Drinking Water Quality Management System

Operational Plan

DRYDEN

DRYDEN DRINKING WATER SYSTEM

250 WILDE ST.

DRYDEN, ON

P8N 1N9

This Operational Plan for the Dryden Drinking Water System will become effective on the 1st day of February 2010.

Table of Revisions

Date	Element	Description of Revisions to Version #15
May 16, 2025	Various	Remove the name "Dean Walker"
May 16, 2025	22	Remove "Cell: 221-9480" beside Waterworks Manager
May 16, 2025	4	Added "Blake Poole – Director of Public Works "as Designated QMS Representative
May 16, 2025	6	Added "City Owned" to Golf Course
May 16, 2025	6	Remove the word "Secondary "in front of Chlorination
May 16, 2025	8	Replace "Waterworks Manager with "Director of Public Works"
May 16, 2025	8	Changed reference to "0.5 NTU" reference to "0.3 NTU" in two under available monitoring and control measures
May 16, 2025	8	Add "Voyent Alert" City App for emergencies and extreme weather
May 16, 2025	10	Add "as applicable" under Operator Competencies
May 16, 2025	10	Change "OIT" to "Operator" in discussion of full Time Staff
May 16, 2025	13	Update Electrician. Remove Kusnick Electric-807-223-6115
May 16, 2025	13	Update Electrician. Change "Dryden Electrix" to "EMCON"
May 16, 2025	18	Emergency Contact List - Brian Spalding Change from OIT to Operator
May 16, 2025	Appendix B	Add DWWP Form 1 for watermain addition, modification, replacement, or extension for submission to MECP

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1 - Quality Management System

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

This plan meets Ministry of the Environment Conservations and Parks standards for the DWQMS.

2 - Quality Management System Policy

The City of Dryden is committed to managing the treatment and supply of clean, safe drinking water to all its customers and commits to consistently meeting all current regulatory legislation and customer needs.

To achieve these goals the City of Dryden commits to:

- Managing water quality from source to customer
- Regular monitoring and testing of water to meet or exceed current legislation as established in the Safe Drinking Water Act
- Providing consistent and relevant training to meet or exceed current training guidelines.
- Investing capital monies to provide upgrades and rehabilitations to treatment and distribution systems.
- Continuing to establish and upgrade current practices and policies.
- Participating in meetings and pilot projects to remain on the leading technical edge of drinking water supply.
- Providing Water Treatment Plant Annual Reports as per Ministry of the Environment Conservations and Parks forms to be available to all customers in hard copy or on the city

web site. These reports provide the customer with an annual overview of the city water supply system.

The City of Dryden will establish and maintain a Drinking Water Quality Management System that will be regularly reviewed, improved, and upgraded by management and employees involved in the supply of drinking water. The highlights of this Operational Plan for this Quality Management system will be readily available in hard copy at the Public Works office, or it can be accessed on the City of Dryden website (www.dryden.ca). Copies are also kept at Dryden City Hall and the Water Treatment Plant.

The Drinking Water Quality Management System will be implemented by the city to effectively minimize and manage any potential risks to drinking water quality and safety.

3 - Commitments and Endorsement

The owner and top management of the operating authority are committed to the implementation, maintenance and continual improvement of a QMS that meets the requirements of the standard.

Proof of commitment and endorsement is demonstrated by the Owner and Top Management in the following ways:

A. **The Owner** - Endorsement of the Operational Plan from the Owner (Mayor/Council) shall be obtained by approval of a Council report requesting endorsement and demonstrated by a certified Council resolution. The certified Council resolution is provided in Appendix "H". Commitment is evidenced by the resources provided for the implementation, maintenance, and continual improvement of this Operational Plan and the QMS.

B. **Owners Representative** – The CAO is the owner's representative.

C. **Top Management** - Endorsement of the Operational Plan from Top Management is demonstrated by signatures of the Director of Public Works and the QMS representative below:

Endorsed by	Signature	Date
Director of Public Works Blake Poole	Blake Poole	MAY 30/2025
Waterworks Manager		

4 - Designated QMS Representative

The City of Dryden has designated two individuals as QMS representatives.

Designated QMS Representative

Name: Blake Poole

Position: Director of Public

Works

QMS Representative (Alternate)

Name: William Aho

Position: Chief Plant Operator / Overall Responsible Operator (ORO)

The QMS representative, in conjunction with the Overall Responsible Operator, will establish, implement and maintain the policies, processes and procedures required for the QMS. In addition, the QMS representative will report on the performance of the QMS and any need for improvement to top management through regular Council meetings once within a calendar year.

5 - Documents and Records Control

In accordance with the requirements of the DWQMS procedures are in place for Document and Record Control. These procedures describe how documents and records are controlled and are attached as Appendix “A” at the end of this document.

6 - Drinking Water System

The Dryden Water System is owned and operated by The Corporation of The City of Dryden and serves the urban citizens of Dryden. The City of Dryden is in Northwestern Ontario, on Highway 17, midway between Winnipeg and Thunder Bay.

Source Water:

The raw water source for the City of Dryden is Wabigoon Lake, which is part of the Wabigoon chain of lakes. There are roughly ten lakes and rivers in the system, which is approximately 70 kms in length. Approximately 5 kms downstream of the intake there is a dam located on the Wabigoon River at the Pulp and Paper Mill. This dam regulates and controls the depth of the lake, which makes it a very reliable source. The lake has a clay base and is relatively shallow. The maximum depth is reported to be approximately 14.8 meters. The average depth is between 3.7 – 5.5 meters. Raw water quality can be characterized as having high levels of turbidity (5.49 – 36.2 NTU) and color (14 – 78 TCU). These results were taken over a five-year period, from 2019 to the end of 2023. Temperature fluctuates between 0.5˚ C in the winter months, to 23˚ C in the summer. Generally, because of the clay and silt in the water, floc formation is usually quite rapid and easy to accomplish with alum.

Bacteriological results from 2022 & 2023, for E. Coli, range from zero in the winter months to 5.0 CFU/100 in the summer months. Total coliforms range from zero in the winter to up to 79 CFU/100 in the summer months.

Events:

Due to the shallow depth of the lake, vertical turnover in spring and fall usually goes unnoticed. Although, it has been noted in the past, on a couple of occasions, depending on the severity and direction of the wind, a slight rise in the raw water temperature and an increase in the solids loading on the treatment units. Usually, it only lasts for a day or two and can be corrected by making the appropriate physical or chemical adjustments to the treatment process, which is the same response for algae blooms and high south winds in the summer months. Refer to Section VII, page 2, in the WTP Operations Manual for Reference. Additionally, because of the cold-water temperatures in the winter months some minor chemical adjustments must be made in the process.

Threats:

Potential sources of raw water contamination include spills from highway or rail mishap, and high rainfall causing pesticide runoff and septic system surcharge from the Golf and Curling Club. The threat of only having a single raw water feed line to the plant has been significantly reduced

with the twinning of the raw water line. A second raw feed line has been installed to provide redundancy to most of the system but there still remains only one intake line to the Raw Water pump-house and one inlet line to the Water Treatment Plant. The pump house is located on a secluded, unpopulated area of the golf course, close to a public beach, so the potential for vandalism or damage by fire is a concern. The pump house also houses the city owned golf course irrigation equipment and golf course maintenance personnel have limited access, so security issues are not a concern.

Operational Challenges:

Wabigoon Lake provides a good consistent supply of source water. The installation of a second raw water line now provides redundancy and helps to ensure that the City is able to receive the quantity of raw water it will need to meet its demands.

Treatment System:

Raw water is presently drawn from Wabigoon Lake, through a 450mm diameter, schedule 80 polyethylene pipe. It extends approximately 150 meters into the lake and supplies raw water via gravity, to the Low Lift pumping station. The water passes through two screens (one course & one fine) before entering the station.

The Low Lift pumping station houses three 60 Hp vertical turbine pumps (2 – duty & 1 – back-up), each with a capacity of 80 L/s. There is also a 100 Hp diesel emergency pump with a capacity of 80 L/s. A Back-up generator with an Automatic Transfer switch has also been installed, (June 2015), to provide electrical power to the pumps. The generator will supply power for heating and lights as well. The raw water is pumped from the Low Lift to the Water Treatment Plant through approximately 2 kilometers of 400mm diameter, class 150 asbestos-cement pipe and 2 Km of 400 mm HDPE/C900 that has been installed to provide redundancy. Valves have also been installed on the new line as well as the existing line. These valves will allow for isolation of either line in case of needed repairs. The Water Plant will still be able to operate with one line available.

Treatment (coagulation, flocculation, sedimentation):

Raw water enters the plant through a 400mm steel pipe, which is reduced to 300mm after a short distance. Alum is added at this time for coagulation. The water then passes through a 250mm Mag-meter for flow measurement. Downstream of the Mag-meter, the flow is then

equally distributed to two Infilco Solids Contact Units. As it enters the lower part of the central hood, Polymer (8181) is added to add weight and strengthen the floc. The mixture of water and floc is lifted up through the central hood by a variable speed Impellor and discharged into the main mixing chamber where reactions are brought to completion. Some water and suspended particulate enter the lower end of the central hood for recirculation and contact with incoming raw water. New floc formation is encouraged by contact with these previously formed flocculates. The rest of the water enters the outer settling section. The lighter floc is kept suspended and clarified water rises to the outlet flume above. The heavier floc settles and is carried along the bottom by a rotating scraper to sludge pits, where it is drained off through automatic blowdown valves to the sanitary sewer. Before the clarified water leaves the unit, it is mixed with Hydrated Lime to bring the PH back up to the desired level.

