February 26, 2016

Report To: Mayor & Council

From: Doug Brown, Manager of Operations & Facilities

SUBJECT: 2015 Schedule 22 (Compliance) Summary Report for the Town's Drinking Water System – DWS # 220000978 - Large Municipal Residential System

Administration is required to present to Council (owner) the 2015 Schedule 22 Summary Report prior to the March 31, 2016 deadline. Please find attached the Administration Report prepared by Douglas Herr, Environmental and Facilities Superintendent outlining the 2015 Schedule 22 Summary Report for the Town's Large Residential Drinking Water System. The entire Schedule 22 Summary Report is attached for your review and acceptance.

Also attached to the administration report prepared by Doug Herr outlined in appendix "E" is the MOE 2015/16 Drinking Water Inspection Report from their "announced detailed" inspection, which was conducted on November 30th & December 1st, 2015. There were two non-compliance issues found during this inspection, the first issue was linked to properly recording information in the logbooks at the Water Treatment Plant and the other in regards to the disinfecting procedure utilized when repairs to parts of the water distribution system were not in accordance with the Town's Drinking Water Works Permit # 224-201 Schedule B – basically the Water Distribution Operators were not recording in the water distribution system logbook that the disinfection process was in accordance AWWA C651 – Standard for Disinfecting Water Mains or an equivalent procedure.

It should be clearly noted that the two non-compliance issues are housekeeping in nature and that there was a multi-barrier of protection system utilized throughout the year in order to ensure that safe drinking water was produced and delivered to all water customers connected to the Town's drinking water system. For example weekly microbiological water quality sampling & testing was completed with no adverse results throughout the year. Also free available chlorine residuals were maintained throughout the water distribution system within normal operating limits.

At this time I would like to acknowledge all the efforts and hard work of the following staff members; Doug Herr - Environmental and Facilities Superintendent, Randy White – Overall Operator in Charge, Brad Webb - Senior Water Treatment Plant (WTP) Operator, Paul Lemesurier - WTP Operator, Travis George -Water Distribution System Operator, Greg Wiedenhoeft -Water Distribution System Operator and Jay Bruyere – Water Distribution System Operator-in-Training (OIT) to ensure that all consumers connected to the Town's drinking water system receive outstanding potable water at all times. Please keep up the good work.

The 2015 Schedule 22 (Compliance) Summary Report will be available for inspection or review by any member of the public at the Water Treatment Plant or the Public Works Office during regular business hours without charge. Also a copy of the report will be forwarded to Couchiching First Nations, the Walleye Trailer Park and the Lakeview Trailer Park prior to March 31, 2016. Also a copy of the report will be posted on the Town's website.

The Operations and Facilities Executive Committee recommends the following;

1. That Council accepts the 2015 Schedule 22 Annual Summary Report and that a separate resolution be prepared.

2. That the 2015/2016 MOE "Announced/detailed" Inspection Report of the Town's water system be reviewed and accepted by Council.

3. That at this time, the staff of the drinking water system should be acknowledged for all their effort and hard work to ensure that all consumers connected to the Town's water system receive outstanding water. Please keep up the good work.

Respectfully submitted,
Operations & Facilities Division

Doug Brown, P. Eng.
Operations & Facilities Manager

Council approval of this report will ensure the following;

1) That Council accepts the 2015 Schedule 22 Annual Summary Report and that a separate resolution be prepared.

2) That the 2015/2016 MOE "Announced/Focused" Inspection Report of the Town's water system be reviewed and accepted by Council.

3) That at this time, the staff of the drinking water system should be acknowledged for all their effort and hard work to ensure that all consumers connected to the Town's water system receive outstanding water. Please keep up the good work.

February 22, 2016

Report To: Doug Brown, Manager of Operations & Facilities

From: Douglas Herr, Environmental & Facilities Superintendent

SUBJECT: Fort Frances Drinking Water System
Annual Summary Report (O. Reg. 170/03, Schedule 22)
(Period: January 01 to December 31, 2015)
and
Ministry of the Environment Inspection Report – 2015/2016

As a requirement of the Ontario Regulation 170/03, Schedule 22 the Owner of the Drinking Water System, Town of Fort Frances shall prepare a report for the preceding calendar year and give to the members of council no later than March 31. The report is to list the requirements of the Act, regulation, system's approval, drinking water works permit, municipal drinking water licence and any orders applicable to the drinking water system that were not met and what duration/measures were taken to correct the failure during this period. The report is also to include a summary of the quantities and flow rates and compare them to the rated capacity and flow rates approved in system's approval, drinking water works permit or municipal drinking water licence.

The attached Schedule 22 Summary Report identifies all of the above including the two (2) non-compliance issues outlined in the MOE Drinking Water Inspection Report found during the Ministry inspection of November 30, 2015.

The non-conformances have been addressed in the Schedule 22 Summary Report.

Once approved by council a copy of the summary report will be sent to the Owners that connected to and receive all of its drinking water for the Town system. Finally a copy of the report will be posted on the Town's website for public viewing.

Respectfully submitted,

Doug Herr
Environmental & Facilities Supt.

FORT FRANCES
DRINKING WATER SYSTEM

Large Municipal Residential Drinking Water System

(O. Reg. 170/03 - SCHEDULE 22)

ANNUAL SUMMARY REPORT

For the period of

JANUARY 01, 2015 TO DECEMBER 31, 2015

DRINKING WATER SYSTEM #220000978

Prepared by: Douglas Herr

TABLE OF CONTENTS

1.0	Description	Page 3
2.0	General Overview	Page 3
3.0	Legislative Requirements	Pages 4 - 6
4.0	System Approvals	Page 6
5.0	Failure to Meet Requirements (Non-Compliance Issues)	Pages 6 - 8
6.0	Quantity and Flow Data (2015)	Pages 9 – 11

Appendix:

Appendix “A” - Municipal Drinking Water License
Appendix “B” - Drinking Water Works Permit
Appendix “C” - Permit to Take Water
Appendix “D” - Regulatory Relief from Lead Sampling Requirements
Appendix “E” - Drinking Water System Inspection Program (2015 – 2016 Inspection Report)

List of References

1.0 Description

This is the summary report for the Fort Frances Drinking Water System, as required by Schedule 22 of O. Reg. 170/03, as amended, Summary Reports for Municipalities. For the purposes of the regulation, the Fort Frances Drinking Water System is considered to be a large municipal residential system.

2.0 General Overview

The reporting period for this report is January 01 to December 31, 2015.

During the reporting period, the Fort Frances Drinking Water System was operated pursuant to the legislative, system approval, license and permits listed below:

1. Municipal Drinking Water License (MDWL) No. 224-101, Issue Number: 1, issued July 29, 2011;
2. Drinking Water Works Permit (DWWP) No. 224-201, Issue Number 1: issued July 19, 2011.
3. Safe Drinking Water Act, 2002;
   - O. Reg. 170/03 Drinking Water Systems
   - O. Reg. 128/04 Certification of Drinking Water Operators and Water Quality Analysts
   - 169/03 Ontario Drinking Water Quality Standard
   - O. Reg. 188/07 Licensing of Municipal Drinking Water Systems
4. Permit to Take Water No. 7280-6UAMD9, issued October 5, 2006.
5. Regulatory Relief from Lead Sampling Requirements, Fort Frances Water Treatment Plant, C of A No. PB220000978RR-01

The DWWP and MDWL were issued in accordance with Sections 40 and 44, respectively of the Safe Drinking Water Act (SDWA), 2002. The issuance of the DWWP and MDWL replaces the previously required Certificate of Approval.

The Fort Frances Water Treatment Plant is designated a Class 3 Water Treatment Facility and the Water Distribution System as a Class 2 Water Distribution System. They are referenced through the Ministry of the Environment as Drinking Water System Number 220000978.

The summary report is required to provide the following:

1. A list of any instances when the system failed to meet the requirements of the Safe Drinking Water Act, the regulations, the system's approval, MDWL, DWWP and any order;
2. Descriptions of the measures that were taken to correct the failure;
3. A summary of the quantities and flow rates of water supplied during the reporting period;
4. The monthly average and maximum instantaneous flow rates;
5. A comparison of the data summarized above to the rated capacities and flow rates in the system's approval and/or MDWL.

3.0 Legislative Requirements

Safe Drinking Water Act, 2002 (SDWA):

Every owner of a municipal drinking-water system or a regulated non-municipal drinking-water system and, if an operating authority is responsible for the operation of the system, the operating authority for the system shall ensure the following:

1. That all water provided by the system to the point where the system is connected to a user's plumbing system meets the requirements of the prescribed drinking-water quality standards.

2. That, at all times in which it is in service, the drinking-water system,
   i. is operated in accordance with the requirements under this Act,
   ii. is maintained in a fit state of repair, and
   iii. satisfies the requirements of the standards prescribed for the system or the class of systems to which the system belongs.

3. That the drinking-water system is operated by persons having the training or expertise for their operating functions that is required by the regulations and the license or approval issued or granted for the system under this Act.

4. That all sampling, testing and monitoring requirements under this Act that relate to the drinking-water system are complied with.

5. That personnel at the drinking-water system are under the supervision of persons having the prescribed qualifications.

6. That the persons who carry out functions in relation to the drinking-water system comply with such reporting requirements as may be prescribed or that are required by the conditions in the license or approval issued or granted for the system under this Act.

Ontario Regulation 170/03:
(Amendment O. Reg. 347/15, December 01, 2015 to December 31, 2015)
(Amendment O. Reg. 335/13, January 01, 2014 to November 30, 2015)

The Town of Fort Frances Drinking Water System is categorized as a Large Municipal Residential System; serves a major residential development and serves more than 100 private residences. For this system the regulation requires that:

The owner of a drinking-water system shall ensure that, not later than March 31 of each year, a report is prepared for the preceding calendar year and is given to,

(a) in the case of a drinking-water system owned by a municipality, the members of the municipal council;

(b) in the case of a drinking-water system owned by a municipal service board established under section 195 of the *Municipal Act, 2001*, the members of the municipal service board; or

(c) in the case of a drinking-water system owned by a corporation, the board of directors of the corporation.

The report must,

(a) list the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water license and any orders applicable to the system that were not met at any time during the period covered by the report; and

(b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure.

The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water license or if the system is receiving all of its water from another system under an agreement to the flow rates specified in the written agreement.

If a report is prepared for a system that supplies water to a municipality under the terms of a contract, the owner of the system shall give a copy of the report to the municipality by March 31.

Ontario Regulation 128/04:
(Certification of Drinking Water Operators and Water Quality Analysts)

This Regulation establishes the training and certification requirements that must be satisfied by certified operators and water quality analysts.

Every operator is required to complete the required training hours within the three year operator certificate renewal period. Operator training consists of the following:

a) Water Treatment Plant (Class 3): 42 hours of Ministry of the Environment's "Director Approved" class room training, plus 78 hours of On-the-job practical training.
b) Water Distribution System (Class 2): 36 hours of Ministry of the Environment's "Director Approved" class room training, plus 69 hours of On-the-job practical training.

During the reporting period January 1, 2015 to December 31, 2015 all the Town's drinking water operators held a valid operator certificate in compliance with O. Reg. 128/04, made under the Safe Drinking Water Act.

Ontario Regulation 129/03:
(Ontario Drinking Water Quality Standards - ODWQS)

This Ontario Drinking Water Standard (ODWQS) identifies the minimum level of drinking water acceptable for human consumption.

The Town of Fort Frances assesses the acceptability of water through compliance with the following standards:

- Schedule 1. Microbiological Standards
- Schedule 2. Chemical Standards
- Schedule 3. Radiological Standards

As this Regulation indicates the minimum standard, exceedance of these values represents the point of which adverse reporting comes into effect.

Ontario Regulation 188/07:
(Licensing of Municipal Drinking Water Systems)

The Safe Drinking Water Act, 2002 requires Owners and Operating Authorities of municipal residential drinking water systems to have an accredited Operating Authority. In order to become accredited, an Operating Authority must establish and maintain a Quality Management System (QMS). Minimum requirements for the QMS are specified within the Drinking Water Quality Management Standard (DWQMS). Ontario Regulation 188/07 of the SDWA has been established to aid licensing of municipal drinking water systems.

4.0 System Approvals

The following outlines the current water system Approvals during the 2015 reporting period:

- Municipal Drinking Water License (No. 224-101), Issue Number: 1: Issued July 29, 2011.
- Drinking Water Works Permit (No. 224-201), Issue Number: 1: Issued July 19, 2011.
- Permit To Take Water: Permit Number 7280-6UAMD9: Issued October 5, 2006.
- Regulatory Relief from Lead Sampling Requirements, Fort Frances Water Treatment Plant, C of A No. PB220000978RR-01, Issued January 12, 2011.

5.0 Failure to Meet Requirements (Non-compliance Issues)

The following is a list of instances when the system failed to meet the requirements of the Act, legislative, the system's approval, MDWL, DWWP or any order that has been issued.

Non-Compliance with Ontario Regulation 170/03:

There were no incidences of non-compliance with the Terms and Conditions of Ontario Regulation 170/03 during this reporting period.

Ontario Regulation 128/04:
(Certification of Drinking Water Operators and Water Quality Analysts)

From November 30th to December 1st, 2015 the Ministry of the Environment and Climate Change conducted an unannounced, detailed inspection of the Town's Water Treatment Plant, see inspection report in Appendix "E". As a result of this inspection there was one (1) non-compliance issue related to this regulatory requirement and what actions, if any the Ministry required the Town to do. The non-compliance item is described below:

> ***The record system did not allow the reader to unambiguously identify the person who made the logbook entry.***
>
> *O. Reg. 128/04, section 27(4) states: "A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry".*
>
> *On the following days during the inspection review period, up to three operators made entries into the WTP logbook; however, there was no way of identifying who made the entry (i.e. no initials or signatures):*
>
> - *January 28, 2015*
> - *February 4, 2015*
> - *February 10, 2015*
> - *June 29, 2015*

Action(s) Required:

Effective immediately, operators must clearly identify themselves in the logbook as the writer during all logbook entry occurrences, in accordance with O. Reg. 128/04, section 27 (4).

By January 26, 2016 The Town of Fort Frances must provide the undersigned Water Inspector with a copy of the Fort Frances WTP logbook for the period of December 7, 2015 to January 22, 2016. A copy of the logs may be provided by email: 808 Robertson St., 2nd Floor, Kenora, ON, P9N 1X9 or email: aaron.causyn@ontario.ca.

Action(s) Taken:
On January 25, 2016 a copy of the logbook entries from December 7, 2015 to January 22, 2016 were emailed to the Water Inspector, Aaron Causyn. A copy of the email/logbook entries for the days requested are attached

Ontario Regulation 129/03:
(Ontario Drinking Water Standards - ODWQS)

There were no incidences of non-compliance with the Terms and Conditions of Ontario Regulation 129/03 during this reporting period.

Ontario Regulation 188/07:
(Licensing of Municipal Drinking Water Systems)

There were no incidences of non-compliance with the Terms and Conditions of Ontario Regulation 188/07 during this reporting period.

**On December 15, 2015 an application was made to the Safe Drinking Waste Branch of the Ministry of the Environment for a Municipal Drinking Water License renewal. Current license will expire July 27, 2016.

Non-Compliance with the Municipal Drinking Water License (MDWL) No. 224-101 and Drinking Water Works Permit (DWWP) No. 224-201:

From November 30th to December 1st, 2015 the Ministry of the Environment and Climate Change conducted an unannounced, detailed inspection of the Town's Water Treatment Plant, see inspection report in Appendix "E". As a result of this inspection there was one (1) non-compliance issue related to this regulatory requirement and what actions, if any the Ministry required the Town to do. The non-compliance item is described below:

Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.

For watermains that form part of a distribution system, DWWP #224-201 Schedule B, Condition 2.3 requires that all parts in contact with the drinking water which are:

- *Added, modified, replaced, extended; or*
- *Taken out of service for inspection, repair or other activities that may lead to Contamination,*

Shall be disinfected before being put into service in accordance with the provisions of the AWWA C651- Standard for Disinfecting Water Mains or an equivalent procedure.

Inspector stated "Although operators indicated that some form of disinfection is occurring during watermain replacements and repairs, the logbook contained no information with respect to disinfection procedures; therefore, the undersigned Water Inspector was unable to verify that appropriate disinfection procedures were being applied throughout the inspection period.

Action(s) Required:

For the purpose of DWWP #224-201, Condition 2.3, the document titled "Watermain Disinfection Procedure" (November 2015) is considered by the MOECC as the equivalent

procedure which replaces ANSI/AWWA C651 – Standard for Disinfecting Water Mains with respect to the cleaning, tapping, maintenance and repair of watermains, appurtenances and fittings.

By January 29, 2016, all personnel working in the distribution system must review the Watermain Disinfection Procedure found in Appendix A. By January 20, 2016, confirmation that all personnel working in the distribution system have reviewed the Watermain Disinfection Procedure must be provided in writing to the undersigned Water Inspector by email: aaron.causyn@ontario.ca.

Action(s) Taken:
On January 27, 2016 a meeting with all the distribution operators was held to review the disinfection procedure "Watermain Disinfection Procedure". Following the meeting an email was sent to the Water Inspector, Aaron Causyn informing him that the procedure had been reviewed, a copy of the Water Disinfection Procedure operator review sign-off sheet was attached. See attachments for email/operator sign-off sheet.

Non-Compliance with the Permit to Take Water 7280-6UAMD9:

There were no incidences of non-compliance with the Terms and Conditions of the Permit to Take Water during this reporting period.

Provincial Orders:

No Orders have been issued by the Ministry of the Environment with respect to municipal drinking water system during this reporting period.

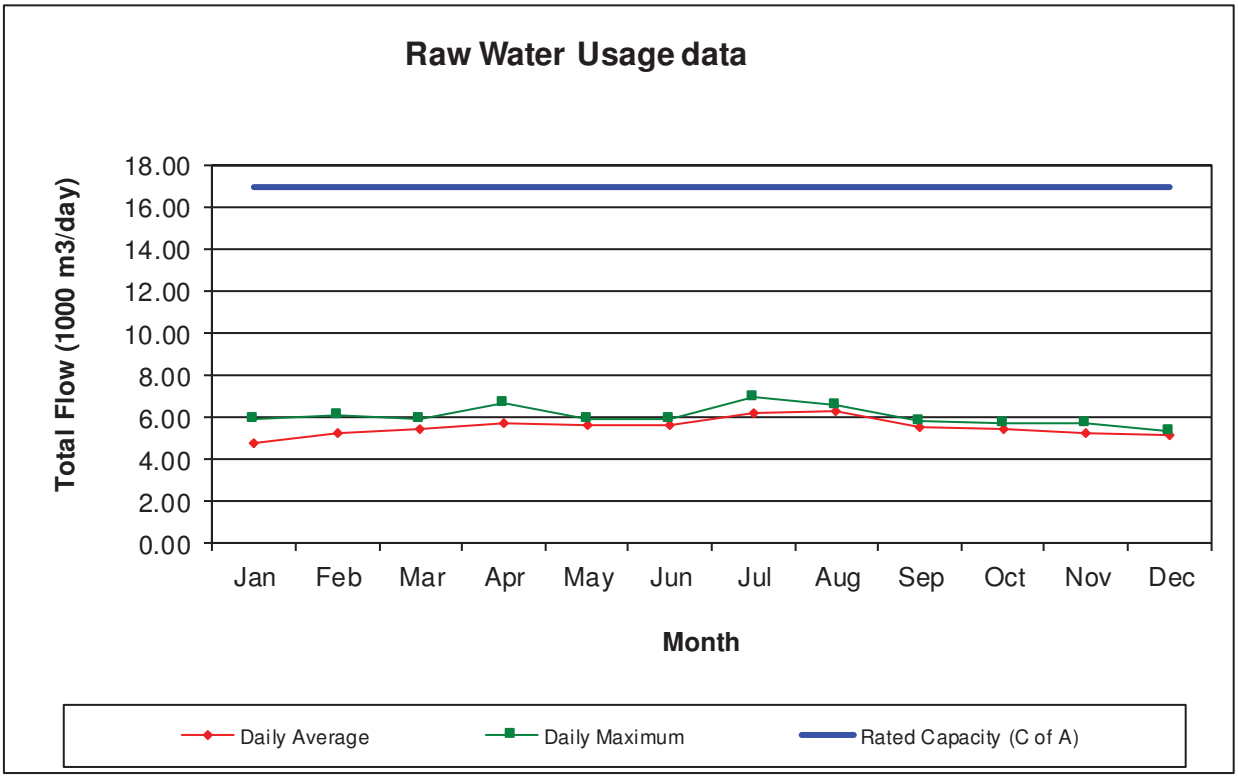
6.0 Quantity and Flow Data (2015)

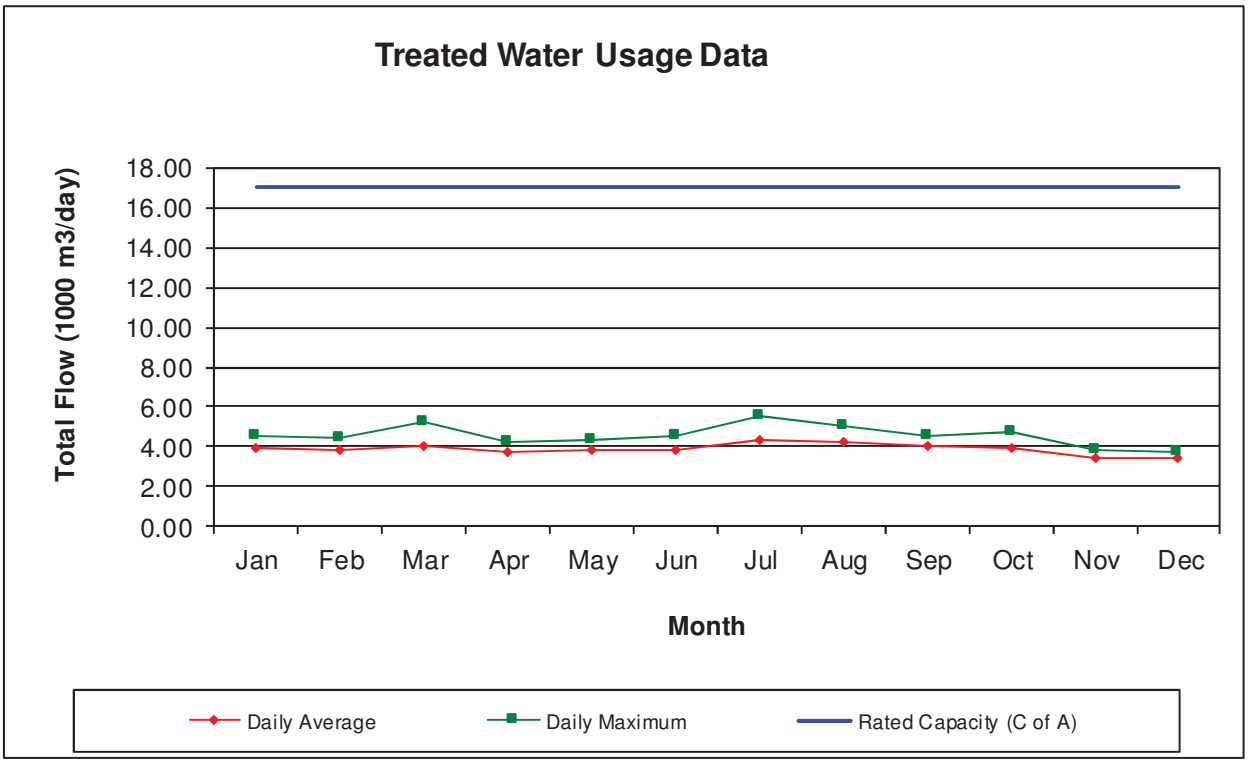
The following tables and graphs indicate the quantities and flow rates of water taken and produced during the reporting period, including monthly average flows, maximum daily flows and total monthly volumes.

