Ontario

DRINKING WATER WORKS PERMIT

Permit Number: 014-201
Issue Number: 11

Pursuant to the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, I hereby issue this drinking water works permit under Part V of the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32 to:

The Corporation of the City of Barrie

70 Collier Street
P.O. Box 400
Barrie, ON L4M 4T5

For the following municipal residential drinking water system:

Barrie Drinking Water System

This drinking water works permit includes the following:

Schedule	Description
Schedule A	Drinking Water System Description
Schedule B	General
Schedule C	All documents issued as Schedule C to this drinking water works permit which authorize alterations to the drinking water system
Schedule D	Process Flow Diagrams

Upon the effective date of this drinking water works permit # 014-201, all previously issued versions of permit # 014-201 are revoked and replaced by this permit.

DATED at TORONTO this 7th day of November, 2025

Signature

Aziz Ahmed, P.Eng.
Director
Part V, *Safe Drinking Water Act*, 2002

Schedule A: Drinking Water System Description

System Owner	**The Corporation of the City of Barrie**
Permit Number	**014-201**
Drinking Water System Name	**Barrie Drinking Water System**
Permit Effective Date	**November 7th, 2025**

1.0 System Description

1.1 The following is a summary description of the works comprising the above drinking water system:

Overview

The **Barrie Drinking Water System** consists of one (1) surface water treatment plant, twelve (12) groundwater wells, seven (7) booster pumping stations, three (3) in-ground storage reservoirs, three (3) elevated storage tanks, and approximately 700 kilometers of watermains and transmission mains.

Barrie Drinking Water System

Water Supply Plant

- Surface Water Treatment Plant

Groundwater Wells

- Well 3A
- Well 5
- Well 7
- Well 9
- Well 11
- Well 12
- Well 13
- Well 14
- Well 15
- Well 16
- Well 17
- Well 18

Booster Pumping Stations

- Anne North Booster Pump Station
- Big Bay Point Booster Pump Station
- Codrington Booster Pump Station
- Harvie Road Booster Pump Station
- Innisfil Booster Pump Station
- Leacock Booster Pump Station
- Sunnidale Road Booster Pump Station

Storage Reservoirs

- Anne Street North At-Grade Reservoir
- Harvie Road At-Grade Water Reservoir
- Sunnidale Road In-Ground Reservoir

Elevated Storage Tanks

- Bayfield Elevated Water Reservoir
- Ferndale North Elevated Water Reservoir
- Mapleview Elevated Water Reservoir

Surface Water Treatment Plant

Site Description

Name	City of Barrie Surface Water Treatment Plant
Street Address	20 Royal Parkside Drive, Barrie ON L4M 0C4
UTM Coordinates	NAD 83, Zone 17, +/- 3.0 m, 4913080 m N, 609500 m E
System Type	Surface water treatment
Notes	

Surface Water Supply

Intake Pipe

Description	Raw water intake pipe equipped with screened intake structure and raw water sample line extending into Lake Simcoe
Dimensions	A 1525 mm nominal diameter pipe extending approximately 750 m at a depth of approximately 26 m into the Lake Simcoe
Mussel Control	A mussel control system utilizing a chlorine gas system to inject chlorine at the intake using two (2) 50 mm HDPE carrier lines (one duty, one standby) extending the length of the intake, terminating in a diffuser at the intake structure
Intake Sampling System	Total chlorine residual and pH sampled at the intake structure downstream of the chlorine injection location and at the raw water header
	Turbidity and temperature sampled at the intake structure upstream of the chlorine injection location
Notes	N/A

Secondary Intake Pipe

Description	A second incomplete raw water intake pipe with provision for a chlorine solution injection line for mussel control and a raw water sample line, for future use if required
Dimensions	A 1525 mm nominal diameter pipe extending approximately 150 m (terminated with a blind flange)
Notes	N/A

Low Lift Works

Low Lift Pumping Station

Location	23 Camelot Square, Barrie ON
UTM Coordinates	NAD 83, UTM Zone 17, 609040 m E, 4913821 m N
Description	One (1) 20 m diameter by 14 m deep in-ground wet well structure with two (2) interconnected raw water wet well cells of equal size, with provision to isolate each cell through one (1) 1200 mm by 1800 mm isolation sluice gate. Each cell equipped with one (1) 1200 mm by 1800 mm inlet sluice gate
Equipment	One (1) travelling screen and one (1) fixed screen, one in each wet well cell, with a mesh opening size of 9.5 mm
	One (1) duty 900 mm discharge header complete with a 600 mm magnetic flow meter and surge/pressure relief valves and one (1) standby 900 mm discharge header complete with a 600 mm magnetic flow meter and surge/pressure relief valves, both connected to 900 mm and 600 mm raw water mains
Pumps	Two (2) variable speed vertical turbine raw water pumps, each rated at 31.5 ML/d at 55 m TDH
	One (1) variable speed vertical turbine raw water pump rated at 15.75 ML/d at 49 m TDH
	One (1) variable speed vertical turbine raw water pump rated at 15.75 ML/d at 49 m TDH
Chlorine	A chlorine gas system used for pre-chlorination (mussel control) and disinfection located at the low lift pumping station in one tonne chlorine gas cylinders and stored in a chlorine gas storage room
	A dry type chlorine gas scrubber capable of neutralizing 200 kg/min of chlorine gas or one (1) complete one tonne chlorine gas cylinder
Notes	N/A