Filtration:

The clarified water then travels to one of the four "dual media" rapid sand filters. As the water passes down through the anthracite and fine sand particles (.45mm-.55mm), any light floc or carryover from the SCU's will be removed, leaving crystal clear colorless water, with turbidity down around the .040 -.070-ntu ranges. Each filter is equipped with a turbidity sensor and a filter to waste valve. In the event the turbidity rises above a desired level (.3 ntu) the operator will get a high turbidity alarm and the filter to waste valve will open, draining the filter to the waste line instead of the Clearwell, minimizing chance of contamination. The clean filtered water flows to the 586 M3 Clear- well, then to the 6,535 M3 underground storage reservoir and finally to the 382 M3 Pump-well, which is approximately 48 Hrs. of supply.

Chlorination / Disinfection:

Chlorine, in the gas form, is used for primary disinfection. It is added to the treated water in the Clear-Well before entering the Reservoir, ensuring that any potentially harmful organisms are destroyed prior to storage and distribution to consumers.

Disinfection is accomplished by adding sufficient chlorine at the treatment plant to maintain a good residual throughout the entire distribution system.

Process Waste Management:

Filter backwash and wastewater enters two backwash clarifier-settling basins. Wastewater is settled out for a predetermined set time and is decanted to the receiving stream, which in this case is Milanese Lake. The heavier settled solids are pumped to the sanitary sewer.

Distribution System:

Treated water flows from the reservoir to the Pump-well. The Pump-well is equipped with three – 50 Hp vertical turbine pumps, each with a capacity of 68L/s. The pumping strategy consists of one variable speed drive pump continuously running to provide a system pressure of 42 – 45psi in the distribution system at the treatment plant. A pressure sensor monitors the system and signals the vertical turbine pumps to maintain the set pressure. A second pressure sensor has been installed to provide redundancy. A second variable speed pump activates when the duty pump cannot sustain the target pressure. A third variable speed pump provides redundant capacity, and there is also a diesel driven emergency pump on standby.
Prior to the water leaving the plant, the chlorine residual and turbidity levels are measured through on-line analyzers.

The distribution network consists of approximately 60 km of piping fed from the water treatment plant and consists of 40 km of cast iron, 15.5 km of ductile cast iron, 1.5 km of PVC, .1 km of HDPE and 2 km of smaller diameter copper. The sizes range from 150mm to 250mm for distribution mains, 300mm and 400mm feeder mains, and copper mains of 25mm to 50mm diameter. Within the system there are 838 valves and 314 fire hydrants. Most fire hydrants have isolation valves. The distribution system also provides potable water to the Pulp and Paper Mill. The mill has its own fire protection system. There are no elevated storage tanks or booster stations in the system.

Barriers to Microbiological Pathogens:

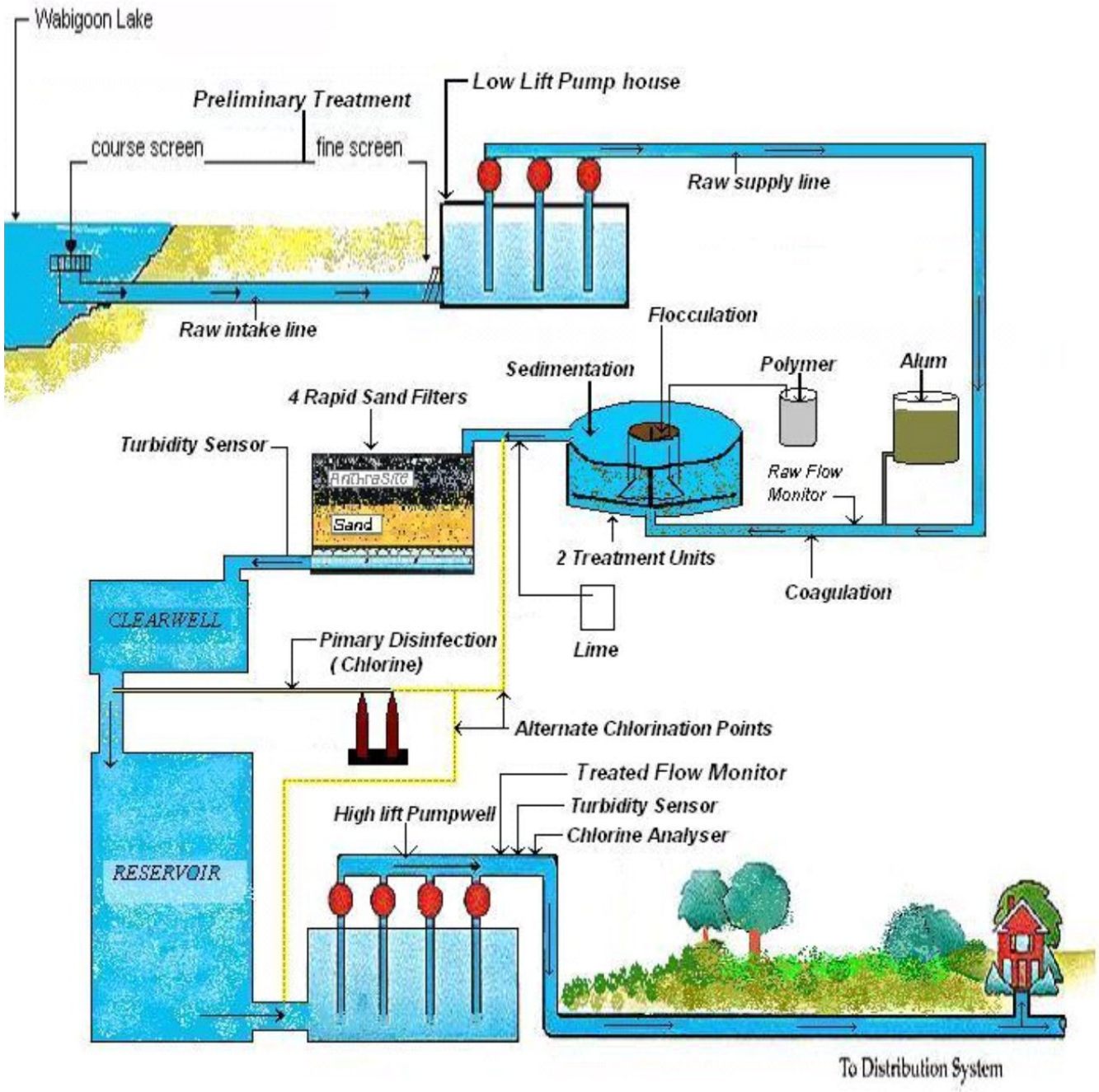
The following processes remove potentially pathogenic organisms:

1. Coagulation / Flocculation / Sedimentation
2. Filtration
3. Chlorination (primary disinfection)
4. Distribution system chlorine residual (secondary disinfection)

Analyses:

Ontario Regulation 170/03 and the current Municipal Drinking Water License issued by the Ministry of Environment, Conservation & Parks (MECP) dictate the sampling and monitoring requirements for this system. Water quality is tested throughout the treatment process and from dedicated locations throughout the distribution system.

1.15 Dryden Water Plant Process Flow Diagram



7 - Risk Assessment:

A risk assessment is performed for all events that are deemed to be controllable and the hazardous results of which are measurable. Controllable events are those that may be prevented through the actions of an operator.

At least once every calendar year, QMS representatives will conduct a review of the currency of information and validity of the assumptions used in the risk assessment.

Once every 36 months a full risk assessment will be completed with representatives from the Water Treatment & Water Distribution operations as well as the QMS reps.

The purpose of the risk assessment is to:

identify potential hazardous events and associated hazards,

- assess the risks associated with the occurrence of the hazardous events,
- rank the hazardous events according to the associated risk,
- identify control measures to address the potential hazards and hazardous events,
- identify critical control points, and
- identify response procedures when an identified risk cannot be controlled.
- Consideration of the potential hazardous events and associated hazards from the MECP document titled “Potential Hazardous Events for Municipal Residential Drinking Water Systems” is included in the risk assessment process.

Each controllable event is assigned a numeric value ranging from 1 to 5 in three different categories: likelihood, severity, and detectability. The three assigned numbers for each event are then added to determine the overall risk value. Any result that reaches 7 or higher is considered a Critical Control Point (CCP).

8 - Risk Assessment Outcomes:

The City of Dryden has established, implemented and maintains this procedure to determine what potential hazards and critical control points exist in the Water Treatment and Distribution System.

The Risk Assessment Team consists of the Director of Public Works, the Chief Plant Operator (ORO) and could also include operations staff as required.

The Risk Assessment procedure is conducted every calendar year or more frequently if a significant process changes or upgrade has occurred.

The process for hazard analysis includes an assessment of each process step and/or activity and identification of hazards that are potentially present or possible at each process step and/or activity.

Once hazards are identified, the next step is the determination of critical control points (CCPs).

This process involved a risk assessment by prioritizing hazards and identifying points where control may be exerted to eliminate or minimize those hazards, (for example, by determining which are CCPs).

The risk assessment was performed by rating the likelihood, severity and detectability of each hazard at each relevant process step or activity on a scale of 1 to 5. The values for each of these factors were added together to give a risk priority number.

Likelihood is probability/likelihood of a hazard or hazardous event occurring.

Severity or Consequence is the potential impact to health or impact on operations if the risk is not controlled (assumes control measures do not work).

Detectability is a measure of the ability to detect the presence of certain hazards. Hazards, which could be easily and quickly detected, were given a low value. Hazards that are hard to detect or undetectable are given a high value. The risk is greater as appropriate responses cannot be taken to control or mitigate the risk. The rating system is defined below.