Table 1 - RAW WATER USAGE - 2015						
Month	**Total Unit (1000 m³)**	**Daily Average Unit (1000 m³)**	**Max Day Unit (1000 m³)**		**Max Daily Instantaneous Peak Flow Rate (m³/min.)**	
January	147.28	4.75	5.89	Jan. 26/15	3.68	Jan. 09/15
February	146.69	5.24	6.12	Feb. 24/15	4.29	Feb. 24/15
March	168.79	5.44	5.97	Mar. 14/15	3.96	Mar. 12/15
April	165.70	5.71	6.65	Apr. 17/15	4.58	Apr. 15/15
May	175.81	5.67	5.94	May 03/15	4.05	May 30/15
June	168.11	5.60	5.95	Jun. 13/15	4.04	Jun. 02/15
July	193.37	6.24	6.97	Jul. 12/15	6.67	Jul. 18/15
August	195.88	6.32	6.62	Aug. 23/15	4.61	Aug. 14 & 23/15
September	166.27	5.54	5.81	Sept. 14/15	5.31	Sept. 21/15
October	170.41	5.50	5.73	Oct. 24/15	3.88	Oct. 02/15
November	159.39	5.31	5.78	Nov. 01/15	3.83	Nov. 01/15
December	159.58	5.15	5.38	Dec. 12/15	3.76	Dec. 03/15
Yearly Totals	2017.28	5.54	6.97 Jul. 12/15		6.67 Jul. 18/15	

Table 2 - TREATED WATER USAGE - 2015						
Month	**Total Unit (1000 m³)**	**Daily Average Unit (1000 m³)**	**Max Day Unit (1000 m³)**		**Max Daily Instantaneous Peak Flow Rate (m³/min.)**	
January	117.88	3.93	4.58	Jan. 11/15	5.98	Jan. 03/15
February	107.69	3.85	4.47	Feb. 28/15	6.66	Feb. 07/15
March	126.45	4.08	5.23	Mar. 10/15	6.24	Mar. 27/15
April	112.83	3.76	4.26	Apr. 12/15	5.33	Apr. 16/15
May	120.10	3.87	4.38	May 03/15	6.90	May 09/15
June	116.43	3.88	4.56	Jun. 18/15	5.91	Jun. 17/15
July	134.84	4.35	5.53	Jul. 28/15	5.47	Jul. 04/15
August	130.29	4.20	5.03	Aug. 16/15	5.84	Aug. 02/15
September	121.92	4.06	4.59	Sept. 29/15	4.59	Sept. 25/15
October	123.45	3.98	4.72	Oct. 05/15	5.38	Oct. 18/15
November	102.56	3.42	3.86	Nov. 16/15	4.93	Nov. 18/15
December	107.11	3.46	3.76	Dec. 20/15	3.88	Dec. 31/15
Yearly Totals	1421.55	3.90	5.53 Jul. 28/15		6.90 May 09/15	

Comparison of Flow Summary to Rated Capacity
(Municipal Drinking Water Licence Number 224-201)





The **Permit to Take Water #7280-6UAMD9** (Issued October 5, 2006) allows the municipality to draw 17,000 m^3/day at a maximum flow rate of 12,000 L/min. from its raw water source. As indicated from the charts provided, the maximum daily flow of raw water in 2015 is 6,970 m^3/day recorded on July 12, 2015, which is 41.0% of the maximum allowable flow rate.

The maximum instantaneous peak flow rate for **Raw** water is 6.670 m^3 /min. (6,670 L/min.) which was recorded on July 18, 2015 due general to water system maintenance and repair work. This accounted for 55.6% of the maximum allowable flow rate.

In accordance with the Municipal Drinking Water License No. 224-101, the Town of Fort Frances Drinking Water System shall not be operated to exceed the rated capacity of 17,000 m^3/day on any calendar day, conveyed from the treatment system to the distribution system. The highest single day treated flow of 5,530 m^3/day was recorded on July 28, 2015, which is 32.5% of the plant's maximum capacity.

The maximum instantaneous peak flow rate for **Treated** water is 6.90 m^3/min. (6,900 L/min.) recorded on May 09, 2015, which is 57.5% of the plant's maximum capacity.

There were no instances of treated water flows exceeding the rated capacity as stated in the Municipal Drinking Water Licence during the reporting period of January 1 to December 31, 2015.

Appendix "A"

MUNICIPAL DRINKING WATER LICENCE
License Number: 224-101
Issue Number: 1

Appendix "B"

DRINKING WATER WORKS PERMIT
Permit Number: 224-201
Issue Number: 1

Appendix "C"

PERMIT TO TAKE WATER
Surface Water
Number: 7280-6UAMD9

Appendix "D"

Regulatory Relief from Lead Sampling Requirements
Fort Frances Water Treatment Plant
Certificate of Approval Number: PB220000978RR-01

Appendix "E"

DRINKING WATER SYSTEM INSPECTION PROGRAM
(2015 – 2016 Inspection Report)

List of References

Safe Drinking Water Act, 2002 (SDWA)
Ontario Regulation 170/03 of the SDWA (Drinking Water Systems),
Ontario Regulation 128/04 of the SDWA (Certification of Drinking Water System Operators and Water Quality Analysts),
Ontario Regulation 169/03 of the SDWA (Ontario Drinking Water Quality Standards)
Ontario Regulation 188/07 of the SDWA (Licensing of Municipal Drinking Water Systems)

MUNICIPAL DRINKING WATER LICENCE

Licence Number: 224-101
Issue Number: 1

Pursuant to the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this municipal drinking water licence is issued under Part V of the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32 to:

The Corporation of the Town of Fort Frances

320 Portage Avenue
Fort Frances, ON P9A 3P9

For the following municipal residential drinking water system:

Fort Frances Drinking Water System

This municipal drinking water licence includes the following:

Schedule	Description
Schedule A	Drinking Water System Information
Schedule B	General Conditions
Schedule C	System-Specific Conditions
Schedule D	Conditions for Relief from Regulatory Requirements

DATED at TORONTO this 29th day of July, 2011

Signature

Indra R. Prashad, P.Eng.
Director
Part V, *Safe Drinking Water Act*, 2002

Schedule A: Drinking Water System Information

System Owner	**The Corporation of the Town of Fort Frances**
Licence Number	**224-101**
Drinking Water System Name	**Fort Frances Drinking Water System**
Schedule A Issue Date	**July 29th, 2011**

The following information is applicable to the above drinking water system and forms part of this licence:

Licence

Licence Issue Date	July 29, 2011
Licence Expiry Date	July 27, 2016
Application for Licence Renewal Date	January 26, 2016

Drinking Water Works Permit

Drinking Water System Name	Permit Number	Issue Date
Fort Frances Drinking Water System	224-201	July 19, 2011

Permits to Take Water

Water Taking Location	Permit Number	Issue Date
Rainy River	7280-6UAMD9	July 12, 2006

Financial Plans

The Financial Plan Number for the Financial Plan required to be developed for this drinking water system in accordance with O. Reg. 453/07 shall be:	224-301
Alternately, if one Financial Plan is developed for all drinking water systems owned by the owner, the Financial Plan Number shall be:	224-301A

Accredited Operating Authority

Drinking Water System or Operational Subsystems	Accredited Operating Authority	Operational Plan Number
Fort Frances Drinking Water System	The Corporation of the Town of Fort Frances	224-401

Schedule B: General Conditions

System Owner	**The Corporation of the Town of Fort Frances**
Licence Number	**224-101**
Drinking Water System Name	**Fort Frances Drinking Water System**
Schedule B Issue Date	**July 29th, 2011**

1.0 Definitions

1.1 Words and phrases not defined in this licence and the associated drinking water works permit shall be given the same meaning as those set out in the SDWA and any regulations made in accordance with that act, unless the context requires otherwise.

1.2 In this licence and the associated drinking water works permit:

"**adverse effect**", "**contaminant**" and "**natural environment**" shall have the same meanings as in the EPA;

"**alteration**" may include the following in respect of this drinking water system:

(a) An addition to the system,
(b) A modification of the system,
(c) A replacement of part of the system, and
(d) An extension of the system;

"**compound of concern**" means a contaminant that, based on generally available information, may be emitted from a component of the drinking water system to the atmosphere in a quantity that is significant either in comparison to the relevant point of impingement limit or if a point of impingement limit is not available for the compound, then based on generally available toxicological information, the compound has the potential to cause an adverse effect as defined by the EPA at a point of impingement;

"**Director**" means a Director appointed pursuant to section 6 of the SDWA for the purposes of Part V of the SDWA;

"**drinking water works permit**" means the drinking water works permit for the drinking water system as identified in Schedule A of this licence;

"**emission summary table**" means the table that was prepared by a Professional Engineer in accordance with O. Reg. 419/05 and the procedure document listing the appropriate point of impingement concentrations of each compound of concern emitted from a component of the drinking water system and providing comparison to the corresponding point of impingement limit;

"**EPA**" means the *Environmental Protection Act*, R.S.O. 1990, c. E.19;

"**financial plan**" means the financial plan required by O. Reg. 453/07 and the conditions of this licence;

"**licence**" means this municipal drinking water licence for the municipal drinking water system identified in Schedule A of this licence;

"**operational plan**" means an operational plan developed in accordance with the Director's Directions – Minimum Requirements for Operational Plans made under the authority of subsection 15(1) of the SDWA;

"**owner**" means the owner of the drinking water system as identified in Schedule A of this licence;

"**point of impingement**" means any point in the natural environment that is not on the same property as the source of the contaminant and as defined by section 2 of O. Reg. 419/05;

"**point of impingement limit**" means the appropriate standard from Schedule 1, 2 or 3 of O. Reg. 419/05 and if a standard is not provided for a compound of concern, the appropriate criteria listed in the Ministry of the Environment publication titled "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)", dated February 2008, as amended;

"**procedure document**" means the Ministry of the Environment procedure titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July 2005, as amended;

"**Professional Engineer**" means a Professional Engineer who has been licenced to practice in the Province of Ontario;

"**provincial officer**" means a provincial officer appointed pursuant to section 8 of the SDWA;

"**publication NPC-205**" means the Ministry of the Environment publication titled "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)" dated October 1995, as amended;

"**publication NPC-207**" means the Ministry of the Environment draft technical publication titled "Impulse Vibration in Residential Buildings" dated November 1983, supplementing the Ministry of the Environment "Model Municipal Noise Control By-law, Final Report" dated August 1978;

"**publication NPC-232**" means the Ministry of the Environment publication titled "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)" dated October 1995, as amended;

"**SDWA**" means the *Safe Drinking Water* Act, 2002, S.O. 2002, c. 32;

"**sensitive populations**" means any one or a combination of the following locations where the health effects of nitrogen oxides emissions from emergency generator(s) shall be considered using the point of impingement limit instead of the Ministry of the Environment screening level for emergency generator(s):

(a) health care units (e.g., hospitals and nursing homes),
(b) primary/junior public schools,
(c) day-care facilities, and
(d) playgrounds;

2.0 Applicability

2.1 In addition to any other requirements, the drinking water system identified above shall be established, altered and operated in accordance with the conditions of the drinking water works permit and this licence.

3.0 Licence Expiry

3.1 This licence expires on the date identified as the licence expiry date in Schedule A of this licence.

4.0 Licence Renewal

4.1 Any application to renew this licence shall be made on or before the date identified as the application for licence renewal date set out in Schedule A of this licence.

5.0 Compliance

5.1 The owner and operating authority shall ensure that any person authorized to carry out work on or to operate any aspect of the drinking water system has been informed of the SDWA, all applicable regulations made in accordance with that act, the drinking water works permit and this licence and shall take all reasonable measures to ensure any such person complies with the same.

6.0 Licence and Drinking Water Works Permit Availability

6.1 At least one copy of this licence and the drinking water works permit shall be stored in such a manner that they are readily viewable by all persons involved in the operation of the drinking water system.

7.0 Permits to Take Water

7.1 A permit to take water identified in Schedule A of this licence is associated with the taking of water for purposes of the operation of the drinking water system and is the applicable permit on the date identified as the Schedule A Issue Date.

8.0 Financial Plan

8.1 The owner of the drinking water system, by the later of July 1, 2010 and the date that is six months after the date the first licence for the system is issued, shall prepare and approve financial plans for the system that satisfy the requirements prescribed under section 3 of O. Reg. 453/07.

8.2 The owner of the drinking water system shall ensure that every financial plan prepared in accordance with subsections 2 (1) and 3 (1) of O. Reg. 453/07 contains on the front page of the financial plan, the appropriate financial plan number as set out in Schedule A of this licence.

9.0 Interpretation

9.1 Where there is a conflict between the provisions of this licence and any other document, the following hierarchy shall be used to determine the provision that takes precedence:

9.1.1 The SDWA*;*

9.1.2 A condition imposed in this licence that explicitly overrides a prescribed regulatory requirement;

9.1.3 A condition imposed in the drinking water works permit that explicitly overrides a prescribed regulatory requirement;

9.1.4 Any regulation made under the SDWA;

9.1.5 Any provision of this licence that does not explicitly override a prescribed regulatory requirement;

9.1.6 Any provision of the drinking water works permit that does not explicitly override a prescribed regulatory requirement;

9.1.7 Any application documents listed in this licence, or the drinking water works permit from the most recent to the earliest; and

9.1.8 All other documents listed in this licence, or the drinking water works permit from the most recent to the earliest.

9.2 If any requirement of this licence or the drinking water works permit is found to be invalid by a court of competent jurisdiction, the remaining requirements of this licence and the drinking water works permit shall continue to apply.

9.3 The issuance of and compliance with the conditions of this licence and the drinking water works permit does not:

9.3.1 Relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including the *Environmental Assessment Act*, R.S.O. 1990, c. E.18; and

9.3.2 Limit in any way the authority of the appointed Directors and provincial officers of the Ministry of the Environment to require certain steps be taken or to require the owner to furnish any further information related to compliance with the conditions of this licence or the drinking water works permit.

9.4 For greater certainty, nothing in this licence or the drinking water works permit shall be read to provide relief from regulatory requirements in accordance with section 46 of the SDWA, except as expressly provided in the licence or the drinking water works permit.

10.0 Adverse Effects

10.1 Nothing in this licence or the drinking water works permit shall be read as to permit:

10.1.1 The discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or

10.1.2 The discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters.

10.2 All reasonable steps shall be taken to minimize and ameliorate any adverse effect on the natural environment or impairment of the quality of water of any waters resulting from the operation of the drinking water system including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

10.3 Fulfillment of one or more conditions imposed by this licence or the drinking water works permit does not eliminate the requirement to fulfill any other condition of this licence or the drinking water works permit.

11.0 Change of Owner or Operating Authority

11.1 This licence is not transferable without the prior written consent of the Director.

11.2 The owner shall notify the Director in writing of a change of any operating authority identified in Schedule A of this licence.

12.0 Information to be Provided

12.1 Any information requested by a Director or a provincial officer concerning the drinking water system and its operation, including but not limited to any records required to be kept by this licence or the drinking water works permit, shall be provided upon request.

13.0 Records Retention

13.1 Except as otherwise required in this licence or the drinking water works permit, any records required by or created in accordance with this licence or the drinking water works permit, other than the records specifically referenced in section 12 of O. Reg. 170/03, shall be retained for at least 5 years and made available for inspection by a provincial officer, upon request.

14.0 Chemicals and Materials

14.1 All chemicals and materials used in the alteration or operation of the drinking water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60 and NSF/61.

14.2 The most current chemical and material product registration documentation from a testing institution accredited by either the Standards Council of Canada or by the American National Standards Institution ("ANSI") shall be available at all times for each chemical and material used in the operation of the drinking water system that comes into contact with water within the system.

14.3 Conditions 14.1 and 14.2 do not apply in the case of the following:

14.3.1 Water pipe and pipe fittings meeting AWWA specifications made from ductile iron, cast iron, PVC, fibre and/or steel wire reinforced cement pipe or high density polyethylene (HDPE);

14.3.2 Articles made from stainless steel, glass, HDPE or Teflon®;

14.3.3 Cement mortar for watermain lining and for water contacting surfaces of concrete structures made from washed aggregates and Portland cement;

14.3.4 Food grade oils and lubricants; or

14.3.5 Any particular chemical or material where the owner has written documentation signed by the Director that indicates that the Ministry of the Environment is satisfied that the chemical or material is acceptable for use within the drinking water system and the chemical or material is only used as permitted by the documentation.

15.0 Drawings

15.1 All drawings and diagrams in the possession of the owner that show any treatment subsystem as constructed shall be retained by the owner unless the drawings and diagrams are replaced by a revised or updated version showing the subsystem as constructed subsequent to the alteration.

15.2 Any alteration to any treatment subsystem shall be incorporated into process flow diagrams, process and instrumentation diagrams, and record drawings and diagrams within one year of the substantial completion of the alteration.

15.3 Process flow diagrams and process and instrumentation diagrams for any treatment subsystem shall be kept in a place, or made available in such a manner, that they may be readily viewed by all persons responsible for all or part of the operation of the drinking water system.

16.0 Operations and Maintenance Manual

16.1 An up-to-date operations and maintenance manual or manuals shall be maintained and applicable parts of the manual or manuals shall be made available for reference by all persons responsible for all or part of the operation or maintenance of the drinking water system.

16.2 The operations and maintenance manual or manuals, shall include at a minimum:

16.2.1 The requirements of this licence and associated procedures;

16.2.2 The requirements of the drinking water works permit for the drinking water system;

16.2.3 Procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water system;

16.2.4 Procedures for the operation and maintenance of monitoring equipment;

16.2.5 Contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown;

16.2.6 Procedures for dealing with complaints related to the drinking water system, including the recording of the nature of the complaint and any investigation and corrective action taken in respect of the complaint;

16.3 Procedures necessary for the operation and maintenance of any alterations to the drinking water system shall be incorporated into the operations and maintenance manual or manuals prior to those alterations coming into operation.

Schedule C: System-Specific Conditions

System Owner	**The Corporation of the Town of Fort Frances**
Licence Number	**224-101**
Drinking Water System Name	**Fort Frances Drinking Water System**
Schedule C Issue Date	**July 29th, 2011**

1.0 Performance Limits

Rated Capacity

1.1 For each treatment subsystem listed in column 1 of Table 1, the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed the value identified as the rated capacity in column 2 of the same row.

Table 1: Rated Capacity

Column 1 Treatment Subsystem Name	Column 2 Rated Capacity (m^3/day)
Fort Frances Water Treatment Plant	17,000

1.2 Despite condition 1.1, a treatment subsystem may be operated temporarily at a daily volume above the value set out in column 2 of Table 1 for the purposes of fighting a large fire or for the maintenance of the drinking water system.

