

1. Incidents of Regulatory Non-Compliance: Drinking Water Systems

The following Incidents of Regulatory Non-Compliance with the terms and conditions of the Drinking Water Works Permit or the Municipal Drinking Water License, O.Reg 170/03 – Drinking Water Systems and O.Reg 169/03 – Ontario Drinking Water Quality Standards are noted:

Chatham Drinking Water System

Filtration, Inadequate Filtration to meet the regulatory requirements

- 1 instance of elevated filter discharge turbidity

Wheatley Drinking Water System

Filtration, Inadequate Filtration to meet the regulatory requirements

- 1 instance of elevated filter discharge turbidity

Adverse Water Quality Incidents:

Chatham Drinking Water System (including Dover, North Kent & Thamesville)

Bacteriological Sample Results

- 2 instances of Total Coliforms in a distribution sample

Elevated Filter Discharge Turbidity

Ridgetown Drinking Water System

Pressure Loss in the Distribution System

- 3 instances of pressure less than 20 psi

57-month reporting period for naturally occurring substances greater in concentration than the drinking water quality standards

- Fluoride
- Sodium

Wallaceburg Drinking Water System

Bacteriological Sample Results

- 1 instance of Total Coliforms in a distribution sample

Pressure Loss in the Distribution System

- 1 instance of pressure less than 20 psi

Wheatley Drinking Water System

Pressure Loss in the Distribution System

- 2 instances of pressure less than 20 psi

Spill Event

- 1 Chlorine gas leak vented to atmosphere

2. Incidents of Regulatory Non-Compliance: Wastewater Systems

The following incidents of Regulatory Non-Compliance with the terms and conditions of the Environmental Certificates of Approval (ECA - Provincial), and the Wastewater Systems Effluent Regulation (WSER - Federal) are noted:

Blenheim & Charing Cross Wastewater System

Bypass Event

- 1 planned bypass of the sand filtration process

Chatham Wastewater System

Bypass Event

- 1 emergency bypass of the disinfection process

Overflow Events

- 8 emergency overflow events at pump stations in the collection system

Dresden Wastewater System

Effluent Limit Exceedances

- 1 Five-day Carbonaceous Biochemical Oxygen Demand concentration in the final effluent
- 1 Total Phosphorus concentration in the final effluent
- 1 Total Suspended Solids concentration in the final effluent
- 1 Escherichia coli average geometric concentration in the final effluent
- 1 Total Suspended Solids final effluent waste loading average

Mitchell's Bay Wastewater System

Effluent Limit Exceedances

- 1 event - Federal Wastewater System Effluent Regulations

Tilbury Wastewater System

Bypass Event

- 1 emergency bypass of the disinfection process

Effluent Limit Exceedance

- 1 Total Ammonia Nitrogen concentration in the final effluent

Wallaceburg Wastewater System

Bypass Event

- 1 emergency bypass of the secondary treatment

Wheatley Wastewater System

Bypass Events

- 2 planned bypasses of the disinfection process

Spill Event

- 1 Chlorinated effluent discharge to Lake Erie

Effluent Limit Exceedances

- 4 final effluent pH values lower than 6.0
- 12 Total Residual Chlorine concentrations in the final effluent
- 1 Total Suspended Solids concentration in the final effluent

3. Deviations for Critical Control Points – Drinking Water Systems

A Critical Control Point is an essential step or point in the system where controls are applied to prevent or eliminate a hazard or to reduce it to an acceptable level. The following incidents of Deviation from Critical Control Points occurred:

Chatham Drinking Water System

Filtration, Inadequate Filtration to meet the regulatory requirements

- 1 instance of elevated filter discharge turbidity

Ridgetown Drinking Water System

Distribution System Pressure Loss

- 2 instances due to watermain breaks

Wallaceburg Drinking Water System

Distribution System Pressure Loss

- 1 instance due to a power interruption that faulted the high lift pumps

Wheatley Drinking Water System

Filtration, Inadequate Filtration to meet the regulatory requirements

- 1 instance of elevated filter discharge turbidity

Secondary Disinfection, Deterioration of Chlorine Residual

- 2 instances due to equipment impairment

4. Deviations for Critical Control Points – Wastewater Systems

A Critical Control Point is an essential step or point in the system where controls are applied to prevent or eliminate a hazard or to reduce it to an acceptable level. The following incidents of Deviation from Critical Control Points occurred:

