innservices

Water Operations

Annual Summary Report

~ Stroud Drinking Water System ~

DWS #220006204

~ Town of Innisfil ~

Reporting Year - 2020

InnServices Utilities Inc.

Stroud DWS

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 Stroud Drinking Water System (DWS) services a population of approximately 1836, on 612 residential connections, with an additional 37 commercial connections.
The system relies on 3 drilled wells located on the same property as the pump house.
The distribution system is comprised of approximately 12.5 kilometers of PVC piping and cast iron piping, 79 hydrants and 116 valves.

InnServices has prepared this Summary Report for the operations conducted during the 2020 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 DWS, a summary of the operations and maintenance of the Stroud DWS that took place during the reporting period of January 1 to December 31, 2020;
- To provide a status update of the systems capabilities and capacities as of December 31, 2020 and;
- To satisfy the requirements of O. Reg 170/03 Section 11
- To satisfy the requirements of O. Reg.170/03 Schedule 22

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 Stroud DWS and is available on the Town of Innisfil website (https://innisfil.ca/annual-reports-drinking-water) and at InnServices Headquarters at 7251 Yonge St., Innisfil, Ontario.

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

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MECP Approvals

The Stroud DWS is classified as a Large Municipal Residential DWS, as defined by Ontario Regulation 170/03.

The **Safe Drinking Water Act, 2002** requires that the Owner of a municipal DWS 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 DWS. The MDWL provides the authority to use or operate the system.

The Stroud DWS operated for the majority of the year under
DWWP # 120-204, Issue #4 (Issued January 8, 2016)
MDWL # 120-104, Issue #3 (Issued January 8, 2016)
New DWWP and MDWL were issued December 15, 2020:
DWWP # 120-204, Issue #5
MDWL # 120-104, Issue #4

For the reporting period covered by this report, InnServices Utilities Inc. was defined as the Operating Authority of the Stroud DWS.

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 Stroud DWS relies on three drilled wells as its source of groundwater.
Sodium hypochlorite is used for primary and secondary disinfection.
A Duplex Greensand Pressure Filter system reduces iron and manganese in the drinking water.
A 2-cell, grade level 1263 cubic meter capacity clearwell is designed to provide adequate contact time for disinfection purposes, also providing fire protection for the community.
A 125 kilowatt standby generator at the pump house ensures that the system is provided with water in the event of a power failure.
Significant expenses incurred in relation to equipment installation and repair was as follows:

Greensands Filter media replacement - $77,700
Well head protection - $5860
HMI Upgrade - $6950
Well inspection, maintenance & repairs - $30,000

Testing conducted on the wells resulted in an increase in the daily maximum allowed under the Permit to take Water for Well #1, to better serve growth in the community.

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 the DWS is contending with. 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.

Zero (0) items of non-compliance with the Ontario Drinking Water Standards related to bacteriological analyses occurred during the reporting period.

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

	Number of Samples	*Range of E. coli Results Min. – Max.*	*Range of Total Coliform Results Min.- Max.*	*Number of HPC Samples*	*Range of HPC Results Min. – Max.*
Raw	153	0-0	0-0	N/A	N/A
Treated	51	0-0	0-0	51	0-1
Distribution	200	0-0	0-0	200	0-104

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 DWS 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).

InnServices has engaged the Walkerton Clean Water Centre to undertake a study to investigate THM (Trihalomethanes) and HAA (Haloacetic Acids) formation in the Stroud DWS. Raw water quality was assessed in 2020, pilot studies for treatment options will be undertaken during Q1-Q2, 2021, with a report including recommendations and next steps.
With the issuance of the new Municipal Drinking Water Licence December 15, 2020, the Ministry has added a requirement to increase testing and monitoring of the health related parameters for THM and HAAs from quarterly to monthly, beginning in January 2021.

Zero (0) incidents of non-compliance with Ontario Drinking Water Standards related to chemical analysis were reported during 2020.

A summary of all analytical results for Organic and Inorganic testing is attached in Appendix A.

Continuous Water Quality Monitoring

Free Chlorine Residual

The Stroud DWS utilizes NSF® certified 12% sodium hypochlorite to meet primary disinfection requirements and provide an adequate chlorine residual for secondary disinfection requirements.

