



Water Operations

Annual Summary Report
~ Innisfil Lake Simcoe Drinking Water System ~
~ Town of Innisfil ~
DWS #220007472

Reporting Year - 2023

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 11,154 residential connections, with an additional 186 non-residential connections. The distribution system is comprised of approximately 193 kilometers of various sized ductile iron, concrete, asbestos cement, and PVC piping, and approximately 1225 hydrants and 13931 gate valves and curb stop 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 2023 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, 2023 to December 31, 2023;
- To provide a status update of the systems capabilities and capacities as of December 31, 2023, 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. It is presented to the Board of Directors by March 31, 2024.

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 # 0162550, issued December 13 ,2024 by SAI Global.

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.

Significant expenses incurred in relation to installation, repair, or replacement of required equipment amounted approximately \$4.06 Million dollars:

Item	Cost
Lefroy Booster pumping station upgrade	\$3.7 M
20 Sideroad valve chamber repairs	\$55,000
WTP Intake Mussel Control	\$51,000
Flow meter replacements	\$100,000
Chemical pumps	\$56,000
Cookstown valve replacement	\$75,000
UV Lamp parts & service	\$23,018

In addition, \$58,000 was spent on hydrant rehabilitation throughout the drinking water systems servicing the Town of Innisfil.

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 was one (1) item of non-compliance with the Ontario Drinking Water Standards related to bacteriological analyses which occurred during the reporting period. This was 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>
July 7, 2023	Total Coliform	3	Cfu/100mL	Flush, Resample test	July 10, 2023

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	54	0 – 28	0 - 181	n/a	n/a
Treated	54	0 - 0	0 - 0	54	0 - 55
Distribution	639	0 - 0	0 - 3	639	0 - 180

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 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.

- One (1) item of non-compliance with O. Reg. 170/03, Schedule 13 related to chemical analysis was reported during the 2023 calendar year. Organic/Inorganic (Schedule 23/24) testing was not conducted within the

regulated timeframe. This was reported to the MECP immediately upon discovery (Incident # 1-4KBY5S) and corrective action was prescribed, samples were taken January 2, 2024. Preventive measures were put in place.

A summary of all analytical results for Organic and Inorganic testing completed for 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 2023 with a monthly average measurement of 99.93%.

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.

5-minute data collection	Compliance	Results	Unit of Measure
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 and Cookstown standpipes 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 are 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 for the reporting period.

Table 1: Summary of Raw Water Takings

	Units	Takings under PTTW # 3220-A6HJR4
PTTW Daily Maximum	(m ³ /day)	45,000
Maximum Day	(m ³ /day)	22,362.00
Average Day	(m ³ /day)	13,844.60
Total Annual Takings	(m ³)	5,053,280

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 34.90% of the rated capacity of 38 MLD. At the maximum flow, treated water demand flow for the reporting period was 55% of the rated capacity.

Based on total annual raw water takings and treated water production values, the ILS WTP operated at an efficiency of 95.80%.

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

Table 2: Summary of Treated Water Production

System Rated Capacity (m ³ /day)	38,000
Maximum Day (m ³ /day)	21,040.00
Average Day (m ³ /day)	13,262.66
Total Annual Demand (m ³)	4,840,870
System Performance-rated capacity	34.90%
System Performance – at Maximum Flow	55%

