



innservices

Water Operations

Annual Summary Report

~ Innisfil Lake Simcoe Drinking Water System ~

~ Town of Innisfil ~

DWS #220007472

Reporting Year - 2022

InnServices Utilities Inc.

Innisfil Lake Simcoe Drinking Water System

Introduction

Effective January 1, 2016, the Town of Innisfil transferred ownership of its municipal drinking water systems to InnServices Utilities Inc. (InnServices). InnServices is a municipal service corporation, wholly owned by the Town of Innisfil, charged with the responsibility to operate, maintain, and expand the municipal drinking water systems that service the Town of Innisfil.

The Innisfil Lake Simcoe Drinking Water System (ILS DWS) services a population of approximately 26,600, on 10,499 residential connections, with an additional 158 non-residential connections. The distribution system is comprised of approximately 155 kilometers of various sized ductile iron, concrete, asbestos cement, and PVC piping, and approximately 838 hydrants and 1106 valves placed strategically throughout the system.

The system relies on surface water drawn directly from Lake Simcoe and processed at the Lakeshore Water Treatment Plant (WTP).

InnServices has prepared this Annual Summary Report for the operations conducted during the 2022 calendar year.

This Annual Summary Report has been prepared to meet the following commitments:

- To provide InnServices Utilities Inc. Board of Directors, as “Owners” of the drinking water system, a summary of the operations and maintenance of the Innisfil Lake Simcoe Drinking Water System that took place during the reporting period of January 1, 2022 to December 31, 2022;
- To provide a status update of the systems capabilities and capacities as of December 31, 2022, and;
- To satisfy the requirements of O. Reg 170/03 Section 11
- To satisfy the requirements of O. Reg. 170/03 Schedule 22
- Submitted to the InnServices Board of Directors and publicly posted in accordance with the Safe Drinking Water Act, 2002

The Annual Summary Report identifies specific details regarding the overall quality of the drinking water submitted to the Ministry of the Environment Conservation and Parks (MECP) for the Innisfil Lake Simcoe Drinking Water System and is available on the InnServices website (<https://innservices.co/regulatory>) and at InnServices Headquarters at 7251 Yonge St., Innisfil, Ontario.

This report provides information to the InnServices Board of Directors related to the operations, maintenance, drinking water quality, and system capacities of the Innisfil Lake Simcoe DWS, which aids decision making related to system expansion needs, and assists the Board in meeting their Statutory Standard of Care requirements.

MECP Approvals

The Innisfil Lake Simcoe Drinking Water System is classified as a Large Municipal Residential drinking water system, as defined within Ontario Regulation 170/03.

The **Safe Drinking Water Act, 2002** requires that the Owner of a municipal drinking water system have MECP approvals in the form of a Drinking Water Works Permit (DWWP) and a Municipal Drinking Water Licence (MDWL). The DWWP provides a description of the overall system and provides the authority to establish or alter the drinking water system. The MDWL provides the authority to use or operate the system. The Innisfil Lake Simcoe DWS operated under

DWWP # 120-203, Issue #6 issued December 15, 2020

MDWL # 120-103, Issue #6 issued December 15, 2020

For the reporting period covered in this report, InnServices Utilities Inc. was defined as the Operating Authority of the Innisfil Lake Simcoe Drinking Water System.

InnServices Utilities Inc. has established and maintains accreditation to the Drinking Water Quality Management Standard Version 2-2017 (DWQMS) under Certificate of Accreditation # 0136878, issued November 4, 2020 by SAI Global. The Certificate of Accreditation expires September 20, 2023.

Drinking Water System

The System consists of a Surface Water Treatment Plant (WTP) and associated low lift pumping station, 3 in-ground storage facilities, 4 elevated storage facilities and 5 booster pumping stations.

Disinfection is achieved by two-stage membrane filtration trains equipped with primary UV treatment for Cryptosporidium and Giardia; Granular Activated Carbon Contactors (GACC) are used for taste and odour control; post chlorination achieves acceptable contact time (CT), and final chlorination to distribution maintains secondary chlorine residuals.