Strainers

Membrane Feed Strainers

Description	Two (2) self-cleaning strainers (one duty, one standby) with mesh openings of 0.5 mm
Notes	Hydraulic pressure differential indicates need for cleaning

Flocculation

Flocculation Tanks

Description	A flocculation system consisting of two (2) basins, each with two (2) compartments. Each compartment containing one mechanical mixer
Dimensions	Each basin with a total storage volume of 670 m^3
Monitoring	A sampling station complete with temperature transmitter, turbidity analyzer and pH analyzer located immediately upstream of the dynamic mixer
	One (1) ultrasonic level sensor located in the flocculation inlet channel
Notes	N/A

Primary Membrane Filtration

Filters

Description	A total of five (5) trains for a total firm production of 60 ML/day
Pumps	Five (5) variable speed centrifugal type permeate pumps (one per train), each pump capable of delivering 1,012 m^3/hour with a TDH of 15.8 m, complete with a magnetic flow meter and a sampling station on each permeate discharge monitoring turbidity
	Two (2) recirculation pumps (one duty, one standby) capable of delivering 214 m^3/hour at a TDH of 8.1 m to transfer membrane cleaning solution into the membrane tanks and to complete neutralization within the neutralization tanks. The recirculation pumps are shared with the secondary membrane system
	Two (2) heated water recirculation pumps (one duty, one standby) to circulate water within the membrane tank during a recovery clean and capable of delivering 18 m^3/hour at a TDH of 10 m. The pumps are shared with the secondary membrane system
	Two (2) backpulse pumps, (one duty, one standby) capable of delivering 1,012 m^3/hour with a TDH 16.1 m to draw water from the backpulse tanks and to reverse flow through the primary membranes to remove foulants
Tanks	Two (2) concrete equalization tanks (one duty, one standby) with volumes of 685 m^3 (Equalization tank #1) and 875 m^3 (Equalization Tank #2) used for primary membrane backwash water and GAC backwash water storage. Each tank is equipped with an ultrasonic level sensor
	Two (2) concrete neutralization tanks (one duty, one standby) with the dimensions of 2.4 m by 3.6 m by 4.7 m high and an operating volume of 35 m^3 for the neutralization of the membrane cleaning solution, and heating of water for the membrane heated cleans. Each tank is shared with the secondary membrane system and equipped with an ultrasonic level sensor
Heat Cleaning System	Heated cleaning system utilizing hot water from the building services boilers through a heat exchanger, and comprised of air separators, pressure and temperature gauges, pressure and flow switches and associated valves and piping. The heated cleaning system is shared with the secondary membrane system
Air Compressors	Two (2) air compressors (one duty, one standby) for providing compressed air to the pneumatic valves. The air compressors are shared with the secondary membrane system
Air Blowers	Two (2) air blowers (one duty, one standby) capable of delivering approximately 1100 Nm^3/h for providing scouring air to the membrane tanks during backwashes and chemical cleans
Air Removal System	Ejector on each primary membrane header to evacuate air from the system
Primary Membrane Feed Channel	One (1) concrete primary membrane feed channel equipped with two (2) ultrasonic level sensors
Monitoring	Operating interface that monitors membrane integrity testing, log reduction value criteria, filtrate turbidity measurements, maintenance clean sequences and operating pressures
Notes	N/A

Secondary Membrane Filtration

Filters

Description	Two (2) trains each with a production rate of 3.3 ML/day
Pumps	Two (2) variable speed centrifugal type permeate pumps (one per train) capable of delivering 1.58 ML/d each, complete with a magnetic flow meter and a sampling station on each permeate discharge pipe monitoring turbidity
Tanks	Two (2) concrete waste tanks (one duty, one standby) with the dimensions of 5.0 m by 3.2 m by 4.7 m high and 7.0 m by 3.0 m by 4.7 m high, used for temporary storage of secondary membrane backwash water, neutralized secondary membrane chemical waste and flocculation drain lines. Each tank is equipped with an ultrasonic level sensor. The combined discharged of the waste tanks are directed to sanitary sewer.
Air Blowers	Two (2) air blowers (one duty, one standby) capable of delivering approximately 1100 Nm^3/h for providing scouring air to the membrane tanks during backwashes and chemical cleans
Air Removal System	Ejectors are located on each secondary membrane header to evacuate air from the system
Secondary Membrane Feed Channel	One (1) concrete secondary membrane feed channel equipped with one (1) ultrasonic level sensor
Monitoring	Operating interface that monitors membrane integrity testing, log reduction value criteria, filtrate turbidity measurements, maintenance clean sequences and operating pressures
Notes	N/A