1.3 Condition 1.2 does not authorize the discharge into the distribution system of any water that does not otherwise meet all of the requirements of this licence and all other regulatory requirements, including compliance with the Ontario Drinking Water Quality Standards.

Maximum Flow Rates

1.4 For each treatment subsystem listed in column 1 of Table 2, the maximum flow rate of water that flows into a treatment subsystem component listed in column 2 shall not exceed the value listed in column 3 of the same row.

Table 2: Maximum Flow Rates

Column 1 Treatment Subsystem Name	Column 2 Treatment Subsystem Component	Column 3 Maximum Flow Rate (L/s)
Not Applicable	Not Applicable	Not Applicable

Residue Management

1.5 In respect of an effluent discharged into the natural environment from a treatment subsystem or treatment subsystem component listed in column 1 of Table 3:

1.5.1 The annual average concentration of a test parameter identified in column 2 shall not exceed the value in column 3 of the same row; and

1.5.2 The maximum concentration of a test parameter identified in column 2 shall not exceed the value in column 4 of the same row.

Table 3: Residue Management

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Annual Average Concentration (mg/L)	Column 4 Maximum Concentration (mg/L)
Not Applicable	Not Applicable	Not Applicable	Not Applicable

UV Disinfection Equipment Performance

1.6 For each treatment subsystem or treatment subsystem component listed in column 1 of Table 4, the UV disinfection equipment shall be operated such that a continuous pass-through UV dose is maintained throughout the life time of the UV lamp(s) that is at least the minimum continuous pass-through UV dose set out in column 2 of the same row.

Table 4: UV Disinfection Equipment Performance

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Minimum Continuous Pass-Through UV Dose (mJ/cm^2)
Not Applicable	Not Applicable

2.0 Flow Measurement and Recording Requirements

2.1 For each treatment subsystem identified in column 1 of Table 1 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:

2.1.1 The flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system.

2.1.2 The flow rate and daily volume of water that flows into the treatment subsystem.

2.2 For each treatment subsystem component identified in column 2 of Table 2 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for the flow rate and daily volume of water that flows into the treatment subsystem component.

2.3 Where a rated capacity from Table 1 or a maximum flow rate from Table 2 is exceeded, the following shall be recorded:

2.3.1 The difference between the measured amount and the applicable rated capacity or maximum flow rate specified in Table 1 or Table 2;

2.3.2 The time and date of the measurement;

2.3.3 The reason for the exceedance; and

2.3.4 The duration of time that lapses between the applicable rated capacity or maximum flow rate first being exceeded and the next measurement where the applicable rated capacity or maximum flow rate is no longer exceeded.

3.0 Calibration of Flow Measuring Devices

3.1 All flow measuring devices must be checked and calibrated in accordance with the manufacturer's instructions.

3.2 If the manufacturer's instructions do not indicate how often to check and calibrate a flow measuring device, the equipment must be checked and calibrated at least once every year during which the drinking water system is in operation.

4.0 Additional Sampling, Testing and Monitoring

Drinking Water Health and Non-Health Related Parameters

4.1 For each treatment subsystem or treatment subsystem component identified in column 1 of Tables 5 and 6 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 at the sampling frequency listed in column 3 and at the monitoring location listed in column 4 of the same row.

Table 5: Drinking Water Health Related Parameters

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Table 6: Drinking Water Non-Health Related Parameters			
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	**Column 2 Test Parameter**	**Column 3 Sampling Frequency**	**Column 4 Monitoring Location**
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Environmental Discharge Parameters

4.2 For each treatment subsystem or treatment subsystem component identified in column 1 of Table 7 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 using the sample type identified in column 3 at the sampling frequency listed in column 4 and at the monitoring location listed in column 5 of the same row.

4.3 For the purposes of Table 7:

4.3.1 Manual Composite means the mean of at least three grab samples taken during a discharge event, with one sample being taken immediately following the commencement of the discharge event, one sample being taken approximately at the mid-point of the discharge event and one sample being taken immediately before the end of the discharge event; and

4.3.2 Automated Composite means samples must be taken during a discharge event by an automated sampler at a minimum sampling frequency of once per hour.

4.4 Any sampling, testing and monitoring for the test parameter Total Suspended Solids shall be performed in accordance with the requirements set out in the publication “Standard Methods for the Examination of Water and Wastewater”, 21st Edition, 2005, or as amended from time to time by more recently published editions.

Table 7: Environmental Discharge Parameters				
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	**Column 2 Test Parameter**	**Column 3 Sample Type**	**Column 4 Sampling Frequency**	**Column 5 Monitoring Location**
Fort Frances Water Treatment Plant	Suspended Solids	Composite	Quarterly	Point of discharge to Rainy River

UV Disinfection Equipment

4.5 For each treatment subsystem or treatment subsystem component listed in column 1 of Table 8 and in addition to any other sampling, analysis and recording that may be required, continuous monitoring and recording with a minimum testing/reading and recording frequency of every four (4) hours shall be carried out for the test parameters set out in column 3 of the same row.

Table 8: UV Disinfection Equipment

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Control Strategy	Column 3 Test Parameter
Fort Frances Water Treatment Plant	Not Applicable	Not Applicable

5.0 Studies Required

5.1 Not applicable

Schedule D: Conditions for Relief from Regulatory Requirements

System Owner	**The Corporation of the Town of Fort Frances**
Licence Number	**224-101**
Drinking Water System Name	**Fort Frances Drinking Water System**
Schedule D Issue Date	**July 29th, 2011**

1.0 Lead Regulatory Relief

1.1 Any relief from regulatory requirements previously authorized by the Director in respect of the drinking water system under section 38 of the SDWA in relation to the sampling, testing or monitoring requirements contained in Schedule 15.1 of O. Reg. 170/03 shall remain in force until such time as Schedule 15.1 of O. Reg. 170/03 is amended after June 1, 2009.

2.0 Other Regulatory Relief

2.1 Not Applicable.

DRINKING WATER WORKS PERMIT

Permit Number: 224-201
Issue Number: 1

Pursuant to the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this drinking water works permit is issued under Part V of the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32 to:

The Corporation of the Town of Fort Frances

320 Portage Avenue
Fort Frances, ON P9A 3P9

For the following municipal residential drinking water system:

Fort Frances Drinking Water System

This drinking water works permit includes the following:

Schedule	Description
Schedule A	Drinking Water System Description
Schedule B	General
Schedule C	All documents issued as Schedule C to this drinking water works permit which authorize alterations to the drinking water system

DATED at TORONTO this 19th day of July, 2011

Signature

A. Ahmed

Aziz Ahmed, P.Eng.
Director
Part V, *Safe Drinking Water Act*, 2002

Schedule A: Drinking Water System Description

System Owner	**The Corporation of the Town of Fort Frances**
Permit Number	**224-201**
Drinking Water System Name	**Fort Frances Drinking Water System**
Schedule A Issue Date	**July 19th, 2011**

1.0 System Description

1.1 The following is a summary description of the works comprising the above drinking water system:

Overview

The **Fort Frances Drinking Water System** consists of a drinking water treatment plant, a two-celled storage ground reservoir, an elevated storage tank and approximately 6.0 kilometers of trunk watermains and 70.4 kilometers of distribution watermains.

The Fort Frances Water Treatment Plant is a conventional surface water treatment plant. Raw water is drawn from Rainy River through low lift pumps. Liquid alum is added to the raw water ahead of the in-line mixer for coagulation while polyelectrolytes are added to the solids contact tanks for assisting flocculation. The water then flows to the two solids contact clarifiers units, operating in parallel, where flocculation and sedimentation occurs. The settled floc is disposed of to the sanitary sewer. Powdered activated carbon, soda ash, and hydrofluosilicic are also added ahead of in-line mixer, in solids contact clarifiers, and/or in chemical contact chambers, as needed, for taste and odour and pH adjustment. The settled effluent is gravity fed to four dual media gravity sand filters. The filters are equipped with a backwash pump. The filtered water flows to a two-celled, ground storage reservoir through a chemical contact chamber. Chlorine and fluoride are added in the chemical contact chamber. The treated water then flows to the high lift pump wells where it is pumped to the distribution system. Chlorine residual and fluoride are monitored with continuous on-line analyzers just prior to the water leaving the plant. The Fort Frances Drinking Water System also includes an elevated water storage tank within the distribution system equipped with re-chlorination facilities.

Fort Frances Water Treatment Plant

Treatment Plant

Location and General Description

Name	Fort Frances Water Treatment Plant housed in an approximately 46 m by 32 m masonry structure
Street Address	901 Colonization Road East
UTM Coordinates	NAD 83: Zone 15 +/- 10m: Easting 472938: Northing 5384735
System Type	Treatment, storage and distribution
Notes	Houses screen chamber, low and high lift pumps, solids contact clarifiers, filters, chemical storage and feeding equipment, instrumentation and control, an administration area comprising of an office, lunchroom, washrooms and control room/laboratory

Surface Water Supply

Raw Water Intake

Description	Approximately 190 m of 630 mm diameter intake pipe located in the Rainy River including an upturned elbow intake structure with a coarse bar screen
Source	Rainy River
Location	Approximately 190 m east of the Water Treatment Plant in Rainy River
Notes	

Low Lift Works

Screens

Description	A raw water screen chamber equipped with two sets of screens
Dimensions	Each screen 2.25 m^2 in area
Notes	Screen chamber located ahead of raw water pumping well

Low Lift Pumps

Description	Three (3) vertical turbine low lift pumps
Capacity	- Two (2) pumps rated at 100 L/s against a total dynamic head (TDH) of 14 m - One (1) VFD pump capable of providing flows in the range of 40 to 150 L/s against a total dynamic head (TDH) of 14m
Metering Device	Equipped with one metering device for measuring raw water flows
Notes	

Coagulation

In-Line Mixer

Description	An in-line mixer located downstream of the low lift pumps within the influent (raw water) line to facilitate the dosing of liquid alum, activated carbon slurry and soda ash solution
Dimensions	450 mm diameter
Notes	Located between low lift pumps and solids contact clarifiers

Flocculation/Clarification

Flocculation/Clarification Tanks - Solids Contact Clarifiers

Description	Two (2) solids contact clarifier units, operating in parallel equipped with facilities for polymer dosing
Dimensions	Each solids contact clarifier approximately 13.7 m x 13.7 m x 3.75 m side water depth (s.w.d.)
Notes	The settled floc is discharged to sanitary sewer

Filtration

Filters

Description	Four (4) dual media, gravity filters (sand and anthracite)
Dimensions	Each filter approximately 4.9 m x 4.9 m providing a total filtration area of 96 m^2
Equipment	One (1) vertical turbine backwash pump capable of delivering 290.3 L/s at 14 m TDH at one condition point and 94.7 L/s at another condition point
	A turbidimeter on each filter
	All filters equipped with an underdrain and air scouring system
Notes	

Instrumentation and Control

SCADA System

Description	A computerized control system monitoring the critical components of the process including raw and finished water quantity and quality
Equipment	Four (4) turbidimeters for continuously monitoring filter effluent
	One (1) laboratory model turbidimeter for manual testing
	One (1) continuous chlorine/fluoride analyzer monitoring free chlorine and fluoride residual in the discharge pipe of the high lift pumps
	Three (3) flowmeters to measure flow at various locations
Notes	Status of the elevated storage tank by telemetry, receiving alarms and controlling the operation

Waste Residual Management

Outfall Pipe

Description	Filter backwash disposal
Dimensions	Approximately 60 m of 800 mm diameter pipe
	One (1) vertical turbine backwash pump capable of delivering 290.3 L/s at 14 m TDH at one condition point and 94.7 L/s at another condition point
Notes	Filter backwash water returned to Rainy River through outfall line

Sludge Disposal

Description	Solids contact clarifier settled sludge disposal
Equipment	Settled sludge discharged through a 150 mm pipe using pneumatic blow down valves - gravity system, no pumps utilized
Notes	Solids contact clarifier settled sludge discharged to the sanitary sewer system

High Lift Works

High Lift Pumps

Description	Four (4) vertical turbine high lift pumps and one (1) diesel engine driven vertical turbine fire pump
Capacity	Two (2) vertical turbine pumps rated at 63.1 L/s. at TDH of 55m
	One (1) vertical turbine pump rated at 94.7 L/s at TDH of 55m
	One (1) vertical turbine pump rated at 126.2 L/s at a TDH of 55m
	One (1) fire pump rated at 220 L/s at a TDH of 53m
Notes	The fire pump also serves as standby for the high lift pumps and includes a metering device for measuring finished water flows

On-Site Storage

Chemical Contact Chamber

Description	One (1) chemical contact chamber to provide chlorine contact time
Volume	240 m^3
Notes	

Clearwell/Reservoir

Description	Two-celled, ground storage reservoir
Capacity	Cell No. 1 = 2,565 m^3 Cell No. 2 = 1,465 m^3 Total = 4,030 m^3
Notes	The two cells receive filtered water after passing through chemical contact chamber

Chemical Addition

Alum

Description	Alum feed system for coagulation
Feed Point	Liquid alum to the raw water ahead of the in-line mixer for coagulation
Equipment	A chemical metering pump with a calibration cylinder controlled automatically on the basis of the raw water flow complete with alum storage
	A day tank with secondary spill containment
Notes	

Chlorine

Description	Chlorine gas disinfection System
Feed Point	Chemical contact chamber and discharge line from high lift pumps to the distribution system
Equipment	One (1) 100 kg/day V-notch duty chlorinator
	One (1) 227 kg/day V-notch standby chlorinator including: - two (2) one tonne chlorine cylinders with an automatic switch over device in a separate room - a weight scale - chemical metering pumps - a free chlorine analyzer for monitoring finished water residuals
Notes	

Hydrofluosilicic Acid

Description	Fluoridation system
Feed Point	Chemical Contact Chamber
Equipment	One (1) day tank
	One (1) chemical metering pump
	Secondary spill containment
Notes	

Polyelectrolytes

Description	Polyelectrolytes to the solids contact tanks for assisting flocculation
Feed Point	Solids Contact Clarifiers
Equipment	Two (2) chemical metering pumps complete with aging and batch tanks
Notes	

Powdered Activated Carbon

Description	Powdered activated carbon for taste and odor control
Feed Point	Ahead of in-line mixer or solids contact clarifiers
Equipment	One (1) slurry tank
	One (1) chemical metering pump
	Secondary spill containment
	A dust control system
Notes	

Soda Ash

Description	Soda ash dosing system for pH adjustment
Feed Point #1	Chemical contact chamber
Feed Point #2	Solid contact clarifiers
Feed Point #3	In-line mixture
Equipment	A silo inside the building
	One (1) day tank
	Volumetric feeder
	A dust collector
Notes	

Polymer

Description	Polymer feed system c/w back-up system
Feed Point	Within the solids contact clarifiers
Equipment	One (1) 114 L capacity aging tank
	One (1) 150 L capacity solution tank
	Two (2) metering pumps each capable of delivering up to 20 L/min; one to each clarifier. Pumps capable of delivering to each clarifier.
Notes	Back-up system is similar is size and capacity.

Fort Frances Water Distribution System

Elevated Storage Tank

Description	An elevated storage tank
Location	South-east side of the intersection of Colonization Road West and McIrvine Road
UTM Coordinates	NAD 83: Zone 15 +/- 10: Easting 468540: Northing 5383616
Capacity	4,500 m^3
Equipment	Includes calcium hypochloride re-chlorination facility along with: - a telemetry system providing the water level information to the main computer at the plant; and - a looped circulation system
Notes	

Watermains

1.2 Watermains within the distribution system comprise:

1.2.1 Watermains that have been set out in each document or file identified in column 1 of Table 1.

Table 1: Watermains

Column 1 Document or File Name	Column 2 Date
TOWN OF FORT FRANCES WATER DISTRIBUTION SYSTEM - EAST.pdf	January 12, 2010
TOWN OF FORT FRANCES WATER DISTRIBUTION SYSTEM - WEST.pdf	
TOWN OF FORT FRANCES WATER DISTRIBUTION SYSTEM.pdf	

1.2.2 Watermains that have been added, modified, replaced or extended further to the provisions of Schedule C of this drinking water works permit on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

Schedule B: General

System Owner	**The Corporation of the Town of Fort Frances**
Permit Number	**224-201**
Drinking Water System Name	**Fort Frances Drinking Water System**
Schedule B Issue Date	**July 19th, 2011**

1.0 Applicability

1.1 In addition to any other requirements, the drinking water system identified above shall be altered and operated in accordance with the conditions of this drinking water works permit and the licence.

1.2 The definitions and conditions of the licence shall also apply to this drinking water works permit.

2.0 Alterations to the Drinking Water System

2.1 Any document issued by the Director as a Schedule C to this drinking water works permit shall provide authority to alter the drinking water system in accordance, where applicable, with the conditions of this drinking water works permit and the licence.

2.2 All Schedule C documents issued by the Director for the drinking water system shall form part of this drinking water works permit.

2.3 All parts of the drinking water system in contact with drinking water which are:

2.3.1 Added, modified, replaced, extended; or

2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination,

shall be disinfected before being put into service in accordance with the provisions of the AWWA C651 – Standard for Disinfecting Water Mains; AWWA C652 – Standard for Disinfection of Water-Storage Facilities; AWWA C653 – Standard for Disinfection of Water Treatment Plants; or AWWA C654 – Standard for Disinfection of Wells; or an equivalent procedure.

2.4 The owner shall notify the Director within thirty (30) days of the placing into service or the completion of any addition, modification, replacement or extension of the drinking water system which had been authorized through:

2.4.1 Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;

2.4.2 Any Schedule C to this drinking water works permit respecting works other than watermains; or

2.4.3 Any approval issued prior to the issue date of the first drinking water works permit respecting works other than watermains which were not in service at the time of the issuance of the first drinking water works permit.

2.5 For greater certainty, the notification requirements set out in condition 2.4 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

2.5.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03;

2.5.2 Constitutes maintenance or repair of the drinking water system; or

2.5.3 Is a watermain authorized by condition 3.1 of Schedule B of this drinking water works permit.

2.6 The owner shall notify the legal owner of any part of the drinking water system that is prescribed as a municipal drinking water system by section 2 of O. Reg. 172/03 of the requirements of the licence and this drinking water works permit as applicable to the prescribed system.

2.7 For greater certainty, any alteration to the drinking water system made in accordance with this drinking water works permit may only be carried out after other legal obligations have been complied with including those arising from the *Environmental Assessment Act*, *Niagara Escarpment Planning and Development Act*, *Oak Ridges Moraine Conservation Act, 2001* and *Greenbelt Act, 2005*.

3.0 Watermain Additions, Modifications, Replacements and Extensions

3.1 The drinking water system may be altered by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:

3.1.1 The design of the watermain addition, modification, replacement or extension:

a) Has been prepared by a Professional Engineer;

b) Has been designed only to transmit water and has not been designed to treat water;

c) Satisfies the design criteria set out in the Ministry of the Environment publication “Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – March 2009”, as amended from time to time; and

d) Is consistent with or otherwise addresses, the design objectives contained within the Ministry of the Environment publication “Design Guidelines for Drinking Water Systems, 2008”, as amended from time to time.

3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.

3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.

3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.

3.1.6 The owner of the drinking water system consents to the watermain addition, modification, replacement or extension.

3.1.7 A Professional Engineer has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.

3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.

3.2 The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:

3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;

3.2.2 Has a nominal diameter greater than 750 mm;

3.2.3 Connects to another drinking water system; or

3.2.4 Results in the fragmentation of the drinking water system.

3.3 The verifications required in conditions 3.1.7 and 3.1.8 shall be:

3.3.1 Recorded on "Form 1 – Record of Watermains Authorized as a Future Alteration" as published by the Ministry of the Environment; and

3.3.2 Retained for a period of ten (10) years by the owner.

3.4 For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

3.4.2 Constitutes maintenance or repair of the drinking water system.

3.5 The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.

3.6 The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

4.0 Minor Modifications to the Drinking Water System

4.1 The drinking water system may be altered by modifying or replacing the following components:

4.1.1 Raw water, treatment process or treated water pumps;

4.1.2 Chemical metering or chemical handling pumps;

4.1.3 Valves;

4.1.4 Instrumentation and controls;

4.1.5 Cathodic corrosion protection; or

4.1.6 Spill containment works.

4.2 The drinking water system may be altered by replacing the following:

4.2.1 Raw water, treatment process or treated water piping within the treatment subsystem.

4.3 The modification or replacement of a drinking water system component set out in condition 4.1 or the replacement of a drinking water system component set out in condition 4.2 must not result in:

4.3.1 An exceedance of a treatment subsystem rated capacity or a treatment subsystem component maximum flow rate as specified in the licence;

4.3.2 The bypassing of any unit process within a treatment subsystem;

4.3.3 A deterioration in the quality of drinking water provided to consumers;

4.3.4 A reduction in the reliability or redundancy of any component of the drinking water system;

4.3.5 A negative impact on the ability to undertake compliance and other monitoring; or

4.3.6 An adverse effect on the environment.

4.4 The owner shall verify in writing that the modification or replacement of drinking water system components in accordance with conditions 4.1 and 4.2 has met the requirements of the conditions listed in condition 4.3.