Sulphuric acid, sodium hypochlorite and citric acid are used for membrane clean-in-place (CIP) processing; sodium hydroxide and sodium bisulphite are used as neutralizing agents.

Expenses incurred in relation to installation, repair, or replacement of required equipment amounted approximately \$ 538,868.60:

20" Valve at low lift	\$38,875
Intake Cleaning	\$146,527
Pipeline to Bradford Bolt Replacement	\$175,000
Zebra Mussel Chlorination System	\$13,317
Cooktown water tower cleaning	\$109,913
25 th Sideroad watermain repair	\$44,360
Chemical pump replacement	\$10,876

The following expenses for equipment benefitted all InnServices' Drinking Water Systems:

Electronic logbook implementation	\$13,221
Hydraulic cutter	\$6375
Reservoir inspection device	\$13,168
Data Concentrator	\$66,470
Water Loss Audit	\$14,000

Analytical Laboratory Water Quality Monitoring

Bacteriological Analysis

Bacteriological testing is completed to verify that no microbiological contamination of the treated drinking water can be detected. Raw water is also analyzed to inform operations of the level of microbiological contamination within the drinking water system.

Bacteriological monitoring for the reporting period was conducted as required by Ontario Regulation 170/03.

SGS Environmental Services, Lakefield, Ontario, conducted the bacteriological analysis of the drinking water.

There were two (2) items of non-compliance with the Ontario Drinking Water Standards related to bacteriological analyses which occurred during the reporting period. These were reported to Spills Action Centre and the Simcoe Muskoka District Health Unit as required.

<i>Incident Date</i>	<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Corrective Action</i>	<i>Corrective Action Date</i>
August 22, 2022	Total Coliform	2	Cfu/100mL	Resample test	August 24, 2022
July 4, 2022	Total Coliform	3	Cfu/100mL	Resample test	July 6, 2022

Microbiological testing done under the Schedule 10 of Regulation 170/03, during this reporting period:

	<i>Number of Samples</i>	<i>Range of E.coli Results min.-max.</i>	<i>Range of Total Coliform Results min.-max.</i>	<i>Number of HPC Samples</i>	<i>Range of HPC Results min.-max.</i>
Raw	52	0 – 28	0 - 81	n/a	n/a
Treated	52	0 - 0	0 - 0	50	0 - 86
Distribution	490	0 - 0	0 - 3	601	0 - 147

Chemical Analysis

Chemical analysis of this water supply is conducted as required by Ontario Regulation 170/03.

SGS Environmental Services, Lakefield, Ontario, conducted the required chemical analyses for the drinking water system during the reporting period. This lab, as well as any laboratories to which they sub-contract certain types of analyses, are licensed by the MECP and accredited by the Canadian Association for Laboratory Accreditation (CALA) and/or Standard Council Canada (SCC).

Sodium in the drinking water is tested every 60 months (latest test November 2021). Results were above the Maximum Allowable Concentration, but below the Aesthetic Objective. This is not a concern for most people. The Simcoe Muskoka District Health Unit was advised, and they share this information with physicians who may need to consider the potential impact on their patients. InnServices has posted this information on their website, in billing inserts, and will share the information from time to time on social media.

A summary of all analytical results for Organic and Inorganic testing completed during the reporting period is attached in Appendix A.

Continuous Water Quality Monitoring

Filter Effluent Turbidity

The Procedure for Disinfection of Drinking Water in Ontario requires turbidity of 0.10 NTU (100 mNTU) in 99% of monthly measurements of filtered water turbidity. This criterion was met in 2022 with a monthly average measurement of 99.98%.

Free Chlorine Residual

The Innisfil Lake Simcoe Water Filtration Plant utilized NSF® certified chlorine gas to meet post disinfection requirements and provide an adequate chlorine residual for secondary disinfection requirements. A requirement of O.Reg. 170/03 and the Procedure for Disinfection of Drinking Water in Ontario is that chlorine residual must be recorded at the point directly after primary disinfection is achieved, at a frequency of every 5 minutes.

