Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Englehart Drinking Water System

2021 Annual/Summary Report

Prepared by the Ontario Clean Water Agency
on behalf of the Town of Englehart

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INTRODUCTION

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

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

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

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

Schedule 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 regulatory requirement 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 2021 Annual/Summary Report.

Englehart Drinking Water System

Section 11

2021 Annual Report

Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name:	**Englehart Drinking Water System**
Drinking-Water System No.:	220000353
Drinking-Water System Owner:	The Corporation of the Town of Englehart
Drinking-Water System Category:	Large Municipal, Residential System
Period being reported:	January 1, 2021 to December 31, 2021

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

Is your annual report available to the public at no charge on a web site on the Internet? Yes at http://www.englehart.ca/

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

Englehart Town Office
61 Fifth Avenue
Englehart, Ontario P0J 1H0

Drinking Water Systems that receive drinking water from the Englehart Drinking Water System

The Englehart Drinking Water System provided drinking water to the Town of Englehart and five neighbouring distribution systems:

1. Bradley Subdivision DWS #: 260069927
2. First St North DWS #: 260078871
3. Kap-kig-iwan Road DWS #: 260078650
4. Bryans' Road DWS #: 260080574
5. Brown's Road DWS #: 260078663

The Annual Report was provided to all Drinking Water System owners that are connected to the Englehart Drinking Water System.

The Ontario Clean Water Agency prepared the 2021 Annual/Summary Report for the Englehart Drinking Water System and provided a copy to the system owner; the Town of Englehart. A copy was also provided to the Municipality of Charlton and Dack (Bradley Subdivision) and the following list of representatives for the remaining private lines:

1. Ms. Cindy Kirkbride — First St North
2. Mr. Len Fisher — Kap-kig-iwan Road
3. Ms. Marie Bryan — Bryans' Road
4. Mr. Daryl Rowlandson — Brown's Road

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

- Notice on the Town's Facebook page
- Notice on the Town's website
- Notice in the Municipal Office

2.0 DESCRIPTION OF THE DRINKING WATER SYSYTEM (DWS No. 220000353)

The Englehart Drinking Water System is owned by the Corporation of the Town of Englehart and consists of a Class 1 water treatment subsystem and a Class 1 water distribution subsystem. The Ontario Clean Water Agency is the accredited operating authority and is designated as the Overall Responsible Operator for both the water treatment and water distribution facilities. It is a communal ground water well supply that services the Town of Englehart and five neighbouring distribution systems.

Raw Water Supply

The water treatment plant is located on 56 First Street in Evanturel Township in the district of Timiskaming and is supplied by two deep-drilled wells; Well No. 2 and Well No. 3.

Well No. 2 is located in a separate well house situated approximately 40 meters south of the treatment plant (approximately 52 m east of 1st Street and 15 m north of 6th Avenue). The well was constructed on July 27, 1948 is drilled to a depth of 89.3 meters. It consists of a stainless steel intake screen and a 400 mm diameter steel casing which reduces to a 200 mm diameter steel casing. It is equipped with vertical turbine pump and fixed-rate control system to pump at the maximum rate of 15.15 L/second. It includes a magnetic flow meter installed on the 100 mm diameter discharge line that directs water into the water treatment plant and has pump-to-waste provisions.

Well No. 3 is located in a separate well house situated approximately 20 meters east of the treatment plant (approximately 75 m east of 1st Street and 53 m north of 6th Avenue). The well was constructed on July 27, 1976 and is drilled to a depth of 90.5 meters. It consists of stainless steel intake screen and a 300 mm diameter casing that later reduces to a 150 mm diameter steel casing. It is equipped with vertical turbine pump and fixed-rate control system to pump at the maximum rate of 18.9 L/second. It also includes a magnetic flow meter installed on the 100 mm diameter discharge line that directs water into the water treatment plant and has pump-to-waste provisions.

Water Treatment

The production wells feed the main water treatment plant that has a maximum rated capacity of 2488 cubic meters per day (m^3/d).

The process consists of a Filtronics Electromedia iron and manganese removal/pressure filtration system rated at 2998 m^3/d. It consists of two reaction vessels; one for sodium hypochlorite and one for sodium bisulphite (which is currently not in use) and one filter tank. Sodium hypochlorite is injected prior to the reaction vessels. It is used as an oxidant for iron and manganese removal and as a disinfectant. Primary disinfection is achieved in the filter system and a 210 foot, 8 inch diameter contact pipe and is continuously monitored using a free chlorine residual analyzer. The system is also equipped with a turbidity analyzer, backwash flow meter and a filter backwash pump. The backwash residue discharges to the sanitary sewer. A treated water flow meter is located on the common header just downstream of the pressure filter system.

