

Annual Report

For the 2022 Operating Year

Wingham Drinking Water System 2022 Operation and Maintenance Annual Report

PREPARED BY

Veolia Water
130 Wallace St.
Walkerton, On
N0G 2V0

TO

Township of North Huron,
274 Josephine St,
Wingham, ON
N0G 2W0

Table of Contents

1.0 INTRODUCTION AND BACKGROUND	4
2.0 DESCRIPTION OF WATER SYSTEM	4
3.0 SUMMARY OF WATER QUALITY MONITORING	6
3.1 Water Treatment Equipment Operation and Monitoring as Per Schedule 7, O. Reg 170/03.....	6
3.1.1 Point of Entry Chlorine Residual	6
3.1.2 Distribution Chlorine Residual	6
3.1.3 Turbidity	7
3.2 Microbiological Sampling as per Schedule 10, O. Reg.170/03 Well 3.....	8
3.2.1 Microbiological Sampling as per Schedule 10, O. Reg.170/03 Well 4.....	8
3.2.2 Treated Water Samples	9
3.2.3 Distribution Samples	10
3.3 Chemical Sampling & Testing as per Schedule 13, O. Reg.170/03	11
3.3.1 Inorganics	11
3.3.2 Lead	12
3.3.3 Organics	13
3.3.4 Trihalomethanes	15
3.3.5 Nitrate & Nitrite	15
3.3.6 Sodium	16
3.3.7 Fluoride	16
4.0 WATER AND CHEMICAL USAGE	16
4.1 Chemical Usage	16
4.2 Annual Flows	17
5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE.....	18
6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES	19
7.0 HAA5.....	20

List of Tables

Table 1 – Treated and Distribution Chlorine Residuals for Wingham Drinking Water System

Table 2 – Raw and Treated Water Turbidities for Wingham Drinking Water System

Table 3 – Microbiological Results for Raw Water Well 3 Wingham Drinking Water System

Table 3.1- Microbiological Results for Raw Water Well 4 Wingham Drinking water system

Table 4 – Microbiological Results for Point of Entry at Wingham Drinking Water System

Table 5 – Microbiological Results for Wingham Distribution System

Table 6 – Schedule 23 Results for Wingham Drinking Water System

Table 7 – Lead Sampling Program Results for Wingham Drinking Water System

Table 8 – Schedule 24 Results for Wingham Drinking Water System

Table 9 – Nitrate, Nitrite and THM Results at Wingham Drinking Water System

Table 10-Chemical Usage at the Wingham Drinking Water System

Table 11 – Treated Water Flows for Wingham Drinking Water System

Table 12 –Haloacetic Acids

1.0 INTRODUCTION AND BACKGROUND

The purpose of the Annual Report is to document the operation and maintenance data for the Wingham Drinking Water System for review by the Ministry of the Environment Conservation and Parks in accordance with O. Reg. 170/03. This report covers January 1, 2022 to December 31, 2022. A copy of this report will be submitted to the owner to be uploaded to the Township's website and can be supplied, free of charge, to interested parties upon request.

2.0 DESCRIPTION OF WATER SYSTEM

The Wingham Drinking Water System (DWS # **220001502**), is characterized as a "secure ground water" system and is classified as a large municipal residential system. The system consists of two wells – Well 3 with a rated capacity of 6537 m³/day and Well 4 with a rated capacity of 5270 m³/d. Treatment at both sites consists of chlorination (sodium hypochlorite) and iron sequestration (sodium silicate) treatment. The Well 3 system is located at 200 Water St. Well #4 is located at 23 Albert St. The distribution system serves the community of Wingham with a population of approximately 2950 residents, 1150 customer services and 29 km of various size and material water main.

The system is owned by the Corporation of the Township of North Huron and operated by Veolia Water Canada, the Operating Authority.

The Well 3 supply system consists of a 323 mm drilled to a depth of 102.1m fitted with variable speed pump capable of pumping the volume specified in the MECP Permit to Take Water. The raw water consistently has substantial naturally occurring hardness and relatively high iron content that requires sequestering to prevent discoloration in the distribution system which is typical of all drilled wells in the area. Chlorine, (a critical process) and an iron sequestering agent are added to the raw water prior to entry into a baffled contact tank that satisfies the chlorine contact time required with adequate chlorine residual to disinfect.

