



Mackenzie Valley Land and Water Board
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Staff Report

Applicant: City of Yellowknife	
Location: Yellowknife	Application: MV2009L3-0007
Date Prepared: July 13, 2015	Meeting Date: August 13, 2015
Subject: 2014 Annual Report, 2014 Biotreatment Pad Annual Report	

1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (the Board):

- a) Consider the 2014 Annual Report submitted by the City of Yellowknife; and
- b) Consider the 2014 Biotreatment Pad Annual Report.

2. Background

- May 31, 2010 – MV2009L3-0007 issued for a period of 12 years;
- April 1, 2015 – 2014 Annual Reports received;
- May 4, 2015 – Annual Reports sent for review;
- June 18, 2015 – Reviewer comments due;
- July 2, 2015 – Proponent’s response due;
- August 13, 2015 – Annual Reports presented to the Board; and
- May 30, 2022 – MV2009L3-0007 expires.

3. Discussion

Type A Water Licence (Licence) MV2009L3-0007 was issued to the City of Yellowknife (City) for the use of water and disposal of waste for municipal undertakings. Water is drawn from the Yellowknife River for drinking water; sewage is deposited into the Fiddlers Lake Lagoon System (lagoon); and solid waste is deposited at the Solid Waste Disposal Facility (SWDF), located just off of Hwy # 4 north of the City.

The operation of the City’s Biotreatment Pad is regulated through the City’s Licence. The facility is located at the SWDF. The Biotreatment Pad accepts hydrocarbon-contaminated soil and water for treatment. Treated soil that meets criteria outlined in the Licence is reused as cover at the SWDF. Treated water meeting criteria is either reused at the Biotreatment Pad or discharged to land.

The City stated in the Interim Closure and Reclamation Plan submitted March 4, 2015 that the Biotreatment Pad has stopped receiving contaminated soil and water. Once the material on site has been treated the Biotreatment Pad will cease operating in its current capacity and may be used in future as a processing and storage area for vehicles and batteries.

The 2014 Annual Report and 2014 Biotreatment Pad Annual Report (BP Annual Report) were filed in accordance with Part B, Item 3 and Schedule 1, Item 1 of the Licence; these are included in Appendix A of this Staff Report. These Annual Reports are not for Board approval; however, they are being presented as an update to the Board.

4. Comments

2014 Annual Report

Water use:

- The City's Licence authorizes the annual withdrawal of up to 3,600,000 cubic metres of water from the Yellowknife River. In the 2014 Annual Report the City reported a water withdrawal of 3,491,910 cubic metres for the year. This represents an increase of 400,000 cubic metres from the previous year. If the City's water use increases at the same rate in 2015, the quantity of water the City is licenced to withdraw would be exceeded.

Reporting on Waste discharged to the lagoon:

- Section 1b) of the Licence requires reporting of the monthly and annual quantities in cubic metres of each and all Waste discharged to the Waste Disposal Facilities. The 2014 Annual Report includes the monthly and annual volume of sewage sludge that was discharged into the lagoon. However, there are other sources of Waste that may be discharged into the lagoon for which quantities were not reported: Baling facility leachate and sludge, compost leachate, leachate from the sump at Cell A, and sludge and wastewater from the Wastewater Treatment Plant (once it is operational) may all be potentially disposed of at the lagoon.
- In the Board's [January 21, 2015 letter](#) accepting the 2013 Annual Report, the Board encouraged the City to work with an Inspector to develop a method to estimate the volume of liquid discharged from the Baling facility. In section o) of the 2014 Annual Report the City acknowledges this request and states that they will work with the Inspector and include the information in the next revision of the Landfill Operations and Maintenance Plan (LOMP). As per section 1b) of the Licence this information should also be supplied on a yearly basis in the Annual Report.

