



South Dundas Water Treatment Plant
99 Augusta Street, Morrisburg

Supervisor of Water & Wastewater
Ian Kemp

2015 Annual Report

2015 ANNUAL REPORT ON DRINKING WATER QUALITY

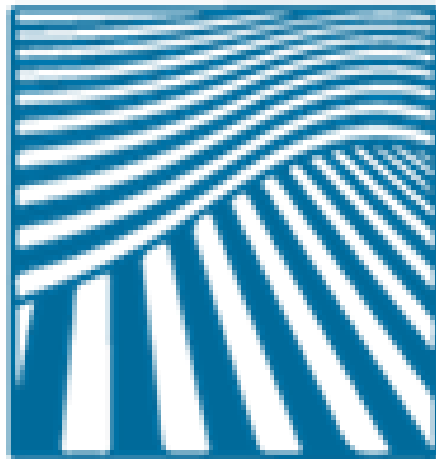
Reporting period - JAN 1st - DEC 31st 2015

SOUTH DUNDAS WATER TREATMENT PLANT 99 AUGUSTA ST MORRISBURG

Drinking Water System Number: 220001012

Drinking Water System Owner: Municipality of South Dundas

Drinking Water System Category: Large Municipal Residential





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Availability

Public Access via the web <http://www.southdundas.com>
Public Access via Public Request Municipal Offices, 34 Ottawa Street,
Morrisburg
Public Notice via Local Newspaper

Free copies of this report and the Summary report prepared in accordance to Schedule 22 of Ontario Regulation 170/03, are available by public request at the municipal offices, and at *www.southdundas.com*. Notices of availability are generally made through the local newspapers and radio. Further information on the Drinking Water Regulations can be found on the Ministry of the Environment web site at www.ene.gov.on.ca.

Drinking Water Quality

The Municipality of South Dundas is proud to present this annual report on drinking water quality. This report has been prepared in accordance to Section 11 of Ontario Regulation 170/03. Regulation 170/03 sets requirements for public waterworks with regard to sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality.



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1. Drinking Water System

The water treatment plant (in service date: June 2006) and distribution system provide water to a population of approximately 3,900 residents in Morrisburg and Iroquois.

Raw Water Source

Source water for the South Dundas Regional WTP is the St. Lawrence River. Historically, the unfiltered water quality from this stretch of the St. Lawrence has been excellent.

Raw water turbidity is generally less than 1 NTU, with relatively few events greater than 5 NTU. The actual range of turbidity varies seasonally and by event from a low of about 0.1 NTU to as high as 10 NTU.

Prior to the construction of the South Dundas Regional WTP, the water quality issues most often discussed in this area related to taste and odour.

The range in temperature for raw water varies from about 0.4C to 23C on an annual basis. In terms of predictable operational challenges, temperature is the factor that most directly drives the CT calculation for the facility.

System Description - Treatment

Intake

Raw water is drawn from the St. Lawrence River through a wooden intake structure and approximately 100 m of 450 mm pipe to the low lift pumping station.

Sodium Hypochlorite is added at the opening of the intake for Zebra Mussel control when raw water temperatures are above 10C. The addition of sodium hypochlorite at this location is not for raw water disinfection purposes.



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Raw Water Pumping (Low Lift)

A Low Lift pump house is located at the bottom of Augusta Street, Morrisburg, on the bank of the St. Lawrence River. Water is pumped from the St. Lawrence River via a raw water well using three vertical turbine pumps, each equipped with fixed speed drives, along approximately 980 m of 400 mm pipe to the water treatment plant located at 99 Augusta Street, Morrisburg.

The pump house contains an intrusion alarm and the equipment therein is monitored by SCADA.

Filtration

Inside the water treatment facility, water undergoes ultra-filtration through membrane cassettes (ZeeWeed membranes, manufactured by Zenon) which are housed in large concrete tanks. There are three concrete filter tanks, each of which contains two ultra-filtration cassettes.

Taste and Odour Control

Three granular activated carbon (GAC) contactors provide taste and odour control.

Disinfection

Sodium Hypochlorite is used for disinfection. Chlorination takes place at two locations prior to the distribution system:

- At the outlet of the GAC tanks (primary disinfection), and
- On the high lift pump discharge manifold, after the plant chlorine residual analyser (residual disinfection).