From the contact tank/reservoir the water flows to the distribution/standpipe that maintains adequate system pressure. The well is cycled by a level controller that starts and stops the well 3/high lift pumps. Emergency power is supplied by a portable diesel generator that allows operation of the equipment during extended power interruptions. The treated drinking water is monitored for chlorine residual and turbidity by on-line equipment connected to SCADA/auto dialer. The monitoring system will alert the on-call operator to respond if the set points are breached. The chlorine and turbidity analysis data levels are stored on a data logger.

The distribution system has elevated storage to maintain pressure. Critical processes to ensure safe water are adequate chlorination and maintenance of system pressure. The monitors activate an alarm through the auto-dialer if the set points are breached, as a critical feature well 3, high-lift 2 and well 4 are equipped with variable frequency drives that can be set to maintain system pressure setpoint in the even the standpipe is not in service.

Well #4 is a 356 mm drilled well, 98.65 m deep, complete with a stainless steel liner and equipped with a submersible vertical turbine pump, well level sensor to measure static level and provide well level monitoring. The system has been designed to operate to alternate the duty wells between well 3 and 4.

The #4 well house is equipped with back-up diesel generator, sodium hypochlorite (2) and sodium silicate pump, a baffled chlorine contact tank equipped with 3 high lift pumps, on-line monitoring, alarm generation and auto-dialer.

Back-up power is supplied by one diesel standby generator with automatic transfer switch and double wall fuel tank.

The water quality is monitored and data-logged by a SCADA system with breaches of set-points going to an alarm dialer.

Disinfection is achieved on the Wingham well supply through the use of 12% sodium hypochlorite. In the well houses this chemical is added prior to the water entering the chlorine contact facilities at dosages high enough to achieve both primary and secondary disinfection objectives.

The distribution system is constructed with a combination of ductile iron, cast iron, PVC and high-density polyethylene piping with polyethylene, copper and galvanized steel services. There are known lead services, of which have been sampled at the initial plumbing sampling program, where no elevated levels were found due to the service material. The iron sequestering also has dual purpose of corrosion control, coupled with very stable pH and substantial alkalinity and hardness that inhibits corrosion that controls lead corrosion. These services will be replaced when street reconstruction takes place.

The system has approximately 135 fire hydrants.

The chlorine dosages range varies with the chlorine demand of the raw water.

The free chlorine residual is monitored at the point of entry to the distribution system, by an on-line chlorine analyzer, with a target residual of > 1.00 mg/l and < 1.30 mg/l.

The Wingham well supply Operates on PTTW # 1450-B38HKS which expires on August 1, 2028 which allows 11,807 cubic meters per day to be pumped from the combined wells.

The Wingham Drinking Water System (treatment Subsystem) has maximum flows as specified in the Municipal Drinking Water License (MDWL) 090-102, Issue 5 and Drinking Water Works Permit (DWWP) 090-202, Issue 5. The maximum total daily flow is 11,807 cubic meters per day.

The treated water is monitored by an on-line chlorine analyzer.

Typical system pressure ranges from 40 psi to 85 psi.

3.0 SUMMARY OF WATER QUALITY MONITORING

3.1 Water Treatment Equipment Operation and Monitoring

3.1.1 Point of Entry Chlorine Residual

Chlorine residuals are continuously measured using an online chlorine analyzer and verified for accuracy using hand-held HACH pocket colorimeter. **Table 1** shows the monthly average of the daily free chlorine residual value on the treated water at the point of entry. At well 4 in September there were 4 days where the Well was out of service due to pre-construction measurement needs to order parts to repair the raw water line. Well 4 was out of service for an additional 16 days in December to complete the raw water line repair, during these 16 days any water that was taken from the well was used for maintenance and at no point was any water directed to the distribution.

3.1.2 Distribution Chlorine Residual

Chlorine residuals in the distribution system are checked daily using a HACH pocket colorimeter. In 2022, 477 distribution chlorine residuals were recorded.