Description	Likelihood of Hazard Occurring	Rating
Rare	May occur in exceptional circumstances, or has not occurred	1
Unlikely	Could occur at some time, historically has occurred annually or less than annually.	2
Possible	Has occurred once or more per year.	3
Likely	Has occurred on a monthly to quarterly basis.	4
Very Likely	One or more occurrences on a monthly or more frequent basis	5
Description	**Severity of Hazard Occurring**	**Rating**
Insignificant	Insignificant impact, little disruption to normal operation.	1
Minor	Minor impact for small population, some manageable operation disruption, some increase in operational requirements.	2
Moderate	Minor impact for small population, significant modification to normal operation but manageable. Increased monitoring and operational requirements.	3
Major	Major impact for small population, systems significantly compromised and abnormal operation if at all.	4
Catastrophic	Major impact for large population, complete failure of all systems.	5
Description	**Detectability of Hazard**	**Rating**
Very Detectable	Very easy to detect, instantaneous, SCADA monitored	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by lab test results.	2
Normally Detectable	No alarm present, visually detectable on rounds or regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; would not be detected before a problem was evident; lab tests that are not done on a regular basis.	4
Undetectable	Undetectable, cannot detect.	5

Included in the following pages is a chart that identifies the process and activity hazards related to The Water Treatment & Distribution System along with the outcome of the risk management, and finally the identification of which of these are identified as critical control points.

Critical control points identified in the table that follows have controlled conditions that are established, implemented and maintained that include:

a) Critical limits

b) The availability of information to operations personnel that outlines the critical limits

c) The availability and awareness of Standard Operating procedures (SOPs), which include recovery procedures, as necessary, and

d) The reliability and redundancy of equipment as appropriate to the identified risks and nature of the Water Treatment Plant.

e) Deviations from Critical Control Limits will be recorded in the plant logbook as per O.Reg.128/04 and automatically logged in the SCADA system events page.

Element / Process Step: Source Water										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Rail Car Derailment or Highway Accident - spill of chemical or contaminant	Chemical contamination of source water		Notification to MECP Spill Action Center of spill and potential for contamination of source water	Stop producing water until plume passes, supply from storage, implement water restrictions if necessary, haul water	1	1	1	3	No	
Proximity of septic system at Golf & Curling club to Lake in vicinity of intake Discharge of inadequately treated septic system effluent as a result of flooding, high rainfall, etc.	Biological contamination of source water	An upstream process to be captured under Source Water Protection.	Conventional Water Treatment Operations. Weekly Bacteriological Testing of Raw Water Source. Increase chlorine dosage	Discuss with Ministry of Health re: source of E.coli	1	2	2	5	No	
Proximity of Golf & Curling Club to Lake in vicinity of intake - pesticides & Herbicides in runoff water as a result of flooding, high rainfall, etc.	Chemical contamination of source water	An upstream process to be captured under Source Water Protection.	Interim Measure: Annual correspondence letter re: risks associated with pesticide application and runoff.	Future action: Discuss with owner of golf course	1	1	2	4	No	
Collapse or breakage of intake pipe	Raw Water Quantity / Quality		Pump shut down on low level in pump well; Loss of raw water flow signal	WTP Operation Manual (OM) Emergency Procedure	1	4	1	6	No	OM:S 12 Emergency Procedures Pg 7, Raw Intake Line Failure

Element / Process Step: Source Water										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Fire at low lift pumping station– loss of controls and pumps	Raw Water Quantity / Quality	Potential for security / vandalism. Emergency Situation.	Fire & Smoke alarm Loss of SCADA signal from low lift pumping station Loss of raw water flow – flow meter	Emergency portable Diesel back-up pump Future action: separate low lift operations from golf course operations.	1	4	1	6	No	
Loss of Hydro Power at Low Lift Station	Quantity	Potential for Emergency Situation	Loss of Communication with Low Lift Station	Automatic Start-up of Back-up Generator. Manual Start of Diesel Pump.	3	1	1	5	No	Emergency Procedures Sec. 12
Loss of Staff due to strike or lock-out	Biological or chemical contamination	Limited staff to monitor and operate WTP & Dist. System.	Management	Qualified Management Staff to Operate Plant, An outside contractor can be brought in to assist.	1	2	1	4	No	Operational Plan –Sec 11 Personnel Coverage
Damaged / Broken pipe – low lift pump station to plant	Raw water Quantity / Quality	Second Raw Water Line installed to provide redundancy	Loss of raw water flow signal	Isolate damaged pipe. Dig and Repair Pipe; Pipe & fittings in stock.	1	1	1	3	No	WTP O&M Manual Sec. XII Emergency Procedures - Raw Intake Line Failure
Loss of Staff due to pandemic	Biological or chemical contamination	Limited staff to monitor and operate WTP & Dist. System.	Management	Qualified Management Staff to Operate Plant, An outside contractor can be brought in to assist.	1	2	1	4	No	Operational Plan –Sec 11 Personnel Coverage

Element / Process Step: Treatment										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Loss of coagulant – plugging of lines, pump failure, clogging of screens	Biological & Chemical contamination	Crypto / Giardia not removed without coagulant.	On-line pressure transmitter shut down plant with pressure loss. Critical Control Limit; Filter Effluent Turbidity 0.3 NTU. "Auto" Filter to Waste Valves.	Operations Manual (OM)	3	3	1	7	Yes	OM: S. 7 'Operating Problems & Solutions', pg 1 'Alum Feed'
Loss of polymer– plugging of lines, pump failure, clogging of screens	Shorter filter runs		High level alarm at filter; Visual inspections throughout the day	Repair polymer feed system.	3	1	2	6	No	
Flocculator Failure	Shorter filter runs		High level alarm at filter; Visual inspections throughout the day	Repair flocculator drive system. (Impeller drive). Spare parts on-site.	2	1	2	5	No	
Filter breakthrough, filter underdrain failure	Biological contamination	Crypto / Giardia not removed without coagulant.	On-line filter effluent turbidity meters; Critical Control Limit- 0.3 NTU. "Auto" filter to waste valves.	Shut down filter; take it out of service.	2	4	1	7	Yes	OM: S. 7, 'Operating Problems & Solutions' pg. 5 'Filters'
Backwash pump failure – 1 Pump only	Quantity / Quality		Shut down of filters on high turbidity, alarms	Spare motor & spare parts for pump at WTP.	1	2	1	4	No	
Filter to waste valve failure	Biological contamination		Shut down of filters on high turbidity Alarm	Shut down filter; take it out of service.	2	2	2	6	No	

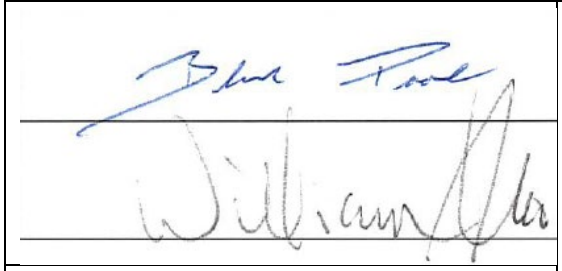
Element / Process Step: Primary Disinfection										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Chlorinator failure	Biological contamination	Bacteria and viruses not inactivated without chlorine	Failure alarm on chlorinator shuts down raw pumps. Online chlorine analyzer alarm- Low Limit 0.75mg/l	Automatic switchover to standby chlorinator & spare parts to make repairs.	1	5	1	7	Yes	OM: S. 7 "Operating Problems & Solutions" pg. 7. "Low Chlorine Residual"
Element / Process Step: Reservoir										
Loss of structural integrity of reservoir – leakage into reservoir	Biological contamination Chemical contamination		Online turbidity meter & CL2 analyzer, weekly bacteriological testing. Site fenced / locked. Daily treated water color analysis.	Shut down & by-pass to Pump-well. Switch to alternate chlorine injection point, increase dosage and issue water restriction notice to community. (long-term plan to construct additional reservoir to allow for repairs)	1	3	2	6	No	OM: S. 12 "Emergency Procedures" Pg. 5. "Procedure for Bypassing Reservoir.

Element / Process Step: Distribution										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Breakage of single pipe from plant to distribution system	Quantity / Quality	No distribution system storage; need to pump continuously from the plant.	Community complaints; Low pressure alarm or high flow indicators at the plant. Critical Control Limit 36 PSI.	Repair; Plan to twin	1	5	1	7	Yes	See: "Emergency Procedure for Water main Breaks" in Distribution O&M Manual on S. Dr.
Loss of chlorine residual (secondary disinfection)	Biological contamination	Legislated under O. Reg. 170/03.	Daily residual testing at far end of system, weekly monitoring at locations in town. Critical Control Limit of not < 0.05 Mg/l.	Flush the system; increase chlorine dosage and resample.	2	3	3	8	Yes	See O. Reg. 170/03 requirements or Plant O&M manual for corrective actions.
Loss of pressure – water main break, water main frozen.	Biological and chemical contamination		Complaints, low pressure alarms at plant. Critical Control Limits 36 PSI – Low 65 PSI - High	Follow; Procedure for Watermain break repair. Run bleeders for frozen lines.	4	2	3	9	Yes	See: "Emergency Procedure for Water Main Breaks" at PW Office.
Cross connection / Backflow	Biological and chemical contamination	Backflow preventers.	Visual. Critical Control Limits: Chlorine Residual: 0.05Mgl	Isolate area; Flush the system and resample; pressurize system.	4	2	3	9	Yes	Future by-law. Back-flow preventers.
High lift pump failure	Quantity / Quality		Low pressure	Back-up pumps	3	1	1	5	No	
Failure of SCADA	Quantity / Quality		Loss of raw flow and signal.	Run on Manual	2	3	1	6	No	