The sodium hypochlorite feed system consists of two (2) 1100 L chemical storage tanks with spill containment and two (2) flow paced chemical metering pumps with automatic backup/switch over.

Water Storage and Pumping Capabilities

The reservoir consists of a twin cell underground clear well with a 3 meter depth and an overall storage volume 1360 m^3. Ammonia sulphate is added before entering the clearwell to produce a combined residual before entering the distribution system. The ammonia sulphate system consists of one 730 liter chemical tank with spill containment and two metering pumps (one duty and one shelf spare).

Each cell is vented and is accessible by an access hatch with ladder. A butterfly valve provides isolation of each cell if required. Two vertical turbine high lift pumps equipped with variable frequency drives (VFDs) direct water into the distribution system, each at a maximum rate of 37.8 L/second. A distribution water flow meter and a continuous total chlorine analyzer are installed on the high lift discharge header.

Emergency Power

A 150 kW diesel generator is located outside the water treatment building and can maintain all aspects of the operation during a power outage.

Distribution System

The Englehart Drinking Water System is classified as a Large Municipal Residential Drinking Water System and serves an estimated population of 1700 residents. Information regarding the age of the distribution system indicated that it was originally installed in 1914. The water mains consists primarily of 12, 10, 8, and 6 inch diameter ductile iron constructed pipe with approximately 50 fire hydrants connected to the system to aid in fire protection. Newly installed

sections of watermain consist of new PVC DR18 piping of the same diameter. Residential service connections consist of 1/2, 5/8, and 3/4 inch copper tubing. There are no off site water storage facilities in the system. Additionally, the distribution system does not receive water from other sources but it provides drinking-water to five neighbouring regulated drinking water systems (one small municipal residential system and four non-municipal year-round residential systems) as listed below:

Distribution System	DWS #	Owner/Operating Authority	# of Service Connections
Town of Englehart	220000353	Town of Englehart	750
Bradley Subdivision	260069927	Municipality of Charlton & Dack	49
First St North	260078871	Ms. Cindy Kirkbride	9
Kap-kig-iwan Road	260078650	Mr. Len Fisher	8
Bryan's Road	260080574	Ms. Marie Bryan	13
Brown's Road	260078663	Mr. Daryl Rowlandson	12

Note:
A Water Supply Agreement between the Corporation of the Town of Englehart and the Corporation of the Municipality of Charlton and Dack came into effect on August 3, 2016. The terms of the agreement allow the Town of Englehart to monitor and sample the Bradley Subdivision System as part of the Englehart System except for lead sampling and testing under Ontario Regulation 170/03, Section 15.1.

3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD

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

- Sodium Hypochlorite - Disinfection
- Ammonium Sulphate - Chloramination
- Sodium Bisulphite - available at the plant, but is currently not in use.

All treatment chemicals meet AWWA and NSF/ANSI standards.

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).

Significant expenses incurred in the drinking water system include:

- Repaired air valve bank system.
- Repaired generator block heater
- Fire hydrant repairs.

5.0 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, One (1) adverse water quality incident was reported to the Ministry's Spills Action Centre in 2021.

Date	AWQI No.	Details
January 5, 2021	153364	Category 2 watermain repair - loss of pressure to approximately 50 residents occurred in order to replace a valve and hydrant on the corner of First St. and Queen St. An external contractor; Pederson Construction Inc. performed the work. The local Health Unit was notified the day before (on January 4th) and issued a precautionary boil water advisory (BWA) for the affected area. The water main was isolated to allow for the installations. All materials were disinfected and the area flushed as per MECP's Watermain Disinfection procedure. Repair was completed and the pressure was restored on January 5th at 1430 hours. After the repair was complete the area was flushed until satisfactory combined chlorine residuals were achieved. Two sets of 3 bacteriological samples were collected on January 5th and 6th. Sample results were acceptable having no total coliforms or *E.coli* and the BWA was lifted on January 8, 2021 at approximately 1430 hours. Notifications and reports completed as required.

