

Annual Report

For the 2016 Operating Year

Wingham Drinking Water System 2016 Operation and Maintenance Annual Report

PREPARED BY

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1.0 INTRODUCTION AND BACKGROUND

The purpose of the 2016 Annual Report is to document the operation and maintenance data for the Wingham Drinking Water System for review by the Ministry of the Environment in accordance with O. Reg. 170/03. This report covers January 1, 2016 to December 31, 2016. 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 - 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 MOE 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.

Well #4 is a 356 mm drilled well, 98.65 m deep 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.

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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 has 1 PTTW (Permit To Take Water) # 7003-7GUHVA with an expiry date of July 24, 2018, which, allows 11,807 cubic metres 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 Licence (MDWL) 090-102, Issue 3 and Drinking Water Works Permit (DWWP) 090-202, Issue 3. 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 colourimeters. **Table 1** shows the monthly average of the daily free chlorine residual value on the treated water at the point of entry.

3.1.2 Distribution Chlorine Residual

Chlorine residuals in the distribution system are checked daily using a HACH pocket colourimeter. In 2016, 365 distribution chlorine residuals were recorded.

Table 1. – Treated and Distribution Chlorine Residuals 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																
Treated																
Chlorine	1.07	1.11	1.12	1.05	1.13	1.10	1.14	1.17	1.21	1.22	1.14	1.14	1.13	0.87	1.70	366
Residual																
(mg/L)																
Avg W4																
Treated																
Chlorine	1.05	1.08	1.08	1.01	1.08	1.05	1.10	1.05	1.07	1.06	1.05	1.12	1.07	0.76	1.70	366
Residual																
(mg/L)																
Average																
Distribution																
Chlorine	0.96	0.99	0.98	0.93	0.90	0.86	0.87	0.88	0.85	0.94	0.93	0.96	1.17	0.50	1.40	468
Residual																
(mg/L)																

^a – Results collected from January 1, 2016 – December 31, 2016

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3.1.3 Turbidity

Turbidity is measured daily using an online analyser. **Table 2.** provides a summary of raw and treated turbidity results. The maximum turbidity measured in the treated water was 0.96 NTU.

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	0.21	0.25	0.25	0.20	0.17	0.18	0.19	0.24	0.15	0.20	0.20	0.21	0.20	0.15	0.25	33.00
Avg W3 Treated Turbidity	0.04	0.04	0.05	0.06	0.06	0.07	0.05	0.07	0.08	0.08	0.09	0.10	0.07	0.03	0.49	366.00
Avg W4 Raw Turbidity	0.21	0.26	0.32	0.19	0.19	0.20	0.20	0.19	0.17	0.19	0.20	0.20	0.21	0.19	0.32	31
Avg W4 Treated Turbidity	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.06	0.06	0.05	0.04	0.40	366

^a – Results collected from January 1, 2016 – December 31, 2016

3.2 Microbiological Sampling

3.2.1 Raw Water Samples

Raw water samples are taken every week. In 2016, a total of 52 samples were collected and analyzed for E. coli and Total Coliforms. Each E. coli and Total Coliform result obtained was 0 cfu/100 ml in the raw water. **Table 3.** provides a summary of bacteriological results performed on the raw water.

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

Date	Total Coliform		# 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, 2016 – December 31, 2016

3.2.2 Treated Water (Point of Entry) Samples

One treated water sample from the point of entry is taken every two weeks and analyzed for E.Coli, Total Coliforms and for Heterotrophic Plate Count (HPC). A total of 104 treated water samples were collected and analyzed at Wells 3 and 4 for the above parameters. 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. Most (100) samples were found to be safe, with 4 deteriorating. The range of HPC results were 0 - >2000 cfu/100 ml. Given no abnormal results in the distribution or subsequent samples, it is suspected to be sampling error where the sample lines were not flushed properly or, since it is not common practice to sterilize sample port, debris in sample port.