Table 1. – Treated and Distribution Chlorine Residuals for Wingham Drinking Water System – Distribution Min/Max/Average was based on all samples not the monthly averages

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	# Samples
Avg W3 Treated Chlorine Residual (mg/L)	1.43	1.39	1.31	1.41	1.31	1.23	1.25	1.27	1.33	1.43	1.57	1.60	1.38	1.23	1.60	364
Avg W4 Treated Chlorine Residual (mg/L)	1.24	1.19	1.41	1.29	1.21	1.29	1.14	1.22	1.24	1.32	1.29	1.35	1.26	1.14	1.41	344
Ave Distribution Chlorine Residual (mg/L)	1.12	1.15	1.25	1.21	1.13	1.08	1.02	1.01	1.04	1.07	1.25	1.33	1.14	0.53	1.62	477

Annual Report
For the 2022 Operating Year

^a – Results collected from January 1, 2022 – December 31, 2022

3.1.3 Turbidity

Treated Turbidity is measured daily using an online analyzer and raw water samples are analyzed using portable turbidimeters. **Table 2**, provides a summary of raw and treated turbidity results. The maximum turbidity measured in the treated water was 0.67 NTU, this reading was recorded from Well 3. With well 4 being out of service for a number of days September and December there are a number of days that Turbidities were not recorded as no water was going to the distribution from well 4 during this time. There was no Raw water Turbidity recorded from Well 4 for the month of May because of a miscommunication with the operators, this was discussed with our Ministry of Environment Parks and Conservation Inspector.

Table 2 – Raw and Treated Water Turbidities for Wingham Drinking Water System ^a

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	# Samples
Avg W3 Raw Turbidity	0.50	0.48	0.31	0.28	0.29	0.24	0.23	0.23	0.27	0.20	0.21	0.21	0.29	0.20	0.50	36
Avg W3 Treated Turbidity	0.11	0.13	0.10	0.09	0.10	0.12	0.16	0.17	0.17	0.23	0.20	0.22	0.15	0.09	0.23	365
Avg W4 Raw Turbidity	0.24	0.19	0.23	0.29	0.00	0.24	0.30	0.21	0.33	0.15	0.18	0.21	0.21	0.00	0.33	32
Avg W4 Treated Turbidity	0.05	0.07	0.07	0.10	0.07	0.05	0.07	0.07	0.07	0.12	0.12	0.16	0.08	0.05	0.16	350

^a – Results collected from January 1, 2022 – December 31, 2022

3.2 Microbiological Sampling

3.2.1 Raw Water Samples

Raw water samples are taken every week. In 2022, a total of 52 samples were collected and analyzed for E.Coli and Total Coliforms from Well 3 and 50 samples from Well 4. Each E. coli and Total Coliform result obtained was 0 cfu/100 ml in the raw water. Well 4 was out of Service in December for 3 weeks of samples due to the raw water line repair, therefore there were 3 less samples in December taken from well 4 raw water.

Table 3 and Table 3.1 provides a summary of bacteriological results performed on the raw water.

Table 3 – Microbiological Results for Raw Water Well 3 at Wingham Drinking Water System ^a

Date	Total Coliform		E. Coli	
	# Samples	# Samples ≥1	# Samples	# Samples ≥1
Jan	4	0	4	0
Feb	4	0	4	0
Mar	5	0	5	0
Apr	4	0	4	0
May	5	0	5	0
Jun	4	0	4	0
Jul	4	0	4	0
Aug	5	0	5	0
Sep	4	0	4	0
Oct	4	0	4	0
Nov	5	0	5	0
Dec	4	0	4	0
Total	52	0	52	0

^a – Results collected from January 1, 2022 – December 31, 2022

Table 3.1 – Microbiological Results for Raw Water Well 4 at Wingham Drinking Water System ^a

Date	Total Coliform		E. Coli	
	# Samples	# Samples ≥1	# Samples	# Samples ≥1
Jan	4	0	4	0
Feb	4	0	4	0
Mar	5	0	5	0
Apr	4	0	4	0
May	5	0	5	0
Jun	4	0	4	0
Jul	4	0	4	0
Aug	5	0	5	0
Sep	4	0	4	0
Oct	4	0	4	0
Nov	5	0	5	0
Dec	2	0	2	0
Total	50	0	50	0