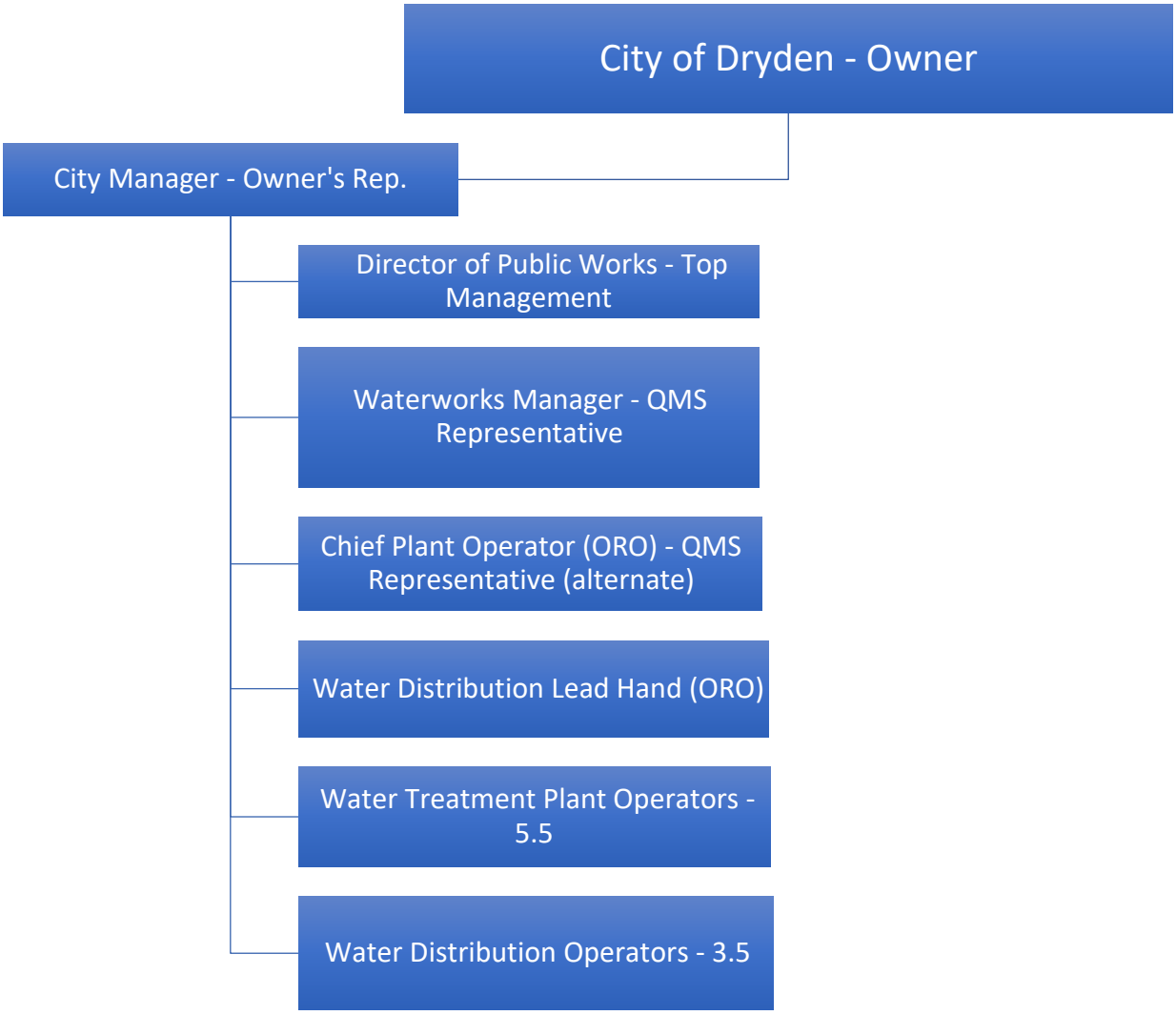
Element / Process Step: All Systems										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Long term Impacts of Climate Change	Quantity / Quality		Participation in MECP DWSP		1	1	2	4	No	Follow directives from MECP & NWHU
Source Water Supply Shortfall	Quantity / Quality		Visual check of lake level & outflow.	Implement water control measures.	1	4	1	6	No	Implement water control measures.
Extreme Weather Events ie; Ice Storm, Tornado	Quantity / Quality		Weather Reports. Back-up Generator.	Run Back-up Generator	1	3	1	5	No	Run Generator when needed. Ensure fuel supply.
Sustained Extreme Temperatures ie; Deep Freeze	Quantity / Quality		Weather Forecast. Residents without water. Water main breaks.	Run bleeder lines to keep mains flowing.	1	3	1	5	No	Repair frozen lines, run bleeders, flat rate users to run water daily.
Cyber Security Threat	Chemical contamination	IT Dept. Firewalls in place	Online analyzer's, FOB access., security alarm, CCTV camera	IT Dept will investigate. Operate the plant manually if needed. Report to authorities.	1	2	1	4	No	Regular cyber threat training. Limited access to SCADA, IT firewalls
Terrorist Threat	Biological and chemical contamination	WTP is equipped with intrusion alarms.	SCADA intrusion alarm, Visual checks, Process monitoring devices	Inform proper authorities.	1	3	2	6	No	Contact MECP & NWHU, Notify Police, Follow any directives
Vandalism	Biological and chemical contamination	Building entrances are locked and alarmed	Security fencing, Intrusion alarms. Walk around check of interior & exterior of building	Plant Operator notified through alarm. Inform proper authorities.	2	1	1	3	No	Security fencing & intrusion alarms. Police investigation.

Element / Process Step: Treatment Systems										
Description of Hazard	**Potential Result of Hazard**	**Comments**	**Available Monitoring & Control Measures**	**Emergency Plan or Contingency Procedure**	**Probability**	**Severity**	**Detectability**	**Risk Priority Number**	**CCP**	**Control Procedure**
Sudden Change to Raw Water Characteristics	Quantity / Quality		Weekly Raw water sampling, Adjust chemical dosages	Adjust operational process	1	2	1	4	No	Process adjustments, alter backwash schedule.
Failure of Equipment Associated with Primary Disinfection ie; coagulant dosing system, filters, UV system, chlorination system.	Biological and chemical contamination		SCADA monitored 24/7.	Plant shut down, process water directed to waste, Plant Operator notified through alarm.	2	2	1	5	No	
Failure of equipment or process associated with secondary disinfection ie; chlorination equipment,	Biological and chemical contamination	No secondary disinfection equipment used.	No secondary disinfection equipment used.	N/A	0	0	0	0	N/A	

Element / Process Step: Treatment Systems using Surface Water										
Algal Blooms	Biological and chemical contamination		Record Visual checks in logbook. If algae present at shoreline take samples from shoreline, raw and treated from the Water Treatment Plant as long as algae is visible at shoreline.	Increase coagulant dosage, Increase Filter backwash frequency.	1	3	1	5	No	Follow directives from MECP & NWHU

Review Completed By:	Date:	Comments:
	May 16, 2025	B. Poole & W. Aho - reviewed & updated risk assessments. Changed reference to ”0.5 NTU” reference to “0.3 NTU” in two under available monitoring and control measures Added reference to Voyent Alert

9 - Organizational Structure, Roles, Responsibilities, and Authorities



City of Dryden, Mayor and Municipal Council. (Owner):

The City of Dryden, which is represented by an elected Mayor and Municipal Council, is responsible for ensuring the delivery of a safe and reliable supply of drinking water to the residents of the City of Dryden.

As per Sec. 19 of the Safe Drinking Water Act, Standard of Care, Mayor and council members shall complete training in understanding their responsibilities with decision making authority over municipal drinking water systems. The training will be completed within 6 months of being elected.

The owner has the authority to delegate the management of the drinking water system to qualified staff.

CAO - (Owner's Representative):

The CAO is responsible for arranging reporting to the Mayor and Council on the oversight of the municipal water system. The manager will receive (information) reports from the Director of Public Works regarding issues that are relevant to the overall operation of the water system.

The city manager is authorized by council to ensure that management staff is in place to ensure the municipal water system is supplying safe and reliable drinking water.

Director of Public Works (Top Management):

The Director of Public Works is responsible for ensuring that operations within the municipal water supply system are being performed to ensure that municipal drinking water is safe, and systems are following current regulations. The Director of Public Works must provide long-term planning and budgeting, inform the City Manager and Council of deficiencies and required resources and provide the City Manager and Council with current technical and administrative information and advice.

The Director of Public Works has the authority to ensure staff are in place to manage the water supply system, develop administrative and technical policy, evaluate and prioritize long-term utility needs.

The Director of Public Works is involved in the QMS Management review.

Waterworks Manager (DWQMS Representative):

The Waterworks Manager is responsible for the management of the daily operations of the water treatment plant and distribution system. The manager will provide guidance and receive feedback from operators on regular operations and future needs. Responsibilities also include preparing reports for capital expenditures, budgeting, maintenance activities, and infrastructure condition assessments for the Director, council, regulatory authorities and public.

The manager is authorized to direct operators, develop policies, and communicate with regulatory and technical authorities including senior managers and the general public.

The Waterworks Manager is responsible for the undertaking of the QMS Management review.

Chief Plant Operator (ORO – DWQMS Representative):

The Chief Plant Operator is the designated Overall Responsible Operator (ORO), and is responsible for the supervision of daily operations and staff at the Water Treatment Plant. The Chief Operator ensures that all operations follow current regulations. Responsibilities include oversight of process operation and controls, scheduling maintenance, scheduling staff, ensure that employee's certifications and minimum training requirements are up to date, confirming all required tests are completed, reporting normal and abnormal conditions to Manager. The Chief Operator also ensures that standard operational procedures are followed as documented in the Operations Manual. The Chief Plant Operator must maintain a minimum Class 2 Water Treatment Certification to fulfill the required responsibilities.

The Chief Operator is authorized to make any process adjustments to ensure the supply of safe and adequate drinking water. Authorization includes purchasing of process chemicals, lab supplies, testing services, and equipment parts. The Chief operator is also authorized to direct the duties of the plant operators and supervise any on-site contractors.

The Chief Operator is involved in the QMS Management review.

