



WALKERTON DRINKING WATER SYSTEM 2018 SUMMARY REPORT

PREPARED IN ACCORDANCE WITH SCHEDULE 22
ONTARIO REGULATION 170/03, AS AMENDED

PREPARED BY VEOLIA WATER CANADA
FOR THE MUNICIPALITY OF BROCKTON

February 25, 2019

DWS NAME : WALKERTON WELL SUPPLY

DWS # : 220002690

CATEGORY: LARGE MUNICIPAL RESIDENTIAL

REPORTING PERIOD: JANUARY 1, 2018 TO DECEMBER 31, 2018

Summary of Reporting Requirements

Section 11 O. Reg. 170/03 Annual Report

1. Brief description of the system.
2. Summary of reports to MOECC (including corrective actions).
3. Summary of Analysis.
4. Major Expenses.
5. Location where report can be inspected.
6. Please note: the Municipality is responsible for effective steps to advise users the reports are available and the obligation to supply the report to "Designated Facilities".

This report will be sent to the Municipality of Brockton by **February 28th of the current year.**

Schedule 22 O. Reg. 170/03 Summary Report

1. Include any orders the system failed to meet and the duration and corrective actions.
2. Summary of flows.
3. A comparison to the rated capacity.

Infrastructure Review – As part of the Drinking Water Quality Management System (DWQMS) an Infrastructure Review is required on an Annual Basis. The Brockton Utilities Manager and the Veolia Water Project Manager review Infrastructure on a regular basis. In the DWQMS Operational Plan it States: *The procedure will be for the Project Manager / Overall Responsible Operator to compile information received from the Maintenance Lead and Operators throughout the year based on work orders and observations relating to the infrastructure of the water treatment system. This information will be summarized in an Infrastructure section of the annual summary report and presented to the Owner on an annual basis. The Annual Summary is required to be submitted to the Owner by March 30th of each year.*

Water Taking Data has been submitted to the MOE (WTRS) for annual water taking for the Permit to Take Water.

SUMMARY

This report is a summary of the water quality and quantity information submitted in accordance with Schedule 22 of Ontario Regulation 170/03, as amended for the reporting period between **January 1, 2018 and December 31, 2018.**

Description

The Walkerton Water System consists of two wells referred to as Well 7 and 9. Well 9 is a 79.3m drilled well with a submersible pump rated at 56.8 l/s at 66 m of head. Well 7 is a 76.2m drilled artesian well fitted with a line shaft pump rated at 56.8 l/s at 66 m head. Water flows through a UV unit for primary disinfection, followed by chlorination. Water storage and pressure is maintained by two standpipes. The system has a standby diesel generator for emergency situations. There are also three pressure zones, two equipped with booster stations to maintain adequate pressure. Both booster stations also have standby diesel generators to maintain pressure in these low-pressure areas during emergency situations.

Water Treatment Chemicals

Water Treatment chemical used is NSF Certified Chlorine gas.

Location of Report

This report is available upon request to the Municipality of Brockton at the Office of Veolia Water (Operating Authority) at 130 Wallace St., Walkerton, Ontario, or The Municipality of Brockton Office at 100 Scott St., Walkerton, Ontario.

TREATMENT CAPACITY ASSESSMENT**Well #7 Raw Water Flow**

Month	Raw Water Flow		
	Average	Maximum	Monthly
	Daily	Daily	Total
	m3	m3	m3
Jan '18	808	2,014	25,055
Feb '18	761	1,841	21,300
Mar '18	812	1,968	25,186
Apr '18	792	1,973	23,759
May '18	775	2,232	24,014
Jun '18	885	2,473	26,559
Jul '18	1,068	2,709	33,100
Aug '18	999	2,336	30,964
Sep '18	914	2,000	27,427
Oct '18	778	2,009	24,114
Nov '18	806	1,977	24,186
Dec '18	1,078	3,105	33,405
Annual Summary			
Total			319,068
Average	874		
Maximum		3,105	