^a – Results collected from January 1, 2022 – December 31, 2022

3.2.2 Treated Water (Point of Entry) Samples

One treated water sample from the point of entry from Well 3 and Well 4 is taken every week and analyzed for E. Coli, Total Coliforms and for Heterotrophic Plate Count (HPC). A total of 103 treated water samples were collected and analyzed at Wells 3 and 4 for both E.Coli and Total Coliforms there were also 101 HPC samples collected from the Point of Entry as there were 2 less samples collected in December with Well 4 being out of service, all samples were found to be safe. Each E. Coli and total coliform result from the treated water was 0 cfu/100 ml. Currently, there is no limit on HPC

\\nh-fileserver\users\Don\1-FILING SYSTEM\E Environmental Services\E13 Water Monitoring\1-Wingham Groundwater Supply\E13 Wingham Water 2022\Annual Reports\Wingham Water 2022 Annual Report.doc

samples, HPC samples can be used as an indication of interior pipe conditions where flushing is required when there are positive results. All (101) samples were found to be safe, with 2 results >50cfu/100ml. The range of HPC results were <10 -110 cfu/100 ml.

Table 4 provides a summary of all bacteriological results performed on treated water.

Table 4 – Microbiological Results for Point of Entry at Wingham Drinking Water System ^a

Date	#TC Samples	# Samples ≥ 1	#EC Samples	# Samples ≥ 1	#HPC Samples	Safe	Deteriorating $\neq >50$
Jan	8	0	8	0	8	8	0
Feb	8	0	8	0	8	8	0
Mar	10	0	10	0	10	10	0
Apr	8	0	8	0	8	8	0
May	10	0	10	0	10	9	1
Jun	8	0	8	0	8	8	0
Jul	8	0	8	0	8	8	0
Aug	10	0	10	0	10	10	0
Sep	8	0	8	0	8	7	1
Oct	8	0	8	0	8	8	0
Nov	10	0	10	0	10	10	0
Dec	7	0	7	0	5	5	0
Total	103	0	103	0	101	99	2

^a – Results collected from January 1, 2022 – December 31, 2022

3.2.3 Distribution System

Distribution samples are collected every week and tested for E. Coli, Total Coliform and for Heterotrophic Plate Count (HPC). In addition to regular samples, we collected 2 samples for a watermain installation. In 2022, a total of 161 distribution samples were collected and analyzed for both Total Coliforms and E. Coli and all but one samples were found to be safe there was one Total Coliform exceedance with a result of 1cfu/100ml AWQI158572 was issued, the re sample results were clear. All E. Coli and all the remaining total coliform result from the treated water were 0 cfu/100 ml. There

Annual Report
For the 2022 Operating Year

was a total of 55 HPC samples with ranges between <10-30 cfu/100 ml. **Table 5** provides a summary of all bacteriological samples taken in the distribution system.

Table 5 – Microbiological Results for Wingham Distribution System ^a

Date	# Samples TC	# Samples ≥1	# Samples EC	# Samples ≥1	# Samples HPC	Safe	Deteriorating = />50
Jan	12	0	12	0	4	4	0
Feb	12	0	12	0	4	4	0
Mar	15	0	15	0	5	5	0
Apr	12	0	12	0	4	4	0
May	15	1	15	0	5	5	0
Jun	15	0	15	0	5	5	0
Jul	12	0	12	0	4	4	0
Aug	15	0	15	0	5	5	0
Sep	12	0	12	0	4	4	0
Oct	14	0	14	0	6	6	0
Nov	15	0	15	0	5	5	0
Dec	12	0	12	0	4	4	0
Total	161	1	161	0	55	55	0

^a – Results collected from January 1, 2022 – December 31, 2022

3.3 Chemical Sampling & Testing

3.3.1 Inorganics

One treated water sample is taken every 36 months and tested for inorganics. The most recent samples for the Wingham Drinking Water System were collected on May 11, 2021 and submitted to the laboratory for analysis of inorganics as listed in Schedule 23. All parameters were found to be within compliance. Inorganic Schedule 23 samples will be collected next in May 2023. Results from 2021 can be found in **Table 6**.

