

Killaloe Drinking Water System

2016 Annual Water Report

Reporting period of January 1, 2016 – December 31, 2016



Prepared For: The Township of Killaloe, Hagarty and Richards

Prepared By:



This report has been prepared to satisfy the annual reporting requirements of the
Provincial Regulations and Guidelines

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Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to residents at the Township of Killaloe, Hagarty and Richards Municipal Office. Notification will be at the Municipal Office and copies provided free of charge if requested. The Township of Killaloe, Hagarty and Richards is located at, 1 John Street in the Village of Killaloe.

There are no systems additional drinking water systems that receive water from this facility.

Compliance Report Card

Drinking Water System Number:	220006026
System Owner:	Township of Killaloe, Hagarty and Richards
Operating Authority:	Ontario Clean Water Agency
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2016 – December 31, 2016

Compliance Event	# of Events	Details
Ministry of Environment Inspections	1	Report received from June 21, 2017 inspection on August 30, 2017. <ul style="list-style-type: none"> No action required Inspection Rating 100%
Ministry of Labour Inspections	0	
QEMS External Audit	1	No Non-Conformances identified
AWQI's	0	
Non-Compliance	0	
Community Complaints	0	
Spills	0	

Quality Control Measures

The Township of Killaloe, Hagarty and Richards facilities are part of OCWA's operational Ottawa Valley Hub. The facilities are supported by hub, regional and corporate resources. Operational Services are delivered by OCWA staff who live and work in the area.

OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

OCWA has additional "Value Added" and operational support services that the Township of Killaloe, Hagarty and Richards benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
 - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
 - Process Data Management (PDM) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
 - Work Management System (WMS) that tracks and reports maintenance activities, and creates predictive and preventative reports.
 - Outpost 5 wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

System Process Description

Raw Source

Raw water source for the Killaloe Drinking Water System is a Well located at the Treatment Plant.



Treatment

Killaloe Water Treatment Plant is a single well, groundwater system equipped with greensand contactors that provide iron and manganese removal.



Pre-disinfection is provided using sodium hypochlorite and ultraviolet light. Secondary disinfection is being provided using stabilized hydrogen peroxide. The peroxide is injected prior to the clearwells and a residual is maintained through the distribution system.



Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Potassium Permanganate	Contactor	Cariox
Sodium Hypochlorite	Disinfection	Brenntag
Hydrogen Peroxide (Huwa San)	Disinfection	San Eco Tech

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Legislation	Details	Corrective Action Taken
There were no Adverse Water Quality Incidents reported for this facility in 2016.						

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non compliances reported for this facility in 2016.				

Non-Compliance Identified in a Ministry Inspection:

There was one (1) inspection reports received during this reporting period.

- Report received from June 21, 2016 inspection on August 30, 2016.
 - No action required
 - Inspection Rating 100%

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
No Actions Required in either inspection report received during this reporting period.				