4.5 The verifications required in condition 4.4 shall be:

4.5.1 Recorded on "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System" as published by the Ministry of the Environment; and

4.5.2 Retained for a period of ten (10) years by the owner.

4.6 For greater certainty, the verification requirements set out in conditions 4.4 and 4.5 do not apply to any modification or replacement in respect of the drinking water system which:

4.6.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

4.6.2 Constitutes maintenance or repair of the drinking water system.

4.7 The owner shall update any drawings maintained for the drinking water system to reflect the modification or replacement of the works, where applicable.

5.0 Equipment with Emissions to the Air

5.1 The drinking water system may be altered by adding, modifying or replacing any of the following drinking water system components that may discharge or alter the rate or manner of a discharge of a compound of concern to the atmosphere:

5.1.1 Any equipment, apparatus, mechanism or thing that is used for the transfer of outdoor air into a building or structure that is not a cooling tower;

5.1.2 Any equipment, apparatus, mechanism or thing that is used for the transfer of indoor air out of a space used for the production, processing, repair, maintenance or storage of goods or materials, including chemical storage;

5.1.3 Laboratory fume hoods used for drinking water testing, quality control and quality assurance purposes;

5.1.4 Low temperature handling of compounds with a vapor pressure of less than 1 kilopascal;

5.1.5 Maintenance welding stations;

5.1.6 Minor painting operations used for maintenance purposes;

5.1.7 Parts washers for maintenance shops;

5.1.8 Emergency chlorine and ammonia gas scrubbers;

5.1.9 Venting for activated carbon units for drinking water taste and odour control;

5.1.10 Venting for a stripping unit for methane removal from a groundwater supply;

5.1.11 Natural gas or propane fired boilers, water heaters, space heaters and make-up air units with a total facility-wide heat input rating of less than 20 million kilojoules per hour, and with an individual fuel energy input of less than or equal to 10.5 gigajoules per hour; and

5.1.12 Emergency generators that fire No. 2 fuel oil (diesel fuel) with a sulphur content of 0.5 per cent or less measured by weight, natural gas, propane, gasoline or biofuel, and that are used for emergency duty only with periodic testing.

5.2 The owner shall not add, modify or replace a drinking water system component set out in condition 5.1 for an activity that is not directly related to the treatment and distribution of drinking water.

5.3 The emergency generators identified in condition 5.1.12 shall not be used for non-emergency purposes including the generation of electricity for sale or for peak shaving purposes.

5.4 The owner shall prepare an emission summary table for nitrogen oxide emissions only, for each addition, modification or replacement of emergency generators identified in condition 5.1.12.

Performance Limits

5.5 The owner shall ensure that a drinking water system component identified in conditions 5.1.1 to 5.1.12 is operated at all times to comply with the following limits:

5.5.1 For equipment other than emergency generators, the maximum concentration of any compound of concern at a point of impingement shall not exceed the corresponding point of impingement limit;

5.5.2 For emergency generators, the maximum concentration of nitrogen oxides at sensitive populations shall not exceed the applicable point of impingement limit, and at non-sensitive populations shall not exceed the Ministry of the Environment half-hourly screening level of 1880 ug/m^3 as amended;

5.5.3 The noise emissions comply at all times with the limits set out in publication NPC-205 and/or publication NPC-232, as applicable; and

5.5.4 The vibration emissions comply at all times with the limits set out in publication NPC-207.

5.6 The owner shall verify in writing that any addition, modification or replacement of works in accordance with condition 5.1 has met the requirements of the conditions listed in condition 5.5.

5.7 The owner shall document how compliance with the performance limits outlined in 5.5.3 and 5.5.4 is being achieved, through noise abatement equipment and/or operational procedures.

5.8 The verifications required in condition 5.6 shall be:

5.8.1 Recorded on “Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere” as published by the Ministry of the Environment.

5.8.2 Retained for a period of ten (10) years by the owner.

5.9 For greater certainty, the verification requirements set out in conditions 5.6 and 5.8 do not apply to any addition, modification or replacement in respect of the drinking water system which:

5.9.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

5.9.2 Constitutes maintenance or repair of the drinking water system.

5.10 The owner shall update any drawings maintained for the works to reflect the addition, modification or replacement of the works, where applicable.

6.0 Previously Approved Works

6.1 The owner may add, modify, replace or extend, and operate part of a municipal drinking water system if:

6.1.1 An approval was issued after January 1, 2004 under section 36 of the SDWA in respect of the addition, modification replacement or extension and operation of that part of the municipal drinking water system;

6.1.2 The approval expired by virtue of subsection 36(4) of the SDWA; and

6.1.3 The addition, modification, replacement or extension commenced within five years of the date that activity was approved by the expired approval.

7.0 System-Specific Conditions

7.1 The following are authorized under this permit:

Not Applicable.

Ministry of the Environment
Northern Region
Technical Support Section
Water Resources
331-435 James St S
Thunder Bay ON P7E 6S7
Fax: (807)475-1754
Telephone: (807)475-1734

Ministère de l'Environnement
Bureau principal de la région du Nord
Section du Soutien Technique
Ressource en eau
331-435 rue James S
Thunder Bay ON P7E 6S7
Télécopieur: (807)475-1754
Téléphone : (807)475-1734

Ontario

RECEIVED
OCT 11 2006

October 5, 2006

The Corporation of the Town of Fort Frances
320 Portage Avenue
Fort Frances, Ontario, P9A 3P9
Canada

Attention: Douglas Herr

RE: Permit to Take Water 7280-6UAMD9
Reference Number 6071-6S5JT7

Dear Mr. Herr,

Please find attached Permit to Take Water (PTTW) 7280-6UAMD9, which renews PTTW 86-P-6003 and grants the taking of water from the Rainy River, in the Original Geographic Township of McIrvine, Town of Fort Frances, District of Rainy River, for the purpose of municipal supply. The rate of taking shall not exceed a maximum of 12,000 litres per minute or 17,000,000 litres per day. The Permit is valid until October 5, 2016.

The Terms and Conditions are shown on pages 2-5 of the Permit.

This Permit does not relieve you, or The Corporation of the Town of Fort Frances as the proponent, from compliance with provisions of any of the applicable Federal or Provincial statutes, regulations or other legal requirements.

Should you have any questions or concerns, please contact this office as soon as possible.

Yours truly,

Jacinth Gilliam-Price
Pttw Coordinator
Northern Region

File Storage Number: TS 31-02 PTTW 86-P-6003 (Fort Frances, The Corporation of the Town of)

Ministry of the Environment

Ministère de l'Environnement

Ontario

PERMIT TO TAKE WATER
Surface Water
NUMBER 7280-6UAMD9

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

The Corporation of the Town of Fort Frances
320 Portage Avenue
Fort Frances, Ontario, P9A 3P9
Canada

For the water taking from: Rainy River

Located at: 901 Colonization Road East, McIrvine Geo. Twp.
Fort Frances, District of Rainy River

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment.

(d) "District Office" means the Kenora District Office.

(e) "Permit" means this Permit to Take Water No. 7280-6UAMD9 including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means The Corporation of the Town of Fort Frances.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated July 12, 2006 and signed by Douglas Herr, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act,* S. O. 2002.

2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including

the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.2.1 Prior to the taking of any water under the authorization of the Permit to Take Water, the Permit Holder shall ensure full compliance with the Safe Drinking Water Act, 2002 and its regulations. At no time does this permit authorize the taking of water when out of compliance with the Safe Drinking Water Act, 2002 and its regulations.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **October 5, 2016**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Rainy River	River	Municipal	Water Supply	12,000	24	17,000,000	365	15 473000 5384717
						Total Taking:	17,000,000		

4. Monitoring

4.1 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit. The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

5. Impacts of the Water Taking

5.1 Notification
The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Surface-Water Takings
The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
2300 Yonge Street, Suite 1700
Toronto, Ontario M4P 1E4

AND

The Director, Section 34
Ministry of the Environment
331-435 James St S
Thunder Bay ON P7E 6S7
Fax: (807)475-1754

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This Permit cancels and replaces Permit Number 86-P-6003, issued on 1999/03/22.

Dated at Thunder Bay this 5th day of October, 2006.

Dave Hollinger
Director, Section 34
Ontario Water Resources Act, R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 7280-6UAMD9, dated October 5, 2006.

- Permit to Take Water 86-P-6003, issued on March 22, 1999
- Amendment to Permit to Take Water 86-P-6003, issued on October 15, 2001

The Corporation of the Town of Fort Frances
320 Portage Avenue
Fort Frances, ON
P9A 3P9

Pursuant to the Safe Drinking Water Act, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this approval is issued under Part V of the Safe Drinking Water Act, 2002, S.O. 2002, c. 32 to:

The Corporation of the Town of Fort Frances
320 Portage Avenue
Fort Frances, ON
P9A 3P9

PART 1 – DRINKING WATER SYSTEM IDENTIFICATION

1.1 with respect to the drinking water system serving The Corporation of the Town of Fort Frances, known as Fort Frances Water Treatment Plant, identified as DWS Number 220000978.

PART 2 – RELIEF FROM REGULATORY REQUIREMENTS

2.1 for relief from regulatory requirements, pursuant to *section 38 of the Safe Drinking Water Act*, as follows:

Notwithstanding the provisions of Schedule 15.1 of O.Reg. 170/03, the Owner is not required to comply with the following:

Sampling Requirements of Schedule 15.1-4 (Standard Sampling)

2.2 In exchange for the relief granted under 2.1 above, the Owner is required to comply with the following:

Sampling Requirements of Schedule 15.1-5 (Reduced Sampling)

SCHEDULE A

The following documents form part of this approval:

1. Request for Regulatory Relief from Lead Sampling Requirements in Schedule 15.1 of Regulation 170/03, Safe Drinking Water Act, dated November 23, 2010, and all supporting documentation and information.

All or part of this decision may be reviewable in accordance with the provisions of Part X of the SDWA. In accordance with Section 129(1) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 129(2) sets out a procedure upon which the 15 days may be extended by the Tribunal. Section 129(3) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, provides that the Notice requiring the hearing shall state:

1. The aspect of the decision, including the portion of the permit, licence, approval, order or notice of administrative penalty in respect of which the hearing is required; and
2. The grounds for review to be relied on by the person at the hearing.

Except with leave of the Tribunal, a person requiring a hearing in relation to a reviewable decision is not entitled to,
(a) a review of an aspect of the decision other than that stated in the notice requiring the hearing; or
(b) a review of the decision other than on the grounds stated in the notice

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Part V, *Safe Drinking Water Act, 2002*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted water works are approved under Part V of the Safe Drinking Water Act.

DATED AT TORONTO this 12th day of January, 2011

Aziz S. Ahmed, P.Eng.
Director, *Part V*
Safe Drinking Water Act

TS/
c: Drinking Water Supervisor, MOE Kenora District Office

Ministry of the Environment
Safe Drinking Water Branch
Floor 19
2 St Clair Ave W
Toronto ON M4V 1L5
Fax: (416)314-1037
Telephone: (416) 314-8184

Ministère de l'Environnement
Direction du contrôle de la qualité de l'eau potable
Étage 19
2 av St Clair Ouest
Toronto ON M4V 1L5
Télécopieur: (416)314-1037
Téléphone : (416) 314-8184

Ontario

January 12, 2011

Douglas Herr
Environmental and Facilities Superintendent
The Corporation of the Town of Fort Frances
320 Portage Avenue
Fort Frances, ON
P9A 3P9

RE: **Regulatory Relief From Lead Sampling Requirements**
Fort Frances Water Treatment Plant
Certificate of Approval Number PB220000978RR-01

We have enclosed a new Certificate of Approval in accordance with Part V, of the SDWA. This Certificate provides regulatory relief from lead sampling requirements of Regulation 170/03 for the above drinking water system.

If you have any questions regarding the above approval, please contact Tony Tsui, EIT, Engineering Intern, at (416) 314-8184.

A. Ahmed

Aziz S. Ahmed, P.Eng.
Director, Part V *SDWA*

cc. Drinking Water Supervisor, MOE Kenora District Office

Ministry of the Environment and Climate Change
Safe Drinking Water Branch
Kenora Area Office
808 Robertson St
2nd Floor,
Kenora ON P9N 1X9
Tel.: 807-468-
Fax.: 807-468-2735
Toll Free: 1-888-367-7622

Ministère de l'Environnement et de l'Action en matière de changement climatique
Direction du contrôle de la qualité de l'eau potable
Bureau du secteur de Kenora
808, rue Robertson
2e étage,
Kenora ON P9N 1X9
Tél.: 807-468-
Téléc.: 807-468-2735
Sans Frais: 1-888-367-7622

Ontario

January 14, 2016

The Corporation of the Town of Fort Frances
P.O. Box 38, 320 Portage Ave
Fort Frances, ON P9A 3P9
dbrown@fort-frances.com

Attn: Mr. Doug Brown, Operations and Facilities Manager

Re: Drinking Water System Inspection Program
2015-2016 Inspection Report for the Fort Frances Drinking Water System (220000978)
Inspection Number: 1-C5DKM

Dear Mr. Brown,

Enclosed is the 2015-2016 municipal drinking water system inspection report. The unannounced, detailed inspection was conducted on November 30th – December 1st, 2015.

Two issues of non-compliance were identified during the inspection. The non-compliance issues and actions which must be taken to address the issues are provided on pages 18-19 of the report. Please note that "Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, licences, permits, or orders. Such violations could result in the issuance of mandatory abatement instruments including orders, tickets, or referrals to the Ministry's Investigations and Enforcement Branch.

There were two best management practice (BMP) issues identified during the inspection.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR), included as Appendix C in the report, provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water systems' annual inspection and regulated water quality testing performance. Please note the attached IRR methodology memorandum describing how the risk rating model has improved to better reflect the health-related and administrative non-compliance issues found in the inspection reports. IRR ratings are published (for the

previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Dave Manol, Water Program Supervisor, at (807)475-1689.

If you have any questions concerning the content of this inspection report; or if you would like to discuss Ontario's drinking water legislation, please contact me at (807)468-2721 or aaron.causyn@ontario.ca.

Sincerely,

Aaron Causyn
Water Inspector
Ministry of the Environment
Northern Region - Kenora Area Office

AC/ac

cc. The Corporation of the Town of Fort Frances
P.O. Box 38, 320 Portage Ave
Fort Frances, ON P9A 3P9
Attn: **Doug Herr, Environment and Facilities Superintendent – dherr@fort-frances.com**
Brad Webb, ORO – bwebb@fort-frances.com
Randy White, ORO – rwhite@fort-frances.com

cc. Northwestern Health Unit
21 Wolsley Street
Kenora, ON P9N 3W7
Attn: **Thomas Nabb, Program Manager – tnabb@nwhu.on.ca**

cc. Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON P9A 1J4
Attn: **Greg Chapman, District Manager – greg.chapman@ontario.ca**

cc. Ministry of the Environment
435 James Street South, Suite 331
Thunder Bay, ON P7E 6S7
Attn: **Dave Manol, Water Program Supervisor – dave.manol@ontario.ca**

cc. Kenora Area Office File

Ministry of the Environment and Climate Change

FORT FRANCES DRINKING WATER SYSTEM

Inspection Report

Site Number:	220000978
Inspection Number:	1-C5DKM
Date of Inspection:	Nov 30, 2015
Inspected By:	Aaron Causyn

OWNER INFORMATION:

Company Name: FORT FRANCES, THE CORPORATION OF THE TOWN OF
Street Number: 320 **Unit Identifier:**
Street Name: PORTAGE Ave
City: FORT FRANCES
Province: ON **Postal Code:** P9A 3P9

INSPECTION DETAILS:

Site Name: FORT FRANCES DRINKING WATER SYSTEM
Site Address: 901 COLONIZATION RD E FORT FRANCES P9A 3P9
County/District: Fort Frances
MOECC District/Area Office: Kenora Area Office
Health Unit: NORTHWESTERN HEALTH UNIT
Conservation Authority N/A
MNR Office: Fort Frances District Office
Category: Large Municipal Residential
Site Number: 220000978
Inspection Type: Unannounced
Inspection Number: 1-C5DKM
Date of Inspection: Nov 30, 2015
Date of Previous Inspection:

COMPONENTS DESCRIPTION

Site (Name): MOE DWS Mapping
Type: DWS Mapping Point **Sub Type:**
Comments:
Not Applicable

Site (Name): SOURCE
Type: Source **Sub Type:** Surface
Comments:
The raw water supply for the Fort Frances municipal drinking water system is taken from the Rainy River at the outflow of Rainy Lake. The source water is generally of good quality, however it can be subject to elevated levels of colour, turbidity, and dissolved organic carbon.

Source water is gravity-fed into a raw-water well located within the plant. It is then drawn through a 630 mm diameter, 190 m long intake line that is equipped at the terminal end with a stainless steel screen. Coarse material is screened at the initial intake point and again through a set of screens within the raw water well.

The taking of water from the Rainy River for this municipal water supply is authorized by Permit To Take Water No. 7280-6AUMD9, a copy of which can be found appended to this report.

Site (Name): TREATED WATER

Type: Treated Water POE **Sub Type:** Pumphouse

Comments:

Three (3) vertical turbine low lift pumps deliver raw water through a common header equipped with alum and soda ash injection points, an in-line mixer, and a flow meter. Alum is added at all times when water is being produced; soda ash is added only when needed based on the pH of the raw water supply. Polymer is then injected as the water passes into two solids contact clarifiers. The clarifiers are equipped with blow-down devices to remove excess sludge, which is discharged to the municipal sanitary sewer. Clarified water passes through one of four dual media (anthracite coal/sand) filters. Each filter effluent line is monitored for pH and turbidity. Water is disinfected in a baffled contact chamber by the addition of chlorine gas. Soda ash, used for pH adjustment is added to the clearwell, as well as hydrofluosilicic acid. Treated water flows are measured using an in-line flow meter.

Four high lift pumps (rated at 63.1 L/s (2), 94.7 L/s and 126.2 L/s) pressurize treated water as it is directed to the distribution system. Distribution system pressure is also maintained by the elevated storage tank located in the southwest portion of Fort Frances.

A complete description of the treatment system can be found in Drinking Water Works Permit No. 224-201 and former Certificate of Approval No. 1811-7MSKDJ located in Appendix B of this report.

.

Site (Name): DISTRIBUTION (WATER INSPECTION)

Type: Other **Sub Type:** Other

Comments:

The Fort Frances distribution system services a population of approximately 8,000 in Town, and another 300 people in the neighbouring community of Couchiching First Nation. The distribution system is comprised of ductile steel, cast iron, and PVC piping. The original system was installed in the early 1900's. As older pipes are replaced, PVC piping comprises an increasing proportion of the works. Some sections of the distribution system have been looped at the recommendation of a consulting engineer, however several dead ends still remain. The distribution system is 70.73 kilometres in length and contains 399 fire hydrants.

A 4,500 cubic meter elevated storage tower is located in the southwest portion of the town. A telemetry system is used to maintain water levels in the tower. A paced-to-flow chlorination system injects liquid calcium hypochlorite at the outflow from the storage tower to maintain adequate chlorine residuals in the distribution system.

INSPECTION SUMMARY

INTRODUCTION

* **The primary focus of this inspection is to confirm compliance with Ministry of the Environment and Climate Change (MOECC) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.**

  This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

  This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

  This detailed inspection was conducted on November 30 - December 1, 2015, by Water Inspector, Aaron Causyn. The inspection included a tour of the Drinking Water System (DWS) components, document review and interview with DWS personnel. The inspection review period is the period of time from the date of the previous Ministry of the Environment and Climate Change (MOECC) inspection conducted on October 10, 2014, to the first day of this inspection, unless otherwise stated.

  Text highlighted in bold-type is computer-generated based on yes/no responses to standard questions answered during the inspection. Supporting information, in regular font, has been added by the undersigned Water Inspector to qualify standard responses and to provide additional guidance/information.

SOURCE

* **There were no obvious potential sources of pollution or activities in or around the source that could impair source water quality.**

  The Rainy River is an international boundary water, shared by Ontario and Minnesota, USA. Several potential sources of contamination are located within the designated "area of interest" for the Fort Frances drinking water intake. The potential sources of contamination include: two fuel storage facilities, an active railway line, a railway station and a railway tie storage area. The Fort Frances Water Treatment Plant (WTP) intake is located in the upper portion of the Rainy River with the majority of Fort Frances' industry located downstream of the intake.

  Although a Source Water Protection Plan has not been developed for the Town of Fort Frances, an emergency Standard Operating Procedure (SOP) for responding to the contamination of the raw water source has been developed.

PERMIT TO TAKE WATER

* **The owner had a valid PTTW for all of the production sources.**

  Permit To Take Water (PTTW) #7280-6UAMD9 was issued to the Town of Fort Frances on October 5, 2006 for the taking of water from Rainy River; the PTTW will expire on October 5, 2016.

PERMIT TO TAKE WATER

* **The maximum water takings were in accordance with those allowed under the PTTW.**

  The maximum allowable water taking under PTTW #7280-6UAMD9 is 17,000 m³/day at a rate no greater than 12,000 L/min. The maximum volume of water taken over a 24 hour period during the inspection review period was 5,530 m³ on July 28, 2015; this represents 32.5% of the maximum allowable daily water taking.

