



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

Mattawa Drinking Water System

# 2020 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency  
on behalf of the Corporation of the Town of Mattawa



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## INTRODUCTION

Municipalities throughout Ontario have been required to comply with Ontario Regulation 170/03 made under the Safe Drinking Water Act (SDWA) since June 2003. The Act was enacted following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This annual report must be completed by February 28th of each year.

Section 22 of the regulation also requires a Summary Report which must be presented & accepted by Council by March 31<sup>st</sup> of each year for the preceding calendar year.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any Provincial Officer Order the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The Safe Drinking Water Act (2002) and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows,
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2020 Annual/Summary Report.



Mattawa Drinking Water System

Section 11

# 2020 ANNUAL REPORT



## Section 11 - ANNUAL REPORT

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### 1.0 Introduction

**Drinking-Water System Name:** MATTAWA DRINKING WATER SYSTEM  
**Drinking-Water System No.:** 210001905  
**Drinking-Water System Owner:** The Corporation of the Town of Mattawa  
**Drinking-Water System Category:** Large Municipal, Residential System  
**Period being reported:** January 1, 2020 to December 31, 2020

**Does your Drinking Water System serve more than 10,000 people?** No

**Is your annual report available to the public at no charge on a web site on the Internet?** Yes

**Location where Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.**

Town Hall at 160 Water Street and on the Municipal website at [www.mattawa.ca](http://www.mattawa.ca)

### ***Drinking Water Systems that receive drinking water from the Mattawa Drinking Water System***

The Mattawa Drinking Water System (DWS) provides all drinking water to the community of Mattawa.

### ***The Annual Report was not provided to any other Drinking Water System Owners.***

The Ontario Clean Water Agency prepared the 2020 Annual/Summary Report for the Mattawa DWS and provided a copy to the system owner; the Town of Mattawa. The Mattawa DWS is a stand-alone system that does not receive water from or send water to another system.

### ***Notification to system users that the Annual Report is available for viewing is accomplished through:***

- A public access notice via the web and a public access notice via Town Office.
- System analysis and reports available in the water System Information Binder available for the public to review at the Town Office.



## 2.0 Mattawa Drinking Water System (DWS No. 210001905)

The Mattawa DWS is owned by the Corporation of the Town of Mattawa and consists of a Class II Distribution and Supply System. The Ontario Clean Water Agency (OCWA) is designated the Overall Responsible Operator for both the water supply and water distribution facilities.

### ***Raw Water Supply***

The water supply system for the Town of Mattawa consists of Well No. 1, Well No. 2, and an in-ground water storage reservoir that floats on the distribution system. These two groundwater supply wells, as well as the reservoir, provide drinking water to the residents of Mattawa. In accordance with the Municipal Drinking Water Licence, the drinking water system shall not be operated to exceed 6,540 cubic meters per day (m<sup>3</sup>/d).

Wells No. 1 and No. 2 are located inside a single structure situated at 400 Bissett Street in the Town of Mattawa. This facility houses two well pumps, an ultraviolet (UV) disinfection system, a sodium hypochlorite disinfection system, all control, monitoring, and alarm systems, as well as a standby diesel generator.

The wells are operated by OCWA and are utilized on a duty/standby basis. Well No. 1 is operated as the duty well from 6 am to midnight. Well No. 2 is used as the duty well from midnight to 6 am, for energy conservation purposes. The switchover of duty wells is automatically done via a timer within the plant programmable logic controller (PLC).

Well No. 1 is equipped with a vertical turbine pump capable of delivering 53.0 L/s at 105.8 m of total dynamic head. Well No. 2 has a vertical turbine pump rated at 22.7 L/s with a total dynamic head of 91.5 m. Recently variable frequency drive (VFD) installed for Well #2.