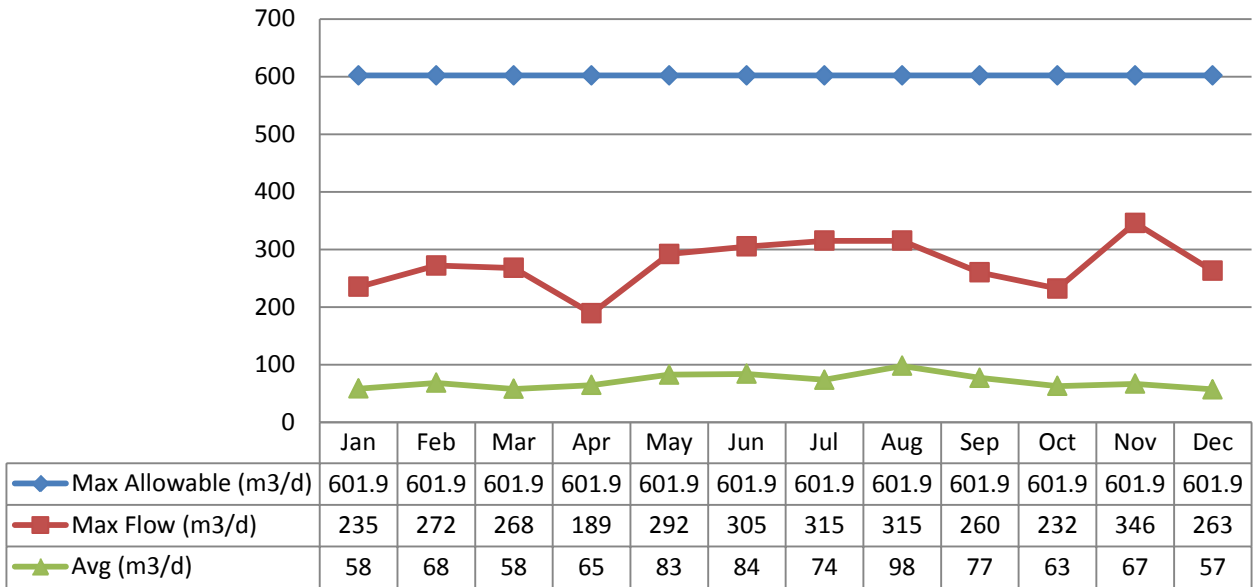
Flows

The Killaloe Drinking Water System is operating on average under half the rated capacity.

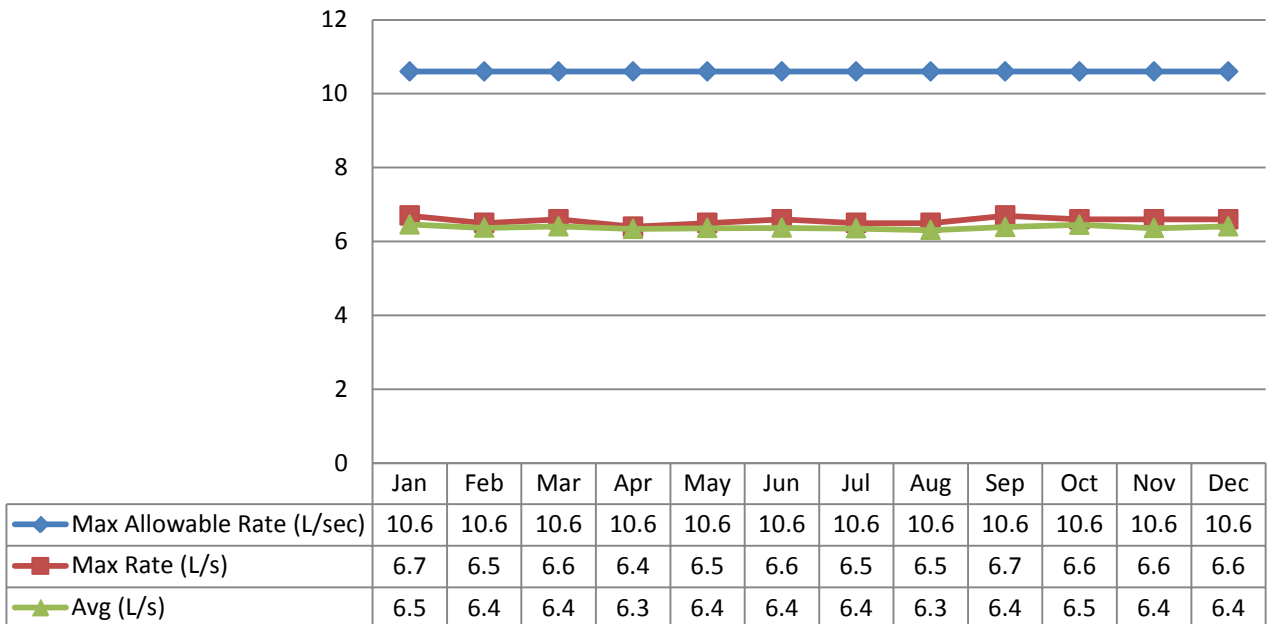
Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water.