Table 6 – Schedule 23 Results for Wingham Drinking Water System ^a

Water Works Name:				Wingham Well Supply		
Well No. (if applicable):				Well # 4 & # 3		
Year:				2021		
Serviced Population				2845		
Laboratories Which Performer Analyses:				SGS Lakefield Research		
Water Works #				220001502		
		Analysis			Analysis	Maximum Allowable Level
Parameter	Date (MM/DD/YY)	Well 3 (ug/L)	Well 4 (ug/L)		(ug/L)	(ug/L)
Schedule 23		May 11-21	May 11-21			
Antimony	May 11-21	0.9	0.9	<MDL		6
Arsenic	May 11-21	1.7	3.1			25
Barium	May 11-21	156	49.1			1000
Boron	May 11-21	27	34			5000
Cadmium	May 11-21	0.003	0.003	<MDL		5
Chromium	May 11-21	0.17	0.23			50
Mercury	May 11-21	0.01	0.01	<MDL		1
Selenium	May 11-21	0.08	0.04			10
Uranium	May 11-21	0.996	0.864			20

^a – Results collected May 21, 2021

*Annual Report**For the 2022 Operating Year***3.3.2 Lead**

Schedule 15.1 of Ontario Regulation 170/03 requires that samples be taken during two seasons: once between December 15 and April 15 and once between June 15 and October 15. The Maximum Allowable Concentration for Lead is 0.01 mg/L or 10 ug/L. 2022 Results can be found in **Table 7**.

Table 7 – Lead Sampling Program Results for Wingham Drinking Water System ^a

Lead Wingham Water 2022 DW- Hydrants				
Date	Location	Alk mg/L	Lead ug/L	Field pH
Mar 15-22	Hydrant - Frances/Diagonal 1st		0.04	8.26
	Hydrant - Frances/Diagonal 2nd		0.04	8.26
	Hydrant - Leopold/Patrick 1st		0.09	8.16
	Hydrant - Leopold/Patrick 2nd		0.13	8.16
Mar 18-22	Hydrant - Leopold/Patrick	236		8.2
	Hydrant - Frances/Diagonal	232		8.2
Sept 20-22	Hydrant Victoria & Leopold 1st		0.4	7.49
	Hydrant Victoria & Leopold 2nd		0.47	
	Hydrant Victoria & Leopold 3rd	220		
	Hydrant Alfred and Victoria 1st		1.06	7.42
	Hydrant Alfred and Victoria 2nd		0.71	
	Hydrant Alfred and Victoria 3rd	223		
Alkalinity AO/OG 30-500	Min	220	0.04	7.42
	Max	236	1.06	8.26
Lead MAC 10	Average	229	0.37	8.02

^a – Samples collected on March 15/18, 2022 and September 20, 2024 respectively.

3.3.3 Organics

One treated water sample is taken every 36 months and tested for schedule 24 organic parameters. The most recent samples were collected on May 11, 2021. All parameters were found to be within compliance. Schedule 24 Samples will be collected again in May of 2023. 2021 sample results can be found in **Table 8**.