Chatham Wastewater System

Failure of Equipment or Process Associated with Aeration

- 1 instance of inadequate dissolved oxygen concentrations

Wheatley Wastewater System

Failure of Equipment or Process Associated with Aeration

- 3 instances of inadequate dissolved oxygen concentrations

5. Effectiveness of the Risk Assessment Process

During the Risk Assessment process, hazardous events to the drinking water systems and wastewater systems are identified. Available Controls to address the Hazardous Events are determined. Based on the Available Controls, rankings for Consequence, Likelihood and detectability are established.

Based on the above rankings Critical Control Points are determined and Critical Control Limits are implemented.

Infrastructure Review / Infrastructure Maintenance, Rehabilitation and Renewal activities are also reviewed and updated for any relevant infrastructure and associated equipment with regards to Hazardous Events and Available Controls.

Risk Assessments are completed as a cycle. After creation and implementation, reviews are completed each year for 2 years, the 3rd year being a renewal of the risk assessments.

During 2024, reviews of the risk assessments were conducted. The controls were reviewed for accuracy and updated accordingly. There were no significant changes to the risk assessments.

6. Internal and External Audit Results

Internal Auditing

Internal Auditing is the Check process of the Drinking Water Quality Management System (DWQMS) cycle. Internal audits are a self-evaluation of the Quality Management System (QMS), to determine if the Chatham-Kent Public Utilities Commission (CK PUC) is conforming to the requirements of the standard.

Internal Audits are conducted on an on-going basis scheduled throughout the year. Internal auditing is conducted by trained representatives of the PUC's Compliance & Quality Standards department.

Audits are conducted with co-operation from PUC Operations, Engineering, Compliance and Management staff. Audits are also conducted with co-operation from PW staff.

Internal Auditing findings from 2024 demonstrated that our QMS's were meeting the requirements of the standard. The majority of Corrective Action Requests (CARs) were issued as a non-conformity to a procedure or requirement and/or documentation/record keeping. Corrective Action was undertaken, in an attempt to rectify the issues.

Opportunities for Improvement (OFIs) were recognized where conformance to the requirement is determined, but there is an opportunity for improvement.

Preventative Action Requests (PARs) were identified to prevent the occurrence of non-conformances.

External Audits

Reaccreditation Audit

The 2023 reaccreditation audit was not completed until 2024 due to scheduling issues with the accreditation authority and resulted in the issuance of 1 Major Nonconformity and 2 Minor Nonconformities.

Major Nonconformity:

Element 5 – Document & Records Control:

Watermain repair records were not being completed in full. This is a repeat non-conformance from 2020.

- Immediate Corrective Action:
 - Public Works Managers to review the logbooks every 2 weeks for omissions and report non-conformances to the responsible Supervisor.
- Root Cause Analysis Actions:
 - Corrective Action is to create a Water Info Notifications procedure, simplify the recorded information in the logbooks (eliminating redundancies) and provide in-person training.
 - Main Repair Logbook template has been revised. New Main Repair Logs have been prepared and distributed to the Public Works Supervisors.
 - New Water Info Notifications procedure was created and implemented.
 - In-person training has been conducted with all relevant staff.
 - Internal audits were conducted to review the immediate corrective action and root cause analysis corrective actions; corrective actions and training were found to have been successfully implemented.

Surveillance Systems Audit

A desktop audit of the operational plans for the subject system to assess whether the documented QMS meets the PLAN requirements of the DWQMS V2.