### ***Water Treatment***

Primary disinfection equipment includes two UV disinfection systems, each designed to deliver the required UV dosage at the rated capacity of the facility. Chlorination equipment includes a 200 L sodium hypochlorite (NaOCl) storage tank and dual chemical feed pumps that inject liquid chlorine into the system. Output from Well No. 1 and No. 2 is governed by system demand (water level in the reservoir). As the water level in the reservoir drops to the low water level (LWL), the selected duty well pump automatically starts.

The well pumps, UV disinfection system, sodium hypochlorite injection system, and analyzers are all supervised locally via the PLC. All alarms are instantly transmitted from the PLC to the alarm panel, which dials a security company and pages the Operator-on-call. Refer to the Treatment System Process Flow Chart for more facility detail.

In 2012, a SCADA system was installed to allow for continuous monitoring and recording. It includes alarming, enhanced operator control of the waterworks, and increased security features.



### ***Water Storage and Pumping Capabilities***

There is a 795 m<sup>3</sup> (175,000 IMPG) in-ground storage reservoir within the distribution system located approximately 700 meters (m) northwest of the Pump-house.

### ***Emergency Power***

Stand-by power is provided by an on-site diesel generator with an automatic transfer switch. In the event of a power outage in the area, the diesel generator automatically starts, providing continuous power to the Pump-house.

### ***Distribution System***

The Mattawa DWS is categorized as a Large Municipal Residential Drinking Water System and serves an estimated population of 2150 residents. The system has approximately 1,050 service connections to residential and commercial consumers. There is approximately 20,000 m of various sized cast iron, ductile iron and polyvinyl chloride piping. There are 117 fire hydrants in the distribution system.

## **3.0 List of Water Treatment Chemicals Used Over the Reporting Period**

The following chemicals were used in the treatment process at the Mattawa Water Treatment Plant.

- Sodium hypochlorite – Secondary Disinfection

## **4.0 Significant Expenses Incurred in the Drinking Water System**

OCWA is committed to maintaining the assets of the drinking water system and maintains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS). OCWA implemented a new Workplace Management System (Maximo) in 2020, which better maintains and optimizes facility assets. All routine maintenance activities conducted at the water treatment plant were accomplished in 2020.

Significant expenses incurred in the drinking water system include:

- Second UV reference sensor arrived on site.
- Ballast #1 on UV #2 was replaced due to failure.
- UV sensor on UV #2 replaced due to low UV alarms leading to system shutdowns.
- Replaced ballast #2 on UV system #2 due to failure alarms.
- Clow hydrant representative worked with Mattawa and OCWA staff to repair and rebuild hydrants. A special hydrant was fabricated locally to complete the repairs.
- UV system issues regarding transmittance and Opti-Vue readings. Replacement parts including UV lamp, expansion card and intensity sensor were ordered.
- OCWA engineers reviewed potential VFD installation on Well #2 to determine that reduced pump speed would not be detrimental to pumping up the reservoir. Obtained pump curves from original manufacturer. VFD use is permitted.
- Second storm in as many days caused damage to communications at the reservoir again requiring repairs. The reservoir level transmitter was also destroyed and replacements were ordered.



- New sodium hypochlorite day tank installed to make room for Well #2 variable frequency drive (VFD).
- New Well #2 VFD installed and functional.
- Alarm panel had expander installed to allow for programming changes for flow meter and additional alarming.
- Programming completed to shut down plant upon low alarm, power or instrument failure of the UVT analyzer.
- Well house generator repairs completed.

## 5.0 Drinking Water System Highlights

- The Ministry of the Environment, Conservation and Parks (MECP) performed an annual inspection on November 17, 2020. The inspection included a physical assessment of the Mattawa Water Treatment Plant and a document review. The system received a risk rating of 0.96% and a final inspection rating of 99.04%.
- SAI Global conducted a System (Stage 1) and Initial Verification Audit (via Remote Technology) of the Mattawa Drinking Water System's Quality and Environmental Management System (QEMS) on April 1, 2020 and June 25, 2020 respectively. The System (Stage 1) Audit identified three (3) Opportunity for Improvement (OFI), which have been addressed. Initial Verification Audit identified one (1) OFI, which has been addressed. Full scope Accreditation on DWQMS 2.0 was achieved on July 10, 2020.