Annual Report
For the 2022 Operating Year

Well No. (if applicable):		Well # 4 & # 3			
Year:		2021			
Serviced Population		2845			
Laboratories Which Performer Analyses:		SGS Lakefield Research			
Water Works #		220001502			
					Maximum
Parameter	Well # 3 (ug/L)		Well #4 (ug/L)		AllowableLevel (ug/L)
Schedule 23 & 24	May 11-21		May 11-21		
Benzene	0.32	<MDL	0.32	<MDL	5
Carbon Tetrachloride	0.17	<MDL	0.17	<MDL	5
1,2-Dichlorobenzene	0.41	<MDL	0.41	<MDL	200
1,4-Dichlorobenzene	0.36	<MDL	0.36	<MDL	5
1,1-Dichloroethylene	0.33	<MDL	0.33	<MDL	14
1,2-Dichloroethane	0.35	<MDL	0.35	<MDL	5
Dichloromethane	0.35	<MDL	0.35	<MDL	50
Monochlorobenzene	0.3	<MDL	0.3	<MDL	80
Tetrachloroethylene	0.35	<MDL	0.35	<MDL	10
Trichloroethylene	0.44	<MDL	0.44	<MDL	5
Vinyl Chloride	0.17	<MDL	0.17	<MDL	1
Diquat	1	<MDL	1	<MDL	70
Paraquat	1	<MDL	1	<MDL	10
Glyphosate	1	<MDL	1	<MDL	280
Polychlorinated Biphenyls	0.04	<MDL	0.04	<MDL	3
Benzo(a)pyrene	0.004	<MDL	0.004	<MDL	0.01
Alachlor	0.02	<MDL	0.02	<MDL	5
Atrazine+N-dealkylated metabolites	0.01	<MDL	0.01	<MDL	5
Atrazine	0.01	<MDL	0.01	<MDL	
De-ethylated atrazine	0.01	<MDL	0.01	<MDL	
Azinphos-methyl	0.05	<MDL	0.05	<MDL	20
Carbaryl	0.05	<MDL	0.05	<MDL	90
carbofuran	0.01	<MDL	0.01	<MDL	90
Chlorpyrifos	0.02	<MDL	0.02	<MDL	90
Diazinon	0.02	<MDL	0.02	<MDL	20
Dimethoate	0.06	<MDL	0.06	<MDL	20
Diuron	0.03	<MDL	0.03	<MDL	150
Malathion	0.02	<MDL	0.02	<MDL	190
Metolachlor	0.01	<MDL	0.01	<MDL	50
Metribuzin	0.02	<MDL	0.02	<MDL	80
Phorate	0.01	<MDL	0.01	<MDL	2
Prometryne	0.03	<MDL	0.03	<MDL	1
Simazine	0.01	<MDL	0.01	<MDL	10
Terbufos	0.01	<MDL	0.01	<MDL	1
Triallate	0.01	<MDL	0.01	<MDL	230
Trifluralin	0.02	<MDL	0.02	<MDL	45
2,4-dichlorophenoxyacetic acid	0.19	<MDL	0.19	<MDL	100
Bromoxynil	0.33	<MDL	0.33	<MDL	5
Dicamba	0.2	<MDL	0.2	<MDL	120
Diclofop-methyl	0.4	<MDL	0.4	<MDL	9
MCPA (mg/L)	0.00012	<MDL	0.00012	<MDL	0.1
Picloram	1	<MDL	1	<MDL	190
2,4-dichlorophenol	0.15	<MDL	0.15	<MDL	900
2,4,6-trichlorophenol	0.25	<MDL	0.25	<MDL	5
2,3,4,6-tetrachlorophenol	0.2	<MDL	0.2	<MDL	100
Pentachlorophenol	0.15	<MDL	0.15	<MDL	60

Table 8 – Schedule 24 Results for Wingham Drinking Water System

\\nh-fileserver\users\Don\1-FILING SYSTEM\E Environmental Services\E13 Water Monitoring\1-Wingham Groundwater Supply\E13 Wingham Water 2022\Annual Reports\Wingham Water 2022 Annual Report.doc

3.3.4 Trihalomethanes

One distribution sample is taken every three months from a point in the distribution system and tested for Trihalomethanes (THMs). The Ontario Drinking Water Quality Standard (ODWQS) have set a Maximum Allowable Concentration (MAC) of 100µg/L for this parameter and it's expressed as a running annual average. In 2022, the average THM was found to be 5.7µg/L, which is well below the MAC. Refer to **Table 9** for the summary of Trihalomethane results.

3.3.5 Nitrate & Nitrite

One treated water sample is taken every three months and tested for nitrate and nitrite. The Ontario Drinking Water Quality Standard (ODWQS) have set a Maximum Allowable Concentration (MAC) of 1 mg/L for nitrites and 10 mg/L for nitrates. The results were found to be within compliance. Refer to **Table 9**.