* **The PTTW imposed additional monitoring or recording requirements and the owner had complied with the conditions of the PTTW.**

  Condition 5.1 of PTTW #7280-6UAMD9 requires that public complaints with respect to water takings are reported to the MOECC. There were no water taking complaints during the inspection review period.

CAPACITY ASSESSMENT

* **There was sufficient monitoring of flow as required by the Permit and Licence or Approval issued under Part V of the SDWA**

  Conditions 2.1.1 and 2.1.2, Schedule C, Municipal Drinking Water Licence (MDWL) #236-102, requires continuous measurements and recording of the flow rate and daily volume of raw water flowing into the WTP and of treated water flowing from the WTP into the distribution system. The Fort Frances WTP is equipped with one raw water flow meter and one treated water flow meter. There were no losses of flow data during the inspection review period.

* **Flow measuring devices were calibrated or verified in accordance with the requirements of a Permit and Licence or Approval issued under Part V of the SDWA.**

  Records were provided which showed that the raw and treated water flow meters were last calibrated on August 26, 2015.

* **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit and Licence or Approval issued under Part V of the SDWA.**

  Condition 1.1, Schedule C, MDWL #224-101, identifies the rated capacity of the Fort Frances WTP as 17,000 m³/day. This represents the maximum daily volume of treated water that is allowed to be directed to the distribution system from the WTP.

  The highest volume of treated water pumped to the distribution system in a single day was 5,530 m³ on July 28, 2015; this represents 32.5% of the rated capacity.

TREATMENT PROCESSES

* **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

  During the inspection, the undersigned Water Inspector toured the WTP and the water tower.

  During past inspections, the following discrepancies had been noted in Schedule A of Drinking Water Works Permit (DWWP) #224-201:

  1. In the "Chemical Contact Chamber" section, the chamber is described as providing chlorine contact time, but it does not mention that the chamber is also the injection point for fluoride and soda ash.

  2. In the "Chlorine" section, one of the chlorine feed points is described as being located between the discharge line from the high lift pumps to the distribution system, but there is no feed point at this location; however, there is a feed point upstream of the flash mixer that is not described. The plant does not currently use the chlorine feed point upstream of the flash mixer, but they are capable of dosing at this location.

TREATMENT PROCESSES

3. The plant has one active and one back-up polymer feed system; however, the permit has separated this description into two sections: "Polyelectrolytes" and "Polymer". These sections need to be combined into one and described together. The current description makes it appear as though there are two separate polymer feed points within each of the solids contact clarifier's.

The DWWP and MDWL require renewal in the near future. When the Town of Fort Frances applies for renewal, corrections should be made to the sections noted above.

* **The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

Form 1 documentation was prepared on May 27, 2015 for thirteen watermain replacements.

* **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

* **The owner/operating authority was in compliance with the requirement to prepare Form 3 and associated documents as required by their Drinking Water Works Permit during the inspection period.**

A Form 3 was completed on August 31, 2015 for the installation of a back-up generator at the WTP. The Form 3 included the necessary components including an engineer's assessment.

* **Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

In accordance with O. Reg. 170/03, Schedule 1-2(2), surface water systems must have chemically assisted filtration and disinfection and achieve an overall performance of at least a 2-log (99%) removal/inactivation of Cryptosporidium oocysts, a 3-log (99.9%) removal/inactivation of Giardia cysts, and a 4-log (99.99%) removal/inactivation of viruses by the time the water is delivered to the first consumer.

The Fort Frances WTP achieves the above performance criteria using conventional treatment consisting of coagulation, flocculation, sedimentation filtration, and chlorine disinfection. Secondary disinfection is achieved using chlorination.

To ensure that primary disinfection is being achieved at all times at the WTP, records must demonstrate that the requirements outlined in the "Procedure for Disinfection of Drinking Water in Ontario" have been met. For systems using chemically assisted filtration, this includes:

• using a chemical coagulant at all times when the treatment plant is in operation;

• monitoring and adjusting chemical dosages in response to variations in raw water quality;

• maintaining effective backwash procedures, including filter-to-waste or an equivalent procedure during filter ripening to ensure that the effluent turbidity requirements are met at all times;

• continuously monitoring filtrate turbidity from each filter; and,

• meeting the performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements taken each month.

Using trend data stored in the plant's SCADA system, paper trending charts, Excel spreadsheets and information documented in logbooks, the undersigned Water Inspector verified that these criteria were met throughout the inspection review period. Two periods of "missing data" were noted in the continuous turbidity data on all four filters; however, a review of the logs revealed that the missing data was caused by power failures. The filters were shut down and not directing water to the next stage of treatment during these time periods.

For assessing the capability of a chemical disinfection system to provide effective pathogen inactivation, the CT concept was developed which considers the combination of the concentration

TREATMENT PROCESSES

of the chemical disinfectant (C - in mg/L) and the effective contact time (T - in minutes) of the disinfectant in the water supply. CT values achieved under various operating conditions (affected by flow, temperature and pH) are then compared with required CT values appended in tables to the "Procedure for Disinfection of Drinking Water in Ontario". The calculated CT value must, at all times during plant operation, be equal to or greater than the required overall CT value to ensure the proper level of disinfection.

Under worst-case conditions at the Fort Frances WTP, consisting of a clearwell pH of 8.5, temperature of 0.5 °C, treated water flow of 11,760 L/min (maximum capacity), contact chamber/clearwell/high lift pump well volume of 4740 m^3 (60% of capacity) and a treated water chlorine concentration of 0.85 mg/L, the CT provided at the Fort Frances WTP would be 171 mg/L*min, exceeding the required CT of 59 mg/L*min.

Abnormal fluctuations in chlorine trends were noted for a period of approximately one week in July, 2015. A review of the logbooks revealed that operators had re-calibrated the continuous chlorine analyzer multiple times during this period while the analyzer normalized following several power outages. There were no instances during the inspection review period when the required CT value was not met. The lowest observed chlorine concentration during the inspection review period was 1.40 mg/L on April 10, 2015.

* **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

Distribution chlorine levels must be maintained at or above 0.05 mg/L at all times. The lowest recorded chlorine level in the distribution system during the inspection review period was 0.23 mg/L, occurring on September 25, 2015 at the water tower.

* **The owner had evidence indicating that all chemicals and materials that come in contact with water within the drinking water system met the AWWA and ANSI standards in accordance with the Permit and Licence issued under Part V of the SDWA.**

Chemicals used in the Fort Frances DWS during the inspection review period include:

- Liquid alum for coagulation
- Chlorine gas for disinfection
- Polymer to assist flocculation
- Soda Ash for pH adjustment
- Hydrofluosilicic acid for fluoridation
- Calcium hypochlorite for re-chlorinating the water at the water tower
- Sodium hypochlorite for disinfection in the distribution system

Supplier statements with ANSI/NSF Standard 60 certification were provided during the inspection for the above noted chemicals. New statements are obtained from the supplier annually.

* **Up-to-date plans for the drinking-water system were available in accordance with the Permit and Licence issued under Part V of the SDWA.**

* **The facility and equipment appeared to be maintained and in a fit state of repair.**

During the inspection the WTP was observed to be clean and well organized.

TREATMENT PROCESSES

* **The Operator-in-Charge had ensured that all equipment used in the processes was monitored, inspected, and evaluated.**

  There is a schedule kept at the plant for daily, weekly, monthly, quarterly, and annual checks/maintenance, in addition to miscellaneous operations. Records of operational checks are maintained in the daily log books.

* **Based on information provided by the owner/operator, it was not likely that contaminants entering the floor drains would have come in contact with the source water or treated water.**

  All floor drains in the WTP discharge to the sanitary sewer.

* **Measures were taken to ensure that pesticides were not applied, stored, or mixed in the immediate vicinity of source(s), treatment, and storage facilities.**

  A Town by-law prohibits the use of pesticides on municipal property.

TREATMENT PROCESS MONITORING

* **Primary disinfection chlorine monitoring was being conducted at a location approved by Permit, Licence or Approval issued under Part V of the SDWA, or at/near a location where the intended CT had just been achieved.**

  The treated water chlorine residual is monitored by a continuous analyzer at the point where treated water enters the distribution system.

* **Operators were aware of the operational criteria necessary to achieve primary disinfection within the drinking water system.**

  Since the previous inspection an Operator in Training (OIT) has begun operating in the WTP. The OIT indicated that upon hire, they received on-site training in primary disinfection requirements and performing CT calculations.

* **Continuous monitoring of each filter effluent line was being performed for turbidity.**

  All four filters in the WTP are equipped with turbidity analyzers. Continuous turbidity data from each filter is printed daily, reviewed by operators and filed in the WTP office.

* **The secondary disinfectant residual was measured as required for the distribution system.**

  Daily chlorine residuals are collected from the water tower, meeting the requirements of O. Reg. 170/03, Schedule 7, subsections 7-2(3),(4). Chlorine residuals are also collected during bacteriological sampling.

* **Records confirmed that the maximum free chlorine residual in the distribution system was less than 4.0 mg/L or that the combined chlorine residual was less than 3.0 mg/L.**

* **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

  Upon arrival at the WTP each morning, operators observe chlorine residuals from the previous 24 hour period on the circle chart recorder which is located next to the continuous chlorine analyzer. The circle chart recorder will hold up to a weeks worth of chlorine data. Operators then review a printout of the turbidity readings off each filter for the previous 24 hour period. These printouts display turbidity in 15 minute intervals; each 15 minute data set includes the minimum, maximum and mean turbidity value for the prior 15 minute time period. Operators then review continuous data for the previous 24 hour period on the SCADA computer. It is worth noting that the SCADA system reads and records turbidity every 10 seconds and chlorine every 60 seconds.

  In 2014, the Town of Fort Frances developed an SOP for "Reviewing Continuous Monitoring Turbidity Test Results".

TREATMENT PROCESS MONITORING

* **Samples for chlorine residual analysis were tested using an acceptable portable device.**

  Chlorine residuals taken in the distribution system and grab samples taken at the WTP were tested using portable Hach colorimeters equipped with electronic, digital displays. These devices were calibrated on August 27, 2015.

* **All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or approval or order, were equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.**

  Since the 2014 MOECC inspection, significant changes have been made to the alarm set points at the Fort Frances WTP; most notable was the elimination of alarm delays on the filter turbidity analyzers.

  Currently, the alarm set points for chlorine and turbidity are as follows:

  • Final Effluent Low Chlorine Alarm = 1.20 mg/L

  • Final Effluent High Chlorine Alarm = 2.90 mg/L

  • Filter Effluent Turbidity High Alarm = 0.30 NTU

  • Filter Effluent Turbidity High High Alarm = 0.80 NTU

  If final effluent chlorine levels drop below 1.20 mg/L, an alarm will sound immediately. If turbidity levels go above 0.3 NTU, an alarm will sound immediately and the filter will shut down. Similarly, if turbidity levels go above 0.8 NTU, an alarm will sound immediately and the filter will shutdown. If an alarm is trigger after hours, an operator will be notified through an alarm call-out system.

* **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.**

  Final effluent chlorine levels are being read and recorded by the SCADA system every 60 seconds. Filter effluent turbidity levels are being read and recorded every 10 seconds; The SCADA system takes all 10 second test data within a period of 15 minutes and calculates and records the maximum, minimum and mean readings (in NTU) at the end of the 15 minute period, along with the time and filter number.

* **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

  Continuous analyzers were calibrated on August 27, 2015.

PROCESS WASTEWATER

* **The process wastewater and residual solids/sludges were being treated, handled and disposed of in accordance with the design requirements approved under the Permit and Licence or Approval issued under Part V of the SDWA.**

  The facility's MDWL/DWWP do not require solids/sludges to be treated, handled or disposed of in a certain manner. Back wash wastewater from the filters is directed to the municipality's sanitary sewer. Once annually the plant will drain and clean the clarifier. Sludge removed from the clarifier discharges to the sanitary sewer as well. A written protocol has been developed by the Town for discharging sludge to the sewer to ensure that the wastewater treatment process does not become disrupted by the addition of large volumes of sludge to the municipal wastewater collection and treatment system.

PROCESS WASTEWATER

* **The process wastewater discharge quality and discharge monitoring program complied requirements established in the Permit and Licence or Approval issued under Part V of the SDWA.**

  Concentration limits are not prescribed by the MDWL, however suspended solids are required to be monitored quarterly at the point of discharge to the Rainy River. Records indicated that composite samples were collected quarterly during the inspection review period as required and tested for suspended solids. Results were 9.4 mg/L (December 3, 2014), 25.2 mg/L (March 9, 2015), 16.8 mg/L (May 19, 2015), and 14.6 mg/L (September 1, 2015).

DISTRIBUTION SYSTEM

* **The owner had up-to-date documents describing the distribution components as required.**

* **There is a backflow prevention program, policy and/or bylaw in place.**

  The Town of Fort Frances has adopted Water System Management By-law No. 16/06 which includes provisions for cross connection control. The Town's backflow prevention program aims at installing backflow prevention devices at all locations that are deemed to be high risk area (i.e. mill, car wash, laundromats) and all new businesses are required to have a device installed. Backflow prevention devices are also being installed at locations where water meters are required to be replaced.

* **The owner had a program or maintained a schedule for routine cleanout, inspection and maintenance of reservoirs and elevated storage tanks within the distribution system.**

  The clearwell at the WTP is drained and cleaned out annually. The water tower is on a 3 year inspection rotation with the last inspection occurring in 2013.

* **Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

  For watermains that form part of the distribution system, DWWP #224-201 Schedule B, Condition 2.3 requires that all parts in contact with drinking water which are:

  • Added, modified, replaced, extended; or

  • Taken out of service for inspection, repair or other activities that may lead to Contamination,

  shall be disinfected before being put into service in accordance with the provisions of the AWWA C651 – Standard for Disinfecting Water Mains or an equivalent procedure.

  Although operators indicated that some form of disinfection is occurring during watermain replacements and repairs, the logbooks contained no information with respect to disinfection procedures; therefore, the undersigned Water Inspector was unable to verify that appropriate disinfection procedures were being applied throughout the inspection review period.

* **The owner had implemented a program for the flushing of watermains as per industry standards.**

  The Town of Fort Frances flushes 20% of their distribution system annually on a rotational basis, ensuring that the entire distribution system is flushed every five years.

* **Records confirmed that disinfectant residuals were routinely checked at the extremities and "dead ends" of the distribution system.**

  Disinfectant residuals are taken daily at the water tower. Microbiological samples are taken at various locations throughout the town, providing a good representation of disinfectant residuals.

DISTRIBUTION SYSTEM

* **A program was in place for inspecting and exercising valves.**

  There are approximately 640 valves in the distribution system. Annually, operators exercise 20% of the valves and in addition, the town strives to replace 20 valves every year.

* **There was a program in place for inspecting and operating hydrants.**

  20% of hydrants are flushed in the distribution system each year. Every hydrant is visually inspected annually in the fall.

* **There was a by-law or policy in place limiting access to hydrants.**

  By-law no. 16/06 includes provisions restricting the use of fire hydrants for emergency operations and training for the fire department.

* **The owner has undertaken efforts to identify, quantify and reduce sources of apparent water loss.**

  The Town of Fort Frances does not have a leak detection program; however, if water comes to the surface due to a break, operators work quickly to repair the break. A program is in place to upgrade old distribution lines which will minimize the number of leaks. In 2015, approximately 800 meters of aging watermain was replaced.

* **The distribution system pressure was monitored to alert the operator of conditions which may have lead to loss of pressure below the value under which the system is designed to operate.**

  Operators observe and record distribution pressure as part of their morning routine at the WTP. Pressures in the distribution system are maintained above 55 psi.

* **Based on the records available the owner was able to maintain proper pressures in the distribution system.**

* **The donor had provided an Annual Report to the receiver stand alone distribution system(s) connected to this system.**

  The Town of Fort Frances provided copies of the 2014 Annual Report to Couchiching First Nation, the Lakeview Trailer Park and the Walleye Trailer Park on March 11, 2015.

OPERATIONS MANUALS

* **Operators and maintenance personnel had ready access to operations and maintenance manuals.**

* **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

* **The operations and maintenance manuals did meet the requirements of the Permit and Licence or Approval issued under Part V of the SDWA.**

  Contingency plans and customer complaint logs were reviewed by the undersigned Water Inspector during the inspection.

LOGBOOKS

* **Logs for the drinking water subsystem(s) contained the required information.**

LOGBOOKS

* **Logbook entries were made in chronological order.**

* **The record system did not allow the reader to unambiguously identify the person who made the logbook entry.**

  O. Reg 128/04, section 27.(4) states: "A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry."

  On the following days during the inspection review period, up to three operators made entries into the WTP logbook; however, there was no way of identifying who made the entry (i.e. no initials or signatures):

  • January 28, 2015

  • February 4, 2015

  • February 10, 2015

  • June 29, 2015

* **Entries in the logbook were made only by appropriate and authorized personnel.**

  All logbook entries were made by certified operators.

* **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

  All operational tests not performed by continuous monitoring equipment are completed by either the ORO or another certified operator.

* **For every required operational test and every required sample, a record was made of the date, time, location, name of the person conducting the test and result of the test.**

  Chain of Custody forms from sampling were reviewed during the inspection. All required information was recorded.

* **The operator-in-charge ensured that records were maintained of all adjustments made to the processes within his or her responsibility.**

* **Logs or other record keeping mechanisms were available for at least five (5) years.**

CONTINGENCY/EMERGENCY PLANNING

* **Spill containment was provided for process chemicals and/or standby power generator fuel.**

* **Clean-up equipment and materials were in place for the clean up of spills.**

  Spill kits are situated throughout the building. Mops and pails and other clean up materials are readily available.

* **Standby power generators were not tested under normal load conditions.**

  A new stand-by generator was installed and commissioned on July 28th, 2015. Operators indicated that since that time, the generator has not been run monthly under load conditions.

SECURITY

* **All storage facilities were completely covered and secure.**

  Water storage is provided by the clearwell at the WTP and by a water tower in the distribution system. All facilities are locked at all times when personnel are absent. The water tower is fenced and equipped with a locked gate. 'No Trespassing' signs have been posted at both locations.

* **Air vents and overflows associated with reservoirs and elevated storage structures were equipped with screens.**

  The clearwell is vented to the inside of the WTP via three inverted, J-shaped pipes that extend from the clearwell through the main floor of the plant. Vents to the water tower are equipped with screens.

* **The owner had provided security measures to protect components of the drinking-water system.**

  Security measures provided at the WTP include:

  • "No Trespassing" signs;

  • alarm system; and

  • locked doors when employees are not present.

  Security measures provided at the water tower include:

  • "No Trespassing" signs; and

  • a fence around the water tower that is gated and locked

  There are a limited number of keys available for the WTP and the water tower.

CONSUMER RELATIONS

* **Water conservation was being practiced by the owner or operating authority.**

  By-law No. 16/06 restricts the non-essential use of potable water drawn from the municipal distribution system from May 15 to September 15 of each year. The by-law restricts the use of potable water for non-essential services (e.g. watering lawns, washing cars, etc.) on odd-numbered days for persons residing at even-numbered municipal addresses and on even-numbered days for persons residing at odd-numbered addresses.

  Commercial businesses have water meters to track water usage and promote water conservation.

* **Required documents were available free-of-charge during normal business hours at a location accessible to the public.**

  Copies of required documents were available to the public at the Fort Frances Public Works Office and the WTP.

* **The owner did take effective steps to advise users of the water system of the availability of Annual Reports, including posting a copy on a web site, if applicable.**

  Annual reports were posted on the Internet and a copy of the report was provided to Couchiching First Nation, Lakeview Trailer Park and Walleye Trailer Park.

CERTIFICATION AND TRAINING

* **The overall responsible operator had been designated for each subsystem.**

  The Fort Frances WTP is a Class 3 subsystem and the distribution system is a Class 2 subsystem. Two operators act as ORO on a rotational basis for both subsystems; both ORO's hold valid certificates that are at the same level or higher than both subsystems.

CERTIFICATION AND TRAINING

* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

  Currently, three operators work in the WTP and two in the distribution system. Two of the three operators in the WTP may be designated as operator in charge (OIC) and one of the two operators in the distribution system may be designated as OIC. One of the operators in both the WTP and the distribution system are currently operators in training (OIT) and may not be designated as OIC. Operators are reminded that they must document in the logbooks each day who is the designated ORO and OIC, even if the same person is acting as both.

* **All activities that were undertaken by uncertified persons in the DW subsystems were overseen by persons having the prescribed qualifications.**

  At the time of the inspection there was one person working in the distribution system who was not a certified operator. When working in the distribution system, this person is working under the supervision of a certified operator.

* **All operators possessed the required certification.**

* **Only certified operators made adjustments to the treatment equipment.**

* **Operator certificates or water quality analyst certificates were displayed in a conspicuous location at the workplace or at the premises from which the subsystem was managed.**

  Operator certificates are displaced at the WTP and at the Public Works building.

* **The classification certificates of the subsystems were conspicuously displayed at the workplace or at premises from which the subsystem was managed.**

  Certificate No. 201 (Water Treatment Subsystem Class 3) was issued to the Town of Fort Frances on November 7, 2005. This certificate is on display at the WTP and Public Works building.