Well #9 Raw Water Flow

Month	Raw Water Flow		
	Average	Maximum	Monthly
	Daily	Daily	Total
	m3	m3	m3
Jan '18	728	1,990	22,580
Feb '18	730	1,806	20,440
Mar '18	678	1,706	21,004
Apr '18	670	1,727	20,107
May '18	884	1,943	27,403
Jun '18	1,007	2,269	30,203
Jul '18	1,038	2,537	32,166
Aug '18	799	2,224	24,767
Sep '18	812	2,126	24,365
Oct '18	801	1,906	24,840
Nov '18	866	1,863	25,984
Dec '18	887	2,333	27,492
Annual Summary			
Total			301,351
Average	826		
Maximum		2,537	

Well 7&9 Combined Raw Water Flow

Month	Raw Water Flow			
	Average	Maximum	Minimum	Monthly
	Daily	Daily	Daily	Total
	m3	m3	m3	m3
Jan '18	1,537	2,014	1,150	47,635
Feb '18	1,491	1,841	1,181	41,740
Mar '18	1,490	1,968	1,091	46,190
Apr '18	1,462	1,973	1,196	43,866
May '18	1,659	2,232	1,061	51,417
Jun '18	1,892	2,473	1,414	56,762
Jul '18	2,105	2,709	1,298	65,266
Aug '18	1,798	2,336	1,084	55,731
Sep '18	1,726	2,126	1,418	51,792
Oct '18	1,579	2,027	1,323	48,954
Nov '18	1,672	1,977	1,185	50,170
Dec '18	1,964	3,105	1,351	60,897
Annual Summary				
Total				620,419
Average	1,700			
Minimum			1,061	
Maximum		3,105		

The above table outlines the average daily, maximum daily and total monthly flows for the raw water conveyed through treatment at the Walkerton WTP. The maximum allowable flow in the Permit to Take Water is 82.6L/s (**7136 m3/day**). In 2018, the average daily flow was at **23.82%** and peak flow was at **43.51%** of Permit to Take Water Capacity.

ISSUES OF NON-COMPLIANCE

The following table lists the requirements of the Act, Regulation, Order or System Approval(s) that the system failed to meet during the reporting period and includes a summary of action taken to correct each failure.

Requirement Type	Requirement the System Failed to Meet	Duration	Corrective Action	Status
N/A				

There were no Non-Compliance issues within the reporting period.

Precautionary Boil Water/Adverse Notices

Date	Reason	Duration	Resolution
October 11, 2018	Total Coliform in Distribution Sample AWQI # 137204	October 11, 2018 - October 16, 2018	Re-sampled location of adverse, as well as one (1) re-sample upstream and one (1) re-sample downstream. Results were 0.

Issues from January 18, 2018 Ministry of the Environment and Climate Change Inspection**Non Compliance Items:**

There were no Non-Compliance issues within the reporting period.

Operational Issues (For further details see monthly reports)

- January 24 - H2Flow completed semi annual UV System servicing.
- May 23 - RKS Electric replaced a start capacitor for the Well #7 motor starter.
- May 30 - ICS Instrumentation completed the flowmeter calibrations for Well 7, Well 9, and the East Ridge Booster Station.
- July 25 - Matt Kemp from H2Flow Service was on site to complete semi-annual UV servicing
- August 16 - Replaced solenoid valve for cooling water on Well 7&9 Generator
- September 28 - Took South Standpipe offline and began emptying it for painting/upgrades
- November 24 - Landmark finished South Standpipe work that will take place in 2018. They will return in the Spring of 2019 to complete the remaining work.
- December 3 - While filling the South Standpipe a vibration noise was noticed from the mixer. Discontinued filling the standpipe and inspected the tower mixer. The tower mixer appears to be damaged. This is suspected to have happened during the rehabilitation work that was being completed by Landmark.

