt								
Lead								
Manganese								
Molybdenum								
Nickel								
Selenium								
Silver								
Strontium								
Vanadium								
Zinc								
Calcium								
Chloride								
Magnesium								
Sodium								
Alkalinity								
Total Dissolved Solids								
Sulphate								
Fluoride								
Potassium								
Total Hardness								

Groundwater Level								
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Station 0053-5d: Year One

Water Licence Parameters	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
pH								
Conductivity								
Temperature								
Dissolved Oxygen								
BOD ₅								
Nitrate and Nitrite								
Total Phenols								
Arsenic								
Iron								
Faecal Coliform								
Oil and Grease								
Copper								
Mercury								
Total Petroleum Hydrocarbons: F1								
Total Petroleum Hydrocarbons: F2								
Total Petroleum Hydrocarbons: F3								
Total Petroleum Hydrocarbons: F4								
Aluminum								

Beryllium								
Boron								
Cadmium								
Chromium								
Cobalt								
Lead								
Manganese								
Molybdenum								
Nickel								
Selenium								
Silver								
Strontium								
Vanadium								
Zinc								
Calcium								
Chloride								
Magnesium								
Sodium								
Alkalinity								
Total Dissolved Solids								
Sulphate								
Fluoride								
Potassium								
Total Hardness								
Groundwater Level								

6) SNP Lab Results Summary – Station number 0053-6 (Return Water at Pumphouse)

This station monitors quality of return Water from the pumphouse to Great Slave Lake, and shall be monitored monthly during periods of flow.

Water Licence Parameters	Sample 1 date	Sample 2 date	Sample 3 date	Sample 4 date	Sample 5 date	Sample 6 date	Sample 7 date	Sample 8 date
Total Chlorine								

7) SNP Lab Results Summary – Station number 0053-7a, b, c and d (Groundwater wells)

This station monitors Water quality associated with runoff and seepage from the Biotreatment Pad, and shall be monitored twice yearly (during spring break up and before fall freeze-up). It is comprised of the four groundwater wells along the northeast perimeter of the Biotreatment Pad.

Water Licence Parameters	0053-7a		0053-7b		0053-7c		0053-7d	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
pH								
Benzene								
Toluene								
Ethylbenzene								
Xylene								
Total Petroleum Hydrocarbons: F1								
Total Petroleum Hydrocarbons: F2								
Total Petroleum Hydrocarbons: F3								
Total Petroleum Hydrocarbons: F4								
Electrical Conductivity								
Aluminum								

Arsenic								
Beryllium								
Boron								
Cadmium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Manganese								
Mercury								
Molybdenum								
Nickel								
Selenium								
Silver								
Strontium								
Vanadium								
Zinc								
Methyl tert-butyl ether								
Water Levels								

8) SNP Lab Results Summary – Station number 0053-8 (Biotreatment Pad Leachate)

This station monitors Water (leachate) quality prior to discharge from the Biotreatment Pad to the Sewage Disposal Facilities, and shall be sampled when leachate is to be discharged from the Biotreatment Pad. Analytical results must be provided to the Board and an Inspector 10 days prior to discharge; discharge must meet the criteria outlined in the approved Biotreatment Pad Operation and Maintenance Plan, and Inspector approval shall be obtained prior to discharge to the Sewage Disposal Facilities (SNP Parts 12, 13 and 14).

Water Licence Parameters	Sample 1 – date	Sample 2 – date	Sample 3 – date
pH			
Conductivity			
Temperature			
Dissolved Oxygen			
Total Ammonia			
Nitrate-Nitrogen			
Total Dissolved Phosphorus			
Total Kjeldahl Nitrogen			
Total Phosphorus			
Ortho Phosphorus			
Total Organic Carbon			
Benzene			
Toluene			
Ethylbenzene			
Xylene			
Total Petroleum Hydrocarbons: F1			
Total Petroleum Hydrocarbons: F2			
Total Petroleum Hydrocarbons: F3			
Total Petroleum Hydrocarbons: F4			
Aluminum			
Arsenic			
Beryllium			
Boron			
Cadmium			
Chromium			

Cobalt			
Copper			
Iron			
Lead			
Manganese			
Mercury			
Molybdenum			
Nickel			
Selenium			
Silver			
Strontium			
Vanadium			
Zinc			
Methyl tert-butyl ether			
Water Levels			

Appendix B: Analytical results for soil chemistry and particle size analysis from soil removed from the Biotreatment Pad (item f)

As per SNP Part 10, the Town shall obtain a representative sample based on the table below, for treated soil and test for the following parameters prior to final disposal of soil from the Biotreatment Pad.

Water Licence Parameters	Sample 1 – date	Sample 2 – date	Sample 3 – date
pH			
Benzene			
Toluene			
Ethylbenzene			
Xylene			
Total Petroleum Hydrocarbons: F1			
Total Petroleum Hydrocarbons: F2			
Total Petroleum Hydrocarbons: F3			
Total Petroleum Hydrocarbons: F4			
Electrical Conductivity			
Aluminum			
Arsenic			
Beryllium			
Boron			
Cadmium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Manganese			
Mercury			
Molybdenum			
Nickel			

Selenium			
Silver			
Strontium			
Vanadium			
Zinc			

Volume of Soil (cubic meters)	Number of composite samples
1 – 50	1
51 – 500	2
501 – 1000	3
1001 – 2000	4
2001 – 5000	5
Each additional 1000	1 additional

*A composite sample should consist of no less than 3 representative grab samples.

Appendix C: Analytical results of leachate testing and analysis (item g)

Appendix D: Inspection reports from inspections of dams, berms, dykes and control structures (item h)

Appendix E: Updated/revised Waste Disposal Facilities Operation and Maintenance Plans, Snow Disposal Plan and Spill Contingency Plan (items i, j, and k)

Appendix F: As-built drawings or reports related to major Modifications and/or maintenance work, and any abandonment and restoration work (items l and p)

Appendix G: Analytical results for Surveillance Network Program (SNP) sampling (items m, o)

Appendix H: Any studies requested by the Board (item q)

Appendix I: Unauthorized discharges (reports, Inspector correspondence or any other pertinent documentation) (item r)

Appendix J: Correspondence between the Inspector and the Licensee (item s)