Free Chlorine residual is monitored for secondary disinfection requirements through the collection of grab samples throughout the distribution system, as required within O. Reg. 170/03. 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, zero (0) incidents of non-compliance with these requirements were reported.

A summary of the chlorination monitoring that took place directly after primary disinfection is achieved is depicted below:

	Number of Grab Samples	*Range of Results Min. – Max.*	*Unit of Measure*
Chlorine	8760	0.0– 5.00*	mg/L

All instances where Free Chlorine Residual (FCR) was less than 1.00 mg/L were investigated and confirmed to coincide with a power outage, calibration activities, and/or appropriate corrective actions were taken to remove non-compliant water from the system.

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

*A Greensand Filtration System at the Stroud Well System removes manganese and iron from the distribution water, and requires an order under the Municipal Drinking Water License to measure the total suspended solids (discharged outside the Well House) on a quarterly basis.				
Date of legal instrument issued	*Parameter*	*Date Sampled*	*Result*	*Unit of Measure*
08-Jan-16	Total Suspended Solids (NOTE: annual average)	9-Nov-2020	5.3	mg/L

Plant Flow Monitoring

Raw Water Takings

The Stroud DWS utilizes groundwater wells as its raw water source. The raw water takings from groundwater wells are authorized by the MECP through a Permit to Take Water (PTTW).

During the reporting period, a new PTTW was issued. The Daily Maximum allowed for Well #1 increased from 677.16 m^3/day to 984.96 m^3/day.

January 1 - September 15: PTTW # 3344-A6HKCT.

September 16, 2020 – September 14, 2030: PTTW # 7607-BTCTQD

Raw water takings for 2020 were reported to the electronic Water Taking Recording System (WTRS).
There were zero (0) incidents of non-compliance related to water takings in 2020.

Table 1 below provides a summary of the Stroud DWS raw water takings in 2020.

Table 1: Summary of 2020 Raw Water Takings

	Units	PTTW# 3344-A6HKCT Jan. 1- Sept. 15 PTTW# 7607-BTCTQD Sept. 16 - Dec. 31			2020 Takings
		Well #1	Well #2	Well #3	
PTTW Daily Maximum	(m^3/day)	984.96	397.44	1,637.28	3019.68
Maximum Day	(m^3/day)	128	65	1688	1688
Average Day	(m^3/day)	2.5	1.1	491	494
Total Annual Takings	(m^3)	910	384	179,620	180,913

System Performance Summary

The volume of daily treated water delivered to the distribution system is authorized by the MECP through the designation of a Rated Capacity within the Municipal Drinking Water Licence (MDWL). It should be noted as a result of the increased capacity of Well #1, the System Rated Capacity has increased to 3020 m^3/day.

The well system is operating at approximately 17% of the rated capacity of 3020 m^3/day. At the maximum flow, treated water demand flow in 2020 was 45.8% of the rated capacity.

Table 2 below provides a summary of the Stroud DWS treated water demand in 2020. Zero (0) incidents of non-compliance related to the rated capacity were reported in 2020.

Table 2: Summary of 2020 Treated Water Demand

System Rated Capacity (m^3/day)	3020
Maximum Day (m^3/day)	1384
Average Day (m^3/day)	523
Total Annual Demand (m^3)	191,351
System Performance-rated capacity	17%
System Performance – at Maximum Flow	45.8%

Distribution Flow Monitoring

The Stroud DWS produces water for distribution to homes and businesses within the Town of Innisfil (TOI).