Clear well Storage

A two-compartment, baffled clear well storage provides chlorine contact time of approximately 156 minutes at maximum daily flow and maximum water depth.



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High Lift Pumping

Four fixed speed drive vertical turbine pumps, discharge water from the treatment facility through a 450 mm discharge manifold. Water exiting the plant enters the Morrisburg distribution system.

Distribution

Water Transmission Main

An 11.5 km water transmission main carries treated drinking water from Morrisburg through the Iroquois booster station, reservoir and elevated storage facility to consumers in Iroquois.

Elevated Storage

The distribution system includes elevated storage facilities in Morrisburg and Iroquois. Storage capacity for the towers is:

945 M³ Morrisburg: Epoxy Lined, Multi-Legged Steel Tank

945 M³ Iroquois: Epoxy Lined, Multi-Legged Steel Tank

Water Main & Laterals

There are approximately 15 klm of water mains servicing the connections in Morrisburg and approximately 12 klm of water mains servicing the connections in Iroquois.

Mains and laterals are constructed of: ductile, PVC, copper or galvanized pipe.

Appurtenances

There are approximately 160 hydrants and 325 valves within the distribution system for both villages.



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Iroquois Booster Station and Reservoir

Residual disinfection is provided by sodium hypochlorite injection on the high lift pumping discharge manifold in the booster station.

Clear well storage is provided by a two-compartment, baffled clear well whose volume is designed to provide peak-hour water demand equalization as well as fire and emergency demands.

High lift pumping is accomplished by three pumps discharging through a 300 mm discharge manifold. Water exiting the booster station enters the Iroquois distribution system.



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2. Monetary expenses incurred during this reporting period

Under Section 11 of Ontario Reg. 170/03, a description of any major expenses incurred during this reporting period must be included in the annual report. The major expenses for this drinking water system are listed below.

- All three Zenon membrane filters have had new membrane modules replaced

3. Notifications submitted in accordance to the Safe Drinking Water Act

Under Ontario Reg. 170/03, notifications were required for any instances where a sample result indicated that a parameter used to measure water quality exceeded a Maximum Acceptable Concentration (MAC). Once a notification is received from a laboratory or an observation of any other indicator of adverse water quality is made by operations personnel, corrective action as dictated by the regulations is initiated in an effort to confirm the initial result. If confirmed, further action may be recommended by the Medical Officer of Health. If not confirmed sampling will typically return to the normal schedule, or depending on the parameter, water operations may choose to increase the sampling frequency to more closely monitor the parameter for a period of time.

There were no exceedances to report during this reporting period.



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4. Definition & Terms

TCU - True Colour Units

mg - Milligram

N/A - Not Applicable

N/D - Non -Detectable

NTU - Nephelometric Turbidity Units - A measure of the amount of particles in water.

mg/l - Milligrams per litre. This is a measure of the concentration of a parameter in water, also called parts per million (ppm).

ug/l - Micrograms per litre, also called parts per billion.

ng/l - Nanograms per litre, parts per trillion.

Parameter-A substance that we sample and analyze for in the water.

AO - Aesthetic objective. AOs are not health related, but may affect the

taste, odour, colour or clarity of the water

OG - Operational guideline. Set to ensure efficient treatment and distribution of water.

MAC - Maximum Acceptable Concentration. This is a health-related drinking water standard established for contaminants having known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.



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5. Water Quality Test Results

Microbiological testing done under schedule 10, 11 or 12 of regulation 170/03, during this reporting period

	Number of Samples	Range of E.Coli or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(Max #)
Raw	52	0-10	<2-88	0	N/A
Treated	52	0-0	0-0	52	<2-4
Distribution	158	0-0	0-0	49	<2-2

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range Of Results(min#)-(Max#)
Raw Turbidity	8760	0.01 - 0.17
Permeate Turbidity	8760	0.02 - 0.26
Train #1	8760	0.01 - 0.87
Train #2	8760	0.01 - 0.76
Train #3	8760	0.01 - 0.19
Chlorine Free	8760	0.42 - 2.32



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Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument

Date of Legal Instrument Issued	Parameter	Date Sampled	Result	Unit Of Measure
	Total Suspended	01/01/15	5.00	mg/L
	Total Suspended	07/02/15	5.00	mg/L
	Total Suspended	10/03/15	5.00	mg/L
	Total Suspended	09/04/15	6.00	mg/L
	Total Suspended	02/05/15	5.00	mg/L
	Total Suspended	04/06/15	6.00	mg/L
	Total Suspended	07/07/15	5.00	mg/L
	Total Suspended	18/08/15	6.00	mg/L
	Total Suspended	01/09/15	4.00	mg/L
	Total Suspended	12/10/15	4.00	mg/L
	Total Suspended	01/11/15	3.00	mg/L
	Total Suspended	01/12/15	5.00	mg/L
	*Annual Average Concentration		4.91	mg/L

***Municipal Drinking Water Licence – Schedule C – Residue Management 1.5.2**



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Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result value	Unit of Measure	Exceedance
Antimony	06/05/15	0.0001	mg/L	
Arsenic	06/05/15	0.0009	mg/L	
Barium	05/05/15	0.021	mg/L	
Boron	05/05/15	0.023	mg/L	
Cadmium	06/05/15	<0.00002	mg/L	
Chromium	05/05/15	<0.002	mg/L	
Mercury	06/05/15	<0.00002	mg/L	
Selenium	06/05/15	<0.001	mg/L	
Uranium	06/05/15	0.00031	mg/L	
Nitrite	Average/Yr.	<0.1	mg/L	
Nitrate	Average/Yr.	0.30	mg/L	



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Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample date	Result value	Unit of Measure	Exceedance
Alachlor	11/05/15	<0.3	µg/L	
Aldicarb	11/05/15	<3	µg/L	
Aldrin + Dieldrin	08/05/15	<0.02	µg/L	
Atrazine + N-dealkylated metabolites	11/05/15	<0.5	µg/L	
Azinphos-methyl	11/05/15	<1	µg/L	
Bendiocarb	11/05/15	<3	µg/L	
Benzine	06/05/15	<0.5	mg/L	
Benzo(a)pyrene	11/05/15	<0.005	µg/L	
Bromoxynil	11/05/15	<0.3	µg/L	
Carbaryl	11/05/15	<3	µg/L	
Carbofuran	11/05/15	<1	µg/L	
Carbon Tetrachloride	06/05/15	<0.2	µg/L	
Chlordane (Total)	08/05/15	<0.04	µg/L	
Chlorpyrifos	11/05/15	<0.5	µg/L	
Cyanazine	11/05/15	<0.5	µg/L	
Diazinon	11/05/15	<1	µg/L	
Dicamba	11/05/15	<5	µg/L	
1,2-Dichlorobenzene	06/05/15	<0.1	µg/L	
1,4-Dichlorobenzene	06/05/15	<0.2	µg/L	
Dichlorodiphenyltrichloroethane (DDT)+metabolites	08/05/15	<0.01	µg/L	



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Parameter	Sample date	Result value	Unit of Measure	Exceedance
1,2-Dichloroethane	06/05/15	<0.1	µg/L	
1,1-Dichloroethene	06/05/15	<0.1	µg/L	
Dichloromethane	06/05/15	<0.3	µg/L	
2-4 Dichlorophenol	11/05/15	<0.1	µg/L	
2,4-Dichlorophenoxy acetic acid (2,4_D)	11/05/15	<5	µg/L	
Diclofop-methyl	11/05/15	<0.5	µg/L	
Dimethoate	11/05/15	<1	µg/L	
Dinoseb	11/05/15	<0.05	µg/L	
Diquat	06/05/15	<5	µg/L	
Diuron	11/05/15	<5	µg/L	
Glyphosate	06/05/15	<25	µg/L	
Heptachlor + Heptachlor Epoxide	08/05/15	<0.1	µg/L	
Lindane (Total)	08/05/15	<0.1	µg/L	
Malathion	11/05/15	<5	µg/L	
Methoxychlor	08/05/15	<0.1	µg/L	
Metolachlor	11/05/15	<3	µg/L	
Metribuzin	11/05/15	<3	µg/L	
Monochlorobenzene	06/05/15	<0.2	µg/L	
Paraquat	06/05/15	<1	µg/L	
Parathion	11/05/15	<3	µg/L	
Pentachlorophenol	11/05/15	<0.1	µg/L	
Phorate	11/05/15	<0.3	µg/L	