6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Microbiological Data

Sample Type	# of Samples	Range of *E. coli* Results *(min to max)*	Range of Total Coliform Results *(min to max)*	# of HPC Samples	Range of HPC Results *(min to max)*
Raw (Well No. 2)	52	0 to 0	0 to 0	0	N/A
Raw (Well No. 3)	52	0 to 0	0 to 0	0	N/A
Treated	52	0 to 0	0 to 0	52	< 10 to 110
Distribution	156	0 to 0	0 to 0	52	< 10 to 160

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
">" denotes greater than the laboratory's method detection limit

Notes:

1. One microbiological sample is collected and tested each week from the raw (each well) and treated water supply. A total of three microbiological samples are collected and tested each week from the Englehart distribution system which includes one sample from the Bradley Subdivision. At least 25% of the distribution samples must be tested for HPC bacteria

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

7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Raw Water Turbidity Data

Parameter	# of Samples	Range of Results *(min to max)*	Unit of Measure
Turbidity (Well No. 2)	25	0.29 to 2.41	NTU
Turbidity (Well No. 3)	25	0.28 to 2.17	NTU

Note: Samples are required once every month.

Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results *(min to max)*	Unit of Measure	Standard
Free Chlorine Residual	8760	0.72 to 5.00	mg/L	CT

Notes:

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

2. 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 Englehart water plant if the free chlorine residual level drops below 0.85 mg/L to ensure primary disinfection is achieved. A CT calculation was performed on March 26th (FCR = 0.72 mg/L) and met CT requirements, meaning the system was providing proper disinfection.

Summary of Chlorine Residual Data in the Distribution System

Parameter	# of Samples	Range of Results *(min to max)*	Unit of Measure	Standard
Combined Chlorine Residual	366	0.40 to 2.22	mg/L	$\geq$ 0.25 and <3.0

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 plant's point of entry into the distribution every quarter)*

Date of Sample	Nitrate Result Value	Nitrite Result Value	Unit of Measure	Exceedance
January 11	< 0.05	< 0.05	mg/L	No
April 12	< 0.05	< 0.05	mg/L	No
July 12	< 0.05	< 0.05	mg/L	No
October 18	< 0.05	< 0.05	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 every quarter)*

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 11	20.4	ug/L	28.1	No
April 12	26.3	ug/L		
July 12	30.6	ug/L		
October 18	35	ug/L		

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

Summary of Total Haloacetic Acid Data *(sampled in the distribution system)*

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 11	26	ug/L	21.8	No
April 12	17	ug/L		
July 12	22	ug/L		
October 18	22	ug/L		

Maximum Allowable Concentration (MAC) for Total Haloacetic Acids = 80 ug/L (Four Quarter Running Average)

Summary of Most Recent Lead Data under Schedule 15.1

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

The Englehart 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 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.

Lead samples were last collected in 2020 and results were well below the MAC. Two rounds of alkalinity and pH testing were carried out on March 8th and September 23rd of 2021. Results are summarized in the table below.

Summary of Lead Data *(sampled in the Englehart distribution system)*

Date of Sample	# of Samples	Field pH *(min to max)*	Field Temperature (°C) *(min to max)*	Alkalinity (mg/L) *(min to max)*	Lead (ug/L) *(min to max)*
March 8	2	7.57 to 7.65	6.5 to 7.4	248 to 250	N/A
September 16	2	7.75 to 7.76	10.8 to 11.0	243 to 247	N/A

Note: Next lead sampling scheduled for 2023

The Bradley Subdivision Distribution System was also 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. Lead samples were last collected in 2020 and results were well below the MAC. Two rounds of alkalinity and pH testing were performed on one distribution sample collected on March 8th and September 15th of 2021. Results are summarized in the table below.

Summary of Lead Data *(sampled in the Bradley Subdivision distribution system)*

Date of Sample	# of Samples	Field pH	Field Temperature (°C)	Alkalinity (mg/L)	Lead (ug/L)
March 8	1	7.53	4.8	250	N/A
September 15	1	7.66	13.5	250	N/A

Note: Next lead sampling scheduled for 2023

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

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	< 1.0	ug/L	10	No	No
Barium	405	ug/L	1000	No	No
Boron	228	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	< 1.0	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	0.8	ug/L	50	No	No
Uranium	< 1.0	ug/L	20	No	No

Note: Sample required every 36 months (sample date = *October 5, 2020).* Next sampling scheduled for October 2023

