



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

Applicant: Town of Fort Smith	
Location: Fort Smith, NT	Application: MV2011L3-0001
Date Prepared: September 25, 2018	Meeting Date: October 4, 2018
Subject: 2016 and 2017 Annual Water Licence Reports	

1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) the 2016 and 2017 Annual Water Licence Reports (Annual Reports) submitted by the Town of Fort Smith (Town) to fulfill Part B, condition 1 and Schedule 1, condition 1 of municipal Water Licence MV2011L3-0001 (Licence).

2. Background

- November 1, 2011 – Issuance of Licence MV2011L3-0001;
- February 21, 2018 – 2016 Annual Report received;
- April 6, 2018 – 2017 Annual Report received;
- April 24, 2018 – Review commenced;
- May 31, 2018 – Reviewer comments and recommendations due and received;
- June 12, 2018 – Town granted extension for responses from June 14, 2018 to June 20, 2018;
- June 20, 2018 – Responses due and received;
- **October 4, 2018 – 2016 and 2017 Annual Reports presented to the Board for information;** and
- October 31, 2026 – Expiration of Licence MV2011L3-0001.

3. Discussion

The Town submitted the 2016 Annual Report on February 21, 2018, and the 2017 Annual Report on April 6, 2018 (attached), both to fulfil Part B, condition 1 and Schedule 1, condition 1 of the Licence. Board staff delayed the public review of the 2016 Annual Report so that both Annual Reports could be distributed simultaneously.

These submissions are not for Board approval; however, they summarize activities undertaken during the previous year, including results of monitoring activities. Additionally, the Board must be satisfied that the Town has completed their annual reporting in accordance with Licence requirements.

4. Comments

The Town submitted the 2016 and 2017 Annual Reports using the annual reporting template created and maintained by Board staff, with several informative additions, namely Regulatory Compliance comparisons (Tables 5, 6 and 7 in both Annual Reports) that demonstrate the Town's compliance with sampling event frequencies and effluent quality criteria for the year in question, compared with data from the previous year.

5. Reviewer Comments

By May 31, 2018, comments and recommendations on the 2016 and 2017 Annual Reports were received from Environment and Climate Change Canada (ECCC), the Government of the Northwest Territories Department of Environment and Natural Resources (GNWT-ENR), and Board staff.

On June 12, 2018, Board staff granted the Town an extension to the response deadline from June 14, 2018 to June 20, 2018 (see ORS review summary). The Town responded on June 20, 2018. The Review Summary and Attachments (attached) presents the concerns identified through this review.

The following summarizes the main issues raised during the review:

Sampling and Record-keeping

Several review comments related to the Town's record-keeping of sampling events (Comment ID ECCC 2 & 3) and measurement of sewage effluent discharge volumes (Comment ID GNWT-ENR 1). Board staff note that the Town is sampling in accordance with Licence requirements and is actively working toward implementing more accurate measurement methods for reporting on waste volumes.

Citing work done previously under the Licence and practices for improving the quality of wastewater discharges, GNWT-ENR (Comment ID 8) also recommended that the Town demonstrate best practices by continuing to research and adopt intermediate enhancement methods, techniques and technology to improving the quality of their wastewater discharges to the environment. The Town responded that they will review improvement measures, including enzyme application from time to time, and implement when determined to be cost effective and agreeable to, or as mandated by, the Board and the Licence. Board staff note that conducting further research and applying improved treatment measures may be discussed during the licence renewal process (projected for 2025-2026).

Surveillance Network Program (SNP) Reporting

GNWT-ENR (Comment ID 2) requested that the Town specifically list missing data parameters with the SNP Compliance Summary tables. The Town agreed to provide additional information on missing parameters in Tables 5, 6 and 7 in both Annual Reports, as well as correct a minor typo in Table 5 of the 2016 Annual Report (identified in Comment ID GNWT-ENR 3). Board staff suggest that in future annual reports, missing data parameters could be specifically listed, and that the revisions be submitted at the same time as the 2018 Annual Report.

GNWT-ENR (Comment ID 4) expressed concern about results from SNP station 567-4 (runoff below the Solid Waste Disposal Facilities), which didn't include concentrations of faecal coliforms as required by the Licence, and requested rationale. The Town responded that the sample was inadvertently missed by the lab and could also revise Table 7 in the 2017 Annual Report to indicate that, for submission with the 2018 Annual Report, as above.

