

February 23, 2018

Clerk Administrator Susan Arnold and Council
The Corporation of the Village of South River
63 Marie Street,
South River, ON P0A 1X0

Re: 2017 Annual/Summary Report for the South River Drinking Water System

Dear Susan Arnold and Council:

Ontario's Drinking-Water Systems Regulation (O. Reg. 170/03), made under the *Safe Drinking Water Act in 2002*, requires that the owner of a drinking water system prepare an Annual Report and an Annual Summary Report of the operation of the system and the quality of its water.

Annual Report

The annual report must cover the period of January 1st to December 31st in a year and must be prepared not later than February 28th of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2017 Annual Report for the South River Drinking Water System.

In accordance with Section 11 (6), the annual report must:

- (a) contain a brief description of the drinking-water system, including a list of water treatment chemicals used by the system during the period covered by the report;
- (b) summarize any reports made to the Ministry under subsection 18 (1) of the Act or section 16-4 of Schedule 16 during the period covered by the report;
- (c) summarize the results of tests required under the Regulation, or an approval or order, including an OWRA order, during the period covered by the report and, if tests required under this Regulation in respect of a parameter were not required during that period, summarize the most recent results of tests of that parameter;
- (d) describe any corrective actions taken under Schedule 17 or 18 during the period covered by the report;
- (e) describe any major expenses incurred during the period covered by the report to install, repair or replace required equipment; and
- (f) if the case of a large municipal residential system or a small municipal residential system, include a statement of where a report prepared under Schedule 22 will be available for inspection under subsection 12 (4) O. Reg. 170/03, s. 11 (6).

In addition, Section 11 (7) gives the direction that a copy of an annual report for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The reports should be made available at the office of the Village, or at a location that is accessible to the users of the water system.

Summary Report

The annual summary report must cover the period of January 1st to December 31st in a year and must be prepared not later than March 31st of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2017 Annual Summary for the South River Drinking Water System.

As required in *Schedule 22, Summary Reports for Municipalities*, the annual summary must:

- (2) (a) list the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, 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.
- (3) 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 licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement.

In addition, Section 12 (1) – 4 – gives the direction that a copy of the annual summary for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The reports should be made available at the office of the Village, or at a location that is accessible to the users of the water system.

These reports were prepared by the Ontario Clean Water Agency on behalf of the Village of South River and are based on information kept on record by OCWA at the South River WTP. The reports cover the period January 1st to December 31st 2017.

Please note that any Provincial Officers Orders or non-compliance issues that you have received directly from the MOE should be reviewed. Where non-compliance with the Order or Issue is evident and it is not included in the attached 2017 Annual/Summary Report, then we recommend that this information be added to the report.

After your review and inclusion of any additional information, this report is to be provided to the Council members representing the Village of South River before March 31, 2018. Please ensure this distribution.

Yours truly,
Ontario Clean Water Agency

Joshua Gravelle
Process and Compliance Technician

Copy to: Vesna Alimpic, Drinking Water Inspector, Ministry of the Environment and Climate Change

South River Drinking Water System

2017 ANNUAL/SUMMARY REPORT



Prepared by the Ontario Clean Water Agency
on behalf of the Village of South River



Table of Contents

INTRODUCTION 2

Section 11 - ANNUAL REPORT 3

 1.0 Introduction 3

 2.0 Description of the Drinking Water System (DWS No. 220013562) 4

 3.0 List of Water Treatment Chemicals Used Over the Reporting Period 6

 4.0 Significant Expenses Incurred in the Drinking Water System 6

 5.0 Drinking Water System Highlights 6

 6.0 Details on Notices of Adverse Test Results and Other Problems Reported to &
 Submitted to the Spills Action Center 7

 7.0 Microbiological Testing Performed During the Reporting Period 8

 8.0 Operational Testing Performed During the Reporting Period 8

Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES..... 13

 1.0 Introduction 13

 2.0 Requirements the System Failed to Meet 13

 3.0 Summary of Quantities and Flow Rates 14

CONCLUSION..... 16

List of Appendices

APPENDIX A – Monthly Summary of Microbiological Test Results

APPENDIX B – Monthly Summary of Operational Data



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 31st 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 2017 Annual/Summary Report.



South River Drinking Water System

Section 11

2017 ANNUAL REPORT



Section 11 - ANNUAL REPORT

1.0 Introduction

Drinking-Water System Name: SOUTH RIVER DRINKING WATER SYSTEM
Drinking-Water System No.: 220013562
Drinking-Water System Owner: The Corporation of the Village of South River
Drinking-Water System Category: Large Municipal, Residential System
Period being reported: January 1, 2017 to December 31, 2017

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? No

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

South River Municipal Office,
63 Marie Street,
South River, Ontario
P0A 1X0

Drinking Water Systems that receive drinking water from the South River Drinking Water System

The South River Drinking Water System provides all drinking water to the community of South River.

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

The Ontario Clean Water Agency prepared the 2017 Annual/Summary Report for the South River Drinking Water System and provided a copy to the system owner; the Corporation of the Village of South River. The South River Drinking Water System 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 notice which is posted on the Village website that the annual report is available for viewing in the public binder at the municipal office.
- A newsletter is included Bi-monthly with the municipal utility billing.
- Discussions during public council meetings.



2.0 Description of the Drinking Water System (DWS No. 220013562)

The South River Drinking Water System is owned by The Corporation of the Village of South River and consists of a Class 3 water treatment subsystem and a Class 1 water distribution subsystem. The Ontario Clean Water Agency is designated as the Overall Responsible Operator for the South River Water Treatment Plant and the South River Water Distribution System.

Raw Water Supply

The plant raw water intake consists of a 300 millimeter (mm) diameter intake pipe extending 232 meters (m) into Forest Lake, with a flared elbow in a wooden and concrete crib located at a depth of 4.5 m. The low lift pumping station is located approx. 170 m south of Howard Street off the gravel access road. The low lift pumping station consists of a raw water well, dual manual screens and three (3) submersible pumps (two duty pumps and one standby), each rated at 10.0 litres per second (L/s) at 11.0 m of total dynamic head (TDH) that pump water to the treatment plant. In accordance with the Permit To Take Water (PTTW), the allowable rate of water taking is 19.3 L/s with a maximum daily volume of 1680 cubic meters per day (m³/d).