Sewage sludge management:

- In a [September 24, 2013 Board decision](#), the requirements for the Operations and Maintenance Plan for the Sewage Disposal Facilities were revised to include a sludge management plan (Schedule 4, Item 1.e). In the City's 2013 Annual Report, the City stated that a sludge management study would be conducted during the 2015 fiscal year to support the completion of a Sludge Management Plan in 2016. However, it appears

that this initiative has been delayed a year as the 2014 Annual Report (section v) states that the sewage sludge study will be completed in 2016; a sludge management plan would therefore be delayed until after this plan is complete.

2014 Biotreatment Pad Annual Report

The BP Annual Report was produced by Biogénie, the City's operations contractor for the Biotreatment Pad.

In the Board's [February 12, 2015 letter](#) accepting the 2013 BP Annual Report, the Board encouraged the City to follow their own recommendation to replace the lagoon liner. A breach of the lagoon liner had been discovered during a liner inspection in 2012 and was temporarily repaired. Both the 2012 and 2013 BP Annual Reports recommended replacement of the liner, with the 2013 BP Annual Report emphasizing that the liner should be replaced soon to avoid environmental concerns. However the 2014 BP Annual Report states that the liner was inspected several times and no breach was reported.

5. Review Comments

By June 18, 2015, comments and recommendations on the 2014 Annual Report were received from Environment and Natural Resources (ENR).

The City responded on July 2, 2015. The reviewer comment summary table (attached) presents the concerns identified through the review of the Annual Report.

6. Conclusion

The Annual Report and BP Annual Report are not for Board approval; however, the Board may wish to follow up with the City based on the information provided in the Annual Report.

7. Recommendation

Board staff has prepared a draft response letter with the following options for the Board's consideration. One or more of these options could be chosen to include in the Board's response letter to address the issues that have been identified:

- The Board could note that the City is approaching the maximum volume of water authorized for withdrawal as defined in condition C.2 of their Water Licence. The Board could encourage the City to contact Board staff to discuss next steps if an increase to the allowable limit is anticipated.
- The Board could note that Section 1b) of the Licence requires the reporting of monthly and annual quantities in cubic metres of each and all Waste discharged to the Waste Disposal Facilities. This may include: Baling facility leachate and sludge, compost leachate, leachate from the sump at Cell A, **and** sludge and wastewater from the Wastewater Treatment Plant. For

clarity, the Board could request that the City report on each of these sources of Waste every year, even if no waste was discharged.

8. Attachments

- [2014 Annual Report](#);
- 2014 Biotreatment Pad Annual Report;
- Comment summary table;
- Draft Board response letter;
- Appendix A – Water Licence conditions pertaining to the Annual Report.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "M Ehrlich". The signature is written in a cursive style with a large initial "M".

Miki Ehrlich
Regulatory Officer

Appendix A

Water Licence Conditions pertaining to the Annual Report

- B.3 The Licensee shall file an annual report with the Board not later than March 31 of the year following the calendar year reported which shall contain the information as set out in Schedule 1, Item 1, included in this Licence.

Schedule 1 – General Conditions

1. The Annual Report referred to in Part B, item 3 shall include, but not necessarily be limited to, the following:
 - a) The monthly and annual quantities in cubic metres of fresh Water obtained from all sources;
 - b) The monthly and annual quantities in cubic metres of each and all Waste discharged to the Waste Disposal Facilities;
 - c) The monthly and annual quantities of Waste removed from the Waste Disposal Facilities;
 - d) A summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures;
 - e) Tabular summaries of all data generated under the Surveillance Network Program;
 - f) A summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;
 - g) A summary of any studies requested by the Board that relate to Waste disposal, Water use or reclamation, and a brief description of any future studies planned;
 - h) A list of unauthorized discharges;
 - i) Comparison of Waste volumes accepted to the remaining storage volume at the Waste Disposal Facilities;
 - j) The monthly and annual quantities of organics received and quantity of compost produced and/or distributed from the compost facility;
 - k) Record of Biotreatment Pad containment pond liner inspections;
 - l) Updates or revisions to the approved Stormwater Management Plan;
 - m) Updates or revisions to the approved Sewage Disposal Facilities Operation and Maintenance Plan;
 - n) Updates or revisions to the approved Spill Contingency Plan;
 - o) Updates or revisions to the approved Solid Waste Disposal Facilities Operation and Maintenance Plan;
 - p) Updates or revisions to the approved Biotreatment Pad Operation and Maintenance Plan;
 - q) Updates or revisions to the approved Hazardous Waste Management Plan;
 - r) Tabular summaries of all data generated from the Stormwater Effluent Monitoring Program;
 - s) At each of the seven sampling locations for stormwater, provide trends of biological and heavy metal data collected in the Stormwater Effluent

