

10.B.4)

# Tweed Drinking Water System Annual Water Report

Reporting period of January 1, 2016 – December 31, 2016

Prepared For: The Corporation of the Municipality of Tweed

Prepared By:



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

This report has been prepared to satisfy the annual reporting requirements of the Provincial Regulations and Guidelines established by the Ministry of the Environment in the Province of Ontario including the section 11 and Schedule 22 reports identified in O.Reg 170/03, Drinking Water Systems Regulation and the Permit to Take Water Reports identified in O.Reg 387/04, Water Taking and Transfer Regulation.

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## Report Availability

<b>Population Served:</b>	< 10,000
<b>Website where the annual report can be viewed by the public:</b>	www.twp.tweed.on.ca
<b>Alternate location where annual report will be available for inspection and is free of charge:</b>	Municipal Office
<b>How are system users notified that the annual report is available and is free of charge?</b>	Public access/notice via Municipal Website and Bi-weekly Municipal News Column
<b>Number of Designated Facilities served:</b>	None
<b>Has a copy of this report been provided to all Designated Facilities?</b>	N/A
<b>Number of Interested Parties reported to:</b>	N/A
<b>Has a copy of this report been provided to all Interested Parties?</b>	N/A
<b>The following Drinking-Water Systems receive drinking water from this system:</b>	N/A
<b>Has a copy of this report been provided to connected owners?</b>	N/A

## Compliance Report Card

<b>Drinking Water System Number:</b>	220001557
<b>System Owner:</b>	The Corporation of the Municipality of Tweed
<b>Operating Authority:</b>	Ontario Clean Water Agency
<b>Drinking Water System Category:</b>	Large Municipal Residential
<b>Reporting Period:</b>	January 1, 2016 – December 31, 2016

Event Summary	# of Events	Date	Details
Ministry of Environment Inspections	1	Sept 16, 2016	Un-announced-Focused Drinking Water Inspection – Final Inspection Rating of 100%
Ministry of Labour Inspections	0		
DWQMS Audits	1	May 9, 2016	12 Month Surveillance Audit – SAI Global
AWQI's	0		
Non-Compliance	0		
Community Complaints	0		
Spills	0		



## Quality Control Measures

The Corporation of the Municipality of Tweed facilities are part of OCWA's operational Trent Valley Hub. The facilities are supported by hub, regional and corporate resources. Operational Services are delivered by OCWA staff that live and work in the surrounding area.

OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

OCWA has additional "Value Added" and operational support services that the Corporation of the Municipality of Tweed benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
  - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
  - Process Data Collection (PDC) and PDM (WISKI) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
  - Work Management System (WMS) tracks and reports maintenance activities, and creates predictive and preventative reports.
  - WonderWare wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Access to a network of operational compliance and support experts at the hub, region and corporate level
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

## System Process Description

### Raw Source

Raw water sources for the Tweed Drinking Water System are from two separate groundwater wells. The main service well is the Crookston Well or Well #3, Well #1 is only utilized as an emergency stand-by well.

### Treatment

No treatment exists at the Well #1 pump house. In the event that this standby well is needed to be put into operation, it is designed to pump water to the Well 3 treatment subsystem for further treatment and disinfection. Well #3 subsystem is equipped with submersible pumps ultraviolet light for primary disinfection and sodium hypochlorite for secondary disinfection. Well #3 (Crookston) has a nitrate uranium removal system (ion exchange). The facility is equipped with on-line, alarmed continuous monitoring for treated water free chlorine residual and turbidity and distribution system free chlorine residual. The facility also contains a well pump lock out system in the case of disinfection failure.

