ANNUAL SUMMARY REPORT

THE CORPORATION OF TOWNSHIP OF CRAMAHE

COLBORNE DRINKING WATER SYSTEM

Prepared by Lakefront Utility Services Inc. (2020)

CONTENTS

1. PURPOSE

The purpose of the Annual Water Quality Report is to provide information to residents and stakeholders of the Township of Cramahe. Furthermore, satisfying the regulatory requirements of the *Safe Drinking Water Act*, *2002* including the Drinking Water Quality Management Standard (DWQMS) reports to owner, and regulatory reporting required under *Ontario Regulation 170/03*. This annual water quality report fulfills all requirements of *Ontario Regulation 170/03* Section 11 Annual Reports and Schedule 22 Summary Reports for Municipalities.

The annual water quality report is prepared by Lakefront Utility Services Inc. (operating authority) on behalf of the Township of Cramahe (owner).

Scope

This annual water quality report includes information pertaining to the Village of Colborne's Drinking Water System (Colborne DWS) for the period of January 1, 2019 to December 31, 2019. *Ontario Regulation 170/03* requires reported information be provided to:

- **Drinking Water System Owners (Mayor and Council)**
- **Owner and Operating Authority Top Management**
- **The Public**

Availability

The Colborne DWS is a large municipal residential system that serves approximately 2,000 people. Copies of this annual water quality report are available online at https://www.lakefrontutilities.com/regulatory-water/. Hard copies are also available at the LUSI's office at 207 Division St, Cobourg ON, K9A 4L3.

Customers of the Colborne DWS are notified that the annual water quality report is available via "What's New" https://www.lakefrontutilities.com/whats-new/, social media posts and "Stay Connected" LUSI bill insert.

Council Resolution

Ontario Regulation 170/03 requires Summary Reports be distributed to municipal council no later than March 31 of each year. The Township of Cramahe must provide LUSI with a copy of council resolution indicating the report has been accepted.

2. COLBORNE DRINKING WATER SYSTEM OVERVIEW

The Colborne Water Treatment Plant (WTP) takes water from two wells, Well #1 and Well #2, located approximately 25m apart from each other. ***Sodium hypochlorite*** is injected for disinfection and ***sodium silicate*** is used as an iron sequestering agent. Primary disinfection is achieved via the 215m serpentine (buried east of the plant). Water is conveyed to the distribution system and the elevated storage tank, which has a capacity of 2,342m3.

The distribution system is split into two pressure zones that are regulated by two pressure reducing valves that maintain the pressure between 20 and 90 PSI. As of December 31, 2019, there are a total of 998 metered customers. Water is conveyed to customers by approximately 27km of watermain ranging from 25mm to 250mm, made of PVC, ductile iron and cast iron. There are 130 fire hydrants located within the system.

3. 2019 COMPLIANCE

3.1 MECP INSPECTION

The MECP began an unannounced focused inspection of the Colborne DWS on February 8, 2019. A final inspection rating of 97.24% was achieved.

During the review of documents, it was identified that on September 24, 2018 an incomplete chain of custody was submitted to the laboratory for analysis of samples. The chain of custody did not include the name of the operator who collected the samples and chlorine residuals. In response to identifying an incomplete chain of custody, LUSI immediately held a meeting to review the procedure for completing the chain of custody. No further action was required. No additional recommendations or issues related to best practices were identified.

The MECP began an inspection of the Colborne DWS on December 17, 2019. A final inspection rating of 100% was achieved. There were no non-compliances with regulatory requirements, and no identified recommendations or issues related to best practices.