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

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.363	ug/L	5	No	No

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

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Atrazine + N-dealkylated metobolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.272	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.01	ug/L	0.01	No	No
Bromoxynil	< 0.105	ug/L	5	No	No
Carbaryl	< 1.0	ug/L	90	No	No
Carbofuran	< 2.0	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.272	ug/L	90	No	No
Diazinon	< 0.272	ug/L	20	No	No
Dicamba	< 0.092	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.3	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.3	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1.0	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.393	ug/L	100	No	No
Diclofop-methyl	< 0.131	ug/L	9	No	No
Dimethoate	< 0.272	ug/L	20	No	No
Diquat	< 0.2	ug/L	70	No	No
Diuron	< 6.0	ug/L	150	No	No
Glyphosate	< 20.0	ug/L	280	No	No
Malathion	< 0.272	ug/L	100	No	No
Metolachlor	< 0.182	ug/L	190	No	No
Metribuzin	< 0.182	ug/L	50	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.2	ug/L	80	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	10	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.182	ug/L	2	No	No
Picloram	< 0.0917	ug/L	190	No	No
Prometryne	< 0.0908	ug/L	3	No	No
Simazine	< 0.272	ug/L	1	No	No
Terbufos	< 0.182	ug/L	10	No	No
Tetrachloroethylene	< 0.3	ug/L	1	No	No
2,3,4,6-Tetrachlorophenol	< 0.2	ug/L	30	No	No
Triallate	< 0.182	ug/L	100	No	No
Trichloroethylene	< 0.2	ug/L	230	No	No

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

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
2,4,6-Trichlorophenol	< 0.2	ug/L	10	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	< 6.55	ug/L	5	No	No
Trifluralin	< 0.182	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 36 months (sample date = *October 5, 2020).* Next sampling scheduled for October 2023

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

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

Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2020	1	44.4	mg/L	20	Yes
October 9, 2020 (resample)	1	46.7	mg/L	20	Yes

Note: Sample required every 60 months. Next sampling scheduled for October 2025

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 Ministry's SAC and the Timiskaming Health Unit on October 9, 2020 as required under Schedule 16 of O. Reg. 170/03 (AWQI# 152519).

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2020	1	0.42	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Additional Testing Performed in Accordance with an Approval, Order or Legal Instrument

Condition 5 (5.1) of Schedule C to Municipal Drinking Water Licence (MDWL) #209-101 issued on November 23, 2021 requires sampling, testing and monitoring of Nitrosodimethylamine

(NDMA). The sample is to be collected each quarter from the farthest point in the distribution system and not exceed the maximum allowable concentration (MAC) of 0.009 ug/L.

A sample was collected on December 6, 2021 and had a result of 0.0017 ug/L falling well below the MAC.

Englehart Drinking Water System

Schedule 22

2021 SUMMARY REPORT

FOR MUNICIPALITIES

Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name:	**Englehart Drinking Water System**
Municipal Drinking Water Licence (MDWL) No.:	209-101-5 (issued November 23, 2021)
Drinking Water Work Permit (DWWP) No.:	209-201-3 (issued November 23, 2021)
Permit to Take Water (PTTW) No.:	P-300-5072679672 (issued June 3, 2020)
Period being reported:	January 1, 2021 to December 31, 2021

2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the Englehart Drinking Water System has complied with all the requirements set out in the system's MDWL, its DWWP, the Act and its Regulations.

It should be mentioned that one (1) adverse water quality incident was reported to the Ministry's Spills Action Center during the reporting period. Refer to Section 5.0 – *Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 6 of this report for details.

3.0 SUMMARY OF FLOWS AND COMPARISON TO REGULATORY LIMITS

Flow Monitoring

MDWL No. 209-101 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 2021 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.

Raw Water

2021 - Monthly Summary of Water Takings from the Source (Well No. 2 and Well No. 3)

Regulated by Permit to Take Water (PTTW) #P-300-5072679672 effective June 3, 2020

Well No. 2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m^3)	5850	5684	6715	5989	6748	7465	8493	8329	7841	6916	6476	6441	82947
Average Volume (m^3/d)	189	203	217	200	218	249	274	269	261	223	216	208	227
Maximum Volume (m^3/d)	245	331	450	246	292	433	550	484	371	260	256	257	550
PTTW - Maximum Allowable Volume (m^3 /day)	1205	1205	1205	1205	1205	1205	1205	1205	1205	1205	1205	1205	1205
Maximum Flow Rate (L/min)	900	581	824	900	900	738	874	595	900	900	900	594	900
PTTW - Maximum Allowable Flow Rate (L/min)	909	909	909	909	909	909	909	909	909	909	909	909	909