Water Distribution System Lead Hand (ORO):

The lead hand is the designated Overall Responsible Operator (ORO) and is responsible for the daily operation and maintenance of the water distribution system. This includes ensuring a safe and adequate supply of water for all customers. The lead hand directs operators and contractors in the repair and maintenance of all aspects of the distribution system, which includes hydrants, main valves, services and shut offs. Recording of daily activities, following current regulations and reporting of normal and abnormal conditions to the Manager are included in the duties. The Lead Hand must maintain a Level 1 Water Distribution Certificate.

The Lead Hand has authorization to take control of emergency situations (ex. water main break) and use whatever equipment is necessary to complete repairs in a safe and efficient manner.

Operator in Charge (OIC):

Must have a minimum Class I Water Treatment Certificate. Identified on daily log sheet as OIC. Makes data entries in logbooks and on log sheets. Performs all on site water tests and makes and records all process adjustments.

Operator:

All operators are responsible for maintaining the required Ministry of the Environment, Conservation and Parks certification for Water Treatment and Water Distribution Systems. Operators are required to carry out the daily duties for the treatment and distribution processes to ensure operations are completed in compliance and if a non-compliance incident occurs it must be acted upon and reported.

Operators are authorized to collect samples, perform testing, adjust treatment processes with direction from the Chief Operator and perform maintenance on the treatment and distribution system in accordance with standard operating procedures to ensure a safe and adequate water supply.

10 - Competencies

The following identifies the competencies required of City of Dryden staff whose performance directly affects drinking water quality.

Director of Public Works:

Shall possess advanced theoretical and working knowledge of administrative skills expected of a senior level manager. In addition, an intermediate theoretical and working knowledge of the Safe Drinking Water Act, applicable regulations, and the City of Dryden Drinking Water Supply System.

Waterworks Manager:

Shall possess advanced theoretical and working knowledge of administrative skills that are expected of a mid-level manager. Shall possess advanced and intermediate theoretical and working knowledge of the Safe Drinking Water Act, applicable regulations, and the City of Dryden water supply system.

Facility Classification:

As of November 22, 2005, the Ministry of the Environment Conservations and Parks (MECP) reclassified the City of Dryden Water Supply System to a Class II Treatment and Class I Distribution system.

Operator Competencies:

Ontario Regulation 128/04 requires that all Water Treatment and Distribution Operators possess operating licenses appropriate to the class of facility where they are employed.

The Overall Responsible Operator (ORO) shall have a minimum Class II Water Treatment Certificate or Class I Water Distribution Certification as applicable.

Operators acting in relief of the ORO shall have a minimum Class II Water Treatment Certificate or Class I Water Distribution Certification as applicable.

All operators shall be licensed to minimum OIT while ultimately working toward obtaining a Class II Treatment or Class I Distribution Certification.

Operators are required to have skills and knowledge in the following areas:

Treatment Plant Operator:

- Understand the concepts and reasons for water treatment, disinfection, water borne diseases, pathogens and other bacteria related to water.
- Basic knowledge of math, science and chemistry used in the treatment process.
- Knowledge of water regulations and adverse water conditions
- Importance of following policies and procedures, and potential consequences for not following them
- Perform lab analyses and interpret results.
- Operate the process using the SCADA (Supervisory Control and Data Acquisition) system.
- Operate the process without the SCADA system.
- Ability to handle emergency situations.
- Adjust and check chemical feed rates.
- Safely handle chlorine and chlorinator maintenance and repair
- Filter maintenance and backwashing
- Pump maintenance and repair
- Knowledge of the chemicals used in the process and safe handling practices.

Distribution System Operator:

- Familiar with City distribution system
- Repair leaks safely and follow regulations on disinfection of repaired watermains.
- Valve maintenance and repair
- Hydrant maintenance and repair

Satisfying Competencies:

The following satisfies Competency requirements for City of Dryden staff:

- Top management is briefed on operating conditions and provided regulatory updates at regular meetings with mid-level management.
- Management regularly attends relevant Drinking water training courses, conferences, and seminars.

Operator Training & Certification:

New Operators (OIT's):

After successful completion of the OIT Water Treatment and Water Distribution Prep Course (60 Hrs.) and OIT exam, a new operator will train with an experienced operator until a satisfactory level of competence has been reached. The Waterworks Manager, Chief Operator and Distribution Lead Hand will determine this through observation and peer review.

Once this level of competence is achieved the OIT may be put into the "On-Call" rotation with telephone or in-person support from the ORO or OIC.

Class I Water Treatment & Distribution Operators:

After the level of competence has been reached, (usually about one year), the operator must successfully complete the Class I Water Treatment and Water Distribution Prep Course and Class I exam for either treatment or distribution to become a Class I water treatment or distribution operator.

Class II Water Treatment & Distribution Operators:

After working approximately one year at the Class I level, the operator can advance to a Class II treatment or distribution operator by successfully completing the Class II Water Treatment & Distribution Prep Course and Class II exam for either water treatment or distribution.

Class III & IV Treatment and Distribution Operators:

Although the treatment plant and distribution system are a Class II & I, all operators are encouraged to advance to the highest level they wish to achieve. The employer recognizes that the extra training and skills are invaluable to the operation, and this is recognized in compensation.

As part of the licensing requirement, all operators experience extensive on-the-job training. Specific requirements are listed in O.Reg. 128/04. According to the reg. a Class II system operator requires 23 hrs. of on-the-job practical training and 12 hrs. of formal CEU training per year. A Class I operator requires 23 hrs. practical & 7 hrs. CEU training per year.

Other than the prep courses noted above, some of the other training courses attended by operators are:

- Gas Chlorination Workshop
- Hypo Chlorination – Disinfection Workshop
- Water Main Disinfection Workshop
- Water Treatment Proficiency Course
- Filter Operation and Maintenance Course
- Pump Maintenance & Repair
- Hydrant Maintenance & Repair
- Confined Space Workshop
- WHMIS

Unless a certificate of completion is provided, training attended by operators is documented and signed by the employee and trainer, which acknowledges successful information transfer. Training files are maintained for all City of Dryden operators.

Recruitment Planning:

The City of Dryden Waterworks Department also operates the wastewater treatment and collection system. Operators work at both treatment plants on a scheduled rotation. Operators

require experience, training and certification in both fields. This must be taken into consideration when planning personnel recruitment. Starting as an OIT it may take approximately 4 years to fully certify a Class II operator for both plants.

Presently we have five full-time and one half-time treatment operators on staff; this includes the chief operator, two operators at each plant and a half-time OIT. This currently meets staffing requirements at the plants. The distribution system is similar in that operators require experience, training and certification in distribution and collection. Presently there are three full-time operators and one half-time operator.

11 - Personnel Coverage

The WTP operators work daily from 07:30 till 15:30. There are two operators on duty except for vacation, days off, etc.

The #1 Operator (OIC) looks after the daily process operations like raw and treated water testing, flow totals, pump logs, filter backwashing, chemical totals and makes all entries on daily log sheets and in plant diary.

The #2 Operator assists in equipment maintenance and repair, and assumes the duties of the #1 Operator in his absence.

The Chief Operator (ORO) oversees the day-to-day operation of the plants and designates OIC.

The plant is equipped with alarms on all plant process equipment, pumps and chemicals. Alarms are monitored by the SCADA system, which transfers it to an alarm monitoring call center, via telephone lines, who in turn contacts the operator on call. Alarms to the call center are not specific, they are all Water Plant alarms, and so the operator must respond immediately to the plant. Although an exact response time is not specified, a time of 5 – 15 minutes is the norm.

In the event of an emergency, all available operators report to the water plant immediately and wait for instructions.

Operators are on call daily from 15:30 → 07:30, seven days a week from Monday to Monday. All operators are on a scheduled rotation. The operator on call also works the weekend and is the back-up ORO.

All plant alarms are sent to the "Operator on Call" via a call center. The Call Center uses a roster of each operator that is in the on-call rotation. The call Centre uses the same phone number all the time to contact the operator designated on-call. The operators change the "Call Forwarding" to whoever is on-call that week. If the call Centre is unable to reach the on-call operator, they proceed to call the remaining operators on the roster one by one until an operator is reached.

The distribution operators work Monday to Friday, 07:30 → 16:00. After hour distribution calls are forwarded to an on-call phone that is manned by rotating personnel. The calls are assessed, and the appropriate personnel and equipment are called out.

Emergency contact numbers for waterworks staff can also be found in Element 18 Emergency Management.

Upper management, if properly licensed to operate, may be required to provide coverage or an outside service provider may be brought in if management is not properly licensed or if extra manpower is required. Refer to O.Reg. 128/04, "Emergency Situations" as described in Sections 32-35 of the regulation for further detail.

12 - Communications

City of Dryden – Owner / Operating Authority:

The Director of Public Works or Public works services shall ensure that the owner is provided with a current copy of the Operational Plan. The Owner shall also be advised of any changes to the Quality Management System, following revisions, and a status update shall be communicated following management reviews. This communication may take place during the regular annual report to Council by the Director of Public Works / Waterworks Manager or through separate meetings arranged as necessary. The procedure for this information to be communicated to the Owner will be once per calendar year by the Director of Public Works / Waterworks Manager to the Owner through the owner's liaison, at council meetings, committee meetings or as applicable.

City Personnel:

Copies of the currently approved City Drinking Water Quality System Operational Plan will be kept on site at the Water Treatment Plant, City Hall and Public Works offices. A copy will also be posted on the City of Dryden website. Communication to staff will be handled internally through informal meeting discussions and feedback from operators. Regular meetings with the Director of Public Works will be used to keep supervisory staff informed. Daily operations are documented in logbooks at the Water Treatment Plant and Public Works maintenance office. WTP equipment operations are documented, and records produced with the Supervisory Control and Data Acquisition (SCADA) system.

Suppliers:

The Dryden Water Treatment Plant achieves oversight control over the activities of all suppliers of supplies and services through written communications and formal agreements.