Best Management Practices – Performed by Veolia Water

- Annual flushing complete with valves in the system being exercised, painted and noted if requiring further action. All valves are exercised over a two year plan.
- We will continue to identify and repair leaks in the distribution system.
- Historical data will be tracked and included with the annual report.
- 17 dead ends have been identified that will be monitored for residual chlorine.

Drinking Water Quality Management System (DWQMS)

January 26th – The System Audit of the DWQMS was conducted by SAI. No Non-Conformances were noted.

February 15th – Completed Annual Emergency Response Training

March 12th & 13th – An Internal Audit of the DWQMS was conducted- Minor Non-Conformity (resolved)

June 12th– Annual Risk Review was conducted

December 7th – The Annual Management Review was completed by Veolia and the Municipality

Walkerton Infrastructure Review

The following items have been identified as potential improvements for the Walkerton Drinking Water System:

- Upgrade of existing SCADA Servers.
- Replacement of aging standby Generator at Well Site
- Possible addition of automatic flushing unit for Wallace St. water main
- Replacement of water main on County Road 2 (Trunk water main) that has been susceptible to breaks.
- Continued review and replacement of aging and/or undersized distribution water mains.

Information Included in Appendices

Appendix 1 Well #7 & #9 Chemical Usage, Turbidity and Disinfection Data

Appendix 2 Bacteriological Samples: Distribution & Well #7 & #9

Appendix 3 Additional Samples

WALKERTON WTP
2018 SUMMARY REPORT
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Appendix 1

Treated Water Chlorine Residuals				Chlorine Usage and Dosage			Distribution Chlorine Residual Results			
Month	Chlorine Analyzer Reading (mg/l)			Month	Chlorine (gas)		Month	No. of	No. of	Average
	Minimum	Maximum	Average		Usage	Dosage		Dist.Samp.	Samples	Free
	Residual	Residual	Residual		Kg.	mg/L		Collected	< 0.05	Residual (mg/l)
Jan '18	1.30	1.47	1.40	Jan '18	74.8	1.57	Jan '18	43	0	1.16
Feb '18	1.21	1.52	1.42	Feb '18	65.8	1.58	Feb '18	39	0	1.16
Mar '18	1.20	1.54	1.45	Mar '18	73.3	1.59	Mar '18	41	0	1.16
Apr '18	1.39	1.55	1.47	Apr '18	70.3	1.60	Apr '18	40	0	1.13
May '18	1.30	1.47	1.37	May '18	80.4	1.57	May '18	43	0	1.07
Jun '18	1.33	1.51	1.42	Jun '18	89.6	1.58	Jun '18	40	0	1.05
Jul '18	1.32	1.48	1.40	Jul '18	101.7	1.56	Jul '18	43	0	1.05
Aug '18	1.43	1.56	1.48	Aug '18	88.0	1.64	Aug '18	41	0	1.09
Sep '18	1.25	1.56	1.47	Sep '18	87.2	1.69	Sep '18	40	0	1.05
Oct '18	1.40	1.65	1.46	Oct '18	74.5	1.52	Oct '18	45	0	1.10
Nov '18	1.29	1.47	1.42	Nov '18	76.7	1.54	Nov '18	40	0	1.16
Dec '18	1.26	1.47	1.43	Dec '18	96.0	1.58	Dec '18	41	0	1.16
Annual Summary				Annual Summary			Annual Summary			
# of Samples			365	Total	978.3		Total	496	0	
Minimum	1.20			Average		1.58	Max			1.44
Maximum		1.65		Minimum		1.20	Min			0.68
Average			1.43	Maximum		2.36	Average			1.11