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Parameter	Sample date	Result value	Unit of Measure	Exceedance
Picloram	11/05/15	<5	µg/L	
Polychlorinated Biphenyls (PCB)	08/05/15	<0.05	µg/L	
Prometryne	11/05/15	<0.1	µg/L	
Simazine	11/05/15	<0.5	µg/L	
THM	N/A	47.1	µg/L	
Temephos	11/05/15	<10	µg/L	
Terbufos	11/05/15	<0.3	µg/L	
Tetrachloroethylene	06/05/15	<0.2	µg/L	
2,3,4,6-Tetrachlorophenol	11/05/15	<0.1	µg/L	
Triallate	11/05/15	<10	µg/L	
Trichloroethylene	06/05/15	<0.1	µg/L	
2,4,6-Trichlorophenol	11/05/15	<0.1	µg/L	
2,4,5- Trichlorophenoxy acetic acid (2,4,5-T)	11/05/15	<10	µg/L	
Trifluralin	11/05/15	<0.5	µg/L	
Vinyl Chloride	06/05/15	<0.2	µg/L	



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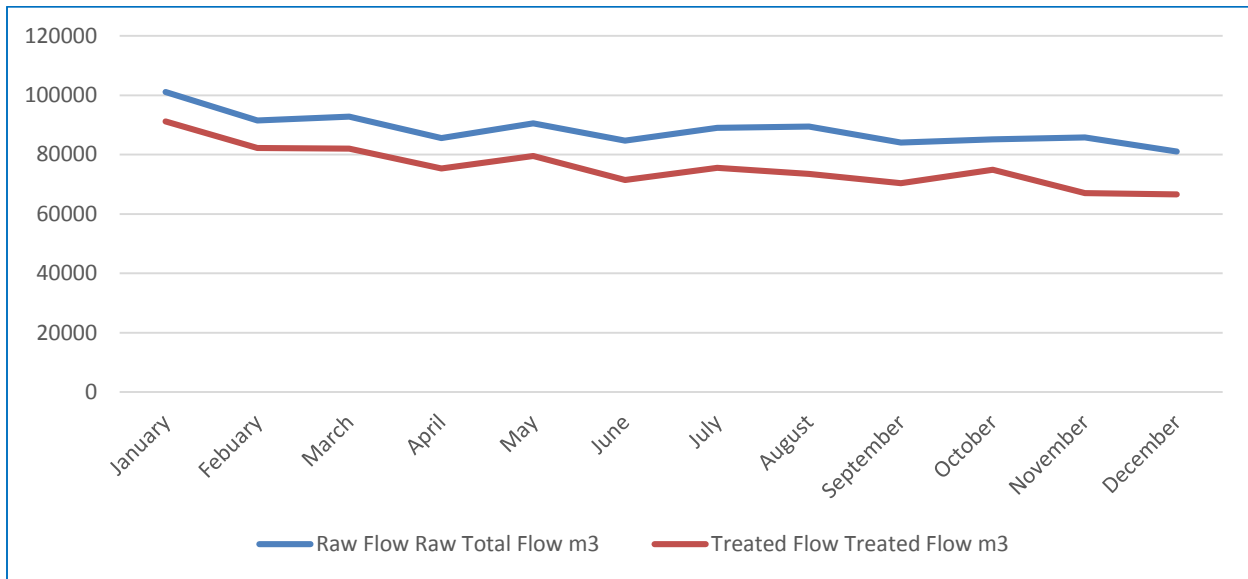
Flow Data

Month	Raw Flow	Treated Flow		
	Total Flow m ³	Treated Flow m ³	Avg. Day m ³ /day	Max Day m ³ day
January	101,130.99	91,173.99	2,941.10	3,724.00
February	91,555.07	82,204.93	2,935.89	3,731.00
March	92,766.24	82,015.08	2,645.65	3,071.00
April	85,618.62	75,292.22	2,509.74	2,914.00
May	90,546.07	79,555.39	2,566.30	3,143.62
June	84,717.22	71,489.78	2,382.99	2,800.78
July	88,980.00	75,509.00	2,435.77	3,905.00
August	89,440.81	73,468.00	2,369.94	2,884.00
September	84,082.00	70,351.00	2,345.03	2,883.00
October	85,166.00	74,859.00	2,414.81	4,115.00
November	85,762.00	67,030.00	2,234.33	3,030.00
December	81,109.00	66,581.95	2,147.80	2,446.00
Total	1,060,874.02	909,530.34		
Minimum	81,109.00	66,581.95		
Maximum	101,130.99	91,173.99	2,941.10	4,115.00
Average	89,069.55	76,631.67	2,494.11	3,220.62