## 6.0 Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Action Center

Based on information kept on record by OCWA, the Mattawa Drinking Water System had no adverse water quality incidents reported to the MOE's Spills Action Centre (MOE SAC).

## 7.0 Microbiological Testing Performed During the Reporting Period

### Summary of Microbiological Data

Sample Type	# of Samples	Range of <i>E. coli</i> Results (min to max)	Range of Total Coliform Results (min to max)	# of HPC Samples	Range of HPC Results (min to max)
Raw (Well No. 1)	53	0 to 0	0 to 1	0	N/A
Raw (Well No. 2)	53	0 to 0	0 to 2	0	N/A
Treated	53	0 to 0	0 to 0	53	0 to 6
Distribution	159	0 to 0	0 to 0	36	0 to 600

Maximum Allowable Concentration (MAC) for *E. coli* = 0 Counts/100 mL

MAC for Total Coliforms = 0 Counts/100 mL

"<" denotes less than the laboratory's method detection limit.

**Notes:** One microbiological sample is collected and tested each week from the raw (each well) and treated water supply. A total of three microbiological samples are collected and tested each week from the Mattawa distribution system.

Refer to *Appendix A* for a monthly summary of microbiological test results.





## 8.0 Operational Testing Performed During the Reporting Period

### Summary of Raw Water Turbidity Data

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure
Turbidity (Well No. 1)	12	0.25 to 0.50	NTU
Turbidity (Well No. 2)	12	0.21 to 0.76	

### Summary of Chlorine Residual Data in the Distribution System

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine	367	0.20 to 1.24	mg/L	0.05

**Note:** A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.

Refer to *Appendix B* for a monthly summary of the above operational data.

### Summary of Nitrate & Nitrite Data (sampled at the water treatment plant)

Date of Sample	Nitrate Result Value	Nitrite Result Value	Unit of Measure	Exceedance
January 20	1.57	< 0.1	mg/L	No
April 14	1.48	< 0.1	mg/L	No
July 21	1.62	< 0.1	mg/L	No
October 27	1.01	< 0.1	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L

MAC for Nitrite = 1 mg/L

### Summary of Total Trihalomethane Data (sampled in the distribution system)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 20	<0.002	mg/L	0.0026	No
April 14	<0.002			
July 21	<0.002			
October 27	0.00449			

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 0.100 mg/L (Four Quarter Running Average)

### Summary of Total Haloacetic Acids Data (sampled in the distribution system)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 20	<0.002	mg/L	<0.002	No
April 14	<0.002			
July 21	<0.002			
October 27	<0.002			

Maximum Allowable Concentration (MAC) for Total Haloacetic Acids = 0.080 mg/L (Four Quarter Running Average)



### **Summary of Most Recent Lead Data under Schedule 15.1**

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The Mattawa DWS was eligible to follow the “Exemption from Plumbing Sampling” as described in section 15.1-5(9) and 15.1-5(10) of Schedule 15.1 of Ontario Regulation 170/03. The exemption applies to a drinking water system if, in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration (MAC) of 10 ug/L or 0.01 mg/L for lead. As such, the system was required to test for total alkalinity and pH in one distribution sample collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period. The Town of Mattawa has been sampling lead every term.

Two rounds of lead, alkalinity and pH testing were carried out on April 14<sup>th</sup> and October 14<sup>th</sup> of 2020. Results are summarized in the table below.