Grab Raw Turbidity Results - Well #7

Month	Average	Minimum	Maximum	Number of
	Turbidity	Turbidity	Turbidity	Samples
	NTU	NTU	NTU	
Jan '18	0.10	0.09	0.11	2
Feb '18	0.11	0.10	0.11	2
Mar '18	0.10	0.09	0.10	2
Apr '18	0.10	0.07	0.13	3
May '18	0.11	0.10	0.11	2
Jun '18	0.09	0.08	0.09	2
Jul '18	0.12	0.12	0.12	2
Aug '18	0.07	0.07	0.07	1
Sep '18	0.11	0.10	0.11	2
Oct '18	0.07	0.06	0.10	3
Nov '18	0.09	0.06	0.11	2
Dec '18	0.09	0.09	0.09	2
Annual Summary				
Total				25
Average	0.10			
Maximum			0.13	
Minimum		0.06		

Grab Raw Turbidity Results - Well #9

Month	Average	Minimum	Maximum	Number of
	Turbidity	Turbidity	Turbidity	Samples
	NTU	NTU	NTU	
Jan '18	0.11	0.10	0.13	3
Feb '18	0.08	0.07	0.08	2
Mar '18	0.12	0.11	0.12	2
Apr '18	0.09	0.08	0.10	2
May '18	0.11	0.10	0.11	2
Jun '18	0.11	0.10	0.11	2
Jul '18	0.10	0.08	0.11	3
Aug '18	0.12	0.06	0.22	3
Sep '18	0.08	0.06	0.10	2
Oct '18	0.09	0.07	0.11	2
Nov '18	0.10	0.09	0.10	2
Dec '18	0.10	0.07	0.12	3
Annual Summary				
Total				28
Average	0.10			
Maximum			0.22	
Minimum		0.06		

Raw Water Turbidity (Analyzer)

Month	Average Grab NTU	Average Turbidity NTU	No. of Samples > 1NTU
Jan '18	0.11	0.04	0
Feb '18	0.09	0.03	0
Mar '18	0.11	0.04	0
Apr '18	0.10	0.04	0
May '18	0.11	0.04	0
Jun '18	0.10	0.04	0
Jul '18	0.11	0.04	0
Aug '18	0.11	0.05	0
Sep '18	0.09	0.49	0
Oct '18	0.08	0.03	0
Nov '18	0.09	0.04	0
Dec '18	0.09	0.03	0
Annual Summary			
Total			0
Average	0.10	0.08	
Maximum	0.22	6.68	
Minimum	0.06	0.03	
#of Samples	53		

U.V Disinfection Results

Month	Treated Water UV	
	UV Average Transmittance	UV Dosage Average MJ/CM2
Jan '18	98.28	69.50
Feb '18	98.15	54.42
Mar '18	98.20	55.51
Apr '18	98.20	59.98
May '18	93.41	55.53
Jun '18	97.88	49.44
Jul '18	97.90	69.77
Aug '18	98.49	51.70
Sep '18	98.49	72.22
Oct '18	98.47	57.60
Nov '18	98.29	63.44
Dec '18	98.40	51.27
Annual Summary		
Average	97.84	59.21
Maximum	99.90	172.10
Minimum	90.00	46.00

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Appendix 2

Distribution Water - Bacteriological Results

DW - E. Coli				DW - Total Coliform			
Month	Monthly Minimum	Monthly Maximum	Monthly # Samples	Month	Monthly Minimum	Monthly Maximum	Monthly # Samples
Jan '18	0	0	17	Jan '18	0	0	17
Feb '18	0	0	15	Feb '18	0	0	15
Mar '18	0	0	14	Mar '18	0	0	14
Apr '18	0	0	14	Apr '18	0	0	14
May '18	0	0	17	May '18	0	0	17
Jun '18	0	0	14	Jun '18	0	0	14
Jul '18	0	0	17	Jul '18	0	0	17
Aug '18	0	0	14	Aug '18	0	0	14
Sep '18	0	0	14	Sep '18	0	0	14
Oct '18	0	0	20	Oct '18	0	1	20
Nov '18	0	0	14	Nov '18	0	0	14
Dec '18	0	0	14	Dec '18	0	0	14
Annual Summary				Annual Summary			
Min	0			Min	0		
Max		0		Max		1	
Avg				Avg			
Total			184	Total			184