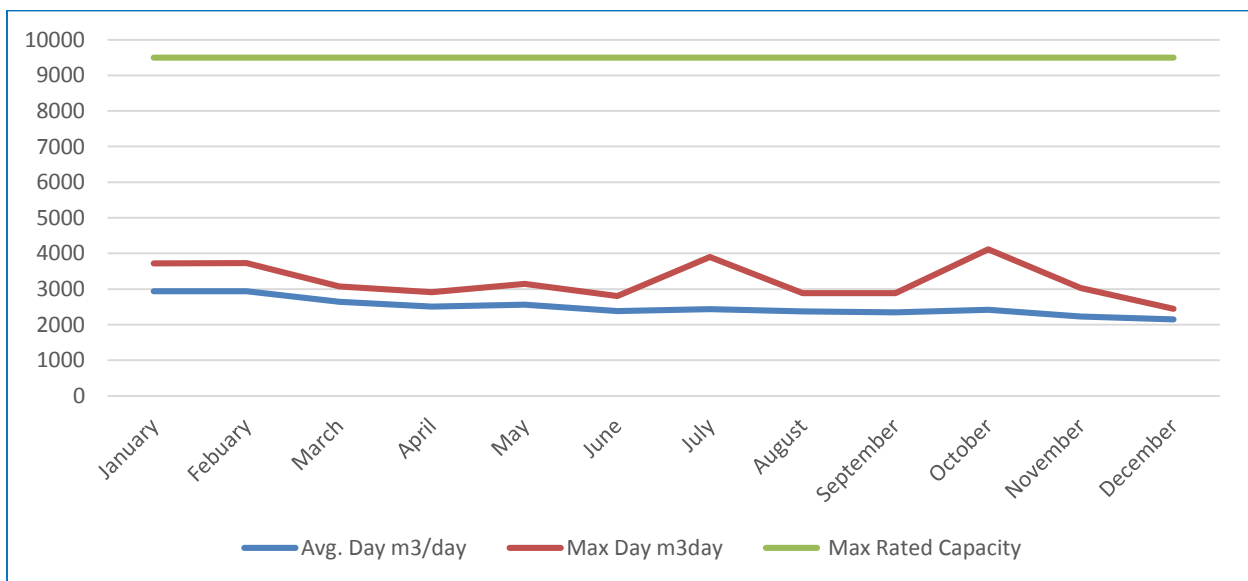


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RAW WATER FLOW and TREATED WATER FLOW – 2015