GNWT-ENR (Comment ID 7) recommended the Town explain the progressive increase in total suspended solids (TSS) concentrations in wastewater discharges to the Slave River and identify corresponding mitigation strategies. The Town responded that it is unclear that there is an increasing trend in TSS, and that “Regardless, increases in TSS from Fort Smith's wastewater effluent would not noticeably impact TSS levels in the Slave River given the dilution ratio of 1:400,000.” Board staff note that the Town’s response is in keeping with the Board’s Reason for Decision at Licence Issuance (attached, see page 10 of 16), which discuss the rationale behind the selection of the site-specific water quality objective for TSS in the Slave River that appear as EQC Part D, condition 2 of the Licence.

Water quality data

GNWT-ENR (Comment ID 5) recommended that the Town submit all water quality data to the public registry in an accessible file type (csv or xls). The Town agreed to provide available xls files to the Board. Board staff note that the Board could encourage the Town to discuss this request with GNWT-ENR.

In addition, GNWT- ENR (Comment ID 6) recommended that the Town complete the GNWT metadata template attached to the Review Comment Table and provide it with the associated water quality data to the Board’s public registry in an accessible file type (csv or xls). The Town noted this request but stated that it feels completion of metadata templates represents a significant recordkeeping burden not currently required by the licence. Board staff note GNWT-ENR has recently requested this type of information in a number of recent reviews. The Board could encourage the Town to discuss this request with GNWT-ENR.

6. Security

Not applicable.

7. Conclusion

Annual Water Licence Reports are not for Board approval; however, the Board may wish to follow up with the Town based on the information provided in the 2016 and 2017 Annual Reports and through the review process.

Board staff conclude that further information was provided by the Town in their responses to reviewer comments and that the Town has committed to continuing to improve their record keeping of sampling events, and to include more details regarding missing sampling parameters in future annual reporting.

8. Recommendation

Board staff recommend the Board accept the 2016 and 2017 Annual Water Licence Reports as submitted, to fulfill Part B, condition 1 and Schedule 1, condition 1 of municipal Water Licence MV2011L3-0001.

A draft letter is attached for the Board’s consideration.

Board staff recommend including the following text in the decision letter:

- The Board encourages the Town to discuss GNWT-ENR's requests to provide water quality data in an accessible file type and to complete their metadata template for posting to the Board's public registry, with GNWT-ENR staff.
- The Board commends the Town for their inclusion of SNP Compliance Summary tables in their annual reporting, and requests that the Town specifically list missing data parameters with these tables in future annual reports.
- Revisions to the 2016 and 2017 Annual Reports as identified during this review shall be submitted concurrently with the 2018 Annual Report (due March 18, 2019), and include the following:
 - Listing of missing data parameters with the SNP Compliance Summary tables;
 - Correction of the typo in Table 5 in the 2016 Annual Report; and
 - Revision of Table 7 in the 2017 Annual Report to indicate the missed faecal coliform sample.
- The Board notes and appreciates the Town's efforts to report in accordance with Licence requirements.
- The Town shall adhere to the commitments made in their responses to reviewer comments dated June 20, 2018.

9. Attachments

- [2016 Annual Report](#)
- [2017 Annual Report](#)
- [MV2011L3-0001 Issuance Reasons for Decision](#)
- Review Summary and Attachments
- Draft Decision Letter from the Board

Respectfully submitted,



Erica Janes
Regulatory Specialist



Heather Scott
Technical Advisor

Review Comment Table

Board:	MVLWB
Review Item:	Town of Fort Smith - 2016 and 2017 Annual Water Licence Reports (MV2011L3-0001)
File(s):	MV2011L3-0001
Proponent:	Town of Fort Smith
Document(s):	MV2011L3-0001 - Ft Smith - 2016 Annual Report - Feb21-18 (23.4 MB) MV2011L3-0001 - Ft Smith - 2017 Annual Water Licence Report - Apr6-18 (14.6 MB) MV2011L3-0001 - Town of Fort Smith - Acceptance - 2013 2014 2015 Annual Reports - Nov3-16 (112.8 KB)
Item For Review Distributed On:	Apr 24 at 08:50 Distribution List
Reviewer Comments Due By:	May 31, 2018
Proponent Responses Due By:	June 20, 2018
Item Description:	<p>June 12, 2018 Update: The Town of Fort Smith has requested and been granted an extension to respond to reviewer comments on the 2016 and 2017 Annual Reports. The new response deadline is June 20, 2018.</p> <p>-----</p> <p>The Town of Fort Smith (Town) has submitted their 2016 and 2017 Annual Water Licence Reports in accordance with Part B, condition 1 and Schedule 1, condition 1 of municipal Water Licence MV2011L3-0001, and in accordance with Board direction provided in the November 3, 2016 acceptance letter for the 2013, 2014 and 2015 Annual Reports (see link).</p> <p>Although formal approval of Annual Reports is not required under the Licence, the Board must be satisfied that the City has reported in accordance with the requirements of their Licence.</p> <p>Reviewers are invited to submit questions, comments and recommendations on the 2016 and 2017 Annual Water Licence Reports by May 31, 2018. As these two Annual Reports are posted for review together; please note which Annual Report your comments pertain to when providing comments.</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 ejanes@mvlwb.com.</p>
General Reviewer Information:	In addition to the email distribution list, the following organizations received review materials by fax:

	<ul style="list-style-type: none"> • Hay River Metis Council - Trevor Beck, President (867)874-4472; and • NWT Metis Nation - Tim Heron, NWTMN IMA Coordinator (867)872-3586.
Contact Information:	Erica Janes 867-766-7466 Heather Scott 867-766-7463 Jen Potten 867-766-7468

Comment Summary

Environment and Climate Change Canada: Gabriel Bernard-Lacaille				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
4	General File	Comment (doc) ECCC Comments Cover Letter Recommendation	--	Noted.
1	ECCC 1- QA/QC field sampling; 2016 and 2017 Annual Water Licence Reports	Comment Quality Assurance/Quality Control (QA/QC) field sampling was not described in the annual reports. Sampling locations, dates and results for field blanks, travel blanks and duplicate field samples should be included in the annual report. Recommendation Environment and Climate Change Canada (ECCC) recommends that the Town of Fort Smith's (the Proponent) QA/QC field sampling protocol be provided in the annual report.	June 20: QA/QC procedures for field blanks and duplicates are presented in the O&M Manual. As the O&M Manual is publically available, the Town does not see the need to include this information in the annual report.	Acceptable response. Board staff also note that QA/QC requirements are also outlined in the SNP Annex to the Licence.
2	ECCC 2-Field parameters; 2016 and 2017 Annual Water Licence Reports	Comment The summary tables provided in Appendix A do not provide data for field pH or field temperature. Collecting this data would assist in interpreting other monitoring results. Recommendation ECCC recommends that the Proponent sample field pH	June 20: The Town is implementing improved record keeping of field conditions during sampling events. Field pH and temperature are not required per the licence.	Acceptable response.

		and field temperature during monitoring events, and that future annual report summary tables provide this data.		
3	ECCC 3- General comment; 2016 and 2017 Annual Water Licence Reports	Comment Recording field notes at the time of sampling is important to support the interpretation of monitoring data. Recommendation ECCC recommends that the Proponent records field notes at the time of sampling (e.g. weather conditions, river conditions, effluent observations), and uses this information to support the interpretation of monitoring data.	June 20: The Town is implementing improved record keeping of field conditions during sampling events.	Acceptable response.

GNWT - ENR: Central Email GNWT

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
10	General File	Comment (doc) Attachment: 2018 Appendix A Water Quality Sample Metadata Template Recommendation	--	Noted.
1	Topic 1: Provide Rationale for Variations in Estimated Sewage Effluent Volumes Discharged to Receiving Environment	Comment In Table 2, Section B of the 2016 and 2017 Annual Reports (Sewage Discharged) it was noted that in 2016 more sewage effluent was discharged than deposited in the lagoon system, and in 2017 less was discharged than deposited. ENR would like to know the reason(s) there is such variation from one year to the next. Typically, losses in the system are anticipated and discharge volumes are expected to be less than volumes deposited, but this is not the case in 2016. Please provide rationale as to why	June 20: It is believed this variation is primarily due to measurement methodology and accuracy. V-notch weir flows will present relatively large changes in flow rates for small increases in height. Prior to 2017, weir measurements were taken once per month only - (refer to comments below table of 2016 report). Daily measurements were instituted in 2017 (when access permitted). Consistency and accuracy of measurement is expected to improve in subsequent years. Discharge flows in subsequent years are expected to be	Board staff note that the Town is actively working toward implementing more accurate measurement methods for reporting on waste volumes, and are of the opinion that the Town has sufficiently explained the variation in volumes measured (i.e. measurement method has changed).