Distribution Flow Monitoring

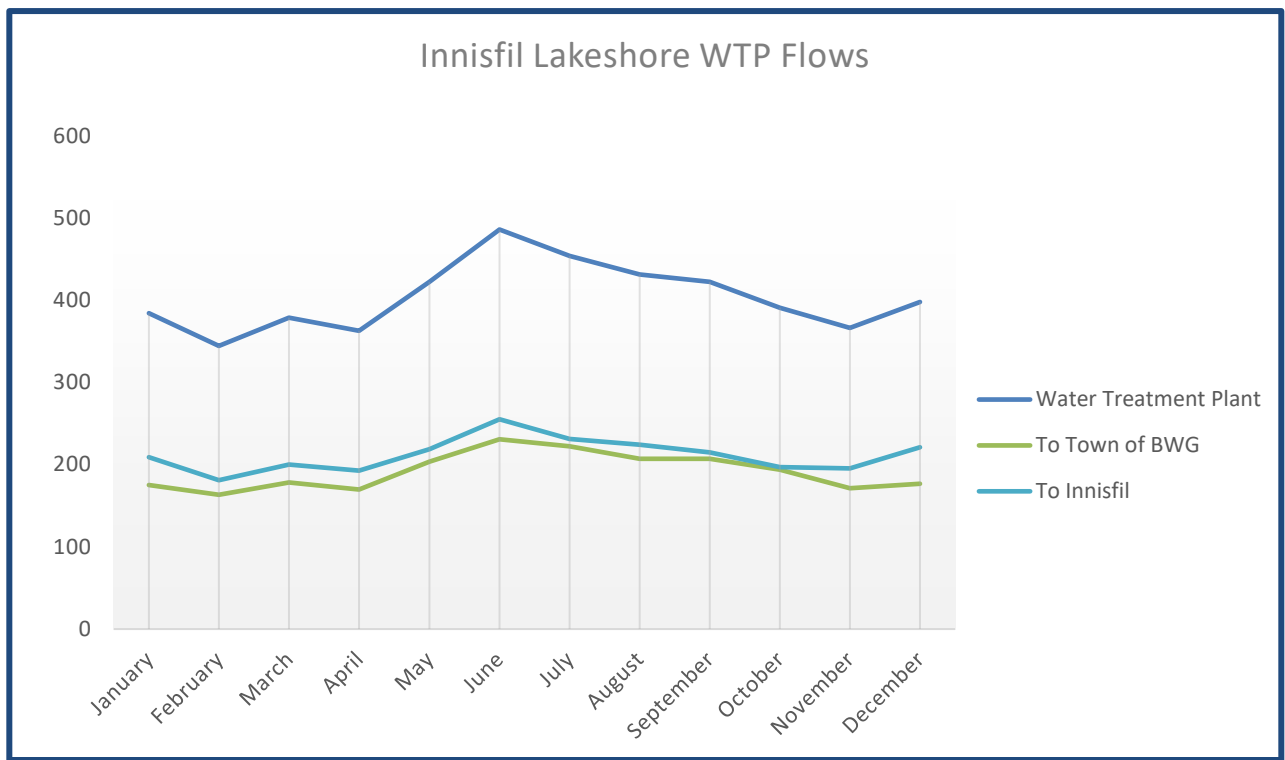
The ILS WTP produces water for distribution to homes and businesses within the Town of Innisfil (TOI) and transmits water to the Town of Bradford West Gwillimbury (BWG) to help meet the drinking water needs of their residents.

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

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 the reporting period.

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

Month	Treated Water Production (MLD)	BWG Use (MLD)	TOI Use (MLD)
January	384.10	175.12	208.98
February	344.45	163.36	181.09
March	378.79	178.49	200.30
April	362.66	169.91	192.75
May	422.35	203.56	218.79
June	486.05	230.86	255.19
July	453.79	222.42	231.37
August	431.23	207.11	224.12
September	422.22	207.27	214.95
October	391.03	194.05	196.98
November	366.49	171.16	195.33
December	397.71	176.58	221.13
Total	4840.87	2299.88	2540.99



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 2023</i>	<i>Number of Exceedances</i>
		Aesthetic Objective 30-500 Mg/L	Maximum Concentration 10 µg/L	
Distribution	8	105-135 Mg/L	0.02 – 0.53 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)	22-Nov-2023	73.50	µg/L	100 µg/L

HAA (NOTE: show latest annual average)	22-Nov-2023	34.64	µg/L	80 µg/L
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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 – 76.88	µg/L	13-Feb-2023
	Q2 – 72.50	µg/L	15-May-2023
	Q3 – 73.50	µg/L	14-Aug-2023
	Q4 – 72.88	µg/L	22-Nov-2023

Service Disruptions

There were ten (10) service disruptions in the drinking water system , 5 of which were planned valve repair/replacement.

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 December 1, 2023, by the Ministry of the Environment Conservation & Parks. The inspection covered the period of October 6, 2022 to December 1, 2023.

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 during the inspection period.

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. Note: Chemical analysis was not performed within the required timeframe. This was reported to the MECF immediately upon discovery (Incident # 1-4KBY5S) and corrective action was taken. Samples were taken January 2, 2024.

<i>Inorganic Parameter</i>	<i>Sample Date (dd/mm/yy)</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Exceedance</i>
Antimony	02-Jan-2024	<0.6	µg/L	No
Arsenic	02-Jan-2024	0.4	µg/L	No
Barium	02-Jan-2024	23.3	µg/L	No
Boron	02-Jan-2024	21	µg/L	No
Cadmium	02-Jan-2024	0.003	µg/L	No
Chromium	02-Jan-2024	0.46	µg/L	No
Mercury	02-Jan-2024	< 0.01	µg/L	No
Selenium	02-Jan-2024	0.10	µg/L	No
Uranium	02-Jan-2024	0.453	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	02-Jan-2024	<0.02	µg/L	No
Atrazine + N-dealkylated metabolites	02-Jan-2024	<0.01	µg/L	No
Azinphos-methyl	02-Jan-2024	<0.05	µg/L	No
Benzene	02-Jan-2024	<0.32	µg/L	No
Benzo(a)pyrene	02-Jan-2024	<0.004	µg/L	No
Bromoxynil	02-Jan-2024	<0.33	µg/L	No
Carbaryl	02-Jan-2024	<0.05	µg/L	No
Carbofuran	02-Jan-2024	<0.01	µg/L	No
Carbon Tetrachloride	02-Jan-2024	<0.17	µg/L	No
Chlorpyrifos	02-Jan-2024	<0.02	µg/L	No
Diazinon	02-Jan-2024	<0.02	µg/L	No
Dicamba	02-Jan-2024	<0.20	µg/L	No
1,2-Dichlorobenzene	02-Jan-2024	<0.41	µg/L	No
1,4-Dichlorobenzene	02-Jan-2024	<0.36	µg/L	No
1,2-Dichloroethane	02-Jan-2024	<0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	02-Jan-2024	<0.33	µg/L	No
Dichloromethane	02-Jan-2024	<0.35	µg/L	No
2-4 Dichlorophenol	02-Jan-2024	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	02-Jan-2024	<0.19	µg/L	No
Diclofop-methyl	02-Jan-2024	<0.40	µg/L	No
Dimethoate	02-Jan-2024	<0.06	µg/L	No
Diquat	02-Jan-2024	<1	µg/L	No
Diuron	02-Jan-2024	<0.03	µg/L	No
Glyphosate	02-Jan-2024	<1	µg/L	No
Malathion	02-Jan-2024	<0.02	µg/L	No

2-Methyl-4-chlorophenoxyacetic acid (MCPA)	02-Jan-2024	0.00012	µg/L	No
Metolachlor	02-Jan-2024	<0.01	µg/L	No
Metribuzin	02-Jan-2024	<0.02	µg/L	No
Monochlorobenzene	02-Jan-2024	<0.3	µg/L	No
Paraquat	02-Jan-2024	<1	µg/L	No
Pentachlorophenol	02-Jan-2024	<0.15	µg/L	No
Phorate	02-Jan-2024	<0.01	µg/L	No
Picloram	02-Jan-2024	<1	µg/L	No
Polychlorinated Biphenyls(PCB)	02-Jan-2024	<0.04	µg/L	No
Prometryne	02-Jan-2024	<0.03	µg/L	No
Simazine	02-Jan-2024	<0.01	µg/L	No
Terbufos	02-Jan-2024	<0.01	µg/L	No
Tetrachloroethylene	02-Jan-2024	<0.44	µg/L	No
2,3,4,6-Tetrachlorophenol	02-Jan-2024	<0.20	µg/L	No
Triallate	02-Jan-2024	<0.01	µg/L	No
Trichloroethylene	02-Jan-2024	<0.44	µg/L	No
2,4,6-Trichlorophenol	02-Jan-2024	<0.25	µg/L	No
Trifluralin	02-Jan-2024	<0.02	µg/L	No
Vinyl Chloride	02-Jan-2024	<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