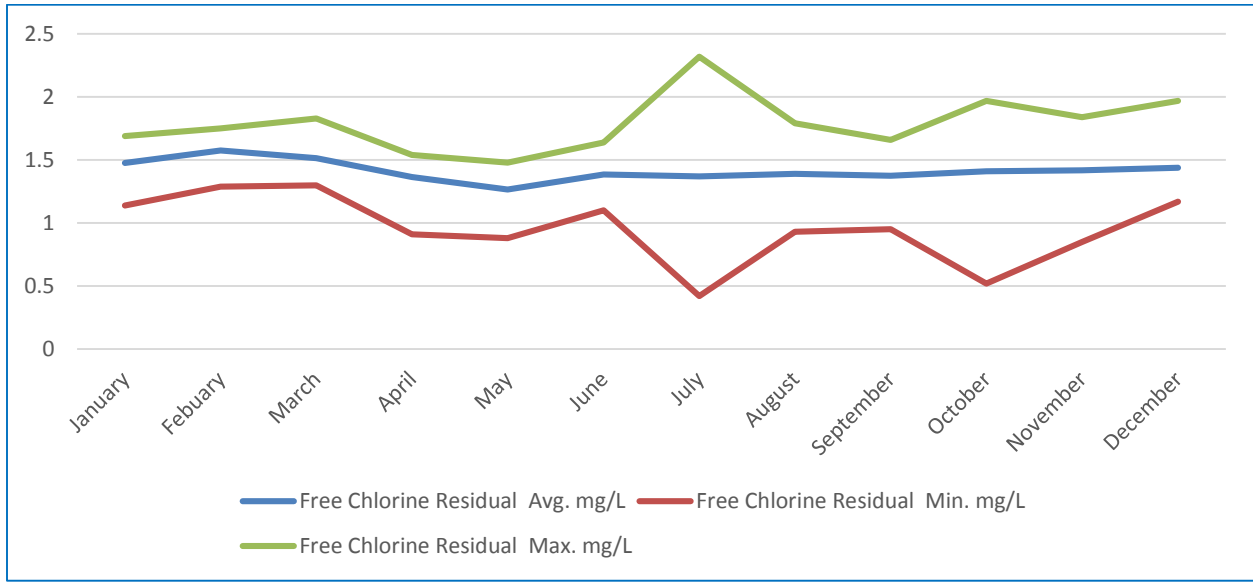
AVERAGE / MAX DAILY FLOW 2015



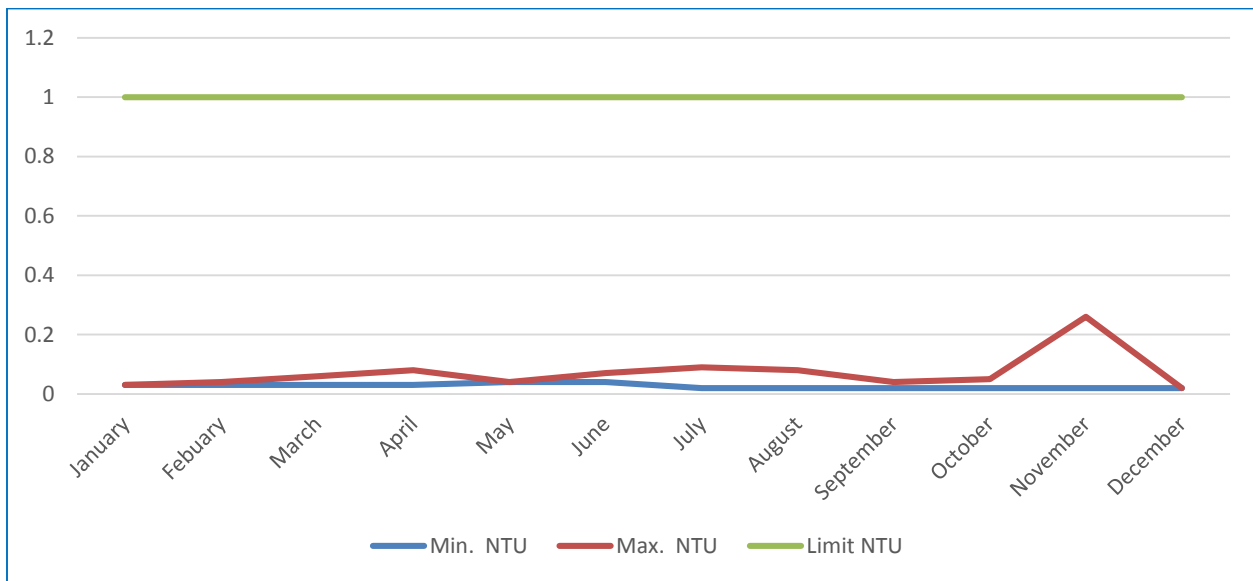


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FREE CHLORINE RESIDUAL



TURBIDITY





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7. Training Accreditations

Operator Certificate Expiry						
	WT 1	WT2	WWT1	WWT2	WD2	WWC2
Andrew Cassell	30/6/16		31/5/17			
Curtis Whitteker (ORO WW)		30/9/15		31/12/15	31/5/16	31/3/16
Denis Villeneuve (ORO Water)		31/10/17		31/7/17	31/12/17	
Ian Kemp (Supervisor)		31/09/16		28/2/19		
Marc McDonald	31/10/18		31/10/18			
Vince Lauzon	31/10/18		31/10/18			

Annual Training		
2015	On the Job Training	Continuous Education Units
A. Cassell	37	2.8
I. Kemp	37	0.7
M. McDonald	37	0.7
V. Lauzon	43	8.4
D. Villeneuve	53	0.7
C. Whitteker	50	3.5