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 = / > 50
Jan	8	0	8	0	8	8	0
Feb	8	0	8	0	8	8	0
Mar	10	0	10	0	10	9	1
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	6	2
Aug	10	0	10	0	10	10	0
Sep	8	0	8	0	8	8	0
Oct	8	0	8	0	8	8	0
Nov	10	0	10	0	10	10	0
Dec	8	0	8	0	8	8	0
Total	104	0	104	0	104	100	4

^a – Results collected from January 1, 2016 – December 31, 2016

3.2.3 Distribution System

Distribution samples are collected every two weeks and tested for E.Coli, Total Coliform and for Heterotrophic Plate Count (HPC). In addition, a new water main was installed on Patrick St where samples were taken prior to being put in service (isolated with no services) which represents the larger number of samples for the month. There is a degree of ambiguity as to whether these samples are actually distribution samples or non-reportable as the main is isolated with no services. The * in the below table in September indicates a sample from this main was overgrown and therefore unable to determine if TC or EC were present and therefore deemed adverse (AWQI 131208). Resample came back with zero EC and TC. In 2016, a total of 180 distribution samples were collected and analyzed for the above parameters and all samples but 1 described above were found to be safe. All E. coli and total coliform result from the treated water were 0 cfu/100 ml, except for 1 described above. The range of HPC results were 0 - 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	14	0	14	0	4	4	0
Mar	15	0	15	0	5	5	0
Apr	14	0	14	0	4	4	0
May	14	0	14	0	4	4	0
Jun	15	0	15	0	5	5	0
Jul	12	0	12	0	4	4	0
Aug	22	0	22	0	5	5	0
Sep	23	0*	23	0*	4	4	0
Oct	12	0	12	0	4	4	0
Nov	15	0	15	0	5	5	0
Dec	12	0	12	0	4	4	0
Total	180	0	180	0	52	52	0

^a – Results collected from January 1, 2016 – December 31, 2016

3.3 Chemical Sampling & Testing

3.3.1 Inorganics

One treated water sample is taken every 60 months and tested for inorganics. The most recent samples for the Wingham Drinking Water System were collected on June 10, 2015 and submitted to the laboratory for analysis of inorganics as listed in Schedule 23. All parameters were found to be within compliance. Results from 2015 can be found in **Table 6**.

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

Parameter	Well #4 (ug/L)	Well #4 (ug/L)	Well # 3 (ug/L)	Well #3 (ug/L)	MAC
Schedule 23	Mar 12-15	Jun 10-15	Mar 12-15	Jun 10-15	
Antimony	0.02	0.03	0.02	0.07	6
Arsenic	2.9	3.2	1.8	1.8	25
Barium	45.8	46.4	144	144	1000
Boron	31.7	30.4	22.3	19.1	5000
Cadmium	0.004	0.003	0.003	0.003	5
Chromium	0.03	0.03	0.03	0.03	50
Mercury	<0.02	0.01	<0.02	0.01	1
Selenium	1<	0.04	1<	0.1	10
Uranium	0.972	0.892	1.02	0.975	20

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. These parameters are required to be sampled and analyzed again between the months of December 2016 and April 2016 and again between June and October 2016. Results can be found in **Table 7**.

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

	pH	Alkalinity (mg/L)	Lead (ug/L)
Distribution			
Dec-Apr	7.0, 7.2	225, 230	0.07, 0.86, 0.18
Jun-Oct	7.52, 7.54	230, 228	1.28, 1.27
Plumbing – 8 Locations			
Mar 24, 28			0.08 – 7.47

^a – Samples collected on March 21, 2016 and September 22, 2016 respectively.

3.3.3 Organics

One treated water sample is taken every 60 months and tested for schedule 24 organic parameters. The most recent samples were collected on June 10, 2015. All parameters were found to be within compliance. 2015 sample results can be found in **Table 8**.

Table 8. – Schedule 24 Results for Wingham Drinking Water System

Parameter	Well #4	well #4	Well # 3	Well # 3	Maximum Allowable Level
	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
Schedule 23 & 24	Mar 12-15	Jun 10-15	Mar 12-15	Jun 10-15	
Benzene	<0.32	<.32	<0.32	<.32	5
Carbon Tetrachloride	<0.16	<.16	<0.16	<0.16	5
1,2-Dichlorobenzene	<0.41	<.41	<0.41	<0.41	200
1,4-Dichlorobenzene	<0.36	<.36	<0.36	<0.36	5
1,1-Dichloroethylene	<0.33	<.33	<0.33	<0.33	14
1,2-Dichloroethane	<0.35	<.35	<0.35	<0.35	5
Dichloromethane	<0.35	<.35	<0.35	<0.35	50
Monochlorobenzene	<0.3	<.3	<0.3	<0.3	80
Tetrachloroethylene	<0.35	<.35	<0.35	<0.35	30
Trichloroethylene	<0.44	<.44	<0.44	<0.44	50
Vinyl Chloride	<0.17	<.17	<0.17	<0.17	2
Diquat	<1	<1	<1	<1	70
Paraquat	<1	<1	<1	<1	10
Glyphosate	<1	<1	<1	<1	280
Polychlorinated Biphenyls	<0.04	<.04	<0.04	<0.04	3
Benzo(a)pyrene	<0.004	<.004	<0.004	<0.004	0.01
2,4-dichlorophenol	<0.15	<.15	<0.15	<0.15	900
2,4,6-trichlorophenol	<0.25	<.25	<0.25	<0.25	5
2,3,4,6-tetrachlorophenol	<0.20	<.20	<0.20	<0.20	100
Pentachlorophenol	<0.15	<.15	<0.15	<0.15	60
Alachlor	<0.02	<.02	<0.02	<0.02	5
Aldicarb	<0.01	<.01	<0.01	<0.01	9
Aldrin+Dieldrin	<0.01	<.01	<0.01	<0.01	0.7
Aldrin	<0.01	<.01	<0.01	<0.01	
Dieldrin	<0.01	<.01	<0.01	<0.01	
Atrazine+N-dealkylated metabolites	<0.01	<.01	<0.01	<0.01	5
Atrazine	<0.01	<.01	<0.01	<0.01	
De-ethylated atrazine	<0.01	<.01	<0.01	<0.01	
Azinphos-methyl	<0.02	<0.05	<0.02	<0.05	20
Bendiocarb	<0.01	<.01	<0.01	<0.01	40

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Parameter	Well #4 (ug/L)	Well #4 (ug/L)	Well # 3 (ug/L)	Well # 3 (ug/L)	Maximum Allowable Level (ug/L)
Chlordane	<0.01	<0.01	<0.01	<0.01	7
a-chlordane	<0.01	<0.01	<0.01	<0.01	
g-chlordane	<0.01	<0.01	<0.01	<0.01	
Oxychlordane	<0.01	<0.01	<0.01	<0.01	
Chlorpyrifos	<0.02	<0.02	<0.02	<0.02	90
Cyanazine	<0.03	<0.03	<0.03	<0.03	10
Diazinon	<0.02	<0.02	<0.02	<0.02	20
(DDT)+Metabolites	<0.01	<0.01	<0.01	<0.01	30
op-DDT	<0.01	<0.01	<0.01	<0.01	
pp-DDD	<0.01	<0.01	<0.01	<0.01	
pp-DDE	<0.01	<0.01	<0.01	<0.01	
pp-DDT	<0.01	<0.01	<0.01	<0.01	
Dimethoate	<0.03	<0.03	<0.03	<0.03	20
Diuron	<0.03	<0.03	<0.03	<0.03	150
Heptachlor-Heptachlor Epoxide	<0.01	<0.01	<0.01	<0.01	3
Heptachlor	<0.01	<0.01	<0.01	<0.01	
Heptachlor epoxide	<0.01	<0.01	<0.01	<0.01	
Lindane	<0.01	<0.01	<0.01	<0.01	4
Malathion	<0.02	<0.02	<0.02	<0.02	190
Methoxychlor	<0.01	<0.01	<0.01	<0.01	900
Metolachlor	<0.01	<0.01	<0.01	<0.01	50
Metribuzin	<0.02	<0.02	<0.02	<0.02	80
Parathion	<0.02	<0.02	<0.02	<0.02	50
Phorate	<0.01	<0.01	<0.01	<0.01	2
Prometryne	<0.03	<0.03	<0.03	<0.03	1
Simazine	<0.01	<0.01	<0.01	<0.01	10
Temephos	<0.01	<0.01	<0.01	<0.01	280
Terbufos	<0.01	<0.01	<0.01	<0.01	1
Triallate	<0.01	<0.01	<0.01	<0.01	230
Trifluralin	<0.02	<0.02	<0.02	<0.02	45
2,4-dichlorophenoxyacetic acid	<0.19	<0.19	<0.19	<.19	100
2,4,5-trichlorophenoxyacetic acid	<0.22	<0.22	<0.22	<.22	280
Bromoxynil	<0.33	<0.33	<0.33	<.33	5
Dicamba	<0.20	<0.20	<0.20	<.20	120
Diclofop-methyl	<0.40	<0.40	<0.40	<0.40	9
Dinoseb	<0.36	<0.36	<0.36	<0.36	10
Picloram	<1	<1	<1	<1	190

3.3.4 Trihalomethanes

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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 100 µg/L for this parameter and it is expressed as a running annual average. In 2016, the average THM was found to be 5.3 µg/L, which is within compliance. 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

Treated Drinking Water - Nitrites and Nitrates					Well #3						
Date	Jan 27-16	Apr 12-16	Jul 19-16	Oct 18-16	Min	Max	Avg	O.Reg 169			
								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	< 0.008	< 0.006	0.006	0.008	0.007	10	5		
NO2+NO3	< 0.006	< 0.006	< 0.008	< 0.006	0.006	0.008	0.007	10	5		
Treated Drinking Water - Nitrites and Nitrates					Well #4						
Date	Jan 27-16	April 12-16	Jul19-16	Oct 18-16	Min	Max	Avg	O.Reg 169			
								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											
THMs (total)	4.5	4.1	11	5.6	4.1	11.0	6.3	100	50		
Bromodichloromethane	1.1	0.96	2.3	1.2	1.0	2.3	1.4				
Bromoform	< 0.34	< 0.34	< 0.34	< 0.34	0.340	0.340	0.340				
Chloroform	3	3.1	8.2	4.4	3.0	8.2	4.7				
Dibromochloromethane	0.41	< 0.37	0.76	< 0.37	0.37	0.76	0.4775				
Rolling Annual Avg	5.7	5.3	6.5	6.3				100	50		

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 last collected on January 30, 2013 and were found to be 11.9 mg/L at Well 3 and 15.6 mg/L at Well 4, which is within compliance.

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 last collected on January 30, 2013 and were found to be 0.91 mg/L at Well 3 and 0.89 mg/L at Well 4, which is within compliance. The next water sample for Fluoride will be collected and analyzed on or before January 30, 2018.

4.0 WATER AND CHEMICAL USAGE

4.1 Chemical Usage

Refer to **Table 10**. From January 1, 2016 to December 31, 2016, 1017.7 kg of sodium hypochlorite was used to ensure proper disinfection in the distribution system with an average dosage of 2.15 mg/L.

Table 10. – Chemical Usage at Wingham Drinking Water System

Well #3					Well #4				
Chlorine used (Kg)	Cl Dosage	Avg Free Cl Res	Silicate (L)	Silicate Dosage	Chlorine used (Kg)	Avg Free Cl Res	Cl Dosage	Silicate (L)	Silicate Dosage
17.2	1.87	1.07	71.5	3.04	60.5	1.0	2.18	137.9	1.93
22.4	1.99	1.11	95.4	3.36	54.2	1.1	2.25	113.9	1.86
29.6	1.97	1.12	121.5	3.10	34.0	1.1	2.10	83.5	1.94
26.8	2.02	1.05	112.0	3.24	36.4	1.0	1.96	108.1	2.29
27.5	2.07	1.13	116.9	4.30	53.6	1.1	2.12	234.4	3.52
38.0	2.47	1.10	165.4	4.93	59.1	1.1	2.25	315.5	4.71
42.5	2.05	1.14	193.0	3.67	61.2	1.1	2.27	359.9	5.23
51.4	2.29	1.17	205.7	3.58	68.8	1.1	2.37	375.1	4.98
47.4	2.31	1.21	186.2	3.46	52.6	1.1	2.24	258.1	4.21
37.7	2.12	1.22	161.8	3.44	56.6	1.1	2.24	170.8	2.49
31.9	1.91	1.14	152.3	3.67	35.8	1.1	2.33	88.3	2.23
31.0	2.11	1.14	143.2	3.87	41.4	1.1	2.25	108.3	2.42
403.4	25.19	13.61	1724.8	43.65	614.3	12.8	26.57	2353.8	37.81
17.2	1.87	1.05	71.5	3.04	34.0	1.0	1.96	83.5	1.86
51.4	2.47	1.22	205.7	4.93	68.8	1.1	2.37	375.1	5.23
33.6	2.10	1.13	143.7	3.64	51.2	1.1	2.21	196.1	3.15

^a – Results collected from January 1, 2016 – December 31, 2016

A summary of the water supplied to the distribution system in 2016 is provided in **Table 11**. This Table provides a breakdown of the monthly flow provided to the distribution system.