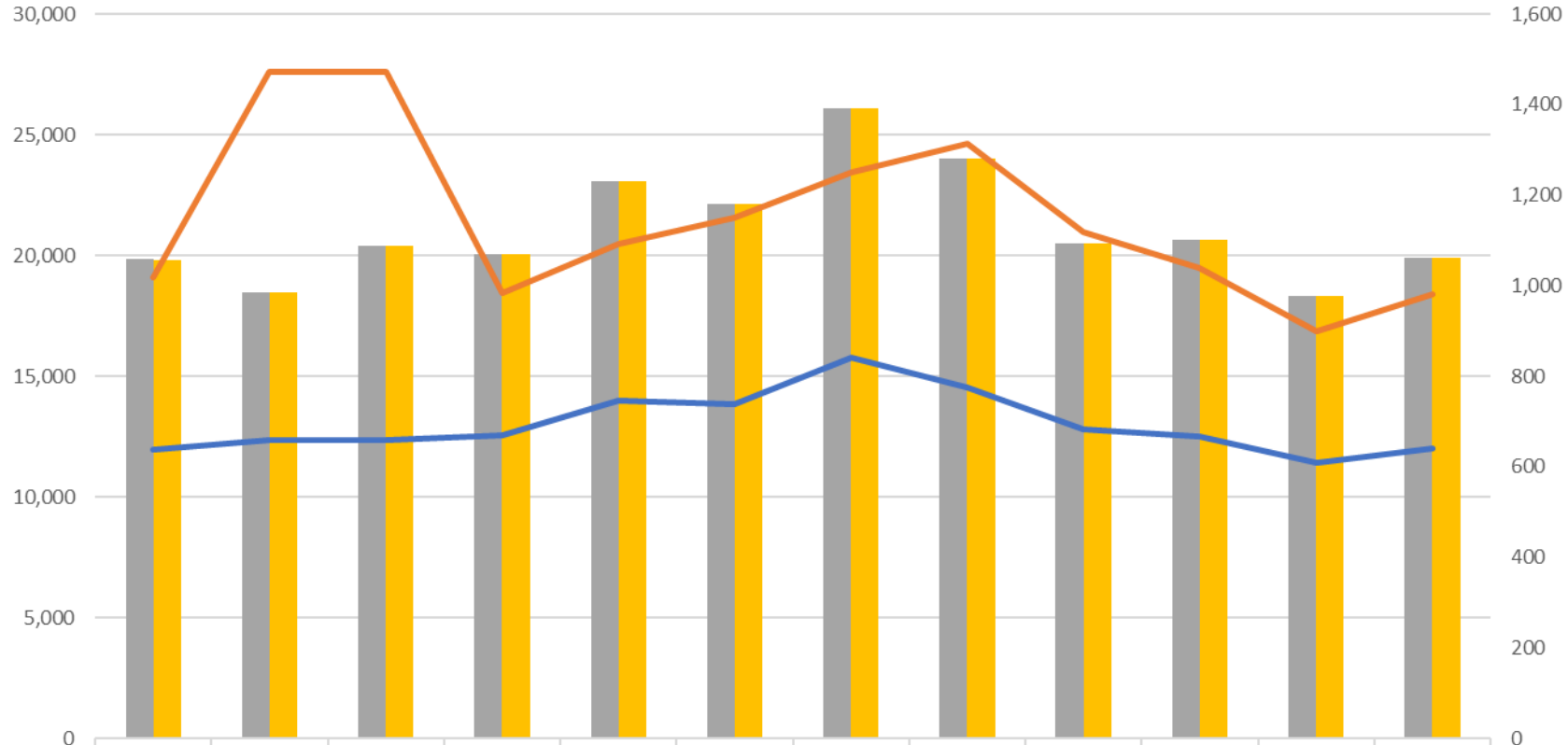
3.2 LICENSE & PERMIT COMPLIANCE

The Colborne DWS maintained compliance with all applicable legislation, and all terms and conditions of the Municipal Drinking Water License, Drinking Water Works Permit and Permit to Take Water in 2019.

The Colborne DWS Permit to Take Water (Permit No. 2363-8VMR6M) allows the taking of 3,283 m^3 of water from each well per day at a rate of 2,280L/min. The average flow rate from production well #2 was 480 L/min, below the maximum rate.