DW - HPC

Month	Monthly Minimum	Monthly Maximum	Monthly # Samples	# Samples >10
Jan '18	0	2	10	0
Feb '18	0	1	8	0
Mar '18	0	1	8	0
Apr '18	0	0	8	0
May '18	0	6	10	0
Jun '18	0	1	8	0
Jul '18	0	2	10	0
Aug '18	0	1	8	0
Sep '18	0	3	8	0
Oct '18	0	3	10	0
Nov '18	0	3	10	0
Dec '18	0	4	10	0
Annual Summary				
Min	0			
Max		6		
Avg				
Total			108	0

Raw Water - E. Coli Results

<u>Well #7</u>				<u>Well #9</u>			
Month	Monthly Minimum	Monthly Maximum	Monthly # Samples	Month	Monthly Minimum	Monthly Maximum	Monthly # Samples
Jan '18	0	0	5	Jan '18	0	0	5
Feb '18	0	0	4	Feb '18	0	0	4
Mar '18	0	0	4	Mar '18	0	0	4
Apr '18	0	0	4	Apr '18	0	0	4
May '18	0	0	5	May '18	0	0	5
Jun '18	0	0	4	Jun '18	0	0	4
Jul '18	0	0	5	Jul '18	0	0	5
Aug '18	0	0	4	Aug '18	0	0	4
Sep '18	0	0	4	Sep '18	0	0	4
Oct '18	0	0	5	Oct '18	0	0	5
Nov '18	0	0	4	Nov '18	0	0	4
Dec '18	0	0	4	Dec '18	0	0	4
Annual Summary				Annual Summary			
Min	0			Min	0		
Max		0		Max		0	
Avg				Avg			
Total			52	Total			52

Raw Water - Total Coliform Results

Well #7				Well #9			
Month	Monthly Minimum	Monthly Maximum	Monthly # Samples	Month	Monthly Minimum	Monthly Maximum	Monthly # Samples
Jan '18	0	0	5	Jan '18	0	1	5
Feb '18	0	0	4	Feb '18	0	0	4
Mar '18	0	0	4	Mar '18	0	1	4
Apr '18	0	0	4	Apr '18	0	0	4
May '18	0	0	5	May '18	0	0	5
Jun '18	0	0	4	Jun '18	0	0	4
Jul '18	0	0	5	Jul '18	0	0	5
Aug '18	0	0	4	Aug '18	0	0	4
Sep '18	0	0	4	Sep '18	0	0	4
Oct '18	0	0	5	Oct '18	0	0	5
Nov '18	0	0	4	Nov '18	0	0	4
Dec '18	0	0	4	Dec '18	0	0	4
Annual Summary				Annual Summary			
Min	0			Min	0		
Max		0		Max		1	
Avg				Avg			
Total			52	Total			52

Treated Water -Bacteriological Results

<u>E. Coli</u>				<u>Total Coliform</u>				<u>HPC</u>			
Month	Monthly Minimum	Monthly Maximum	Monthly # Samples	Month	Monthly Minimum	Monthly Maximum	Monthly # Samples	Month	Monthly Minimum	Monthly Maximum	Monthly # Samples
Jan '18	0	0	5	Jan '18	0	0	5	Jan '18	0	2	5
Feb '18	0	0	4	Feb '18	0	0	4	Feb '18	0	0	4
Mar '18	0	0	4	Mar '18	0	0	4	Mar '18	0	0	4
Apr '18	0	0	4	Apr '18	0	0	4	Apr '18	0	0	4
May '18	0	0	5	May '18	0	0	5	May '18	0	1	5
Jun '18	0	0	4	Jun '18	0	0	4	Jun '18	0	0	4
Jul '18	0	0	5	Jul '18	0	0	5	Jul '18	0	1	5
Aug '18	0	0	4	Aug '18	0	0	4	Aug '18	0	1	4
Sep '18	0	0	4	Sep '18	0	0	4	Sep '18	0	2	4
Oct '18	0	0	5	Oct '18	0	0	5	Oct '18	0	1	5
Nov '18	0	0	4	Nov '18	0	0	4	Nov '18	0	0	2
Dec '18	0	0	4	Dec '18	0	0	4	Dec '18	0	0	2
Annual Summary				Annual Summary				Annual Summary			
Min	0			Min	0			Min	0		
Max		0		Max		0		Max		2	
Avg				Avg				Avg			
Total			52	Total			52	Total			48