		<p>there is such variation in the figures and volumes provided in these above noted tables, and explain the 53% increase in sewage effluent discharged in 2016 and the 33. 8% decrease in 2017.</p> <p>Recommendation 1) ENR requests that a rationale is provided to explain the variation in the figures and volumes provided in Table 2, Part b, of the 2016 and 2017 Annual Reports, and explain why there was a 53% increase in sewage effluent discharged in 2016 and a 33. 8% decrease in 2017. Both reports should be updated to include this information.</p>	<p>more consistent with the flows deposited into the lagoon in Table 4.</p>	
2	<p>Topic 2: Missing Data Parameters in SNP Regulatory Compliance Summary Tables to be Included in Comments Section</p>	<p>Comment Tables 5-7 in Section M of the 2016 and 2017 Annual Reports (SNP Regulatory Compliance) note the number of missing data parameters, but don't specify which parameters are missing. ENR recommends that in future reports the missing data parameters be listed in the comments section below the tables. It was noted that this information was included in Tables 1-3 in Appendix A, but including these data parameters in the comments section below the Compliance Summary tables would be a helpful reference for reviewers. In addition, a minor typo in Table 5 (SNP Station 567-2 - Regulatory Compliance) of the 2016 report was noted. The figure (105) in the 'Number of Analyses Performed' column</p>	<p>June 20: Comments below Tables 5 and 6 of section M do discuss missing parameters. Comments will be elaborated for Tables 5 and 6, and will be added for Table 7. The typo will be addressed.</p>	<p>Acceptable response.</p> <p>The Town could revise the 2016 and 2017 Annual Reports as follows:</p> <ul style="list-style-type: none"> • Tables 5 and 6 to include more details regarding missing parameters, • Table 7 to include the same detail on missing parameters, and • Fix the typo in Table 5 of the 2016 AR. <p>Board staff suggest that in future annual reports, missing data</p>

		and the 'Compliant: Below Effluent Quality Criteria' row should be 103. Please update the table with the correct figure. ENR would like to note that these tables were well done and provide an informative summary of SNP compliance. ENR highly recommends inclusion of these tables in future reports. Recommendation 1) ENR recommends that in future reports the missing data parameters be specifically listed in the comments section below the SNP Compliance Summary tables.		parameters be specifically listed, and that the revisions be submitted at the same time as the 2018 Annual Report.
3	None	Comment None Recommendation 2) ENR recommends that the above noted typo in Table 5 (SNP Station 567-2 Regulatory Compliance) of the 2016 Annual Report be corrected.	June 20: Refer to response above to ENR Topic 2.	See Comment ID GNWT-ENR 2.
4	Topic 3: Rationale for No Data Results for Fecal Coliforms for SNP 567-4 Sample in September 2017	Comment In Appendix A - Table 3 (SNP Results Summary - Station 567-4 - Run-off below Solid Waste Disposal Facilities) of the 2017 Annual Report it was noted that no data was collected for the Fecal Coliform parameter on September 25th. ENR requests that the Town provide rationale as to why this parameter was not collected. The explanation for this missing data should be updated in the comments section under the SNP Compliance Summary table for SNP 567-4 (Table 7). If the sample exceeded viable hold time for that parameter, ENR recommends that the lab analysis be run regardless and	June 20: The coliform sample was inadvertently missed by the lab. We will add to the comments for Table 7 per above.	Acceptable response. The Town could also revise Table 7 in the 2017 Annual Report to indicate that the faecal coliform sample for September 25 was inadvertently missed by the lab; Board staff suggest the revised 2017 Annual Report be submitted with the 2018 Annual Report.

		<p>the resulting data provided. This omission stresses the importance of good note taking in the field, a recommendation ENR made during previous Annual Report reviews.</p> <p>Recommendation 1) ENR requests that the Town provide rationale as to why sample data for the Fecal Coliform parameter was not collected during the September 25th 2017 sampling event for SNP 567-4. The explanation for this missing data should be updated in the comments section under the SNP Compliance Summary table for SNP 567-4 (Table 7).</p>		
5	Topic 4: Water Quality Data	<p>Comment The Town provided its 2016 water quality sampling results in Appendices A and B in a PDF format. However, the utility of this data is limited by third parties in its current format (i.e. pdf).</p> <p>Recommendation 1) ENR recommends that the Town submit all water quality data associated with the Surveillance Network Program stations and sewage lagoon stations to the public registry in an accessible file type (e.g., csv or xls).</p>	June 20: The Town will provide available xls files from Taiga to the Board.	The Board could encourage the Town to discuss GNWT-ENR's request with them.
6	Topic 5: Metadata Template	<p>Comment ENR appreciates that the Town provided all monitoring sampling results in Appendices A and B of the 2016 Annual Report. However, to ensure consistency among reporting by proponents, ENR encourages the use of a</p>	June 20: The Town notes ENR's request, but feels completion of metadata templates represents a significant recordkeeping burden not currently required by the licence. The Town respectfully submits that it might be more appropriate to	The Board could encourage the Town to discuss GNWT-ENR's request with them.