The total quantity of water taken and discharged from the WTP is illustrated in Figure 1. In 2019 there were no incidents related to surpassing the maximum volume of water permitted to take. In February and March 2019, the WTP operated at 45% of it's maximum rated capacity, as shown in Figure 2. The labels presented in Figure 2 are representative of the maximum flow observed for the respective month (m^3).

Figure 1 - Flow Quantities Colborne Drinking Water System



	January	February	March	April	May	June	July	August	September	October	November	December
Water Taken (m3)	19,855	18,452	20,396	20,065	23,098	22,140	26,091	24,002	20,515	20,660	18,308	19,915
Water Discharge (m3)	19,818	18,452	20,396	20,065	23,098	22,140	26,091	24,002	20,515	20,660	18,308	19,915
Daily Average Discharge (m3)	639	659	658	669	745	738	842	774	684	666	610	642
Maximum Daily Discharge (m3)	1,017	1,472	1,472	984	1,093	1,151	1,250	1,315	1,119	1,039	900	981

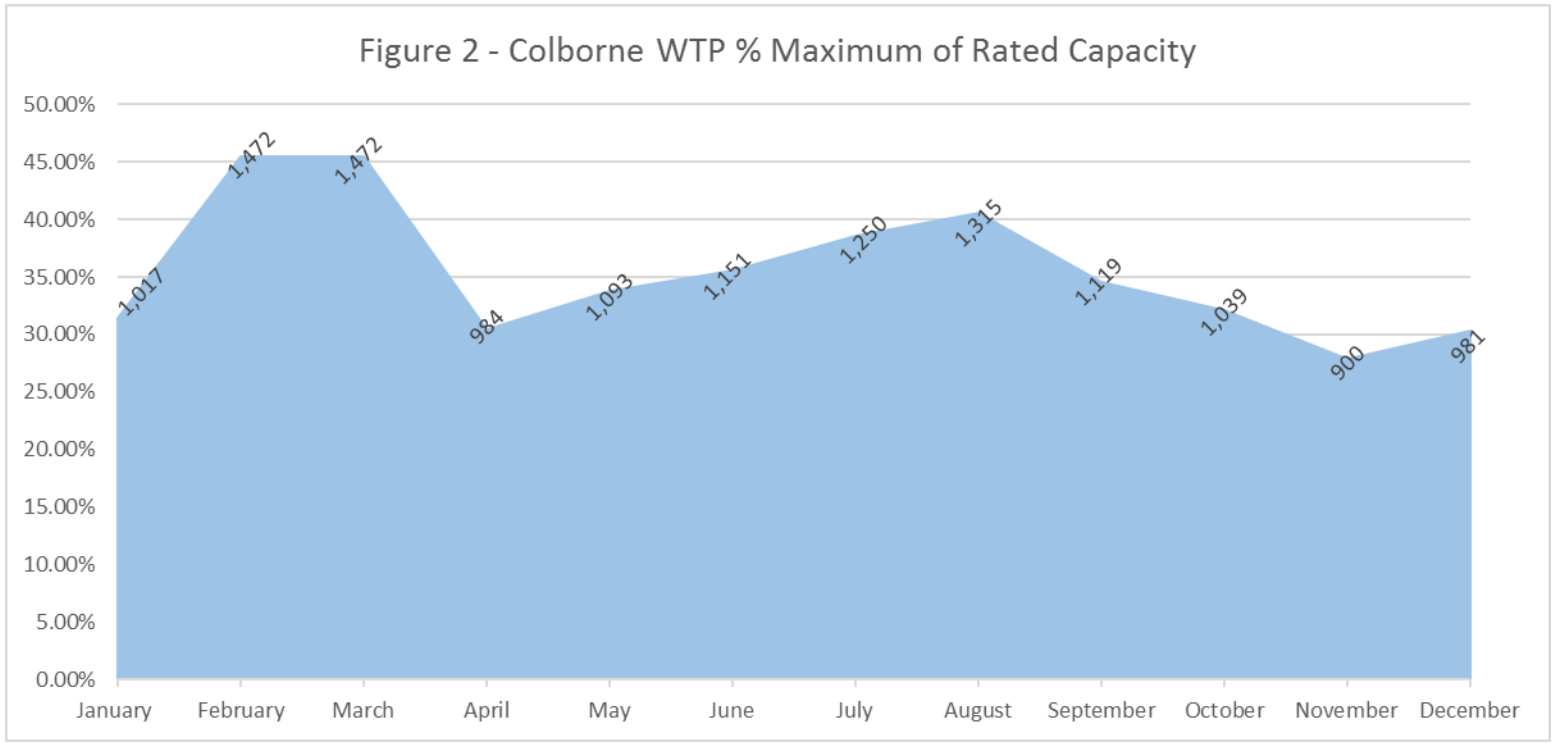


Figure 2 - Colborne WTP % Maximum of Rated Capacity
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
1,017
1,472
1,472
984
1,093
1,151
1,250
1,315
1,119
1,039
900
981
January
February
March
April
May
June
July
August
September
October
November
December

3.3 ADVERSE WATER QUALITY INCIDENT(S)

Incident #1 – November 14, 2019
The bacti sample collected from 36 Burnham St on November 11, 2019 came back adverse, with a total coliform of 30 cfu/100mL. In consultation with the Public Health Unit and the local MECP office, the corrective actions required were to resample the original adverse location, in addition to samples upstream and downstream. On November 14, 2019 samples were collected at 36 Burnham St, 29 Burnham St and 35 Burnham St. Results from November 14, 2019 indicated that the water quality was not adverse. No further action from LUSI was required.

