

The Corporation of the County of Brant

Drinking Water Quality Management Standard Operational Plan (062-401)

Airport Drinking Water System

MDWL: 062-101

DWWP: 062-201

Cainsville Distribution System

MDWL: 062-102

DWWP: 062-202

Mt. Pleasant Drinking Water System

MDWL: 062-103

DWWP: 062-203

Paris Drinking Water System

MDWL: 062-105

DWWP: 062-205

St. George Drinking Water System

MDWL: 062-104

DWWP: 062-205

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 24, 2023	Version Number: 10

Index

Element	Current Revision Date (mm/dd/yyyy)	Version Number
Element 1: Quality Management System	04/18/2019	8
Element 2: Quality Management System Policy	06/17/2020	8
Element 3: Commitment and Endorsement	05/16/2023	11
Element 4: Designated QMS Representative	11/09/2023	10
Element 5: Document and Record Control	11/09/2023	14
Element 6: Drinking Water Systems	03/14/2023	22
Element 7: Risk Assessment	11/09/2023	12
Element 8: Risk Assessment Outcomes	10/17/2023	19
Element 9: Organizational Structure, Roles, Responsibilities and Authorities	11/09/2023	18
Element 10: Competencies	11/09/2023	13
Element 11: Coverage	11/24/2023	18
Element 12: Communications	11/09/2023	11
Element 13: Essential Supplies and Services	10/06/2023	18
Element 14: Review and Provision of Infrastructure	10/26/2023	14
Element 15: Infrastructure Maintenance, Rehabilitation and Renewal	11/10/2023	12
Element 16: Sampling, Testing & Monitoring	01/20/2022	13
Element 17: Measurement & Recording Equipment Calibration & Maintenance	10/18/2022	13
Element 18: Emergency Management	01/21/2022	10
Element 19: Internal Audits	01/21/2022	9
Element 20: Management Review	11/10/2023	15
Element 21: Continual Improvement	09/22/2022	12

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 24, 2023	Version Number: 10

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Creation of index.	02/17/2022	Water Technologist	1
2	Element 5 Updated Element 9 Updated	03/30/2022	Water Technologist	2
3	Element 8	04/13/2022	Water Technologist	3
4	Elements 3,6,8,9,10,11,13, 14, 17, and 20	10/20/2022	Water Technologist	4
5	Element 11	02/27/2023	Water Technologist	5
6	Element 6	03/14/2023	Water Technologist	6
7	Element 13	10/06/2023	Water Technologist	7
8	Element 14	10/26/2023	Environmental Services Technologist	8
9	Elements 4, 5, 7, 9, 10, 12	11/13/2023	Environmental Services Technologist	9
19	Element 11	11/124/2023	Environmental Services Technologist	10

Schedule "C"

Subject System Description Form				
Municipal Residential Drinking Water System				
Owner of Municipal Residential Drinking Water System:	The Corporation of the County of Brant			
Subject Systems				
Name of Drinking Water System	Licence Number	Name of Operational Subsystems	Name of Operating Authority	DWS Number
Airport Drinking Water System	062-101	NA	The Corporation of the County of Brant	220002743
Cainsville Distribution System	062-102	NA	The Corporation of the County of Brant	260002616
Mt. Pleasant Drinking Water System	062-103	NA	The Corporation of the County of Brant	210000069
Paris Drinking Water System	062-105	NA	The Corporation of the County of Brant	220002752
St. George Drinking Water System	062-104	NA	The Corporation of the County of Brant	220002734
Contact Information for Questions Regarding the Operational Plan				
Name	Title	Phone No.(s)	Email	
Primary: David Stevenson	Environmental Services Technologist/QMS Representative	519-761-2443 519-449-2451 ex.2233	david.stevenson@brant.ca	
Secondary: Kristina Hall	Water Quality Technician	519-732-5589 519-449-3300 ex.2205	kristina.hall@brant.ca	

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: April 18, 2019	Version Number: 8

1. Quality Management System

The County of Brant Drinking Water Quality Management System (QMS) is documented in this Operational Plan as part of the County's efforts to ensure that clean, safe and reliable drinking water is supplied to all customers served by the County of Brant's Drinking Water Systems. The development, implementation and continual improvement of the Quality Management System will ensure that all regulatory and legislative requirements are met and that consumers can be confident that their drinking water will be protected through the effective application of the QMS.

This Quality Management System was developed to meet the Ministry of the Environment Drinking Water Quality Management Standard 2.0 (DWQMS).

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Minor revisions to wording.	05/02/2017	David Stevenson	7
2	Revised to note DWQMS 2.0	04/18/2019	David Stevenson	8

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: June 17, 2020	Version Number: 8

2. Quality Management System Policy

This policy serves as the foundation of the County of Brant's Quality Management System. The policy will be communicated to all Environmental Services Water Operations personnel through orientation sessions and by being posted at specific drinking water facilities and the Environmental Services office. The policy is posted on the County's web site for communication to staff and the public. Owners of the systems are made aware of the policy through orientation sessions.

The County of Brant Quality Management Policy

"The County of Brant is committed to providing its consumers a safe drinking water supply that meets the requirements of all applicable regulations and legislation. We are committed to the implementation, maintenance, and continual improvement of the Drinking Water Quality Management Standard. The County shall require the principles of the Quality Management System in the operation, design and construction of the County's Drinking Water Systems be followed."

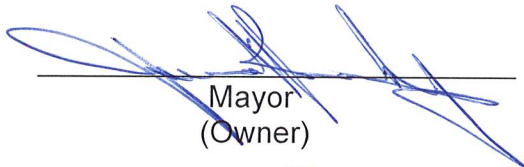
REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Included the word regulations to conform to the wording provided in the standard.	04/18/2019	David Stevenson	7
2	Updated term Water Division personnel to Environmental Services Drinking Water personnel and Water Division office to Environmental Services office	06/17/2020	D. Stevenson	8

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: May 16, 2023	Version Number: 11

3. Commitment and Endorsement

The Owner, represented by the Mayor and Municipal Council, the members of Top Management (as defined by the DWQMS) and the Quality Management System Representative of the Corporation of the County of Brant have demonstrated their endorsement of this Operational Plan by applying their signatures below. The Operational Plan will always be reviewed and continually improved. The Operational Plan will be used for the planning, operation, and maintenance of the County of Brant's Municipal Residential Drinking Water Systems.

Endorsed by:



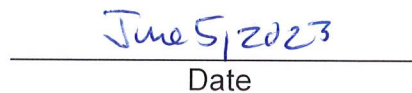
Mayor
(Owner)



Date



General Manager of Operations
(Top Management)



Date



Director of Environmental Services
(Top Management)



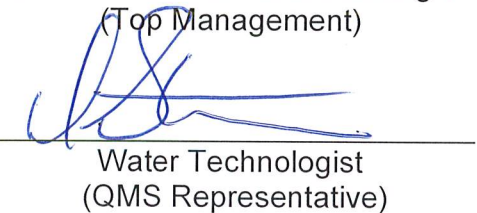
Date



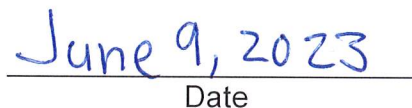
Environmental Services Manager
(Top Management)



Date



Water Technologist
(QMS Representative)



Date

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: May 16, 2023	Version Number: 11

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Added the Water Operation Superintendent as a member of Top Management	11/14/2013	Water Technologist	7
2	Added the General Manager of Operations as a member of Top Management	06/03/2019	Water Technologist	8
3	Director of Water updated to Director of Environmental Services.	06/17/2020	Water Technologist	9
4	Updated Water Operations Superintendent to Environmental Services Manager	10/18/2022	Water Technologist	10
5	New term of Council. Element 3 signed.	05/16/2023	Water Technologist	11

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 9, 2023	Version Number: 10

4. Designated QMS Representative

- 4.1. The County of Brant has designated the Environmental Services Technologist as the QMS Representative.
- 4.2. In the event the Environmental Services Technologist is away for an extended period or QMS related items need to be addressed immediately while the Environmental Services Technologist is out of the office for a meeting, is ill or is on vacation, the Water Quality Technician will fulfill the requirements of the QMS Representative.
- 4.3. The QMS Representative will be responsible for the following:
- a) Ensuring the processes and procedures needed for the QMS are established and maintained.
 - b) Reporting to the Owner and Top Management on the performance of the QMS and any need for improvement, as needed, or during the Management Review meetings.
 - c) Reviews, controls, revises, creates, and approves QMS documentation.
 - d) Implementation and oversight of document control procedure.
 - e) Through training, making appropriate personnel aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system.
 - f) Promoting awareness of the QMS throughout the County's Divisions as required.
 - g) Liaison for internal auditing and external audits.

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Revised to note the change from Public Works Division to Operations Division	10/05/2015	David Stevenson	7
2	Revised to note the Water Records Management Clerk as the back up to the Water Technologist.	05/04/2017	David Stevenson	8
3	Revised to note the Water Quality Technician as the back up to the Water Technologist.	08/20/2018	David Stevenson	9
4	Updated Water Technologist to Environmental Services Technologist.	11/09/2023	Environmental Services Technologist	10

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 14

5. Document and Record Control

5.1. QMS Internal and External Document Control (Other than Records)

5.1.1. Overview

This procedure is applicable to the following QMS Documents:

a) Internal Documents

- Operational Plan
- Standard Operating Procedures
- QMS and Regulatory Forms and Documents
- Operation and Maintenance Manuals
- Emergency Response and Contingency Plan

b) External Documents

- Equipment Manuals
- Applicable Provincial Drinking Water Regulations, Forms and Applications
- Applicable Municipal Bylaws
- Applicable Industry Standards

5.1.2. Creating New or Revising Existing Internal Documents, Forms and Standard Operating Procedures

- a) Requests for the creation of new or revisions to existing QMS documents, QMS forms or Standard Operating Procedures will be made through the QMS Representative.
- b) The creation of new or revisions to an existing QMS documents, QMS forms or Standard Operating Procedures may also be identified through audits, staff meetings, Corrective Actions or Management Reviews.
- c) QMS form "R-35-13 - QMS Form and Procedure Revision or Development Request Form" or an email will be submitted to the QMS Representative prior to the creation or revision of a QMS document, QMS form or Standard Operating Procedure.
- d) The QMS Representative will facilitate or can delegate the task of the creation or revisions of QMS documents, QMS forms, or Standard Operating Procedures.
- e) The QMS Representative will ensure that new or revised internal documents follow "SOP 37-09 - Procedure for the Identification of Internal QMS Documents, Records and Standard Operating Procedures".

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 14

5.1.3. Approving New or Revised Documents, Forms and Standard Operating Procedures

- a) All new and revised internal QMS documents, QMS forms or Standard Operating Procedures shall be reviewed and approved by the QMS Representative.

5.1.4. Document Distribution

- a) The QMS Representative is responsible for ensuring that staff are made aware of the new or revised QMS documents, QMS forms or Standard Operating Procedures either through an email or at a DWQMS monthly staff meeting.
- b) The QMS Representative, or designate, will ensure copies of the new or revised documents are distributed to staff when required.
- c) All forms shall be distributed to staff as per "SOP 47-10 Procedure for Environmental Services Division Drinking Water Forms Distribution".

5.1.5. Reviewing Documents

- a) The Operational Plan, Environmental Services Water Operations QMS documents, QMS forms or Standard Operating Procedures will be reviewed as required by the QMS Representative for applicability, currency, and relevance.
- b) This may be identified through audits, staff meetings, Corrective Actions or Management Reviews.

5.1.6. Document Availability

- a) Current controlled copies of all documents, procedures, instructions, forms, and checklists are retained in the County's central computer server electronically and in the Environmental Services Water Operations OneDrive file.
- b) Hard copies of Operations and Maintenance Manuals, Operational Plan, and Water Supply System Emergency Response Contingency Plan binders are kept in the Environmental Services office and at certain County water facilities and stored in such a way that they are protected from damage or loss.
- c) Obsolete electronic documents will be removed from the central server and hard copies securely destroyed as required.
- d) Original sets of equipment manuals/specifications and record drawings are retained at the County of Brant Administration Building, at certain County water facilities, and will be stored in such a way that they are protected from damage or loss.
- e) Any documents that are required to be securely destroyed shall be in accordance with By-law 229-10.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 14

5.2. QMS Record Control

5.2.1. Overview

This procedure is applicable to all records that demonstrate conformance to DWQMS and compliance with Provincial legislative and regulatory requirements.

- a) All QMS and regulatory drinking water records will be retained and protected from damage or loss in Environmental Services for a minimum of 5 years. However, if by regulation a record is required to be maintained for a period longer than 5 years, then the retention time will be as per the regulation.
- b) Once the record retention time has been reached, records will be securely destroyed. Some records may be retained if they are applicable to ongoing operations.
- c) Retention or the secure destruction of records will be in accordance with By-law 229-10. Older records that are not frequently referenced can be transferred to the County of Brant Records Centre and stored for the duration of their required retention period until they are eligible for destruction as authorized by By-law 229-10.

5.2.2. Manual Records

- a) All manually recorded data and information must be recorded on approved internal QMS forms and documents, forms provided by a Ministry approved laboratory, and the Ministry.
- b) In the event the required form is not accessible, the recorded data must be recorded in a personal and/or a facility logbook and then transferred the required document when possible.
- c) All internal QMS forms and documents, forms provided by a Ministry approved laboratory, and Ministry regulatory documentation will be recorded in a way that all entries are accurate, complete, concise, and as required by the form or document to ensure conformance and compliance. All applicable spaces must be completed.
- d) Manual records must be legible.
- e) Pencils, water soluble ink, black ink or any other erasable marker must not be used to record information or data.
- f) All drinking water-related records will be filed in Environmental Services and protected from damage or loss.
- g) If any file is required to be removed from the Environmental Services filing shelves for any period, the request for the file must be made through a member of the Operations Administration Division.
- h) A "file record card" must be completed by any individual removing a file from the Environmental Services filing shelves. The file record card will be placed in the location of the removed file and the file record card must note the name of the file removed, the date the file was removed, and the individual who removed the file. When the file is returned, it must be placed in its original location, the file card removed, and the information that was recorded on card crossed out.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 14

- i) Files should not be removed from the Burford Administration Building without advising a member of the Operations Administration.

5.2.3. SCADA Records

- a) Daily SCADA Reports generated by e.RIS, are stored in e.RIS server and a pdf copy of the report is filed electronically by the QMS Representative in:
 - <\\eddie.fs2.brant.ca\E08enviro Water Works\SCADA Daily Reports>
- b) In the event of an extended absence of the QMS Representative, the Water Quality Technician will file the reports electronically.

5.2.4. Drinking Water Facility Logbooks

- a) Facility logbooks must be stored in a location where they are protected from damage and loss.
- b) Logbook entries must be made with blue waterproof ink.
- c) Logbook entries must be legible.
- d) Logbook entries must meet the requirements of O. Reg. 128/04 Condition 27.
- e) Upon the completion of a facility logbook, the completed logbook must be returned to the Water Quality Technician to be filed.
- f) The Water Quality Technician will label the logbook and provide it to a member of the Operations Administration group as identified by the Administrative Coordinator to be scanned.
- g) The logbook will be scanned and both copies returned to the Water Quality Technician who will file the hard copy and electronic copy in:
 - <\\eddie.fs2.brant.ca\E08enviro Water Works\Logbooks>
- h) Logbooks must be retained for 5 years.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 14

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 5.1.1 updated. Section 5.1.2 updated. Section 5.1.3 revised to Document Distribution. Section 5.1.4 revised to Reviewing Documents. Section 5.1.5 revised to Document Availability.	10/07/2013	David Stevenson	7
2	Element 5 received a complete review and update. Reviewed with staff May 17, 2017.	05/18/2017	David Stevenson	8
3	Section 5.2.2 revised to note the daily reports generated by e.RIS.	11/01/2017	David Stevenson	9
4	Section 5.2.1 revised to remove reference to the Water Division Records Management Clerk and replace with the Operations Administration Division. Section 5.2.2 revised to remove reference to the Water Division Records Management Clerk and replace with the Water Clerk.	01/29/2020	David Stevenson	10
5	Reference to the Water Division updated to Environmental Services.	06/17/2020	D. Stevenson	11
6	Section 5.2.2 revised to note that the Water Clerk has been replaced by the Water Technologist for filing the daily SCADA reports.	10/07/2021	D. Stevenson	12
7	Element reformatted. 5.1.2(c) – updated to note an email can be submitted. 5.1.3 (a and b) – updated to note that the QMS Rep. reviews and approves. 5.1.6 (a) – Updated to note OneDrive file. 5.2.2 (b) – Updated to note that if a form is not available, the information must be stored in a logbook and transferred to the document when possible. 5.2.4 Updated to expand the logbook process.	03/30/2022	D. Stevenson	13
8	Water Technologist updated to Environmental Services Technologist.	11/09/2023	Environmental Services Technologist	14

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

6. Drinking Water Systems

The County of Brant owns and operates five (5) Municipal Residential Drinking Water Systems. They are identified as the; Airport Drinking Water System, Cainsville Distribution System, Mt. Pleasant Drinking Water System, Paris (Bethel, Gilbert and Telfer) Drinking Water System and St. George Drinking Water System. A description of each system follows. Individual system Process Flow Diagrams and P&ID Diagrams are included as a reference at the back of this Element.

6.1. Airport Drinking Water System

The Airport Drinking Water System is a groundwater system owned and operated by the County of Brant. The well system is classified as Water Distribution and Supply Subsystem Class 2.

6.1.1. Water Source

The Airport Drinking Water System obtains raw water from two (2) drilled non-GUDI wells. Both wells are equipped with submersible pumps. Characterization of the aquifer can be found as part of the Assessment Report for the Grand River Watershed Source Protection Area.

6.1.2. Raw Water Characteristics

The chemistry of the water makes it suitable as a source of drinking water with all parameters below the Ontario Drinking Water Quality Standards. The water temperature is relatively constant, turbidity is low, and pH is considered normal for a ground water system.

The raw water consistently tests negative for total coliforms and E. coli bacteria.

Past historical data indicates that the water source is stable and consistent in terms of both quantity and quality. There have been no historical challenges or event driven fluctuations encountered for this drinking water system and none are anticipated. The County tests and monitors the raw and treated water according to O. Reg. 170/03 and will respond appropriately should monitoring note any abnormalities.

6.1.3. Water Treatment

The Airport Drinking Water System consists of the following:

- Sodium Hypochlorite Dosing System consisting of two Chlorine Pumps (1 duty, 1 standby), and two chemical storage tanks.
- An in-ground dedicated Chlorine Contact Pipe, 2.28 m inside diameter, 12.3 m long with perforated baffle plates, located adjacent to the well house to provide the required chlorine contact time.
- A continuous point of entry chlorine residual analyzer and an alarm system.
- One 1,831 m³ total volume and 1,600 m³ useable volume elevated storage reservoir.
- All associated piping, valves, mechanical and electrical equipment, monitoring instrumentation and control systems.
- One 410 kW diesel generator with subbase fuel storage provides uninterrupted supply.
- A Supervisory Control and Data Acquisition System (SCADA).

A more detailed description is provided in the system's DWWP.

Raw water is pumped from the wells through a flow meter into a discharge header via a vertical turbine pump where it undergoes chemical treatment via chlorination (sodium hypochlorite)

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

dosed into the header to achieve disinfection. The discharge header from the well pump is connected to the on-site baffled storage reservoir, where proper chlorine contact time is achieved and treated water is stored prior to being pumped into the distribution system.

On-line equipment and SCADA monitors and records treated water flow, turbidity, pressure, chlorine residual and other parameters prior to entry into the distribution system to ensure water quality.

6.1.4. Water Distribution

The Airport Drinking Water System is the single pumping and water treatment facility which supplies treated potable water to the Airport Distribution System. Secondary disinfection is practiced through chlorination. Chlorine residual grab samples are taken from the distribution system and recorded daily by an Operator to confirm acceptable chlorine concentrations. Operators are to be aware of the secondary chlorine concentration residual critical control limits noted in SOP-14-09 or Element 8 of the Operational Plan and follow SOP-14-09 for the actions to be taken when a critical control limit is exceeded.

The system consists of approximately 11.3 km of watermain ranging in size from 100 mm – 400 mm which services 299 service connections (273 residential and 26 commercial). There are approximately 61 fire hydrants and 517 curb stops and valves.

The Airport Elevated Reservoir provides a useable volume of 1,600 m³.

6.2. Cainsville Distribution System

The County owns and operates the Cainsville Distribution System. This system is classified as Water Distribution Subsystem Class 1.

The County of Brant purchases treated drinking water from the City of Brantford. This water is treated at the City of Brantford Water Treatment Plant (BWTP) which is owned and operated by the City of Brantford. The City of Brantford is responsible for treating, sampling, testing, and monitoring at the BWTP. The City of Brantford has an on-line chlorine residual analyzer on the treated water leaving the BWTP to ensure water quality. The water supplied by the BWTP maintains a chlorine residual that is sufficient to ensure that the secondary disinfection regulatory requirements are met within the Cainsville Distribution System. Re-chlorination is not practiced within the Cainsville Distribution System.

Secondary disinfection is practiced through chloramination. Chlorine residual grab samples are taken from the distribution system and recorded daily by an Operator to confirm acceptable chlorine concentrations. Operators are to be aware of the secondary chlorine concentration residual critical control limits noted in SOP-14-09 or Element 8 of the Operational Plan and follow SOP-14-09 for the actions to be taken when a critical control limit is exceeded.

While sodium levels are below the aesthetic concentration of 200 mg/L, the concentrations are such that the County must advise the Medical Officer of Health as per O. Reg. 170/03.

The Cainsville Elevated Tank is designed to maintain pressure within the prescribed operating limits in the Cainsville portion of the distribution system, while also providing the required pressure equalization and an emergency storage capacity of 1,100 m³.

A Supervisory Control and Data Acquisition System (SCADA) monitors and records the flow entering the system.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

The Cainsville portion of the distribution system consists of approximately 9 km of watermain ranging in size from 50 mm – 300 mm which services 122 service connections (38 residential and 84 commercial). There are approximately 55 hydrants and 265 curb stops and valves.

There have been no historical challenges or event driven fluctuations encountered for this distribution system and none are anticipated.

6.3. Mt. Pleasant Drinking Water System

The Mt. Pleasant Drinking Water System is a groundwater system owned and operated by the County of Brant. The well system is classified as Water Treatment Subsystem Class 1 and Water Distribution Subsystem Class 2.

6.3.1. Source Water

The Mt. Pleasant Drinking Water System obtains its raw water from two (2) drilled non-GUDI wells (Well 1 and Well 2). Wells 1 and 2 are each equipped with a vertical turbine well water pump. Characterization of the aquifer can be found as part of the Assessment Report for the Grand River Watershed Source Protection Area.

6.3.2. Raw Water Characteristics

The chemistry of the water makes it suitable as a source of drinking water with all parameters below the Ontario Drinking Water Quality Standards. The water temperature is relatively constant, turbidity is low, and pH is considered normal for ground water systems. Iron, manganese, and sodium is present. While sodium levels are below the aesthetic concentration of 200 mg/L, the concentrations are such that the County must advise the Medical Officer of Health as per O. Reg. 170/03. The raw water consistently tests negative for total coliforms and E. coli bacteria.

Past historical data indicates that the water source is stable and consistent in terms of both quantity and quality.

There have been no historical challenges or event driven fluctuations encountered for this drinking water system and none are anticipated. The County tests and monitors the raw and treated water according to O. Reg. 170/03 and will respond appropriately should monitoring note any abnormalities.

6.3.3. Water Treatment

The Mt. Pleasant Drinking Water System consists of the following:

- Two pressure filters to remove iron and manganese from the raw water.
- Sodium Hypochlorite Dosing System which consists of four chlorine pumps (3 duty, 1 standby) and two chemical storage tanks.
- Two continuous chlorine residual analyzers (pre reservoir and point of entry) and alarm system.
- Four high lift pumps.
- Two baffled underground reservoirs, with reservoirs No. 1 and 2 having effective storage volumes of 450 and 1,490 m³ respectively to give a total storage volume of 1,940 m³.
- One 350 kW diesel generator provides uninterrupted supply.
- All associated piping, valves, mechanical and electrical equipment, monitoring instrumentation and control systems.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

- A Supervisory Control and Data Acquisition System (SCADA).

A more detailed description is provided in the system's DWWP.

Raw groundwater is pumped from one of the two water wells, through a flow meter and then enters the treatment facility where sodium hypochlorite is dosed as a pre-treatment chemical to oxidize iron and manganese. Then, the water is filtered using two (2) pressure filters for iron and manganese removal. Following pressure filtration, the filtered water is dosed with sodium hypochlorite for disinfection. The filtered and chlorinated water is then conveyed to the facility's underground reservoirs to achieve adequate contact time.

On-line equipment and SCADA monitors and records treated water flow, turbidity, chlorine residual and other parameters prior to entry into the distribution system to ensure water quality.

6.3.4. Water Distribution

The Mt. Pleasant Drinking Water System is the single pumping and disinfection facility which supplies treated potable water to the Mt. Pleasant Water Distribution System. One Bulk Fill Station is located within the Mt. Pleasant Distribution System.

Secondary disinfection is practiced through chlorination. Chlorine residual grab samples are taken from the distribution system and recorded daily by an Operator to confirm acceptable chlorine concentrations. Operators are to be aware of the secondary chlorine concentration residual critical control limits noted in SOP-14-09 or Element 8 of the Operational Plan and follow SOP-14-09 for the actions to be taken when a critical control limit is exceeded.

The system consists of approximately 31 km of watermain ranging in size from 150 mm – 250 mm which services 705 service connections (669 residential and 36 commercial). There are approximately 135 fire hydrants and 1,018 curb stops and valves.

6.4. Paris Drinking Water Systems (Bethel, Gilbert and Telfer)

The Paris Drinking Water System is a groundwater system owned and operated by the County of Brant. The Bethel, Gilbert and Telfer facilities are rated as a Class 1 Water Treatment Subsystem. The Paris Distribution Subsystem is rated as a Class 3.

6.4.1. Water Source

The Paris Drinking Water System consists of three (3) separate well fields (Bethel, Gilbert and Telfer), three (3) separate treatment facilities (Bethel, Gilbert and Telfer) and the distribution system that connects all three (3) facilities.

The Bethel water facility obtains its raw water from four (4) wells (P51 (PW 1/12), P52 (TW 1/05), P53 (PW 2/12) and P54 (PW 4/12)). The wells are in an unconfined aquifer and have been classified as Groundwater Under the Direct Influence (GUDI) with adequate in-situ filtration.

The Gilbert water facility obtains its raw water from eight (8) wells. P28 and P29 are true groundwater wells drilled into bedrock and are not considered to be under the influence of surface water. Wells P210, P211, P212, P213, P214 and P215 are in an unconfined aquifer and have been classified as Groundwater Under the Direct Influence (GUDI) with adequate in-situ filtration during regional storm events (defined as Hurricane Hazel, 1954).

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

The Telfer water facility obtains its raw water from wells P31 and P32; both wells are drilled into bedrock. Characterization of the aquifer for both well fields can be found as part of the Assessment Report for the Grand River Watershed Source Protection Area.

6.4.2. Raw Water Characteristics

a) Bethel

The chemistry of the raw ground water at Bethel is suitable as a source of drinking water with all parameters below the Ontario Drinking Water Quality Standards. The water temperature is relatively constant, turbidity is low, and pH is considered normal for ground water systems. Since the wells have been developed, there have been occasional instances of very low concentrations of total coliforms and/or E. coli bacteria.

There have been no challenges or event driven fluctuations encountered to date for these wells and none are anticipated. The County tests and monitors the raw and treated water according to O. Reg. 170/03 and will respond appropriately should monitoring note any abnormalities.

b) Gilbert

The chemistry of the raw ground water at Gilbert is suitable as a source of drinking water with all parameters below the Ontario Drinking Water Quality Standards except for sulphates in Wells P28 and P29. The water temperature is relatively constant, turbidity is low, and pH is considered normal for ground water systems. The high sulphates in the bedrock wells at Gilbert (P28 and P29) are quenched via blending with water from the overburden wells to create acceptable sulphate levels in the drinking water.

The raw water occasionally tests positive for total coliforms. Nitrates in production wells P210 through P215 are slightly elevating.

Past historical data indicates that the water source is stable and consistent in terms of both quantity and quality.

There have been no historical challenges or event driven fluctuations encountered for these wells and none are anticipated. The County tests and monitors the raw and treated water according to O. Reg. 170/03 and will respond appropriately should monitoring note any abnormalities.

c) Telfer

The chemistry of the raw ground water at Telfer is suitable as a source of drinking water with all parameters below the Ontario Drinking Water Quality Standards except for nitrates in Well P31. The water temperature is relatively constant, turbidity is low, and pH is considered normal for ground water systems. The elevated nitrates in the water from Well P31 are blended with water from Well P32 to create acceptable nitrate levels in the drinking water.

The raw water consistently tests negative for total coliforms and E. coli bacteria. Nitrates in the raw water is slightly elevated.

Past historical data indicates that the water source is stable and consistent in terms of both quantity and quality.

There have been no historical challenges or event driven fluctuations encountered for these wells and none are anticipated. The County tests and monitors the raw and treated water

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

according to O. Reg. 170/03 and will respond appropriately should monitoring note any abnormalities.

6.4.3. Water Treatment

a) Bethel Water Treatment Facility (97 Bethel Road, Paris)

The Bethel Water Treatment Facility consists of the following:

- Two (2) Trojan UV Swift 2L12TM reactors (1 duty, 1 standby).
- Chemical feed systems as follows:
 - Two (2) parallel (1 duty, 1 standby) Sodium Hypochlorite Dosing Systems consisting of a metering pump and chemical storage tanks.
 - Two (2) parallel (1 duty, 1 standby) Hydrofluosilicic Acid (Fluoridation) Dosing Systems consisting of a metering pump and chemical storage tanks.
- Continuous chlorine (pre contact chamber and point of entry) and fluoride residual analyzers and alarm systems.
- Three (3) horizontal split case pumps.
- Dual chambered chlorine contact chamber.
- Three (3) Ion Exchange vessels (2 duty, 1 standby) and brine tank (offline).
- Online turbidity analyzer.
- A Sodium Hypochlorite Dosing System (1 duty) for touch up chlorination. Consists of a metering pump, drawing from the same storage tank as the first sodium hypochlorite system.
- One 200 kW diesel generator.
- All associated piping, valves, mechanical and electrical equipment, monitoring instrumentation, and control systems.
- Supervisory Control and Data Acquisition System (SCADA).

A more detailed description is provided in the system's DWWP.

Groundwater is pumped from each well through a flow meter to the facility. The raw water may pass through the Ion Exchange vessels for nitrate reduction if required. The Ion Exchange vessels are offline but remain in the facility. The water then branches into one of two (2) Ultraviolet (UV) reactors (1 duty and 1 standby) which provide a minimum UV dosage of 20 mJ/cm². The UV reactors provide pathogen and virus inactivation for the groundwater prior to chemical treatment via chlorination (sodium hypochlorite) and fluoridation (hydrofluosilicic acid).

On-line equipment monitors and a SCADA system records the treated water flow, turbidity, fluoride, pressure, chlorine residual and other parameters prior to entry into the distribution system to ensure water quality.

b) Gilbert Water Treatment Facility (319 Grand River Street North, Paris)

The Gilbert Treatment Facility consists of the following:

- Two (2) Trojan UV Swift 2L12TM reactors (1 duty, 1 standby).
- Chemical feed systems as follows:
 - Two (2) parallel (1 duty, 1 standby) Sodium Hypochlorite Dosing Systems consisting of a metering pump and chemical storage tanks.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

- Two (2) parallel (1 duty, 1 standby) Hydrofluosilicic Acid (Fluoridation) Dosing Systems consisting of a metering pump and chemical storage tanks.
- Two (2) continuous chlorine (pre reservoir and point of entry) and fluoride residual analyzers and alarm systems.
- Three (3) high lift pumps.
- Two (2) underground reservoirs, with reservoirs No. 1 and 2 having effective storage volumes of 684 and 1,105 m³, respectively, to give a total storage volume of 1,789 m³.
- Two (2) underground high lift clear wells each having an effective storage volume of 71.5 m³ (i.e., excludes volume below low water level).
- Two (2) parallel (1 duty, 1 standby) Sodium Hypochlorite Dosing Systems for touch up chlorination consisting of a metering pump drawing from the same chemical storage tank.
- One 600 kW diesel generator.
- All associated piping, valves, mechanical and electrical equipment, monitoring instrumentation, and control systems.
- Supervisory Control and Data Acquisition System (SCADA).

A more detailed description is provided in the system's DWWP.

At Gilbert, groundwater is pumped by six (6) upper aquifer wells and two (2) bedrock aquifer wells. The water from the upper aquifer wells is metered and combines in a 250 mm diameter pipe; that branches into one of two (2) Ultraviolet (UV) reactors (1 duty and 1 standby) providing a minimum UV dosage of 40 mJ/cm². The UV reactors provide pathogen and virus inactivation for the groundwater prior to being combined with the metered raw water from the two (2) bedrock aquifer wells. Primary chlorination (sodium hypochlorite) and fluoridation (hydrofluosilicic acid) occurs in this combined header before being discharged through flow meters into one of two on-site reservoirs for disinfection and storage.

On-line equipment monitors and a SCADA system records the treated water flow, turbidity, fluoride, pressure, chlorine residual and other various parameters prior to entry into the distribution system to ensure water quality.

c) Telfer Water Treatment Facility (166 West River Road, Paris)

The Telfer Water Treatment Facility consists of the following:

- Chemical feed systems as follows:
 - Two (2) parallel (1 duty, 1 standby) Sodium Hypochlorite Dosing Systems consisting of a metering pump and chemical storage tanks.
 - One (1 duty) Hydrofluosilicic Acid (Fluoridation) Dosing System consisting of a metering pump and chemical storage tank.
- A continuous chlorine (pre contact chamber and point of entry) and fluoride (point of entry only) residual analyzers and alarm systems.
- Two (2) 52.2 m³ contact chambers.
- One 350 kW diesel generator.
- All associated piping, valves, mechanical and electrical equipment, monitoring instrumentation, and control systems.
- Supervisory Control and Data Acquisition System (SCADA).

A more detailed description is provided in the system's DWWP.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

Groundwater is pumped through a flow meter to the facility where it undergoes chemical treatment via chlorination (sodium hypochlorite) and fluoridation (hydrofluosilicic acid). Following treatment, water is pumped from the facility through flow meters to two (2) 52.2 m³ buried chlorine contact pipes that normally operate in parallel prior to entry into the distribution system.

On-line equipment monitors and a SCADA system records the treated water flow, turbidity, fluoride, pressure, chlorine residual and other parameters prior to entry into the distribution system to ensure water quality.

6.4.4. Paris Water Distribution

The Bethel, Gilbert, and Telfer well fields are the three (3) active sources that supply potable water to the Paris Drinking Water System. Off-site distribution facilities include the following:

- M. Sharpe Reservoir and Pumping Station (5,400 m³)
- Parkhill Booster Station
- Oak Park Elevated Storage (3,700 m³)
- North Paris Elevated Storage (2,000 m³)
- South Paris Elevated Storage (2,400 m³)

The above facilities provide storage and/or maintain system pressure and convey pressurized treated water throughout the Paris distribution system. The only exception is the M. Sharpe Reservoir, which has the potential to operate booster chemical metering pumps for chlorine residual maintenance, if required. However, this provision is not regularly utilized due to adequate chlorination practices at Bethel, Gilbert, and Telfer Water Treatment Facilities.

Under normal operating conditions, treated water to the Paris Distribution System is provided by the Gilbert Facility. During peak demands or maintenance, the Bethel and Telfer Facilities provide back-up capacity to maintain system pressure and operating levels. The Bethel and Telfer Facilities are to be operated regularly to ensure readiness to perform when required.

Secondary disinfection is practiced through chlorination. Chlorine residual grab samples are taken from the distribution system and recorded daily by an Operator to confirm acceptable chlorine concentrations. Operators are to be aware of the secondary chlorine concentration residual critical control limits noted in SOP-14-09 or Element 8 of the Operational Plan and follow SOP-14-09 for the actions to be taken when a critical control limit is exceeded.

The system consists of approximately 117 km of watermain ranging in size from 19 mm – 600 mm which services 6077 service connections (5776 residential and 301 commercial). There are approximately 491 fire hydrants and 7,199 curb stops and valves.

There are four (4) distinct pressure zones in the Paris service area as follows:

- Gilbert and Telfer supply potable water to Zone No. 1 and the North Paris Elevated Tank, which services the portion of Paris located to the north of the railway tracks on Grand River Street North and west of the Grand River.
- Zone No. 1 also supplies Zone No. 2, which consists of the low areas near the rivers, through pressure regulating valves which maintain the downstream pressure at 310 kPa (45 psi). The M. Sharpe Reservoir water level is maintained from Pressure Zone No. 2.
- Pumps at the M. Sharpe Reservoir and the South Paris Elevated Tank provide water to Zone No. 3.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

- Pressure Zone No. 2 also supplies water to Zone No. 4 via the Parkhill Booster Station, and the Oak Park Elevated Storage Tank services Zone No. 4.

The storage capacities of the M. Sharpe Reservoir, the Oak Park Elevated Storage Tank and the North Paris Elevated Tank are 5,400 m³, 3,700 m³, 2,000 m³ and 2,400m³ respectively and provide 13,500 m³ of storage in the distribution system.

6.5. St. George Drinking Water System

The St. George Drinking Water System is a groundwater system owned and operated by the County of Brant. The well system is classified as Water Distribution and Supply Subsystem Class 3.

6.5.1. Water Source

The St. George Drinking Water System obtains its raw water from three (3) drilled non-GUDI wells; Well 1, Well 2, and Well 3. Wells 1 and 2 are each equipped with a vertical line shaft turbine well water pump. Well 3 is equipped with a submersible well water pump. Characterization of the aquifer can be found as part of the Assessment Report for the Grand River Watershed Source Protection Area.

6.5.2. Raw Water Characteristics

The chemistry of the water makes it suitable as a source of drinking water with all parameters below the Ontario Drinking Water Quality Standards. The water temperature is relatively constant, turbidity is low, and pH is considered normal for ground water systems.

The raw water consistently tests negative for total coliforms and E. coli bacteria. Historical data indicates that the water source is stable and consistent in terms of both quantity and quality.

There have been no historical challenges or event driven fluctuations encountered for this drinking water system and none are anticipated. The County tests and monitors the raw and treated water according to O. Reg. 170/03 and will respond appropriately should monitoring note any abnormalities.

6.5.3. Water Treatment

The St. George Treatment Facility consists of the following:

- Two (2) parallel (1 duty, 1 standby) Sodium Hypochlorite Dosing Systems consisting of a metering pump and chemical storage tanks.
- A continuous online chlorine residual analyzer (pre contact chamber and point of entry) and alarm system.
- Two (2) 52.2 m³ Chlorine Contact Chambers.
- One 150 kW Diesel Generator.
- All associated piping, valves, mechanical and electrical equipment, monitoring instrumentation, and control systems.
- Supervisory Control and Data Acquisition System (SCADA).

A more detailed description is provided in the system's DWWP.

Raw groundwater is pumped through a flow meter on each well to the facility where it undergoes chemical treatment via chlorination (sodium hypochlorite) and dosed at one of two injection points on the main discharge header to achieve disinfection. Following injection, the chlorinated

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

water is then conveyed to the two (2) 52.2 m³ buried chlorine contact pipes that operate in parallel in order to achieve adequate disinfection prior to entry into the distribution system.

Prior to entry into the distribution system, on-line equipment and a SCADA system monitors, and records treated water flow, turbidity, pressure, chlorine residual and other parameters to ensure the quality.

6.5.4. Water Distribution

There are two (2) distinct pressure zones in the St. George service area as follows:

- Zone 1 encompasses the southern portion of St. George.
- Zone 2 encompasses the northern portion of St. George.

The storage capacities of the St. George Standpipe and the St. George Elevated Storage Tank are 437 m³ and 2,876 m³ respectively and provide 3,313 m³ of storage in the distribution system.

The St. George Water Supply and Treatment Facility is the single pumping and disinfection facility which supplies treated potable water to the St. George Water Distribution System. However, within the St. George Distribution Water Distribution System three (3) water storage and supply facilities exist, which are as follows:

- St. George Elevated Water Storage Facility (2,876 m³);
- St. George Standpipe (437 m³);
- St. George Bulk Water Depot.

Following disinfection in the parallel chlorine contact chambers, the facility supplies treated potable water directly to Zone No. 2, which includes the elevated water storage tank and standpipe.

The elevated storage tank is interconnected with the St. George Standpipe. The standpipe supplies potable water directly to Pressure Zone 1. The interconnecting watermain from the elevated water storage tank to the standpipe is equipped with an electrically actuated control valve.

Secondary disinfection is practiced through chlorination. Chlorine residual grab samples are taken from the distribution system and recorded daily by an Operator to confirm acceptable chlorine concentrations. Operators are to be aware of the secondary chlorine concentration residual critical control limits noted in SOP-14-09 or Element 8 of the Operational Plan and follow SOP-14-09 for the actions to be taken when a critical control limit is exceeded.

The distribution system consists of approximately 29 km of watermain ranging in size from 25 mm – 300 mm which services 1415 service connections (1302 residential and 113 commercial). There are approximately 169 fire hydrants and 1785 curb stops and valves.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: March 14, 2023	Version Number: 22

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 6.3 Updated to reflect facility upgrades.	10/07/2013	Water Technologist	7
2	Sections 6.1.4, 6.2, 6.3.4 and 6.4.4: Updated to note most recent service connection numbers	05/30/2014	Water Technologist	8
3	Sections 6.1.4, 6.4.4 and 6.5.4: Updated the length of watermains for each section noted.	09/05/2014	Water Technologist	9
4	Section 6.1.3 revised to 100 kW diesel generator. Section 6.2 Removed the reference to the online chlorine analyzer at the Cainsville Elevated Tank. Section 6.4 revised to note that the Paris Drinking Water System was re-classified to a Class 2 Water Treatment Subsystem. Reference to the Scott facility was removed as the facility was decommissioned. Section 6.4.4 revised to remove the reference to the re-chlorination equipment at the Oak Park Elevated Tank. Sections 6.1.3, 6.3.3 and 6.4.3 (Gilbert and Bethel) revised to note high lift pumps.	03/27/2015	Water Technologist	10
5	Section 6.4.1 revised to note the new production well and the new identification names of the production wells at Bethel. 6.4.2 (Bethel) revised to note changes in raw water characteristics. Sections 6.1.4, 6.2, 6.3.4 and 6.4.4: Updated to note most recent service connection numbers. Section 6: Updated to note that P&ID drawings are included.	09/23/2015	Water Technologist	11
6	Section 6.4.4: Updated to add the North Elevated Tank	02/01/2016	Water Technologist	12
7	Section 6.5.3: Updated to note the upgraded 150 kW emergency gen set.	04/06/2016	Water Technologist	13
8	Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent service connection numbers.	08/04/2016	Water Technologist	14
9	Sections 6.0 and 6.2: Removed reference to the KGR Distribution System.	12/21/2016	Water Technologist	15
10	Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent service connection numbers.	10/18/2017	Water Technologist	16
11	Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent service connection numbers.	03/27/2019	Water Technologist	17
12	Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent length of watermain, number of valves and number of hydrants. Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent service connection numbers.	05/09/2019	Water Technologist	18
13	Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent service connection numbers. Section 6.1.4: Updated to note the Airport Elevated Reservoir being brought online. Sections 6.1.4, 6.2, 6.3.4, 6.4.4 and 6.54: Updated to note and identify secondary disinfection. Section 6.1.1 – Updated to note 2 production wells with submersible well pumps.	09/04/2020	Water Technologist	19

County of Brant Water Division

Title: County of Brant Operational Plan

QMS Reference: D-02-10

Dated Created: April 16, 2009

Current Revision Date: March 14, 2023

Version Number: 22

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT REVISION NUMBER
14	Section 6.4: Updated to note the Paris DWS was reclassified to a Class 1 Water Treatment Subsystem. Section 6.4.3: The Ion Exchange system is noted to be offline and the online nitrate analyzer has been removed.	10/07/2021	Water Technologist	20
15	Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent service connection numbers. Section 6.4.2 raw water information updated to include nitrates.	03/30/2022	Water Technologist	21
16	Section 6.4.4 - Updated to note the South Paris Elevated Tank. Sections 6.1.4, 6.2, 6.3.4 6.4.4 and 6.54: Updated to note most recent length of watermain, number of hydrants and curb stops/valves.	03/14/2023	Water Technologist	22

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 12

7. Risk Assessment

7.1. Overview

The following procedure will be used to assess risks to the County of Brant municipal residential drinking water and distribution systems.

7.1.1. The Operation Authority for the County of Brant's drinking water systems, through this the procedure, will:

- a) Consider potential hazardous events and associated hazards, as identified in the Ministry of the Environment document titled "Potential Hazardous Events for Municipal Residential Drinking Water Systems (February 2017)", as amended.
- b) Identify additional potential hazardous events and associated hazards.
- c) Assess the risks associated with the occurrence of hazardous events.
- d) Ranks the hazardous events according to the associated risk.
- e) Identify control measures to address the potential hazards and hazardous events.
- f) Identify Critical Control Points (CCP's) and associated methods of monitoring and controlling them.
- g) Consider the reliability and redundancy of equipment.

7.1.2. The results of the assessment shall include a list of hazards that will identify:

- a) Control measures where appropriate.
- b) CCP's.
- c) Control limits for CCP's.
- d) Monitoring methods for CCP's.
- e) A method for reporting and recording deviations from CCP limits.

7.2. Risk Assessment Procedure

7.2.1. The Director of Environmental Services, QMS Representative, Environmental Services Manager, and Environmental Services Superintendent will meet at least once per calendar year to identify and verify the currency of the information and the validity of the assumptions used in the risk assessment. The General Manager of Operations, the Water Lead Hand, and other Environmental Services Water Operations staff may be consulted or included in the review.

7.2.2. Positions noted in the above section will also ensure that risks are assessed at least once every 36 months.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 12

7.2.3. All aspects of the County’s municipal residential drinking water and distribution systems and Provincial requirements shall be reviewed to identify risks. These aspects will include, but are not limited to the following:

- a) Raw source water (Source Protection).
- b) Production wells and their components.
- c) Primary disinfection/treatment systems.
- d) Secondary disinfection.
- e) Distribution systems.
- f) Storage.
- g) High lift pumping.
- h) Facility and system security.
- i) Potential hazardous events and associated hazards, as identified in the Ministry of the Environment document titled “Potential Hazardous Events for Municipal Residential Drinking Water Systems (February 2017)”.

7.2.4. Each identified risk will be “ranked”, based on the table below, as to the probability of the events occurring, what impact (severity) the event would have on the drinking water system, how detectable the hazard is, and the reliability and redundancy of equipment is to be considered when assigning ratings to the hazardous or non-hazardous event.

Probability		Severity		Detectability	
1	Rare May occur in exceptional circumstances and has not occurred in the past.	1	Insignificant Insignificant impact, little public exposure, little or no health risk.	1	High Immediately detectable, alarms.
2	Unlikely Could occur at some point, historically has occurred less than once every 5-10 years.	2	Minor Limited public exposure, minor health risk.	2	Moderate Indicated by alarm or lab results.
3	Possible Has occurred or may occur once or more per year.	3	Moderate Minor public exposure, minor health risk.	3	Detectable Visually detectable, rounds or maintenance.
4	Likely Has occurred or may occur on a monthly to quarterly basis.	4	Major Large population at risk.	4	Poor Would not be detected until problem occurred.
5	Certain One or more occurrences on a monthly or more frequent basis.	5	Catastrophic Major impact for large population, complete failure of systems.	5	Undetectable Cannot be detected under any circumstance.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 12

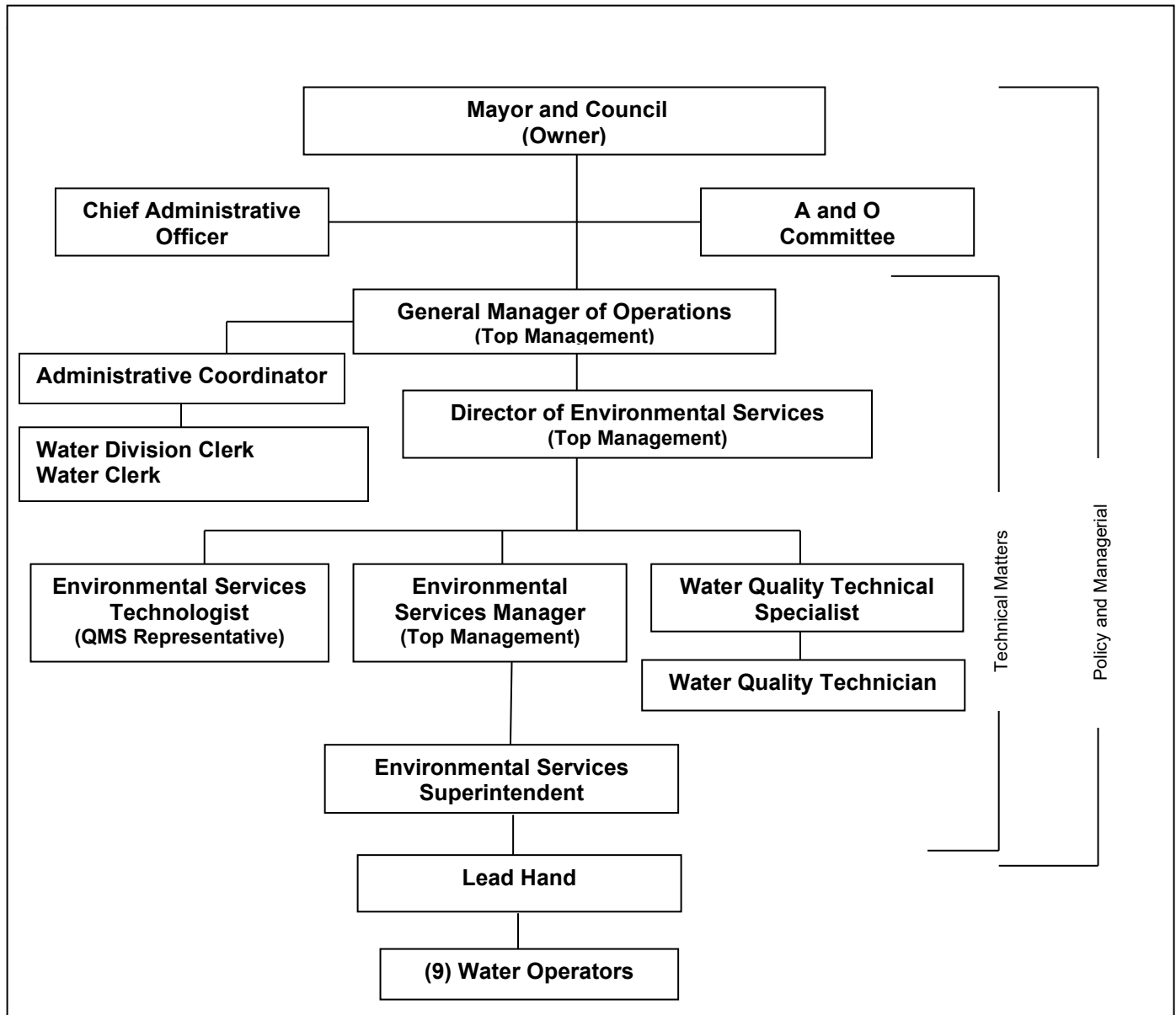
- 7.2.5.** The total risk rank shall be determined by multiplying the individual scores of probability, severity, and detectability as defined by the table below.
- 7.2.6.** A score of twenty-one (21) is the High-Risk Critical Control Point Threshold.
- 7.2.7.** Once the rankings have been determined for each identified risk, Top Management and Environmental Services Drinking Water staff will identify applicable control measures, critical control points, and methods to monitor the identified risks.
- 7.2.8.** Top Management and Environmental Services Drinking Water Staff will also identify where procedures are needed to respond to any deviations from established critical control point limits.
- 7.2.9.** The QMS Representative will work with Top Management and Environmental Services Drinking Water staff to develop response procedures for deviations to the critical control point limits and associated procedures.
- 7.2.10.** All notes, meeting minutes, action items and decisions shall be documented and kept as part of the record-keeping process.
- 7.2.11.** The QMS Representative (or designate) shall ensure that relevant information is circulated to all Environmental Services Drinking Water staff.

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 7.1, 1.- Updated to note the Ministry of the Environment document titled "Potential Hazardous Events for Municipal Residential Drinking Water Systems. Section 7.2, 1. – Added the Water Lead Hand as a position to conduct the Risk Assessment. Added the General Manager of Operations as a position they may be asked for input or to attend the Risk Assessment. Section 7.2, 3 - Updated to note the Ministry of the Environment document titled "Potential Hazardous Events for Municipal Residential Drinking Water Systems.	04/18/2019	David Stevenson	8
2	Section 7.2, 6, 7 and 9 - Revised reference to Water Division staff to Environmental Services Drinking Water staff.	06/17/2020	D. Stevenson	9
3	Entire element was reformatted.	01/31/2022	D. Stevenson	10
4	Section 7.2.1 – Water Operations Superintendent updated to Environmental Services Manager. Added Environmental Superintendent.	09/21/2022	D. Stevenson	11
5	7.2.1 – Added the Director of Environmental Services to staff that will annually.	11/09/23	Environmental Services Technologist	12

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

9. Organizational Structure, Roles, Responsibilities and Authorities

9.1. Operating Authority Organization Structure Chart



***Note:** The organizational structure shown above provides the organizational structure specific to the Drinking Water Quality Management Standard.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

9.2. The Corporation of the County of Brant Council (Owner)

Council of the County of Brant have the authority and responsibility to allocate the necessary resources for the safe operation of the drinking water systems typically resulting from the recommendations of the Administration and Operations Committee.

9.3. Administration and Operations Committee

The Administration and Operations Committee is a standing committee of Council. The committee is responsible for reporting matters related to operations and maintenance of the drinking water systems to Council.

The Committee has the authority to make recommendations to Council typically based upon the recommendations of County of Brant staff.

9.4. Chief Administrative Officer (CAO)

The CAO provides oversight to all operational and administrative matters at the County of Brant. The CAO has the authority to review and approve reports regarding the County's municipal residential drinking water systems to ensure consistency with the policy and managerial procedures of the County.

9.5. General Manager of Operations (Top Management)

The General Manager of Operations is responsible for the oversight of the Environmental Services Division and its role in the County of Brant Operations Division. The General Manager has the authority to review and approve reports regarding the County's municipal residential drinking water systems to ensure consistency with the policy and managerial procedures of the County.

The General Manager of Operations will participate in Management Reviews.

9.6. Director of Environmental Services (Top Management)

The Director of Environmental Services is responsible for ensuring that the municipal drinking water supply is safe and that the County's drinking water systems follow all current regulations and legislation.

The Director of Environmental Services provides the municipal organization with; current technical information, administrative information, short and long-term planning, short and long-term budgeting and will also advise of any deficiencies and any resources required as related to the County's drinking water systems.

The Director of Environmental Services has the authority to manage the municipal drinking water systems.

The Director of Environmental Services, together with the General Manager of Operations, Environmental Services Manager, Environmental Services Superintendent, Environmental Services Technologist, and the Water Quality Technical Specialist are responsible for undertaking the Management Review.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

9.7. Environmental Services Manager (Top Management)

The Environmental Services Manager has the authority to be the Overall Responsible Operator.

The Environmental Services Manager rotates with the Environmental Services Superintendent as the Overall Responsible Operator (ORO). The Environmental Services Manager is responsible for the management of the daily operations of the County's municipal residential drinking water systems.

The Environmental Services Manager is responsible for ensuring that all County of Brant municipal residential drinking water systems are following Safe Drinking Water Act, O. Reg. 170/03, O. Reg. 128/04, the Ontario Watermain Disinfection Procedure, industry standards (AWWA), Municipal Drinking Water Licences, Drinking Water Works Permits, County procedures, and the DWQMS.

The Environmental Services Manager has the authority to deem when new Water Operators are competent and can go on the On-Call rotation.

Responsibilities also include, oversight of process operations and controls, scheduling water operations staff, ensuring that employees' certifications, and minimum training requirements are up to date, confirming all required tests are completed, reporting normal and abnormal conditions to the Director of Environmental Services and the Environmental Services Superintendent.

The Environmental Services Manager will provide guidance to and receive feedback from Operators on regular operations and future needs. The Environmental Services Manager also ensures that standard operational procedures are followed as documented. The Environmental Services Manager is authorized to direct operators, develop policies, and communicate with regulatory and technical authorities.

The Environmental Services Manager is authorized to provide direction and supervise any on-site contractors, to make process adjustments to ensure the supply of an adequate and safe supply of drinking water. Authorization also includes the purchasing of process chemicals, lab supplies, testing services and equipment parts.

The Environmental Services Manager, together with the General Manager of Operations, Director of Environmental Services, Environmental Services Superintendent, Environmental Services Technologist, and the Water Quality Technical Specialist are responsible for undertaking the Management Review.

9.8 Environmental Services Superintendent

The Environmental Services Superintendent has the authority to be the Overall Responsible Operator.

The Environmental Services Superintendent rotates with the Environmental Services Manager as the Overall Responsible Operator (ORO). The Environmental Services Superintendent is responsible for the management of the daily operations of the County's municipal residential drinking water systems.

The Environmental Services is responsible for ensuring that all County of Brant municipal residential drinking water systems are following Safe Drinking Water Act, O. Reg. 170/03, O. Reg. 128/04, the Ontario Watermain Disinfection Procedure, industry standards (AWWA),

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

Municipal Drinking Water Licences, Drinking Water Works Permits, County procedures, and the DWQMS.

Responsibilities also include, oversight of process operations and controls, scheduling water operations staff, confirming all required tests are completed, reporting normal and abnormal conditions to the Director of Environmental Services and the Environmental Services Manager.

The Environmental Services Superintendent will provide guidance to and receive feedback from Operators on regular operations and future needs. The Environmental Services Superintendent also ensures that standard operational procedures are followed as documented. The Environmental Services Superintendent is authorized to direct operators, develop policies, and communicate with regulatory and technical authorities.

The Environmental Services Superintendent is authorized to provide direction and supervise any on-site contractors, to make process adjustments to ensure the supply of an adequate and safe supply of drinking water. Authorization also includes the purchasing of process chemicals, lab supplies, testing services and equipment parts.

The Environmental Services Superintendent, together with the General Manager of Operations, Director of Environmental Services, Environmental Services Manager, Environmental Services Technologist, and the Water Quality Technical Specialist are responsible for undertaking the Management Review.

9.9. Environmental Services Technologist (QMS Representative)

The Environmental Services Technologist has been appointed as the QMS Representative.

The Environmental Services Technologist's responsibilities include: promoting awareness within the Operating Authority for drinking water legislation, regulations and the DWQMS as documented in the County's Operational Plan, developing and maintaining regulatory and quality management documentation and procedures, assisting Provincial Officer's and responding to Provincial Officer's enquiries, preparing regulatory applications (PTTW, MDWL, DWWP, DWIS and facility and system classifications), PTTW Aquifer Annual Report consultant liaison, review and file daily SCADA data reports, regulatory and quality management documentation QA/QC, preparing the O. Reg. 170/03 Schedule 20 Summary Reports, updating system and facility Operation and Maintenance Manuals, the Water Emergency Response and Contingency Plan and the Operational Plan, and preparing compliance, regulatory and information reports for the Director of Environmental Services, General Manager of Operations and Council.

The Environmental Services Technologist has the authority to create and revise controlled QMS documents, develop and revise standard operating procedures, forms, and to distribute controlled documents.

The Environmental Services Technologist has received the Walkerton Clean Water Center training on conducting internal audits.

The Environmental Services Technologist, together with the General Manager of Operations, Director of Environmental Services, Environmental Services Manager, Environmental Services Superintendent, and the Water Quality Technical Specialist are responsible for undertaking the Management Review.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

9.10. Water Quality Technical Specialist

The Water Quality Technical Specialist administers and regulates compliance of water quality matters through the design, development, implementation, and maintenance of the water quality procedures/programs/protocols including but not limiting to; sampling, testing, analysis, disinfection of watermains and facilities, recording and reporting programs. This includes ensuring that various water sampling/monitoring equipment is verified/calibrated and is in satisfactory working order.

The position also provides input to recommendations for treatment methods to meet water quality objectives for both the municipal residential and non-residential water supply systems.

The Water Quality Technical Specialist oversees and operates the County's Non-Residential Drinking Water Systems and conducts the monthly/quarterly monitoring well inspection and sampling program.

The Water Quality Technical Specialist responds to water quality concerns and complaints received by Environmental Services Water Operations.

The Water Quality Technical Specialist provides an oversight roll for the disinfection and commissioning of new watermain installation projects and service connections 100 mm and over. The Water Quality Technical Specialist has the authority to review, request revisions and approve disinfection procedures and final disinfection reports submitted by third parties.

The Water Quality Technical Specialist has the authority to verify/calibrate sampling and monitoring equipment and to collect regulated and non-regulated drinking and raw water samples.

The Water Quality Technical Specialist provides direct supervision to the Water Quality Technician.

The Water Quality Technical Specialist will prepare reports to the Ministry, Council, Committees, Departments, the Brant County Health Unit, the public, and as required by legislative requirements.

The Water Quality Technical Specialist will always follow the requirements of the Safe Drinking Water Act, O. Reg. 170/03, O. Reg. 128/04, the Ontario Watermain Disinfection Procedure, industry standards (AWWA), Municipal Drinking Water Licences, Drinking Water Works Permits and County procedures. If non-compliant incidents occur, the Water Quality Technical Specialist must act upon, report to the ORO, and record all information as required regulations and County Procedures when working in the drinking water systems.

The Water Quality Technical Specialist, together with the General Manager of Operations, Director of Environmental Services, Environmental Services Manager, Environmental Services Superintendent, and the Environmental Services Technologist are responsible for undertaking the Management Review.

The Water Quality Technical Specialist has received the Walkerton Clean Water Center training on conducting internal audits.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

9.11. Lead Hand Water Operator

The Lead Hand, in coordination with the Overall Responsible Operator, is responsible for the supervision of daily operations and maintenance of the water facilities and distribution systems.

The Lead Hand has the authority to be the Overall Responsible Operator when the Environmental Services Manager and the Environmental Services Superintendent are unable to act.

The Lead Hand has the authority to direct Operators and contractors in the repair and maintenance of all aspects of the water facilities and distribution systems, which includes watermains, pumps, regulatory and non-regulatory monitoring equipment, hydrants, valves, services, and shut offs.

Recording of daily activities, following current regulations and legislation, and reporting of normal and abnormal conditions to the Environmental Services Superintendent are included in the duties.

The Lead Hand is required to carry out daily duties for the treatment and distribution processes to ensure operations are completed and recorded in compliance with Safe Drinking Water Act, O. Reg. 170/03, O. Reg. 128/04, the Ontario Watermain Disinfection Procedure, industry standards (AWWA), Municipal Drinking Water Licences, Drinking Water Works Permits and County procedures. If non-compliant incidents occur, the Lead Hand must act upon, report to the ORO, and record all information as required regulations and County Procedures.

The Lead Hand has authorization to take control of emergency situations (e.g. watermain breaks) to ensure repairs are completed in a safe and efficient manner.

The Lead Hand may participate in the Management Review.

9.12. Certified Water Operators

All Certified Operators are responsible for maintaining the County of Brant's Large and Small Municipal Residential Drinking Water Systems (Water Treatment and Water Distribution and Supply).

Operators are required to carry out daily duties for the treatment and distribution processes to ensure operations are completed and recorded in compliance with Safe Drinking Water Act, O. Reg. 170/03, O. Reg. 128/04, the Ontario Watermain Disinfection Procedure, industry standards (AWWA), Municipal Drinking Water Licences, Drinking Water Works Permits, and County procedures. If non-compliant incidents occur, Operators must act upon, report to the ORO, and record all information as required regulations and County Procedures.

Certified Operators have the authority to collect regulatory and non-regulatory drinking water samples, perform testing, monitor, and adjust treatment processes (with direction from the Overall Responsible Operator as required) and perform maintenance, calibration and verification on the treatment and distribution equipment within the systems, in accordance with standard operating procedures, to ensure a safe and adequate water supply.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

9.13. Water Quality Technician

The Water Quality Technician administers and regulates compliance of water quality matters through the design, development, implementation, and maintenance of the water quality procedures/programs/protocols including but not limiting to; sampling, testing, analysis, disinfection of watermains and facilities, recording and reporting programs. This includes ensuring that various water sampling/monitoring equipment is verified/calibrated and is in satisfactory working order. The position also provides input to recommendations for treatment methods to meet water quality objectives for both the municipal residential and non-residential water supply systems. Additionally, this position reviews and verifies water pumping and consumption data and completes associated regulatory reconciliation calculations.

The Water Quality Technician is responsible for the administration of technical/maintenance matters and communication (internal & external) related to the bulk water fill stations.

The Water Quality Technician oversees and operates the County's Non-Residential Drinking Water Systems and conducts the monthly/quarterly monitoring well inspection and sampling program.

The Water Quality Technician responds to water quality concerns and complaints received by Environmental Services Water Operations.

The Water Quality Technician has the authority to verify/calibrate sampling and monitoring equipment and to collect regulated and non-regulated drinking and raw water samples.

The position is under supervision of the Water Quality Technical Specialist and will assist in the preparation of reports for the Ministry, Council, Committees, Departments, the Brant County Health Unit, the public, and as required by legislative requirements.

The Water Quality Technician will always follow the requirements of the Safe Drinking Water Act, O. Reg. 170/03, O. Reg. 128/04, the Ontario Watermain Disinfection Procedure, industry standards (AWWA), Municipal Drinking Water Licences, Drinking Water Works Permits and County procedures. If non-compliant incidents occur, the Water Quality Technician must act upon, report to the ORO, and record all information as required regulations, and County Procedures when working in the drinking water systems.

The Water Quality Technician has received the Walkerton Clean Water Center training on conducting internal audits.

The Water Quality Technician will assume the role of the QMS Representative in the event the Environmental Services Technologist is unable to act.

9.14. Water Division Clerk

The Water Division Clerk is responsible and has the authority for, but not limited to; arranging and logging fire flow tests, procurement of water treatment chemicals, equipment and parts for water operations, processing invoices and forwarding them to accounts payable, coordinating and tracking staff training, processing water connection and demolition permit applications, arranging locates and trench numbers (emergency and non emergency), maintaining records of watermain breaks, the liaison for renewals and/or upgrades to operator certification, records management (both hard and electronic copies), filing, and provides support to water operations, including customer concerns (receive, dispatch, log and follow up to ensure satisfactory closure), checks and prepares weekly microbiological samples for pickup, tracking

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

scheduled absences, and updating the daily operator assignments. The position will also provide general administrative support and coverage for the Operations Administration staff as required.

9.15. Water Clerk

The Water Clerk is responsible and has the authority for, but not limited to; the scheduling of consumer water meter maintenance/replacements, reconciliation of consumer water and waste water accounts, recording/control of water meters for temporary watermain projects and recording the associated water use, liaison with GrandBridge Energy in regards to water account billing and collection, consumer water billing inquiries, management and coordination of water operations data for regulatory and non-regulatory reporting, , records management (both hard and electronic copies), provides support to water operations, including customer concerns (receive, dispatch, log and follow up to ensure satisfactory closure), checks and prepares weekly microbiological samples for pickup, tracking scheduled absences, and updating the daily operator assignments. The position will also provide general administrative support and coverage for the Operation Administration staff as required.

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Updated sections 9.1 to 9.15 to note authorities for the various positions.	07/12/13	Dave Stevenson	7
2	Sections 9.1 and 9.5: Updated General Manager of Public Works to General Manger of Operations	01/11/2016	Dave Stevenson	8
3	Section 9.15: Updated to note that the Water Records Management Clerk has received the Walkerton Clean Water Center training on conducting internal audits and will act as the QMS Representative in the event the Water Technologist is unable to act.	11/21/2016	Dave Stevenson	9
4	Section 9.14 to note Energy+ replacing Brant County Power, added recording and control of temporary water meters and water usage. Section 9.13 Added notification for watermain/service connection leaks/breaks and interruption of service notices. Section 9.9 and 9.12 Added monitoring well inspections and sampling, non-residential drinking water systems and responds to water quality concerns and complaints.	11/23/2017	Dave Stevenson	10
5	Section 9.9 revised to note the position has received the Walkerton Clean Water Center training on conducting internal audits. Section 9.12 revised to note the position has received the Walkerton Clean Water Center training on conducting internal audits and will assume the role of the QMS Representative in the event the Water Technologist is unable to act. Section 9.15 revised to note that the position no longer position has training on conducting internal audits and will not assume the role of the QMS Representative in the event the Water Technologist is unable to act.	08/16/2018	Dave Stevenson	11
6	Sections 9.1 and 9.5 revised to note that GM of Operations is a member of Top Management.	06/03/2019	Dave Stevenson	12

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 18

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
7	Revoked Section 9.15 as the position of the Water Division Records Managements Clerk no longer exists. Sections 9.13 and 9.14 were updated to both include the roles, responsibilities and authorities that were carried out by the Water Records Management Clerk. Section 9.1 revised to note the new structure for the Administration Division.	01/29/2020	Dave Stevenson	13
8	Reference to the Director of Water has been revised to the Director of Environmental Services. Sections 9.1 and 9.3 was updated to identify the new Administration and Operations Committee which replace Public Works and Corporate Development Committees.	03/17/2020	D. Stevenson	14
9	Section 9.13 and 9.14 – Water Division replaced by Environmental Services	06/17/2020	D. Stevenson	15
10	Section 9.12, 9.13 and 9.14 had the descriptions updated.	03/30/2022	D. Stevenson	16
11	Section 9.1 – Water Operations Superintendent updated to Environmental Services Manager. Added Environmental Services Superintendent. Updated Operators to 9. Sections 9.6 and 9.10 – Water Operations Manager updated to Environmental Services Manager. Environmental Services Superintendent added. Environmental Services Superintendent added as Section 9.8. All other sections following renumbered.	09/21/2022	D. Stevenson	17
12	Updated Water Technologist to Environmental Services Technologist in all required sections. 9.6 and 9.11– Removed the Director of Environmental Services can be the ORO. 9.7, 9.8, 9.10, 9.11, 9.12 and 9.13 – Added regulatory requirements to be followed when working in the drinking water systems.	11/09/2023	Environmental Services Technologist	18

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 9, 2023	Version Number: 13

10. Competencies

10.1. Identifying Competencies

The following identifies the competencies required of County of Brant staff whose performance may have a direct impact on drinking water quality.

10.2. Director of Environmental Services

10.2.1. The Director of Environmental Services must possess advanced theoretical and working knowledge of administrative skills expected of a senior level manager. In addition, an advanced theoretical and working knowledge of the Safe Drinking Water Act, all applicable drinking water regulations, County of Brant Water Standard Operating Procedures and Guidance Documentation, AWWA/ANSI Standards, the DWQMS, the Operational Plan, Source Water Protection Program, and the County of Brant Municipal Residential Drinking Water Systems.

10.3. Environmental Services Manager

10.3.1. The Environmental Services Manager must possess intermediate theoretical and working knowledge of administrative skills expected of a senior level manager. Posses advanced theoretical and working knowledge of scheduling work and maintenance, the Safe Drinking Water Act, all applicable drinking water regulations, Ontario Watermain Disinfection Procedure, County of Brant Water Standard Operating Procedures and Guidance Documentation, AWWA/ANSI Standards, the DWQMS, the Operational Plan and the County of Brant Municipal Residential Drinking Water Systems.

10.3.2. The Environmental Services Manager is designated as an Overall Responsible Operator. The Environmental Services Manager will meet and comply with Section 23 of O. Reg. 128/04 regarding operator certification.

10.4. Environmental Services Superintendent

10.4.1. The Environmental Services Superintendent must possess theoretical and working knowledge of administrative skills expected of an intermediate level manager. Posses advanced theoretical and working knowledge of scheduling work and maintenance, the Safe Drinking Water Act, all applicable drinking water regulations, Ontario Watermain Disinfection Procedure, County of Brant Water Standard Operating Procedures and Guidance Documentation, AWWA/ANSI Standards, the DWQMS, the Operational Plan, the operation of the County of Brant Municipal Residential Drinking Water Systems and their Operation and Maintenance manuals.

10.4.2. The Environmental Services Superintendent is designated as an Overall Responsible Operator. The Environmental Services Superintendent will meet and comply with Section 23 of O. Reg. 128/04 regarding operator certification.

10.5. Lead Hand

10.5.1. The Lead Hand will posses working knowledge of scheduling work and maintenance, the Safe Drinking Water Act, all applicable drinking water regulations, Ontario Watermain Disinfection Procedure, County of Brant Water Standard Operating Procedures and Guidance Documentation, AWWA/ANSI Standards, the DWQMS, the

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 9, 2023	Version Number: 13

Operational Plan, the operation of the County of Brant Municipal Residential Drinking Water Systems and their Operation and Maintenance Manuals.

- 10.5.2.** The Lead Hand can be designated as an Overall Responsible Operator when the Environmental Services Manager and Environmental Services Superintendent cannot act. The Lead Hand will meet and comply with Section 23 of O. Reg. 128/04 regarding operator certification.

10.6. Operator Competencies

- 10.6.1.** Section 22 of O. Reg. 128/04 requires that all Water Treatment and Distribution Operators possess certification appropriate to the type of subsystem where they are employed.

- 10.6.2.** All operators must have at least an OIT level certificate, while ultimately working toward obtaining Class 3 Water Distribution and Supply and Class 1 Water Treatment certification.

- 10.6.3.** Newly hired and current Water Operators are competent when they have completed their training, have appropriate certification, and are placed on the “Duty Roster (On-Call)” by the Environmental Services Manager.

- 10.6.4.** Count of Brant certified Water Operators are required to have skills and knowledge in the following areas:

- The concepts of waterborne diseases, pathogens and other bacteria related to water and the reason for water treatment and disinfection.
- The math, science and chemistry used in drinking water treatment processes.
- Drinking water treatment processes including the CT concept to ensure proper disinfection.
- All applicable Provincial drinking water legislation and regulations.
- The requirements of Municipal Drinking Water Licences (MDWL), Drinking Water Works Permits (DWWP) and Permits To Take Water (PTTW).
- The County’s Operational Plan and the DWQMS.
- The Ontario Watermain Disinfection Procedure.
- AWWA, NSF and ANSI Standards.
- Identifying, reporting, and responding to adverse drinking water conditions as required by regulations and County procedures.
- Critical Control Limits.
- The importance of following County of Brant and provincial policies and procedures and the potential consequences for not following them.
- Performing certain bench top lab analysis and interpreting the results.
- Working knowledge of the operation of the County of Brant’s water treatment system using the SCADA (Supervisory Control and Data Acquisition) system.
- Working knowledge of the operation of the County of Brant’s water treatment system without the SCADA system.
- Retrieving, trending, and analyzing data from the SCADA Historian and the e.RIS software system.
- An ability to handle emergency situations.
- Adjust, check, and calibrate/verify chemical feed rates.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 9, 2023	Version Number: 13

- Knowledge of sodium hypochlorite; it's use in the water treatment process and safe handling practices.
- Knowledge of the use of hydrofluorosilicic acid and it's use in the water treatment process and safe handling practices.
- Knowledge of the use of sodium thiosulphate acid and it's use in the water treatment process and safe handling practices.
- The operation and maintenance of the UV systems at Bethel and Gilbert.
- The operation of the filtration system at Mt. Pleasant.
- Conducting equipment maintenance, calibrations, verifications, and repairs.
- Conducting online analyzer maintenance, calibrations, verifications, and repairs.
- The County's drinking water distribution systems and their operation, including under and above ground storage facilities, booster pumping facilities, and PRV chambers.
- Primary and secondary disinfection.
- Modifying and repairing water distribution piping and appurtenances safely while following regulatory and County requirements for disinfection of all new and repaired water mains.
- Conducting valve maintenance and repair.
- Conducting hydrant maintenance and repair.
- Certified in water meter installations.

10.7. Water Quality Technical Specialist and Water Quality Technician

10.7.1. The Water Quality Technical Specialist and Water Quality Technician will possess working knowledge of scheduling work and maintenance, the Safe Drinking Water Act, all applicable drinking water regulations, Ontario Watermain Disinfection Procedure, County of Brant Water Standard Operating Procedures and Guidance Documentation, AWWA/ANSI/NSF Standards, the DWQMS, the Operational Plan, the operation of the County of Brant Municipal Residential Drinking Water Systems.

10.8. Satisfying Competencies

10.8.1. The County of Brant may administer certain tests, conduct interviews, verify references and/or request specific documentation as part of the hiring process to verify skills, experience, and knowledge.

10.8.2. To meet ongoing changes to technology, software, the requirements of O. Reg. 128/04 and County of Brant drinking water system processes, all Operators holding certification will obtain training as required by O. Reg. 128/04, as a minimum. The training may be provided on or off site by qualified employees or contracted subject matter experts. Training effectiveness is evaluated when appropriate through testing or a demonstration of knowledge gained.

10.8.3. Once Operators have been deemed competent by the Environmental Services Manager in the system (North/South) they started their employment in, they will be integrated into the other system (when possible) to gain competencies in operating all five County drinking water systems.

10.8.4. Training and information on regulatory information and documentation, the DWQMS and the County's QMS will be presented to all County of Brant drinking water staff by

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 9, 2023	Version Number: 13

the QMS Representative through monthly meetings. Meetings may not be conducted in July and August to accommodate staff vacations.

10.8.5. Training records and Operator certification is tracked and maintained by the Water Division Clerk.

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Revised Sections 10.2 and 10.3 to note the DWQMS	04/18/2019	D. Stevenson	8
2	Updated Director of Water to Director of Environmental Services.	03/17/2020	D. Stevenson	9
3	Section 10.4 – Updated to note Operators work towards obtaining Class 1 Water Treatment certification. Section 10.4 – Removed reference to the Bethel Ion Exchange units.	01/04/2021	D. Stevenson	10
4	Entire Element reformatted.	01/31/2022	D. Stevenson	11
5	Sections 10.2 and 10.3 – Updated and title of Water Operations Superintendent to Environmental Services Manager. Section 10.4 - Added to note the new Environmental Services Superintendent. Section 10.5 – Added to include the Lead Hand. Section 10.7 – Added to include the Water Quality Technical Specialist and Water Quality Technician. 10.6.4 – Updated list of requirements.	09/22/2022	D. Stevenson	12
6	10.2.2 and 10.5.2 – Removed section noting the Director as ORO. 10.6.4 – Added sodium thiosulphate. 10.8.3 – Added to document how competencies are developed for County DWS's.	11/09/2023	Environmental Services Technologist	13

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 24, 2023	Version Number: 18

11. Coverage

11.1. Overview

- 11.1.1. The County of Brant employs certified Water Operators. All Operators are required to hold Operator certification for water treatment and/or water distribution and supply.
- 11.1.2. The Lead Hand and certified Operators are employed according to the terms and conditions of a collective agreement between the County of Brant and C.U.P.E. Local 1000.
- 11.1.3. In the event of a strike or lock-out, drinking water system coverage will be provided by Environmental Services administrative staff that possess Ministry Drinking Water Operator certification.
- 11.1.4. In the event of an emergency the County may follow the MECP requirements in the use of “emergency substitute operators” as per O. Reg. 128/04 and O. Reg. 129/04.
- 11.1.5. The Environmental Services Manager and Environmental Services Superintendent rotate as the Overall Responsible Operator (ORO) for the County of Brant water facilities and distribution systems. In the event the Environmental Services Manager and Environmental Services Superintendent are absent or unable to act, the Lead Hand is designated as the ORO (SOP-49-10).
- 11.1.6. A rotating On-Call Operator schedule is prepared annually and is revised as required by the Environmental Services Manager and Environmental Services Superintendent.
- 11.1.7. In the event of a pandemic, the County of Brant Pandemic Plan will be reviewed and followed. A copy of the plan is available in the Environmental Services Division at the Burford Administration Building.

11.2. On-site Coverage Normal Weekdays

- 11.2.1. The following describes coverage in the County’s drinking water office, facilities, and distribution systems during regular business hours.
 - a) The water facilities and distribution systems are staffed Monday through Friday 7:00 a.m. to 3:30 p.m. (except for observed holidays).
 - b) The Environmental Services Division, Water Operations office is staffed Monday through Friday 8:30 a.m. to 4:30 p.m. (except for observed holidays).
 - c) The County designates all Operators with Class 1 Certification or higher as an Operator-In-Charge (OIC) (except for Water Quality Technical Specialist and Water Quality Technician). This allows these Operators to perform tasks requiring an OIC.
 - d) An Operator with Class 1 Certification or higher that is assigned a task is considered as the OIC for that designated task.

11.3. After-hours / Weekend / Observed Holiday Coverage

- 11.3.1. The following describes coverage in the County’s drinking water facilities and distribution systems after hours, weekends and observed holidays.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 24, 2023	Version Number: 18

- a) After-hours, weekend and observed holiday shifts are covered by the North On-Call Duty Operator (OIC) and the South On-Call Duty Operator (OIC).
- b) If additional staff are required, the On-Call Duty Operator can request the assistance of other Operator(s).

11.4. Additional Information

11.4.1. Emergency contact information is documented in Section 3, of the Water Systems Emergency Response Contingency Plan (D-01-10).

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 11 – Included reference to County of Brant Pandemic Plan	October 7, 2013	Water Technologist	7
2	Section 11.2 b) – Revised to note on-call schedule is now prepared twice annually from quarterly. Section 11.2 c) – Revised to note WIN 911 calls out alarms to operators SCADA auto dialler is a back up to WIN 911. Section 11.2 f) – Updated call sequence of staff.	November 12, 2014	Water Technologist	8
3	Section 11.2 – Added bullet b) Section 11.2 updated to note the term OIC. Section 11.2 g) – OIT added.	August 1, 2017	Water Technologist	9
4	Sections 11.1 and 11.2 – Sections revised to reflect coverage more accurately.	May 10, 2018	Water Technologist	10
5	Section 11.2 b) – Revised to note review changed from twice annually to annually.	04/19/2019	Water Technologist	11
6	Updated title of Director of Water to Director of Environmental Services.	03/17/2020	Water Technologist	12
7	Section 11 – Revised Water Division Administration staff to Environmental Services staff.	06/17/2020	Water Technologist	13
8	Section 11.1 – b, c and d updated to describe coverage.	01/04/2021	Water Technologist	14
9	Entire element revised.	01/31/2022	Water Technologist	15
10	11.1.4 – Added. 11.1.5 - Revised to note that the Environmental Services Manager and Environmental Services Superintendent rotate as ORO. 11.3.1 c) – Added scheduling of the ORO.	09/22/2022	Water Technologist	16
11	11.1.5 - Added reference to SOP-49-10. 11.1.6 - Added section. 11.2 and 11.3 - Updated to address OIT's as On-Call Duty Operator.	02/27/2023	Water Technologist	17
12	11.1.5 – Remove the Director as ORO. 11.2.1 c) – Removed Director. 11.2, 11.3, and 11.4 received a complete update.	11/24/2023	Environmental Services Technologist.	18

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 11

12. QMS Communications

The QMS Representative, in conjunction with Top Management, will ensure that the QMS is communicated to the Owner of the County's drinking water systems, members of the Operating Authority, other employees employed by the County (as required), suppliers, service providers and consumers.

12.1. Owner

- 12.1.1. Keep the Owner informed of any changes to the Operational Plan, the County's QMS, internal and external audit results, the outcome of on-going activities from the Management Review and other QMS issues through various reports.
- 12.1.2. Keep the Owner informed of legislative and regulatory requirements through various reports.
- 12.1.3. Ensure an orientation session on the DWQMS, the QMS Policy and the Operational Plan is provided when a new Council is elected. This is provided as part of the Standard of Care Training.
- 12.1.4. Minutes of QMS related meetings and/or reports will be filed at the Environmental Services office.

12.2. Operating Authority and County of Brant Staff

- 12.2.1. Will be kept informed on the QMS and any changes or updates to the QMS through monthly DWQMS & Health and Safety meetings chaired by the QMS Representative or via email messages.
- 12.2.2. New permanent staff and/or temporary Operating Authority staff will be provided an overview of the DWQMS, the Operational Plan and regulatory requirements during orientation. Details of the overview session will be provided in the staff persons training file.
- 12.2.3. Some County of Brant employees will be advised of how their roles may impact the quality management system.
- 12.2.4. A current version of the Operational Plan is available for review by staff at the Environmental Services Office, Gilbert Water Treatment Facility, Mt. Pleasant Water Treatment Facility and electronically on the County website, in the staff DWQMS file on the County's server, and via the Environmental Services Water Operations OneDrive folder.
- 12.2.5. Details of all QMS related meetings will be archived in the Environmental Services files.
- 12.2.6. QMS Policy is posted at select water facilities, Burford Administration Office and on the County website.

12.3. Critical Suppliers

- 12.3.1. Suppliers are required to submit documentation for certain supplies and services to ensure conformance of regulatory or County of Brant requirements as required.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 09, 2023	Version Number: 11

12.3.2. Essential suppliers and service providers are provided guidance document GD-04-18 Notification to Contractors, Consultants, Developers, Supplier, Services Providers Quality Management System and Regulatory Information as required.

12.4. Consumers

12.4.1. Water bill inserts are used to communicate the QMS to County of Brant water customers at least once each calendar year advising of the QMS Policy and that the Operational Plan is available for viewing on the County's website.

12.4.2. Water service interruptions, planned maintenance, and unplanned maintenance is communicated to the consumers and the public as described by SOP-46-10.

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 12.1: Updated General Manager of Public Works to General Manager of Operations	01/11/2016	David Stevenson	7
2	Section 12.1 and 12.2 – Revised Water Division reference to Environmental Services.	06/17/2020	D. Stevenson	8
3	Section 12.1 – Updated to note DWQMS training is provided through the Standard of Care Training. Section 21.1 – Updated to note keeping Owners informed of legislative and regulatory requirements. Section 12.3 – Updated to describe the requirement to potentially submit documentation. Section 12.4 – Updated to note that Operational if on the website. Section 12.4 – SOP-46-10 used to communicate to the public.	01/04/2021	D. Stevenson	9
4	Entire element revised. Section 12 updated to note that the QMS Rep, in conjunction with top management, will ensure the QWS is communicated. Section 12 and 12.2.3 –was added to include other County staff.	01/31/2022	D. Stevenson	10
5	12.1.3 – Removed WCWC. 12.3.1 and 12.3.2 revoked. 12.3.2 – Added reference to GD-04-18 Notification to Contractors, Consultants, Developers, Supplier, Services Providers Quality Management System and Regulatory Information	11/09/2023	Environmental Services Technologist	11

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: October 26, 2023	Version Number: 14

14. Review and Provision of Infrastructure

14.1. Overview

14.1.1. An infrastructure review ensures the periodic evaluation of the condition and capacity of the County's drinking water system's infrastructure components.

14.1.2. The results of the evaluation are to be used to prioritize future resource allocation.

14.2. Meetings and Meeting Records

14.2.1. At least once per year, the Director of Environmental Services, Environmental Services Manager, Environmental Services Superintendent, and the QMS Representative will meet to conduct an infrastructure review.

14.2.2. The General Manager of Operations, Director of Engineering & Infrastructure Planning, Director of Infrastructure and Asset Management, Lead Hand, and Water Operators may attend the meeting or will be asked for input prior to the meeting.

14.2.3. Minutes or a summary of the meeting(s) and records of attendance will be documented by the QMS Representative and will be filed in Environmental Services Records within 30 days of the conclusion of the meeting(s).

14.3. Infrastructure Review Items

14.3.1. The Director of Environmental Services, Environmental Services Manager, and Environmental Services Superintendent will consider:

a) The outcomes of the risk assessment documented under Element 8 and ensure that the adequacy of the infrastructure necessary to operate and maintain the County's municipal residential drinking water and distribution systems is reviewed.

b) Buildings, storage, and distribution:

- New infrastructure required in the upcoming year (due to regulations, growth, or unforeseen circumstances).
- Recommended infrastructure maintenance for the upcoming fiscal year and looking forward five years.
- Recommended infrastructure rehabilitation or renewal for the upcoming year and looking forward ten years.
- Recommended infrastructure upgrading or replacement for the upcoming year and looking forward beyond ten years.

c) Machinery, equipment, software:

- New machinery, equipment (includes tools and vehicles), computers and software required in the upcoming year and looking forward three years.
- Planned and unplanned machinery and equipment maintenance and replacement parts for the upcoming fiscal year.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: October 26, 2023	Version Number: 14

- Machinery and equipment maintenance costs (based upon the original manufacturer's recommended maintenance frequency).
 - Machinery and equipment planned maintenance costs (based upon normal operating life and past planned and unplanned maintenance history).
- d) Drinking water related projects identified by the General Manager of Operations, Director of Infrastructure, Director of Roads, and other County of Brant staff.
- e) Other items that are to be reviewed to determine priority needs:
- Previous year's Review and Provision Infrastructure Report.
 - Input from Operating Authority staff.
 - Future Infrastructure Division projects.
 - MECP Compliance Inspection Reports.
 - Water production and consumption trends.
 - Flow data trends.
 - Watermain break records.
 - Water quality reports.
 - Operations maintenance records.

14.4. Notification to Owners

- 14.4.1.** At the conclusion of the review, an Infrastructure Review Report must be presented to the Owners prior to budget deliberations.
- 14.4.2.** The report must include a summary of the finding from section 14.3.
- 14.4.3.** The report will be provided to the Administration and Operations Committee and then forwarded to Council (Owners).

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: October 26, 2023	Version Number: 14

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Added the Director of Roads to paragraph 3.	October 7, 2013	Water Technologist	7
2	Updated the title of Director of Engineering to the Director of Infrastructure Services.	November 15, 2017	Water Technologist	8
3	Section 2 – Updated to note that the General Manager of Operations, Director of Infrastructure Services, Director of Roads, Water Lead Hand and Water Operators should be considered or asked to provide input. Section 3 – Added the requirement to consider the outcomes from Element 8. Section 3 – Added or updated items that should be considered as part of the review. Added Section 6 – The requirement to keep and file minutes and record of attendance.	04/18/2019	Water Technologist	9
4	The Director of Water was revised to Director of Environmental Services. Section 5 – Public Works Committee updated to Administration and Operations Committee.	03/17/2020	Water Technologist	10
5	Section 6 Revised Water Division to Environmental Services.	06/17/2020	Water Technologist	11
6	Entire element revised. 14.2.4 – Added requirement to file meeting minutes within 30 days of the meeting.	01/31/2022	Water Technologist	12
7	Sections 14.2.1 and 14.3.1 – Updated Environmental Services Manager title and added Environmental Services Superintendent.	09/22/2022	Water Technologist	13
8	14.2.1, 14.2.2, 14.2.3, and 14.2.4 – Updated position title changes in these sections. 14.2.2 and 14.2.3 were merged to note positions that can attend the annual meeting.	10/26/2023	Environmental Services Technologist	14

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 10, 2023	Version Number: 12

15. Infrastructure Maintenance, Rehabilitation, and Renewal

15.1. Overview

15.1.1. The Environmental Services Water Operations (Operating Authority) will:

- a) Keep the summary of the infrastructure maintenance, rehabilitation, and renewal programs current.
- b) Ensure that the long-term forecast is reviewed at least once every year.
- c) Communicate the programs to the Owner (Council).
- d) Monitor the effectiveness of the maintenance program.

15.2. Planned Maintenance, Replacement and Renewal: Distribution System

15.2.1. Whenever practical, the planned maintenance, rehabilitation, or renewal of distribution infrastructure will be in conjunction/coordination with other divisions (Infrastructure Services, Development Services, Roads Division), and utilities (GrandBridge Energy/Hydro One, Union Gas, Bell Canada, etc.).

15.2.2. All work to existing distribution infrastructure will comply with all applicable County of Brant Standard Operating Procedures, O. Reg. 128/04, O. Reg. 170/03, MDWL, DWWP, AWWA standards, and the Ontario Watermain Disinfection Procedure.

15.2.3. If the planned maintenance, replacement, or renewal can be conducted by County of Brant Water Operators, then the ORO and/or Water Lead Hand will direct staff accordingly.

15.2.4. For work beyond the capability of available resources (staff and equipment), the County will engage a qualified contractor through the tender process, or a contractor noted in Element 13.

15.2.5. All operational work must be conducted and documented by or under the supervision of a certified Operator or an Operator In Charge (OIC) as required by regulation.

15.2.6. Long term maintenance, rehabilitation, and renewal forecasting for distribution infrastructure is conducted and documented during the annual Element 14 Review and Provision of Infrastructure.

15.2.7. Planned distribution system maintenance includes but is not limited to the annual watermain flushing and hydrant inspections, the valve turning program, reservoir and elevated tank inspections (5-7 years), and leak detection program.

15.3. Unplanned Maintenance, Replacement and Renewal: Distribution System

15.3.1. Unplanned maintenance tasks result from unexpected malfunction or breakage.

15.3.2. Unplanned maintenance is conducted as required.

15.3.3. Unplanned maintenance typically consists of watermain breaks, service pipe leaks, curb stop repairs, and valve, hydrant, or meter replacements.

15.3.4. All unplanned maintenance activities are authorized by the ORO and/or the Water Lead Hand.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 10, 2023	Version Number: 12

15.3.5. The County engages a qualified contractor for work related to watermain breaks, service leaks, valve, and hydrant repairs.

15.3.6. A list of acceptable contractors is contained within Element 13 of the Operational Plan.

15.3.7. All operational work must be conducted and documented by or under the supervision of a certified Operator or an OIC as required by County of Brant Standard Operating Procedures, O. Reg. 128/04, O. Reg. 170/03, AWWA standards, MDWL, DWWP, and the Ontario Watermain Disinfection Procedure.

15.3.8. All records are retained in the Environmental Services office.

15.4. Planned Maintenance, Replacement and Renewal: Buildings, Machinery and Equipment – Water Treatment

15.4.1. Planned maintenance includes annual calibrations of flow meters and online analyzers, annual calibrations and quarterly verification of Hach kits, annual service of UV units (Gilbert and Bethel), and reservoir/elevated tank inspections.

15.4.2. Planned maintenance must be conducted and documented by or under the supervision of a certified Operator or OIC. All maintenance will follow the requirements of County of Brant Standard Operating Procedures, MDWL, DWWP, Provincial Regulations, AWWA Standards and manufacturers' specifications.

15.4.3. Details of all maintenance must be recorded in the facility/system's logbook.

15.4.4. Completed logbooks will be forwarded to the Water Quality Technician for filing.

15.4.5. Long term maintenance, rehabilitation, and renewal forecasting for buildings, machinery, and equipment is conducted and documented during the annual Element 14 Review and Provision of Infrastructure.

15.5. Unplanned Maintenance: Buildings, Machinery and Equipment – Water Treatment

15.5.1. Unplanned maintenance is completed as required and must be conducted and documented by or under the supervision of a certified Operator or OIC. All maintenance will follow the requirements of County of Brant Standard Operating Procedures, MDWL, DWWP, Provincial Regulations, AWWA Standards and manufacturers' specifications.

15.5.2. If the repair is beyond the capabilities of an Operator or OIC, the County will engage a qualified contractor(s), noted in Element 13, to carry-out the work under the supervision of an Operator or OIC.

15.5.3. All unplanned maintenance will follow the requirements of County of Brant Standard Operating Procedures, MDWL, DWWP, Provincial Regulations, AWWA Standards and/or manufacturers' specifications.

15.6. Planned Maintenance: Wells (Production and Monitoring)

15.6.1. Planned Maintenance, Replacement, and Renewal for wells follows the requirements of SOP-09-09.

15.6.2. Major components of production wells are inspected and serviced approximately every 5 years.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 10, 2023	Version Number: 12

15.6.3. An above surface, physical inspection of all County wells is conducted and documented by Water Operators and Water Quality staff monthly.

15.6.4. All planned maintenance will follow the requirements of County of Brant Standard Operating Procedures, MDWL, DWWP, Provincial Regulations, AWWA Standards and/or manufacturers' specifications.

15.6.5. All work to a well will be conducted by a licenced well contractor.

15.6.6. Long term maintenance, rehabilitation, and renewal forecasting for wells is conducted and documented during the annual Element 14 Review and Provision of Infrastructure.

15.7. Unplanned Maintenance: Wells (Production and Monitoring)

15.7.1. Unplanned maintenance to wells is conducted as required by a certified Well Contractor (noted in Element 13).

15.7.2. All unplanned maintenance will follow the requirements of County of Brant Standard Operating Procedures, MDWL, DWWP, Provincial Regulations, AWWA Standards and/or manufacturers' specifications.

15.8. Monitoring the Effectiveness of the Maintenance Program

15.8.1. The Environmental Services Manager and Environmental Services Superintendent will seek input from Water Operators and the Water Quality staff as required to determine the effectiveness of the maintenance program and to receive recommendations to improve the maintenance program.

15.9.1 Communicating the Program to the Owner (Council)

15.9.2 The Operating Authority will provide the Owners an overview of the infrastructure, maintenance, and renewal programs annually as part of the Element 14 Review and Provision of Infrastructure and the Element 20 Management Review summary.

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 15.1: Revised Brant County Power to Energy +	01/11/2016	Dave Stevenson	8
2	Element 15 has had a complete revision to meet the requirements of DWQMS 2.0.	04/18/2019	D. Stevenson	9
3	Section 15.1(iv) Water Records Management Clerk updated to Water Clerk.	03/17/2020	D. Stevenson	10
4	Entire element reformatted. 15.2.2, 15.3.7 and 15.4.2 updated to note requirements of SOPs, regulatory documentation and AWWA standards.	01/31/2022	D. Stevenson	11
5	15.2.1 – Updated Energy + to GrandBridge Energy and added Hydro One. 15.2.5, 15.3.7, 15.4.2, 15.5.1, 15.5.2– Added Operator or OIC. 15.8.1 – Updated Top Management to Environmental Services Manager and Environmental Services Superintendent. 15.9.2 – Updated Water Division to Operating Authority. 15.2.7 – Added reservoir and elevated tank inspections.	11/10/2023	Environmental Services Technologist	12

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 20, 2022	Version Number: 13

16. Sampling, Testing, and Monitoring

- 16.1. Sampling, testing, and monitoring of the upstream raw groundwater for the County of Brant groundwater systems is conducted by Water Quality Technical Specialist and Water Quality Technician as required by O. Reg. 170/03, O. Reg. 169/03, the systems' Municipal Drinking Water Licence and Permits to Take Water.
- 16.2. For the Airport, Mt. Pleasant, Paris and St. George Drinking Water Systems, certified Water Operators ensure that raw water is treated and that the treated water supplied to the distribution systems meets the requirements of O. Reg. 170/03 via grab samples, online analyzers, and the SCADA system. Typical parameters that are monitored by online continuous analyzers include: chlorine concentration (pre reservoir/contact chamber and Point of Entry), turbidity, fluoride (Paris only), flows, pressure, UV dose/transmittance (Paris - Gilbert and Bethel only), and nitrates (Telfer).
- 16.3. Daily operational tests for chlorine residuals are conducted by Water Operators on the treated water, via grab samples, at the facilities and in the distribution systems.
- 16.4. In accordance with O. Reg. 170/03, weekly bacti samples are collected from each production well (raw), each treatment facilities' Point of Entry (treated) and each systems' distribution system (treated) by Certified Operators and submitted to an accredited lab. Weekly bacti test results from the accredited lab are emailed to the Water Quality Technical Specialist and/or Water Quality Technician to be reviewed.
- 16.5. The results, once reviewed, are provided to the acting Overall Responsible Operator and all other Environmental Services Water Operations staff via email by the Water Quality Technical Specialist or Water Quality Technician.
- 16.6. The results are entered electronically on the server by the Water Quality Technician, or Water Quality Technical Specialist (or designate). Hardcopies of the results are filed at the Environmental Services office.
- 16.7. Regulatory samples for new watermain disinfection, disinfection of service connections, the disinfection of wells, treatment facilities and water storage facilities are collected by Certified Water Operators, Water Quality staff or a Certified Well Technician, and submitted to an accredited lab.
- 16.8. Bacti test results from the accredited lab are emailed to the Water Quality Technical Specialist and/or Water Quality Technician to be reviewed.
- 16.9. The results, once reviewed, are provided to the acting Overall Responsible Operator via email by the Water Quality Technical Specialist or Water Quality Technician. The results are entered electronically on the server by the Water Quality Technician, or Water Quality Technical Specialist (or designate). Hardcopies of the results are filed at the Environmental Services office.
- 16.10. A SCADA system monitors and records regulatory and non-regulatory parameters for each drinking water system via online continuous analyzers and other equipment.
- 16.11. In accordance with O. Reg. 170/03 and "SOP-55-11 Procedure for Review and Retrieval of Operational Data Stored by the SCADA Historian or e.RIS and the Regeneration of Dream Reports", daily SCADA data reports are reviewed by the On-Call Duty Operator within 72 hours of the report being generated.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 20, 2022	Version Number: 13

- 16.12.** The acting Overall Responsible Operator and/or Operators in Charge may adjust processes affecting water quality based upon the information and data provided by the analyzers or by the SCADA system.
- 16.13.** Any adjustments made to process parameters and analyzers must be recorded in the facility's logbook.
- 16.14.** Water Operators monitor the online continuous turbidity analyzers.
- 16.15.** The Water Quality Technical Specialist and/or Water Quality Technician are responsible for the monthly regulatory turbidity sampling from the production wells (grab samples), adjustments to the online turbidity analyzers, calibrations/verifications and/or repairs to the analyzers. The Bethel turbidity analyzer is the only regulatory analyzer.
- 16.16.** Visual inspections of the treatment facilities are conducted by the Certified Water Operators daily. Equipment and building conditions, if changed, are noted in the daily logbook and are to be reported to the ORO.
- 16.17.** Sampling is to be conducted as noted in "SOP-57-12 Procedure for Sampling Municipal Residential Drinking Water Systems".
- 16.18.** The Annual Reports will show all sample test results. The report is provided to the Owner when complete and is made available to the public via the County of Brant website.

County of Brant Water Division

Title: County of Brant Operational Plan

QMS Reference: D-02-10

Dated Created: April 16, 2009

Current Revision Date: January 20, 2022

Version Number: 13

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Updated paragraph 1 to note monitoring requirements of the Permit's to Take Water	07/13/2015	David Stevenson	8
2	Revised paragraph 3 to note nitrates are now monitored at Telfer and Bethel. Gilbert was removed. Revised paragraph 2 to note that data is entered by the Water Clerk (or designate).	10/06/2015	David Stevenson	9
3	Removed reference to the KGR system.	12/21/2016	David Stevenson	10
4	Section 1 – Revised to note Airport, Mt. Pleasant, Paris and St. George have a minimum free chlorine residual of at least 0.20 mg/L POE. Section 2 – Revised to note that the Water Quality Technician also reviews the weekly lab results. Also revised to note that the results, once reviewed, are provided to all Water Division staff via email. The results are entered electronically on the server by the Water Clerk (or designate). The Water Quality Technical Specialist or Water Quality Technician were added as positions that upload lab results. Section 3 – Added Bethel as a location where nitrates are monitored. Section 4 – Revised to note that the SCADA system records and monitors regulatory parameters for all systems.	04/18/2019	David Stevenson	11
5	Section 1 - Revised to note raw water testing, sampling and monitoring. Section 2 – Revised to note treated water sampling testing and monitoring. Section 3 – Updated to note daily operational checks for Cl2. Section 4 and 5 – Updated to note Environmental Services Drinking Water Staff/Operators. Section 4 - Removed Airport, Mt. Pleasant, Paris and St. George have a minimum free chlorine residual of at least 0.20 mg/L POE. Section 5 – Expanded to identify sampling for watermain, connections, facilities, wells, and water storage. Added Section – Turbidity Sampling, testing and monitoring,	06/17/2020	D. Stevenson	12
6	Entire element renumbered and reformatted.	01/20/2022	D. Stevenson	13

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: October 18, 2022	Version Number: 13

17. Measurement & Recording Equipment Calibration & Maintenance

- 17.1.** On-line analyzers throughout the County are calibrated and/or verified at the frequency and using the method specified by the manufacturer, the system's Municipal Drinking Water Licence, or O. Reg. 170/03.
- 17.2.** Manufacturer specifications can either be found in the system specific facility or on the internet.
- 17.3.** At Gilbert, results of these calibrations/verifications are recorded in the facility's Instrument Calibration Logbook.
- 17.4.** For all other County of Brant Water Facilities, results of calibrations/verifications will be recorded in the facility's logbook.
- 17.5.** All logbook entries are to be made in non-soluble blue ink and logbooks are to be protected from damage or loss.
- 17.6.** SOP-30-09 Procedure for the Maintenance and Calibration of Monitoring Equipment will be referenced.
- 17.7.** Portable Hach kits are calibrated every 12 months by a certified manufacturer's representative.
- 17.8.** Quarterly verifications of Hach kits are conducted by the Water Quality Technical Specialist and/or the Water Quality Technician. Records of calibration/verifications will be retained in the Environmental Services office.
- 17.9.** Flow meters will be calibrated/verified every 12 months by a qualified/certified contractor in accordance with Schedule C, Condition 3.0 of each system's Municipal Drinking Water Licence.
- 17.10.** Records of calibration are recorded in the facility logbook and electronic records received from third parties are retained in the Environmental Services office.
- 17.11.** Calibration of CT monitoring equipment will be conducted in accordance with Schedule C, Condition 4.0 of each system's Municipal Drinking Water Licence.
- 17.12.** The Water Quality Technical Specialist and/or Water Quality Technician are responsible for the monthly adjustments to the online turbidity analyzers, calibrations/verifications and/or repairs to the analyzers. The Bethel turbidity analyzer is the only regulatory analyzer.
- 17.13.** Records of calibration for turbidity analyzers are recorded in the facility logbook and electronic records received from third parties shall be retained in the Environmental Services office.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: October 18, 2022	Version Number: 13

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Updated to note that manufactures specifications can be found in the facility or via the internet.	10/06/2015	David Stevenson	8
2	Section 2 – Revised to note Quarterly verifications are conducted by the Water Quality Technical Specialist and/or the Water Quality Technician. Records of calibration/verifications shall be retained in the Water Division office. Revised Section 1 to note that entries for Gilbert are to be made in the Instrument Calibration Logbook. All other systems, entries are made in the facility logbook with non-soluble ink	04/18/2019	David Stevenson	9
3	Section 1 - Reference to MDWL and Reg. 170/03 was added. Section 3 - Updated to reference MDWL requirement. Added Section 4. Revised references to Water Division to Environmental Services	06/17/2020	D. Stevenson	10
4	Revised Section 2 and 3 – Changed annually to every 12 months.	11/30/2020	D. Stevenson	11
5	Entire element reformatted.	01/31/2022	D. Stevenson	12
6	17.13 Added to note verification and calibrations for online turbidity units.	10/18/2022	D. Stevenson	13

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 21, 2022	Version Number: 10

18. Emergency Management

18.1. Emergency Documentation

- 18.1.1. Detailed documented procedures for emergency situations which could result in an adverse water quality event, are kept for reference at the County's main drinking water system facilities and are available electronically in the Environmental Services Water Operations OneDrive account folder and staff DWQMS folder on the County's electronic server.

These documents include:

- The Operations and Maintenance Manuals
- The Water Supply Systems Emergency Response Contingency Plan
- Environmental Services Water Operations SOP electronic files. These procedures outline the roles and responsibilities of the Owner and the Operating Authority for emergency conditions.

- 18.1.2. Procedures for responding to adverse water quality and reporting procedures are documented in SOP's:

- SOP 04-09 Procedure for Reporting Adverse Condition Large and Small Municipal Residential System
- SOP 14-09 Procedure for Low Chlorine Residual in Distribution System

- 18.1.3. Detailed procedures for responding to all other emergencies are kept for reference at the County's main drinking water system facilities and are available electronically in the Environmental Services Water Operations OneDrive account folder and staff DWQMS folder on the County's electronic server.

These documents include:

- The Operation and Maintenance Manuals
- The Water Supply Systems Emergency Response Contingency Plan
- Environmental Services Drinking Water Facility SOP binder/electronic files. These procedures outline the roles and responsibilities of the Owner and the operating authority for the emergency conditions.

- 18.1.4. A complete hard copy set of all facility Operations and Maintenance Manuals is kept in the Environmental Services Manager's office.

- 18.1.5. The County of Brant Emergency/Pandemic Plan has a documented emergency plan for the County of Brant as a whole. This document is kept at the County of Brant Burford Administration Office.

18.2. Preparedness

- 18.2.1. All Water Operators working for the County of Brant have been made be aware of the County's emergency procedures, have been provided training on the emergency procedures, and have been made aware of where these procedures are stored for reference (hard and electronic copies) for water treatment, the water treatment facilities, and the water distribution system emergencies.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 21, 2022	Version Number: 10

18.2.2. The Water Supply Systems Emergency Response Contingency Plan which covers emergency situations, response, and recovery procedures is reviewed annually at a monthly DWQMS meeting.

18.2.3. Once a year, a desk top exercise is conducted to test selected emergency procedures. If present methods should change, or new employees are brought into the system, training will occur in dealing with emergency situations. The QMS Representative, or direct supervisors will provide training. All training will be documented and placed into the employee personnel files.

18.2.4. Twenty-four hour On-call Operators and water facility alarms ensure that a qualified Water Operator attend and assess any emergency within a reasonable period of time.

18.2.5. An Emergency Contact List is provided in Section 3 of the Water Supply Systems Emergency Response Contingency Plan binder.

18.3. Water Emergencies

18.3.1. During regular business hours (Monday to Friday - 8:30 to 16:30hrs), calls will be received at the Burford Administration Office.

18.3.2. After hours and weekends, calls are directed to Brant County Fire Dispatch. Dispatch will have a current On-Call Operators call out list for the North and South water zones. Any changes to the list are provided to the Brant County Fire Dispatch.

18.3.3. After hours problems at the water facilities are indicated by alarms, which will be attended to by the On-Call Operator (North and South).

18.4. Customer Concerns

18.4.1. If a member of the public calls during regular business hours with a drinking water concern, County staff receiving the call will always follow SOP 45-10 Procedure for Customer Concerns.

18.4.2. After hour calls will be received by Brant County Fire Dispatch. Brant County Fire Dispatch will immediately contact the On-Call Operator (North or South).

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 18: Removed reference to SOP-12-09 and revised SOP- 04-09 which now covers both large and small systems.	11/02/15	David Stevenson	7
2	Section 18.3: Updated to the County of Brant Emergency Plan. Section 18.1.2 – Updated to note an Emergency Contact is provided in the Water Supply Systems Emergency Response Contingency Plan binder and the facilities Operations Manual.	04/18/2019	David Stevenson	8
3	Revised reference from Water Division to Environmental Services.	06/17/2020	D. Stevenson	9
4	Complete update and reformat of the element.	01/21/2022	D. Stevenson	10

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 21, 2022	Version Number: 9

19. Internal Audits

19.1. Overview

- 19.1.1.** Internal audits are conducted to ensure that the County's Quality Management System (QMS), as documented in the County of Brant Operational Plan, conforms to the requirements of the DWQMS. These requirements include ensuring that the QMS has been effectively implemented and properly maintained.
- 19.1.2.** The County of Brant may, from time to time, request that internal audits be conducted by trained auditors from a neighbouring municipality. In turn, the County of Brant may provide the same service to other municipalities.
- 19.1.3.** The County of Brant may, from time to time, request that internal audits be conducted by trained auditors from a third-party accreditation-body.

19.2. Internal Audits Conducted by the County of Brant

- 19.2.1.** All internal auditors must have successfully completed the WCWC Internal Auditor training sessions or other approved training.
- 19.2.2.** Internal audits can be scheduled throughout the year except for January, July and August as these months typically have higher workloads, regulatory reporting, and/or increased staff vacation.
- 19.2.3.** Each element of the DWQMS will be audited at least once per year.
- 19.2.4.** The auditor will review all QMS related documentation, the results from the previous internal and external audits, and ongoing corrective and preventative actions prior to the audit.
- 19.2.5.** The auditor, in conjunction with the QMS Representative, will develop an audit checklist prior to the audit, which will include the Plan and Do requirements of the DWQMS.
- 19.2.6.** The auditor and QMS Representative will conduct an Audit Kickoff Meeting with Top Management. At least two of the three members of Top Management must attend the kickoff meeting. The scope of the audit will be presented to Top Management at this meeting. The QMS Representative will keep a record of this meeting and place it in the audit electronic file.
- 19.2.7.** The auditor will observe activities, review records and interview personnel as necessary to ensure that the status of the audited element meets the requirements of the Operational Plan and the DWQMS.
- 19.2.8.** At the conclusion of the audit, the auditor will submit a completed checklist and discuss the findings with the QMS Representative. The checklist will note non-conformances, opportunities for improvement and preventative actions identified during the audit.
- 19.2.9.** After reviewing the checklist and the audit results with the QMS Representative, the auditor will document the findings in an Internal Audit Report. The report will identify non-conformances, opportunities for improvement and preventative actions.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 21, 2022	Version Number: 9

- 19.2.10.** Once the QMS Representative receives the Internal Audit Report, an Audit Closeout Meeting will be conducted with the QMS Representative, the auditor, and Top Management. At least two of the three members of Top Management must attend this meeting.
- 19.2.11.** The Auditor will chair the Audit Close Meeting. The meeting will discuss the audit findings and will determine which members of the Operating Authority will be assigned to any required Corrective or Preventive Actions. Timelines will be set to address the audit findings.
- 19.2.12.** The audit report and the audit checklist will be filed electronically by the QMS Representative in the following file:
<\\eddie.fs2.brant.ca\E08enviro Water Works\DWQMS\Element 19 Internal Audits>
- 19.2.13.** The QMS Representative will document and track all Corrective and Preventative Actions identified by the County on form R-29-11. These forms and resolutions will be stored electronically in the following file:
<\\eddie.fs2.brant.ca\E08enviro Water Works\DWQMS\Corrective Actions>.
- 19.2.14.** The Internal Audit Report will be forwarded to the Owners (Council) via the first semiannual regulatory compliance and DWQMS report after the audit closeout meeting.
- 19.2.15.** The Internal Audit Report will be provided to and reviewed with Operating Authority staff at monthly DWQMS meeting once the final report has been issued.
- 19.3. Audits Conducted by Another Municipality or a Third-Party Accreditation Body**
- 19.3.1.** Outside auditors must provide proof of competency prior to conducting the audit and are required to have completed a minimum of two internal audits or external of a municipal DWQMS quality management system.
- 19.3.2.** Audits are to be conducted per the County of Brant schedule.
- 19.3.3.** Audits may be planned and conducted per the procedures of the auditing Municipality or third-party auditors' standards. Prior approval by the County of Brant's QMS Representative and Top Management is required. Section 19.2 will be followed at a minimum.
- 19.3.4.** Audit results may be reported as per the procedures of the auditing municipality or third-party's standards, as long as the results are documented and approved by the County of Brant's QMS Representative. Requirements for noted corrective actions must be indicated.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: January 21, 2022	Version Number: 9

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Section 19.1 - Internal Audit Schedule revised.	10/07/2013	D. Stevenson	7
2	Section 19.1 (1) – Removed the term 16 hours for length of workshop.	06/17/2020	D. Stevenson	8
3	Entire element reformatted, re-numbered and expanded. 19.1.3 added allowing for a third party to conduct internal audits. 19.2.6 and 19.2.10 added the requirement to keep a record of the meeting and 2 or 3 members of Top Management must attend. 19.2.12 and 19.2.13 added to include file paths. 19.2.14 and 19.2.15 added to describe how the audit report is communicated.	01/21/2022	D. Stevenson	9

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 10, 2023	Version Number: 15

20. Management Review

This procedure defines the Management Review process to ensure the continuing suitability, adequacy, and effectiveness of the County of Brant's Quality Management System.

20.1. Review Frequency

20.1.1. Management reviews will be conducted at least once every calendar year.

20.2. Review Participants

20.2.1. The Management Review is arranged and chaired by the QMS Representative.

20.2.2. Attendees at the meeting include:

- General Manager of Operations (Top Management)
- Director of Environmental Services (Top Management)
- Environmental Services Manager (Top Management)
- Environmental Services Superintendent
- QMS Representative
- Water Quality Technical Specialist
- Water Quality Technician (back-up to the QMS Representative)

20.2.3. For there to be a quorum, a QMS Representative, 2 members of Top Management and the Water Quality Technical Specialist or Water Quality Technician must be in attendance.

20.2.4. Attendees may also include Council members (Owner), Water Operators and Operations Administration staff.

20.3. Review Input

20.3.1. The QMS Representative will provide information regarding the following categories and facilitate discussions regarding them:

- a) Incidents of regulatory non-compliance.
- b) Incidents of adverse drinking water tests.
- c) Deviations from identified Critical Control Point limits and response actions.
- d) The effectiveness of the risk assessment process.
- e) Results of internal and 3rd party audits.
- f) Results of relevant emergency response testing.
- g) Operational performance.
- h) Raw water supply and drinking water quality trends.
- i) Follow up on actions from previous management reviews.
- j) Status of action items identified between management reviews.
- k) Changes that could affect the Quality Management System.
- l) Consumer feedback.
- m) Resources needed to maintain the QMS.
- n) The results of the Element 14 Infrastructure Review and the Element 15 Infrastructure Maintenance, Rehabilitation and Renewal programs.
- o) Operational Plan currency, content, and updates.
- p) Staff suggestions.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: November 10, 2023	Version Number: 15

20.4. Review Process

- 20.4.1.** The Management Review will be a planned event.
- 20.4.2.** A minimum of 2 hours shall be set aside by the participants to ensure a thorough review of the QMS is conducted.
- 20.4.3.** At a minimum, each item noted in Section 20.3 will be reviewed by the QMS Representative with meeting attendees to identify, where and when improvements to the QMS and its procedures are required and any other updates to the County's QMS.
- 20.4.4.** The management review group will review and consider applicable best management practices. This will include anything published by the Ministry and available on www.ontario.ca/drinkingwater.
- 20.4.5.** The QMS Representative will document any requested changes to QMS processes, documentation, action items and recommendations identified during the review.

20.5. Review Output

- 20.5.1.** Minutes of Management Review will be recorded and maintained by the QMS Representative. These minutes shall include the date and time of the review activity and the name of participants and attendees. The approved meeting minutes will be provided to the Owners (Council).
- 20.5.2.** At the conclusion of the meeting, action items identified and recorded during the Management Review will be added to the Management Review Action Item tracking spreadsheet by the QMS Representative.
- 20.5.3.** All action items will identify an individual responsible (lead) and a timeline to implement/review/update the action item.
- 20.5.4.** The QMS Representative is responsible for keeping the tracking sheet current.
- 20.5.5.** Outstanding or recently completed Action Items will be reviewed at each DWQMS Monthly meeting.

County of Brant Water Division

Title: County of Brant Operational Plan

QMS Reference: D-02-10

Dated Created: April 16, 2009

Current Revision Date: November 10, 2023

Version Number: 15

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	Removed December from Section 20.1	09/23/2013	David Stevenson	7
2	Section 20.2 Updated General Manager of Public Works to General Manger of Operations.	01/11/2016	Dave Stevenson	8
3	Section 20.1.1 – Revised to note shall be conducted at least once every calendar year. Section 20.3.1. – Updated to conform to DWQMS 2.0.	04/18/2019	David Stevenson	9
4	Section 20.2.1 – Updated to add the General Manager of Operations an attender to the Management Review Meetings.	06/03/2019	David Stevenson	10
5	Section 20.2 – Director of Water revised to Director of Environmental Services	06/17/2020	D. Stevenson	11
6	Section 20.2 – Reformatted section noted that the Water Technologist chairs the meeting and the requirements for a quorum. Section 20.4 (1) – Updated minimum of 4 hours to 2 hours. Section 20.4 (2) – Updated to make reference Section 20.3 and that the QMS Rep will conduct review. Section 20.4 (3) – Updated to describe what the QMS Rep records. Section 20.5 – Section reordered. Section 20.5 (1) – Updated to note the systems for recording and tracking action items. Section 20.5 (1) – Changed timeline for submission of meeting minutes to Owner from next Council meeting will be submitted to Council.	11/30/2020	D Stevenson	12
7	Updated formatting.	01/24/2021	D. Stevenson	13
8	Section 20.2.2 – Updated titles and added Environmental Services Superintendent.	10/18/2022	D. Stevenson	14
9	20.2.1 and 20.2.2 – Removed reference to Water Technologist, replaced with QMS Representative. 20.4.4 – Added	11/10/2023	Environmental Services Technologist	15

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: September 22, 2022	Version Number: 12

21. Continual Improvement

21.1. Overview

- 21.1.1.** The County of Brant will establish and maintain a Drinking Water Quality Management System that will be regularly reviewed and improved by Top Management and the Operating Authority of the County of Brant's municipal residential drinking water systems.
- 21.1.2.** As required, the County of Brant will modify/update, adjust processes and procedures (while remaining compliant with Provincial legislation and regulations) to improve operations and customer satisfaction.
- 21.1.3.** Continual Improvement will be tracked and kept current by the QMS Representative (or designate) on the tracking sheet located in DWQMS Element 21 electronic file. Continual Improvement will be provided to the Owners once every 12 months as part of the Management Review.
- 21.1.4.** The Environmental Services Drinking Water staff will strive to continually improve the effectiveness of its Quality Management System by implementing and conforming to this procedure.

21.2. Best Management Practices

- 21.2.1.** At least once every 36 months, as part of the Management Review, the management review group will review and consider applicable best management practices. This will include anything published by the Ministry and available on www.ontario.ca/drinkingwater.

21.3. Corrective Actions

- 21.3.1.** The following documents the process for the identification and management of Quality Management System Corrective Actions:
 - a) Corrective Actions are typically identified through internal audits, external audits, and Ministry Annual Inspections. Occasionally, Corrective Actions will be identified through items that come up during day-to-day operations.
 - b) Upon the identification of a Corrective Action, a meeting will be conducted. The meeting will be arranged by the QMS Representative and attended by at least two of the three members of Top Management. Other attendees may include the Environmental Services Superintendent, Lead Hand, Water Quality Technical Specialist, Water Quality Technician and/or any other relevant Environmental Services Water Operations or County of Brant staff. The purpose of the meeting is to review the non-conformity and to determine if preventive actions are necessary.
 - c) The QMS Representative will open an R-29-11 Corrective Action Record to ensure the action(s) that will be taken to correct the non-conformity and to prevent the non-conformity from re-occurring are documented.
 - d) The resolution to the Corrective Action for the non-conformity, as documented in a completed R-29-11, will be reviewed by the Internal Auditor(s) prior to the next internal audit. The Auditor(s) will verify that the action(s), documented in

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: September 22, 2022	Version Number: 12

the R-29-11, have been implemented and are effective in correcting and preventing the re-occurrence of the non-conformity.

- e) Corrective Actions and their outcomes will be communicated to the Environmental Services Water Operations staff at the Monthly DWQMS meetings and to the Owners in the Quarterly Update on Municipal Water Systems Regulatory Requirements and Drinking Water Quality Management Standard reports by the QMS Representative.

21.4. Preventative Action (Opportunities for Improvement)

21.4.1. The following documents the process for the identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities:

- a) Preventive Action(s) or Opportunities for Improvement are typically identified through internal audits, external audits, Ministry Annual Inspections and during day-to-day operations.
- b) Upon the identification of a Preventive Action(s) or an Opportunity for Improvement, a meeting will be conducted. The meeting will be arranged by the QMS Representative and attended by at least two of the three members of Top Management). Other attendees may include the Environmental Services Superintendent, Lead Hand, Water Quality Technical Specialist, Water Quality Technician and/or any other relevant Environmental Services Water Operations or County of Brant staff. The purpose of the meeting is to review the potential non-conformity and to determine if preventive actions are necessary.
- c) The QMS Representative will open an R-29-11 Corrective Action Record to ensure the action(s) that will be taken to correct the potential non-conformity and to prevent the potential non-conformity from occurring are documented.
- d) The resolution to the Preventive Action for the potential non-conformity, as documented in the completed R-29-11, will be reviewed by the Internal Auditor(s) prior to the next internal audit. The Auditor(s) will verify that the action(s), documented in the R-29-11, have been implemented and are effective in preventing a non-conformity from occurring.
- e) Preventative Actions and their outcomes will be communicated to Environmental Services Water Operations staff at the Monthly DWQMS meetings and to the Owners in the Quarterly Update on Municipal Water Systems Regulatory Requirements and Drinking Water Quality Management Standard reports by the QMS Representative.

County of Brant Water Division		
Title: County of Brant Operational Plan		
QMS Reference: D-02-10		
Dated Created: April 16, 2009	Current Revision Date: September 22, 2022	Version Number: 12

REVISION NUMBER	REVISION	DATE OF REVISION (MM/DD/YYYY)	REVISION COMPLETED BY:	CURRENT VERSION NUMBER
1	The entire element has been revised to meet the requirements of DWQMS 2.0.	04/18/2019	David Stevenson	8
2	Revised Water Division (staff) to Environmental Services (Drinking Water staff)	06/17/2020	D. Stevenson	9
3	Section 21 updated to identify the continual improvement tracking sheet.	11/30/2020	D. Stevenson	10
4	Element reformatted. 21.3.1 (b) and 21.4.1 (b) meeting attendees were updated.	01/24/2022	D. Stevenson	11
5	21.3.1 (b) and 21.4.1 (b) – Environmental Services Superintendent was added.	09/22/2022	D. Stevenson	12