- Monitoring Program (short term) and Surveillance Network Program monitoring station (long term);
- t) Comparison of the Surveillance Network Program data to Water Licence regulated limits and sampling and analysis requirements;
 - u) The inclusion of all formal written correspondence between the Inspector and Licensee;
 - v) A summary of efforts to monitor, manage, treat and dispose of sewage sludge at the Sewage Disposal Facilities; and
 - w) Any other details on Water use or Waste disposal requested by the Board by November 1 of the year being reported.

Review Comment Table

Board:	MVLWB
Review Item:	City of Yellowknife - 2014 Annual Water Licence Report and Updates to Plans (MV2009L3-0007)
File(s):	MV2009L3-0007
Proponent:	City of Yellowknife
Document(s):	MV2009L3-0007 - City of Yk - 2014 Annual Report (2 MB) MV2009L3-0007 - City of Yk - 2014 Biotreatment Pad Annual Report (24 MB) MV2009L3-0007 - City of Yk - Compost Operations and Maintenance Plan (Version 2) (1 MB) MV2009L3-0007 - City of Yk - Hazardous Waste Management Plan (Version 4) (1 MB)
Item For Review Distributed On:	May 4 at 11:38 Distribution List
Reviewer Comments Due By:	June 18, 2015
Proponent Responses Due By:	July 2, 2015
Item Description:	<p>The City of Yellowknife has submitted their 2014 Annual Report in accordance with item B.3 of the City's Water Licence. They have also submitted a Biotreatment Pad Annual Report. Although these reports are not for Board approval, your comments are appreciated.</p> <p>The City has also submitted revised versions of the two Plans listed below, for Board approval. For each Plan, there is a change summary provided as an appendix to the Annual Report.</p> <ol style="list-style-type: none"> 1. Compost Operations and Maintenance Plan - The Board requested updates in their December 11, 2014 letter. 2. Hazardous Waste Management Plan - The Board requested updates in their November 20, 2014 letter. <p>Please submit comments on the Plans and the Annual Reports using the Online Review System by June 11, 2015. Please specify which Plan or Report you are commenting on in the Topic section of your entry.</p>

	<p>Please note: to reduce download times, right-click on the file link and choose "Save link as..." to save the file directly to your computer.</p> <p>If you have any questions or comments regarding this review or using the Online Review System, please contact Miki Ehrlich at 867-766-7469 or mehrlich@mvlwb.com.</p>
General Reviewer Information:	<p>In addition to the email distribution list, the following organizations received review materials by fax:</p> <p>Fort Resolution Métis Council - Trudy King - (867)394-3322</p> <p>Hay River Metis Council - Wally Shuman, President - (867)874-4472</p> <p>NWT Metis Nation - Tim Heron, NWTMN IMA Coordinator - (867)872-3586</p>
Contact Information:	<p>Miki Ehrlich 867-766-7469</p> <p>Tyree Mullaney 867-766-7464</p>