		<p>standard metadata template. Metadata sets the context for the water quality data, providing a description of data that was collected as part of a water quality sampling program and includes field conditions and a description of laboratory analyses conducted. Metadata standards are required to ensure the proper use and interpretation of the data by the users. Also, as with the water quality data itself, ENR encourages that the metadata be available in an accessible file type.</p> <p>Recommendation 1) ENR recommends that the Town complete the attached metadata template and provide it with the associated water quality data to the public registry in an accessible file type (e.g., csv or xls).</p>	<p>have Taiga provide results, with associated metadata, in a format ENR finds useful.</p>	
7	<p>Topic 6: Current Sewage Disposal Facilities Performance CBOD & TSS</p>	<p>Comment A trend analysis of the past 10 years from 2008-2017 at SNP 567-2 (Compliance Point) showed a progressive concentration increase for TSS, as follows: . ~ 35 mg/L (2008-2009) . 40-50 mg/L (2010-2014) . 55-68 mg/L (2015-2016) . 79 mg/L (2017), including an exceedance event of 385 mg/L on August 29th. ENR notes that the TSS concentrations discharged from the Town's system are higher than are typically present at other treatment systems in the NWT. Previous studies on the Town facility have identified the main factors affecting</p>	<p>June 20: The TSS exceedance event recorded in August of 2017 of 385 mg/L is not believed to be representative of the effluent quality. It is believed that the sample was contaminated. A grab sample that included sediments could have produced an elevated TSS reading like the one in August - which is the only reading over the referenced time period that exceeded 200 mg/L, and more than double the next highest reading in that same 10 year period. Excluding that measurement, 2017's average for TSS was 51.2 mg/L, making it unclear that there is an increasing TSS trend.</p>	<p>Acceptable response.</p> <p>Board staff note that the Town's response is in keeping with the Board's Reason for Decision at Issuance, which discuss the rationale behind the selection of the site-specific water quality objective for TSS in the Slave River.</p>

		<p>wastewater/sewage treatment performance as an insufficient cells storage volume to foster longer hydraulic retention time [estimated to 24 days in winter, and 106 days in summer - Ammonia Discussion Paper, Section 2.2]; and the absence of a wetland to allow polishing treatment.</p> <p>Recommendation 1) ENR recommends the Town submit the reasons in the Annual Report for the progressive increase in concentrations of TSS in wastewater discharges to the Slave River since 2010, and identify migration strategies that could be used to stop this increasing TSS trend.</p>	<p>Regardless, increases in TSS from Fort Smith's wastewater effluent would not noticeably impact TSS levels in the Slave River given the dilution ratio of 1:400,000.</p>	
8	<p>Topic 7: Best Practices for Improving Quality of Wastewater Discharges to the Environment</p>	<p>Comment During the 2011 Fort Smith Water Licence renewal process, conditions were developed to foster ammonia treatment options [Ammonia Discussion Paper (Part D, Item 13)] and sewage treatment improvement [Sewage Treatment Improvement Plan (Part D, Item 14)]. Through the Ammonia Discussion Paper, it was established that while ammonia levels discharged at SNP 567-2 would be meeting WSER based on yearly averages, concentrations of CBOD and TSS monitored at the compliance point would not be meeting WSER treatment standards, being 3 to 4 times higher. In their Sewage Treatment Improvement Plan, the Town specified that since effluent</p>	<p>June 20: The Town will review improvement measures, including enzyme application from time to time, and implement when determined to be cost effective and agreeable to, or as mandated by, the Board and the terms of the licence.</p>	<p>Acceptable response. Further research and application of improved treatment measures may be discussed during the licence renewal process.</p>