- Conformance: The management system is effectively implemented and maintained and meets the requirements of the standard relative to the scope of the audit.
- Opportunities for Improvement: It was suggested to consider water main breaks as emergency events rather than critical control points due to the lack of control over their occurrence. This suggestion will be considered during the next Risk Assessment Renewal.

7. Results of Emergency Response Testing

The annual 2024 CK PUC Mock Emergency was conducted in the form of response to reduced water treatment and supply capabilities at the Ridgetown Drinking Water System following a severe summer storm.

The Mock Emergency captured the availability of emergency/standby power, the approximate times before reservoir depletions, and actions taken for immediate response and recovery of the Ridgetown Drinking Water System.

8. Operational Performance: Drinking Water Systems

Rated Capacity Data

DRINKING WATER SYSTEM	RATED CAPACITY m ³	AVERAGE DAILY FLOW m ³	% of RATED CAPACITY	MAXIMUM DAILY FLOW m ³	% of RATED CAPACITY
Bothwell	--	260	--	512	--
Chatham	67,999	30,014	44	40,722	60
Ridgetown (Erie)	2,780	1,095	39	2,412	87
Ridgetown (Scane)	1,310	520	40	1,021	78
South CK	22,809	10,159	45	12,097	53
Wallaceburg	13,600	4,195	31	8,247	61
Wheatley Temporary Treatment Plant	8,640	4,460	52	7,279	84

There were no significant operational issues encountered, as a result of, system deficiencies during this reporting period.

The Wheatley Temporary Treatment Plant came online on May 13, 2024, and supplied the Wheatley Distribution System until November 12, 2024, when it was shut down for the winter. The new Wheatley Temporary Water Treatment Plant draws raw water from Lake Erie. Raw water is pumped through strainers to filter out any large debris. The water then is filtered by membrane filtration trains contained in trailers. After filtration the water is disinfected with chlorine before being pumped to the distribution system.

While the Wheatley Temporary Treatment Plant is not in use, the Wheatley Water Distribution System received treated water through multiple interconnects from the South Chatham-Kent Drinking Water System and from the Leamington Distribution System. The Leamington Distribution System is fed from the Union Water Supply System (UWSS), a system which receives water from the Ruthven Water Treatment Plant (RWTP) located in the hamlet of Ruthven in the Town of Kingsville, Ontario and draws water from Lake Erie.

Water was hauled by bulk water truck to the Tilbury Reservoir, as required, to maintain supply in the Tilbury area of the distribution system. Consumers and water users and residents have been asked to conserve water.

Watermain Breaks

DRINKING WATER SYSTEM	# of WATERMAIN BREAKS
Bothwell	0
Chatham	
Chatham	40
Dresden	5
Mitchell's Bay	0
Pain Court	0
Thamesville	0
Ridgetown	
Ridgetown	6
Highgate	0
South CK	
Blenheim	6
Cedar Springs	1
Charing Cross	0
Dealtown	1
Erieau	0
Merlin	3
Shrewsbury	0
Wallaceburg	25
Wheatley	
Wheatley	3
Tilbury	7
TOTAL	97

9. Operational Performance: Wastewater Systems

Rated Capacity Data

WASTEWATER SYSTEM	RATED CAPACITY m ³	AVERAGE DAILY FLOW m ³	% of RATED CAPACITY	MAXIMUM DAILY FLOW m ³
Blenheim	4,045	2,848	70	6,141
Chatham	36,000	23,194	64	59,250
Dresden	4,546	1,533	34	4,042
Merlin	464	175	38	768
Mitchell's Bay	509	151	30	837
Ridgetown	2,347	1,910	81	4,341
Tilbury	5,434	2,593	48	10,805
Wallaceburg	10,800	6,796	63	31,850
Wheatley	2,752	1,900	69	7,164

There were no significant operational issues encountered, as a result of system deficiencies during this reporting period, with the following exceptions:

Blenheim Wastewater System

Waterfowl that nest on the tertiary sand filters defecate on the sand filters leading to increased concentrations of *Escherichia coli* discharged in the final effluent from the treatment system.