<i>5-minute data collection</i>	<i>Compliance</i>	<i>Results</i>	<i>Unit of Measure</i>
Chlorine	0.05	0.04 – 5.00	Mg/L

All instances where Free Chlorine Residual (FCR) was less than 1.00 mg/L were investigated and confirmed to be isolated instantaneous readings, or coincide with a power outage, calibration activities, and/or disinfection calculations were completed to confirm CT was met.

Harmful Algal Bloom (HAB)

InnServices has implemented a proactive program for the monitoring of Harmful Algal Bloom (Blue-green algae), which can have mild to serious health effects.

The program includes weekly sampling of raw and treated water to test for Microcystin, a toxin produced by the algae bloom, from June 1 – October 31.

All sample results for microcystin were below the detectable limit of 0.1 µg/Liter. Maximum allowable concentration is 1.5 µg/Liter.

UV Disinfection – Ultra Filtration Membrane

UV disinfection is provided as a primary barrier to inactivate *Giardia* and *Cryptosporidium*. Water flows through fine strainers, then splits into two separate UV reactor feed lines. These operate one at a time. A minimum continuous pass-through dose of 5.2 mJ/cm² (milliJoules per square centimeter) must be maintained.

The flow then discharges to the Ultra Filtration membranes.

Membrane filtration is a pressure-driven, liquid-phase separation process which uses microporous membranes to remove contaminants from the water. The membrane treatment process forces the pre-treated water through the UF membrane, leaving contaminants behind on the feed side of the membrane. The filtered water (or permeate) can pass through the pores of the membrane and continue through to the next treatment process.

The flow can be directed to the GAC Contactors (granular active carbon, for taste and odour control) then to the Chlorine Contact Tanks (CCT); or it can bypass the GACC and go directly to the CCT.

Post chlorination is provided in the CCT after the membranes and to provide disinfection against viruses. It then flows from the clearwells to the high lift pumps, where additional chlorine can be added, if necessary, before being pumped into the distribution system.

Secondary Disinfection

Within the distribution system NSF® certified 12% sodium hypochlorite can be added to the water at the Alcona or Lefroy Reservoirs, Friday Harbour water tower and Goldcrest standpipe to ensure adequate levels of chlorine are available to protect the water from microbiological contamination as it moves through the distribution system and is delivered to homes and businesses.

Chlorine residual is continuously monitored in numerous locations throughout the distribution system. Additionally, grab samples are taken and analyzed for free chlorine residual when microbiological samples are taken throughout the distribution system.

Ontario Regulation 170/03 requires that sufficient residual be available in the water to achieve a residual of greater than 0.05 mg/L at all points in the distribution system.

During the reporting period covered by this report, there were zero (0) incidents of non-compliance related to Continuous Water Quality Monitoring.

Plant Flow Monitoring

Raw Water Takings

The Innisfil Lake Simcoe Water Filtration Plant (ILS WTP) utilizes Lake Simcoe as its raw water source. The raw water takings from Lake Simcoe are authorized by the MECP through a Permit to Take Water (PTTW) # 3220-A6HJR4. Raw water takings for 2022 were reported to the electronic Water Taking Recording System (WTRS).

Table 1 below provides a summary of the ILS WTP raw water takings from Lake Simcoe in 2022.

Table 1: Summary of 2022 Raw Water Takings

	Units	Takings under PTTW # 3220-A6HJR4
PTTW Daily Maximum	(m ³ /day)	45,000
Maximum Day	(m ³ /day)	20,534.28
Average Day	(m ³ /day)	13,802.14
Total Annual Takings	(m ³)	5,072,351

Performance Summary

The volume of daily treated water production is authorized by the MECP through the designation of a Plant Rated Capacity within the Municipal Drinking Water License (MDWL). The system is operating at approximately 36.32% of the rated capacity of 38 MLD. At the maximum flow, treated water demand flow in 2022 was 54% of the rated capacity.

