



TSAWWASSEN FIRST NATION
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Drinking Water Quality Monitoring Report 2017

August 2018

Executive Summary

Tsawwassen First Nation (TFN) provides this report in fulfillment of the Drinking Water Protection Act Section 15b. This report outlines a summary of water quality testing results for the year 2017 as well as system improvement actions and plans.

A total of 48 samples were taken from the water distribution system during 2017, including *Escherichia coli* (48 samples), and total coliforms (48 samples). No samples exceeded the limits set out in the *Drinking Water Protection Act and Regulation* and the *Guidelines for Canadian Drinking Water Quality*. TFN is committed to delivery of water of the highest quality, and will continue to make the necessary investment to ensure its continued success.

The following modifications were completed to the water distribution system in 2017.

- Completion of water main extension and services to accommodate the Tsawwassen Mills mall, the Commons and the surrounding development.

- Supply and installation of fixed base radio read system and water meters for new residential and commercial customers.

Any questions relating to this report of the water system can be directed to Michael Murphy at 604-868-3550.

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1.0 INTRODUCTION

The purpose of this report is to provide a summary of the Drinking Water Quality Monitoring Program during 2017 for TFN's water distribution system.

During 2017 the provision of drinking water was governed by the Drinking Water Protection Regulation (pursuant to the *Drinking Water Protection Act*). This regulation requires suppliers of drinking water in BC to:

1. Develop a process to notify the Drinking Water Officer (DWO) of situations or conditions that render or could render the water unfit to drink.
2. Implement a plan for collecting, shipping and analyzing water samples in compliance with the direction set by the DWO.
3. Implement a plan for reporting monitoring results to the DWO and to water users including the preparation of an annual report.

TFN is required to hold an annual Operating Permit and to monitor the water quality in the TFN distribution system. **Appendix A** includes a summary of test result for 2017.

This document includes a brief introduction to TFN's water distribution system and its drinking water monitoring and testing program. The remaining parts of this document summarize the results and analysis of water samples collected in 2017 and evaluates the distribution system's performance in delivering safe drinking water.

Water Distribution System

An overview drawing of the existing TFN water distribution system is available in **Appendix B**. The system services residential, commercial, and operations sites located on TFN lands, most of which are north of Highway 17. Water quality is monitored at seven different sampling sites throughout the distribution system network.

Water is supplied to TFN by Metro Vancouver and the Corporation of Delta. Two connections to the Metro Vancouver South Delta Main #1 350mm trunk watermain are located along 52 Street, one at 28 Ave and another at Canoe Pass Way. These connections are the primary sources for TFN's distribution system. Two additional connections to a 450mm trunk main owned by Delta are located on Highway 17. The connection south of Salish Sea Dr. services the Big Splash Waterpark, while the connection at Tsawwassen Drive north of Highway 17 is a backup connection that is not typically used. There are also two areas where TFN is directly serviced by Delta's water system located at Pacific Dr. and Tsawwassen Beach Rd. These areas serviced directly by Delta are not part of this monitoring report as the operation and maintenance of these areas is provided by the Corporation of Delta.

The main distribution system is comprised of pipes ranging in size from 150 mm diameter to 500 mm diameter and consists of PVC and HDPE materials.

The following modifications were completed to the water distribution system in 2017. Details of the current water system is outlined in the Figure in **Appendix B**.

- Completion of water main extension and services to accommodate the Tsawwassen Mills Mall, the Commons and the surrounding development.
- Supply and installation of fixed base radio read system and water meters for new residential and commercial customers.

2.0 TESTING AND MONITORING PROGRAM

Drinking water quality is a function of source water quality, water treatment, and water quality changes after treatment. As a result, monitoring of drinking water quality consists of three components: source water monitoring, monitoring after treatment, and monitoring in the distribution system. While Metro Vancouver carries out testing of water at the source and testing after treatment, TFN’s Drinking Water Quality Monitoring Program is focused on monitoring the water quality within its own water distribution system. No additional water treatment is provided to the water at TFN.

The monitoring and testing program consist of routine monitoring, for obtaining an accurate overview of water quality within the distribution system, and non-routine monitoring, for handling complaint and emergency situations. Monitoring includes two components: collection of the sample and laboratory analysis of the sample.

2.1 Routine Monitoring

The collection of water samples is performed by TFN staff and forwarded to a qualified lab for analysis. All microbiological analyses were conducted by laboratories that are approved by Canadian Association of Environmental Analytical Laboratories or an equivalent certification program for the other tests performed.

Results of the analyses are reported by the Fraser Health Authority.

SAMPLING PARAMETERS

2.1.1 The parameters that were analyzed are summarized in **Table 1**.

Table 1: Sampling Parameters

	PARAMETERS
Microbiological	Total Coliforms, Escherichia coli (E. coli)
Chemical and Physical	None
Radiological	None

The significance of the parameters of most relevance is briefly discussed below. Further details regarding the parameters listed in the above table can be found by accessing the supporting documents of the Guidelines for Canadian Drinking Water Quality (GCDWQ) through the following web site, <http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php>, or by contacting Health Canada at (613) 957-2991.