  Certificate No. 202 (Water Distribution Subsystem Class 2) was issued to the Town of Fort Frances on November 7, 2005. This certificate is on display at the WTP and Public Works building.

* **The owner/operating authority was aware of the operator training and record keeping requirements, and they were taking reasonable steps to ensure that all operators receive the required training.**

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for raw water samples were being met.**

  Section 10-4, Schedule 10, O. Reg. 170/03 requires that at least one raw water sample be taken every week and tested for total coliform bacteria and E. coli. This requirement was met throughout the inspection review period.

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for distribution samples were being met.**

  O. Reg. 170/03, Schedule 10, section 10-2 requires owners and operating authorities of DWS's that serve 100,000 people or fewer to ensure that at least eight distribution samples plus one additional distribution sample for every 1,000 people served by the system are taken each month. At least one of the samples must be taken each week. The samples must be tested for E. coli and total coliform bacteria with at least 25% of the required samples to be tested for general bacteria measured using heterotrophic plate counts (HPC).

  The Fort Frances DWS serves a population of approximately 8,000 people; therefore, at least 16 distribution samples must be taken every month. Throughout the inspection review period, operators collected a minimum of 17 and as many as 118 bacteriological samples per month.

* **All microbiological water quality monitoring requirements for treated samples were being met.**

  Section 10-3, Schedule 10, O. Reg. 170/03 requires at least one treated water sample to be taken every week from the point of entry to the distribution system and tested for total coliform bacteria, E. coli and HPC. This requirement was met throughout the inspection review period.

* **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Treated water samples must be tested at least once every 12 months (+/- 30 days from the anniversary of the previous sampling date) for inorganic parameters listed in O. Reg. 170/03, Schedule 23. These parameters were last sampled for on March 9, 2015, and had been previously sampled on March 10, 2014.

* **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Treated water samples must be tested at least once every 12 months (+/- 30 days from the anniversary of the previous sampling date) for organic parameters listed in O. Reg. 170/03, Schedule 24. These parameters were last sampled for on March 9, 2015, and had been previously sampled on March 10, 2014.

* **All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Trihalomethanes (i.e. THMs) are required to be collected from the distribution system and tested once every three months, in accordance with section 13-6, Schedule 13, O. Reg. 170/03. During the inspection review period, THM samples were collected on December 3, 2014; March 9, 2015; May 19; 2015 and September 1, 2015. The running annual average THM concentration at the time of the inspection was 70.32 ug/L; the maximum acceptable concentration is 100 ug/L.

* **Trihalomethane samples were being collected from a point in the distribution system or connected plumbing system that was likely to have an elevated potential for the formation of trihalomethanes.**

  THM samples were collected from the water tower which is towards the end of the distribution system.

* **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

  Treated water samples must be taken every three months for analysis of nitrate and nitrite, in accordance with O. Reg. 170/03, Schedule 13, section 13-7. During the inspection review period, samples were collected on the following days: December 3, 2014; March 9, 2015; May 19, 2015; and September 1, 2015. All nitrate and nitrite samples were collected from the WTP at the point of entry to the distribution system.

WATER QUALITY MONITORING

* **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Sodium samples must be collected from the WTP at the point of entry to the distribution system at least once every 60 months to meet the requirements of O. Reg. 170/03, Schedule 13, section 13-8. A sodium sample was last collected from the Fort Frances WTP on March 9, 2015 and the result was 16.4 mg/L.

* **The required daily samples were being taken at the end of the fluoridation process.**

  Fluoride residuals were being recorded daily by operators.

* **The owner ensured that water samples were taken at the prescribed location.**

* **All water quality monitoring requirements imposed by the Permit and Licence or Approval issued under Part V of the SDWA were being met.**

  Suspended solids are required to be monitored quarterly at the point of discharge to the Rainy River. Records indicated that composite samples were collected quarterly during the inspection review period and tested for suspended solids as required.

* **All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

  Sampling and testing for lead, pursuant to the authorization included in Certificate of Approval (C of A) PB220000978RR-01 is currently being carried out by the Town of Fort Frances. The C of A authorizes the owner to sample in accordance with Schedule 15.1-5, O. Reg. 170/03 (reduced sampling). The specified sampling requirements include three distribution samples, collected twice annually. Lead and alkalinity samples were collected on April 17, 2015 and October 13, 2015.

* **The owner was conducting sampling beyond the minimum legislative requirements.**

  More than 25% of distribution samples were tested for HPC bacteria and more than the minimum number of distribution microbiological samples were collected throughout 2014-2015. In addition, the Town of Fort Frances participates in the Drinking Water Surveillance Program.

* **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

* **The drinking water system owner had submitted written notices to the Director that identified the laboratories that were conducting tests for parameters required by legislation, Order Certificate of Approval (OWRA) or a Permit, Licence or Approval issued under Part V of the SDWA.**

* **Based on information provided by the owner/operator, samples were being taken and handled in accordance with instructions provided by the drinking-water system's laboratories.**

  ALS Laboratory Group provides sampling instructions with each sampling shuttle.

* **The owner indicated that the required records are kept and will be kept for the required time period.**

WATER QUALITY ASSESSMENT

WATER QUALITY ASSESSMENT

* **Records show that water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O. Reg. 169/03), with the following exceptions:**

  On October 8, 2015, total coliforms were found to be present in the distribution system. This incident is further discussed below.

REPORTING & CORRECTIVE ACTIONS

* **Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

  On October 8, 2015, total coliforms were found to be present in the distribution system following a watermain repair. Operators re-sampled in accordance with O. Reg 170/03, Schedule 17-6.

* **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**

* **All required written notices of adverse water quality incidents were provided as per O. Reg. 170/03 16-7.**

* **In instances where written notice of issue resolution was required by regulation, the notice was provided as per O. Reg. 170/03 16-9.**

* **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

  For after hours turbidity and chlorine alarms, operators are reminded that they must record the time of alarm and the time that they arrived at the WTP in response.

* **The Annual Report containing the required information was prepared by February 28th of the following year.**

  The 2014 Annual Report was prepared on February 24, 2015.

* **Summary Reports for municipal council were completed on time, included the required content, and were distributed in accordance with the regulatory requirements.**

OTHER INSPECTION FINDINGS

* **The following issues were also noted during the inspection:**

  It was noted during the inspection that operators are not overly comfortable or proficient with navigating through their SCADA computer system.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

1. **Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

   For watermains that form part of the distribution system, DWWP #224-201 Schedule B, Condition 2.3 requires that all parts in contact with drinking water which are:

   • Added, modified, replaced, extended; or

   • Taken out of service for inspection, repair or other activities that may lead to Contamination,

   shall be disinfected before being put into service in accordance with the provisions of the AWWA C651 – Standard for Disinfecting Water Mains or an equivalent procedure.

   Although operators indicated that some form of disinfection is occurring during watermain replacements and repairs, the logbooks contained no information with respect to disinfection procedures; therefore, the undersigned Water Inspector was unable to verify that appropriate disinfection procedures were being applied throughout the inspection review period.

   Action(s) Required:
   For the purpose of DWWP #224-201, Condition 2.3, the document titled "Watermain Disinfection Procedure" (November 2015) is considered by the MOECC as the equivalent procedure which replaces ANSI/AWWA C651 - Standard for Disinfecting Water Mains with respect to the cleaning, tapping, maintenance and repair of watermains, appurtenances and fittings.

   A copy of this document was provided to the Town of Fort Frances by the MOECC Approvals and Licencing Section in December, 2015 and a copy is also included as Appendix A.

   By January 29, 2016, all personnel working in the distribution system must review the Watermain Disinfection Procedure found in Appendix A. By January 29, 2016, confirmation that all personnel working in the distribution system have reviewed the Watermain Disinfection Procedure must be provided in writing to the undersigned Water Inspector by email: aaron.causyn@ontario.

   Effective immediately, operators must document disinfection procedures that are taken during watermain maintenance, confirming that acceptable disinfection procedures have been applied.

2. **The record system did not allow the reader to unambiguously identify the person who made the logbook entry.**

   O. Reg 128/04, section 27.(4) states: "A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry."

   On the following days during the inspection review period, up to three operators made entries into the WTP logbook; however, there was no way of identifying who made the entry (i.e. no initials or signatures):

   • January 28, 2015

   • February 4, 2015

   • February 10, 2015

   • June 29, 2015

   Action(s) Required:

Effective immediately, operators must clearly identify themselves in the logbook as the writer during all logbook entry occurrences, in accordance with O. Reg. 128/04, section 27.(4).

By January 26, 2016, The Town of Fort Frances must provide the undersigned Water Inspector with a copy of the Fort Frances WTP logbook for the period of December 7, 2015 to January 22, 2016. A copy of the logs may be provided by mail: 808 Robertson St., 2nd Floor, Kenora, ON, P9N 1X9 or email: aaron.causyn@ontario.ca.

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

1. **Standby power generators were not tested under normal load conditions.**

   A new stand-by generator was installed and commissioned on July 28th, 2015. Operators indicated that since that time, the generator has not been run monthly under load conditions.

   Recommendation:
   It is recommended that the Town of Fort Frances implement a program for testing the back up generator monthly, under normal load conditions (i.e. running all essential WTP processes). A written record should be kept indicating the time and date that tests were conducted.

2. **The following issues were also noted during the inspection:**

   It was noted during the inspection that operators are not overly comfortable or proficient with navigating through their SCADA computer system.

   Recommendation:
   An important asset for operators is the ability to proficiently review electronic data, review historic alarms, adjust alarm settings and diagnose potential issues in the SCADA computer system. It is recommended that the Town of Fort Frances provide WTP operators with additional training on SCADA.

SIGNATURES

Inspected By:	Signature: (Provincial Officer):
Aaron Causyn	
Reviewed & Approved By:	Signature: (Supervisor):
Dave Manol	
Review & Approval Date:	

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

Watermain Disinfection Procedure

Watermain Disinfection Procedure

Ministry of the Environment and Climate Change
Safe Drinking Water Branch
November 2015

TABLE OF CONTENTS

	Page
Preface	1
Definitions	1
1. Addition, Modification, Replacement, Extension and Planned Maintenance	2
1.1. New Watermains	2
1.1.1. Disinfection of New Watermains	3
1.1.2. Microbiological Samples for New Watermains	4
1.2. Relining of Watermains	4
1.3. Planned Watermain Cleaning	5
1.4. Planned Maintenance of Watermain Appurtenances and Fittings	5
1.5. Tapping of Watermains	5
1.6. Service Pipes	5
2. Emergency/Unplanned Repairs	6
3. Watermain Disinfection Procedures for Emergency Repairs	6
3.1. Categorization and Public Agency Notification of Watermain Breaks	6
3.1.1. Category 1	6
3.1.2. Category 2	7
3.1.3. Public Agency Notification	7
3.1.3.1. Category 1	7
3.1.3.2. Category 2	7
3.2. Watermain Break Common Disinfection Procedure	8
3.2.1. Maintenance of Flow	8
3.2.2. Excavation Dewatering	8
3.2.3. Disinfection of Pipe and Repair Parts	8
3.2.4. Installation of Repair Parts	8
3.2.5. Post Repair Flushing	9
3.2.6. Restoration of Secondary Disinfection-and Return to Normal Service	9
3.3. Additional Information for Category 1 Watermain Break Repairs	9
3.3.1. Microbiological Samples	9

Page

3.4. Additional Requirements for Category 2 Watermain Break Repairs 9

3.4.1. Removal of Contaminants from Watermain 10

3.4.2. Additional Disinfection Procedures 10

3.4.3. Microbiological Samples 10

3.4.4. Special Case - Sewage Contamination 10

3.4.5. Special Case – Chemical Contamination 11

4. Documentation 11

Appendix A - Tools to Help Determine the Category of Watermain Break - Flowchart 13

Appendix B - Tools to Help Determine the Category of Watermain Break - Pictures 14

Appendix C – Category 1 Flowchart 16

Appendix D – Category 2 Flowchart 17

Appendix E – Category 2 – Special Cases Flowchart 19

Preface

For watermains that form part of the distribution system, Drinking Water Works Permit (DWWP) Schedule B, Condition 2.3 ("DWWP Condition 2.3") requires that all parts in contact with drinking water which are:

- Added, modified, replaced, extended; or
- Taken out of service for inspection, repair or other activities that may lead to Contamination,

shall be disinfected before being put into service in accordance with the provisions of the AWWA C651 – Standard for Disinfecting Water Mains or an equivalent procedure.

For the purpose of DWWP Condition 2.3, this document is considered by the Ministry of the Environment and Climate Change (Ministry) as the equivalent procedure which replaces ANSI/AWWA C651 - Standard for Disinfecting Water Mains with respect to the cleaning, tapping, maintenance and repair of watermains, Appurtenances and fittings.

With respect to new watermains, relined watermains and temporary watermains, the provisions of this document, including sections 1.1 and 1.2 shall be followed by operating authorities for compliance with DWWP Condition 2.3. Where this document makes reference to ANSI/AWWA Standard C651, the most current version shall be used.

Service pipes of 100 mm diameter and greater shall be considered as watermains for the purposes of this procedure.

Operating authorities shall use Certified Operators for functions that must be performed by a Certified Operator.

Definitions

In this procedure,

"Water Advisory is declared" means a boil or drinking water advisory has been declared for the area being serviced by the affected watermains by the local Medical Officer of Health.

"**Air gap**" means an air space at the location of the maintenance/repair between the exterior surface of the watermain and the interior surfaces of the excavation, including the water in the excavation, sufficient to prevent water and soil in the excavation from contacting the watermain, fittings, or Appurtenances throughout the maintenance/repair process.

"**Appurtenance**" means an appurtenance within the meaning of O. Reg. 170/03.

"**Backflow prevention**" means the prevention of a reversal of normal flow that could introduce Contamination to the potable water supply; accomplished by an Air gap or a CSA approved backflow

preventer selected, installed and tested in accordance with CSA Standard B64.10: ”Selection and Installation of Backflow Preventers”.

“Certified operator” means certified operator within the meaning of O. Reg. 170/03.

“Contaminant” means foreign matter that is not intended to enter a watermain.

“**Contamination**” means the introduction of a Contaminant into a watermain.

“**Flushing”** means post repair valve operation to restore secondary disinfection and discharge suspended materials by flowing water through the repaired section of watermain and out of the system. This definition does not include recharging the watermain or a requirement to achieve scouring velocity within the watermain.

“Higher velocity flushing” means Flushing of a watermain with sufficient velocity to discharge settled materials.

“**Isolate**” means operate valves to ensure that there is no flow of water to the location of the maintenance/repair.

“Microbiological samples” means water samples taken and tested for *Escherichia coli* and Total Coliforms.

“Operator-in-Charge” means an operator-in-charge within the meaning of O. Reg. 128/04.

“Service pipe” means a service pipe within the meaning of O. Reg. 170/03.

1. Addition, Modification, Replacement, Extension and Planned Maintenance

1.1. New Watermains

Drinking water system operating authorities shall ensure that the most current version of the ANSI/AWWA Standard C651 is followed for addition, modification, replacement and extensions of watermains to an existing distribution system for compliance with DWWP Condition 2.3. However, the backflow protection provisions within ANSI/AWWA Standard C651 shall be mandatory for any work related to this section. The provisions outlined in ANSI/AWWA Standard C651 for final connections to existing mains are also mandatory. The requirements in this section also apply to temporary watermains.

1.1.1. Disinfection of New Watermains

Where the operating authority is chlorinating using the tablet, continuous feed, slug, or spray chlorination methods for disinfecting newly constructed watermains as per the procedures in ANSI/AWWA Standard C651, the minimum contact times, initial chlorine concentrations, and maximum allowable decreases in chlorine concentration as listed in Table 1 shall be used.

Where copper pipe is used for smaller diameter watermains, Table 1 does not apply. Copper watermains shall be disinfected using the Continuous Feed method, with an Initial Chlorine Concentration of ≥ 50 mg/L. Due to the chlorine demand exerted by the copper, no minimum chlorine concentration is required following the 24 hour contact time, and the effectiveness of the disinfection process shall be demonstrated by the Microbiological sampling referred to in section 1.1.2.

Table 1: Chlorine Concentrations and Contact Times for New Watermains*

Disinfection Method	Minimum Contact Time	Initial Chlorine Concentration	Maximum Allowable Decrease in Chlorine Concentration
Tablet or Continuous Feed	24 hours	≥ 25 mg/L	40% of the Initial Chlorine Concentration to a Maximum of 50 mg/L
Slug	3 hours	≥ 100 mg/L	25 mg/L
Spray	30 minutes	≥ 200 mg/L	Measurement Not Required

* At levels over 10 milligrams per litre, a measurement of total chlorine shall be deemed to be equivalent to a measurement of free chlorine.

The following examples are provided to demonstrate the proper use of Table 1.

Example 1

When using the continuous feed method of chlorination with an initial chlorine concentration of 50 mg/L, the maximum allowable decrease in chlorine concentration is 40% of 50 mg/L, or 20 mg/L. Therefore, at least 30 mg/L of chlorine must be present after 24 hours.

Example 2

When using the continuous feed method of chlorination with an initial chlorine concentration of 150 mg/L, the maximum allowable decrease in chlorine concentration is 50 mg/L, because 40%

of 150 mg/L is greater than the maximum allowable decrease of 50 mg/L. Therefore, at least 100 mg/L of chlorine must be present after 24 hours.

Example 3

When using the slug method of chlorination, with a minimum contact time of 3 hours, the chlorine concentration shall be measured in the slug at the beginning of the disinfection process, as the slug moves through the watermain, and at the point of discharge. If at any point the chlorine concentration has decreased by more than 25 mg/L, the flow shall be stopped and additional chlorine shall be added to restore the chlorine concentration in the slug to not less than 100 mg/L. For example, if the initial chlorine concentration in the slug is 150 mg/L, then the chlorine concentration must not decrease below 125 mg/L.

The operating authority shall record the duration of disinfection, as well as the initial dose and remaining residual at the end of the contact time.

1.1.2. Microbiological Samples for New Watermains

The operating authority shall ensure that the Microbiological samples taken in accordance with ANSI/AWWA Standard C651 shall include as a minimum *Escherichia coli* and Total Coliforms.

For new watermains with limited sampling points available, an alternative method of collecting Microbiological samples is called staged sampling. Staged sampling shall be performed as follows:

- a flow meter shall be installed to measure flow through the new watermain;
- a sampling point shall be installed at the end of the new watermain (additional sampling points may also be installed along the length of the watermain); and
- flow shall be established and samples shall be collected from the sampling point(s) at intervals that are calculated to represent the lengths of the watermain as required by ANSI/AWWA C651, based on the pipe size and the measured flow rate.

1.2. Relining of Watermains

For relining of existing watermains, the conditions of section 1.1 will apply. Notwithstanding the conditions of section 1.1, return to service will be allowed prior to receiving acceptable Microbiological sample test results if all the following conditions are met:

- the local Medical Officer of Health is consulted prior to the commencement of the project and their advice is documented and followed;
- watermain is physically isolated from the remainder of the system through Backflow prevention; and

- Flushing of the watermain has been completed and secondary disinfection has been restored as prescribed in section 3.2.6.

1.3. Planned Watermain Cleaning

For planned swabbing and hydraulic (e.g. Flushing) watermain cleaning, the requirements of section 3.2.6 – "Restoration of Secondary Disinfection and Return to Normal Service" shall apply.

For all other types of cleaning (e.g. air scouring, ice pigging, etc.), the operating authority shall develop a site specific plan for cleaning, disinfection and sampling in agreement with the local Ministry office (in consultation with the local Medical Officer of Health). The operating authority shall implement the plan as prescribed and the watermain cannot be put back in service until the cleaning, disinfection and sampling is completed as per the plan unless a Water Advisory is declared.

1.4. Planned Maintenance of Watermain Appurtenances and Fittings

The watermain disinfection procedures as defined under section 3 for Category 1 watermain breaks shall apply to the installation/replacement/repairs of Appurtenances and/or fittings. If Contamination is evident or suspected, the procedures defined under section 3 for Category 2 watermain breaks shall apply.

1.5. Tapping of Watermains

Where existing watermains are tapped, the pipe surface at the location of the tap shall be cleaned and disinfected using a minimum 1% sodium hypochlorite solution. Where applicable, the drill/cutting/tapping bits and all surfaces of mainstops, service saddles, tapping sleeves and valves which will come into contact with drinking water shall likewise be cleaned and disinfected using a minimum 1% sodium hypochlorite solution immediately prior to installation. If any of the disinfected surfaces come into contact with the soil and/or water in the excavation prior to use, the cleaning and disinfection procedure shall be repeated.

1.6. Service Pipes

Service pipes of 100 mm diameter and greater shall be considered as watermains for the purposes of this procedure, and shall be disinfected and tested in accordance with the requirements of ANSI/AWWA C651 as amended herein, including the mandatory backflow protection provision referred to in section 1.1. For Service pipes of diameter less than 100mm, operating authorities shall maintain sanitary conditions during installation and/or repairs, and shall clean and flush prior to placing in service.

2. Emergency/Unplanned Repairs

Drinking water system operating authorities shall ensure that emergency repairs to watermains and Appurtenances are undertaken in accordance with this procedure by any person authorized to perform the repairs.