Comment Summary

GNWT - Environment and Natural Resources: Central Email GNWT				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
6	General File	Comment (doc) ENR Letter with Comments and Recommendations Recommendation		
1	Topic 1: 2014 Annual Report / Groundwater Monitoring Sampling Stations	Comment Comment(s): Section e 3) of the Annual Report specifies that changes to the City of Yellowknife (City of YK) SNP monitoring program were submitted to the MVLWB on December 2nd, 2014 for two additional [surface] sampling stations. This same section also states that the City of YK will be requesting that several groundwater monitoring wells be added around their Solid Waste Facility, and that	July 2: In the MVLWB's May 21, 2015 letter approving the Solid Waste Facility Interim Landfill Closure and Reclamation Plan, it states that "Proposed changes to the Surveillance Network Program, including station locations, testing frequency, and sampling and analysis requirements for monitoring location included in the Groundwater Monitoring	Satisfactory response.

		<p>the City anticipates that all of these wells locations will be added and tested in 2015.</p> <p>Recommendation Recommendation(s): 1) ENR recommends that the City OF YK specify dates which groundwater monitoring locations will be proposed to the MVLWB, so that sampling of these wells can occur in the 2015 sampling season.</p>	<p>Program, shall be submitted with the revised ICRP by January 28, 2016." The City intends to follow this timeline and submit a detailed Groundwater Monitoring Plan along with the proposed SNP changes, including locations, by this deadline. The City may do some preliminary testing of existing wells during the 2015 season but the formal request will be included as requested by the MVLWB.</p>	
2	<p>Topic 2: Biotreatment Pad 2014 Annual Report / Treated Water Criteria: Treated Effluent Monitoring Standards Differences Comparison Amongst City and KBL</p>	<p>Comment Comment(s): The City of YK and KBL both operate a similar contaminated soil and water treatment facility - where treated effluent is ultimately disposed at an approved disposal site once quality standards have been achieved. ENR has identified differences in water standards associated with treated water disposal between the City of YK and KBL treatment facilities. Effluent discharge criteria for the City are found in Table 3 of Appendix B of the submitted Biotreatment Pad Annual Report, while KBL treated water criteria can be located in Part F.7 of water licence MV2014L1-0005. Differences in water treatment criteria are as follows: Boron: 0.005 mg/L (City) vs 1.5 mg/L (KBL) Selenium: 0.05 mg/L (City) vs 0.001 mg/L (KBL) Uranium: 0.2 mg/L (City) vs 0.02 mg/L (KBL) Zinc: 0.05</p>	<p>July 2: This recommendation was directed to MVLWB, not the City, however, the City would like to note that the contaminated soil and water treatment facility at the Solid Waste Facility is no longer accepting contaminated soil or water and will be closing when the material currently on site has been treated. Therefore, these inconsistencies will no longer exist as the KBL facility will be the only operational facility.</p>	<p>The observations made by ENR are noted.</p>

	<p>mg/L (City) vs 0.03 mg/L (KBL) F1: 0.15 mg/L (City) vs 2.2 mg/L (KBL) F2: 0.14 mg/L (City) vs 1.1 mg/L (KBL) ENR also notes several differences in the parameters that are to be assessed. For example, the City of YK does not assess the presence and concentration of Antimony, Barium, Iron, Manganese and several other parameters that are being assessed by KBL. On the other hand, the City of YK evaluates the presence and concentration of Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Vanadium that are not currently monitored by KBL prior to disposal. Finally, differences of treated effluent discharge criteria were noted between the City of YK "Table 3 - Water Treatment Criteria" from the 2014 Biotreatment Pad Annual Report, and its most recent "Yellowknife Soil and Water Treatment Facility - Operation and Maintenance Plan, March 2014". These differences (in µg/L) are respectively: Aluminum (5 vs 5,000); Boron (5 vs 5,000); Cobalt (1 vs 1,000); Copper (5 vs 5,000); Nickel (1 vs 1,000); Zinc (50 vs 50,000); PHC F1 (150 vs 150,000); PCH F2 (140 vs 140,000); Nitrite (10 vs 10,000); Nitrite and Nitrate (100 vs 100,000) & TSS (25 vs 25,000).</p>		
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		<p>Recommendation</p> <p>Recommendation(s): 1) ENR recommends that MVLWB further evaluate these areas of inconsistency, and where they feel it is appropriate, address them with the operators.</p>		
3	<p>Topic 3: Biotreatment Pad 2014 Annual Report / Monitoring Results Presented in Appendix E</p>	<p>Comment Comment(s): The City of YK Biotreatment Pad Operation and Maintenance Plan states, section 3.1.1 that "Water analyses have to be sent to Biogenie by the sender prior to any reception at the treatment facility. Any representative sample of the contaminated water has to meet the criteria listed in Table VIII." It appears that these lab results for contaminated water accepted at the City for water treatment are not provided within the Biotreatment Pad Annual Reports. A total of 3 tables were provided in Appendix E of 2014 Biotreatment Pad Annual Report, representing water sampling events conducted in 2014 (see p. 64-66 and 73 of 274). Lab data (located on p. 73) were limited to one page, and did not provide include results for metals, nitrite & nitrate, TSS, COD and Oil & grease. A comparison of Appendix 9 data to "Table 3 - Water Treatment Criteria" has revealed exceedences (with conversion from µg/L to mg/L) for aluminum, boron, cadmium and copper (p. 65). It is not clear if these data are pre- or post- treated</p>	<p>July 2: In the next report the City will attempt to be more clear in identifying what the reported data represents.</p>	<p>Satisfactory response.</p>

		<p>water quality results.</p> <p>Recommendation</p> <p>Recommendation(s): 1) ENR recommends all reported data clearly identify if they represent: treated effluent quality results prior to disposal or water analyses received by Biogenie prior to acceptance at the facility.</p>		
4	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that missing results pages (that would normally accompany p. 73) be submitted with the 2015 Biotreatment Pad Annual Report.</p>	<p>July 2: The City will ensure that all lab data is submitted with the 2015 report.</p>	Satisfactory response.
5	None	<p>Comment None</p> <p>Recommendation 3) ENR recommends that monitoring results for treated effluent reflect the parameters included in the “Table 3 - Water Treatment Criteria”.</p>	<p>July 2: 2015 will be the final year that the City submits a Biotreatment Pad Annual Report as the facility is shutting down, however, the City will ensure the treated effluent reflects the parameters in this year's report.</p>	Satisfactory response.

June 18, 2015

Miki Ehrlich
Regulatory Officer
Mackenzie Valley Land and Water MVLWB
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT
X1A 2P6

Dear Ms. Ehrlich,

**Re: City of Yellowknife
Water Licence – MV2009L3-0007
2014 Annual Water Licence Report and Updates to Plans
Request for Comments**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories (GNWT) has reviewed the report and plans at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, the *WRD Act* and the *Wildlife Act* and has the following comments and recommendations for the consideration of the Board.

Topic 1: 2014 Annual Report / Groundwater Monitoring Sampling Stations

Comment(s):

Section e 3) of the Annual Report specifies that changes to the City of Yellowknife (City of YK) SNP monitoring program were submitted to the MVLWB on December 2nd, 2014 for two additional [surface] sampling stations.

This same section also states that the City of YK will be requesting that several groundwater monitoring wells be added around their Solid Waste Facility, and that the City anticipates that all of these wells locations will be added and tested in 2015.

Recommendation(s):

- 1) ENR recommends that the City OF YK specify dates which groundwater monitoring locations will be proposed to the MVLWB, so that sampling of these wells can occur in the 2015 sampling season.