Table 11. – Treated Water Flows for Wingham Drinking Water System ^a

Permit to Take Water 7003-7GUHVA Compliance Report - 2016

3.2 -Maximum Amount of Taking Permitted			
	Max/Day on Permit	Peak Flow	%of Limit
Well #3 (in m3)	6537 m3	1661	25.4 %
Well #4 (in m3)	5270 m3	4602	87.3 %

3.2 - Average Annual Amount of Taking Permitted

Well #3 (in m3)	6537	m3	532.1178	8.1	%
Well #4 (in m3)	5270	m3	754.0192	14.3	%

Municipal Drinking Water License 090-102 Issue 3 - Capacity Report

	Total Peak Flow			
	Maximum	Actual	%of Cap	
Capacity (m3/d)	11807.6	2195	18.6	%
Total Average Flow				
Capacity (m3/d) -annual	4309774	469440	10.9	%
Capacity (m3/d) -daily	11807.6	1286.137	10.9	%

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:

- Chlorine Analyser installed July 13, 2016
- Replaced Generator at Well 4
- Water main replaced on Patrick St between Carling Terrace and Catherine St
- Maintenance as per computerized maintenance system

6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES

The most recent Ministry of Environment inspection was completed by Matt Shannon on October 13, 2016.

There were no non-compliances noted.

1 adverse water quality event occurred in 2016 under AWQI 131208. This was a new water main replacement and not yet in service. Re-samples were good.

7.0 EMERGENT ISSUES

It should be noted that there will be some upcoming changes to Ontario Regulation 170/03 and Ontario Regulation 169/03 that strengthen standards and clarify testing requirements as follows:

- Strengthen standards for Arsenic, Carbon Tetrachloride, Benzene, and Vinyl Chloride;
- Adopt new standards for Chlorate, Chlorite, 1-Methyl-4-Chlorophenoxyacetic acid (MCPA) and Haloacetic Acids (HAAs); (NOTE: Chlorate and Chlorite testing is only required for Municipal Drinking Water Systems using Chlorine Dioxide treatment equipment.)
- Clarify/optimize testing, sampling and reporting requirements for Trihalomethanes (THMs) and HAAs; and
- Remove 13 pesticides from testing requirements.

The aforementioned amendments will be phased in over the next four years to allow system owners and/or operators the opportunity to collect baseline information and complete required system upgrades. Currently, the new sampling, testing, reporting and re-sampling requirements, and the removal of 13 pesticides came into effect January 1, 2016. Refer to **Table 12** for the new Regulatory Requirements. Subsequent phase-in dates are:

- January 1, 2017: Testing requirements for HAAs and updates to standards for Carbon Tetrachloride, Benzene, Vinyl Chloride, Chlorate, Chlorite, and MCPA come into effect / require reporting
- January 1, 2018: Updates to standards for Arsenic come into effect / require reporting
- January 1, 2020: New standards for HAAs and HAAs testing optimization rule for smaller systems will come into effect / require reporting.

Table 12 – Regulatory Requirements

Parameter	Current Requirement		Amended Requirement	
	MAC	½ MAC	MAC	½ MAC
Arsenic	25 µg/L	12.5 µg/L	10 µg/L	5 µg/L
Benzene	5 µg/L	2.5 µg/L	1 µg/L	0.5 µg/L
Carbon Tetrachloride	5 µg/L	2.5 µg/L	2 µg/L	1 µg/L
Vinyl Chloride	2 µg/L	1 µg/L	1 µg/L	0.5 µg/L

7.1.0 ARSENIC REVIEW

Historic Arsenic values were reviewed from 2015 and are shown in **Table 13**.

Table 13 – Historic Arsenic Values

Date	Well #3	Well #4
Mar 2015	2.9	1.8
Jun 2006	3.2	1.8

7.2.0 EMERGENT ISSUES SUMMARY

A review of the sample results in 2015 indicates that Arsenic is not likely to be in exceedance of the amended ½ MAC requirements.

Historic values of the other parameters (Benzene, Carbon Tetrachloride, and Vinyl Chloride), are all below the amended standards prescribed.

NOTE:

O. Reg. 170/03, Schedule 13: Increased frequency under ss. 13-2 and 13-4

13-5. (1) If a test result obtained under section 13-2 or 13-4 for a parameter **exceeds half of the standard prescribed** for the parameter in Schedule 2 to the Ontario Drinking Water Quality Standards, the frequency of sampling and testing for that parameter under that section shall be **increased** so that at least one water sample is taken and tested **every three months**.