Based on total annual raw water takings and treated water production values, the ILS WTP operated at an efficiency of 97.46%.

Table 2 below provides a summary of the ILS WTP treated water production in 2022. Zero (0) incidents of non-compliance related to the plant's rated capacity were reported in 2022.

Table 2: Summary of 2022 Treated Water Production

System Rated Capacity (m ³ /day)	38,000
Maximum Day (m ³ /day)	20,534.28
Average Day (m ³ /day)	13,802.14
Total Annual Demand (m ³)	5,072,351
System Performance-rated capacity	36.32%
System Performance – at Maximum Flow	54%

Distribution Flow Monitoring

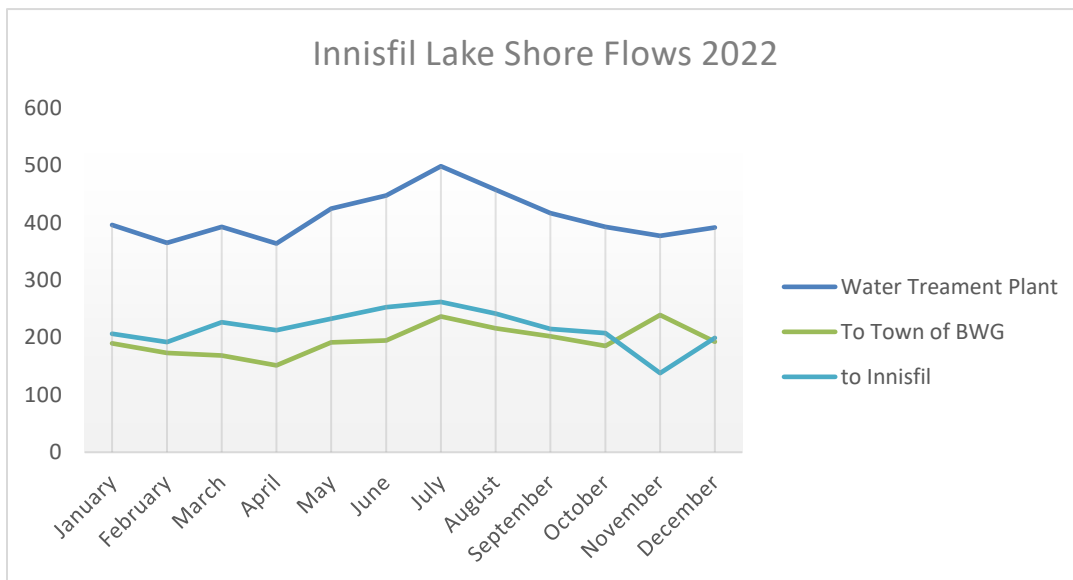
The ILS WTP produces water for distribution to homes and businesses within the Town of Innisfil (TOI) and transmits water to the Town of Bradford West Gwillimbury (BWG) to help meet the drinking water needs of their residents.

Approximately 47% of the water produced at ILS WTP was supplied to Bradford-West Gwillimbury (BWG) in 2022.

The following table and graph demonstrate the volume of the ILS WTP production that was directed to Town of Innisfil and Town of BWG during 2022.

Table 3: Monthly volumes (MLD = 1000 m3) of drinking water directed toward TOI and BWG distribution systems in 2022:

Month	Treated Water Production (MLD)	BWG Use (MLD)	TOI Use (MLD)
January	395.99	189.75	206.24
February	365.12	173.00	192.12
March	392.95	168.68	226.44
April	363.79	151.40	212.39
May	424.30	191.57	232.73
June	447.46	194.63	252.83
July	498.45	236.49	261.96
August	457.60	216.04	241.56
September	416.84	201.90	214.94
October	392.92	185.36	207.56
November	377.09	239.17	137.92
December	391.76	192.70	199.06
Total	4924.27	2340.69	2585.75



Service Disruptions

During the 2022 calendar year, there were three (3) watermain breaks causing disruption of service to residents and businesses.

