



**Nanticoke Drinking Water System  
2021 Annual Water Quality Report**

**January 1, 2021 – December 31, 2021**

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# Quality Management System Policy

The purpose of The Corporation of Haldimand County's Quality Management System policies are to:

- Ensure our drinking water systems comply with all current legislation and regulatory requirements for the safe supply of drinking water;
- Ensure financial support is provided to maintain infrastructure integrity to allow safe and consistent delivery of drinking water to our water customers;
- Commit to review and update our Operational Plans as regulated by the Drinking Water Quality Management Standard in order to continually improve our Quality Management System and to communicate the results with our water customers.



## Haldimand County Quality Management System Summary

Haldimand County's Quality Management System (QMS) is legislated under the Drinking Water Quality Management Standard (DWQMS) through the Safe Drinking Water Act. To maintain operating authority accreditation, the Ministry of the Environment, Conservation and Parks (MECP) mandate tasks that must be completed annually. These activities include:

- Conducting an internal audit of the Quality Management System.
- Conducting a Management Review meeting.
- Participating in an external audit conducting by a third party Accreditation Body
- Updating the Quality Management System Operational Plan.
- Updating Council of the status of the County's Quality Management System.

The QMS Operational Plan was reviewed and updated in 2021, with focus on Document and Records Control (Element 5) and Continual Improvement (Element 21) all while incorporating organizational changes within the County.

Internal audits were completed with support from Water and Wastewater Operations staff and Aclains Environmental. No non-conformities were identified as a result of the internal audit. The audit report did note four areas for opportunities for improvement.

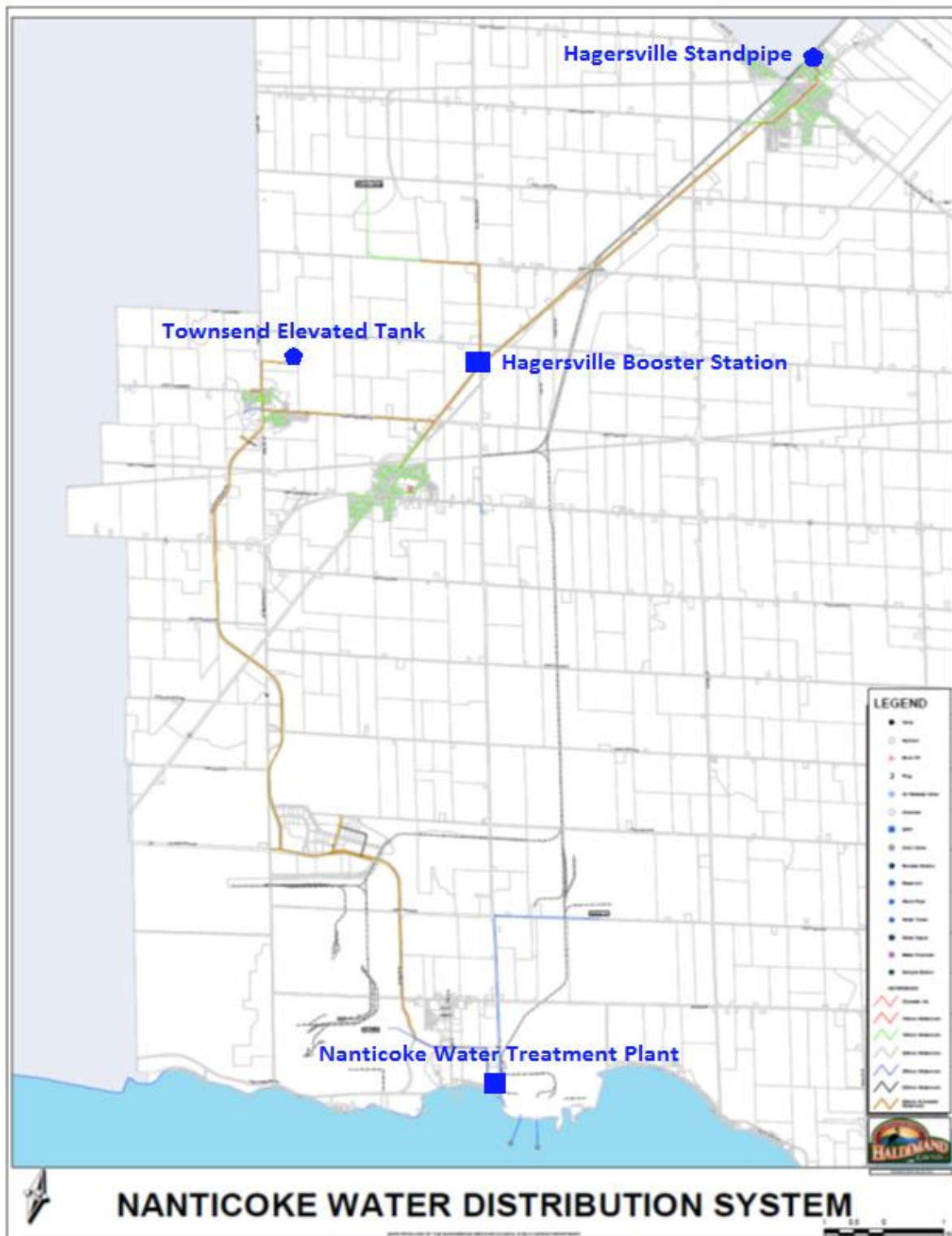
Haldimand County must receive accreditation annually to operate the water distribution systems. Through a qualified third party auditor, the County must demonstrate that its QMS (Quality Management System) meets the requirements of the DWQMS (Drinking Water Quality Management Standard). SAI Global conducted an external audit on November 9<sup>th</sup>, 2021. The County received one minor non-conformance. This was a result of an administrative issue and corrective action was implemented immediately to resolve the issue.

Staff are required to conduct an annual Management Review meeting to evaluate the effectiveness of the QMS. Deficiencies and opportunities for improvement are identified and action items are developed to ensure follow-up. The County held their management review meeting on October 29<sup>th</sup>, 2021.

All requirements were achieved in 2021 and SAI Global have issued an accreditation certificate to Haldimand County, which allows us to continue to operate the water distribution systems.

As part of the agreement with the County and through the regulations, Ontario Clean Water Agency (OCWA) must obtain accreditation to operate the water treatment facilities on behalf of the County. November 11, 2021 OCWA obtained full scope accreditation under the requirements of DWQMS.

# NANTICOKE DRINKING WATER SYSTEM



Lake Erie raw water flows from the Ontario Power Generation forebay into the Nanticoke Industrial Pumping Station forebay. Raw water can be pre-chlorinated for zebra mussel control and then drawn into two raw water wet wells. Seven vertical turbine pumps are capable of supplying Imperial Oil and US Steel plants with raw water. Two submersible pumps supply the municipal treatment works with raw water.

A settling lagoon collects waste water from various water treatment plant processes and continuously discharges to Lake Erie.

The distribution system is comprised of three residential communities (Townsend, Jarvis and Hagersville) and the Lake Erie Industrial Park. Townsend utilizes a water tower for storage and to maintain pressure in the distribution system. A booster station is utilized to maintain pressure and flow to Hagersville. As required, this facility has the capability to add sodium hypochlorite to the potable water to boost chlorine residuals. Hagersville utilizes a standpipe for storage and to maintain pressure in the distribution system. Bulk water stations are located in Hagersville and Jarvis. In addition, the Nanticoke Drinking Water System provides potable water to the Mississaugas of the Credit First Nation.



The distribution system infrastructure services approximately 4,900 people (2016 Census).

Ontario Clean Water Agency is contracted to operate and maintain the raw water transmission mains, low lift pumping station, water treatment plant, and the standpipe. Haldimand County operates and maintains the distribution system, including the bulk water depots.

### **Expenditure Information**

Haldimand County and its contract operators are diligent in prioritizing projects on an annual basis to eliminate unnecessary expenditure. Using the best available information at the time of this report, expenses incurred in the Nanticoke Drinking Water System for 2021 are identified in Table 1. Not all drinking water expenditure information is included in this report.

**Table 1: Nanticoke Drinking Water System 2021 Expenditures**

<b>Nanticoke Drinking Water System:</b>	
Nanticoke WTP Filter 3 Media Replacement	
<b>Total Cost:</b>	<b>\$43,000</b>



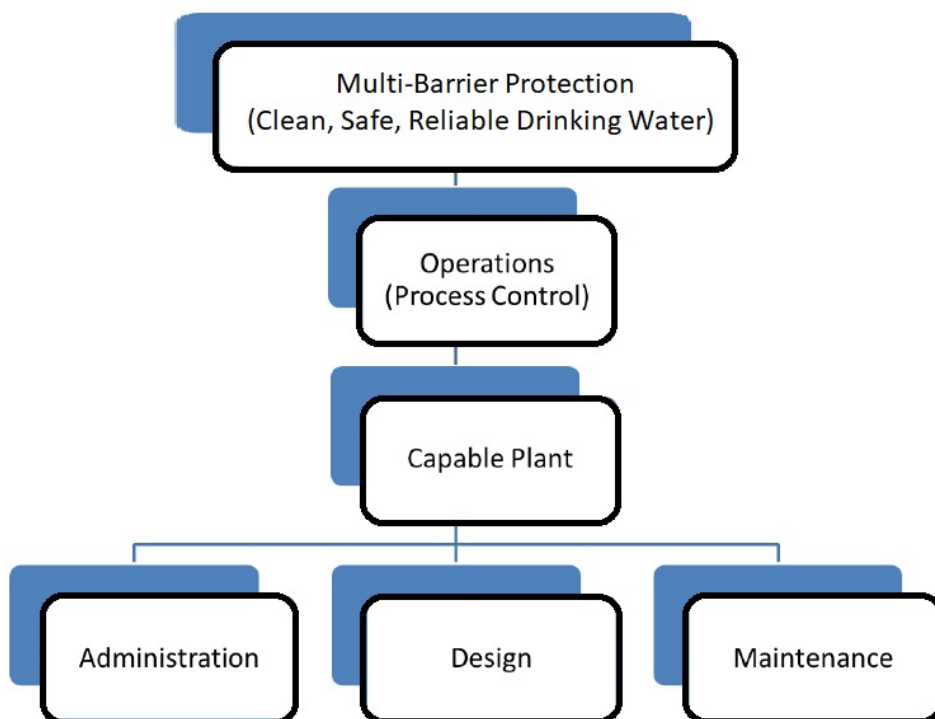
## Multi-Barrier Approach

Through the Walkerton Inquiry, Justice O'Connor recommended that drinking water is best protected by taking an approach that uses multiple barriers to prevent contamination from affecting our drinking water. The multi-barrier approach addresses potential threats by ensuring barriers are in place to either eliminate or minimize their impact. This holistic approach recognizes that each barrier may not be able to completely remove a contaminant, but by working together the barriers provide a high-level of protection. Typical barriers include:

- **Source Protection**
  - **Source Protection Plans**
- **Treatment**
  - **Treatment and Disinfection Goals**
- **Distribution System**
  - **Residual Maintenance**
- **Monitoring**
  - **Sampling Programs**
- **Emergency Preparedness**
  - **Emergency Plans**



Haldimand County has adopted the multi-barrier approach in ensuring safe, reliable drinking water. Figure 2 shows how administration, design, maintenance, and operations work together to establish and maintain multi-barrier protection (US EPA, 1998).



**Figure 2: Responsibilities for Clean, Safe and Reliable Drinking Water**



A description of the responsibilities in each area is summarized as follows:

- **Administration:** The administrators or managers of a water treatment system are responsible for providing the resources (budget and staff) and policies (hours of staffing, reporting requirements, training and certification requirements, etc.). Funding may also need to be justified and obtained if the design of a system is inadequate or major upgrades are required. Managers establish and maintain emergency response plans and communication procedures to ensure prompt response to unsafe drinking water.
- **Design:** The designer's responsibility is to provide the physical infrastructure (pipes, valves, tanks, meters, etc.) capable of reliably producing and distributing the quality and quantity of water required. The design must provide adequate flexibility and controllability to enable the operator to make appropriate adjustments.
- **Maintenance:** The system must be maintained in good working order with the key equipment functional at all times. Should a key piece of equipment break down then it should be repaired in a timely manner.
- **Operations:** Once a capable system is in place, then it is the operator's responsibility to deliver safe drinking water through monitoring, testing and process control (for example by changing the setting on the dosing pumps). Operators are also responsible for maintaining records (log books, data forms, etc.), which aid in troubleshooting and design of upgrades. A further, and commonly unrecognized responsibility of the operator is to communicate the needs of the facility to administrators for possible action.

## WATER SAMPLING

To comply with drinking water legislation, drinking water systems are required to monitor their water quality. Haldimand County has committed to providing safe, reliable drinking water and is diligent in ensuring that sampling and monitoring programs effectively characterize water quality. All samples are taken by certified operators and tests performed by accredited, licensed laboratories.

### Microbiological Sampling

Microbial quality is one of the primary indicators for the safety of a drinking water supply. Of all contaminants in drinking water, human and/or animal feces present the greatest danger to public health. Pathogenic or disease causing microorganisms (including certain protozoa, bacteria or viruses) may be found in untreated water supplies. Bacteriological monitoring and testing is a way to detect and control pathogenic bacteria in treated drinking water supplies. Heterotrophic Plate Count (HPC) and background bacteria samples are monitored to identify potential changes in water quality and are not used as an indicator of adverse human health effects. Table 2 provides a summary of microbiological sampling completed in the Nanticoke Drinking Water System during 2021.

**Table 2: 2021 Nanticoke Drinking Water System Microbiological Sampling**

	Number of Samples	Range of E.coli Results (cfu/100ml)	Range of Total Coliform Results (cfu/100ml)	Number of HPC Samples	Range of HPC Results (cfu/ml)	Number of Background Samples	Range of Background Results (cfu/ml)
<b>Raw</b>	156	0 – 78.4	0– 602	N/A	N/A	N/A	N/A
<b>Treated</b>	156	0	0	156	0 – 10	N/A	N/A
<b>Industrial Park Distribution System</b>	52	0	0	52	0-3	52	0-113
<b>Townsend Distribution System</b>	104	0	0	104	0 - 19	52	0-67
<b>Jarvis Distribution System</b>	52	0	0	52	0 – 22	52	0
<b>Hagersville Booster Station</b>	52	0	0	52	0 - 10	N/A	N/A
<b>Hagersville Distribution System</b>	104	0	0	104	0 – 300	52	0 -200

\*Note: At a minimum, 25% of all drinking water samples must be analyzed for HPC.

## Operational Sampling

Operational sampling and monitoring is important in maintaining the integrity of each barrier in the multi-barrier approach. Schedules 7 and 8 of Ontario Regulation 170/03, specify requirements for operational checks that municipalities must follow. Table 3 provides a summary of operational samples taken for the drinking water system. Regulatory requirements were achieved for filtered water turbidity and efforts continue to consistently achieve settled and filter targets. Disinfection regulatory requirements and operational targets were consistently achieved in 2021.

**Table 3: 2021 Nanticoke Drinking Water System Operational Sampling**

	Number of Grab Samples	Range of Results	Regulatory Requirement	Recommended Target
<b>Raw Turbidity</b>	8760	0.92 – 92.9	N/A	N/A
<b>Settled Turbidity</b>	8760	0 – 4.9	N/A	1.00 NTU
<b>Filtered Turbidity</b>	8760	0.014- 0.062	≤ 0.30 in 95% of all monthly readings	0.10 NTU
<b>Treated Turbidity</b>	8760	0.02 – 0.58	N/A	≤ 5.00
<b>Free Chlorine High Lift</b>	8760	1.07 – 1.54	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Industrial Park</b>	104	0.73 – 1.48 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Townsend</b>	156	0.76 - 1.39 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Jarvis</b>	104	0.40 – 1.32 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Hagersville Booster Station</b>	52	0.30 – 1.44 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Hagersville</b>	156	0.17 – 1.38 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L

\*Note: 8760 is used for continuous monitoring.

Water treatment plant filters are backwashed to maintain or improve performance of the filters. The backwash water is discharged to a lagoon, which continuously discharges to Lake Erie. Municipal Drinking Water License number 066-102 specifies sampling requirements, summarized in Table 4, to monitor the discharge and ensure minimal impact to the natural environment.

**Table 4: 2021 Nanticoke Water Treatment Plant Lagoon Sampling**

Date of Legal Instrument Issued	Parameter	# of Samples	Annual Average (mg/L)	Regulatory Requirement
License 066-202 Dec 10, 2021	Backwash Lagoon Total Suspended Solids	45	3.3	Annual Average Concentration 25 mg/L

As result of public inquiries, a quarterly treated water hardness sampling program was initiated.

The term hardness was originally applied to waters that were hard to wash in, referring to the soap wasting properties of hard water. Hardness prevents soap from lathering by causing the development of an insoluble curdy precipitate in the water; hardness typically causes the buildup of hardness scale (such as seen in cooking pans). Dissolved calcium and magnesium salts are primarily responsible for most scaling in pipes and water heaters and can cause numerous problems in laundry, kitchen, and bath. Hardness is usually expressed in grains per gallon (or ppm) as calcium carbonate equivalent.

The degree of hardness standard as established by the American Society of Agricultural Engineers (S-339) and the Water Quality Association (WQA) is shown in the following table:

**Table 5: Standard Degree of Hardness**

Degree of Hardness	Grains per Gallon (gpg)	Ppm (mg/L)
Soft	< 1.0	< 17.0
Slightly Hard	1.0 – 3.5	17 - 60
Moderately Hard	3.5 – 7.0	60 - 120
Hard	7.0 – 10.5	120 - 180
Very Hard	> 10.5	> 180

The sample results in Table 6 indicate that the average values for Nanticoke is considered hard water as taken from the Degree of Hardness Table above.

**Table 6: 2021 Nanticoke Drinking Water System Hardness Sampling**

Parameter	Sample Date	Industrial Park	Townsend	Jarvis	Hagersville
<b>Total Hardness (mg/L as CaCO<sub>3</sub>)</b>	February 25, 2021	126	124	120	126
	May 12, 2021	126	114	112	112
	August 25, 2021	136	135	204	152
	November 16, 2021	120	130	118	126
2021 Average ----->		<b>127</b>	<b>126</b>	<b>139</b>	<b>129</b>

## Lead Sampling

The community lead testing program is a requirement of O. Reg. 170/03 under the Safe Drinking Water Act, 2002. Haldimand County is exempt from sampling private residences due to having less than 10% of plumbing sample locations exceed the standard for two consecutive periods of reduced sampling. Annual pH and alkalinity samples are taken, as well as distribution system lead samples every three years. There are no regulatory limits for alkalinity and pH, however Haldimand County sample results are within the operational guidelines provided by the MECP. A summary of 2021 sampling has been provided in Table 7.

**Table 7: 2021 Nanticoke Drinking Water System Lead Sampling**

	Sample Type	Number of Samples	Range of Results	Number of Exceedances
<b>Industrial Park</b>	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.06-0.08 ug/L	N/A
	Distribution - Alkalinity	2	95-96 mg/L	N/A
	Distribution - pH	2	7.71-8.02	N/A
<b>Townsend</b>	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.07-0.12 ug/L	N/A
	Distribution - Alkalinity	2	98-99 mg/L	N/A
	Distribution - pH	2	7.87-8.14	N/A
<b>Jarvis</b>	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.08-0.09 ug/L	N/A
	Distribution - Alkalinity	2	97-99 mg/L	N/A
	Distribution - pH	2	7.89-8.14	N/A
<b>Hagersville</b>	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.04-0.12 ug/L	N/A
	Distribution - Alkalinity	2	98-100 mg/L	N/A
	Distribution - pH	2	7.94-8.18	N/A

## Organic Sampling

To protect drinking water from pathogens, a disinfectant (usually chlorine) is added to the drinking water. Disinfectants can react with naturally-occurring materials in the water to form disinfection byproducts (DBP), which may pose health risks.



A challenge for water systems is balancing pathogen control and disinfection byproduct formation. It is important to provide protection from pathogens while minimizing health risks from disinfection byproducts. More information on each byproduct is summarized in Table 8.

Haldimand County sample for haloacetic acids (HAA) and trihalomethanes (THM) at the water treatment plant and in the distribution system where there is an elevated potential for the formation of these byproducts. Although a treatment sample and individual distribution system samples are not required by regulation, these samples are used to monitor byproduct formation within the drinking water system.

**Table 8: Disinfection Byproduct Information**

Disinfection Byproduct	How it is formed?	Health Effects
Trihalomethanes	Trihalomethanes occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing total trihalomethanes in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and an increased risk of cancer.
Haloacetic Acids	Haloacetic acids occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Regulatory reporting is based on a running annual average of quarterly sample results using the worst case scenario. The calculated THM and HAA averages were below the maximum allowable concentrations (MAC) permitted by the MECP. Table 9 provides a summary of 2021 disinfection byproduct sampling.

**Table 9: 2021 Nanticoke Drinking Water System DBP Sampling**

Parameter	Sample Location	Sample Date	Sample Results (ug/L)	Annual Average (ug/L)	Regulatory MAC (ug/L)	Exceedance
Haloacetic Acids	Nanticoke WTP	February 16, 2021 May 17, 2021 August 16, 2021 November 16, 2021	5.3 7.8 21.4 19	10.5	80	No
	Industrial Park Distribution	February 25, 2021 May 12, 2021 August 19, 2021 November 16, 2021	5.8 15.6 27.8 24.4	12.5	80	No
	Townsend Distribution	February 25, 2021 May 12, 2021 August 19, 2021 November 16, 2021	7.2 17.2 38.8 28.2	17.9	80	No
	Jarvis Distribution	February 25, 2021 May 12, 2021 August 19, 2021 November 16, 2021	6.4 16.7 38.6 32.1	18.9	80	No
	Hagersville Distribution	February 25, 2021 May 12, 2021 August 19, 2021 November 16, 2021	13.8 21.6 41 28.9	20.1	80	No

**Table 9: 2021 Nanticoke Drinking Water System DBP Sampling (continued)**

Parameter	Sample Location	Sample Date	Sample Results (ug/L)	Annual Average (ug/L)	Regulatory MAC (ug/L)	Exceedance
<b>Trihalomethanes</b>	Nanticoke WTP	February 16, 2021	22	36	100	<b>No</b>
		May 17, 2021	31			
		August 16, 2021	47			
		November 16, 2021	44			
	Industrial Park Distribution	February 25, 2021	24	43.3	100	<b>No</b>
		May 12, 2021	35			
		August 19, 2021	56			
		November 16, 2021	58			
	Townsend Distribution	February 25, 2021	30	<b>51.3<sup>1</sup></b>	100	<b>No</b>
		May 12, 2021	37			
		August 19, 2021	75			
		November 16, 2021	63			
	Jarvis Distribution	February 25, 2021	28	<b>54<sup>1</sup></b>	100	<b>No</b>
		May 12, 2021	39			
		August 19, 2021	77			
		November 16, 2021	72			
	Hagersville Distribution	February 25, 2021	30	<b>59.8<sup>1</sup></b>	100	<b>No</b>
		May 12, 2021	44			
		August 19, 2021	86			
		November 16, 2021	79			

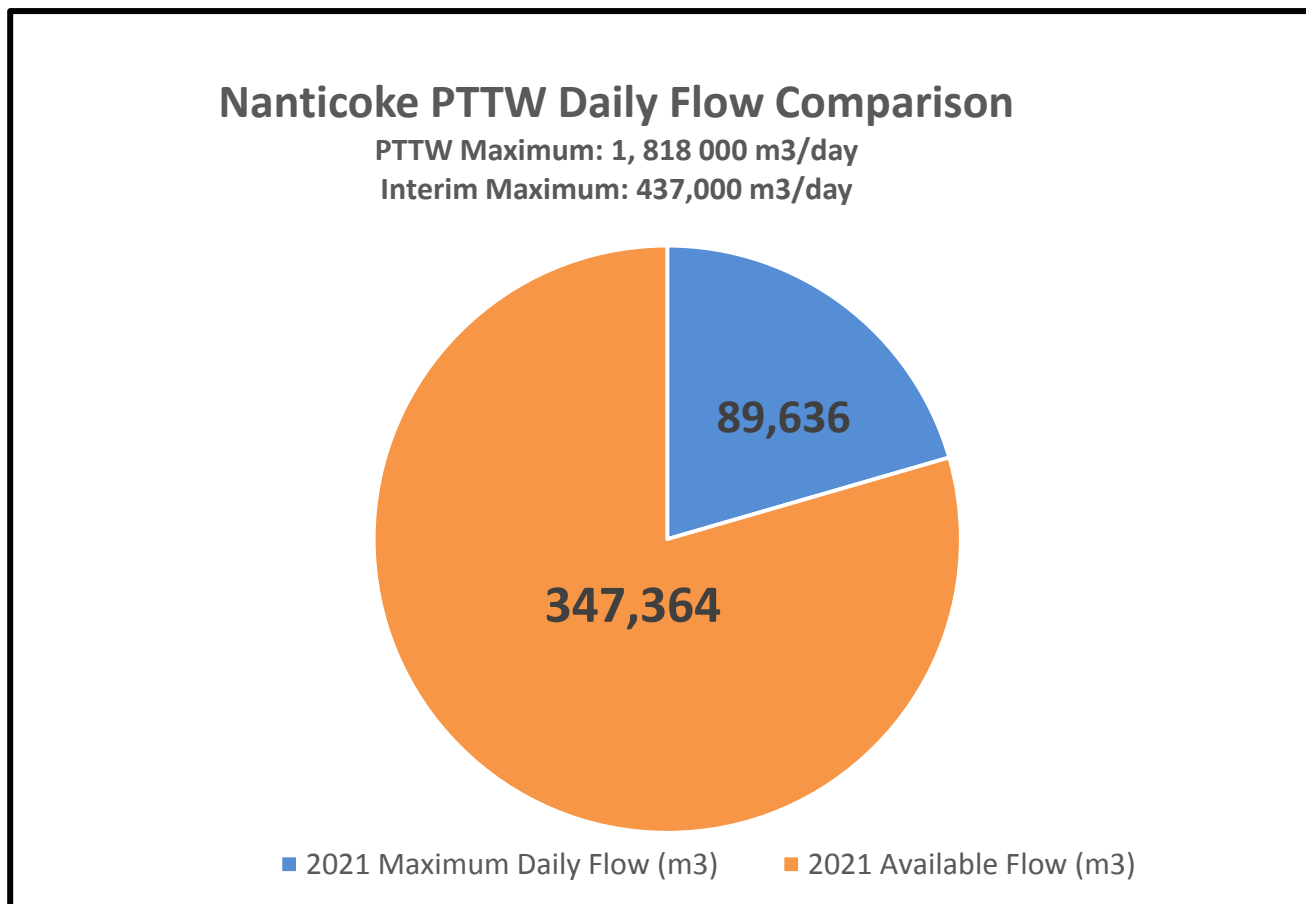
<sup>1</sup> Result exceeded half the standard prescribed in Schedule 2 on the Ontario Drinking Water Quality Standards.

Additional sample results for organic and inorganic parameters are located in the appendices.

## **WATER USE**

### **Raw Water**

The Nanticoke Drinking Water System's raw water source is Lake Erie. A Permit to Take Water (PTTW) specifies the maximum volume of raw water that can be taken from the water source and conveys MECP site-specific regulatory requirements. Haldimand County has a large volume of available raw water capacity, however an interim limit of 437 MLD is in place until a number of conditions have been satisfied. When comparing the 2021 maximum raw water flow and the interim permit limits (Figure 3), 79% of Haldimand County's raw water allotment was available for use.



**Figure 3: Nanticoke Permit To Take Water Flow Comparison**

## Potable Water

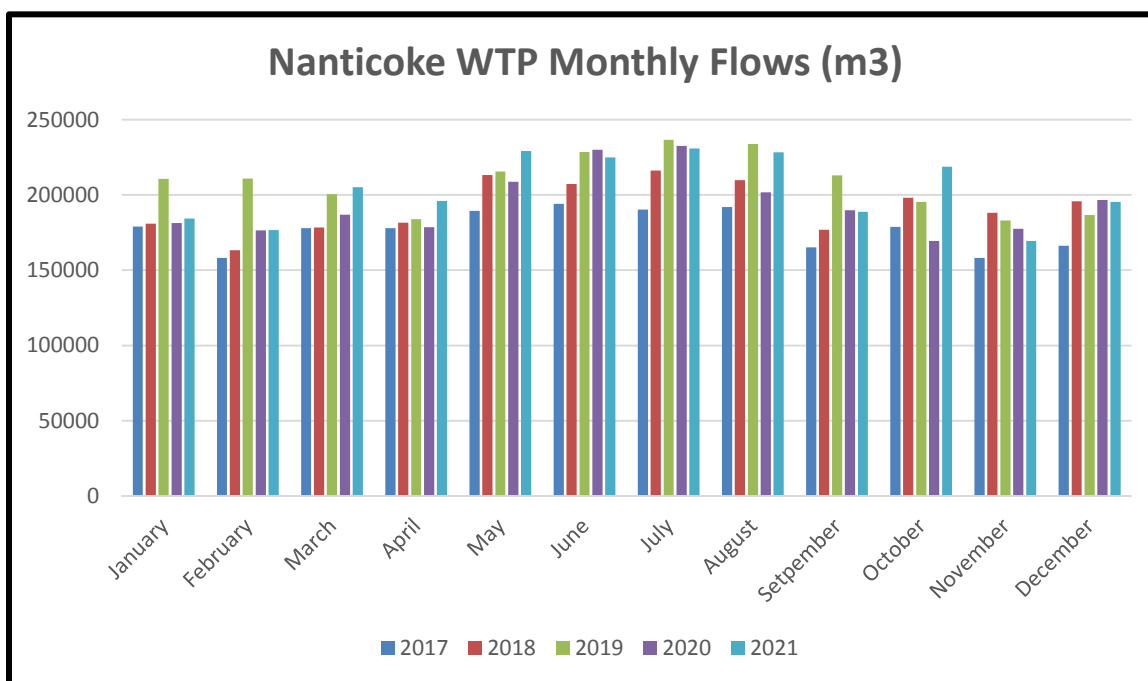
As required by Schedule 22 of Ontario Regulation 170/03, Table 10, Table 11 and Figure 4 are intended to provide a summary of potable water supplied by the Nanticoke Drinking Water System in 2021.



**Table 10: 2021 Nanticoke Monthly Potable Water Flow Data**

System	Month	Monthly Total m <sup>3</sup>	Daily Average m <sup>3</sup> /d	Maximum Daily Flow m <sup>3</sup> /d	Maximum Daily Peak Flow L/s
<b>Nanticoke Drinking Water System</b>	<b>January</b>	184,243	5943	7105	253.8
	<b>February</b>	176,634	6308	7363	303.7
	<b>March</b>	205,104	6616	7898	297.8
	<b>April</b>	196,121	6537	7643	300
	<b>May</b>	229,165	7392	9563	284.9
	<b>June</b>	225,007	7500	8558	334.6
	<b>July</b>	230,805	7445	11229	296.4
	<b>August</b>	228,280	7364	8557	334.9
	<b>September</b>	188,770	6292	8070	304.8
	<b>October</b>	218,688	7054	11129	305.3
	<b>November</b>	169,491	5649	7675	336.9
	<b>December</b>	195,428	6304	8176	337.5

Figure 4 compares the monthly flows over the last five years at the Nanticoke Water Treatment Plant. When comparing the average monthly flows for 2020 and 2021, there was a 5.1% increase in potable water produced at the Nanticoke Water Treatment Plant.



**Figure 4: Nanticoke WTP Five Year Monthly Potable Flow Comparison**

The facility has a rated capacity of 13,636 cubic metres per day. When compared against the maximum daily flow for 2021, the Nanticoke Water Treatment Plant operated at approximately 82.0% of design capacity, however this calculation does not take into account any operational and infrastructure limitations.

**Table 11: Comparison of Rated Capacity and 2021 Maximum Flow Rate**

<b>System and Municipal Drinking Water Licence</b>	<b>Rated Capacity (m<sup>3</sup>/day)</b>	<b>Maximum Daily Flow (m<sup>3</sup>)</b>	<b>Percentage of Capacity</b>
Nanticoke 066-102	13,636	11,229	82.0%

\*Note: Since April of 2021 Nanticoke Water Treatment plant has been undergoing capacity demonstrations resulting in higher flows for the year. The percentage capacity is not representative of actual system water flows. Average system water flows are approximately 8735 m<sup>3</sup>/day.

To ensure the water treatment facility is capable of meeting current and projected demands, Haldimand County staff annually review plant capability and performance and update development allocation accordingly.

## **REGULATORY COMPLIANCE**

### **Adverse Water Quality Incidents**

Regulatory compliance requires reporting adverse water quality incidents to the Ministry of Health (MOH) and the MECP. In all instances, corrective action is initiated to resolve the issue.

### **Annual Drinking Water Inspection**

The MECP annually confirms compliance with drinking water legislation by conducting inspections on drinking water systems. All aspects of the drinking water system are reviewed, including treatment equipment, disinfection, training records, and operational data required under the Safe Drinking Water Act, Ontario Regulations 170/03, 169/03 and 128/04. These inspections provide Haldimand County and OCWA an opportunity to review best management practices and work towards continually improving the operation and management of the drinking water systems. Any issues of regulatory non-compliance are identified and corrective actions issued.

The findings for the 2021 annual drinking water system inspections is included in this report. Below is a summary of the key findings for the inspection:

### **Nanticoke Drinking Water System – DWS# 210001558**

There were no non-compliance identified during the 2021 inspection period. The County received a **100%** inspection rating from the MECP.

Haldimand County continues to work closely with regulatory bodies to ensure a continued supply of safe, reliable drinking water to its users. All recommendations have been addressed and communicated to the MECP.

# REPORT AVAILABILITY

This report can be viewed online at:

<https://www.haldimandcounty.ca/drinking-water/>

Reports can also be obtained upon request at the Haldimand County Administration Building:



## **Cayuga Administration Building**

53 Thorburn St. S.

Cayuga, ON

N0A 1E0

For more information on report content, please contact the Haldimand County Environmental Operations Division at:

Email: [wwwops@haldimandcounty.on.ca](mailto:wwwops@haldimandcounty.on.ca)

Telephone: 905-318-5932

# Appendix A

## Inorganic and Organic Sample Results

### Inorganic Parameters:

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	March 1, 2021	ND	ug/L	No
Arsenic	March 1, 2021	0.4	ug/L	No
Barium	March 1, 2021	21.8	ug/L	No
Boron	March 1, 2021	19	ug/L	No
Cadmium	March 1, 2021	0.006	ug/L	No
Chromium	March 1, 2021	ND	ug/L	No
Mercury	March 1, 2021	ND	mg/L	No
Nitrite	February 2, 2021 May 3, 2021 August 2, 2021 November 1, 2021	ND	mg/L	No
Nitrate	February 2, 2021 May 3, 2021 August 2, 2021 November 1, 2021	0.259 0.172 0.164 0.223	mg/L	No
Selenium	March 1, 2021	0.21	ug/L	No
Uranium	March 1, 2021	0.090	ug/L	No

**ND** = Not Detectable

## Organic Parameters:

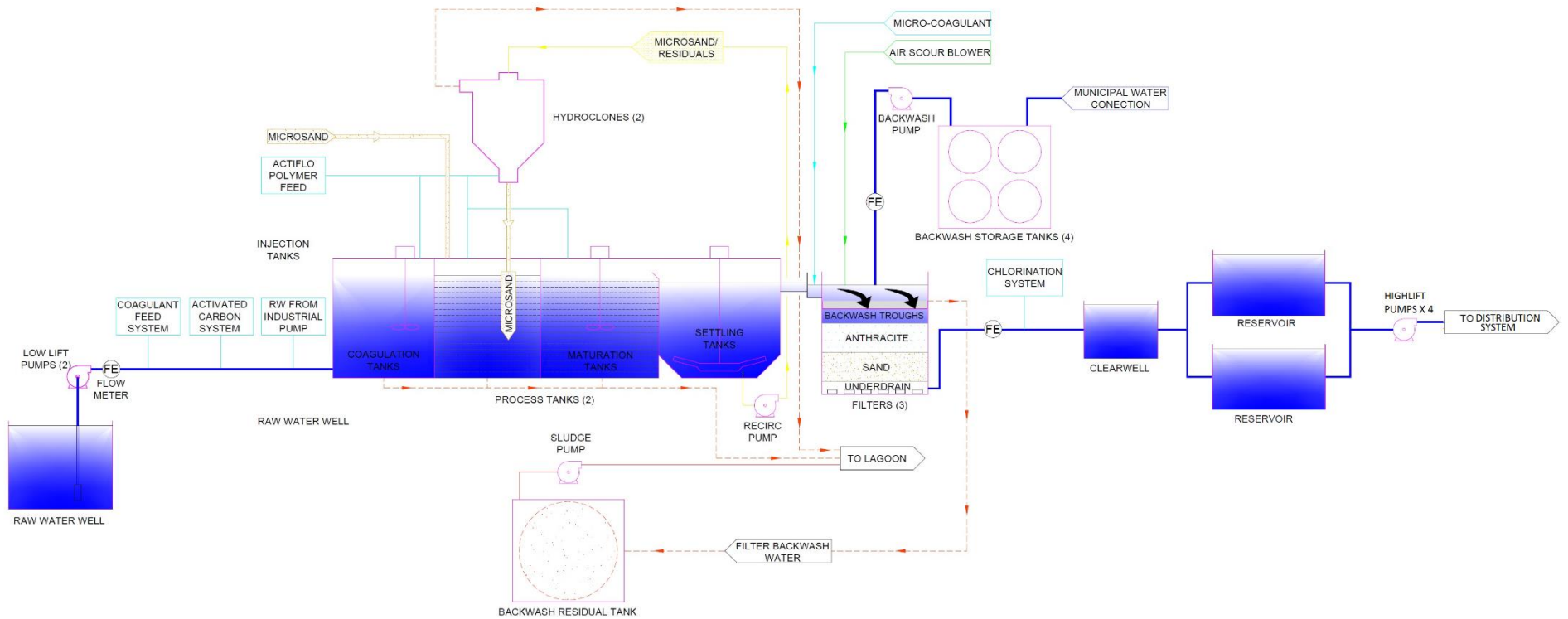
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	March 1, 2021	ND	ug/L	No
Atrazine + Metabolites	March 1, 2021	ND	ug/L	No
Azinphos-methyl	March 1, 2021	ND	ug/L	No
Benzene	March 1, 2021	ND	ug/L	No
Benzo(a)pyrene	March 1, 2021	ND	ug/L	No
Bromoxynil	March 1, 2021	ND	ug/L	No
Carbaryl	March 1, 2021	ND	ug/L	No
Carbofuran	March 1, 2021	ND	ug/L	No
Carbon Tetrachloride	March 1, 2021	ND	ug/L	No
Chlorpyrifos	March 1, 2021	ND	ug/L	No
Diazinon	March 1, 2021	ND	ug/L	No
Dicamba	March 1, 2021	ND	ug/L	No
1,2-Dichlorobenzene	March 1, 2021	ND	ug/L	No
1,4- Dichlorobenzene	March 1, 2021	ND	ug/L	No
1,2- Dichloroethane	March 1, 2021	ND	ug/L	No
1,1- Dichloroethylene	March 1, 2021	ND	ug/L	No
Dichloromethane (Methylene Chloride)	March 1, 2021	ND	ug/L	No
2,4- Dichlorophenol	March 1, 2021	ND	ug/L	No
2,4- Dichlorophenoxy acetic acid (2,4-D)	March 1, 2021	ND	ug/L	No
Diclofop-methyl	March 1, 2021	ND	ug/L	No
Dimethoate	March 1, 2021	ND	ug/L	No
Diquat	March 1, 2021	ND	ug/L	No
Diuron	March 1, 2021	ND	ug/L	No
Glyphosate	March 1, 2021	ND	ug/L	No
Malathion	March 1, 2021	ND	ug/L	No
MCPA	March 1, 2021	ND	ug/L	No
Metolachlor	March 1, 2021	ND	ug/L	No
Metribuzin	March 1, 2021	ND	ug/L	No
Monochlorobenzene (Chlorobenzene)	March 1, 2021	ND	ug/L	No
Paraquat	March 1, 2021	ND	ug/L	No
Pentachlorophenol	March 1, 2021	ND	ug/L	No
Phorate	March 1, 2021	ND	ug/L	No
Picloram	March 1, 2021	ND	ug/L	No
Prometryne	March 1, 2021	ND	ug/L	No
Simazine	March 1, 2021	ND	ug/L	No
Terbufos	March 1, 2021	ND	ug/L	No
Tetrachloroethylene	March 1, 2021	ND	ug/L	No
2,3,4,6- Tetrachlorophenol	March 1, 2021	ND	ug/L	No
Total PCBs	March 1, 2021	ND	ug/L	No
Triallate	March 1, 2021	ND	ug/L	No
Trichloroethylene	March 1, 2021	ND	ug/L	No
2,4,6- Trichlorophenol	March 1, 2021	ND	ug/L	No
Vinyl Chloride	March 1, 2021	ND	Ug/L	No

**ND** = Not Detectable

## Microcystin Sample Results

Parameter	Sample Date	Raw Water Results	Treated Water Results	Unit of Measure	Exceedance
Microcystin	May 3, 2021	0.10	ND	ug/L	No
	June 7, 2021	0.10	ND		
	June 14, 2021	0.10	ND		
	June 21, 2021	0.10	ND		
	June 28, 2021	0.10	ND		
	July 5, 2021	0.10	ND		
	July 12, 2021	0.10	ND		
	July 19, 2021	0.10	ND		
	July 26, 2021	0.10	ND		
	August 2, 2021	0.10	ND		
	August 10, 2021	0.10	ND		
	August 23, 2021	0.10	ND		
	August 30, 2021	0.10	ND		
	September 6, 2021	0.10	ND		
	September 13, 2021	0.10	ND		
	September 23, 2021	0.10	ND		
	September 30, 2021	0.10	ND		
	October 4, 2021	0.10	ND		
	October 12, 2021	0.10	ND		
	October 18, 2021	0.10	ND		
	October 25, 2021	0.10	ND		

**ND** = Not Detectable



**SIMPLIFIED PROCESS FLOW DIAGRAM**  
NANTICOKE WATER TREATMENT PLANT

LEGEND	
—	AIR TRIM
—	CHEMICAL TRIM
—	LIQUID TRIM
—	RESIDUAL TRIM
—	SUPERNATANT TRIM
—	SLUDGE/SUPERNATANT TRIM