The written communications inform each supplier of policies and regulations with which the city must comply, as well as providing a list of all documentation that is required, such as NSF certification and MSDS's. Suppliers and delivery personnel must report to the operator prior to delivery of the product. A blank copy of this document can be found on the Share Dr. in the Water Plant - "Essential Suppliers" folder.

Consumers:

Copies of the DWQMS Operational Plan will be available for viewing at City Hall and Public Works offices. The Director of Public Works at an open public council meeting will communicate updates and revisions. Questions can be directed to the Waterworks Manager. Annual Water Treatment Plant reports as per Ministry of the Environment Conservations and Parks guidelines are available to consumers in hard copy at the Public Works office and can also be viewed on the City of Dryden website. Consumer water complaints can be handled through the Public Works Office or through the Water Treatment personnel. Refer to Section X I, page 5, in the WTP Operations Manual for Procedure for handling water related complaints.

The written communication informs each supplier of our QMS policy and regulations with which the city must comply, as well as provides a list of all documentation that is required, such as NSF or ANSI certification and MSDS's. For laboratories that perform regulated water testing, a certificate of accreditation is required.

The notice must be signed, dated and returned to our office before any new contract can be awarded. The document titled "***Notice to Essential Suppliers and Service Providers"*** can be found at the PW office, in the WTP Chemicals file and is included as Appendix "D" in this Operational Plan.

Operators verify proper supplies are delivered by inspecting delivery items and recording information onto a log sheet.

14 - Review and Provision of Infrastructure

Element 14 requires the Operational Plan to document a procedure for the annual review of the drinking water infrastructure.

The city must review the adequacy of the infrastructure to operate and maintain the system, to further determine the infrastructure that needs repair or replacement. Dryden considers the outcomes of the DWQMS risk assessment and completes the Capital Justification forms for each of the capital budget items requested in the annual budget. Capital justifications are also evaluated on ten (10) criteria listed on the Capital Justification form.

1. Health & Safety.
2. Maintenance/renewal/replacement of existing capital assets.
3. Consistent with Strategic Plan.
4. Accommodating pressures for development and growth.
5. Promoting/facilitating economic growth & diversification
6. Enhancing Productivity.
7. Maintaining or enhancing quality of life.
8. Aesthetic enhancement.
9. Prior year commitments by Council.
10. Availability of offsetting grants/revenue generation.

Evidence of this consideration is recorded on the Capital Justification forms.

The status and the adequacy of the City's drinking water infrastructure is assessed by the Waterworks Staff on an ongoing basis, through operational & capital budget planning and through outcomes of the risk assessment review

Procedure - The Waterworks Manager conducts regular reviews, through supervisor meetings, of the unplanned maintenance activities to identify potential planned activities for the following year. Infrastructure rehabilitation and renewal are planned by the Waterworks Manger and Director of Public Works. Operational & Capital requirements are authorized by City Council.

The results of this assessment are communicated to top management through the Management review.

15 - Infrastructure Maintenance, Rehabilitation and Renewal

The City of Dryden has implemented a preventative maintenance program for the water supply system. Preventative maintenance schedules and procedures for the Water Treatment Plant are described in the Operations Manual. Preventative maintenance on the distribution system is performed on a regular schedule that is reviewed and updated by the Waterworks Manager according to needs and priorities.

A Land Use Implementation Study (2018) can be used as a benchmark and the Maintenance Work Order System (Cartegraph) can be used to monitor and assess the maintenance activity. The maintenance is kept current and reported to the Owner through the annual report.

Equipment and pumps at the WTP are regularly serviced and documented records are kept at the WTP in the equipment maintenance binder. Details of these procedures can be found in the WTP operations manual. Distribution system maintenance consists of flushing fire hydrants in spring and fall. When hydrants are flushed isolation valves are occasionally checked along with hydrant markers and visible identification numbers. The chlorine residual is also checked at this time. This information is documented on hydrant inspection forms, which are in a binder at the public works building in the water distribution shop. When hydrant flushing is complete and if manpower is available, a valve-exercising program is started. This consists of physically operating main line valves and documenting the date's locations and problems found on valve inspection sheets located in a binder in the water distribution shop. This program is in the initial stages and is not yet fully implemented.

Rehabilitation and Renewal of the water supply system is performed on a needs schedule. Capital and operational money is allocated each year for improvements to the system. The Director of Public Works and the Waterworks Manager determine the areas where the money will be spent in consultation with operators. The Director of Public Works and the Waterworks Manager will annually review the long-term forecast using all information available. Once priority projects are determined, City staff or consultants will complete detailed estimates to establish how much capital will be required to complete the project. The capital justifications are then submitted to the Senior Management Team and Council for budgetary approval.

16 - Sampling, Testing and Monitoring

The Dryden Water Treatment Plant has a sampling program based on the requirements set out in Ontario Regulation 170/03 and our current C of A. Refer to ***Section IX "Water Testing & Calibration Procedures"*** in the WTP Operations Manual for a complete list of all sampling requirements and detailed instructions on how to perform all tests.

Laboratory Sampling:

A competent certified operator performs all in-house water tests. Results are recorded on a daily log sheet and monitored by plant operators.

An accredited laboratory performs all off site lab work. Bacteriological and chemical results from the accredited lab are e-mailed to the Waterworks Manager, the Water Treatment Plant and filed electronically on the shared network server.

Distribution chlorine levels are checked daily at the Wastewater Treatment plant, and weekly at the six bacteriological sample sites. Results from the daily tests are recorded on the WWTP log sheet. Chlorine residual results from the weekly samples are recorded on the sampling chain of custody forms.

Copies of all bacteriological and chemical analytical results are provided to members of the public upon request. Furthermore, all results are summarized in tables at the end of the year and are discussed in the water plant annual compliance report. This report is also available to the public via the city website at www.dryden.ca or in hardcopy form upon request.

17 - Measurements and Recording Equipment Calibration & Maintenance

On-Line Measurement:

At present our on-line measurement devices consist of, filter effluent turbidity meters, treated water turbidity meter, treated water “free” chlorine residual analyzer, raw and treated temperature probes.

Turbidity and chlorine analyzers are calibrated according to recommendations in the manufacturer’s operation manuals and documented in the quarterly duty log.

Detailed procedures for calibrating each devise can be found in the WTP Operations Manual, ***Section IX “Water Testing & Calibration Procedures”.***

The results from each device are displayed and recorded on the SCADA system and have alarm set points well below the established adverse parameters. The on-line analyzers as well as the portable analyzers used in the field are calibrated annually by a third party.

18 - Emergency Management

“An Emergency is a potential situation or service interruption that may result in an acute drinking water health risk.”

Emergencies may still occur despite our best efforts to prevent them. Proper planning for emergencies is necessary to minimize potential health risks. Below are the three (3) main categories of emergencies that can affect the system’s ability to produce clean, safe, reliable drinking water.

New employees will be required to review the Water Treatment Plant Operations Manual including the DWQMS Operational Plan and the Emergency Procedures. Water Treatment Plant Operators and staff will be kept up to date with annual reviews of the Operational Plan and Emergency procedures or as required if changes occur.

Raw water supply interruption due to:

1) Major power outage
2) Raw intake line collapse, restriction or breakage
3) Fire at Low Lift, pumps damaged or destroyed
4) Raw water supply line failure between Low Lift & Water Plant

Treated water supply interruption due to:

1) Major Power outage
2) Loss of high lift pump controller (variable speed drive)
3) Unusually high-water demand due to a major water break
4) Personnel shortage due to illness (pandemic)

Treated water contamination due to:

1) Reservoir cracking or collapse (infiltration)
2) Chemical spill
3) Distribution contamination due to loss of pressure (backflow)

Detailed documented procedures for the above emergency situations, which could result in adverse water quality in the Drinking water supply system, are in the **WTP Operations Manual, *Section XII "Contingency Plan & Emergency Procedures".***

Preparedness:

All operators in the City of Dryden have training and are aware of the locations of written procedures to deal with emergencies in the water treatment and distribution system. Twenty-four hour on call operators and Water Treatment Plant alarms ensure that a qualified staff member will attend and assess any emergency situation within a very short period of time. The emergency plan shall contain an up-to-date list of emergency contacts.

Identification of Emergency Situations or Service Interruptions:

The CAO, Director of Public Works, Waterworks Manager & QMS representative meet to review the list of emergency situations or service interruptions that have been identified and to examine current operations to determine if additional emergency situations or service interruptions exist. This review occurs during the Top Management Review. The QMS Representative is responsible for maintaining and updating the potential emergency situations or service interruptions.

Process for Emergency Response and Recovery:

Based on the emergencies identified the QMS Representative is responsible for ensuring that Standard Operating Procedures (SOP) are developed.

The SOPs outline the roles and responsibilities for various staff and the activities related to the response and recovery from the emergency or service interruption.

The City of Dryden has a Peacetime Emergency Plan that outlines the communication procedures during emergency situations. The roles and responsibilities of the Owner and appropriate Public Works staff depending on the level of emergency are also identified.

Emergency Response Training & Testing Requirements:

The Waterworks Manager is responsible for ensuring that emergency response training is undertaken by appropriate staff. The training is tracked for staff and documented in the "Operator Training" spreadsheet located in the shared drive and in employee personnel files.

In addition, a debriefing after larger scale emergencies will be undertaken by the Manager and may include the CAO, Director of Public Works, QMS Representatives and other applicable staff.

The Emergency Procedures will be evaluated, and modifications made to the procedures where required based on the review and/or debriefing following emergency situations. The evaluations will be a minimum of once per calendar year.

The testing of emergency systems is on-going. WTP alarms are tested monthly, both locally and remotely to the call center. Emergency generators and diesel-powered pumps are test ran monthly. First-aid kits, fire extinguishers and emergency lights are checked monthly. All checks and tests are recorded on the monthly log sheet at the WTP. Fire alarms and sensors are tested annually.