Cookstown Tower

On June 20, 2022 an 8" service saddle failed at 4152 Hwy 89 Cookstown resulting in water bubbling up at the roads edge. A boil water advisory was implemented for the entire of Cookstown (742 services) which was lifted after repairs were completed and water sample results were confirmed safe.

Cookstown 89 & Hwy 400

On July 22, 2022 an air release valve was knocked off the watermain during construction on HWY89 at HWY400. Water service was shut off to Cookstown Tanger Outlet Mall and A&W gas bar (2 large commercial services, no residential services were affected) for approx. 6 hours between 10am to 4pm. Simcoe Muskoka District Health Unit inspectors were on site and instructions were followed during repair.

25th Side Road

On October 14, 2022 a section of 12" PVC pipe and one residential service connection were replaced, resulting in a boil water advisory which was lifted after repairs and water sample results were confirmed safe. Approximately 28 residential services were affected.

MECP Annual Inspection

The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period.

An Announced Focused inspection was conducted on October 6, 2022, by the Ministry of the Environment Conservation & Parks. The inspection covered the period of November 5, 2021 to October 6, 2022.

Items of Non-Compliance

There were zero (0) items of non-compliance identified during the inspection period.

Provincial Officer's Orders

No Provincial Officer's Orders were issued in the Report as a result of the 2022 inspection.

Inspection Risk Rating

This year the Innisfil Lake Simcoe system received an Inspection Risk Rating of 0%, resulting in a Compliance Rating of 100%.

Appendix A – Chemical Analysis

Organic and Inorganic parameters testing is required at least once every 12 months from a raw water supply that is surface water.

<i>Inorganic Parameter</i>	<i>Sample Date (dd/mm/yy)</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Exceedance</i>
Antimony	07-Nov-2022	<0.6	µg/L	No
Arsenic	07-Nov-2022	0.4	µg/L	No
Barium	07-Nov-2022	24.9	µg/L	No
Boron	07-Nov-2022	23	µg/L	No
Cadmium	07-Nov-2022	0.007	µg/L	No
Chromium	07-Nov-2022	1.05	µg/L	No
Mercury	07-Nov-2022	< 0.01	µg/L	No
Selenium	07-Nov-2022	0.04	µg/L	No
Uranium	07-Nov-2022	0.373	µg/L	No

<i>Parameter</i>	<i>Sample Date (dd/mm/yy)</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Exceedance</i>
Alachlor	07-Nov-2022	<0.02	µg/L	No
Atrazine + N-dealkylated metabolites	07-Nov-2022	<0.01	µg/L	No
Azinphos-methyl	07-Nov-2022	<0.05	µg/L	No
Benzene	07-Nov-2022	<0.32	µg/L	No
Benzo(a)pyrene	07-Nov-2022	<0.004	µg/L	No
Bromoxynil	07-Nov-2022	<0.33	µg/L	No
Carbaryl	07-Nov-2022	<0.05	µg/L	No
Carbofuran	07-Nov-2022	<0.01	µg/L	No
Carbon Tetrachloride	07-Nov-2022	<0.17	µg/L	No
Chlorpyrifos	07-Nov-2022	<0.02	µg/L	No
Diazinon	07-Nov-2022	<0.02	µg/L	No
Dicamba	07-Nov-2022	<0.20	µg/L	No
1,2-Dichlorobenzene	07-Nov-2022	<0.41	µg/L	No
1,4-Dichlorobenzene	07-Nov-2022	<0.36	µg/L	No
1,2-Dichloroethane	07-Nov-2022	<0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	07-Nov-2022	<0.33	µg/L	No
Dichloromethane	07-Nov-2022	<0.35	µg/L	No
2-4 Dichlorophenol	07-Nov-2022	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	07-Nov-2022	<0.19	µg/L	No
Diclofop-methyl	07-Nov-2022	<0.40	µg/L	No
Dimethoate	07-Nov-2022	<0.03	µg/L	No
Diquat	07-Nov-2022	<1	µg/L	No
Diuron	07-Nov-2022	<0.03	µg/L	No
Glyphosate	07-Nov-2022	<1	µg/L	No
Malathion	07-Nov-2022	<0.02	µg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	07-Nov-2022	<0.00012	µg/L	No
Metolachlor	07-Nov-2022	<0.01	µg/L	No