Water Treatment

The South River Water Treatment facility, owned by the Village of South River, was commissioned in May of 2000. The plant provides full conventional treatment to raw water drawn from Forest Lake, a dam controlled section of the South River. Treatment consists of chemically assisted coagulation, flocculation, clarification and filtration in dual package plants followed by disinfection with sodium hypochlorite before entering the distribution system. This is a pressurized system due to there being no elevated treated water storage reservoir in the community. The water treatment facility consists of two (2) Conventional Napier Reid package plants each rated at 840 m³/d with flocculation tanks, up flow clarifiers, and filters each consisting of triple media that includes Garnet Sand, Silica Sand and Granular Activated Carbon both with surface areas of 4.49 square meters (m²). The chemical feed system consists of two (2) coagulant metering pumps, one (1) duty and one (1) standby, each with the capacity of 5 litres per hour (L/hour) and one (1) 15 cubic meters (m³) storage tank; two (2) polymer metering pumps, each with a capacity of 8 L/hour and one (1) 1350 L storage tank; three (3) alkalinity and pH adjustment (soda ash) metering pumps with a capacity of 3 L/hour and one (1) 1350 L storage tanks; four (4) primary and post disinfection (sodium hypochlorite) metering pumps, three (3) duty, and one standby, each rated at 3 L/hour and a 450 L storage tank. Raw water entering the plant is injected with soda ash and polyaluminum chloride (PACl). Sodium hydroxide was replaced by Soda Ash August 10, 2016. Soda ash offers numerous advantages such as affordability, ease and safety of handling and transportation. Furthermore, Soda Ash is more effective at increasing alkalinity. Aluminum sulphate (Alum) was replaced by PACl June 7, 2017. PACl has greater flexibility, coagulates at a wider pH range, creates better floc formation at low temperatures, requires lower dosage, reduces sludge production and reduces wear on pumping equipment due to the lower dosing rates. Following rapid mixing, the water flows into the flocculation tank. A polymer can be injected into the flocculation chamber as a coagulant aid. Treated water overflows from the clarifiers through two multimedia filters consisting of garnet/sand/ anthracite. Filtered water is then injected with a 12% sodium hypochlorite solution and directed to a baffled clear well reservoir located beneath the plant. Treated water is pumped from the clearwell, and directed to the distribution system by a high lift pumping system. A



second chlorination point and pH adjustment is available prior to the point of entry to the distribution system, if needed.

A six month trial using potassium permanganate ($KMNO_4$) began December 20, 2017. The six month trial will involve injecting $KMNO_4$ at the raw water header. An existing pre-chlorination injection system originally incorporated at the facility on the raw water header intended for sodium hypochlorite would be utilized for the $KMNO_4$. Sodium hypochlorite was trialed last year at 12% concentration, but with near freezing surface water temperatures and detention time of the package plants the oxidation process was ineffective. In an attempt to improve treated water quality $KMNO_4$ will be used as a pre-oxidizing agent. Based on a review of published jar testing reports with similar raw characteristics, it is proposed that depending on iron and manganese concentrations the dosage range for $KMNO_4$ would be approximately 1.5 to 4.0 milligrams per litre (mg/L). Continuous monitoring of the iron and manganese concentrations as well as subsequent jar testing would be the basis for dosage. However, the intention would be to slightly under-dose $KMNO_4$ which would oxidize most of the iron and manganese to eliminate potential colour related issues in the drinking water system rather than overshoot with potential for pink treated water occurrences. Using $KMNO_4$ will suit the water quality in South River due to fluctuations of iron and manganese levels caused by thermal turnover.

Water Storage and Pumping Capabilities

An in ground clearwell reservoir located under the facility has the approximate capacity of 1,536 m^3 of useable storage. The water supply system is a pressurized system. High lift pumps at the treatment facility run continually to maintain water pressure in the water distribution system piping which delivers the treated water to the systems users. There are four high lift pumps, two (2) pumps each rated at 7 L/s at a TDH of 45 m; two (2) pumps each rated at 14 L/s at a TDH of 45 m. The high lift pumps are controlled by variable frequency drives and sequence automatically to maintain system pressure and flow demands. In addition there are two (2) high lift fire pumps each rated at 56 L/s at a TDH of 38 m.

Waste Management

A wastewater treatment system consists of a two cell backwash holding tank / settling tank with approximately 210 m^3 total capacity; one (1) sludge pump rated at 5.0 L/s pumping to a 4500 L sludge storage tank and a two (2) unit bag sludge dewatering system. Process waste is generated at the South River Water Treatment Plant from clarifier blowdown to remove sludge and filter backwashing. The sludge from the clarifier blow down is directed to the sludge thickening tank with the decant from this tank being directed to the clarification tank. The filter backwash water goes to the clarification tank with the sludge that is built up pumped to the sludge thickening tank. The supernatant from the clarification tank is decanted and discharged to a storm sewer which discharges to the lake. The sludge from the sludge thickening tank is pumped to the sludge bagging system every 3-5 times/week for disposal. Dechlorination is practiced for all wastewater entering the collection system. Composite samples of the effluent are collected monthly.

Emergency Power

Standby emergency power is provided by one (1) 135 kilowatt (kW) radiator cooled diesel generator housed in a separate building. It has one (1) double walled external fuel tank with the capacity of 1135 L for diesel fuel storage.



Distribution System

The South River Water Supply System is classified as a Large Municipal Residential Drinking Water System which serves a population of approximately 1100 consumers, with around 500 connections. The South River distribution system consists of a mixture of cast iron, ductile iron, asbestos and polyvinyl chloride (PVC) piping ranging in size from 300 mm in diameter down to 50 mm diameter. As of December 2010 there is: 250 m of 50 mm, 1984 m of 100 mm, 6657 m of 150 mm, 1401 m of 200 mm, 1451 m of 250 mm, and 685 m of 300 mm. The length of the entire system is therefore approximately 12.43 kilometers (km). There are 11 dead end locations and 66 fire hydrants. There is no water storage tower or reservoir in the distribution system. The distribution system undergoes routine flushing twice a year, in the spring and in the fall.

3.0 List of Water Treatment Chemicals Used Over the Reporting Period

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

- Aluminum Sulphate (Alum) - Coagulation/Flocculation
- Polyaluminum Chloride (PACl) - Coagulation/Flocculation
- Potassium Permanganate (KMNO₄) – Iron and Manganese Control
- Magnafloc LT25 Poly Acrylamide Polymer – Coagulant aid
- Sodium Carbonate (Soda Ash) – Alkalinity and pH Adjustment
- Sodium Hypochlorite – 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 2015 which better maintains and optimizes facility assets. All routine maintenance activities conducted at the water treatment plant were accomplished in 2017.

Significant expenses incurred in the drinking water system include:

- Soda ash system stairs installed.
- PACl replaced Alum as coagulant.
- New tech cable installed for replacement actuator for filter #2.
- High lift pump P-8 replaced.
- Disconnect, remove and ship backwash pump P-10 out for rebuild.
- Backwash pump was rebuilt, installed and wired.
- Potassium permanganate purchased for trial.
- New filter #1 effluent valve and actuator installed, wired and placed back into service.

5.0 Drinking Water System Highlights

- The Ministry of the Environment and Climate Change (MOECC) performed their last annual inspection on January 12, 2017. The unannounced inspection included a physical



assessment of the South River Water Treatment Plant and a document review. The system received a risk rating of 4.63%, with a final inspection rating of 95.37%.

- SAI Global conducted a 12 Month Surveillance audit of the South River Drinking Water Systems' Quality and Environmental Management System (QEMS). The system and processes associated with the QEMS were evaluated on May 25, 2017 to ensure implementation of the Operational Plan and procedures and conformance to the Drinking Water Quality Management Standard. Two (2) opportunities for improvement were identified during the audit and have been resolved. Re-accreditation was achieved on June 9, 2016.
- Distribution systems leaks caused clearwell levels to drop faster than the plant could produce. Locating the distribution leaks was difficult. A contractor was hired to locate the leaks using a correlator. All Seasons Mobile Wash supplied potable water to fill clearwells and prevent shortage of water.
- Significant process improvement experienced as a result of reduced raw water turbidity and the PACI trial, producing excellent clarity in the clarifier effluent. Lead sampling took place on a bi-weekly basis during the PACI trial to determine effects, if any on the distribution lead levels.
- PACI trial completed with extra lead sampling as per MOECC instructions with no reported issues. Conversion from Alum to PACI approved by MOECC on June 7, 2017. Low lead results and a decrease in filter turbidities were seen with the use of PACI.
- Schedule C Amendment submitted to MOECC for $KMNO_4$ trial on November 9, 2017. Trial start date pending until final approval from MOECC. Final approval from MOECC given on December 11, 2017. $KMNO_4$ is a pre-oxidizing agent, to help control iron and manganese and prevent colour complaints. Trial started on December 20, 2017.

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, three (3) adverse water quality incidents were reported to the Ministry of the Environment's Spills Action Centre (MOE SAC) in 2017.

1. **AWQI 5837-AKHP23 – Watermain Break/Loss of Pressure/Boil Water Advisory**
March 16 @ 1040 hrs: Watermain break occurred on Marie Street affecting approximately 15 houses. The break was isolated to conduct repairs. MOE SAC and the local Health Unit were notified. A precautionary boil water advisory (BWA) was issued. The water main was repaired and the affected section was flushed and sampled as per American Water Works Association (AWWA) Standard C651-14. Two sets of 3 bacteriological samples were collected. Sample results indicated no detectable total coliforms or *Escherichia coli* (*E.coli*). BWA was lifted on March 20, 2017.
2. **AWQI 132670 – Watermain Break/Loss of Pressure/Boil Water Advisory**
March 18 @ 1919 hrs: Watermain break occurred on Howard Street affecting approximately 16 houses. The break was isolated to conduct repairs. MOE SAC and the local Health Unit

were notified. A precautionary BWA was issued. The water main was repaired and the affected section was flushed and sampled as per AWWA Standard C651-14. Two sets of 3 bacteriological samples were collected. Sample results indicated no detectable total coliforms or *E.coli*. BWA was lifted on March 21, 2017.

3. **AWQI 138158 – Watermain Break/Loss of Pressure/Boil Water Advisory**

November 23 @ 0221 hours: Category 2 watermain break on Ottawa Ave, affecting 14 houses on Ottawa Ave. A circumferential differential settlement break on a 6 inch line due to deterioration, so main was shut down for repair. Town operators responded to and repaired break. The local Health Unit was notified and extended the BWA for the affected area. MOE SAC also notified immediately. The water main was isolated and repaired main break. All materials were disinfected and the area flushed as per MOECC's Watermain Disinfection procedure. Repair was completed and the pressure was restored on November 23, 2017. The area was flushed and 2 sets of 3 microbiological samples were collected (upstream, downstream and at site of the break). Sample results indicated no total coliforms or *E.coli* or general bacteria. BWA was lifted on November 25, 2017.

7.0 Microbiological Testing Performed During the Reporting Period

Summary of Microbiological Data

Sample Type	No. 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 (Lake)	52	0 to 29	10 to 1560	0	N/A
Treated	54	0 to 0	0 to 0	53	0 to 2
Distribution	159	0 to 0	0 to 0	55	0 to 2

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.

NDOGT = No Data, Overgrown with Target

NDOGHPC = No Data, Overgrown with HPC

Notes: One microbiological sample is collected and tested each week from the raw and treated water supply. A total of three microbiological samples are collected and tested each week from the South River distribution system.

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

8.0 Operational Testing Performed During the Reporting Period

Continuous Monitoring in the Treatment Process

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure
Filter #1 Turbidity	8760	0.0 to 0.60	NTU
Filter #2 Turbidity	8760	0.0 to 1.76	NTU
Free Chlorine	8760	1.13 to 5.00	mg/L

Notes: For continuous monitors 8760 is used as the number of samples.

CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for



the South River water plant if the free chlorine residual level drops below 1.00 mg/L to ensure primary disinfection is achieved.

Effective backwash procedures, including filter to waste are in place to ensure that the effluent turbidity requirements are met all times. The plant is configured to shut down and creates a callout whenever turbidity reaches 1.00 NTU for 0 seconds. Thus, the maximum result over 1 NTU on Filter #2 is not representative of the water entering the clearwell.

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	365	0.09 to 3.20	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 23	0.057	0.012	mg/L	No
April 10	0.151	< 0.003	mg/L	No
July 10	0.069	< 0.003	mg/L	No
October 10	0.069	< 0.003	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 23	57.0	ug/L	64.25	No
April 10	29.0			
July 10	104.0			
October 10	67.0			

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/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 23	66.4	ug/L	65.63	No
April 10	27.8			
July 10	101.0			
October 10	67.3			

Summary of Most Recent Lead Data

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

The South River Drinking Water System 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 for lead. As such, the system was required to test for lead, total alkalinity and pH in two 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.

Two rounds of lead, alkalinity and pH testing were carried out on April 5th and September 15th of 2017. Results are summarized in the table below. Furthermore, extra lead sample results taken for the PACI trial are summarized in table below.

Summary of Lead, pH & Alkalinity Data

Date of Sample	No. of Samples	Sample Location/ID	Lead (ug/L)	Field pH	Alkalinity (mg/L)
March 22(PT)	1	Hydrant #26	0.41	7.29	22
March 22(PT)	1	Hydrant #61	0.51	7.18	24
April 5	1	Hydrant #26	0.32	7.51	22
April 5	1	Hydrant #61	1.00	7.37	27
April 25(PT)	2	1 Fitz (First)	0.42	6.95	n/a
		1 Fitz (Second)	0.23	6.95	n/a
April 25(PT)	2	56 Howard (Third)	0.29	7.03	n/a
		56 Howard (Fourth)	0.13	7.03	n/a
May 25(PT)	2	2 Fitz (First)	0.47	6.92	n/a
		2 Fitz (Second)	0.17	6.92	n/a
May 25(PT)	2	32 Main (Third)	1.30	6.98	n/a
		32 Main (Fourth)	0.27	6.98	n/a
Sept. 15	1	Hydrant #26	<0.001	7.35	28.0
Sept. 15	1	Hydrant #61	<0.001	7.28	28.5

Note: PT=PACI Trial

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

Parameter	Result Value	Unit of Measure	Standard	Exceedance
Antimony	0.03	ug/L	6	No
Arsenic	<MDL 0.2	ug/L	25	No
Barium	23.2	ug/L	1000	No
Boron	9.0	ug/L	5000	No
Cadmium	0.006	ug/L	5	No
Chromium	0.48	ug/L	50	No
Mercury	<MDL 0.01	ug/L	1	No
Selenium	<MDL 0.04	ug/L	10	No
Uranium	<MDL 0.002	ug/L	20	No

Note: Sample required every 12 months (sample date = January 23, 2017)



Most Recent Schedule 24 Organic Data Tested at Water Treatment Plant

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW	2017/01/23	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2017/01/23	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2017/01/23	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2017/01/23	<MDL 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW	2017/01/23	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2017/01/23	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2017/01/23	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2017/01/23	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2017/01/23	<MDL 0.16	5.00	No	No
Chlorpyrifos (ug/L) - TW	2017/01/23	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2017/01/23	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2017/01/23	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2017/01/23	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2017/01/23	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2017/01/23	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2017/01/23	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2017/01/23	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2017/01/23	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2017/01/23	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2017/01/23	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2017/01/23	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW	2017/01/23	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2017/01/23	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2017/01/23	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2017/01/23	<MDL 0.02	190.00	No	No
Metolachlor (ug/L) - TW	2017/01/23	<MDL 0.01	50.00	No	No
Metribuzin (ug/L) - TW	2017/01/23	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2017/01/23	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2017/01/23	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2017/01/23	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2017/01/23	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW	2017/01/23	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2017/01/23	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2017/01/23	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2017/01/23	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2017/01/23	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2017/01/23	<MDL 0.35	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2017/01/23	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2017/01/23	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2017/01/23	<MDL 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2017/01/23	<MDL 0.25	5.00	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)*	2017/01/23	<MDL 0.12	100.00	No	No
Trifluralin (ug/L) - TW	2017/01/23	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2017/01/23	<MDL 0.17	2.00	No	No

Note: Sample required every 12 months (sample date = January 23, 2017)

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	No. of Samples	Result Value	Unit of Measure	Standard	Exceedance
January 21, 2013(Compliance)	1	24.0	mg/L	20	Yes (AWQI #109845)
January 29, 2013 (resample)	1	22.0	mg/L	20	Yes (AWQI #109845)
January 19, 2016	1	37.1	mg/L	20	Yes (see note)

Note: Sample required every 60 months. Next sampling scheduled for January 2018.

The aesthetic objective for sodium in drinking water is 200 mg/L at which it can be detected by a salty taste. It is required that the local Medical Officer of Health be notified when the concentration exceeds 20 mg/L so that persons on sodium restricted diets can be notified by their physicians. The adverse sodium result was reported to MOE SAC and the North Bay Parry Sound Health Unit on January 25, 2013 as required under Schedule 16 of O. Reg. 170/03 (AWQI# 109845). Therefore, sodium exceedances are reported if there has not been an adverse reported in the previous 57 months. The last sodium exceedance was reported in January of 2013.

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	No. of Samples	Result Value	Unit of Measure	Standard	Exceedance
January 19, 2016	1	<MDL 0.06	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for January 2021.

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

Condition 1.5 of Schedule C to Municipal Drinking Water Licence (MDWL) #200-101 requires that the annual average concentration of total suspended solids (TSS) from the effluent discharged to Forest Lake not exceed 25 mg/L. Further, Condition 4.4 of Schedule C to the MDWL requires that composite samples are collected every month.

The South River water treatment plant did not exceed this limit in 2017.

Summary of Total Suspended Solids Data from the Effluent Discharge

Date of Sample	No. of Samples	Result Value	Unit of Measure	Annual Average	Limit
January	1	19	mg/L	10.42	25
February	1	19			
March	1	17			
April	1	8			
May	1	2			
June	1	29			
July	1	3			
August	1	6			
September	1	5			
October	1	<2			
November	1	11			
December	1	4			



South River Drinking Water System

Schedule 22

2017 SUMMARY REPORT

FOR MUNICIPALITIES



Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 Introduction

Drinking-Water System Name:	SOUTH RIVER DRINKING WATER SYSTEM
Municipal Drinking Water Licence (MDWL) No.:	200-101-2 (issued March 11, 2016)
Drinking Water Work Permit (DWWP) No.:	200-201-2 (issued March 11, 2016)
Permit to Take Water (PTTW) No.:	0365-7T6P5G (issued June 19, 2009)
Period being reported:	January 1, 2017 to December 31, 2017

2.0 Requirements the System Failed to Meet

According to information kept on record by OCWA, the South River Drinking Water System has complied with all the requirements set out in the system’s MDWL, its DWWP, the Act and its Regulations, with the exception of one non-compliance item noted in MOECC inspection.

Also, it should be noted that, three (3) adverse water quality incidents were reported to the MOE’s Spills Action Center. Refer to *Section 6.0 – Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 7 of this report for details.

The last MOECC inspection report dated January 12, 2017 identified the following non-compliance items.

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
Section 7-2(4) of Schedule 7 of O.Reg. 170/03.	The secondary disinfectant residual was not measured as required for the distribution system. All three free chlorine residual samples taken on Friday, Dec 30, 2016 were performed less than 48 hours after the last sample was taken on Wednesday, December 28, 2016.	December 28, 2016 to December 30, 2016.	SOP #DR-2020 developed on secondary disinfection residual sampling requirements and sent to operator. Training record provided and filled out upon completion of SOP review on March 9, 2017.	Complete



3.0 Summary of Quantities and Flow Rates

Flow Monitoring

MDWL No. 200-101 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of treated water that flows from the treatment subsystem the distribution system, and
- the flow rate and daily volume of water that flows into the treatment subsystem.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers' instructions.

Water Usage

The following water usage tables summarize the quantities and flow rates of water taken and produced during the 2017 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.

Raw Water

2017 - Monthly Summary of Water Takings from the Source (Forest Lake)

Regulated by Permit to Take Water (PTTW) #0365-7T6P5G, issued June 19, 2009

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	19541	24321	23412	18204	16790	18205	21637	20716	19033	19460	18670	16049	236035
Average Volume (m ³ /d)	630	869	755	607	542	607	698	668	634	628	622	518	648
Maximum Volume (m ³ /d)	832	972	1126	1113	704	778	891	845	773	721	751	632	1126
PTTW - Maximum Allowable Volume (m ³ /day)	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680
Maximum Flow Rate (L/min)	664	736	856	949	971	817	792	866	1069	923	682	599	1069
PTTW - Maximum Allowable Flow Rate (L/min)	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160

The system's Permit to Take Water #0365-7T6P5G allows the municipality to withdraw a maximum volume of 1680 cubic meters from Forest Lake each day. A review of the raw water flow data indicates that the system never exceeded this allowable limit having a maximum volume of 1126 m³ in March 2017. The Permit also allows a maximum flow rate of 1160 litres per minute (L/min). At no point during the reporting period did the system exceed this rate having a maximum recorded flow of 1069 L/min in September 2017.



Treated Water

2017 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #200-101 - Issue 2, issued March 11, 2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	12921	16971	17503	14075	12689	14696	16799	16102	14952	15469	14433	10765	177376
Average Volume (m ³ /d)	417	606	565	469	409	490	542	519	498	499	481	347	487
Maximum Volume (m ³ /d)	545	681	870	915	444	539	601	593	663	538	592	448	915
MDWL - Rated Capacity (m ³ /day)	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680

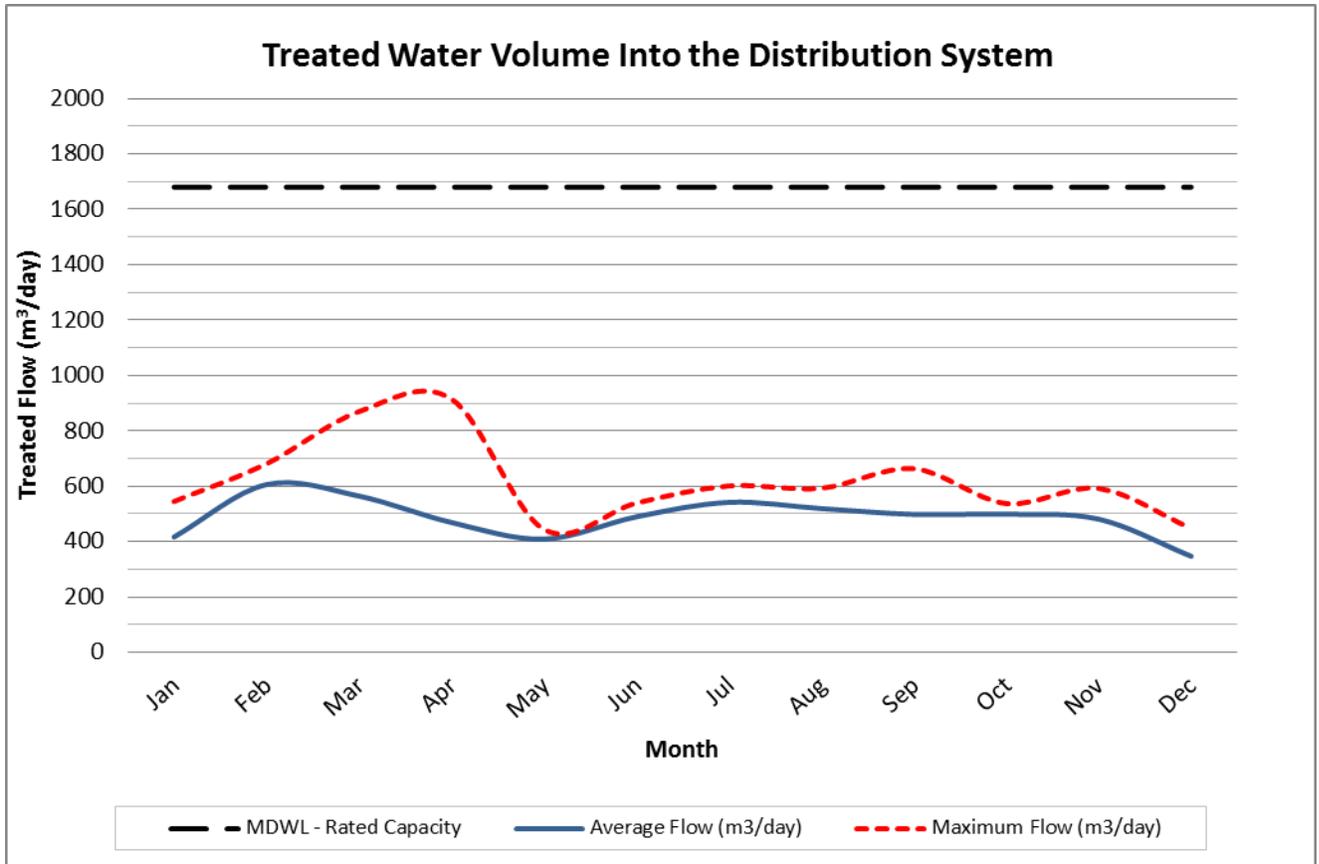
Schedule C, Section 1.1 of MDWL No. 200-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed a maximum flow rate of 1680 m³ on any calendar day. The South River DWS complied with this limit having a recorded maximum volume of 915 m³/day in April 2017, which is 54.5% of the rated capacity.

Figure 1 compares the average and maximum flow rates into the distribution system to the rated capacity of the system identified in the MDWL. This information enables the Owner to assess the system’s existing and future planned water usage needs.

Comparison of the Flow Summary to Systems Licence & Permit

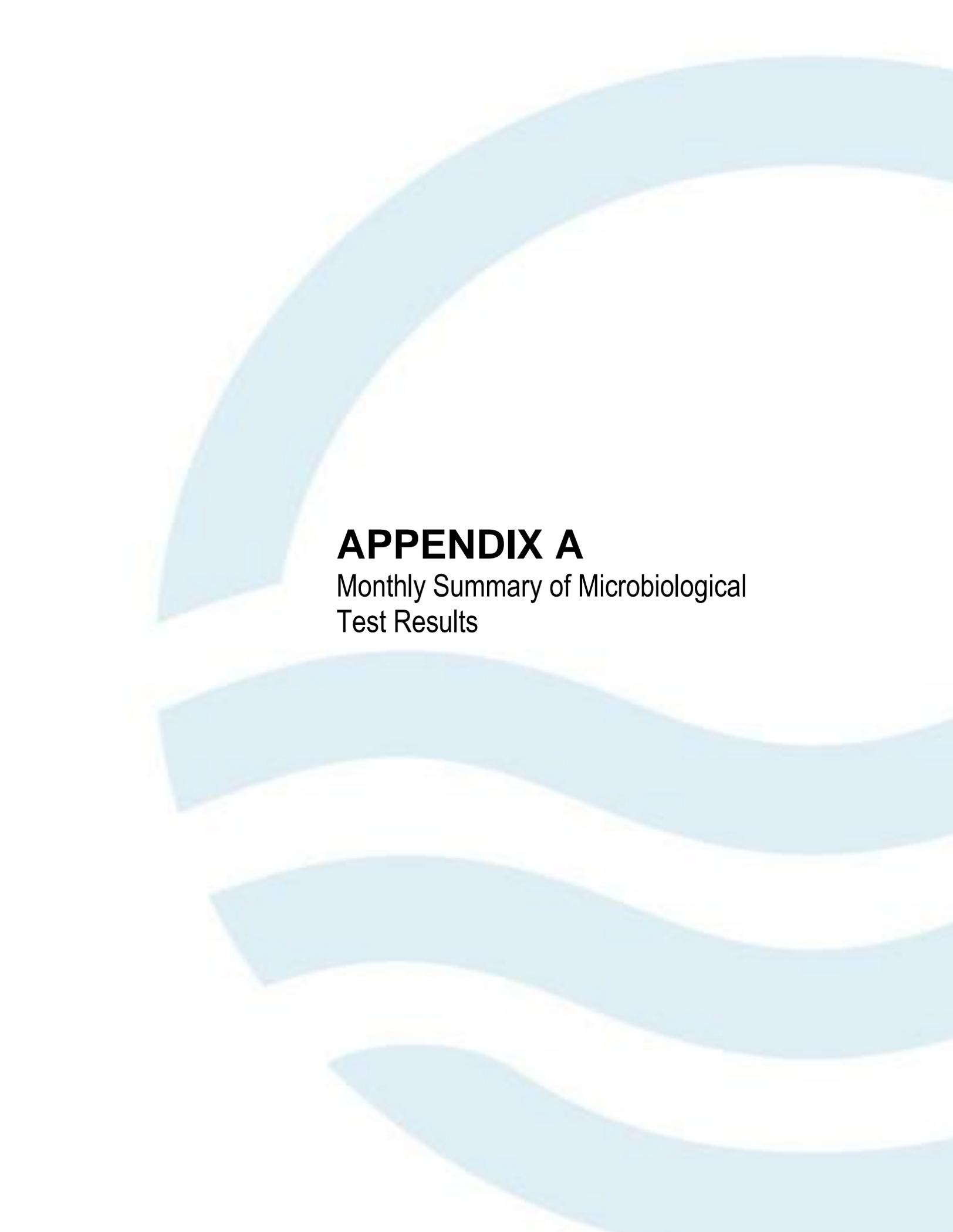
Rated Capacity of the Plant (MDWL)	1680 m ³ /day	
Average Daily Flow for 2017	487 m ³ /day	28.9% of the rated capacity
Maximum Daily Flow for 2017	915 m ³ /day	54.5% of the rated capacity
Total Treated Water Produced in 2017	177,376 m ³	

The South River water treatment plant is rated to produce 1680 cubic meters of water per day as specified in the system’s Municipal Drinking Water Licence. The average daily flow was 487 m³ per day, which is 28.9% of the rated capacity. This information clearly shows that the plant is well within its rated capacity and is able to meet current demands of consumers.



CONCLUSION

In 2017, the South River Drinking Water System (DWS) met the terms and conditions outlined in its site specific drinking water works permit and municipal drinking water licence having one incidents of non-compliance and three adverse water quality incident during the reporting period. The system was able to operate within the water taking limits of the permit and in accordance with the rated capacity of the licence while meeting the community's demand for water use.



APPENDIX A

Monthly Summary of Microbiological
Test Results

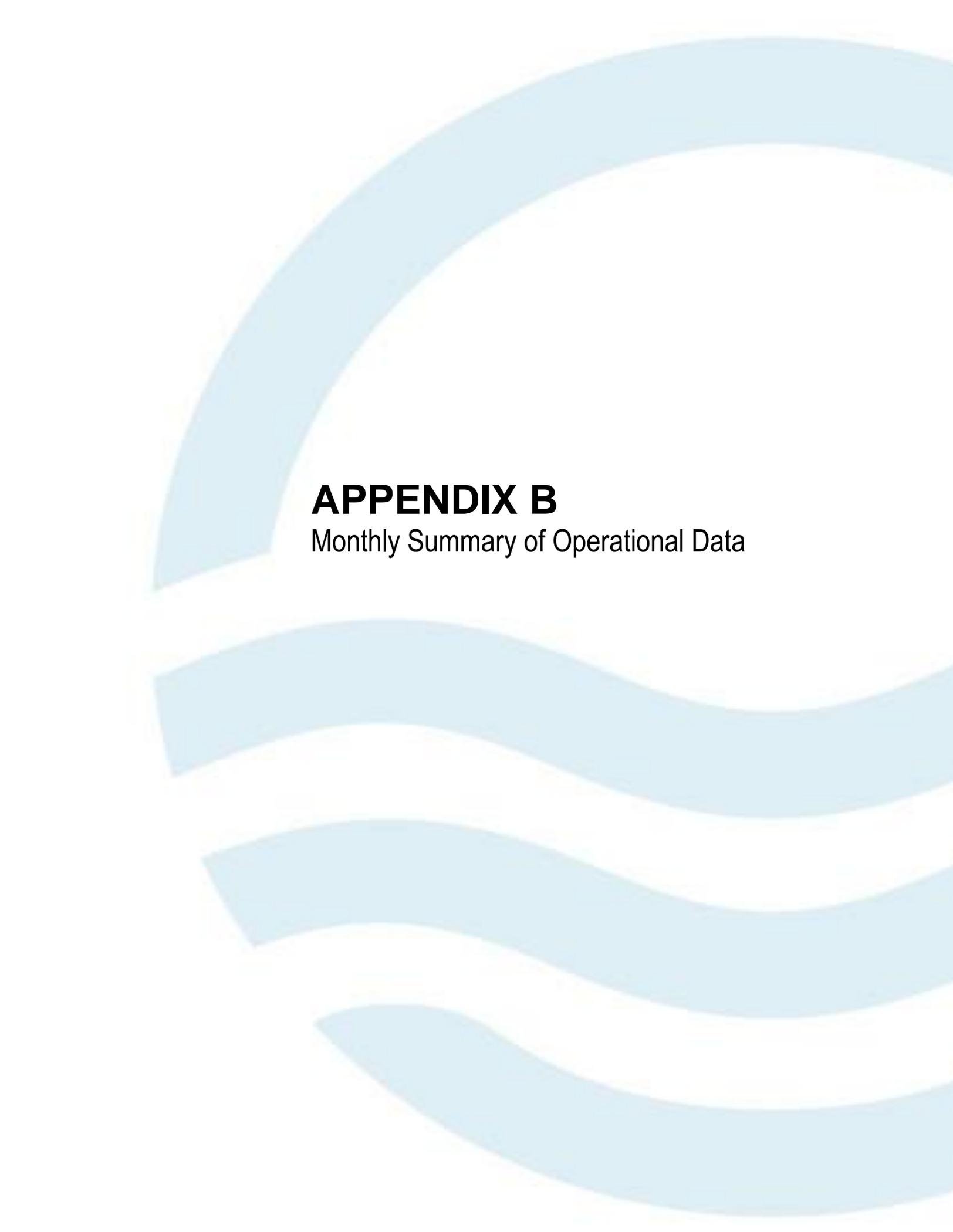
**South River Drinking Water System
Monthly Microbiological Results**

From: 01/01/2017 to 31/12/2017

Report extracted 01/16/2018 09:36

Facility Org Number: 5083
Facility Works Number: 220013562
Facility Name: SOUTH RIVER DRINKING WATER SYSTEM
Municipality: The Corporation of the Village of South River
Facility Owner:
Facility Classification: Class 3 Water Treatment
Receiver:
Service Population: 1049.0
Total Design Capacity: 1680.0 m3/day

	01/2017	02/2017	03/2017	04/2017	05/2017	06/2017	07/2017	08/2017	09/2017	10/2017	11/2017	12/2017	Total	Avg	Max	Min
Distribution Water / E. Coli - cfu/100mL																
Count Lab	15	12	12	12	15	14	15	12	12	15	12	13	159			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Distribution Water / HPC - cfu/mL																
Count Lab	5	4	5	4	5	5	5	4	4	5	4	5	55			
Max Lab	0	1	0	0	1	0	0	2	0	0	0	1			2	
Mean Lab	0	0.25	0	0	0.2	0	0	0.5	0	0	0	0.2		0.094		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Distribution Water / Total Coliform: TC - cfu/100mL																
Count Lab	15	12	12	12	15	14	15	12	12	15	12	13	159			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Raw Water / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	4	5	4	5	4	4	5	4	4	52			
Max Lab	7	29	6	3	3	9	14	9	20	7	10	2			29	
Mean Lab	2.6	10.5	3	2.25	1.6	3.25	5.4	3	7.75	4.6	3.5	1		4		
Min Lab	0	4	0	2	0	0	0	1	2	2	0	0				0
Raw Water / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	4	5	4	5	4	4	5	4	4	52			
Max Lab	80	640	150	55	75	520	680	540	1560	460	116	98			1560	
Mean Lab	58.4	200.25	78.5	46	40.8	297	302.2	245.5	796.25	287.4	83.5	75.75		206.442		
Min Lab	43	38	32	38	10	68	50	122	185	71	71	55				10
Treated Water / E. Coli: EC - cfu/100mL																
Count Lab	5	4	5	4	5	5	5	4	4	5	4	4	54			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water / HPC - cfu/mL																
Count Lab	5	4	4	4	5	5	5	4	4	5	4	4	53			
Max Lab	0	2	0	1	1	0	1	0	0	0	0	1			2	
Mean Lab	0	0.5	0	0.25	0.2	0	0.4	0	0	0	0	0.25		0.132		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	5	4	5	5	5	4	4	5	4	4	54			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0



APPENDIX B

Monthly Summary of Operational Data

**South River Drinking Water System
Monthly Operational Data**

From: 01/01/2017 to 31/12/2017

Report extracted 02/23/2018 12:08

Facility Org Number: 5083
Facility Works Number: 220013562
Facility Name: SOUTH RIVER DRINKING WATER SYSTEM
Facility Owner: Municipality: The Corporation of the Village of South River
Facility Classification: Class 3 Water Treatment
Receiver:
Service Population: 1049.0
Total Design Capacity: 1680.0 m3/day

	01/2017	02/2017	03/2017	04/2017	05/2017	06/2017	07/2017	08/2017	09/2017	10/2017	11/2017	12/2017	Total	Avg	Max	Min
Distribution Water / Cl Residual: Free DW1 - mg/L																
Count IH	9	8	9	8	10	8	9	8	9	9	8	9	104			
Total IH	9.01	12.01	14.57	11.2	8.55	9.2	8.99	7.79	7.56	9.2	10.16	14.6	122.84			
Max IH	1.7	2.07	2.3	2.11	1.37	2.09	1.82	1.92	1.85	2.01	1.81	2.2			2.3	
Mean IH	1.001	1.501	1.619	1.4	0.855	1.15	0.999	0.974	0.84	1.022	1.27	1.622		1.181		
Min IH	0.31	0.64	1.01	0.74	0.37	0.65	0.67	0.53	0.2	0.31	0.76	1.15				0.2
Distribution Water / Cl Residual: Free DW2 - mg/L																
Count IH	9	8	9	8	10	8	9	8	9	9	8	9	104			
Total IH	12.22	13.33	14.23	10.08	13.51	10.04	9.99	6.7	7.87	11.96	11	13.23	134.16			
Max IH	2.16	2.3	2.01	2.02	1.83	1.41	1.86	1.49	1.72	2.08	1.94	1.86			2.3	
Mean IH	1.358	1.666	1.581	1.26	1.351	1.255	1.11	0.838	0.874	1.329	1.375	1.47		1.29		
Min IH	0.64	0.83	1.25	0.09	0.77	1.08	0.1	0.38	0.2	0.87	0.27	1.23				0.09
Distribution Water / Cl Residual: Free DW3 - mg/L																
Count IH	9	8	9	8	10	8	9	8	9	9	8	9	104			
Total IH	13.58	14.24	15.26	13.82	17.06	13.9	11.76	11.39	13.03	15	16.18	16.23	171.45			
Max IH	3.2	2.4	2.5	2.6	2.03	2.4	1.78	2.04	1.86	2.2	2.6	2.12			3.2	
Mean IH	1.509	1.78	1.696	1.728	1.706	1.737	1.307	1.424	1.448	1.667	2.023	1.803		1.649		
Min IH	0.2	1.53	1.2	0.78	1.4	1.35	0.39	0.68	0.75	0.64	1.11	1.15				0.2
Distribution Water / Cl Residual: Free DW4 - mg/L																
Count IH	5	4	4	4	5	4	5	4	5	5	4	4	53			
Total IH	8.93	6.49	6.03	7.91	9.25	7.29	9.26	6.61	9.01	9.31	6.79	8.59	95.47			
Max IH	2.5	1.85	2.4	2.4	2.3	2.12	2.6	1.94	1.98	2.12	2.08	2.6			2.6	
Mean IH	1.786	1.623	1.507	1.977	1.85	1.823	1.852	1.652	1.802	1.862	1.698	2.148		1.801		
Min IH	1.13	1.43	0.17	1.18	1.31	1.64	1.28	1.09	1.61	1.41	1.05	1.87				0.17
Filter 1 / Turbidity - NTU																
Max OL	0.209	0.318	0.555	0.6	0.109	0.073	0.236	0.055	0.082	0.136	0.191	0.446			0.6	
Mean OL	0.031	0.029	0.039	0.01	0.014	0.023	0.028	0.019	0.02	0.017	0.016	0.013		0.022		
Min OL	0.018	0.018	0	0.009	0.009	0.018	0.009	0.009	0	0.009	0	0.009				0
Filter 2 / Turbidity - NTU																
Max OL	1.76	0.55	0.47	0.67	0.22	0.12	0.37	0.1	0.14	0.09	0.27	0.24			1.76	
Mean OL	0.04	0.032	0.037	0.012	0.014	0.025	0.033	0.025	0.027	0.02	0.02	0.016		0.025		
Min OL	0.02	0.01	0	0.01	0.01	0.01	0.02	0.02	0	0	0.01	0.01				0
Treated Water / Cl Residual: Free (Min = 1.0 mg/L) - mg/L																
Max OL	4.99	4.99	5	3.61	4.16	4.99	5	4.99	4.83	3.25	4.84	4.99			5	
Mean OL	2.567	2.624	2.608	2.51	2.494	2.516	2.557	2.552	2.647	2.669	2.7	2.448		2.574		
Min OL	1.13	1.22	1.22	2.2	2.15	2.1	1.87	1.33	1.91	2.19	2.08	1.5				1.13