Algae growth in lagoon cells during the summer months is pumped onto the sand filters resulting in sand filter media plugging, restricting the filtration flow and potential removal of nutrients and bacteria. Ultrasonic transducers were installed in lagoon cells 4 and 5 to eradicate the algae with ultrasonic waves, but the units were only operational for a short time before they malfunctioned. Due to the algal growth and fouling/plugging of the sand filters, a planned bypass of the sand filters was required.

Dresden Wastewater System

During a seasonal produce production run, the treatment plant experienced high concentrations and loadings of organic parameters. Monitoring is increased during the food processing production season. Operational adjustments were made within the best of abilities with the operational capacity of the system, however elevated concentrations of organic parameters, solids, nutrients, and *Escherichia coli* were found in the effluent.

Tilbury Wastewater System

The total ammonia-nitrogen concentration in the final effluent was elevated in the month of August due to two separate events. The first being a plant washout resulting from heavy wet weather and the second, a faulty seal in the bottom of Secondary Clarifier #1 that reduced the volume of settled activated sludge ability to be pumped back as return activated sludge to the biological treatment system. The seal was promptly repaired.

Wheatley Wastewater System

A change in influent wastewater characteristics that started in mid-January 2024 posed several challenges such as treatment of increased solids, phosphorus, and decreased pH. Increased industrial sampling was conducted in the month of March and concluded once the influent quality returned to typical influent wastewater characteristics.

Prior to the construction and commissioning of the de-chlorination system, the regulations were changed for final effluent total residual chlorine exceedances from monthly averages to single sample results. De-chlorination pucks, which are effective but require constant maintenance, monitoring and upkeep, were being used until the de-chlorination system was commissioned on August 13th, 2024.

10. Raw Water Supply & Drinking Water Quality Trends**Raw Water Supply*****Ground Water (Ridgetown Drinking Water System)***

Well # 2 (Hitch) continues to exhibit a steady increasing trend in raw water turbidity.

Naturally occurring Fluoride and Sodium concentration remain consistently above the drinking water quality standards.

Lake Erie (Chatham, South Chatham-Kent & Wheatley Drinking Water Systems)

The monthly average temperature of the incoming lake water at the South CK and Wheatley Water Treatment plant intakes has risen approximately 2.5 °C from 2008 to 2024.

Chenal Ecarte (Wallaceburg Drinking Water System)

The trending of the monthly average turbidity of the incoming river water at the Wallaceburg Water Treatment Plant intake has continued to decrease from 2008 to 2024.

Treated Drinking Water

The total volume of treated drinking water has been trending upwards from 2008 to 2024, however the volume produced in 2024 was approximately 7% lower than that of 2023.

Wallaceburg Drinking Water System

The treated water continues to exhibit decreasing concentrations of Nitrates.

Distribution Water

Bothwell Drinking Water System (DWS), Chatham DWS, South CK DWS, and Wallaceburg DWS continue to exhibit sustained or reduced concentrations of disinfection by-products, THM's (Trihalomethanes).

Chatham DWS, South CK DWS, and Ridgetown DWS continue to exhibit sustained or reduced concentrations of disinfection by-products, HAA's (Haloacetic Acids).

Distribution water continues to see decreased concentrations of THM's in the drinking water due to the installation of hydrodynamic mixing systems in elevated tanks, when rehabilitation/improvements are completed.

Ridgetown DWS has exhibited increased THM's since expansion of the distribution system to Highgate, however decreases in concentration have been observed during 2022 to present.

The increase in concentrations of both disinfection by-products (THM and HAA) in the Wheatley DWS in 2024 could be attributed to the longer distance the water is required to travel when the temporary treatment plant is not in operation and the water is being supplied through the interconnects with the South CK DWS and the Leamington Union DWS.