Total Monthly Flows (m3/d)



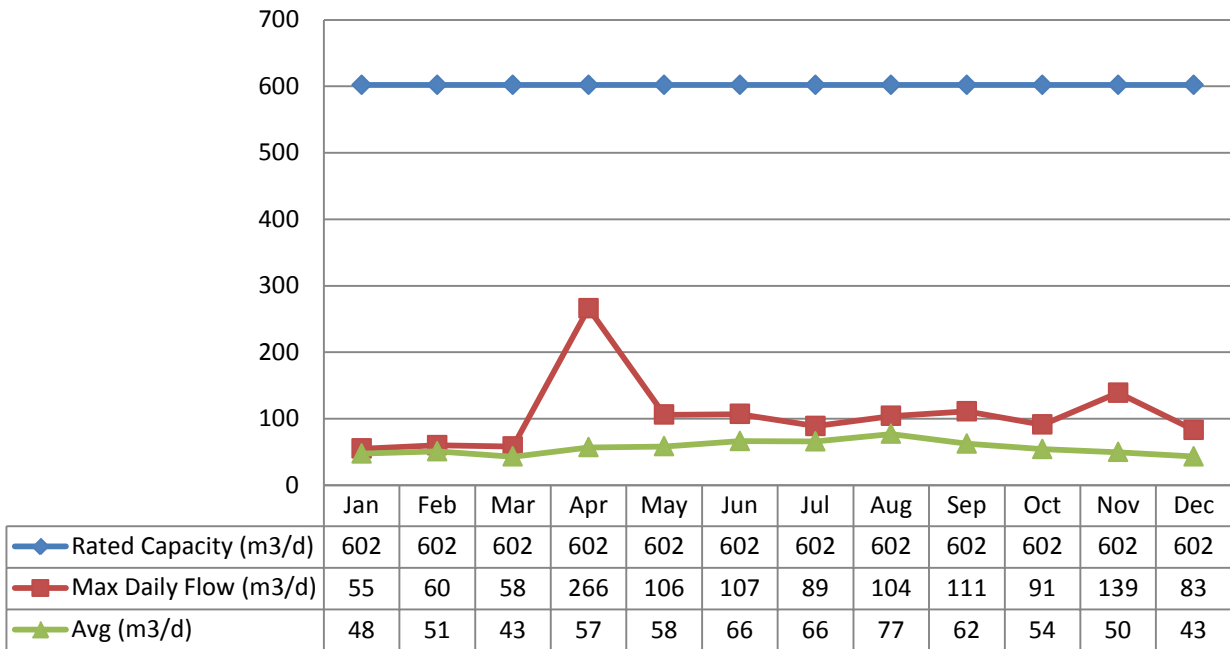
Monthly Rated Flows



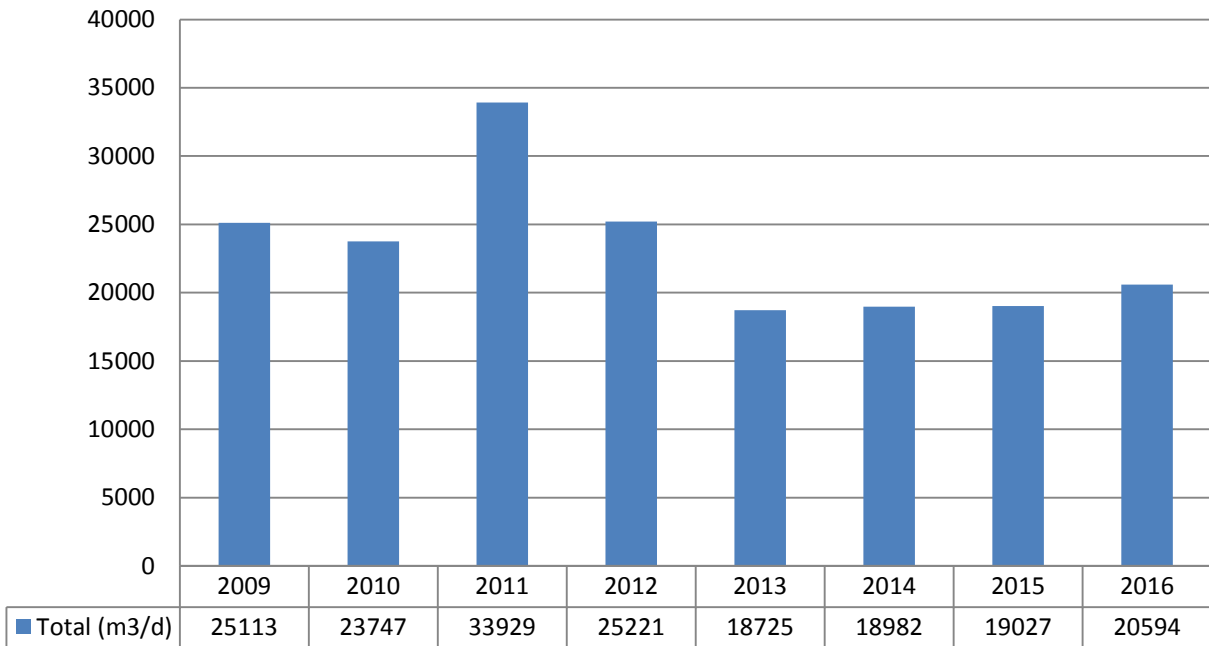
Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence.