4. CONTINUAL IMPROVEMENT

LUSI's commitment to continual improvement requires investigating and investing in, where appropriate, methods and technologies to improve

- The quality of processes used to ensure production of ample clean water, and
- The quality and effectiveness of the distribution system.

During the 2019 reporting year, LUSI demonstrated this commitment by completing all the activities listed in Table 1. Table 1 also satisfies O. Reg 170/03 requirement to describe major expenses occurred during the reporting period.

Table 1 - 2019 Major Expenses Incurred at the Colborne WTP, Distribution System and Misc. Activities

Colborne Water Treatment Plant	Generator Upgrades for TSSA Compliance	$2,000
	Well 1A Upgrades	$8,150
Colborne Distribution System	Water Tower Inspection	$5,400
	Hydrant Flow Testing & Painting	$6,500
	Water Distribution Model	$12,250
Miscellaneous	Source Water Protection Updates for Well 1A Commissioning	$19,235

5. SAMPLING AND ANALYSIS

The Colborne DWS exhibited compliance with all sampling and testing as required by *Ontario Regulation 170/03* in the 2019 calendar year. Table 2 illustrates all microbiological testing done under Schedule 10 of *Ontario Regulation 170/03*. There were no instances of adverse water quality results as a result of a parameter exceeding its respective maximum acceptable concentration.

Table 2 – Colborne DWS Microbiological Sampling

	E. Coli, (cfu/100mL)		**Total Coliform**, (cfu/100mL)		**HPC**, (cfu/1mL)	
	# of Samples	Range of Results (min # - max #)	# of Samples	Range of Results (min # - max #)	# of Samples	Range of Results (min # - max #)
Raw	106	0 - 0	106	0 - 360	0	N/A
Treated	53	0 - 0	53	0 - 0	53	0 - 1
Distribution	162	0 - 0	162	0 - 30	106	0 - 210

Operational testing done under Schedule 7 of Ontario Regulation 170/03 during the 2019 reporting period are tabulated in Table 3.