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Appendix 3

Nitrate**MAC: 10 mg/l****1/2 MAC: 5 mg/l****Well #7**

Date	Nitrates mg/L	Excedences
Jan 09, '18	1.40	0
Apr 10, '18	1.81	0
Jul 10, '18	1.23	0
Oct 16, '18	1.21	0
Min	1.21	
Max	1.81	
Avg	1.41	
Total		0

Well #9

Date	Nitrates mg/L	Excedences
Jan 09, '18	3.10	0
Apr 10, '18	1.48	0
Jul 10, '18	3.04	0
Oct 16, '18	3.22	0
Min	1.48	
Max	3.22	
Avg	2.71	
Total		0

Nitrite**MAC: 1 mg/l****1/2 MAC: 0.5 mg/l****Well #7**

Date	Nitrites mg/L	Excedences
Jan 09, '18	<0.100	0
Apr 10, '18	<0.010	0
Jul 10, '18	<0.010	0
Oct 16, '18	<0.010	0
Min	<0.010	
Max	<0.100	
Avg	<0.033	
Total		0

Well #9

Date	Nitrites mg/L	Excedences
Jan 09, '18	<0.100	0
Apr 10, '18	<0.010	0
Jul 10, '18	<0.010	0
Oct 16, '18	<0.010	0
Min	<0.010	
Max	<0.100	
Avg	<0.033	
Total		0

Selenium

MAC: 10 ug/l

1/2 MAC: 5 ug/l

Well #7

Date	Selenium ug/l	Excedences
Jan 09, '18	12	1
Apr 10, '18	15	1
Jul 10, '18	12	1
Oct 16, '18	10	1
Min	10	
Max	15	
Avg	12	
Total		4

Well #9

Date	Selenium ug/l	Excedences
Jan 09, '18	18	1
Apr 10, '18	14	1
Jul 10, '18	17	1
Oct 16, '18	15	1
Min	14	
Max	18	
Avg	16	
Total		4

Uranium

MAC: 20 ug/L

1/2 MAC: 10 ug/L

Well #7

Date	Uranium ug/L	Excedences
Jan 09, '18	10.60	0
Apr 10, '18	12.70	0
Jul 10, '18	11.80	0
Oct 16, '18	11.50	0
Min	10.60	
Max	12.70	
Avg	11.65	
Total		0

Well #9

Date	Uranium ug/L	Excedences
Jan 09, '18	10.60	0
Apr 10, '18	16.00	0
Jul 10, '18	15.90	0
Oct 16, '18	14.30	0
Min	14.20	
Max	16.00	
Avg	14.20	
Total		0

THM's			Lead		
MAC: 100 ug/L			MAC: 10 ug/L		
1/2 MAC: 50 ug/L			1/2 MAC: 5 ug/L		
Distribution			Distribution		
Date	THM's ug/L	Excedences	Date	THM's ug/L	Excedences
Jan 09, '18	3.90	0	Oct 16, '18	1.0000	0
Apr 10, '18	4.00	0			
Jul 11, '18	10.20	0			
Oct 16, '18	9.50	0			
Min	3.90		Min	1.0000	
Max	10.20		Max	1.0000	
Avg	6.90		Avg	1.0000	
Total		0	Total		0