Total Monthly Flows (m3/d)



Annual Total Flow Comparison



Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli		Range of Total Coliform Results		Number of HPC Samples	Range of HPC Results	
		Min	Max	Min	Max		Min	Max
Raw Water	52	0	0	0	4	0		
Treated Water	52	0	0	0	0	52	0	5
Distribution Water	108	0	0	0	0	108	0	20

Operational Testing

Chlorine is only used for primary disinfection as Hydrogen Peroxide is used for secondary disinfection in the distribution system.

Fluoride is not added to the process.

On-Line

Parameter	Range of Results (min # - max #)
Primary Free Chlorine	0.12 – 1.0 mg/L
Pre Clearwell Peroxide	0.023 – 19.995 ppm
Post Clearwell Peroxide	0.762 – 9.375 ppm
Distribution Peroxide	0.5 – 12.8 ppm

NOTE: spikes recorded by on-line instrumentation were a result of air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O.Reg 170/03 and the Municipal Drinking Water License

In-House

Parameter	# of grab samples taken	Range of Results (min # - max #)
Primary Free Chlorine	247	0.3 – 1.25 mg/L
Raw Colour	104	2-6 TCU
Raw Iron	104	0.086 – 0.208 mg/L
Raw Manganese	104	0.191 – 0.278 mg/L
Raw Turbidity	248	0.13 – 0.33 NTU
Raw pH	104	8.0 – 8.12
Treated Turbidity	249	0.09 – 0.16 NTU
Treated Colour	104	0 – 2 TCU
Treated pH	52	8.03 – 8.19
Treated Iron	104	0.002 - 0.01 mg/L
Treated Manganese	104	0.01 - 0.22 mg/L
Distribution pH	52	7.97 – 8.1
Distribution Peroxide Residual	199	1.4 – 6.4 ppm

Laboratory

Parameter	# of Samples	Range of Results (min # - max #)
Raw Alkalinity	12	246 - 277 mg/L
Raw Colour	12	6 - 12 TCU
Raw pH	12	7.88 – 8.28
Raw Total Dissolved Solids	12	389 – 477 mg/L
Raw Hardness	12	312 – 374 mg/L
Treated Alkalinity	12	242 - 281 mg/L
Treated Colour	12	3 - 8 TCU
Treated pH	12	7.77 – 8.32
Treated Total Dissolved Solids	12	417 – 497 mg/L
Treated Hardness	12	322 – 380 mg/L
Distribution Alkalinity	12	246-271 mg/L
Distribution Colour	12	3 - 7 TCU
Distribution pH	12	7.92 – 8.27
Distribution Total Dissolved Solids	12	420 – 483 mg/L
Distribution Hardness	12	322 – 382 mg/L
Production Well Benzene	1	<0.32 ug/L
Production Well Ethylbenzene	1	<0.33 ug/L
Production Well m/p-xylene	1	<0.43 ug/L
Production Well o-xylene	1	<0.17 ug/L
Production Well Xylene: Total	1	<0.43 mg/L
Production Well Toluene	1	<0.36 ug/L
Test Well Benzene	1	<0.32 ug/L
Test Well Ethylbenzene	1	<0.33 ug/L
Test Well m/p-xylene	1	<0.43 ug/L
Test Well o-xylene	1	<0.17 ug/L
Test Well Xylene: Total	1	<0.43 mg/L
Test Well Toluene	1	<0.36 ug/L