#### **Summary of Lead, pH & Alkalinity Data** (sampled in the distribution system)

Date of Sample	# of Samples	Sample Location	Lead (mg/L)	Field pH	Alkalinity (mg/L)
April 14	1	Hydrant at Pine & Gorman St.	<0.0001	7.55	45.5
April 14	1	Hydrant at 1 <sup>st</sup> & Bissett	0.0005	7.15	46.5
October 14	1	Hydrant at Mattawan & Park	0.0002	7.56	43.4
October 14	1	Hydrant at 1 <sup>st</sup> & Bissett	0.0001	7.85	43.6

#### **Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant**

Parameter	Result Value	Unit of Measure	Standard	Exceedance
Antimony	<0.001	mg/L	0.006	No
Arsenic	<0.001	mg/L	0.01	No
Barium	0.03	mg/L	1	No
Boron	0.01	mg/L	5	No
Cadmium	<0.0001	mg/L	0.005	No
Chromium	<0.001	mg/L	0.05	No
Mercury	<0.0001	mg/L	0.001	No
Selenium	<0.001	mg/L	0.05	No
Uranium	<0.001	mg/L	0.02	No

**Note:** Sample required every 36 months (sample date = July 31, 2018). Next sampling scheduled for July 2021.



**Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant**

**Statement of Analytical Results - Final**

**Job 110913**

**Mattawa, Town of**  
Dan Finnigan  
160 WATER ST, PO BOX 390, MATTAWA ON P0H 1V0

**210001905 - MATTAWA DRINKING WATER SYSTEM**

Lab ID Collection Date Collection Time Matrix Description	18G2192				Criteria	Reg 170						
	2018-Jul-31					Sampler	Josh Dewaal					
	10:40					Received	2018 Jul 31 14:50					
	Treated Water				Criteria	Turn Around	7 Day					
	WTP Treated Water: 400 Bissett St.				SDWA / Ont. Reg. 170/03	MDL / RDL	Units	Method	Completed	Analyst		
Antimony, total	<0.001	-	-	0.006	0.001	mg/L	ICP	2018-Sep-05	-			
Arsenic, total	<0.001	-	-	0.025	0.001	mg/L	ICP/MS	2018-Sep-05	-			
Barium, total	0.03	-	-	1.0	0.001	mg/L	ICP/MS	2018-Sep-05	-			
Boron, total	0.01	-	-	5.0	0.002	mg/L	ICP/MS	2018-Sep-05	-			
Cadmium, total	<0.0001	-	-	0.005	0.0001	mg/L	ICP/MS	2018-Sep-05	-			
Chromium, total	<0.001	-	-	0.05	0.001	mg/L	ICP/MS	2018-Sep-05	-			
Mercury, total	<0.0001	-	-	0.001	0.0001	mg/L	ICP	2018-Sep-05	-			
Selenium, total	<0.001	-	-	0.01	0.001	mg/L	ICP	2018-Sep-05	-			
Uranium, total	<0.001	-	-	0.02	0.001	mg/L	ICP/OES	2018-Sep-05	-			
	<0.0005	-	-	0.014	0.0005	mg/L	GC/MS	2018-Sep-05	-			
Dichloroethylene												
1,2-Dichlorobenzene	<0.0004	-	-	0.2	0.0004	mg/L	GC/MS	2018-Sep-05	-			
1,2-Dichloroethane	<0.0002	-	-	0.005	0.0002	mg/L	GC/MS	2018-Sep-05	-			
1,4-Dichlorobenzene	<0.0004	-	-	0.005	0.0004	mg/L	GC/MS	2018-Sep-05	-			
Benzene	<0.0005	-	-	0.001	0.0005	mg/L	GC/MS	2018-Sep-05	-			
Carbon tetrachloride	<0.0002	-	-	0.005	0.0002	mg/L	GC/MS	2018-Sep-05	-			
Dichloromethane	0.004	-	-	0.05	0.004	mg/L	GC/MS	2018-Sep-05	-			
Monochlorobenzen e <sup>2</sup>	<0.0005	-	-	0.08	0.0005	mg/L	GC/MS	2018-Sep-05	-			
Tetrachloroethylen e <sup>2</sup>	<0.0003	-	-	0.030	0.0003	mg/L	GC/MS	2018-Sep-05	-			
Trichloroethylene <sup>2</sup>	<0.0003	-	-	0.005	0.0003	mg/L	GC/MS	2018-Sep-05	-			
Vinyl chloride <sup>2</sup>	<0.0002	-	-	0.002	0.0002	mg/L	GC/MS	2018-Sep-05	-			
2 methyl-4-chlorophenoxyaceti c acid (MCPA)	<0.010	-	-	-	0.010	mg/L	GC/MS	2018-Sep-05	-			
2,3,4,6-Tetrachlorophenol	<0.001	-	-	0.100	0.001	mg/L	GC/MS	2018-Sep-05	-			
2,4-D	<0.001	-	-	0.100	0.001	mg/L	GC/ECD	2018-Sep-05	-			
2,4-Dichlorophenol	<0.0002	-	-	0.900	0.0002	mg/L	GC/MS	2018-Sep-05	-			
2,4,6-Trichlorophenol	<0.001	-	-	0.005	0.0010	mg/L	GC/MS	2018-Sep-05	-			