Metribuzin	07-Nov-2022	<0.02	µg/L	No
Monochlorobenzene	07-Nov-2022	<0.3	µg/L	No
Paraquat	07-Nov-2022	<1	µg/L	No
Pentachlorophenol	07-Nov-2022	<0.15	µg/L	No
Phorate	07-Nov-2022	<0.01	µg/L	No
Picloram	07-Nov-2022	<1	µg/L	No
Polychlorinated Biphenyls(PCB)	07-Nov-2022	<0.04	µg/L	No
Prometryne	07-Nov-2022	<0.03	µg/L	No
Simazine	07-Nov-2022	<0.01	µg/L	No
Terbufos	07-Nov-2022	<0.01	µg/L	No
Tetrachloroethylene	07-Nov-2022	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	07-Nov-2022	<0.20	µg/L	No
Triallate	07-Nov-2022	<0.01	µg/L	No
Trichloroethylene	07-Nov-2022	<0.44	µg/L	No
2,4,6-Trichlorophenol	07-Nov-2022	<0.25	µg/L	No
Trifluralin	07-Nov-2022	<0.02	µg/L	No
Vinyl Chloride	07-Nov-2022	<0.17	µg/L	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

<i>Parameter</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Date of Sample</i>
N/A			

One water sample is taken every 60 months to test for Sodium and Fluoride

<i>Parameter</i>	<i>Date of Sample</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Exceedance</i>
Sodium *	22-Nov-2021	30.8	mg/L	Yes
Sodium re-sample	29-Nov-2021	33.4	mg/L	Yes
Fluoride	22-Nov-2021	<0.06	mg/L	No

*Sodium result was reported to both the MECP and the Simcoe Muskoka District Health Unit; public notification & information program was prescribed

One water sample is taken every 3 months and tested for nitrate and nitrite

<i>Parameter</i>	<i>Date of latest Sample</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Exceedance</i>
Nitrite	07-Nov-2022	< 0.003	mg/L	No
Nitrate	07-Nov-2022	0.096	mg/L	No

Distribution Sampling (Lead, THM and HAA)

Based on results of community lead sampling conducted, the Innisfil Lake Simcoe DWS has qualified for reduced sampling protocol as per O. Reg. 170/03 Schedule 15.1. Under this protocol, only alkalinity and pH are required from four (4) sampling points for each summer and winter period. Lead is tested every third 12-month period.

<i>Location Type</i>	<i>Number of Samples</i>	<i>Range of Alkalinity Results Minimum – maximum, 2022</i>	<i>Range of Lead Results- 2020</i>	<i>Number of Exceedances</i>
		Aesthetic Objective 30-500 Mg/L	Maximum Concentration 10 µg/L	
Distribution	8	100-122 Mg/L	0.02 – 0.73 µg/L	0

Trihalomethanes (THMs) and Haloacetic Acids (HAAs) are sampled on a quarterly basis in accordance with O. Reg.170/03 Schedule 13. The most recent sample results:

<i>Parameter</i>	<i>Sample Date</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Maximum Allowable Concentration</i>
THM (NOTE: show latest annual average)	07-Nov-2022	76.96	µg/L	100 µg/L
HAA (NOTE: show latest annual average)	07-Nov-2022	31.62	µg/L	80 µg/L

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards. (Lead, THM and HAA)

<i>Parameter</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Date of Sample</i>
THM (Rolling Annual Avg.)	Q1 – 75.9	µg/L	11-Feb-2022
	Q2 – 79.15	µg/L	27-May-2022
	Q3 – 82.96	µg/L	12-Aug-2022
	Q4 – 78.96	µg/L	07-Nov-2022