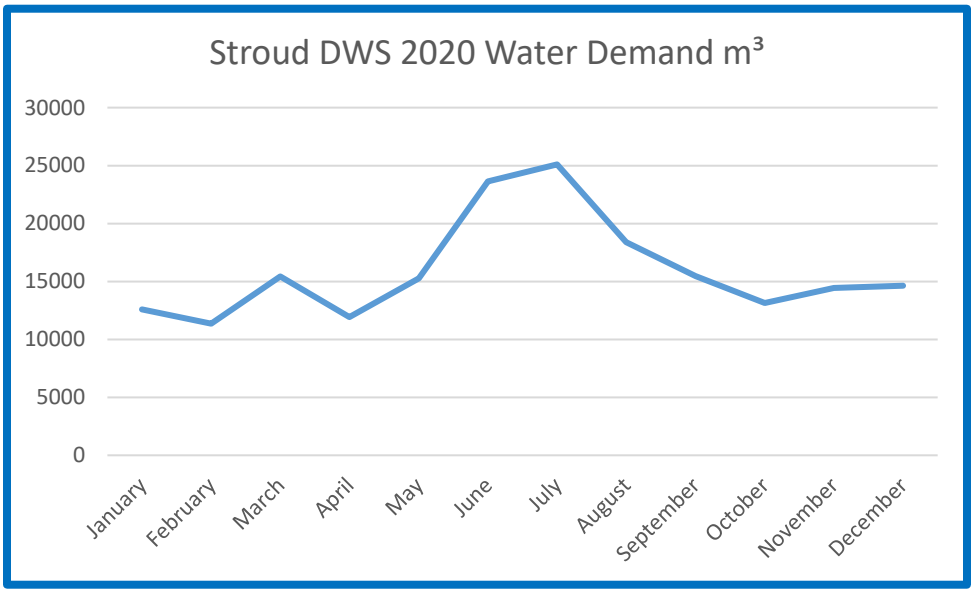
The following tables and graphs demonstrate the monthly water system demand.

Table 3, on page 6, demonstrates the monthly volumes of drinking water directed toward the Stroud distribution system in 2020.

Table 3: Monthly Water Demand

	Treated Water Demand (m^3)
January	12587
February	11357
March	15422
April	11931
May	15258
June	23626
July	25098
August	18400
September	15467
October	13129
November	14438
December	14639
Annual Total	**191,351**

The following graph provides a visual display of the information provided in Table 3.



MECP Annual Inspection

An Announced Focused inspection was conducted on December 3, 2020 by the Ministry of the Environment Conservation and Parks. The inspection covered the period of June 4, 2019 to December 3, 2020.

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 2020 inspection.

Inspection Risk Rating
This year the Stroud 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 36 months from a raw water supply that is ground water.

Inorganic Parameter	*Sample Date*	***Result Value***	*Unit of Measure*	*Exceedance*
Antimony	20-Nov-2018	0.02	µg/L	No
Arsenic	20-Nov-2018	<0.2	µg/L	No
Barium	20-Nov-2018	309	µg/L	No
Boron	20-Nov-2018	90	µg/L	No
Cadmium	20-Nov-2018	<0.003	µg/L	No
Chromium	20-Nov-2018	0.37	µg/L	No
Mercury	20-Nov-2018	<0.01	µg/L	No
Selenium	20-Nov-2018	<0.04	µg/L	No
Uranium	20-Nov-2018	<0.002	µg/L	No

Organic Parameter	*Sample Date*	*Result Value*	*Unit of Measure*	*Exceedance*
Alachlor	20-Nov-2018	<0.02	µg/L	No
Atrazine + N-dealkylated metobolites	20-Nov-2018	<0.01	µg/L	No
Azinphos-methyl	20-Nov-2018	<0.05	µg/L	No
Benzene	20-Nov-2018	<0.32	µg/L	No
Benzo(a)pyrene	20-Nov-2018	<0.004	µg/L	No
Bromoxynil	20-Nov-2018	<0.33	µg/L	No
Carbaryl	20-Nov-2018	<0.05	µg/L	No
Carbofuran	20-Nov-2018	<0.01	µg/L	No
Carbon Tetrachloride	20-Nov-2018	0.25	µg/L	No
Chlorpyrifos	20-Nov-2018	<0.02	µg/L	No
Diazinon	20-Nov-2018	<0.02	µg/L	No
Dicamba	20-Nov-2018	<0.2	µg/L	No
1,2-Dichlorobenzene	20-Nov-2018	<0.41	µg/L	No
1,4-Dichlorobenzene	20-Nov-2018	<0.36	µg/L	No
1,2-Dichloroethane	20-Nov-2018	<0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	20-Nov-2018	<0.33	µg/L	No
Dichloromethane	20-Nov-2018	<0.35	µg/L	No
2-4 Dichlorophenol	20-Nov-2018	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	20-Nov-2018	<0.19	µg/L	No
Diclofop-methyl	20-Nov-2018	<0.4	µg/L	No
Dimethoate	20-Nov-2018	<0.03	µg/L	No
Diquat	20-Nov-2018	< 1	µg/L	No
Diuron	20-Nov-2018	<0.03	µg/L	No
Glyphosate	20-Nov-2018	< 1	µg/L	No
Malathion	20-Nov-2018	<0.02	µg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	20-Nov-2018	<0.00012	Mg/L	No
Metolachlor	20-Nov-2018	<0.01	µg/L	No