Table 3 – Colborne DWS Schedule 7 Operational Monitoring Samples

	Number of Grab Samples	Range of Results (min # - max #)
Turbidity, Raw Water (NTU)	12	0.12 – 1.58
Turbidity, Treated Water (NTU)	12	0.09 – 0.45
Treated Water Free Chlorine Residual (mg/L)	8760 (continuous monitoring)	0 – 5.0

In addition to the microbiological sampling and testing requirements, sampling and testing is required for chemical, inorganic and organic parameters. Table 4 illustrates Schedule 13, Schedule 23 and Schedule 24 sample analysis results, with no exceedances during the reporting period. If there were multiple samples taken during the reporting period, the most recent sample result is provided. A parameter below the method detection limit indicated by (<), cannot be detected as the concentration is lower than minimum concentration that can be measured and reported with 99% certainty.

Table 4 – Colborne DWS Schedule 13, 23 and 24 Sampling			
PARAMETER	**STANDARD (µg/L)**	**SAMPLE RESULT (µg/L)**	**SAMPLE DATE**
Antimony	6	0.06	07-Jan-19
Arsenic	25	1	
Barium	1000	130	
Boron	5000	9	
Cadmium	5	0.003	
Chromium	50	0.16	
Mercury	1	0.01 <MDL	
Selenium	10	0.07	
Uranium	20	3.5	
Benzene	5	0.32 <MDL	
Carbon tetrachloride	5	0.16 <MDL	
2-Dichlorobenzene	200	0.41 <MDL	
4-Dichlorobenzene	5	0.36 <MDL	
1-Dichloroethylene (vinylidene chloride)	14	0.33 <MDL	
2-Dichloroethane	5	0.35 <MDL	
Dichloromethane	50	0.35 <MDL	
Monochlorobenzene	80	0.3 <MDL	
Tetrachloroethylene (perchloroethylene)	30	0.35 <MDL	
Trichloroethylene	5	0.44 <MDL	
Vinyl Chloride	2	0.17 <MDL	
Diquat	70	1 <MDL	
Paraquat	10	1 <MDL	
Glyphosate	280	1 <MDL	
Polychlorinated Biphenyls (PCBs) - Total	3	0.04 <MDL	
Benzo(a)pyrene	0.01	0.004 <MDL	
Alachlor	5	0.02 <MDL	
Atrazine + N-dealkylated metabolites	5	0.02 <MDL	
Atrazine	-	0.01 <MDL	
Desethyl atrazine	-	0.01 <MDL	
Azinphos-methyl	20	0.05 <MDL	
Carbaryl	90	0.05 <MDL	
Carbofuran	90	0.01 <MDL	
Chlorpyrifos	90	0.02 <MDL	
Diazinon	20	0.02 <MDL	
Dimethoate	20	0.03 <MDL	
Diuron	150	0.03 <MDL	
Malathion	190	0.02 <MDL	
Metolachlor	50	0.01 <MDL	
Metribuzin	80	0.02 <MDL	
Phorate	2	0.01 <MDL	

Table 4 – Colborne DWS Schedule 13, 23 and 24 Sampling			
PARAMETER	**STANDARD (µg/L)**	**SAMPLE RESULT (µg/L)**	**SAMPLE DATE**
Prometryne	1	0.03 <MDL	
Simazine	10	0.01 <MDL	
Terbufos	1	0.01 <MDL	
Triallate	230	0.01 <MDL	
Trifluralin	45	0.02 <MDL	
4-dichlorophenoxyacetic acid (24-D)	100	0.19 <MDL	
Bromoxynil	5	0.33 <MDL	
Dicamba	120	0.20 <MDL	
Diclofop-methyl	9	0.40 <MDL	
MCPA	-	0.00012 <MDL	
Picloram	190	1 <MDL	
4-dichlorophenol	900	0.15 <MDL	
6-trichlorophenol	5	0.25 <MDL	
6-tetrachlorophenol	100	0.20 <MDL	
Pentachlorophenol	60	0.15 <MDL	
Fluoride	1.5	0.09	16-Sept-19
Sodium	20	6.87	
THM: Annual Average	100	10.18	28-Oct-19
HAA: Annual Average	80	5.3 < MDL	
Nitrite	1	< 0.003 MDL	
Nitrate	10	1.64	