Total Coliforms and *E. coli*

One of the primary concerns in water quality is the growth of coliform bacteria. The presence of total coliforms indicate that treatment is inadequate or that the distribution system is experiencing regrowth or infiltration. *Escherichia coli*, one of the species in the fecal coliform group, is a definite indicator of the presence of contamination within the distribution system.

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2.1.2 SAMPLING LOCATIONS

Sampling locations are distributed in different areas throughout TFN so as to obtain an accurate overview of water quality of the distribution system. A system map is available in **Appendix B**.

These locations are described in the table below. **Appendix A** contains the results of the testing conducted throughout the year.

**Table 2: Sample Locations
Distribution System**

Site	Location	Flow Category	Description
W-1	Cardinal Residence- 3404 Falcon Way	Dead End	Kitchen Tap
W-2	Plant Lab- 2292 Tsawwassen Dr	Medium	Plant Lab Tap
W-3	Band Office- 1926 Tsawwassen Dr	Medium	Lunchroom Tap
W-4	Tsatsu Gas Station- 101 Tsawwassen Dr	Dead End	Store Sink
W-5	Park Canada- 4761 Nulelum Way	Dead End	Store
W-6	Corner House- 1500 blk Tsawwassen Dr	Medium	Outdoor Tap
W-7	Tsatsu Shores Condo 101 Tsatsu Shores	Dead End	Outdoor Tap

2.1.3 SAMPLING FREQUENCY

Sampling frequencies are outlined in **Table 3**.

Table 3: Sampling Frequency

Monthly Distribution System	
Frequency:	Monthly
Sites:	W-1, W-3, W-4, W-6
Parameters:	Total coliforms, E. coli

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Quarterly Distribution System	
Frequency:	Quarterly
Sites:	W-2, W-5, W-7
Parameters:	Total coliforms, E. coli

Information provided by TFN indicates the number of users of the water system is approximately 490 persons (prior to the Mall and commercial areas coming on line late in 2017). Discussions with FHA, based on the *Drinking Water Protection Regulation*, require that TFN, as a purveyor of drinking water, tests at least four samples per month for bacteriological parameters. During 2017, TFN tested six samples per month for January, February, and June, no samples in either November or December, and three samples in each of the remaining seven months for a total of 48 samples. During 2017 the number of distribution system monitoring samples reported were not met for nine months of the annual recording period.

TFN has recently completed an updated assessment of the serviced population to reflect the Mall and other commercial areas being added and is currently in the process of reviewing and discussing this with Fraser Health to confirm the appropriate number of samples to be collected in 2018 and have also submitted an updated system classification application to the Environmental Operators Certification Program.

2.2 Non-routine Monitoring

Consumer complaints are recorded so that water quality concerns can be tracked and responded to efficiently. The parameters to be sampled for depend on the nature of the complaint. In any emergency situation, the procedures outlined in the TFN Emergency Response Plan were followed. A watermain break occurred at Canoe Pass and 52 Street which was a developer warranty claim and water quality tests were taken, and emergency procedures were followed to ensure a satisfactory repair. There were no additional reported events in 2016 which resulted in the need for emergency sampling.

3.0 SAMPLE ANALYSIS RESULT

48 samples were taken from the water distribution system during 2017. No samples exceeded the limits set out in the BC Drinking Water Protection Regulation (DWPR) and the GCDWQ. The sample analysis results are summarized in **Table 4** below, and some of the parameters worth noting are discussed in this section.

3.1 Coliform and Escherichia coli

The BCDWPR requires that (1) no sample should contain fecal coliform and Escherichia coli (E. coli) and that (2) no sample should contain more than 10 total coliforms per 100 millilitre or not more than 10% of samples from the distribution system in a given calendar month should show the presence of total coliform bacteria.

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Of the 48 samples analysed for microbiological criteria in the year 2017, no *E. coli* or total coliforms were detected. All colony forming units (CFU) were reported as <1 CFU/100mL. Therefore, all samples met the water quality requirements of the BCDWPR.

Table 4: Coliform Analysis Results

Sample Station	Total Coliform CFU/100mL				E. coli CFU/100mL				Positive Coliform Tests	Positive E. Coli Tests
	Sample Tested	Low	Average	High	Sample Tested	Low	Average	High		
W-1	8	< 1	n/a	< 1	8	< 1	n/a	< 1	None	None
W-2	5	< 1	n/a	< 1	5	< 1	n/a	< 1	None	None
W-3	8	< 1	n/a	< 1	8	< 1	n/a	< 1	None	None
W-4	7	< 1	n/a	< 1	7	< 1	n/a	< 1	None	None
W-5	3	< 1	n/a	< 1	3	< 1	n/a	< 1	None	None
W-6	5	< 1	n/a	< 1	5	< 1	n/a	< 1	None	None
W-7	3	< 1	n/a	< 1	3	< 1	n/a	< 1	None	None

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4.0 SUMMARY

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A total of 48 samples were taken from the water distribution system during 2017, including *Escherichia coli* (48 samples), and total coliforms (48 samples). No samples exceeded the limits set out in the *Drinking Water Protection Act and Regulation* and the *Guidelines for Canadian Drinking Water Quality*. TFN is committed to delivery of water of the highest quality, and will continue to make the necessary investment to ensure its continued success.