Table 9 – Nitrate, Nitrite and THM Results at Wingham Drinking Water System

2022										
Township of North Huron - 2022 Quarterly Sampling Summary										
Treated Drinking Water - Nitrites and Nitrates					Well #3					
O.Reg 169										
Date	Jan 11-22	Apr 5-22	Jul 5-22	Nov 1-22	Min	Max	Avg	MAC	1/2 MAC	
NO2	< 0.003	< 0.003	< 0.003	0.003	0.003	0.003	0.003	0.003	1	0.5
NO3	0.011	0.009	0.009	0.010	0.009	0.011	0.010	10	5	
NO2+NO3	0.011	0.009	0.009	0.010	0.009	0.011	0.010	10	5	
Treated Drinking Water - Nitrites and Nitrates					Well #4					
O.Reg 169										
Date	Jan 11-22	Apr 5-22	Jul 5-22	Nov 1-22	Min	Max	Avg	MAC	1/2 MAC	
NO2	< 0.003	< 0.003	< 0.003	0.003	0.003	0.003	0.003	1	0.5	
NO3	< 0.006	< 0.006	< 0.006	0.006	0.006	0.006	0.006	10	5	
NO2+NO3	< 0.006	< 0.006	< 0.006	0.006	0.006	0.006	0.006	10	5	
Distribution Drinking Water - Trihalomethanes										
	Jan 11-22	Apr 5-22	Jul 5-22	Nov 1-22						
THMs (total)	5.3	4.2	6.9	6.4	4.2	6.9	5.7	100	50	
Bromodichloromethane	1.2	1	1.3	1.5	1.0	1.5	1.3			
Bromoform	0.34	< 0.34	< 0.34	0.34	0.340	0.340	0.340			
Chloroform	3.5	2.8	5.2	4.4	2.8	5.2	4.0			
Dibromochloromethane	0.42	0.37	0.39	0.54	0.37	0.54	0.43			

^a – Samples collected on January 11th, April 5th, July 5th and Nov 1st 2022 respectively.

3.3.6 Sodium

One water sample is collected every 60 months and tested for Sodium. O. Reg 170/03 has set a Maximum Acceptable concentration (MAC) of 20 mg/L for Sodium which requires the Medical Office of Health be notified if the concentration exceeds the MAC. These samples were collected on January 2, 2018 and were found to be 11.5 mg/L at Well 3 and 15.7 mg/L at Well 4.

3.3.7 Fluoride

One water sample is collected at least once in every 60 months and tested for Fluoride. The Ontario Drinking Water Quality Standards (ODWQS) have set a MAC of 1.5 mg/L. These samples were collected on January 2, 2018 and were found to be 1.0 mg/L at Well 3 and 1.02 mg/L at Well 4, which is within compliance.

Treated Water POE Sodium/Fluoride mg/L			
Date	Location	Fluoride	Sodium
Jan 2-18	Well 3	1	11.5
	Well 4	1.02	15.7
	MAC	1.5	20
	Min	1	11.5
	Max	1.02	15.7
	Average	1.01	13.60

Treated Water Sodium and Fluoride is required to be collected and analyzed in 2023

4.0 WATER AND CHEMICAL USAGE

4.1 Chemical Usage

Refer to **Table 10**. From January 1, 2022 to December 31, 2022, 1005 kg of sodium hypochlorite was used to ensure proper disinfection in the distribution system with an average dosage of 2.52 mg/L between the two wells.

Table 10 – Chemical Usage at Wingham Drinking Water System

Township of North Huron - Wingham Well Supply - 2022 Summary						Township of North Huron - Wingham Well Supply - 2022 Summary					
Well 3						Well 4					
Month	Chlorine used (Kg)	Cl Dosage	TDW Cl Free Res	Silicate (L)	Silicate Dosage	Month	Chlorine used (Kg)	Cl Dosage	TDW Cl Free Res	Silicate (L)	Silicate Dosage
January	42.3	2.42	1.43	220.1	6.43	January	25.7	2.44	1.24	126.6	4.62
February	38.7	2.37	1.39	200.3	4.51	February	24.6	2.24	1.19	171.0	6.01
March	54.4	2.08	1.31	284.7	4.64	March	24.9	3.51	1.41	117.6	5.75
April	55.7	2.25	1.41	250.6	3.96	April	16.1	2.23	1.29	92.5	5.00
May	60.7	2.23	1.31	324.3	4.60	May	31.7	2.57	1.21	168.6	5.30
June	58.6	2.11	1.23	322.8	4.53	June	32.7	2.64	1.29	164.5	5.11
July	67.9	2.22	1.25	367.7	4.70	July	34.3	2.58	1.14	184.7	5.46
August	68.3	2.44	1.27	347.9	5.04	August	30.6	2.80	1.22	153.5	5.49
September	70.7	2.53	1.33	333.3	4.62	September	30.7	3.04	1.24	142.3	5.17
October	59.2	2.48	1.43	287.4	4.67	October	27.0	2.84	1.32	121.8	5.15
November	54.2	2.45	1.57	263.8	4.65	November	22.8	3.25	1.29	92.7	4.73
December	65.2	2.55	1.60	311.1	4.86	December	7.6	2.32	1.35	35.9	5.15
Total	695.8	28.13	16.52	3514.1	57.21	Total	308.8	32.44	15.18	1571.6	62.95
Min	38.7	2.08	1.23	200.3	3.96	Min	7.6	2.23	1.14	35.9	4.62
Max	70.7	2.55	1.60	367.7	6.43	Max	34.3	3.51	1.41	184.7	6.01
Avg	58.0	2.34	1.38	292.8	4.77	Avg	25.7	2.70	1.26	131.0	5.25