Well No. 3

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m^3)	17039	16412	18965	17057	19216	20837	23041	22988	21849	19708	18571	18236	233919
Average Volume (m^3/d)	550	586	612	569	620	695	743	742	728	636	619	588	641
Maximum Volume (m^3/d)	715	950	1306	697	825	1201	1512	1338	1034	742	34	714	1512
PTTW - Maximum Allowable Volume (m^3 /day)	1591	1591	1591	1591	1591	1591	1591	1591	1591	1591	1591	1591	1591
Maximum Flow Rate (L/min)	1368	1354	1500	1348	1500	1500	1500	1303	1283	1302	1500	1310	1500
PTTW - Maximum Allowable Flow Rate (L/min)	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727

Raw Water Total - Combined Water Taking (Well No. 2 and Well No. 3)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m^3)	22889	22096	25680	23046	25964	28302	31534	31317	29690	26624	25047	24677	316866
Average Volume (m^3/d)	738	789	828	768	837	943	1017	1010	990	859	835	796	868
Maximum Volume (m^3/d)	960	1281	1756	943	1117	1634	2062	1822	1405	1002	990	971	2062
PTTW - Maximum Allowable Volume (m^3 /day)	2796	2796	2796	2796	2796	2796	2796	2796	2796	2796	2796	2796	2796

The system's Permit to Take Water #P-300-5072679672 allows the Town to withdraw water at the following rates:

Well No. 2:	1204.69 m^3/day	909 L/minute
Well No. 3	1591.10 m^3/day	1727 L/minute
Total Combined Daily Volume:	2795.79 m^3/day	

A review of the raw water flow data indicates that the system did not exceed the maximum allowable volumes or maximum flow rates during the reporting period.

Treated Water

2021 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #209-101 (issue 5), issued November 23, 2021

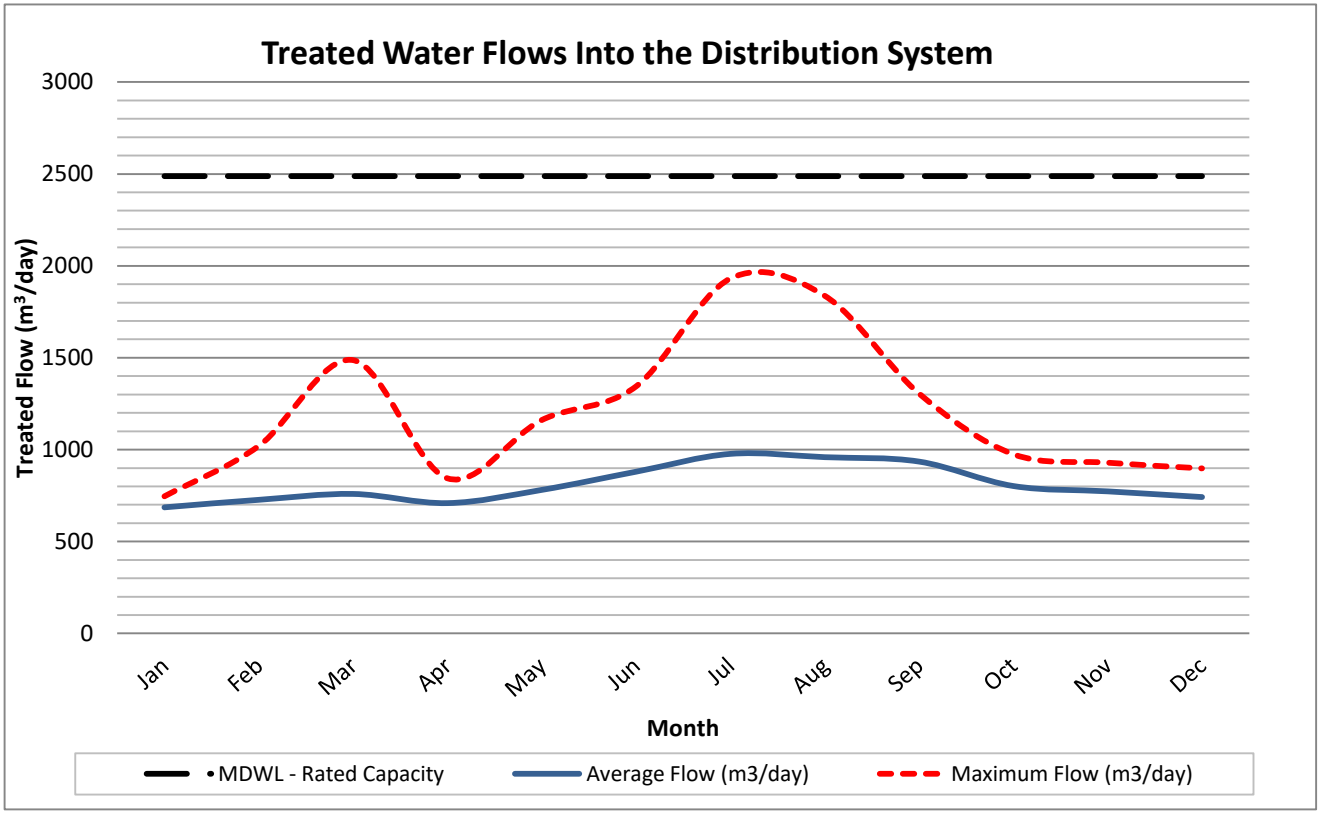
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m^3)	21257	20361	23515	21275	24212	26386	30300	29741	28050	24854	23193	23000	296144
Average Volume (m^3/d)	686	727	759	709	781	880	977	959	935	802	773	742	811
Maximum Volume (m^3/d)	746	1020	1487	844	1161	1344	1931	1837	1305	975	929	898	1931
MDWL/C of A - Rated Capacity (m^3/day)	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488