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All microbiological samples collected were reported <1 CFU/100 mL. The minimum required number of samples (i.e., 4 samples throughout the distribution system) was not collected in nine months of the annual collection period. It is recommended to collect at least the required 4 samples per month during the year subject to revision based on updated discussions with Fraser Health.

The following modifications were completed to the water distribution system in 2017.

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Any questions relating to this report of the water system can be directed to Michael Murphy at 604-868-3550.

REFERENCES

1. British Columbia Drinking Water Protection Act and Regulation
2. Guidelines for Canadian Drinking Water Quality (October 2014)
3. Standard Methods for the Examination of Water and Wastewater 22 Edition
4. Guidance Manual for Maintaining Distribution System Water Quality, AWWA Research Foundation
5. Maintaining Water Quality in Finished Water Storage Facilities, AWWA Research Foundation
6. Water Quality Monitoring and Reporting Plan for the GVRD and Member Municipalities
7. Simplified Procedures for Water Examination, AWWA Manual of Water Supply Practices M12
8. Guidelines for the Approval of Waterworks, Coast Garibaldi Health

APPENDIX A

Sample Analysis Results

Sample Range Report

Fraser Health Authority

Facility Name: TFN Water System
Date Range: Jan 1 2017 to Dec 31 2017

Operator Michael Murphy
1926 Tsawwassen Drive
Tsawwassen. BC V4M 4G2

<u>Sampling Site</u>	<u>Date Collected</u>	<u>Total Coliform</u>	<u>E. Coli</u>	<u>Fecal Coliform</u>
<u>Cardinal Residence -</u>				
<u>Kitchen Tap, 3404</u>				
<u>Falcon Way</u>				
	5/3/2017	L1	L1	
	6/6/2017	L1	L1	
	7/4/2017	L1	L1	
	8/9/2017	L1	L1	
	9/5/2017	L1	L1	
	10/3/2017	L1	L1	
	11/14/2017	L1	L1	
	12/12/2017	<u>L1</u>	<u>L1</u>	
	Total Positive:	0	0	0
<u>Plant Lab Tap, 2292</u>				
<u>Tsawwassen Dr</u>				
	4/27/2017	L1	L1	
	5/16/2017	L1	L1	
	6/6/2017	L1	L1	
	6/20/2017	L1	L1	
	7/18/2017	L1	L1	
	8/22/2017	L1	L1	
	9/19/2017	L1	L1	
	10/17/2017	L1	L1	
	12/12/2017	<u>L1</u>	<u>L1</u>	
	Total Positive:	0	0	0
<u>Band Office -</u>				
<u>Lunchroom Tap,</u>				
<u>1926 Tsawwassen</u>				
<u>Dr</u>				
	4/27/2017	L1	L1	
	5/16/2017	L1	L1	
	6/20/2017	L1	L1	
	7/4/2017	L1	L1	
	8/9/2017	L1	L1	
	9/5/2017	L1	L1	
	10/3/2017	L1	L1	
	10/17/2017	L1	L1	
	11/14/2017	L1	L1	

12/12/2017	<u>L1</u>	<u>L1</u>	0
Total Positive:	0	0	

TSATSU Gas
Station - Store Sink
101 Tsawwassen Dr

4/27/2017	L1	L1	
5/16/2017	L1	L1	
6/20/2017	L1	L1	
7/4/2017	L1	L1	
8/9/2017	L1	L1	
9/5/2017	L1	L1	
10/3/2017	L1	L1	
11/14/2017	L1	L1	
12/19/2017	<u>L1</u>	<u>L1</u>	
Total Positive:	0	0	0

Park Canada -
Store, 4761 Nulelum
Way

5/3/2017	L1	L1	
6/6/2017	L1	L1	
7/18/2017	L1	L1	
8/22/2017	L1	L1	
9/19/2017	L1	L1	
12/19/2017	<u>L1</u>	<u>L1</u>	
Total Positive:	0	0	0

Corner house at
entrance - Outdoor
Tap, 1500 blk
Tsawwassen Dr

5/3/2017	L1	L1	
7/18/2017	L1	L1	
9/19/2017	L1	L1	
10/17/2017	<u>L1</u>	<u>L1</u>	
Total Positive:	0	0	0

Tsa-Tsu Shores
Condo - Outdoor
Tap, 101 TSATSU
Shores

8/22/2017	L1	L1	
12/19/2017	<u>L1</u>	<u>L1</u>	
Total Positive:	0	0	0

Result Values: E - estimated L - less than G - greater than

Samples that contain total coliform:	0	0.00% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that	0	

contain total coliform:		
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	48	

Comments:

Environmental Health Officer

Jul 6 2018

FOR FURTHER INFORMATION PLEASE CALL: Binny Sivia (604) 870-7900

APPENDIX B

TFN Distribution System Map