The procedure for ***"Adverse or Unsafe Water Sample Results"*** is tested annually unless an actual adverse incident or boil order advisory has been issued in the past twelve months, in which case the procedure would have been tested and recorded. The reason we test these procedures is to verify that emergency contact information is accurate and up to date and to keep personnel familiar with reporting and communicating to outside agencies such as the MECP, MOH and independent laboratories.

The Contingency Plan and Emergency Procedures will be reviewed and tested at a minimum of every 3 years through a tabletop exercise.

Water Emergencies:

During working hours 7:30 am to 4:00 pm call the Public Works Office - 223-2367 or the Water Treatment Plant – 223-1450 from 7:30 am to 3:30 pm.

After hours and weekend calls are transferred to an "On-Call" phone. The "On-Call" list is kept at the Public Works building. The "On-Call" person will notify the proper personnel to handle the emergency. Water Treatment Plant alarms are directed to the "On-Call" Operator through a call center.

19 - Internal Audits

In accordance with the requirements of the DWQMS the City of Dryden has documented a procedure for internal audits. The procedure is titled QMS Internal Audit Procedure and is included as “Appendix B” in this Operational Plan.

20 - Management Review

In accordance with the requirements of the DWQMS the City of Dryden has documented a procedure for Management Review. The procedure is titled QMS Management Review Procedure and is included as “Appendix C” in this Operational Plan.

21 - Continual Improvement

The City of Dryden shall strive to continually improve the effectiveness of its Quality Management System using corrective actions, opportunities for improvement, best management practices and preventative action procedures. These procedures ensure the Operating Authority continually improves the effectiveness of its Quality Management System by reviewing and considering best management practices, identifying corrective actions and identifying and implementing preventive actions to eliminate the occurrence of non-conformities.

21.1 Procedure

Best Management Practices:

Best Management Practices (BMPs) will be reviewed and considered at least once every thirty-six (36) months. This could include:

- BMPs published by the Ministry of the Environment, Conservation and Parks (MECP). These can be available at the following website: www.ontario.ca/drinkingwater
- Attending the annual DWQMS workshop facilitated by the Walkerton Clean Water Centre
- Communicating with Local Area Municipalities
- Internal Audits & External Audits
- MECP inspections
- Any other means (i.e. manufacturer recommendations, staff suggestions, etc.)

Appendix “G” will be used to track the date the BMP was considered, the type of improvement, the action item of the considered BMP, and the date to implement the BMP, if applicable

Corrective Action:

Corrective action involves taking measures to eliminate causes of identified non-conformances of the QMS with the requirements of the DWQMS or other undesirable situations. Corrective actions may be initiated because of the following indicators:

- Internal audits
- Management Review
- External audits
- Customer complaints
- Staff suggestions
- Trends identified in management reports.

Corrective actions are documented on the Continual Improvement Form (appendix "G"). Once the form is complete, the corrective action is then logged in the DWQMS Tracking sheet for the corresponding year and the DWQMS Action Item Status.

Preventative Action:

Preventive actions are taken to eliminate or prevent the cause of a potential nonconformance.

Preventive actions may be initiated as a result of the following indicators:

- Internal audits
- Management Review
- External audits
- Customer complaints
- Staff suggestions
- Trends identified in management reports.

Any employee can initiate preventive action by completing part "A" of Continual Improvement Form, Appendix "G", then forwarding it to a QMS representative. The QMS representative will

complete Part “B” and Part “C” of the form. To determine the root cause of the problem, the QMS representative should determine why the issue or potential issue occurred or had the potential to occur.

The QMS representative will determine and implement the corrective action and change documentation as applicable. They are responsible for investigating the root cause of the problem or potential problem, required action, the necessary steps to be taken, and an appropriate timeframe.

The QMS representatives will review the previous Non-Conformances annually to verify they have been implemented and they are effective in correcting and preventing the recurrence of the non-conformity. The review will be documented on the Continual Improvement form App. “G” and the DWQMS tracking spreadsheet.

This procedure documents the process to be taken to ensure effective resolution of non-conformances, OFI’s & Best management practices.

APPENDIX “A” - Document & Record Control Procedure

1.0 Procedure Description

This procedure defines the processes in place to ensure control of all documentation and records affecting the City of Dryden DWQMS. This is necessary to ensure that creating, revising, approving and releasing documents are completed in a consistent manner to make certain they are retrievable, current and accurate.

2.0 Reason for Procedure

To ensure control of documentation and records which affect the City of Dryden DWQMS.

3.0 Responsibility

The designated QMS Representative, (or the alternate), shall be responsible for the control of all QMS documents. All documents must meet the approval of the QMS Representative before initial or revision issuance.

4.0 Procedure

The following list indicates the location and list of key documents that are relevant to the QMS:

List of Key Documents	
Document	**Location**
Water Treatment Plant Municipal Drinking Water License	Public Works Office File / Share Drive
WTP System Classification	WTP / Public Works Office File
Water Distribution System Classification	Public Works Office File
DWQMS Operational Plan	WTP / Public Works/City Hall/Share Drive
Land Use Implementation and Servicing Plan Study	Public Works Library / Share Drive
Maintenance Manuals	WTP / WD Office
WTP Building and Site plans	WTP / Public Works / Share Drive
Operator Certifications and Training	Public Works Office / WTP / Share Drive
Supplier List & Documentation	WTP/ PW Office
Treatment Operators Logbook	WTP
Distribution Operators Logbook	PW Office
Calibration Manuals and Records	WTP
Equipment Maintenance Records	WTP
WTP Daily & Monthly Reports	WTP / Share Drive
Lab Results	Share Drive
Generator Test Log	Public Works
Plant Duty Checklists	WTP
SCADA Reports	WTP
Adverse Reporting	Water Works Manager Office
Municipal Drinking Water License	Share Drive
Permit to Take Water	Share Drive
Peacetime Emergency Plan	Share Drive
Long Range Financial Plan	Share Drive
MECP Inspections	Share Drive
NSF Certifications	Share Drive
Document Transmittal Form	Share Drive

Document Change Form	Share Drive
Operator Recommendation Form	Share Drive
DWQMS Checklist	Share Drive
Table-Top Exercise Form	Share Drive
DWQMS Operator Sign-in	Share Drive
Continual Improvement Form	Share Drive
Capital Justification Form	Share Drive
Sampling Plan	Share Drive
Shut-Down Report	Share Drive
Internal Training Document	Share Drive
DWQMS Tracking Document	Share Drive
Internal Audit Report	Share Drive
External Audit Report	Share Drive
Management Review Report	Share Drive
DWWP Form 1	Share Drive

The filing system at the Public Works Office is organized into numbered and titled documents filed into annual or on-going project files. If possible, new files are duplicated electronically and stored in the shared network drive, which is backed up automatically each night. All documentation related to water supply issues including operator training and certifications are added to existing files that are readily identifiable and retrievable in a designated storage cabinet in the Public Works file room. Some older records that are not relevant in day-to-day operations may be filed into a separate room upstairs at the Public Works building but can still be considered easily accessible.

Water Treatment Plant SCADA data is stored in duplicate electronically with one set saved on the shared network, which is automatically backed up each night. Daily logbooks and sampling records are filed at the WTP. Daily logs for the Water Distribution System are stored at the WD office at the Public Works building.

A definition of Vital records is listed in City of Dryden Policy # MU-IN-06. The City of Dryden Records Retention Schedule states that records associated with the management and operation

of treatment and pumping plants are kept for 5 years. General records associated with the operation of water plants, reservoirs, and storage facilities along with records associated with log sheets, lab reports and testing are kept for 15 years.

Records are disposed of according to procedure # MU-IN-09 & MU-IN-10. Policies and procedures can be viewed on the City of Dryden website.

Records associated with the specifications of treatment and pumping plants are considered permanent and are archived.

Results of QMS meetings and Management reviews will be posted to the share drive along with the Internal and External audit results.

Previous versions of the DWQMS operational plan will be destroyed when a new version is published.

All revisions to the new version of the Operational plan are to be documented in the "Table of Revisions."

The destruction or creation of documents is kept current by document transmittal forms, document change forms and Operator recommendation forms. These forms are located on the share drive.

Appendix "B" - QMS Internal Audit Procedure

1.0 - Procedure Description:

This procedure defines the process used by The City of Dryden to conduct internal audits of the Drinking Water Quality Management System (DWQMS).

2.0 - Reason for Procedure:

Internal audits are conducted to confirm that the DWQMS is effectively implemented and meets or exceeds the requirements of the DWQMS Standard.

3.0 – Responsibility:

Internal audits shall only be conducted by persons approved by the DWQMS Representative and having the following qualifications:

- Employees who have completed internal audit training.
- Employees of other operating authorities who have completed internal audit

- training and who have completed an internal audit of quality management systems within their own organizations.
- Third party auditors that have been contracted by the City of Dryden.

4.0 – Procedure:

4.1 This procedure is applicable to City of Dryden management, plant operations, and distribution activities that fall under the scope of the DWQMS.

4.2 Internal audits are conducted once per calendar year.

4.3 Internal auditors will be selected by the DWQMS Representative.

4.4 Internal auditors shall review DWQMS Standard and previous internal and third-party audit reports in preparation for the audit.

4.5 The audit checklist created and maintained by the DWQMS Representative shall be used by the internal auditor as a guideline for conducting the interviews and document review during the audit.

4.6 The audit report shall be in the form of a completed audit checklist.

4.7 The audit report shall include a description of any non-conformances between the QMS and the Standard, including a reference to the section of the Standard.

4.8 The audit lead shall complete a Continual Improvement form (App. "G") for any non-conformities identified during the audit and provide them to the QMS representative as part of the audit report.