Schedule C, Section 1.0 (1.1) of MDWL No. 209-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 2488 m^3/day. The Englehart DWS complied with this limit having a recorded maximum volume of 1931 m^3/day on July 11th, which represents 77.6% 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.

Figure 1: 2021 - Comparison of Treated Water Flows to the Rated Capacity

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m^3/day)	686	727	759	709	781	880	977	959	935	802	773	742
Maximum Flow (m^3/day)	746	1020	1487	844	1161	1344	1931	1837	1305	975	929	898
MDWL - Rated Capacity	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488
% Rated Capacity	30	41	60	34	47	54	78	74	52	39	37	36



The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs.

Summary of System Performance

Rated Capacity of the Plant (MDWL)	2,488 m^3/day	
Average Daily Flow for 2021	811 m^3/day	32.5 % of the rated capacity
Maximum Daily Flow for 2021	1931 m^3/day	77.6 % of the rated capacity
Total Treated Water Produced in 2021	296,144 m^3	

Historical Flows

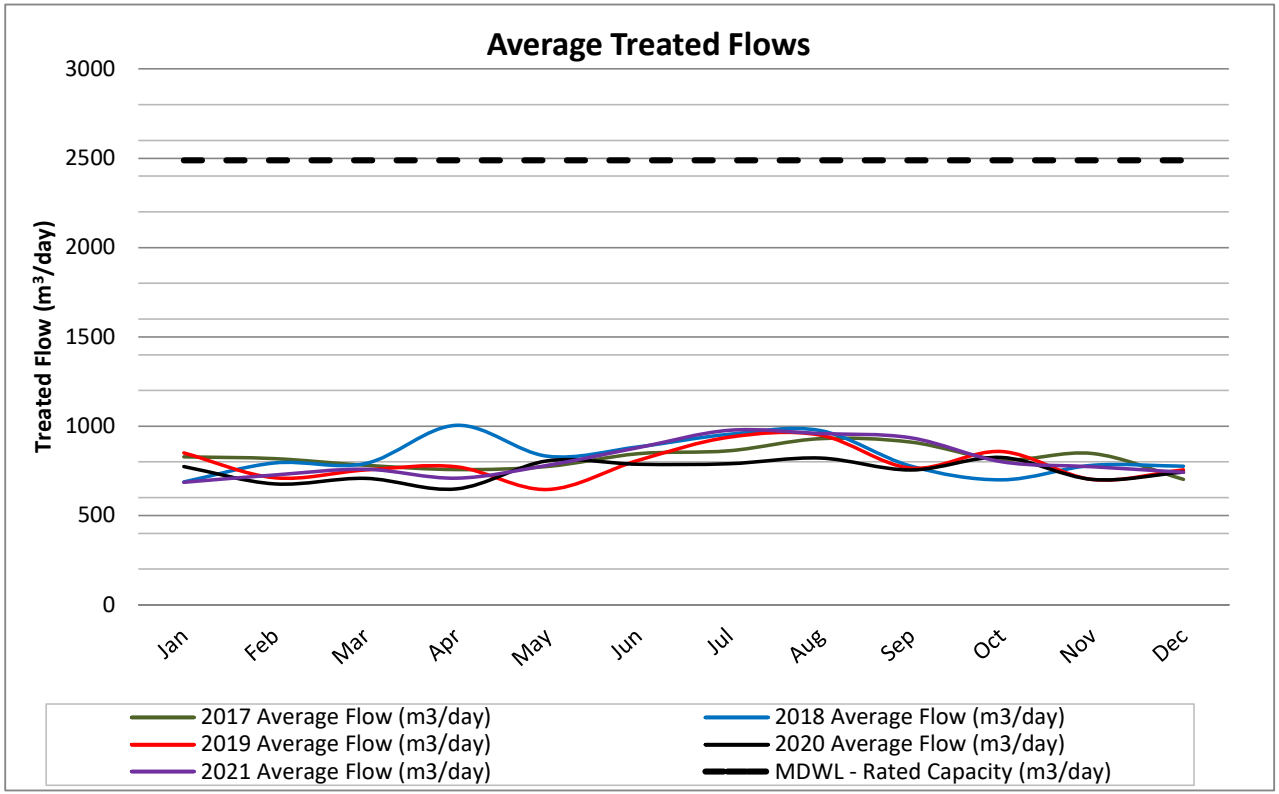
Englehart Water Treatment Plant – Historical Flow Comparison

Year	Maximum Treated Flow (m^3/d)	Average Daily Treated Flow (m^3/d)	Average Day % of Rated Capacity (2488 m^3/d)
2021	**1931**	**811**	**32.5%**
2020	1684	753	30.3%
2019	1714	793	31.8%
2018	1744	830	33.4%
2017	1327	823	33.1%

Figure 2 compares the average treated water flows from 2017 to 2021.

Figure 2: Englehart Water Treatment System - Average Treated Water Flows from 2017 to 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017 Average Flow (m^3/day)	829	818	781	757	775	846	862	930	911	813	847	702
2018 Average Flow (m^3/day)	688	794	791	1005	832	884	955	976	777	700	781	776
2019 Average Flow (m^3/day)	851	711	755	773	646	809	938	951	765	858	702	756
2020 Average Flow (m^3/day)	774	677	708	649	806	787	790	822	755	825	702	743
2021 Average Flow (m^3/day)	686	727	759	709	781	880	977	959	935	801	773	742
MDWL - Rated Capacity (m^3/day)	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488	2488



CONCLUSION

The water quality data collected in 2021 demonstrates that the Englehart drinking water system provided high quality drinking water to its users. One adverse water quality incident was reported during distribution repairs and was immediately reported, responded to and resolved.

The Englehart Drinking Water System was able to operate in accordance with the terms and conditions of the Permit to Take Water 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

ENGLEHART DRINKING WATER SYSTEM
2021 SUMMARY OF MICROBIOLOGICAL TEST RESULTS

Facility Works Number: 220000353
Facility Owner: Municipality: Town of Englehart
Facility Classification: Class 1 Water Treatment

RAW WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Well 2 / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
Well 2 / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
Well 3 / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
Well 3 / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Treated Water (POE) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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 (POE) / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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 (POE) / HPC - cfu/mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	40	< 20	< 30	20	< 10	< 10	< 10	< 20	< 110	< 80	< 10	< 10			110	
Mean Lab	< 17.5	< 12.5	< 16	< 12.5	< 10	< 10	< 10	< 12	< 35	< 27.5	< 10	< 10		< 15		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

DISTRIBUTION WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
E-3 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
E-3 (Bacti) / E. Coli - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
E-3 (Bacti) / HPC - cfu/mL																
Count Lab	2	1	2	1	2	1	1	3	1	1	3	1	19			
Max Lab	30	< 10	< 20	40	< 10	< 10	< 10	60	30	160	< 70	< 10			160	
Mean Lab	30	< 10	< 15	40	< 10	< 10	< 10	33.333	30	160	< 30	< 10		< 30		
Min Lab	30	< 10	< 10	40	< 10	< 10	< 10	20	30	160	< 10	< 10				< 10
E-4 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
E-4 (Bacti) / E. Coli - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
E-4 (Bacti) / HPC - cfu/mL																
Count Lab	1	2	1	1	1	2	1	1	1	2	1	2	16			
Max Lab	40	< 10	20	< 10	< 10	< 10	20	20	< 10	< 30	< 10	< 10			40	
Mean Lab	40	< 10	20	< 10	< 10	< 10	20	20	< 10	< 20	< 10	< 10		< 15		
Min Lab	40	< 10	20	< 10	< 10	< 10	20	20	< 10	< 10	< 10	< 10				< 10
E-5 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
E-5 (Bacti) / E. Coli - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
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
E-5 (Bacti) / HPC - cfu/mL																
Count Lab	1	1	2	2	2	1	2	1	2	1	1	1	17			
Max Lab	30	< 10	< 10	< 30	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10			30	
Mean Lab	30	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		< 12.353		
Min Lab	30	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

APPENDIX B

Monthly Summary of Operational Data

ENGLEHART DRINKING WATER SYSTEM
2021 SUMMARY OF OPERATIONAL TEST RESULTS

Facility Works Number: 220000353
Facility Owner: Municipality: Town of Englehart
Facility Classification: Class 1 Water Treatment

RAW WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Well 2 / Turbidity - NTU																
Count IH	2	2	2	2	2	2	2	3	2	2	2	2	25			
Max IH	1.02	0.75	0.49	0.38	1.11	0.56	0.69	0.55	2.41	0.39	0.33	0.76			2.41	
Mean IH	0.945	0.59	0.435	0.36	0.96	0.43	0.6	0.51	2.305	0.375	0.31	0.585		0.693		
Min IH	0.87	0.43	0.38	0.34	0.81	0.3	0.51	0.47	2.2	0.36	0.29	0.41				0.29
Well 3 / Turbidity - NTU																
Count IH	2	2	2	2	2	2	2	3	2	2	2	2	25			
Max IH	1.99	1.06	0.55	0.51	2.17	0.69	0.34	0.76	2.01	0.4	0.37	0.7			2.17	
Mean IH	1.78	0.88	0.5	0.395	1.995	0.54	0.325	0.623	1.975	0.39	0.36	0.54		0.849		
Min IH	1.57	0.7	0.45	0.28	1.82	0.39	0.31	0.4	1.94	0.38	0.35	0.38				0.28

FILTERED WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Pressure Filter / Cl Residual: Free-CT (0.85 mg/L) - mg/L																
Max OL	4.999	5.00	4.999	4.999	4.999	4.999	4.999	4.999	4.999	4.999	4.999	4.284			5.00	
Mean OL	0.986	1.391	1.114	0.941	1.092	1.244	1.138	1.2	1.222	1.496	1.43	1.222		1.206		
Min OL	1.29	1.18	0.72	1.02	1.02	0.85	0.98	1	1.09	0.85	0.88	1.29				0.72

DISTRIBUTION WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Residual No. 1 / Cl Residual: Combined - mg/L																
Count IH	9	8	10	9	9	9	8	9	9	8	9	9	106			
Max IH	2	1.99	2.22	2.01	1.95	1.77	1.53	1.82	1.76	1.69	1.66	1.75			2.22	
Mean IH	1.877	1.629	1.909	1.776	1.708	1.531	1.28	1.632	1.533	1.4	1.392	1.636		1.616		
Min IH	1.8	1.41	1.67	1.46	1.29	0.88	0.71	1.2	1.19	0.71	0.40	1.42				0.40
Residual No. 2 / Cl Residual: Combined - mg/L																
Count IH	8	8	9	9	9	9	8	9	9	8	9	9	104			
Max IH	2.02	1.99	2.00	2.04	1.76	1.83	1.92	1.9	1.81	2.07	1.81	1.81			2.07	
Mean IH	1.831	1.698	1.857	1.787	1.673	1.632	1.505	1.542	1.504	1.574	1.482	1.621		1.642		
Min IH	1.74	1.31	1.71	1.51	1.44	1.33	1.09	1.15	1.26	0.82	0.46	1.36				0.46
Residual No. 3 / Cl Residual: Combined - mg/L																
Count IH	8	8	9	9	9	9	8	9	9	8	9	9	104			
Max IH	1.85	1.89	2.1	2	1.77	1.71	1.91	2.00	1.99	1.92	1.85	1.85			2.1	
Mean IH	1.69	1.605	1.83	1.757	1.658	1.5	1.488	1.414	1.554	1.609	1.379	1.67		1.596		
Min IH	1.49	1.34	1.49	1.47	1.39	1.32	0.84	1.14	1.21	1.1	0.44	1.46				0.44
Residual No. 4 / Cl Residual: Combined - mg/L																
Count IH	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max IH	1.87	2.11	2.00	1.74	1.72	1.85	1.97	1.88	1.57	1.9	1.83	1.74			2.11	
Mean IH	1.835	1.86	1.82	1.658	1.562	1.495	1.543	1.352	1.515	1.608	1.326	1.665		1.596		
Min IH	1.81	1.58	1.62	1.6	1.43	1.05	1.07	1.16	1.44	1.09	0.51	1.53				0.51

NOTES:
* 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 Englehart water plant if the free chlorine residual level drops below 0.85 mg/L. A CT calculation was performed on March 16th (FCR = 0.72 mg/L) to ensure primary disinfection was achieved.