		<p>quality was meeting EQC limits of their Water Licence, there is currently no evidence supporting that improved wastewater is required to protect species in the Slave River based on a 1:400,000 dilution ratio, and WSER regulations are expected to be drafted/implemented in the next few years. The Town will not advance any particular option to improve wastewater treatment until such time as a comprehensive regulatory framework exists for the Far North. Comments and recommendations made by the MVLWB (see Staff Report on Ammonia Discussion Paper, p. 21 of 30) stated that it was not clear if and when the WSERs would be adopted and/or legislated in the NWT, and that the Town's improvement of sewage treatment facilities should not wait for the implementation of WSER. ENR notes that the next Water Licence renewal process is set to occur in October 2026. In their response to aeration enhancement options such as a pilot study conducted in Behchoko (Staff Report, p. 22 of 30), the Town specified that their consultants had significant experience with lagoon aeration, and identified other treatment processes that were more effective in northern locations. ENR commends the Town for the removal of approximately 400 m³ of sludge from the anaerobic</p>		
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		<p>cells in July 2016. ENR notes that other communities in the NWT, such as the Town of Inuvik, have had success with supplementing their lagoon cells treatment with enzyme application. Inuvik has used this supplement since 1993, which has reportedly decreased the amount of sludge generated (and associated need for removal), and likely also positively influence effluent treatment.</p> <p>Recommendation 1) ENR recommends that the Town demonstrate best practices by continuing to research and adopt intermediate enhancement methods, techniques and technology to improving the quality of their wastewater discharges to the environment.</p>		
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GNWT - ENR: Patrick Clancy

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	General File	<p>Comment (doc) ENR Letter with Comments, Recommendations and Attachment</p> <p>Recommendation</p>	--	Noted.

MVLWB: Erica Janes

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	2016 & 2017 Annual Reports: Laboratory analytical results	<p>Comment Board staff note that the analytical results provided by Taiga Labs consistently reference the wrong Licence number.</p> <p>Recommendation Please ensure that Town staff and Taiga Labs reference the correct Licence number: MV2011L3-0001</p>	June 20: Noted - the Town will confirm with Taiga that the correct licence is referenced.	Acceptable response.

2	2016 & 2017 Annual Reports: SNP summary data	<p>Comment Board staff note that SNP results at station 567-4 (summary table 3) show high concentrations for Fecal Coliforms and Iron (2016) and Iron (2017).</p> <p>Recommendation Is the Town able to provide an explanation for these high concentrations of Fecal Coliforms and Iron in the surface run-off from the Solid Waste Disposal Facilities? Does the Town have any environmental concerns based on these results?</p>	<p>June 20: The TNTC coliform reading was followed by measurements of 100 and 84 CFUs on the two subsequent readings. It is believed the TNTC coliform reading was nonrepresentative (i.e., contaminated). Iron readings at SNP-567-4 have fluctuated between 506 and 2120 µg/L since 2013. The Town does not have any environmental concerns but will continue to monitor.</p>	Acceptable response.
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APPENDIX A: Water Quality Sample Metadata Template - Field Data

Proponent Identification

Proponent Name:

Contact Name:

Contact Number and Email:

Program/Project Title:

Unique Identifier for Sample:

Sample Identification

Sampled By:

Date Sample was Collected (DD-MM-YYYY):

Time of Sample Collection (24 hr clock hh:mm):

Sampling Frequency (e.g. 3x/yr, monthly):

Program/Project Title:

Program Initiation (MM-YYYY):

Purpose of Data Collection:

Legal Sample:

Sampling Equipment

Instrumentation Type with Model Number:

Sensors Used, Including Model Numbers:

Date of Last Calibration:

Field Data

Waterbody Type:

Sample Matrix:

Sample Type:

Sample Form:

Sampling Equipment:

Sample Location:

Depth of Sample (m):

Wind Speed/Direction:

Air Temperature (0C):

Precipitation in the Previous 24 Hours (Y/N):

Water Depth (m):

Ice Thickness (m):

Snow Thickness (m):

Cloud Cover (%):

Field Observations & Comments. Note anything unusual about the location or sampling procedure

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Sample 1

Sample 2

Sample 3

Etc.

**APPENDIX B: Water Quality Sample Metadata
Template - Lab Data**

Proponent Identification

Proponent Name:

Contact Name:

Contact Number and Email:

Program/Project Title:

Unique Identifier for Sample:

Lab Data

Parameter

Sample Date (DD-MM-YYYY)

Laboratory Used

Lab Analysis Date (DD-MM-YYYY)

Sample Preservation Method

Sample Preparation Method

Laboratory Analytical Method Used

Method Detection Limit

Sample 1

Sample 2

Sample 3

Etc.



May 31, 2018

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

Dear Ms. Janes,

**Re: Town of Fort Smith (the Town)
Water Licence – MV2011L3-0001
2016 and 2017 Annual Water Licence Reports
Request for Review and Comments**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the reports 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: Provide Rationale for Variations in Estimated Sewage Effluent Volumes Discharged to Receiving Environment

Comment(s):

In Table 2, Section B of the 2016 and 2017 Annual Reports (Sewage Discharged) it was noted that in 2016 more sewage effluent was discharged than deposited in the lagoon system, and in 2017 less was discharged than deposited. ENR would like to know the reason(s) there is such variation from one year to the next. Typically, losses in the system are anticipated and discharge volumes are expected to be less than volumes deposited, but this is not the case in 2016. Please provide rationale as to why there is such variation in the figures and volumes provided in these above noted tables, and explain the 53% increase in sewage effluent discharged in 2016

and the 33.8% decrease in 2017.

Recommendation(s):

- 1) ENR requests that a rationale is provided to explain the variation in the figures and volumes provided in Table 2, Part b, of the 2016 and 2017 Annual Reports, and explain why there was a 53% increase in sewage effluent discharged in 2016 and a 33.8% decrease in 2017. Both reports should be updated to include this information.

Topic 2: Missing Data Parameters in SNP Regulatory Compliance Summary Tables to be Included in Comments Section

Comment(s):

Tables 5-7 in Section M of the 2016 and 2017 Annual Reports (SNP Regulatory Compliance) note the number of missing data parameters, but don't specify which parameters are missing. ENR recommends that in future reports the missing data parameters be listed in the comments section below the tables. It was noted that this information was included in Tables 1-3 in Appendix A, but including these data parameters in the comments section below the Compliance Summary tables would be a helpful reference for reviewers.

In addition, a minor typo in Table 5 (SNP Station 567-2 – Regulatory Compliance) of the 2016 report was noted. The figure (105) in the '*Number of Analyses Performed*' column and the '*Compliant: Below Effluent Quality Criteria*' row should be 103. Please update the table with the correct figure.

ENR would like to note that these tables were well done and provide an informative summary of SNP compliance. ENR highly recommends inclusion of these tables in future reports.

Recommendation(s):

- 1) ENR recommends that in future reports the missing data parameters be specifically listed in the comments section below the SNP Compliance Summary tables.
- 2) ENR recommends that the above noted typo in Table 5 (SNP Station 567-2 – Regulatory Compliance) of the 2016 Annual Report be corrected.

Topic 3: Rationale for No Data Results for Fecal Coliforms for SNP 567-4 Sample in September 2017

Comment(s):

In Appendix A - Table 3 (SNP Results Summary - Station 567-4 - Run-off below Solid Waste Disposal Facilities) of the 2017 Annual Report it was noted that no data was collected for the Fecal Coliform parameter on September 25th. ENR requests that the Town provide rationale as to why this parameter was not collected. The explanation for this missing data should be updated in the comments section under the SNP Compliance Summary table for SNP 567-4 (Table 7).

If the sample exceeded viable hold time for that parameter, ENR recommends that the lab analysis be run regardless and the resulting data provided.

This omission stresses the importance of good note taking in the field, a recommendation ENR made during previous Annual Report reviews.

Recommendation(s):

- 1) ENR requests that the Town provide rationale as to why sample data for the Fecal Coliform parameter was not collected during the September 25th 2017 sampling event for SNP 567-4. The explanation for this missing data should be updated in the comments section under the SNP Compliance Summary table for SNP 567-4 (Table 7).

Topic 4: Water Quality Data

Comment(s):

The Town provided its 2016 water quality sampling results in Appendices A and B in a PDF format. However, the utility of this data is limited by third parties in its current format (i.e. pdf).

Recommendation(s):

- 1) ENR recommends that the Town submit all water quality data associated with the Surveillance Network Program stations and sewage lagoon stations to the public registry in an accessible file type (e.g., csv or xls).

Topic 5: Metadata Template

Comment(s):

ENR appreciates that the Town provided all monitoring sampling results in Appendices A and B of the 2016 Annual Report. However, to ensure consistency among reporting by proponents, ENR encourages the use of a standard metadata template. Metadata sets the context for the water quality data, providing a description of data that was collected as part of a water quality sampling program and includes field conditions and a description of laboratory analyses conducted. Metadata standards are required to ensure the proper use and interpretation of the data by the users. Also, as with the water quality data itself, ENR encourages that the metadata be available in an accessible file type.

Recommendation(s):

- 1) ENR recommends that the Town complete the attached metadata template and provide it with the associated water quality data to the public registry in an accessible file type (e.g., csv or xls).

Topic 6: Current Sewage Disposal Facilities Performance – CBOD & TSS

Comment(s):

A trend analysis of the past 10 years from 2008-2017 at SNP 567-2 (Compliance Point) showed a progressive concentration increase for **TSS**, as follows:

- ~ 35 mg/L (2008-2009)
- 40-50 mg/L (2010-2014)
- 55-68 mg/L (2015-2016)
- 79 mg/L (2017), including an exceedance event of 385 mg/L on August 29th.

ENR notes that the TSS concentrations discharged from the Town's system are higher than are typically present at other treatment systems in the NWT. Previous studies on the Town facility have identified the main factors affecting wastewater/sewage treatment performance as an insufficient cells storage volume to foster longer hydraulic retention time [estimated to 24 days in winter, and 106 days in summer - *Ammonia Discussion Paper*, Section 2.2]; and the absence of a wetland to allow polishing treatment.

Recommendation(s):

- 1) ENR recommends the Town submit the reasons in the Annual Report for the progressive increase in concentrations of TSS in wastewater discharges to the

Slave River since 2010, and identify migration strategies that could be used to stop this increasing TSS trend.

Topic 7: Best Practices for Improving Quality of Wastewater Discharges to the Environment

Comment(s):

During the 2011 Fort Smith Water Licence renewal process, conditions were developed to foster ammonia treatment options [Ammonia Discussion Paper (Part D, Item 13)] and sewage treatment improvement [Sewage Treatment Improvement Plan (Part D, Item 14)]. Through the Ammonia Discussion Paper, it was established that while ammonia levels discharged at SNP 567-2 would be meeting WSER based on yearly averages, concentrations of CBOD and TSS monitored at the compliance point would not be meeting WSER treatment standards, being 3 to 4 times higher.

In their Sewage Treatment Improvement Plan, the Town specified that since effluent quality was meeting EQC limits of their Water Licence, there is currently no evidence supporting that improved wastewater is required to protect species in the Slave River based on a 1:400,000 dilution ratio, and WSER regulations are expected to be drafted/implemented in the next few years. The Town will not advance any particular option to improve wastewater treatment until such time as a comprehensive regulatory framework exists for the Far North. Comments and recommendations made by the MVLWB (see Staff Report on Ammonia Discussion Paper, p. 21 of 30) stated that it was not clear if and when the WSERs would be adopted and/or legislated in the NWT, and that the Town's improvement of sewage treatment facilities should not wait for the implementation of WSER. ENR notes that the next Water Licence renewal process is set to occur in October 2026.

In their response to aeration enhancement options such as a pilot study conducted in Behchoko (Staff Report, p. 22 of 30), the Town specified that their consultants had significant experience with lagoon aeration, and identified other treatment processes that were more effective in northern locations. ENR commends the Town for the removal of approximately 400 m³ of sludge from the anaerobic cells in July 2016. ENR notes that other communities in the NWT, such as the Town of Inuvik, have had success with supplementing their lagoon cells treatment with enzyme application. Inuvik has used this supplement since 1993, which has reportedly decreased the amount of sludge generated (and associated need for removal), and likely also positively influence effluent treatment.

Recommendation(s):

- 1) ENR recommends that the Town demonstrate best practices by continuing to research and adopt intermediate enhancement methods, techniques and

technology to improving the quality of their wastewater discharges to the environment.

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

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.

Sincerely,



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

Att: 2018 Appendix A Example of Water Quality Sample Metadata Template



Environmental Protection Operations Directorate
Prairie & Northern Region
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

ECCC File: 5200 000 042/001
MVLWB File: MV2011L3-0001

May 31, 2018

Via online submission

Jen Potten
Regulatory Coordinator
Mackenzie Valley Land and Water Board
7th Floor, 4922 48th Street
P.O. Box 2130
Yellowknife, NT X1A 2P6

Dear Ms. Potten

RE: MV2011L3-0001– Town of Fort Smith– Municipal Water Licence - 2016 and 2017 Annual Water Licence Reports

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (MVLWB) regarding the above-mentioned 2016 and 2017 Annual Water Licence Reports and is submitting comments via online submission as requested by the MVLWB. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*.

Should you require further information, please do not hesitate to contact me at (867) 669-4746 or Gabriel.Bernard-Lacaille@canada.ca

Sincerely,

[original signed by]

Gabriel Bernard-Lacaille
A/ Senior Environmental Assessment Coordinator

Attachment(s): ECCC Comments Excel Sheet

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)