Operating authorities shall develop and document operating procedures for emergency watermain repairs within their systems. In developing these procedures, operating authorities may use best management practices that go beyond the minimum requirements in this document.

3. Watermain Disinfection Procedures for Emergency Repairs

This procedure uses a risk management approach to categorize watermain breaks based on the potential for Contamination. The objective of this procedure is to set minimum disinfection requirements to minimize the potential for drinking water health hazards during emergency/unplanned repairs resulting from the physical failure of a watermain or Appurtenance (a “break”).

This procedure also establishes minimum standards for record keeping, and notification to the Ministry and the local Medical Officer of Health.

3.1. Categorization and Public Agency Notification of Watermain Breaks

Upon completion of the excavation, the Operator-in-Charge (OIC) shall conduct a visual inspection to determine the nature of the break. The OIC will assess the evidence of Contamination or potential Contamination of the watermain before and during the repair procedure, and shall classify the break into one of two categories as per 3.1.1 and 3.1.2.

Refer to Appendices A and B for a flowchart and pictures to better understand the criteria to determine the categories of watermain breaks.

3.1.1. Category 1

Watermain breaks with no evident or suspected Contamination are classified as Category 1. Follow the steps described in section 3.2 and 3.3 for repairs.

Contamination is typically not suspected for circumferential breaks or small leaks where flow is maintained from the break until an Air gap is established and where the Air gap is maintained during the repair procedure. If, at any time, Contamination is evident or suspected, the break shall be reclassified as Category 2.

3.1.2. Category 2

Watermain breaks with evident or suspected Contamination are classified as Category 2. Watermain repairs involving more than 6 metres of replaced pipe are also classified as Category 2. Follow the steps described in section 3.2 and 3.4 for repairs.

3.1.3. Public Agency Notification

3.1.3.1. Category 1

Category 1 watermain breaks are not defined as an observation of improper disinfection in accordance with Section 16-4 of Schedule 16 of O. Reg. 170, and are not required to be reported to the Spills Action Centre.

This procedure does not require that the local Medical Officer of Health be notified of Category 1 watermain break repairs; however, the local Medical Officer of Health may exercise his/her option to require such notification. Operating Authorities may choose to provide notification to, or seek advice from, the local Medical Officer of Health at any time.

3.1.3.2. Category 2

Category 2 watermain breaks are not required to be reported to the Spills Action Centre unless an operating authority believes that contaminated water was directed to users. If an operating authority believes that contaminated water was directed to users, this will constitute an observation of improper disinfection in accordance with Section 16-4 of Schedule 16 of O. Reg. 170/03, and the reporting and corrective actions of Schedule 16 and the applicable Schedule 17 or 18 of O. Reg. 170/03 shall apply.

This procedure does not require that the local Medical Officer of Health be notified of Category 2 watermain break repairs unless an observation of improper disinfection has been reported as noted above; however, the local Medical Officer of Health may exercise his/her option to require such notification. Operating authorities may choose to provide notification to, or seek advice from, the local Medical Officer of Health at any time.

Notification to the local Ministry office is not required for Category 2 watermain breaks unless:

- a Water Advisory is declared: The local Ministry office shall be notified as soon as reasonably possible during business hours. After business hours, the operating authority shall send an e-mail to the e-mail address specified by local Ministry office no later than 10 AM the next business day; or

- in the Special Cases described in sections 3.4.4 and 3.4.5: The local Ministry office shall be notified as soon as reasonably possible during business hours. After business hours, the operating authority shall contact the Spills Action Centre as soon as reasonably possible.

3.2. Watermain Break Common Disinfection Procedure

The following steps must be performed for all emergency watermain repairs (Category 1 and Category 2). Examples of typical steps for Category 1, 2 and for special cases are attached as Appendices C, D and E respectively.

3.2.1. Maintenance of Flow

The operating authority shall determine if flow can be maintained to the break site until the watermain is excavated. This determination shall be based on risks to worker and public safety, the possibility of property damage, and/or adverse impact to the natural environment.

The operating authority will attempt to maintain flow from the break, where possible, until an Air gap is established. Flow may be reduced by throttling valves while maintaining sufficient flow from the break to minimize the potential for Contamination. Flow may be discontinued after an Air gap has been created.

3.2.2. Excavation Dewatering

Excavation dewatering shall be continued for the duration of the repairs such that the Air gap between the location of the break in the watermain and the water in the excavation is maintained. If the water level in the excavation rises such that the Air gap is not maintained after flow from the break has been discontinued, then the watermain break shall be classified as Category 2.

3.2.3. Disinfection of Pipe and Repair Parts

All surfaces of pipe and repair parts which will come into contact with drinking water shall be disinfected using a minimum 1% sodium hypochlorite solution immediately prior to installation. If any of the disinfected surfaces come into contact with the water and/or soil in the excavation prior to installation, the surfaces shall be cleaned and the disinfection procedure shall be repeated.

If cutting out a section of pipe, the interior surfaces of the cut ends of the existing watermain shall be disinfected as well, using a minimum 1% sodium hypochlorite solution, swabbed or sprayed as far as can be practically reached.

3.2.4. Installation of Repair Parts

The repair parts shall be installed while ensuring that Contaminants do not enter the watermain.

3.2.5. Post Repair Flushing

Flushing shall be conducted following repairs by creating a temporary dead end downstream of the break through valve operation, and Flushing through the location of the repair to a discharge point. Flushed water may be discharged from a hydrant, plumbing or Appurtenances. Where there is no discharge point to allow for Flushing, the operating authority shall tap the watermain on the downstream side of the break and discharge from that point.

Flushing shall continue until the discharged water is free from discoloration, and secondary disinfection has been restored as per 3.2.6.

Dechlorination of discharged water is required for any water that is directed into surface water or if the discharge into the natural environment causes or is likely to cause an adverse effect, as per Condition 10 of Schedule B of the Municipal Drinking Water Licence. The discharged water is deemed to be a Class II spill for the purposes of O. Reg. 675/98 (Classification and Exemption of Spills and Reporting of Discharges) made under the Environmental Protection Act. Discharges of flushed water are also regulated under Condition 4.5 of newer Municipal Drinking Water Licences.

3.2.6. Restoration of Secondary Disinfection and Return to Normal Service

Flushing shall continue until the disinfectant concentration at the point of Flushing reaches at least 0.2 mg/L free chlorine in a chlorinated system or 1.0 mg/L combined chlorine in a chloraminated system. If these disinfectant concentrations cannot be achieved, Flushing shall continue until the disinfectant concentration at the point of Flushing is representative of the system residual in the break area, determined by sampling upstream of the break area and downstream at the Flushing location, or by using documented benchmarks for the area, as long as free chlorine concentrations are at least 0.05 mg/L in a chlorinated system and combined chlorine concentrations are at least 0.25 mg/L in a chloraminated system.

Upon restoration of secondary disinfection, the system can be returned to normal service, defined as having all valves returned to normal operating position.

3.3. Additional Information for Category 1 Watermain Break Repairs

3.3.1. Microbiological Samples (Optional)

There is no requirement to undertake Microbiological sampling for Category 1 watermain break repairs. Where the operating authority opts to undertake Microbiological sampling, samples shall be considered distribution samples within the meaning of O. Reg. 170/03, and the reporting/corrective actions of Schedule 16 and the applicable Schedule 17 or 18 of O. Reg. 170/03 shall apply.

3.4. Additional Requirements for Category 2 Watermain Break Repairs

In addition to the requirements described in section 3.2, the following steps are required for Category 2 watermain break repairs.

3.4.1. Removal of Contaminants from Watermain

Additional steps shall be undertaken as appropriate to remove Contaminants from the watermain, such as:

- mechanical removal of Contaminants;
- Flushing into the excavation;
- Higher velocity flushing after repairs where practical and feasible.

3.4.2. Additional Disinfection Procedures

In addition to the procedures in 3.2.3, site specific disinfection procedures may also be used depending on the severity or nature of the Contamination. The steps may include the disinfection procedures for new watermains as per ANSI/AWWA Standard C651.

3.4.3. Microbiological Samples (Mandatory)

After the completion of Flushing and restoration of secondary disinfection, at least one Microbiological sample shall be collected and submitted as soon as reasonably possible, taking into consideration laboratory working hours and transportation timeframes.

The flow shall be directed to ensure that the sample represents water that has passed through the location of the repair. The sampling will typically occur at the point of Flushing, and may take place from sampling ports, hydrants, blow-offs, or premise plumbing. All samples shall be considered distribution samples, taken and tested in accordance with O.Reg 170/03 requirements. The reporting and corrective actions of Schedule 16 and the applicable Schedule 17 or 18 of O. Reg. 170/03 shall apply.

The watermain may be returned to normal service defined as having all valves returned to normal operating position prior to receipt of sample results.

3.4.4. Special Case - Sewage Contamination

If there is evident or suspected sewage Contamination of a watermain, in addition to the procedures in sections 3.2 and 3.4, the operating authority shall develop and implement a plan with site specific procedures for disinfection and sampling. The sampling plan shall include as a minimum taking two sets of Microbiological samples at least 24 hours apart.

Return to normal service is contingent upon the corrective actions and sampling plan being completed to the satisfaction of the local Ministry office (in consultation with local Medical Officer of Health). The affected watermain(s) may not be put back in service before the corrective actions and sampling plan are completed unless a Water Advisory is declared.

The disinfection requirements for new watermains as per Section 1.1.1 may be used based on agreement between the operating authority and the local Ministry office (in consultation with the local Medical Officer of Health).

3.4.5. Special Case – Chemical Contamination

If there is evident or suspected chemical Contamination of a watermain, in addition to the procedures in sections 3.2 and 3.4, the operating authority shall develop and implement a plan with site specific procedures for disinfection and/or decontamination and sampling. The operating authority shall finalize the plan in agreement with the local Ministry office (in consultation with the local Medical Officer of Health).

Return to normal service is contingent upon the corrective actions and sampling plan being completed to the satisfaction of the local Ministry office (in consultation with the local Medical Officer of Health). The affected watermain(s) may not be put back in service before the corrective actions and sampling plan are completed unless a Water Advisory is declared.

4. Documentation

When performing maintenance and repair activities as per sections 1.4 and 3 of this procedure, the operating authority shall maintain records of the following information as a minimum. The information shall be retained as per the record keeping requirements of Section 27 of O. Reg. 128/04. This section does not require that all of the information be recorded on a single form:

- Date
- Location (e.g. a municipal address)
- Flow maintained at the site until Air gap created? (Yes/No)
- Watermain size and material (e.g. 150 mm cast iron)
- Evident or suspected Contamination of the watermain before or during the repair process? (No = Category 1 / Yes = Category 2)
- If watermain break, indicate type of watermain break (e.g. circumferential, longitudinal, split bell, spiral, rupture, blow-out, hole, leak at main stops/tapping valves, etc.)
- If planned maintenance, indicate type of planned maintenance (e.g. valve replacement)
- Air gap maintained, once established, throughout the repair process? (Yes/No)
- Name of Operator-in-Charge who classified the watermain break as Category 1 or Category 2
- Type of Repair (e.g. clamp, cut out, etc.)
- Pipe and Repair Parts disinfected? (Yes/No)
- Post-repair Flushing undertaken? (Yes/No)
- For Category 2, where additional steps were required under 3.4.1 and 3.4.2, describe these steps.
- For Category 2 – Special Cases, include site specific plan. If chlorine disinfection was used, indicate initial concentration, contact time, final concentration and final concentration as percentage of initial concentration.
- Disinfectant residual on final post repair Flushing. If final disinfectant residual is less than 0.2 mg/L free chlorine in a chlorinated system or 1.0 mg/L combined chlorine in a

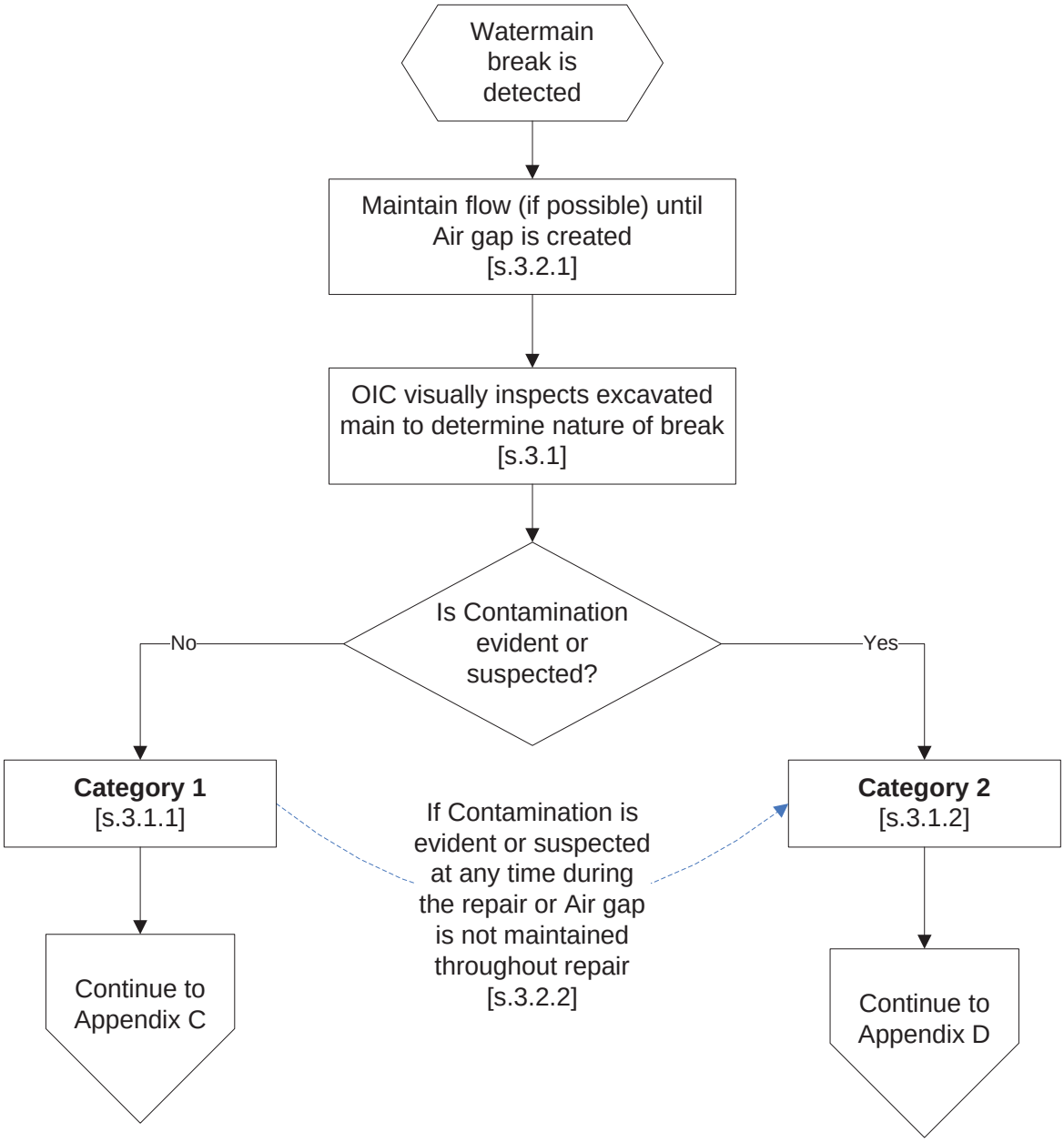
chloraminated system, then provide the location and results of upstream disinfectant residual(s) or by using documented benchmarks for the area, as per section 3.2.6.

- Microbiological samples taken (Yes/No/Not applicable)
- Date and location(s) of sample(s) (e.g. Chain of custody)
- Date and time of return to normal service
- Water Advisory declared: Date and Time (Yes/No/Not Applicable)
- Public Agency Notification – local Ministry office (Date and Time) (Yes/No/Not Applicable)
- Public Agency Notification – Spills Action Centre (Date and Time) (Yes/No/Not Applicable)
- Public Agency Notification/Direction – local Medical Officer of Health (Date and Time) (Yes/No/Not Applicable)

APPENDIX A

Tools to Help Determine the Category of Watermain Break - Flowchart

The following flowchart will help determine the categories of watermain breaks.



APPENDIX B

Tools to Help Determine the Category of Watermain Break - Pictures

Examples of watermain breaks that are typical of Category 1 are included below for illustrative purposes only:

Figure 1: Circumferential watermain break with flow maintained until after an Air gap was created.

Figure 2: Corrosion hole leak in a watermain with flow maintained until after an Air gap was created.

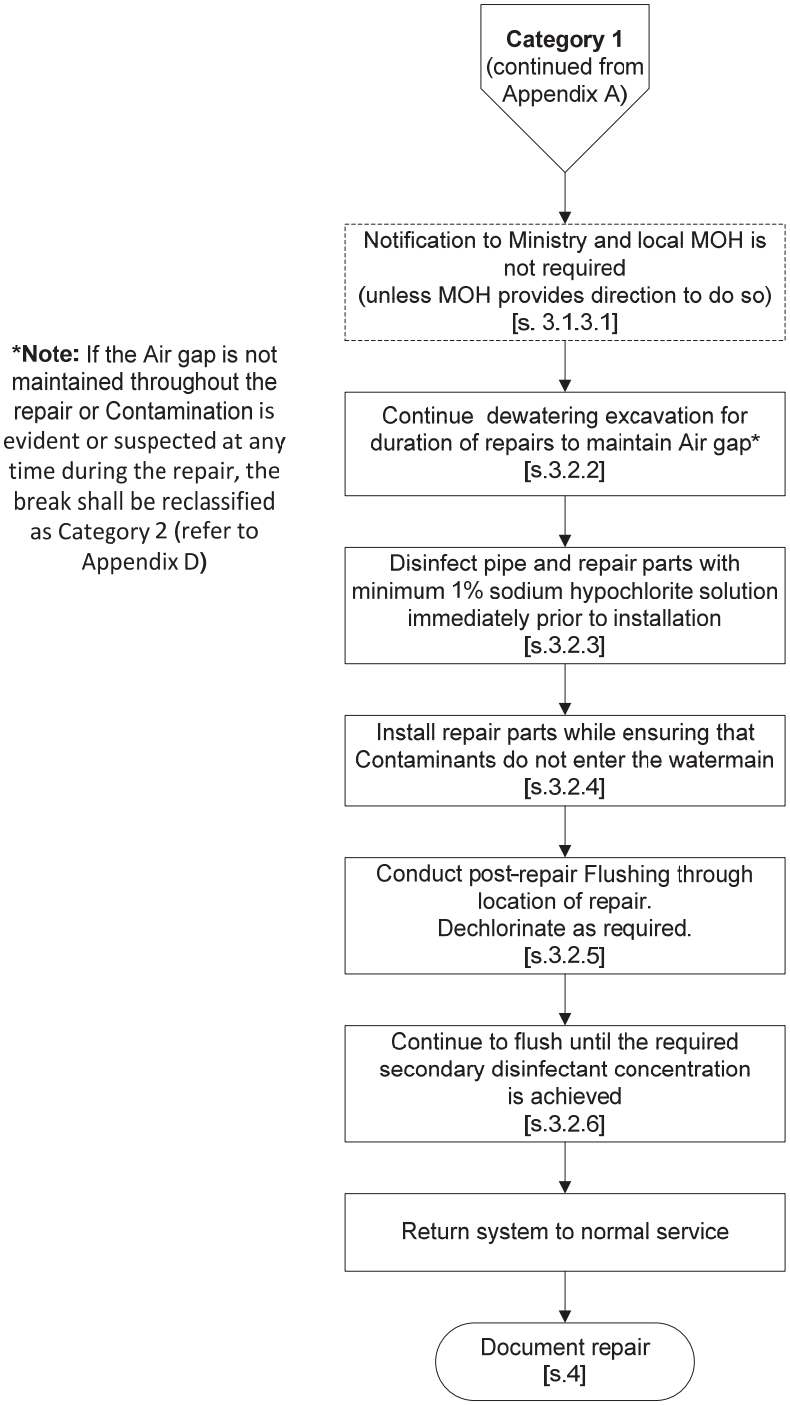
Examples of watermain breaks that are typical of Category 2 are included below for illustrative purposes only:

Figure 3: Longitudinal watermain break with evident Contamination.

Figure 4: Spiral watermain break with evident Contamination.