Additional Legislated Samples

Legal Document	Date of Issuance	Parameter	Date Sampled	Result	Unit of measure
Municipal License #259-101	02-Dec-2015	Backwash Effluent Suspended Solids	Annual Avg	2.083	mg/L

Legal Document	Date of Issuance	Parameter	Date Sampled	Result	Unit of measure
		Backwash Effluent pH	Annual Avg	7.81	no units
		Distribution Copper	January 2016	31.2 – 31.6	ug/L
			July 2016	72.9 – 73.7	ug/L
		Distribution Lead	January 2016	0.19 – 0.23	ug/L
			July 2016	0.3 – 0.3	ug/L

- Hydrogen peroxide residuals see Operational Testing
- HPC Testing Results see Microbiological testing
- pH testing results see Operational Testing

Inorganic Parameters

These parameters are tested annually as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrates are tested quarterly as required under 170/03. In the event any of the parameters (except Sodium and Fluoride) exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2016/01/05	<MDL 0.02	6.0	No	No
Arsenic: As (ug/L) - TW	2016/01/05	<MDL 0.2	25.0	No	No
Barium: Ba (ug/L) - TW	2016/01/05	171.0	1000.0	No	No
Boron: B (ug/L) - TW	2016/01/05	112.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2016/01/05	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2016/01/05	0.08	50.0	No	No
Mercury: Hg (ug/L) - TW	2016/01/05	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2016/01/05	0.04	10.0	No	No
Uranium: U (ug/L) - TW	2016/01/05	2.15	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2013/01/03	0.27	1.5	No	No
Nitrite (mg/L) - TW	2016/01/05	0.004	1.0	No	No
Nitrite (mg/L) - TW	2016/04/05	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2016/07/05	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2016/10/04	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2016/01/05	0.011	10.0	No	No
Nitrate (mg/L) - TW	2016/04/05	0.01	10.0	No	No
Nitrate (mg/L) - TW	2016/07/05	0.008	10.0	No	No
Nitrate (mg/L) - TW	2016/10/04	0.009	10.0	No	No
Sodium: Na (mg/L) - TW	2013/01/09	30.4	20*	Yes	Yes

*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified mg/L when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

Schedule 15 Sampling:

This facility is sampling under the exemption requirements of O.Reg 170/03 sampling program.

Location Type	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Distribution Water - Lead Results (ug/L)	Sampling was completed in 2015. Next samples 2018.				
Distribution Water - Alkalinity (mg/L)	12	246	271	n/a	n/a
Distribution Water - pH	12	7.92	8.27	n/a	n/a

The Municipal License requires lead sampling to be sampled every 6 months. The sample results are included in this report under the "Additional Legislated Samples".

Organic Parameters

These parameters are tested annually as a requirement under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

In recent changes to the regulation the following Organic Parameters were removed from Schedule 24:

- Aldicarb
- Aldrin+Dieldrin
- Bendiocarb
- Chlordane
- Cyanazine
- DDT + metabolites
- Dinoseb
- Heptachlor+hepachlor epoxide
- Lindane
- Methoxychlor
- Parathion
- Temephos
- 2,4,5-Trichlorophenoxyacetic acid

The following parameter was added:

- 2-Methyl-4chlorophenoxyacetic Acid (MCPA)

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
TREATED WATER					
Alachlor (ug/L) - TW	2016/01/05	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2016/01/05	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2016/01/05	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2016/01/05	<MDL 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW	2016/01/05	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2016/01/05	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2016/01/05	<MDL 0.05	90.00	No	No