Lab ID	18G2192								
Collection Date	2018-Jul-31								
Collection Time	10:40								
Matrix	Treated Water								
Description	WTP Treated Water: 400 Bissett St.								
				Criteria SDWA / Ont. Reg. 170/03	Criteria Reg 170 Sampler Josh Dewaal Received 2018 Jul 31 14:50 Turn Around 7 Day				
					MDL / RDL	Units	Method	Completed	Analyst
Alachlor	<0.0005	-	-	0.005	0.0005	mg/L	GC/MS	2018-Sep-05	-
Atrazine + N-dealkylated metabolites	<0.001	-	-	0.005	0.001	mg/L	Calculation	2018-Sep-05	-
Azinphos-methyl	<0.002	-	-	0.02	0.002	mg/L	GC/MS	2018-Sep-05	-
Benzo(a)pyrene	<0.00001	-	-	0.00001	0.00001	mg/L	GC/MS	2018-Sep-05	-
Bromoxynil	<0.0005	-	-	0.005	0.0005	mg/L	GC/ECD	2018-Sep-05	-
Carbaryl	<0.005	-	-	0.09	0.005	mg/L	HPLC	2018-Sep-05	-
Carbofuran	<0.005	-	-	0.09	0.005	mg/L	HPLC	2018-Sep-05	-
Chlorpyrifos	<0.001	-	-	0.09	0.001	mg/L	GC/MS	2018-Sep-05	-
Cyfluthrin	<0.001	-	-	0.02	0.001	mg/L	GC/MS	2018-Sep-05	-
Dicamba	<0.001	-	-	0.12	0.001	mg/L	GC/ECD	2018-Sep-05	-
Diclofop-methyl	<0.0009	-	-	0.009	0.0009	mg/L	GC/ECD	2018-Sep-05	-
Dimethoate	<0.0025	-	-	0.02	0.0025	mg/L	GC/MS	2018-Sep-05	-
Diquat	<0.005	-	-	0.07	0.005	mg/L	HPLC	2018-Sep-05	-
Diuron	<0.01	-	-	0.15	0.01	mg/L	HPLC	2018-Sep-05	-
Glyphosate	<0.01	-	-	0.28	0.01	mg/L	HPLC	2018-Sep-05	-
Malathion <sup>2</sup>	<0.005	-	-	0.19	0.005	mg/L	GC/MS	2018-Sep-05	-
Metolachlor <sup>2</sup>	<0.001	-	-	0.05	0.001	mg/L	GC/MS	2018-Sep-05	-
Metribuzin <sup>2</sup>	<0.005	-	-	0.08	0.005	mg/L	GC/MS	2018-Sep-05	-
Paraquat <sup>2</sup>	<0.001	-	-	0.01	0.001	mg/L	HPLC	2018-Sep-05	-
Polychlorinated Biphenyls (PCBs) <sup>2</sup>	<0.0001	-	-	0.003	0.0001	mg/L	GC/ECD	2018-Sep-05	-
Pentachlorophenol <sup>2</sup>	<0.001	-	-	0.06	0.001	mg/L	GC/MS	2018-Sep-05	-
Phorate <sup>2</sup>	<0.0005	-	-	0.002	0.0005	mg/L	GC/MS	2018-Sep-05	-
Picloram <sup>2</sup>	<0.005	-	-	0.19	0.005	mg/L	GC/ECD	2018-Sep-05	-
Prometryne <sup>2</sup>	<0.00025	-	-	0.001	0.00025	mg/L	GC/MS	2018-Sep-05	-
Simazine <sup>2</sup>	<0.001	-	-	0.01	0.001	mg/L	GC/MS	2018-Sep-05	-
Terbufos <sup>2</sup>	<0.0004	-	-	0.001	0.0004	mg/L	GC/MS	2018-Sep-05	-
Triallate <sup>2</sup>	<0.001	-	-	0.23	0.001	mg/L	GC/MS	2018-Sep-05	-
Trifluralin <sup>2</sup>	<0.001	-	-	0.045	0.001	mg/L	GC/MS	2018-Sep-05	-

**Note:** Sample required every 36 months (sample date = July 31, 2018). Next sampling scheduled for July 2021.

### ***Inorganic or Organic Test Results that Exceeded Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.***

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.



***Most Recent Sodium Data Sampled at the Water Treatment Plant***

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
January 16, 2018	1	13	mg/L	20	No

**Note:** Sample required every 60 months. Next sampling scheduled for January 2023.

***Most Recent Fluoride Data Sampled at the Water Treatment Plant***

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
January 16, 2018	1	<0.15	mg/L	1.5	No

**Note:** Sample required every 60 months. Next sampling scheduled for January 2023.

***Summary of Additional Testing Performed in Accordance with a Legal Instrument.***

1. Schedule C, Section 1.6 of Municipal Drinking Water Licence #195-101 requires the UV disinfection system to maintain a continuous pass-through UV dose of at least 40 millijoules per square centimeter ( $\text{mJ}/\text{cm}^2$ ) throughout the life span of the UV lamps.

A primary disinfection system consisting of two (2) parallel UV reactors (duty and standby), each rated to provide dosage of  $40 \text{ mJ}/\text{cm}^2$  at a peak flow of 76 L/s, equipped with automatic switchover controls. Ultra-Violet Light Transmittance (UVT) is continuously monitored. If the duty reactor fails the following would occur:

- the low lift pump would shut off
- the (failed) duty UV reactor's water inlet valve would close
- an alarm would be generated and sent through the emergency call-out system to alert operators of the failure of the duty reactor
- the standby UV reactor would switchover and begin producing water

Table 4 of the licence also requires the following parameters related to the UV disinfection system to be continuously monitored and recorded every four (4) hours:

***UV Intensity(Calculated UV Dose)*** Measured continuously by the UV system. UV intensity is monitored by each individual unit's control module and should the light intensity of the unit fall outside the specified range, the unit will automatically shut down and a standby unit will be activated. Such an event will be recorded by the UV control system.

***Flow Rate*** The maximum flow rate through each of the units is 76 L/s (see Schedule A of DWWP 195-201) which is continuously measured by the raw/treated water flow meters. One flow meter measures flow from both wells, while the other flow meter only measures Well 2 flows. Each UV unit is equipped with a flow control valve and an electronically activated water shut-off valve which will automatically close in the event of a UV equipment malfunction, loss of power or ceases to provide an appropriate level of disinfection.



**UV Transmittance** UVT is continuously monitored.

**Lamp Status** Monitored by each unit's control module. Should the lamp status fail, the unit will automatically shut down and a standby unit will be activated. Such an event will be recorded by the UV control system.