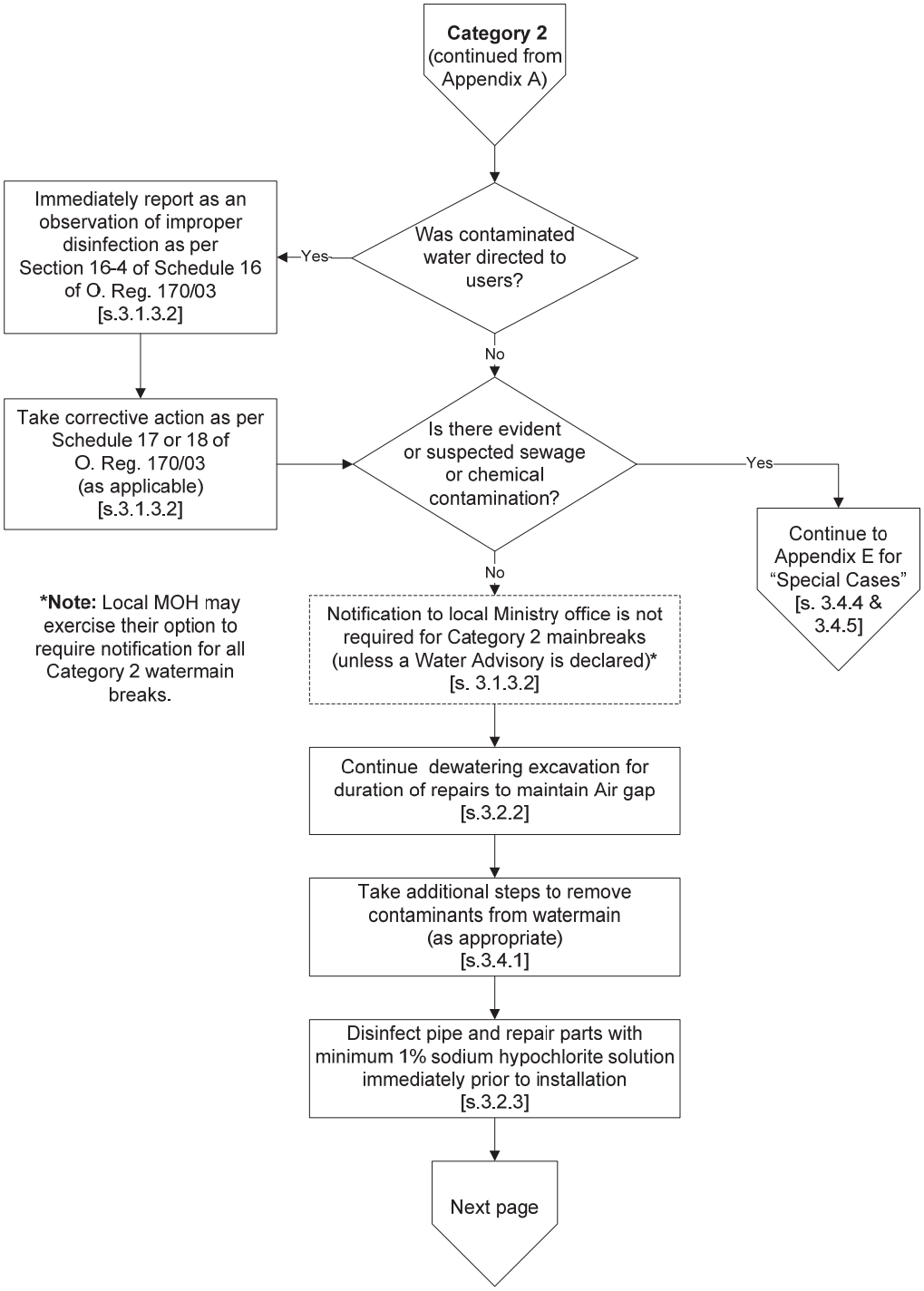
APPENDIX C – CATEGORY 1 FLOWCHART

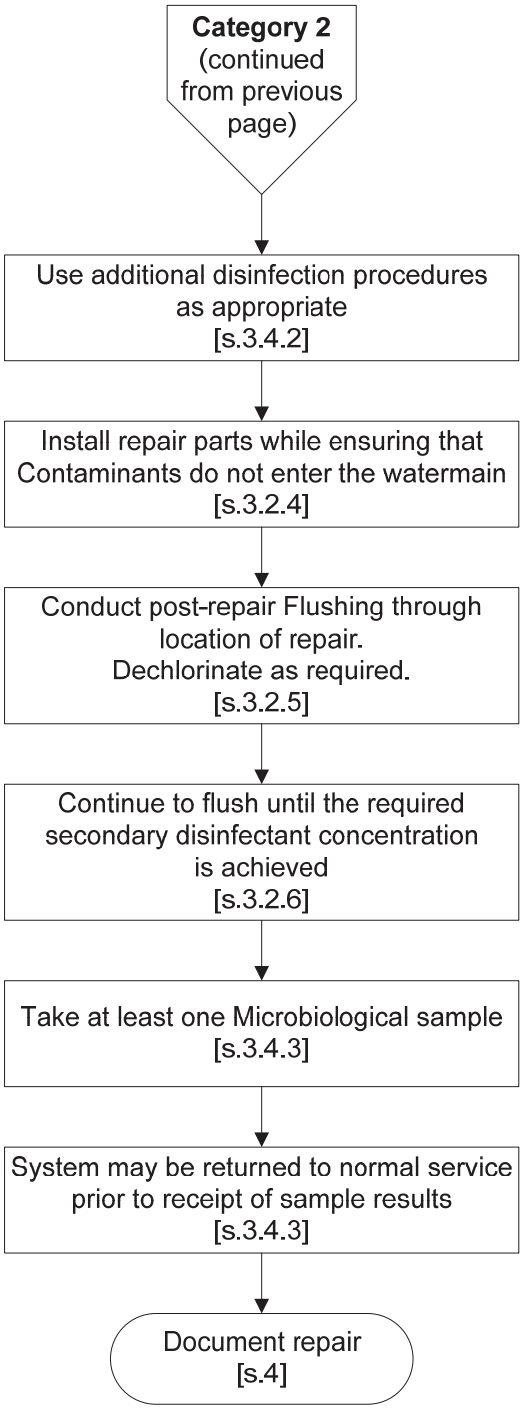
The following flowchart is an example of the typical steps required for **Category 1** watermain breaks
Note: These steps also apply to the planned maintenance of watermain Appurtenances and fittings (refer to section 1.4). Any additional directions given by the Ministry and/or the local Medical Officer of Health must be followed.



APPENDIX D

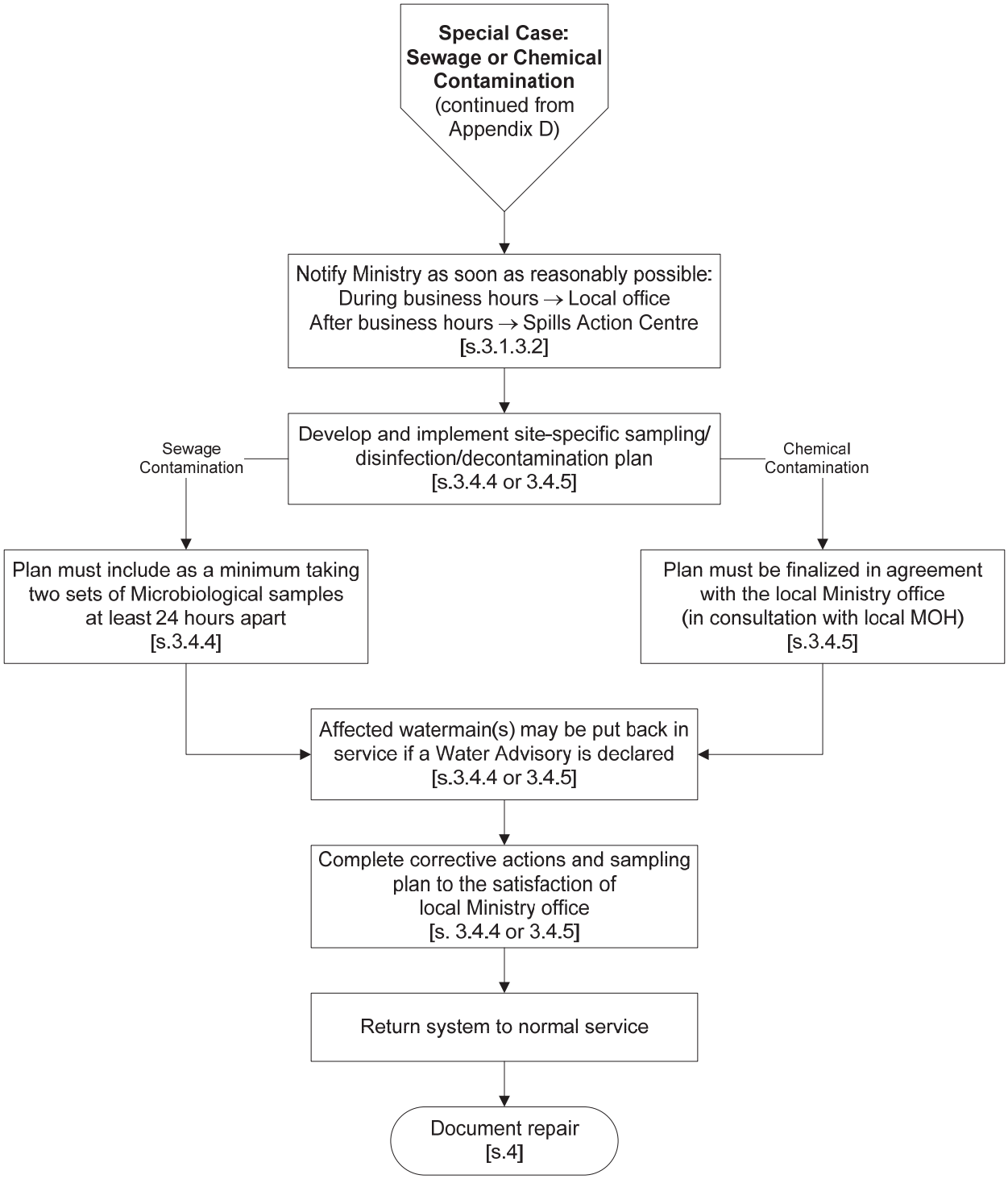
The following flowchart is an example of the typical steps required for **Category 2** watermain breaks. **Note:** The sequence of actions may be varied as appropriate for the specific situation. Any additional directions given by the Ministry and/or the local Medical Officer of Health must be followed.




Category 2
(continued
from previous
page)
Use additional disinfection procedures
as appropriate
[s.3.4.2]
Install repair parts while ensuring that
Contaminants do not enter the watermain
[s.3.2.4]
Conduct post-repair Flushing through
location of repair.
Dechlorinate as required.
[s.3.2.5]
Continue to flush until the required
secondary disinfectant concentration
is achieved
[s.3.2.6]
Take at least one Microbiological sample
[s.3.4.3]
System may be returned to normal service
prior to receipt of sample results
[s.3.4.3]
Document repair
[s.4]

APPENDIX E

The following flowchart depicts the requirements for special case Contamination (sewage or chemical) as a result of a watermain break.



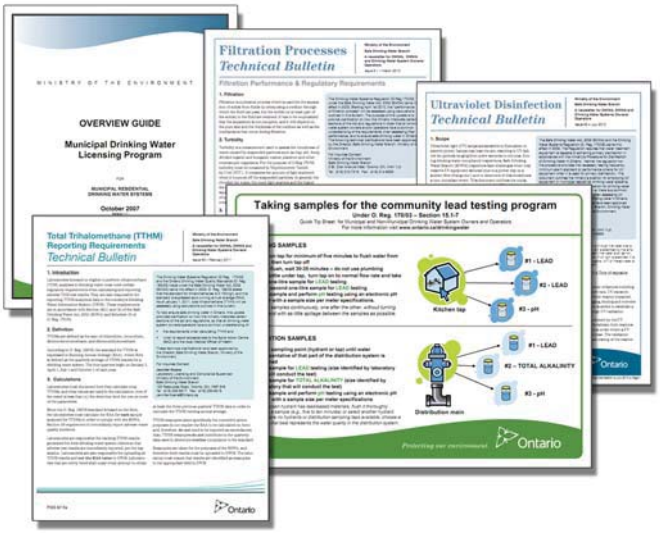
Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are posted on the Ministry of the Environment's **Drinking Water Ontario** website at **www.ontario.ca/drinkingwater** to help in the operation of your drinking water system.

Below is a list of key materials frequently used by owners and operators of municipal drinking water systems. To read or download these materials, go to **Drinking Water Ontario** and search in the **Resources** section by **Publication Number**.

Visit **Drinking Water Ontario** for more useful materials. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or **picemail.moe@ontario.ca**.



PUBLICATION NUMBER	PUBLICATION TITLE
4448e01	Procedure for Disinfection of Drinking Water in Ontario
7152e	Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids
7467	Filtration Processes Technical Bulletin
7685	Ultraviolet Disinfection Technical Bulletin
8215	Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)
2601e	Overview Guide: Municipal Drinking Water Licensing Program
0000	Municipal Drinking Water Licensing Program Bulletin, Issue 1, January 2011
0000	Certification Guide for Operators and Water Quality Analysts
6560e	Taking Samples for the Community Lead Testing Program
7423e	Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption
7128e	Drinking Water System Contact List
4449e01	Technical Support Document for Ontario Drinking Water Quality Standards

PIBS 8990b

Ontario

Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

Beaucoup de documentation sur le fonctionnement d'un réseau d'eau potable se trouve sur le site Web du **ministère de l'Environnement**.

Vous trouverez ci-dessous la liste des principaux documents que les propriétaires et les exploitants de réseaux municipaux d'eau potable utilisent fréquemment. Pour lire ou télécharger ces documents, allez sur le site Web du Ministère, et effectuez une recherche par numéro de publication dans la section RESSOURCES.

Consultez le site d'**Eau potable Ontario** pour obtenir d'autre documentation. Communiquez avec le Centre d'information du public au 1 800 565-4923 ou au 416 325-4000, ou encore à **picemail.moe@ontario.ca** si vous avez des questions ou besoin d'aide.

NUMÉRO DE PUBLICATION	TITRE DE LA PUBLICATION
4448f01	Marche à suivre pour désinfecter l'eau portable en Ontario
7152e	Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)
7467	Filtration Processes Technical Bulletin (en anglais seulement)
7685	Ultraviolet Disinfection Technical Bulletin (en anglais seulement)
8215	Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (février 2011) (en anglais seulement)
2601f	Guide général - Programme de délivrance des permis de réseaux municipaux d'eau potable
0000	Bulletin du Programme des permis de réseaux municipaux d'eau potable, numéro 1, janvier 2011
0000	Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable
6560f	Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités
7423f	Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption
7128f	Liste des personnes-ressources du réseau d'eau potable
4449f01	Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario

ontario.ca/drinkingwater

PIBS 8990b

Ontario

Inspection Rating Record

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years to account for legislative and societal changes that affect acceptable risk levels. As a result of the most recent review, the methodology has been modified to present an improved metric for the evaluation of the risk/safety of MRDWS operations.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that

PIBS 6797e

ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. Additionally, the inspection protocol contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry have assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating that is less than 100 per cent does not mean that the drinking water from the system is unsafe. It shows areas where a system's operation can improve. To that end, the ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards; understanding the likelihood and consequences of the hazards; and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:

Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:

Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 3:

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?

Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	**Major** Administrative Consequence	**Minor** Environmental Consequence	**Minor** Health Consequence	**Medium** Environmental Consequence	**Major** Environmental Consequence	**Medium** Health Consequence	**Major** Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely	L=3 (Likely)	L=2 (Possible)
R=4	**R=2**	**R=6**	**R=12**	**R=15**	**R=6**	**R=21**	**R=16**

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions that relate to regulatory compliance and input their responses as “yes”, “no” or “not applicable” into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone), type of inspection (i.e., focused, detailed), and source type (i.e., groundwater, surface water).

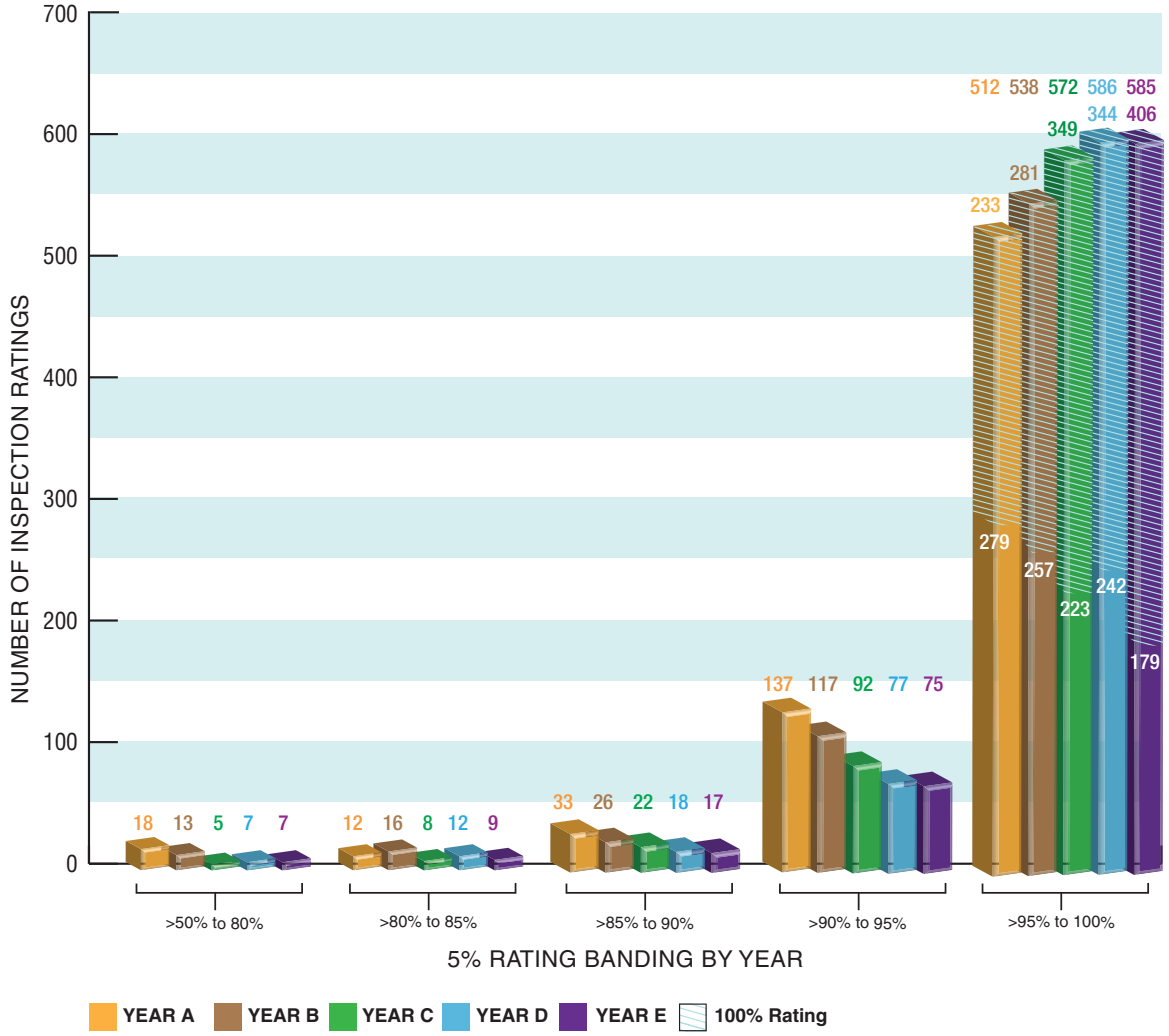
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Process Wastewater
6. Distribution System
7. Operations Manuals
8. Logbooks
9. Contingency and Emergency Planning
10. Consumer Relations
11. Certification and Training
12. Water Quality Monitoring
13. Reporting, Notification and Corrective Actions
14. Other Inspection Findings

For further information, please visit **www.ontario.ca/drinkingwater**

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2015-2016)

DWS Name:	FORT FRANCES DRINKING WATER SYSTEM
DWS Number:	220000978
DWS Owner:	Fort Frances, The Corporation Of The Town Of
Municipal Location:	Fort Frances
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Detailed
Inspection Date:	November 30, 2015
Ministry Office:	Kenora Area Office

Maximum Question Rating: 767

Inspection Module	Non-Compliance Rating
Permit To Take Water	0 / 30
Capacity Assessment	0 / 38
Treatment Processes	0 / 115
Process Wastewater	0 / 20
Distribution System	21 / 29
Operations Manuals	0 / 42
Logbooks	4 / 42
Consumer Relations	0 / 8
Certification and Training	0 / 58
Water Quality Monitoring	0 / 160
Reporting & Corrective Actions	0 / 84
Other Inspection Findings	0 / 0
Treatment Process Monitoring	0 / 141
TOTAL	**25 / 767**

Inspection Risk Rating	**3.26%**

FINAL INSPECTION RATING:	**96.74%**

Inspection Rating Record Generated On 14-JAN-16 (Inspection ID: 1-C5DKM).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2015-2016)

DWS Name:	FORT FRANCES DRINKING WATER SYSTEM
DWS Number:	220000978
DWS Owner:	Fort Frances, The Corporation Of The Town Of
Municipal Location:	Fort Frances
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Detailed
Inspection Date:	November 30, 2015
Ministry Office:	Kenora Area Office

Non-compliant Question(s)	Question Rating
Distribution System	
Are existing parts of the distribution system that are taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that come in contact with drinking water, disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit?	21
Logbooks	
Does the record system allow the reader to unambiguously identify the person making the logbook entry?	4
TOTAL QUESTION RATING	25

Maximum Question Rating: 767

Inspection Risk Rating	**3.26%**

FINAL INSPECTION RATING:	**96.74%**

Inspection Rating Record Generated On 14-JAN-16 (Inspection ID: 1-C5DKM).