^a – Results collected from January 1, 2022 – December 31, 2022

4.2 Annual Flows

A summary of the water supplied to the distribution system in 2022 is provided in **Table 11**. This Table provides a breakdown of the flow provided to the distribution system.

Flow meters were calibrated in 2022 by Iconix and were found to be acceptable. The Flow meters will be calibrated again 2022.

Permit to Take Water 1450-B38HKS Compliance Report - 2022					
3.2 -Maximum Amount of Taking Permitted					
	Max/Day on Permit		Peak Flow	%of Limit	
Well #3 (in m3)	6537	m3	1663	25.4	%
Well #4 (in m3)	5270	m3	1271	24.1	%
3.2 - Average Annual Amount of Taking Permitted					
Well #3 (in m3)	6537	m3	815	12.5	%
Well #4 (in m3)	5270	m3	323	6.1	%
Municipal Drinking Water License 090-102 Issue 5 - Capacity Report					
Total Peak Flow					
	Maximum		Actual	%of Cap	
Capacity (m3/d)	11808	m3	2375	20.1	%
Total Average Flow					
Capacity (m3/d)	4309774	m3	415359	9.6	%
	11808	m3	1138	9.6	%

Table 11 – Treated Water Flows for Wingham Drinking Water System

5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE

The following summarizes water system improvements and routine and preventative maintenance for the Wingham Drinking Water System:

- Routine & corrective maintenance as per computerized maintenance system
- Well 4 Raw water line replaced (Apprx. \$150,000)
- Well 4 Installed new stenner pump (\$1297.79)
- Hutton Heights Watermain/ hydrant (Approx \$1.2M)
- Well 4 Fuel tank for generator replaced

6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES

The Ministry of Environment inspection was completed by Shayne Finlay on June 21, 2022.

There were no non-compliances noted and the final inspection rating was 100%

7.0 Haloacetic Acids (HAA5)

In 2022 Samples for HAA5's were collected at the beginning of every quarter, Maximum acceptable concentration for HAA5's is 80 ug/L all samples were compliant to the limit in 2022

Table 12 Total Haloacetic Acids

HAA5 DW 2022 ug/L								
Date	Location	Total HAA5	Chloroacetic Acid	Bromoacetic Acid	Dichloroacetic Acid	Dibromoacetic Acid	Trichloroacetic Acid	Ave ug/L
Jan 11-22	435 Minnie St.	5.3	4.7	2.9	2.6	2	5.3	3.8
	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
Apr 5-22	435 Minnie St.	5.3	4.7	2.9	2.6	2	5.3	3.8
	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
Jul 5-22	Royal Homes	5.3	4.7	2.9	2.6	2	5.3	3.8
	435 Minnie St.	5.3	4.7	2.9	2.6	2	5.3	3.8
Nov 1-22	royal homes	5.3	4.7	2.9	2.6	2	5.3	3.8
	435 Minnie St	5.3	4.7	2.9	2.6	2	5.3	3.8
							MAC 80 ug/L	
	Min	5.3	4.7	2.9	2.6	2	5.3	
	Max	5.3	4.7	2.9	2.6	2	5.3	
	Ave	5.3	4.7	2.9	2.6	2	5.3	

Annual Report
For the 2022 Operating Year

Report Completed by: Veolia Water
For More information please contact:
Scott Gowan, Project Manager

Veolia Water Canada, Inc.

130 Wallace St PO Box 220, Walkerton On, N0G 2V0

Tel 1-519-881-1474

scott.gowan@veolia.com

www.veoliawaterna.com