**Treatment Chemicals used during the reporting year:**

Chemical Name	Use	Supplier
Sodium Chloride	Softener	Sifto Canada Corp
Sodium Hypochlorite	Disinfection	Brenntag

**Summary of Non-Compliance**

**Adverse Water Quality Incidents**

Date	AWQI #	Cause			Corrective Action Taken
		Parameter	Result	Exceedance of	
n/a					

**Non-Compliance**

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
n/a				

**Non-Compliance Identified in a Ministry Inspection:**

Ministry of Environment Inspection Rating: 100%

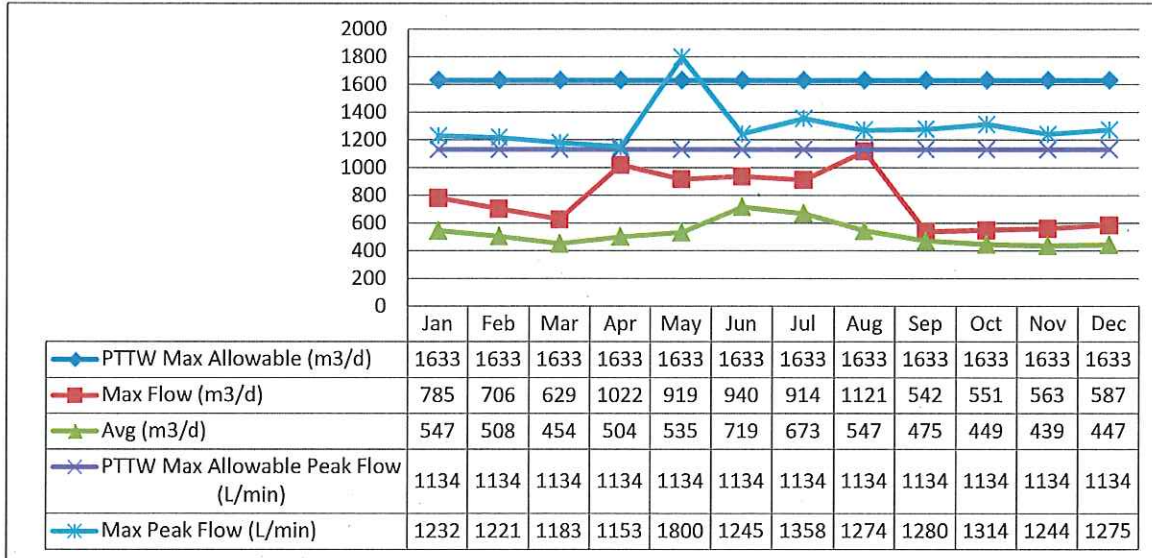
Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
n/a				

## Flows

The Tweed Drinking Water System is has a rated capacity of 1633 m3/day.

### Raw Water Flows – RW3

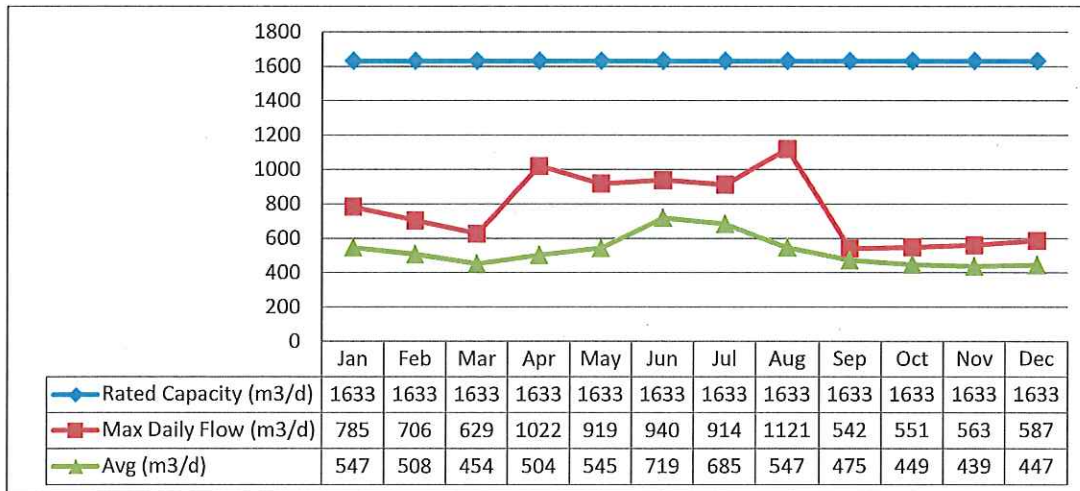
The Raw Water flows are regulated under the Permit to Take Water.



The above table shows there were exceedances in instantaneous peak flow rate (L/min) these occurrences were caused during pump start-up/pump to waste. The significant spike in May was due to scheduled Flow Meter calibration.

### Treated Water Flows - TW

The Treated Water flows are regulated under the Municipal Licence.





## Regulatory Sample Results Summary

- RW1 =Raw Water Well 1
- RW3 = Raw Water Well 3
- TW=Treated Water
- DW=Distribution Water

## Microbiological Testing

Location	Number of Samples	E.coli Results (min) - (max)	Total Coliform Results (min) – (max)	Number of HPC Samples	HPC Results (min) - (max)
Raw Water – RW 1	53	0 - 0	0 - 1	~	~
Raw Water – RW 3	53	0 - 0	0 - 0	~	~
Treated Water - TW	53	0 - 0	0 - 0	52	0 – 30
Distribution - DW	130	0 - 0	0 - 0	130	0 - 2000

## Operational Testing

### On-Line

Parameter	Range of Results (min # - max #)
Treated Free Chlorine	0.94 – 3.85 mg/L
Distribution Free Chlorine	0.60 – 2.51 mg/L
Treated Water Fluoride	Fluoride is not added at this facility

Instrument spikes and dips recorded by on-line instrumentation were a result of air bubbles and various maintenance and calibration activities. Power interruptions may also cause an instrument reading to drop to zero. All events are reviewed for compliance with O. Reg. 170/03 and if warranted, are reported to the Ministry of Environment as Adverse Water Quality Incidents

### In-House

Parameter	# of grab samples taken	Range of Results (min # - max #)
Raw Well 1 Turbidity	12	0.15 – 1.10 NTU
Raw Well 1 UVT	12	90.6 – 98.7 %
Raw Well 3 Turbidity	12	0.12 - 0.84 NTU
Raw Well 3 UVT	12	92.0 – 98.4 %
Treated Free Chlorine	54	1.25 – 2.40 mg/L
Distribution Free Chlorine	135	0.27 – 1.92 mg/L

**Laboratory - Reg. 170/03**

Parameter	# of grab samples taken	Range of Results (min # - max #)
Treated Well 3 Uranium	5	0.09 – 0.31 ug/L
Treated Well 3 Fluoride	4	0.72 – 1.02 mg/L
Distribution Uranium	4	0.08 – 0.32 ug/L

**Additional Legislated Samples**

Legal Document	Date of Issuance	Parameter	# of grab samples taken	Range of Results (min # - max #)	
PTTW # 4464-A9NRHH Section 4 (4.3.1)	May 10, 2016	Raw Well 1	Ammonia	4	0.04 – 0.07 mg/L
			Uranium	4	374 – 418 ug/L
			Nitrate	4	2.26 – 5.07 mg/L
			Nitrite	4	0.16 – 0.22 mg/L
		Raw Well 3	Ammonia	4	0.04 – 0.11 mg/L
			Uranium	4	17.3 – 22.7 ug/L
			Nitrate	4	3.16 – 4.40 mg/L
			Nitrite	4	0.00 – 0.00 mg/L

**Lead Sampling**

The Lead Sampling Program is required under O.Reg 170/03. This system qualified for the plumbing exemption.

Location	Date	Lead	pH	Alkalinity (mg/L) as CaCO <sub>3</sub>
	<i>Limit/Ranges</i>	<b>10</b>	<b>6.5-8.5</b>	<b>30-500</b>
Hydrant #1	12-Apr-16	n/a	8.14	266
Hydrant #88	12-Apr-16	n/a	7.97	260
Hydrant #1	11-Oct-16	n/a	7.87	256
Hydrant #88	11-Oct-16	n/a	8.03	260



### Inorganic Parameters

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level
- Note: Fluoride and Sodium are only required to be tested every 60 months.

TREATED WATER	Sample Date	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW3	2016/3/14	0.29	6.0	No	No
Arsenic: As (ug/L) - TW3	2016/3/14	1.4	25.0	No	No
Barium: Ba (ug/L) - TW3	2016/3/14	379	1000.0	No	No
Boron: B (ug/L) - TW3	2016/3/14	26.6	5000.0	No	No
Cadmium: Cd (ug/L) - TW3	2016/3/14	0.007	5.0	No	No
Chromium: Cr (ug/L) - TW3	2016/3/14	0.07	50.0	No	No
Mercury: Hg (ug/L) - TW3	2016/3/14	0.03	1.0	No	No
Selenium: Se (ug/L) - TW3	2016/3/14	<1.0	10.0	No	No
Uranium: U (ug/L) - TW3	2016/3/14	0.036	20.0	No	No
<b>Additional Inorganics</b>					
Uranium: U (ug/L) - TW3	2016/01/04	0.09	20.0	No	No
Uranium: U (ug/L) - TW3	2016/04/11	0.11	20.0	No	No
Uranium: U (ug/L) - TW3	2016/07/11	0.17	20.0	No	No
Uranium: U (ug/L) - TW3	2016/10/11	0.31	20.0	No	No
Fluoride (mg/L) - TW3	2016/01/04	0.80	1.5	No	Yes
Fluoride (mg/L) - TW3	2016/04/11	0.72	1.5	No	No
Fluoride (mg/L) - TW3	2016/07/11	1.02	1.5	No	Yes
Fluoride (mg/L) - TW3	2016/10/11	0.72	1.5	No	Yes
Nitrite (mg/L) - TW3	2016/01/04	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	2016/04/11	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	2016/07/11	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	2016/10/11	<0.003	1.0	No	No
Nitrate (mg/L) - TW3	2016/01/04	2.62	10.0	No	No
Nitrate (mg/L) - TW3	2016/04/11	4.53	10.0	No	No
Nitrate (mg/L) - TW3	2016/07/11	3.26	10.0	No	No
Nitrate (mg/L) - TW3	2016/10/11	3.35	10.0	No	No

\*Uranium and Fluoride typically exceed half of the maximum acceptable concentration (1/2 MAC) as these parameters are considered naturally occurring. To comply with Regulation 170/03 sampling is increased from annually to quarterly. There is no duty to report ½ MAC exceedances; Duty to report only occurs if we exceed the MAC.

### Organic Parameters

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level

Parameter	Sample Date	Result Value	MAC	Exceedance	
				MAC	½ MAC
Alachlor (ug/L) - TW3	14/03/2016	<MDL 0.02	5	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	14/03/2016	0.04	5	No	No
Azinphos-methyl (ug/L) - TW3	14/03/2016	<MDL 0.05	20	No	No
Benzene (ug/L) - TW3	14/03/2016	<MDL 0.32	5	No	No
Benzo(a)pyrene (ug/L) - TW3	14/03/2016	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW3	14/03/2016	<MDL 0.33	5	No	No
Carbaryl (ug/L) - TW3	14/03/2016	<MDL 0.05	90	No	No
Carbofuran (ug/L) - TW3	14/03/2016	<MDL 0.01	90	No	No
Carbon Tetrachloride (ug/L) - TW3	14/03/2016	<MDL 0.16	5	No	No
Chlordane: Total (ug/L) - TW3	02/03/2015	<MDL 0.01	7	No	No
Chlorpyrifos (ug/L) - TW3	14/03/2016	<MDL 0.02	90	No	No
Diazinon (ug/L) - TW3	14/03/2016	<MDL 0.02	20	No	No
Dicamba (ug/L) - TW3	14/03/2016	<MDL 0.2	120	No	No
1,2-Dichlorobenzene (ug/L) - TW3	14/03/2016	<MDL 0.41	200	No	No
1,4-Dichlorobenzene (ug/L) - TW3	14/03/2016	<MDL 0.36	5	No	No
1,2-Dichloroethane (ug/L) - TW3	14/03/2016	<MDL 0.35	5	No	No
1,1-Dichloroethylene (ug/L) - TW3	14/03/2016	<MDL 0.33	14	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	14/03/2016	<MDL 0.35	50	No	No
2,4-Dichlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.15	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	14/03/2016	<MDL 0.19	100	No	No
Diclofop-methyl (ug/L) - TW3	14/03/2016	<MDL 0.4	9	No	No
Dimethoate (ug/L) - TW3	14/03/2016	<MDL 0.03	20	No	No
Diquat (ug/L) - TW3	14/03/2016	<MDL 1.0	70	No	No
Diuron (ug/L) - TW3	14/03/2016	<MDL 0.03	150	No	No
Glyphosate (ug/L) - TW3	14/03/2016	<MDL 1.0	280	No	No
Malathion (ug/L) - TW3	14/03/2016	<MDL 0.02	190	No	No
Metolachlor (ug/L) - TW3	14/03/2016	<MDL 0.01	50	No	No
Metribuzin (ug/L) - TW3	14/03/2016	<MDL 0.02	80	No	No
MCPA (mg/L) - TW3	14/03/2016	<MDL 0.00012	-	-	-
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	14/03/2016	<MDL 0.3	80	No	No
Paraquat (ug/L) - TW3	14/03/2016	<MDL 1.0	10	No	No
PCB (ug/L) - TW3	14/03/2016	<MDL 0.04	3	No	No
Pentachlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.15	60	No	No
Phorate (ug/L) - TW3	14/03/2016	<MDL 0.01	2	No	No
Picloram (ug/L) - TW3	14/03/2016	<MDL 1.0	190	No	No
Prometryne (ug/L) - TW3	14/03/2016	<MDL 0.03	1	No	No



Simazine (ug/L) - TW3	14/03/2016	<MDL 0.01	10	No	No
Terbufos (ug/L) - TW3	14/03/2016	<MDL 0.01	1	No	No
Tetrachloroethylene (ug/L) - TW3	14/03/2016	<MDL 0.35	30	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.2	100	No	No
Triallate (ug/L) - TW3	14/03/2016	<MDL 0.01	230	No	No
Trichloroethylene (ug/L) - TW3	14/03/2016	<MDL 0.44	50	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.25	5	No	No
Trifluralin (ug/L) - TW3	14/03/2016	<MDL 0.02	45	No	No
Vinyl Chloride (ug/L) - TW3	14/03/2016	<MDL 0.17	2	No	No
<b>DISTRIBUTION WATER</b>					
Trihalomethane: Total (ug/L) Annual Average - DW	2016	11	100	No	No

### Maintenance Summary

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer’s and/or industry standards. Maintenance is completed using various tools and operational supports.

OCWA uses a Workplace Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the The Corporation of the Municipality of Tweed in the form of a “Capital Forecast”. This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

Preventative Maintenance Work Orders Completed	176
Operational Maintenance Work Orders Completed	19
Capital Maintenance Work Orders Completed	1
Weekly Maintenance Work Orders Completed	360

### Maintenance Highlights: major expenses incurred to install, repair or replace required equipment

Chlorine Preventative Maintenance Parts and Service	\$ 4,745
Trojan UV Preventative Maintenance Parts and Service	\$ 667
VFD Installation	\$ 8,374
Air Compressor Service	\$ 317



## QEMS

A 12 Month Surveillance Audit was conducted by QMI-SAI Canada Limited on May 9, 2016. The Corporation of the Municipality of Tweed's Quality Management System conforms to the Standard.

## Water Taking and Transfer Data

Data was submitted electronically to the Ministry of the Environment and Climate Change for the reporting periods of January 1, 2016 – December 31, 2016 for Permit to Take Water #1674-8WAL9T and # 4464-A9NRHH on January 26, 2017



Ministry of the Environment  
and Climate Change

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WTRS-WT-008

**Water Taking Data submitted successfully.**

### Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 4464-A9NRHH  
Permit Holder: THE CORPORATION OF THE MUNICIPALITY OF TWEED.  
Received on: Jan 26, 2017 10:27 AM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.



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WTRS-WT-008

**Water Taking Data submitted successfully.**

### Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 1674-8WAL9T  
Permit Holder: THE CORPORATION OF THE MUNICIPALITY OF TWEED.  
Received on: Jan 26, 2017 11:30 AM

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