11.Raw Wastewater Influent & Effluent Quality Trends

Raw Wastewater Influent

With respect to raw wastewater influent trends, collection was consistent in 2024 with previous years. Total collection totalled 14,729,001 m³, an increase of approximately 1% from, 14,476,430 m³ in 2023. Precipitation received in Chatham-Kent in 2024 increased by 28% from 2023.

Dresden Wastewater System

Trending of increased concentrations of Total Suspended Solids, Total Phosphorus and Biochemical Oxygen Demand (BOD) observed since 2021, potential due to a seasonal produce production run at a local industry.

Wastewater Effluent

Effluent quality discharged from the wastewater systems was typical of previous years with no significant elevations in parameter concentrations. Effluent quality complied with the Environmental Compliance Approval limits the majority of the reporting year, with some exceptions due to events.

12. Changes that could affect the Quality Management Systems**MECP Disinfection Procedures – Currently in final draft status (Not implemented at this time)**

Technical Working Group developed procedures:

- Water Treatment Plant Disinfection Procedure to replace AWWA Standard C653
- Water Storage Facility Disinfection Procedure to replace AWWA Standard C652
- Well Disinfection Procedure to replace AWWA Standard C654

13. Consumer Feedback

2024 Drinking Water System feedback received as complaints or inquiries.

DRINKING WATER SYSTEM	TASTE & ODOUR	COLOUR	LOW PRESSURE	OTHER
Bothwell				
Chatham				
Chatham	4	19	9	7
Dresden	1	3	1	1
Mitchell's Bay				
Pain Court		1	1	
Thamesville			1	
Ridgetown				
Ridgetown	3	5	2	
Highgate				
South CK				
Blenheim		4	1	
Charing Cross		2	1	
Dealtown			1	
Erieau				
Merlin		1		
Shrewsbury				
Wallaceburg	1	6	1	1
Wheatley				
Wheatley	4	4	1	3
Tilbury	2	1	1	4
TOTALS	15	46	20	16

2024 Wastewater System feedback received as complaints or inquiries.

WASTEWATER SYSTEM	ODOUR	OTHER
Blenheim & Charing Cross		
Chatham		
Dresden		
Merlin		
Mitchell's Bay		
Ridgetown & Thamesville		
Tilbury		
Wallaceburg		
Wheatley	1	
TOTALS	1	

14. Resources Needed to Maintain the Quality Management Systems

1. Electronic Document Management System
 - a. Software
 - b. Annual Maintenance
 - c. On site backup of every document
2. Quality Management System Representative
 - a. Wages
 - b. Workstation
3. Administrative Costs
 - a. Travel for Conferences, Meetings
 - b. Stationery, photocopies
4. Internal Auditing Staff
 - a. Captured through Compliance Staff
5. External Audit Fee
 - a. Budgeted annually
6. Permit To Take Water Renewals
7. Municipal Drinking Water Renewals / Applications
8. Drinking Water Works Permit Amendments
9. Environmental Compliance Approval Applications / Amendments

15. Results of the Infrastructure Review

Infrastructure Addition, Renewal, Rehabilitation and Replacement projects and activities underway or completed in 2024:

Bothwell Drinking Water System (including Dover, North Kent & Thamesville)

Addition

- Standby Power: Permanently connected generator for Elevated Tank

Chatham Drinking Water System (including Dover, North Kent & Thamesville)

Replacement

- Wyandott Street, Chatham Watermain Replacement (Chippewa Drive to Cecile Avenue)

Ridgetown Drinking Water System

Replacement

- Cathcart Street, Ridgetown Watermain Replacement (Head St to Cunningham Ave)
- Raw Water Pumping: Replacement Well Pump Motor for Well #3A (Harris)

South Chatham-Kent Drinking Water System**Replacement**

- Merlin Road, Queen's Line & Merlin Road Intersection Improvements (110m south to 70m north of Queens Line-Merlin Road intersection)

Wallaceburg Drinking Water System**Replacement**

- Elizabeth Street, Wallaceburg Watermain Replacement (Lorne Avenue to Lisgar Street)
- Lisgar Street, Wallaceburg Watermain Replacement (Elizabeth Street to Elgin Street)

Rehabilitation

- Bridal Path Road, Wallaceburg Watermain Relining (Bridal Path Road, Bethel Road, Winners Circle, and Paddock Rd)

Wheatley Drinking Water System**Addition**

- Wheatley Temporary Treatment Plant

Replacement

- Hillside Road, Wheatley Watermain Replacement (offset over the Joseph Julian Drain)
- 4th Concession, Wheatley Watermain Replacement (under the Baker Drain)

Blenheim & Charing Cross Wastewater System**Replacement**

- Chittim Road Pump Station: Various pump station components and appurtenances

Chatham Wastewater System**Addition**

- Standby Power: Permanently connected 200kW generator for Pump Station #2

Renewal

- Selkirk Street, Chatham Sewer Separation (Van Allen Avenue to Memory Lane)
- Wyandott Street, Chatham Sewer Separation (Chippewa Drive to Cecile Avenue)

Replacement

- Raw Sewage Pumping: Pump Station #11 (2 pumps)

Dresden Wastewater System**Replacement**

- Standby Power: 250kW Diesel Generator for the treatment plant

Ridgetown & Thamesville Wastewater System**Replacement**

- Cathcart Street, Cathcart Sewer Replacement (Head Street to Cunningham Avenue)

Wallaceburg Wastewater System**Renewal**

- Standby Power: Libby Street Pump Station

Replacement

- Elizabeth Street, Wallaceburg Sanitary Sewer Replacement (Lorne Avenue to Lisgar Street)
- Lisgar Street, Wallaceburg Sanitary Sewer Replacement (Elizabeth Street to Elgin Street)

Wheatley Wastewater System**Addition**

- De-chlorination System

16. Operational Plan Currency, Content and Updates

Annual review of all 21 Water & Wastewater Operational Plan Elements were reviewed by the Management Team. Revisions were completed as necessary.

Numerous System Level Procedures, Standard Operating Procedures and associated documents were reviewed by the applicable staff. Revisions were completed as necessary.

New System Level Procedures and site-specific Procedures and documents were created and implemented.

Document and procedure revisions or creations required by the new Wastewater Collection Consolidated Linear Infrastructure (CLI) ECA's have been completed and continue to be undertaken.

The 2020 regulated Water and Wastewater Records were archived at the McGeorge warehouse after remaining on site at the facilities for 3 years. After a period of 12 additional years these records will be released for retrieval or destruction.

The 2008 regulated Water Records were released for destruction, following a retrieval period issued.

17. Staff Suggestions

pH Analyzer (Benchtop & Portable) Calibration Log Sheet

Draft version prepared and provided to operations & maintenance staff for review and comments

- 2 Chief Operators reviewed with staff and reached out with comments and suggestions for revisions to the template for implementation

18. Continual Improvement

Best Management Practices published by the Ministry:

None currently published by the MECP.

Best Management Practices from Ministry Inspection Reports:

None issued by the MECP in 2024.

Procedure Revisions & Development:

Numerous procedure revisions and developments were completed in 2024 to include new, update/revise or to obsolete content and information, as well as, inclusion of any Quality Management Standard requirements or regulatory requirements from the Municipal Drinking Water Licence, Drinking Water Works Permit, Environment Compliance Approvals, or regulations, bulletins, etc.

Examples:

- Water and Wastewater Monitoring, Responding to, Reporting and Recording Deviations to a Critical Control Point Procedure revised & Log sheets implemented.
- Water and Wastewater Communication Procedures revised and implemented.
- Traffic Protection Plans revised to comply with new OTM Book 7 Temporary Conditions revisions.

pH Analyzer Verification and Calibration:

Developed and implemented for review and documentation of buffer expiration dates and calibration of analyzer.

Virtual Staff Training Sessions:

Reduces the requirement to schedule multiple training sessions to ensure applicable staff receive the required training.