Topic 2: Biotreatment Pad 2014 Annual Report / Treated Water Criteria: Treated Effluent Monitoring Standards Differences Comparison Amongst City and KBL

Comment(s):

The City of YK and KBL both operate a similar contaminated soil and water treatment facility – where treated effluent is ultimately disposed at an approved disposal site once quality standards have been achieved. ENR has identified differences in water standards associated with treated water disposal between the City of YK and KBL treatment facilities. Effluent discharge criteria for the City are found in Table 3 of Appendix B of the submitted Biotreatment Pad Annual Report, while KBL treated water criteria can be located in Part F.7 of water licence MV2014L1-0005. Differences in water treatment criteria are as follows:

Boron: 0.005 mg/L (City) vs 1.5 mg/L (KBL)
Selenium: 0.05 mg/L (City) vs 0.001 mg/L (KBL)
Uranium: 0.2 mg/L (City) vs 0.02 mg/L (KBL)
Zinc: 0.05 mg/L (City) vs 0.03 mg/L (KBL)
F1: 0.15 mg/L (City) vs 2.2 mg/L (KBL)
F2: 0.14 mg/L (City) vs 1.1 mg/L (KBL)

ENR also notes several differences in the parameters that are to be assessed. For example, the City of YK does not assess the presence and concentration of Antimony, Barium, Iron, Manganese and several other parameters that are being assessed by KBL. On the other hand, the City of YK evaluates the presence and concentration of Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Vanadium that are not currently monitored by KBL prior to disposal.

Finally, differences of treated effluent discharge criteria were noted between the City of YK “Table 3 – Water Treatment Criteria” from the 2014 Biotreatment Pad Annual Report, and its most recent “Yellowknife Soil and Water Treatment Facility – Operation and Maintenance Plan, March 2014”. These differences (in µg/L) are respectively: Aluminum (5 vs 5,000); Boron (5 vs 5,000); Cobalt (1 vs 1,000); Copper (5 vs 5,000); Nickel (1 vs 1,000); Zinc (50 vs 50,000); PHC F1 (150 vs 150,000); PCH F2 (140 vs 140,000); Nitrite (10 vs 10,000); Nitrite and Nitrate (100 vs 100,000) & TSS (25 vs 25,000).

Recommendation(s):

- 1) ENR recommends that MVLWB further evaluate these areas of inconsistency, and where they feel it is appropriate, address them with the operators.

Topic 3: Biotreatment Pad 2014 Annual Report / Monitoring Results Presented in Appendix E

Comment(s):

The City of YK Biotreatment Pad Operation and Maintenance Plan states, section 3.1.1 that “Water analyses have to be sent to Biogenie by the sender prior to any reception at the treatment facility. Any representative sample of the contaminated water has to meet the criteria listed in Table VIII.” It appears that these lab results for contaminated water accepted at the City for water treatment are not provided within the Biotreatment Pad Annual Reports.

A total of 3 tables were provided in Appendix E of 2014 Biotreatment Pad Annual Report, representing water sampling events conducted in 2014 (see p. 64-66 and 73 of 274). Lab data (located on p. 73) were limited to one page, and did not provide include results for metals, nitrite & nitrate, TSS, COD and Oil & grease.

A comparison of Appendix 9 data to “Table 3 - Water Treatment Criteria” has revealed exceedences (with conversion from µg/L to mg/L) for aluminum, boron, cadmium and copper (p. 65). It is not clear if these data are pre- or post- treated water quality results.

Recommendation(s):

- 1) ENR recommends all reported data clearly identify if they represent: treated effluent quality results prior to disposal or water analyses received by Biogenie prior to acceptance at the facility.
- 2) ENR recommends that missing results pages (that would normally accompany p. 73) be submitted with the 2015 Biotreatment Pad Annual Report.
- 3) ENR recommends that monitoring results for treated effluent reflect the parameters included in the “Table 3 - Water Treatment Criteria”.

Comments and recommendations were provided by ENR technical experts in the Water Resources Division and the North Slave Region, and were coordinated and collated by the Environmental Impact Assessment, Conservation, Assessment and Monitoring Section (CAM).

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at 920-6118 or patrick_clancy@gov.nt.ca.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Clancy', written in a cursive style.

Patrick Clancy
Environmental Regulatory Analyst
Environmental Impact Assessment Section
Conservation, Assessment and Monitoring Division
Department of Environment and Natural Resources
Government of the Northwest Territories