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Carbofuran (ug/L) - TW	2016/01/05	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2016/01/05	<MDL 0.16	5.00	No	No
Chlorpyrifos (ug/L) - TW	2016/01/05	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2016/01/05	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2016/01/05	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2016/01/05	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2016/01/05	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2016/01/05	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2016/01/05	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2016/01/05	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2016/01/05	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2016/01/05	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2016/01/05	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2016/01/05	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW	2016/01/05	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2016/01/05	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2016/01/05	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2016/01/05	<MDL 0.02	190.00	No	No
Metolachlor (ug/L) - TW	2016/01/05	<MDL 0.01	50.00	No	No
2-Methyl-4chlorophenoxyacetic Acid (MCPA)	2016/01/05	<MDL 0.00012	N/A	N/A	N/A
Metribuzin (ug/L) - TW	2016/01/05	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2016/01/05	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2016/01/05	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2016/01/05	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2016/01/05	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW	2016/01/05	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2016/01/05	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2016/01/05	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2016/01/05	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2016/01/05	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2016/01/05	<MDL 0.35	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2016/01/05	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2016/01/05	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2016/01/05	<MDL 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2016/01/05	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW	2016/01/05	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2016/01/05	<MDL 0.17	2.00	No	No
DISTRIBUTION WATER					

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Trihalomethane: Total (ug/L) Annual Average - DW	2016/01/01	28.5	100.00	No	No

Evaluation of the Effectiveness of Secondary Disinfectant

The hydrogen peroxide continues to work well as a secondary disinfection while producing reduced THM's within the distribution system. All parameters that are being monitored are remaining within compliance and normal operating limits. There have been no significant anomalies in any tested levels.

Maintenance Summary

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports. The Ottawa Valley Hub has specialized certified staff such as Millwrights, Electricians and Instrumentation Specialists to name a few.

OCWA uses a Workplace Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the Township of Killaloe, Hagarty and Richards in the form of a "Capital Forecast". This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

Preventative Maintenance Work Orders Completed	219
Operational Maintenance Work Orders Completed	37
Corrective Maintenance Work Orders Completed	22

Maintenance Highlights

WO#	Details
29152	SAI Global Audit
124311	Annual UV Intensity Sensor Verifications
171462	Hydrogen Peroxide analyzer replacement parts
106612	Hydrogen Peroxide analyzer replacement parts

Distribution Maintenance Highlights

Date of Incident	Street	Details	Corrective Action Taken
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Date of Incident	Street	Details	Corrective Action Taken
There were no Watermain Breaks during this reporting period.			

Community Complaints

There were no complaints received during the reporting year.

QEMS

The Ontario Clean Water Agency has received Full scope accreditation. There was an external surveillance audit completed. There were no non-conformances identified. The Internal Audit and Management Review were completed. Minutes from the Management Review were provided to the Town.

Water Taking and Transfer Data

2016 data was submitted electronically on February 8, 2017 under permit #2835-9LMRUZ. The WTRS data and submission confirmation are attached in Appendix A.

Small System Summary

The Ontario Clean Water Agency sampled at four (4) small Ministry of Health regulated systems owned by The Township of Killaloe, Hagarty and Richards. Below is a summary of the sample results.

Sampling Results

Location	Number of Samples	E.coli Results (min) - (max)	Total Coliform Results (min) – (max)
Killaloe Rink	8	0 – 0	0 – 7
Killaloe Medical Center	13	0 – 0	0 – 0
Round Lake Arena	4	0 – 0	0 – 0

Non-Compliance/Adverse Results

Facility	Date	Legislation	AWQI #	Problem	Corrective Action
Killaloe Rink	June 16, 2016	319/09	50514	7 Total Coliform	Flushed and resampled (June 21, 2016) all OK
Killaloe Rink	October 27, 2016	319/09	53393	3 Total Coliform	Resampled November 1, 2016. Results OK

Maintenance Highlights

- Operations staff clean UV system and replace sediment filters as required at the Killaloe Medical Center.

Appendix A

WTRS Data and Submission Confirmation

Appendix B

Raw Water Data