Organic Parameter	*Sample Date*	*Result Value*	*Unit of Measure*	*Exceedance*
Metribuzin	20-Nov-2018	<0.02	µg/L	No
Monochlorobenzene	20-Nov-2018	<0.3	µg/L	No
Paraquat	20-Nov-2018	<1	µg/L	No
Pentachlorophenol	20-Nov-2018	<0.15	µg/L	No
Phorate	20-Nov-2018	<0.01	µg/L	No
Picloram	20-Nov-2018	< 1	µg/L	No
Polychlorinated Biphenyls(PCB)	20-Nov-2018	<0.04	µg/L	No
Prometryne	20-Nov-2018	<0.03	µg/L	No
Simazine	20-Nov-2018	<0.01	µg/L	No
Terbufos	20-Nov-2018	<0.01	µg/L	No
Tetrachloroethylene	20-Nov-2018	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	20-Nov-2018	<0.20	µg/L	No
Triallate	20-Nov-2018	<0.01	µg/L	No
Trichloroethylene	20-Nov-2018	<0.44	µg/L	No
2,4,6-Trichlorophenol	20-Nov-2018	<0.25	µg/L	No
Trifluralin	20-Nov-2018	<0.02	µg/L	No
Vinyl Chloride	20-Nov-2018	<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.

Parameter	*Result Value*	*Unit of Measure*	*Date of Sample*
N/A			

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

Parameter	*Date of Sample*	*Result*	*Unit of Measure*	*Exceedance*
Sodium	19-Dec-2016	40.3	Mg/L	Yes
Fluoride	19-Dec-2016	0.4	mg/L	No

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

Parameter	*Date of latest Sample*	*Result*	*Unit of Measure*	*Exceedance*
Nitrite	09-Nov-2020	<0.003	mg/L	No
Nitrate	09-Nov-2020	0.024	mg/L	No

Distribution Sampling

Based on results of community lead sampling program conducted, Innisfil Heights 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 2 sampling points for each summer and winter period. Lead is tested every third 12-month period.

Location Type	*Number of Samples*	*Range of Alkalinity Results Minimum - maximum*	*Range of Lead Results- 2020*	*Number of Exceedances*
		Aesthetic Objective 30-500 Mg/L	*Maximum Concentration 10 µg/L*	
Distribution	4	190-201 Mg/L	0.07 – 0. 19 µg/L	0

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

Parameter	*Sample Date*	*Result Value*	*Maximum Allowable Concentration*
THM (latest rolling annual average)	09-Nov-2020	96.50 µg/L	100 µg/L
HAA (latest rolling annual average)	09-Nov-2020	76.30 µg/L	80 µg/L

Lead, Haloacetic Acids (HAA) or Trihalomethanes (THM) results that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards

Parameter	*Result Value*	*Unit of Measure*	*Date of Sample*
THM (running annual average)	Q1 – 89.46	µg/L	March 6, 2020
	Q2 – 90.58	µg/L	June 8, 2020
	Q3 – 92.67	µg/L	September 21, 2020
	Q4 – 96.50	µg/L	November 25, 2020
HAA (running annual average)	Q1 – 63.23	µg/L	March 6, 2020
	Q2 – 71.31	µg/L	June 8, 2020
	Q3 – 74.92	µg/L	September 21, 2020
	Q4 – 76.30	µg/L	November 9, 2020