4.9 The QMS representative shall complete a Continual Improvement form for all OFI's identified during the internal audit and update the DWQMS tracking sheet with OFI's & NC's identified in the internal audit.

4.10 The internal audit shall be considered closed upon submission of the audit report to the Management Review Committee

5.0 - Associated Documents:

- Internal Audit Checklist
- Management Review procedure

Appendix “C” - Management Review Procedure

1.0 - Procedure Description:

This procedure defines the process for the review of the effectiveness of the Drinking Water Quality Management System (DWQMS) by the Management Review Committee.

2.0 - Reason for Procedure:

Management reviews are conducted to assess and ensure the continuing suitability, adequacy, and effectiveness of the DWQMS.

3.0 – Responsibility:

Management reviews shall be conducted during a meeting of the following participants:

- Director of Public Works (Top Management)
- Waterworks Manager (QMS Representative-responsible for undertaking Management Review)
- Chief Plant Operator (QMS Representative - alternate)

Other participants may be added at the discretion of the Management Review Committee.

4.0 - Procedure:

4.10 This procedure is applicable to The City of Dryden management, plant operations, and distribution and collection activities that fall under the scope of the QMS.

4.11 A management review shall be conducted at least once per calendar year following completion and documentation of an internal audit and prior to the next scheduled third-party audit.

4.12 Prior to the Management Review Meeting, the QMS Representative or Alternate shall provide summaries of the following information to the Management Review Committee:

a) Incidents of regulatory non-compliance

b) Results of internal and third-party audits

c) Incidents of adverse drinking water tests

d) Deviations from critical control point limits and response actions

e) The effectiveness of the risk assessment process

f) Consumer Feedback

g) Results of emergency response testing

h) Operational performance

i) Follow-up on action-items from previous Management Reviews

j) Status of Management Action Items identified between reviews.

k) Changes that could affect the QMS

l) The resources needed to maintain the QMS

m) Raw water supply & drinking water quality trends

n) Recommendations for improvement of the QMS

o) Results from the infrastructure review

p) Operational Plan currency, content and updates, and

q) Staff suggestions

4.13 The Management Review Committee shall review and discuss all information presented including previous corrective action items and where necessary identify opportunities for improvement. Action items arising from the management review will be documented on a Continual Improvement form and listed on the DWQMS tracking sheet. The Committee shall make recommendations and initiate action for all corrective actions identified including persons responsible and timelines, as appropriate, to improve the content and implementation of the Operational Plan and related procedures, and to ensure the provision of adequate resources

4.14 Minutes of management review meetings, including all recommendations, decisions, CAR's, person's responsible and timelines shall be maintained by the QMS Representative or Alternate. The minutes shall document all new and outstanding action items as well as any decisions made by the Committee and will be forwarded to Mayor and Council for review.

4.15 The QMS Representative and Alternate shall be responsible for communication and implementation of the management review action items as per item DWQMS Communication procedure.

5.0 - Associated Documents:

- Internal Audit Checklist
- Continual Improvement form – App. G
- DWQMS Tracking Sheet

Notice to Essential Suppliers and Service Providers

This is to inform you that as of February 1st, 2010, the City of Dryden has developed and implemented a Drinking Water Quality Management System (DWQMS).

Our Quality Management Policy states: The City of Dryden is committed to managing the supply of safe and high-quality drinking water to all of our customers. Our water will consistently meet all current regulatory requirements and customers’ needs. The DWQMS will be implemented by the City to effectively minimize and manage any potential risks to drinking water quality and safety.

O.REG.179/03 requires all chemicals used be ANSI or NSF certified for water treatment.

This will be provided to operating personnel upon delivery. Material Safety Data Sheets (MSDS) will also be provided and updated as required.

O.REG. 170/03 requires all regulated water testing be performed by an accredited lab.

A certificate of accreditation will be provided as required.

All equipment powered by electricity will be CSA approved or equivalent.

All suppliers and delivery personnel will report to the operator prior to the delivery or unloading of the product.

Please sign this document, keep a copy for your files and return original to the City.

_____ _____

Signed Date

_____

Company

APPENDIX “E” - Operator Acknowledgement

I have reviewed the City of Dryden Operational Plan:		
Operator	**Sign**	**Date**
William Aho		
Cory Russell		
Scott Fuerst		
Barry Miner		
Brian Spalding		
Crey Raine		
Shawn Bull		
Brodie Church		
Jared Vandenbrand		
Waterworks Manager		

Appendix “F” - Dryden Drinking Water System Profile

DRINKING WATER SYSTEM PROFILE INFORMATION

as of 16-May-2025

Drinking Water System Name: Dryden Drinking Water System
Drinking Water System Number: 220001432
Drinking Water System Category: Large Municipal Residential System (LMRS)
Municipality: Dryden
Physical Location: 250 Wilde Street, Dryden, Ontario, Canada P8N 3A9

OWNER INFORMATION

Owner Legal Name: Dryden, The Corporation Of The City Of
Owner Address: 30 Van Horne Ave, Dryden, Ontario, Canada P8N 2A7

Primary Contact Name:
Primary Contact Job Title: Waterworks
Manager **Primary Contact Phone:** (807)2232367
Primary Contact Fax: (807)2233915
Primary Contact Email Address:

Alternate Contact Name: Mr. Blake Poole
Alternate Contact Job Title: Director of PW
Alternate Contact Phone: (807)2232367
Alternate Contact Fax: (807)2233915
Alternate Contact Email Address: bpoole@dryden.ca

OPERATING AUTHORITY INFORMATION

Operating Authority Legal Name: Dryden, The Corporation Of The City Of
Operating Authority Business Name: Dryden, The Corporation Of The City Of
Operating Authority Address: 30 Van Horne Ave, Dryden, Ontario P8N 2A7

Primary Contact Name:
Primary Job Title: Waterworks
Manager **Primary Contact Phone:** (807)2232367
Primary Contact Fax: (807)2233915
Primary Contact Email Address:

Alternate Contact Name: Mr. William Aho
Alternate Contact Job Title: Overall Responsible
Operator **Alternate Contact Phone:** (807)2231450
Alternate Contact Fax: (807)2233915
Alternate Contact Email Address: waho@dryden.ca

OPERATIONAL INFORMATION

24/7 Contact Name: Mr. William Aho
24/7 Job Title: Overall Responsible Operator
24/7 Contact Phone: (807)2231450

24/7 Contact Fax:	(807)2233915
24/7 Contact Email Address:	waho@dryden.ca
24/7 Contact Mobile:	(807)216-7380
24/7 Contact Pager:	N/A

DRINKING WATER SYSTEM PROFILE INFORMATION

Population:	6700
Number of Private Residences:	2500
Number of Service Connections:	2500
Design Rated Capacity:	157 L/S

Number of Designated Facilities Served: 0

DESIGNATED FACILITY:

GROUND WATER SOURCE:

Surface Water Source

Waterbody Name	Point of Entry
Wabigoon Lake	TREATED: DRYDEN WTP

Treatment Processes

Point of Entry / Distribution	Treatment Type	Treatment Process
DISTRIBUTION:DRYDEN DRINKING WATER SYSTEM	Primary Disinfection	CHLORINATION
	Secondary Disinfection	CHLORINATION
TREATED: DRYDEN WTP	Primary Disinfection	CHLORINATION
	Secondary Disinfection	CHLORINATION
	Other Treatments	FLOCCULATION
		PH ADJUSTMENT
		SEDIMENTATION
		FILTRATION
		CLARIFIER - UPFLOW
		CLARIFIER - SLUDGE BLANKET
		ALKALINITY ADJUSTMENT
		COAGULATION

RECEIVING DWS:

SUPPLYING DWS:

RELATIONSHIPS:

REGULATORY FORM SUBMISSIONS

Forms Submitted	Receive Date
Application For Relief From Lead Sampling	22-Jul-09

Appendix “G”- Continual Improvement Log

DWQMS Continual Improvement Form - Part “A”					
Issue Initiated / Improvement Details					
Issued By:		**Element #:**			
Action Item Derived From:	**Management Review**		**Date:**		
	Internal Audit		**Date:**		
	External Audit		**Date:**		
	MECP Inspection		**Date:**		
	Staff Suggestions		**Date:**		
	Risk Assessment Outcomes		**Date:**		
	Training Outcomes		**Date:**		
	Consumer Complaints		**Date:**		
	Capital Justification Forms		**Date:**		
Type of Improvement	**Non-Conformity**				
	Opportunity for Improvement				
	Best Management Practice				
	Preventive Action				
	Non-Compliance				
Issued To:		**Date:**			

DWQMS Continual Improvement Form - Part "B"
Root Cause Analysis – Non-Conformity / Non-Compliance Only:
Action Taken:

DWQMS Continual Improvement Form - Part "C"				
Completed Actions Reviewed By:	**QMS Rep:**		**Date:**	
	QMS Rep:		**Date:**	
Implemented in Operational Plan Version Number:			**Date:**	
Comments:				

Appendix “H” Council Resolution

THE CORPORATION OF THE CITY OF DRYDEN

MOVED BY:	Latham	**DATE:**	09-Jun-25
SECONDED BY:	MacKinnon	**RESOLUTION NO.:**	10

That as per the recommendation in Staff Report Public Works-2025-09, Council endorse the Drinking Water Quality Management Standard (DWQMS) Operational Plan (Version 15).

RECORDED VOTE

Council	Yes	No
Councillor C. Kiewning		
Councillor B. Latham		
Councillor M. MacKinnon		
Councillor R. Noel		
Councillor M. Price		
Councillor B. Tardiff		
Mayor J. Harrison		
TOTALS		

DECLARATION UNDER THE MUNICIPAL CONFLICT OF INTEREST ACT

Councillors who have declared an interest, abstained from discussion and did not vote on this question.

Disposition of Resolution

(Check One)

Carried X **Defeated**

Harrison

MAYOR: