



**Mackenzie Valley Land and Water Board**  
**7th Floor - 4922 48th Street**  
**P.O. Box 2130**  
**YELLOWKNIFE NT X1A 2P6**  
**Phone (867) 669-0506**  
**FAX (867) 873-6610**

**Staff Report**

<b>Applicant:</b> City of Yellowknife	
<b>Location:</b> Yellowknife, NT	<b>File Number:</b> MV2009L3-0007
<b>Date Prepared:</b> January 28, 2019	<b>Date of Board Meeting:</b> February 7, 2019
<b>Subject:</b> Stormwater Management Plan Version 4 and Stormwater Trend Analysis Proposal	

**1. Purpose**

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) the Stormwater Management Plan Version 4 (SWMP V4) and the Stormwater Trend Analysis Proposal (SWTA Proposal) submitted by the City of Yellowknife (City). The SWTA Proposal outlines how the City intends to move forward with the Stormwater Management Plan and Stormwater Trend Analysis (SWTA), which are required by Part D, condition 10 of municipal Licence MV2009L3-0007 (Licence) and Board direction provided in the May 15, 2013 letter to the City, respectively.

**2. Background**

- May 31, 2010 – Issuance of Licence MV2009L3-0007;
- March 31, 2017 – Stormwater Management Plan Version 4 received;
- May 30, 2017 – Review commenced;
- June 27, 2017 – Reviewer comments and recommendations due and received;
- July 18, 2017 – Responses due;
- July 21, 2017 – Responses received;
- April 13, 2018 – Board staff suspend review process pending submission of additional information;
- October 26, 2018 – City submits Stormwater Trend Analysis Proposal;
- November 1, 2018 – Review commenced;
- December 11, 2018 – Meeting of Parties held to discuss SWTA Proposal and review;
- December 20, 2018 – Reviewer comments and recommendations due and received;
- January 8, 2019 – Responses received;
- January 31, 2019 – Responses due;
- **February 7, 2019 – Stormwater Management Plan Version 4 and Stormwater Trend Analysis Proposal presented to the Board;** and
- May 30, 2022 – Expiration of Licence MV2009L3-0007.

**3. Discussion**

Submission History and Licence Requirements

Previous versions of the SWMP have been submitted, reviewed, revised and approved by the Board, dating back to August of 2011, and in accordance with Part D, condition 10 and Schedule 2, condition 1 of the Licence (see Appendix A). Following public review of SWMP Version 2.1 and a meeting of Parties on February 27, 2013

(summary notes attached), the Board wrote to the City on May 15, 2013 (attached), approving the SWMP V2.1 and requiring the City to submit a three-year trend analysis of data collected under the revised Stormwater Monitoring Plan, for Board approval, by March 31, 2016.

On September 8, 2016, the Board granted the City an extension to the submission deadline for the Stormwater Trend Analysis, from March 31, 2016 to April 30, 2017 (attached).

The City submitted Version 4 of their Stormwater Management Plan (SWMP) on March 31, 2017. At that time, Board staff distributed the SWMP V4 for public review; once comments and responses were submitted, Board staff suspended the review process, with the reasoning that a better understanding of the quality of stormwater and its potential impacts on the receiving environment was required, and that the Stormwater Trend Analysis (SWTA) should be completed before all the questions about the SWMP posed during the review can be answered.

At that point, the City committed to submitting a proposal, for public review, outlining how they intend to move forward on the SWTA. On May 8, 2018, City staff invited the Inspector and Board staff to accompany City staff on a tour of stormwater sampling locations. During this tour, sampling locations and timing were discussed, and best practices clarified with City staff.

On October 26, 2018, the City submitted the Stormwater Trend Analysis Proposal, which was posted for public review. During the review period, Board staff organized a meeting of interested parties to discuss the City's SWTA Proposal, along with several other items related to their Licence (summary notes attached). At the meeting, the SWTA Proposal was discussed and the City answered questions related to it. As shown by the Review Summary and Attachments for this review (attached), reviewers largely agreed with the City's planned approach for meeting these Licence requirements.

#### Description of Stormwater Trend Analysis Proposal

The City's SWTA Proposal outlines the Board's requirements for this submission (see Appendix A), and states that recent years of dry weather have hampered the City's sampling program, and therefore their ability to conduct a trend analysis. The City proposed changes to the most recently-approved SWMP, including better-timed sampling events (i.e. during/following rain events) and identification of exact sampling locations (GPS locations were recorded during the site tour with the Inspector and Board staff in May 2018). The City states in the SWTA Proposal that before a trend analysis can be performed, additional information on the stormwater collection system and sampling program is required. The City proposes to hire a consultant to do an in-depth examination of the City's stormwater infrastructure and sampling program in 2019, with a report being finalized before the end of 2019. The City then would look at implementing changes to the SWMP beginning in 2020, and then be in a position to perform the SWTA. The City acknowledges that this submission does not directly address the SWTA required by the Board, but says the proposed approach will optimize the SWMP and put it in a better position to complete the SWTA.

#### **4. Comments**

Board staff have combined the reviews of the SWMP V4 and the SWMP Proposal into one Board package, as the two submissions are interrelated.

Board staff suggest that given the City's proposed approach to meet the Licence requirements, the Board defer their decision on the SWMP V4, pending submission of the next version of the SWMP (Version 5) in 2020. Board staff are of the opinion that the Board could request the City to provide the report of their consultant on the in-depth examination of the City's stormwater infrastructure and sampling program, once finalized before the end of 2019.

## 5. Public Review

### Stormwater Management Plan Version 4

By June 27, 2017, comments and recommendations on the SWMP V4 were received from four reviewers:

- Environment and Climate Change Canada (ECCC; No Comment);
- Lois Little (General Public);
- The Government of the Northwest Territories Department of Environment and Natural Resources (GNWT-ENR); and
- Board staff.

The City responded on July 21, 2017, after the July 18, 2017 deadline. The SWMP V4 Review Summary and Attachments (attached) presents the concerns identified through this review.

### Main Issues Raised during the Review of the SWMP V4

The following summarizes the main issues raised during the review:

- Back Bay water quality;
- Provision of the three-year Stormwater Trend Analysis; and
- Plan details, including use of guidelines, results reporting and information included.

#### Back Bay water quality

Lois Little (General public, Comment ID 1) raised the need for “regular and fulsome testing of water quality” in Back Bay, and an endorsement of testing for metals and results reporting to residents as part of the management plan. The City responded that the Back Bay Community Association should contact the City to discuss their request. Board staff note that the City has proposed improvements to their stormwater sampling program in the Stormwater Trend Analysis Proposal, and that total metals (including Arsenic, Cadmium, Aluminum and Chromium) are to be sampled three times per year at the Back Bay location. *E coli* is not listed as a parameter to be sampled in stormwater; Board Staff note that sewage management practices are included in the Sewage Disposal Facilities O&M Plan and regulated to meet Effluent Quality Criteria in the Water Licence.

Board staff further note that the improved data collection proposed by the City will help to illustrate any trends or concerns with water quality in Back Bay.

#### Stormwater Trend Analysis

GNWT-ENR (Comment ID 1, 2) recommended that the City provide the SWTA “in order to assess any associated risks to the environment from uncontrolled releases of stormwater to local waters”, and include stormwater quality studies from other municipalities for comparison. The City responded that the Stormwater Trend Analysis Report should include the requested information; Board staff note that the City has proposed to improve data collection under the Stormwater Management Plan, and then will be in a better position to conduct the required Stormwater Trend Analysis.

#### Plan details

Board staff raised questions about the City’s use of guidelines, reporting of results, and the information included in the SWMP (Comment ID Board staff 1, 2, 3). The City clarified their use of Guidelines and referred to results being reported in Annual Reports; the City could be reminded to include these details in the next version of the Stormwater Management Plan. The City also stated that they continue to review stormwater treatment options and may put this section back in future versions of the SWMP. Board staff note that stormwater treatment options may be discussed in detail following the completion of the Stormwater Trend Analysis.

## Stormwater Trend Analysis Proposal

By December 20, 2018, comments and recommendations on the SWTA Proposal were received from three reviewers:

- Environment and Climate Change Canada (ECCC; No Comment);
- The Government of the Northwest Territories Department of Environment and Natural Resources (GNWT-ENR); and
- Indigenous and Northern Affairs Canada (INAC).

The City responded on January 8, 2019, ahead of the January 31, 2019 deadline. The SWTA Proposal Review Summary and Attachments (attached) presents the concerns identified through this review.

## Main Issues Raised during the Review of the SWTA Proposal

The following summarizes the main issues raised during the review:

- Strategies to improve sampling; and
- Consider data from the current trend analysis in planning for improvements;

### Strategies to improve sampling

Reviewers had recommendations for how the City could improve their stormwater sampling success, including the use of community volunteers (Comment ID GNWT-ENR 1), and changing approaches for determining sampling timing (Comment ID INAC 1). The City responded that they will consider the use of volunteers to assist in the stormwater sampling process, and as part of the SWTA Proposal, the City plans to hire a consultant to "Examine the City's existing sampling procedures, frequency and measured parameters, and recommend any changes to increase the effectiveness of the sampling program, if any".

### Consider data from the current trend analysis

GNWT-ENR (Comment ID 2) encouraged the City to consider "past findings as a part of their current stormwater program improvements planning - via possible engagements with Government and Academia for research partnership and funding opportunities to investigate causes and potential mitigation options." The City stated that they plan to consider data from the current trend analysis as part of the stormwater program improvements planning, and is happy to consider any research partnerships should they be available.

## **6. Security**

Not applicable.

## **7. Conclusion**

Board staff conclude that further information was provided by the City in their responses to reviewer comments for the public review of the STMP V4, and in the submission and public review of the Stormwater Trend Analysis Proposal. Board staff conclude that the Stormwater Trend Analysis Proposal, as submitted, will facilitate the robust collection and analysis of stormwater data by the City of Yellowknife, and facilitate the City's completion of a revised Stormwater Management Plan (Version 5). Board staff are of the opinion that the Board could defer a decision on the SWMP V4, until the City submits SWMP V5.

Board staff conclude there are no outstanding issues or concerns with the Stormwater Trend Analysis Proposal, and that the City could be reminded to include details around guideline comparisons in the next version of the Stormwater Management Plan.

## 8. Recommendation

Board staff recommend the Board **make a motion to defer their decision on the Stormwater Management Plan Version 4**, as required by Part D, condition 10 of Licence MV2009L3-0007, until the City submits the Stormwater Management Plan Version 5.

Board staff recommend the Board acknowledge the submission of the Stormwater Trend Analysis Proposal, which outlines how the City intends to move forward with the Stormwater Management Plan (SWMP) and Stormwater Trend Analysis (SWTA), and will facilitate the robust collection and analysis of stormwater data by the City of Yellowknife, as well as facilitate the City's completion of a revised Stormwater Management Plan (Version 5).

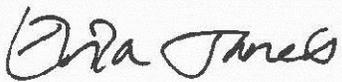
A draft letter is attached. Board staff recommend including the following text in the decision letter:

- The Board reminds the City to include details around guideline comparisons in the next version of the Stormwater Management Plan (Version 5).
- The Board notes and appreciates the City's diligence in addressing outstanding Licence compliance requirements.
- The City shall adhere to the commitments made in their responses to reviewer comments dated July 21, 2017 and January 8, 2019.

## 9. Attachments

- [Stormwater Trend Analysis Proposal](#)
- [Stormwater Management Plan Version 4](#)
- Stormwater Management Plan Version 4 Review Summary and Attachments
- Stormwater Trend Analysis Proposal Review Summary and Attachments
- [May 15, 2013 Board letter to City requiring Stormwater Trend Analysis](#)
- [February 27, 2013 Summary Notes from Stormwater Management Plan Meeting](#)
- [September 8, 2016 Board letter approving extension to Stormwater Trend Analysis submission deadline](#)
- [December 11, 2018 Summary Notes from Meeting of Parties](#)
- Draft Letter from the Board

Respectfully submitted,



Erica Janes  
Regulatory Specialist



Heather Scott  
Technical Advisor

## **Appendix A: Licence and Regulatory Requirements**

Part D, condition 10 of Licence MV2009L3-0007:

*The Licensee shall, within 15 months of the issuance of this licence, submit to the Board for approval a stormwater management plan which shall contain the information as set in Schedule 2, item 1, included in this Licence.*

Schedule 2, condition 1 of Licence MV2009L3-0007:

*The Stormwater Management Plan, referred to in Part D, item 13, shall include, but not be limited to, the following:*

- a) Best management practices in order to address any potential issues reflected through the Stormwater Effluent Monitoring Program;*
- b) Commitment to long-term monitoring through the addition of strategic sampling locations within the Surveillance Network Program;*
- c) The continuation of monitoring for hydrocarbons as performed during the 2009 sampling program;*
- d) Commitment to analyze and report on best management practices for stormwater management which the Licensee intends to adopt along with any expansion to the Yellowknife stormwater system;*
- e) General discussion regarding back-up power to all lift stations and their implementation; and*
- f) Discussion on snow disposal outlining areas currently used or to be used for snow disposal, and the methods for managing drainage Water from the snow disposal area(s).*

Stormwater Trend Analysis Requirements from May 15, 2013 Board letter to City:

*Submit a trend analysis report by March 31, 2016 after three years of data collection under the revised monitoring program*

*The trend analysis report is to be submitted for Board approval by March 31, 2016. As agreed upon at the February 27, 2013 meeting, the trend analysis must include:*

- An in depth look at trends since sampling began in 2009, which involves analysing the data in terms of effect to the watercourses;*
- Estimates of potential impacts to the watercourses, with an emphasis on effects to fish bearing watercourses;*
- Any research and reports on background data; and*
- If necessary, what treatments are being researched.*

## Review Comment Table

<b>Board:</b>	MVLWB
<b>Review Item:</b>	City of Yellowknife - Stormwater Trend Analysis Proposal (MV2009L3-0007)
<b>File(s):</b>	<a href="#">MV2009L3-0007</a>
<b>Proponent:</b>	City of Yellowknife
<b>Document(s):</b>	<a href="#">MV2009L3-0007 - City of YK - Stormwater Trend Analysis Proposal - Oct26-18</a> (170.4 KB) <a href="#">MV2009L3-0005 - City of YK - STORMWATER MANAGEMENT PLAN V4 - MARCH 2017 - Mar31-17</a> (6.4 MB) <a href="#">MV2009L3-0007 - City of YK - SWMP Approved (Version 2-1) - May15-13</a> (439.4 KB)
<b>Item For Review Distributed On:</b>	Nov 1 at 11:47 <a href="#">Distribution List</a>
<b>Reviewer Comments Due By:</b>	Dec 20, 2018
<b>Proponent Responses Due By:</b>	Jan 31, 2019
<b>Item Description:</b>	<p>The City of Yellowknife has submitted a proposal outlining how they intend to move forward with the Stormwater Management Plan (SWMP) and Stormwater Trend Analysis (SWTA). These items are required by Part D, condition 10 of municipal licence MV2009L3-0007 and Board direction provided in the May 15, 2013 letter to the City, respectively.</p> <p>The City previously submitted the SWMP Version 4 on March 31, 2017. At that time, Board staff distributed the SWMP for public review; once comments and responses were submitted, Board staff temporarily suspended the review process, with the reasoning that a better understanding of the quality of stormwater and its potential impacts on the receiving environment is required, and that the SWTA should be completed before all the questions about the SWMP posed during the review can be answered.</p> <p>At that point, the City committed to submitting a proposal, for public review, outlining how they intend to move forward on the SWTA. On October 26, 2018, the City submitted the Stormwater Trend Analysis Proposal. This submission constitutes the additional information expected from the City that is referred to in the April 31, 2018 Update posted to the Stormwater Management Plan Version 4 review page.</p> <p>Board staff intend to organize a meeting of interested parties during the review period for this proposal; the outcomes of this meeting will then be taken to the Board as an information item.</p> <p>Reviewers are invited to submit questions, comments and recommendations on the Stormwater Trend Analysis Proposal by <b>December 20, 2018</b>.</p> <p>If you have questions or comments regarding this review or the Online Review System, please contact Erica Janes at (867)766-7466 or <a href="mailto:ejanes@mvlwb.com">ejanes@mvlwb.com</a>.</p>

<b>General Reviewer Information:</b>	In addition to the email distribution list, the following organizations received review materials by fax: <ul style="list-style-type: none"> <li>NWT Metis Nation: Tim Heron, NWTMN IMA Coordinator: (867)872-3586</li> </ul>
<b>Contact Information:</b>	Erica Janes 867-766-7466 Heather Scott 867-766-7463 Jen Potten 867-766-7468

### Comment Summary

Environment and Climate Change Canada: Bradley Summerfield				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	ECCC no comments	<b>Comment</b> ECCC has reviewed in accordance with our mandate and has no comments at this time <b>Recommendation</b> N/A	--	Noted.
GNWT - ENR: Central Email GNWT				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
3	General File	<b>Comment</b> ( <a href="#">doc</a> ) ENR Letter with Comments and Recommendations <b>Recommendation</b>	--	Noted.
1	Topic 1: Cooperation Support Initiatives	<b>Comment</b> As specified in the current proposal and at the December 11th meeting between the City, the MVLWB, ENR and ECCC, revisions will be made to the current Stormwater Management Program (SWMP) towards improving the program's quality and consistency such as ensuring that monitoring is occurring at the same stormwater outlet locations each time (and not in the receiving environment), that sampling activities will be conducted by the same professional staff, etc. Dry conditions were identified as an important factor that prevented sample collections in some locations/years	<b>Jan 8:</b> The City will consider the use of volunteers to assist in the stormwater sampling process.	Noted.

		<p>(further info on results availability per stormwater outlet in additional comment below). To aid and inform the City of specific times that sufficient water may be present to allow sampling during overall dryer seasons, the City may consider involving nearby citizens as volunteers to assist in more successful sampling events in the future.</p> <p><b>Recommendation 1)</b> ENR recommends that the City consider the involvement of volunteers in proximity to stormwater outlets to provide additional information on presence of flow to achieve higher sampling success.</p>		
2	<p>Topic 2: Preliminary Trends in Annual Reports from 2011 to 2017</p>	<p><b>Comment</b> Stormwater data has been collected at various stormwater outlet locations around the City of Yellowknife since 2009. As such, 9 years of monitoring results are currently available to inform stormwater quality trend analysis for most stormwater monitoring locations with the exception of the Deh Cho outlet [8 years of data available] and the Grace Lake outlet [2 years of data available]. The total amount of sampling data available for each location may therefore vary, based on: 1) Different sampling regimes occurring at each station (see Table 1 of current Proposal); 2) Sampling frequency modifications in 2013 (for Deh Cho and Kam Lake outlets); and 3) Missing data on certain years at 3 outlets [Back Bay (2015, 2016 &amp; 2017), Niven Lake (2014, 2016 &amp; 2017) and Kam Lake</p>	<p><b>Jan 8:</b> The City plans to consider data from the current trend analysis as part of the stormwater program improvements planning. The City is happy to consider any research partnerships should they be available.</p>	<p>Noted.</p>

	<p>(2014)]. This translated in the following number of available lab reports: . 21 at Jan Stirling &amp; School Draw . 16 at Deh Cho Bld . 14 at Back Bay &amp; Range Lake . 13 at Frame Lake &amp; Range Lake . 10 at Niven Lake . 2 at Grace Lake While efforts will be invested to further improve the SWMP consistency/adequacy, preliminary "Stormwater Effluent Trends" provided in Annual Reports from 2011 to 2017 indicated elevated results for the same heavy metals every year (mostly aluminum, arsenic, copper, iron &amp; zinc), and at most stormwater monitoring stations. ENR encourages the City to consider these past findings as a part of their current stormwater program improvements planning - via possible engagements with Government and Academia for research partnership and funding opportunities to investigate causes and potential mitigation options. The intent of such research initiatives is to provide clarity and improve understanding on background influences and/or potential risks to the receiving environment - from anthropogenic and natural contributions to water quality of local water bodies.</p> <p><b>Recommendation 1)</b> ENR recommends that the City consider data from current trend analysis in stormwater (i.e. elevated heavy metals) as a part of their current stormwater program improvements planning - via possible engagements with Government and Academia</p>		
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		for research partnership and funding opportunities.		
<b>INAC - Yellowknife: Dinah Elliott</b>				
<b>ID</b>	<b>Topic</b>	<b>Reviewer Comment/Recommendation</b>	<b>Proponent Response</b>	<b>Board Staff Analysis</b>
1	Sampling	<p><b>Comment</b> The City of Yellowknife has experienced some difficulty in collecting samples over time due to dry conditions, resulting in a small dataset.</p> <p><b>Recommendation</b> CIRNAC recommends changing approaches for determining sampling time to increase the likelihood of being able to collect samples.</p>	<p><b>Jan 8:</b> Noted. Part of the City's proposal is for the consultant to "Examine the City's existing sampling procedures, frequency and measured parameters, and recommend any changes to increase the effectiveness of the sampling program, if any;"</p>	Acceptable response.

## Review Comment Table

<b>Board:</b>	MVLWB
<b>Review Item:</b>	City of Yellowknife - Stormwater Management Plan, Version 4 (MV2009L3-0007)
<b>File(s):</b>	<a href="#">MV2009L3-0007</a>
<b>Proponent:</b>	City of Yellowknife
<b>Document(s):</b>	<a href="#">MV2009L3-0005 - City of YK - STORMWATER MANAGEMENT PLAN V4 - MARCH 2017 - Mar31-17</a> (6.4MB)
<b>Item For Review Distributed On:</b>	May 30 at 11:12 <a href="#">Distribution List</a>
<b>Reviewer Comments Due By:</b>	June 27, 2017
<b>Proponent Responses Due By:</b>	July 18, 2017
<b>Item Description:</b>	<p>The City of Yellowknife has submitted a revised Stormwater Management Plan (Version 4), in accordance with Part D, item 10 and Schedule 2, item 1 of their municipal Water Licence MV2009L3-0007. This Plan is for Board approval.</p> <p>Reviewers are invited to submit questions, comments and recommendations on the Stormwater Management Plan (Version 4) by <b>June 27, 2017</b>.</p> <p>If you have questions or comments regarding this review or the Online Review System, please contact Erica Janes at (867)766-7466 or <a href="mailto:ejanes@mvlwb.com">ejanes@mvlwb.com</a>.</p>
<b>General Reviewer Information:</b>	<p>In addition to the email distribution list, the following organizations received review materials by fax:</p> <ul style="list-style-type: none"> <li>• Fort Resolution Métis Council - Trudy King (867)394-3322;</li> <li>• Hay River Metis Council - Trevor Beck, President (867)874-4472; and</li> <li>• Northwest Territory Metis Nation - Tim Heron, NWTMN IMA Coordinator (867)872-3586.</li> </ul>
<b>Contact Information:</b>	<p>Erica Janes 867-766-7466  Heather Scott 867-766-7463  Jen Potten 867-766-7468</p>

## Comment Summary

Environment and Climate Change Canada: Gabriel Bernard-Lacaille				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	General	<p><b>Comment</b> ECCC has reviewed in accordance with its mandate and doesn't have any comments at this time.</p> <p><b>Recommendation</b> Not applicable.</p>	--	Noted.
General Public: Lois Little				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	Lois Little, Yellowknife	<p><b>Comment</b> As a resident of Peace River Flats on Back Bay, our neighbourhood has long been concerned about water quality both within the natural preservation area (aka wetlands) along the south shore of Back Bay as well as the water quality of the Bay itself. Being located downhill from most of the City, the storm sewers together with all the surface run-off are the reasons for these concerns along with of course, leaching and run-off from Giant Mine and Baker Creek.</p> <p><b>Recommendation</b> Due to the high level of human use of Back Bay for recreation purposes, the Back Bay Community Association has, as resources have been available, undertaken testing for e-coli and arsenic in the Bay. We have not had the resources to do regular testing nor to test for such elements as cadmium, aluminum or chromium. I believe that regular and fulsome testing of water quality is required and would endorse this level of testing</p>	<p><b>July 21:</b> The Back Bay Community Association should contact the City to discuss their request.</p>	<p>Board staff note that the City has proposed improvements to their stormwater sampling program in the Stormwater Trend Analysis Proposal, and that total metals (including Arsenic, Cadmium, Aluminum and Chromium) are to be sampled three times per year at the Back Bay location. E Coli is not listed as a parameter to be sampled in stormwater; Board Staff note that sewage management practices are included in the Sewage Disposal Facilities O&amp;M Plan and regulated to meet Effluent Quality Criteria in the Water Licence.</p>

		and reporting of the results to residents as part of the management plan.		Board staff further note the that improved data collection proposed by the City will help to illustrate any trends or concerns with water quality in Back Bay.
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**GNWT - ENR: Central Email GNWT**

<b>ID</b>	<b>Topic</b>	<b>Reviewer Comment/Recommendation</b>	<b>Proponent Response</b>	<b>Board Staff Analysis</b>
3	General File	<b>Comment</b> ( <a href="#">doc</a> ) ENR Letter with Comments and Recommendations <b>Recommendation</b>	--	Noted.
1	Topic 1: Risks to Local Water from Uncontrolled Stormwater Releases	<b>Comment</b> Since the first version of their Stormwater Management Plan (SWMP) in 2009, the City of Yellowknife (the City) has been collecting data at various locations at stormwater outlets around the city. A 2013 Staff Report regarding the SWMP requested the City to provide a more in depth look and establish trends by submitting a 3 years analysis of stormwater data. It was specified in 2011-2016 Annual Reports that above guidelines (CCME Protection of Aquatic Life) levels for aluminum, arsenic, copper, iron and zinc were consistently collected during these years, and were interpreted to be due to the rich mineral environment in the Yellowknife area. Upon review of the 2016 Annual Report sampling results which were provided in Appendix E, elevated levels were noted for Total Phosphorus (TP) at nearly all locations and during each sampling period. As elevated levels of metals and	<b>July 21:</b> The Stormwater Trend Analysis Report should contain the requested information.	Board staff note that the City has proposed to improve data collection under the Stormwater Management Plan, and then will be in a better position to conduct the required Stormwater Trend Analysis.

		<p>TP have been consistently monitored, the next step is to assess potential impacts of these stormwater flows on the receiving waters (or catchment areas). ENR notes that the MVLWB has required a trend analysis be done for the stormwater data. Specifically, the 2013 MVLWB Staff Report described that the Trend Analysis include: 1) A more in depth look at trends since sampling began in 2009, which involves analyzing the data in terms of effect to the watercourses; 2) Estimates of potential impacts to the watercourses [or Catchment Areas], with an emphasis on effects to fish bearing watercourses; 3) Any research and reports on background data, and 4) If necessary, treatment options or methods being researched ENR further notes that the 2016 Annual Report makes reference (in Section x), to a "Stormwater Trend Analysis Report" which is to be submitted in April 2017.</p> <p><b>Recommendation 1)</b> ENR recommends for City include and provide the information outlined above in order to assess any associated risks to the environment from uncontrolled releases of stormwater to local waters.</p>		
2	None	<p><b>Comment</b> None</p> <p><b>Recommendation 2)</b> ENR recommends the City include any comparisons with stormwater quality studies from other municipalities as they may be useful to identify similarities and may provide information on how other</p>	<p><b>July 21:</b> The City will take this into consideration for future revisions to the SWMP.</p>	Acceptable response.

		Canadian cities manage stormwater prior to its release to local waters.		
<b>MVLWB: Heather Scott</b>				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	Section 10.1: Stormwater Quality	<p><b>Comment</b> Section 10.1 indicates that "There are two sets of guidelines the City uses to compare the results of the stormwater monitoring program against. These are the Canadian Water Quality Guidelines for Recreational Use and the Canadian Water Quality Guidelines for the Protection of Aquatic Life." In the previous version (Version 3) of the Stormwater Management Plan (SMP), the City included the following statement: "The results of the sampling program have thus far demonstrated that the City's stormwater is in compliance with the guidelines for fecal coliforms, pH, and hydrocarbons. Stormwater samples have shown concentrations for E.coli, aluminum, arsenic, cadmium, copper, iron lead, silver, and zinc that are higher than the guidelines for the protection of aquatic life. The results also show very low values for Total Suspended Solids (TSS). Items shown in yellow in Appendix H are above the guidelines." In Version 4, that statement was removed.</p> <p><b>Recommendation</b> How does Version 4 of the SMP apply the two sets of guidelines that are referenced? Are they both applied to all results or are certain guidelines applied to certain locations/parameters?</p>	<p><b>July 21:</b> E. Coli, Fecal Coliforms and pH are from Canadian Water Quality Guidelines for Recreational Use. All other values are from Canadian Water Quality Guidelines for the Protection of Aquatic Life. Both Guidelines are only used for the specific parameters just mentioned. The sampling results are compared to each guideline as results are received. As the SWMP is a Plan, not a report, results are no longer included in the plan, but reported in the Annual Report. To see how they have compared since Version 3 of the SMP please refer to the Annual Report.</p>	<p>Noted. The City could be reminded to include these details in the next version of the Stormwater Management Plan.</p>

		How are sampling results compared to each of the guidelines? How have they compared since Version 3 of the SMP?		
2	None	<b>Comment</b> None <b>Recommendation</b> Why were the results summary and detailed results from Version 3 deleted from Version 4?	<b>July 21:</b> The results summary and detailed results were removed as this Plan is not the appropriate location to report on results. They are reported on in the Annual Report.	Acceptable response.
3	Stormwater Treatment Information	<b>Comment</b> Version 3 of the SMP included "Stormwater Treatment Information". <b>Recommendation</b> Why was this information included in Version 3? Why was this information deleted from Version 4?	<b>July 21:</b> The City had included "Stormwater Treatment Information" in previous versions of the SWMP as potential options that could be used in Yellowknife. Since Version 3 of the SWMP, the City has further investigated the treatment options in the SWMP and determined that they are not feasible for this area. The City continues to review stormwater treatment options and may put this section back in future versions of the SWMP.	Noted. Board staff also note that stormwater treatment options may be discussed in detail following the completion of the Stormwater Trend Analysis.



December 13, 2018

Erica Janes  
Regulatory Officer  
Mackenzie Valley Land and Water Board  
7<sup>th</sup> Floor – 4910 50<sup>th</sup> Avenue  
P.O. Box 2130  
Yellowknife, NT  
X1A 2P6

Dear Ms. Janes,

**Re: City of Yellowknife (the City)  
Water Licence – MV2009L3-0007  
Stormwater Trend Analysis Proposal  
Request for Comment**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the proposal at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, the *Species at Risk (NWT) Act*, the *Waters Act* and the *Wildlife Act* and provides the following comments and recommendations for the consideration of the Board.

### **Topic 1: Cooperation Support Initiatives**

#### **Comment(s):**

As specified in the current proposal and at the December 11<sup>th</sup> meeting between the City, the MVLWB, ENR and ECCC, revisions will be made to the current Stormwater Management Program (SWMP) towards improving the program's quality and consistency such as ensuring that monitoring is occurring at the same stormwater outlet locations each time (and not in the receiving environment), that sampling activities will be conducted by the same professional staff, etc.

Dry conditions were identified as an important factor that prevented sample collections in some locations/years (further info on results availability per

stormwater outlet in additional comment below). To aid and inform the City of specific times that sufficient water may be present to allow sampling during overall dryer seasons, the City may consider involving nearby citizens as volunteers to assist in more successful sampling events in the future.

**Recommendation(s):**

- 1) ENR recommends that the City consider the involvement of volunteers in proximity to stormwater outlets to provide additional information on presence of flow to achieve higher sampling success.

**Topic 2: Preliminary Trends in Annual Reports from 2011 to 2017**

**Comment(s):**

Stormwater data has been collected at various stormwater outlet locations around the City of Yellowknife since 2009. As such, 9 years of monitoring results are currently available to inform stormwater quality trend analysis for most stormwater monitoring locations with the exception of the Deh Cho outlet [8 years of data available] and the Grace Lake outlet [2 years of data available].

The total amount of sampling data available for each location may therefore vary, based on:

- 1) Different sampling regimes occurring at each station (see Table 1 of current Proposal);
- 2) Sampling frequency modifications in 2013 (for Deh Cho and Kam Lake outlets); and
- 3) Missing data on certain years at 3 outlets [Back Bay (2015, 2016 & 2017), Niven Lake (2014, 2016 & 2017) and Kam Lake (2014)]. This translated in the following number of available lab reports:

- 21 at Jan Stirling & School Draw
- 16 at Deh Cho Bld
- 14 at Back Bay & Range Lake
- 13 at Frame Lake & Range Lake
- 10 at Niven Lake
- 2 at Grace Lake

While efforts will be invested to further improve the SWMP consistency/adequacy, preliminary “Stormwater Effluent Trends” provided in Annual Reports from 2011 to 2017 indicated elevated results for the same heavy metals every year (mostly aluminum, arsenic, copper, iron & zinc), and at most stormwater monitoring stations. ENR encourages the City to consider these past findings as a part of their

current stormwater program improvements planning - via possible engagements with Government and Academia for research partnership and funding opportunities to investigate causes and potential mitigation options. The intent of such research initiatives is to provide clarity and improve understanding on background influences and/or potential risks to the receiving environment - from anthropogenic and natural contributions to water quality of local water bodies.

**Recommendation(s):**

- 1) ENR recommends that the City consider data from current trend analysis in stormwater (i.e. elevated heavy metals) as a part of their current stormwater program improvements planning - via possible engagements with Government and Academia for research partnership and funding opportunities.

Comments and recommendations were provided by ENR technical experts in the Water Management and Monitoring Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Environmental Stewardship and Climate Change Division.

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email [patrick.clancy@gov.nt.ca](mailto:patrick.clancy@gov.nt.ca).

Sincerely,



Patrick Clancy  
Environmental Regulatory Analyst  
Environmental Assessment and Monitoring Section  
Environmental Stewardship and Climate Change Division  
Department of Environment and Natural Resources  
Government of the Northwest Territories



June 27, 2017

Erica Janes  
Regulatory Officer  
Mackenzie Valley Land and Water Board  
7<sup>th</sup> Floor – 4910 50<sup>th</sup> Avenue  
P.O. Box 2130  
Yellowknife, NT  
X1A 2P6

Dear Ms. Janes,

**Re: City of Yellowknife  
Water Licence – MV2009L3-0007  
Storm Water Management Plan Version 4  
Request for Review and Comments**

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

### **Topic 1: Risks to Local Water from Uncontrolled Stormwater Releases**

#### **Comment(s):**

Since the first version of their Stormwater Management Plan (SWMP) in 2009, the City of Yellowknife (the City) has been collecting data at various locations at stormwater outlets around the city. A 2013 Staff Report regarding the SWMP requested the City to provide a more in depth look and establish trends by submitting a 3 years analysis of stormwater data.

It was specified in 2011-2016 Annual Reports that above guidelines (CCME Protection of Aquatic Life) levels for aluminum, arsenic, copper, iron and zinc were consistently collected during these years, and were interpreted to be due to the rich mineral environment in the Yellowknife area. Upon review of the 2016 Annual

Report sampling results which were provided in Appendix E, elevated levels were noted for Total Phosphorus (TP) at nearly all locations and during each sampling period. As elevated levels of metals and TP have been consistently monitored, the next step is to assess potential impacts of these stormwater flows on the receiving waters (or catchment areas).

ENR notes that the MVLWB has required a trend analysis be done for the stormwater data. Specifically, the 2013 MVLWB Staff Report described that the Trend Analysis include:

- 1) A more in depth look at trends since sampling began in 2009, which involves analyzing the data in terms of effect to the watercourses;
- 2) Estimates of potential impacts to the watercourses [or Catchment Areas], with an emphasis on effects to fish bearing watercourses;
- 3) Any research and reports on background data, and
- 4) If necessary, treatment options or methods being researched

ENR further notes that the 2016 Annual Report makes reference (in Section x), to a “Stormwater Trend Analysis Report” which is to be submitted in April 2017.

**Recommendation:**

- 1) ENR recommends for City include and provide the information outlined above in order to assess any associated risks to the environment from uncontrolled releases of stormwater to local waters.
- 2) ENR recommends the City include any comparisons with stormwater quality studies from other municipalities as they may be useful to identify similarities and may provide information on how other Canadian cities manage stormwater prior to its release to local waters.

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 Assessment and Monitoring Section (EAM), Conservation, Assessment and Monitoring Division.

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email [patrick.clancy@gov.nt.ca](mailto: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  
Environmental Regulatory Analyst  
Environmental Assessment and Monitoring Section  
Conservation, Assessment and Monitoring Division  
Department of Environment and Natural Resources  
Government of the Northwest Territories