Granular Activated Carbon Contractors

Dimensions	Three (3) granular activated carbon contactors, with a total carbon volume of 120 m^3
Backwash Pumps	Two (2) backwash pumps (one duty, one standby) capable of delivering 44 ML/day at a TDH of 12 m.
Notes	N/A

Chlorine Contact Chamber/On-Site Storage

Reservoir

Chlorine Contact Tank	Two (2) 5 ML chlorine contact tanks, each tank directly joined to the adjacent reservoir cells via a weir and equipped with a 450 mm magnetic flow meter and an ultrasonic level sensor
	A sampling station at the weir capable of monitoring pH and free chlorine
In-ground reservoir	Two (2) 5 ML in-ground interconnected reservoirs, complete with baffles and equipped with an ultrasonic level sensor for monitoring water levels in the reservoir
Notes	N/A

Instrumentation and Control

SCADA System

SCADA System	A SCADA System
Flow Measurement Locations	Two (2) flowmeters, one (1) flowmeter on each raw water discharge pipe to pre-treatment (located at the Low Lift Pumping station) Two (2) flowmeters, one (1) flowmeter on each header to the chlorine contact tank Two (2) flowmeters, one (1) flowmeter on each highlift discharge main
Level Measurement Locations	Two (2) level sensors, one (1) level sensor for each chlorine contact tank
Regulatory Analyzer Locations	Each membrane unit equipped with one (1) turbidity analyzer Chlorine Contact Tanks each equipped with one (1) chlorine analyzer, one (1) temperature analyzer, and one (1) pH analyzer
Notes	N/A

High Lift Works

High Lift Pumps

Description	Six (6) fixed speed vertical turbine pumps to provide a firm capacity of 72 ML/day (described below)
Pumps	Two (2) constant speed high lift pumps each rated at 29 ML/day, at a TDH of 65.5 m
	Three (3) constant speed high lift pumps each rated at 14.5 ML/day at a TDH of 65.5 m
	One (1) constant speed high lift pump rated at 7.0 ML/day at a TDH of 65.5 m for use during low demand periods
Sampling	A sampling station on the discharge of the high lift header capable of monitoring pH, temperature, free chlorine and turbidity
Notes	One (1) 900 mm discharge header complete with a 600 mm magnetic flow meter and surge/pressure relief valve and one (1) standby 900 mm discharge header complete with a 600 mm magnetic flow meter and surge/pressure relief valve, both connected to a 1200 mm watermain

Standby Power

Equipment	One (1) 2,000 kW diesel fired generator. The generator also supplies power to the low lift pumping station via a 13.8 kV feeder

Notes	N/A

Chemical Addition

Coagulant

Description	Coagulant dosing system
Feed Point	Coagulant added and mixed after the strainers using a 900 mm inline dynamic mixer
Equipment	Two (2) coagulant storage tanks 25,000 L each, complete with spill containment
	Three (3) peristaltic dosing pumps (two duty, one standby) capable of providing the appropriate dosage
Notes	N/A

Sulphuric Acid

Description	Sulphuric acid dosing system
Equipment	Two (2) sulphuric acid storage tanks, 25,000 L each, complete with spill containment
	Two (2) peristaltic dosing pumps (one duty, one standby) capable of providing the appropriate dosage
Notes	Not in use

Sodium Hypochlorite

Description	Sodium Hypochlorite dosing system
Equipment	One (1) 1,000 L sodium hypochlorite storage tank and tote, spill containment
	Two (2) peristaltic dosing pumps (one duty, one standby) capable of providing the appropriate dosage
Notes	N/A

Sodium Hydroxide

Description	Sodium Hydroxide dosing system
Equipment	One (1) 1,000 L sodium hydroxide storage tank and tote, spill containment
	Two (2) peristaltic dosing pumps (one duty, one standby) capable of providing the appropriate dosage
Notes	N/A

Citric Acid

Description	Citric acid dosing system
Equipment	One (1) 1,000 L citric acid storage tank and tote, spill containment
	Two (2) peristaltic dosing pumps (one duty, one standby) capable of providing the appropriate dosage
Notes	N/A

Calcium Thiosulfate

Description	Calcium thiosulfate dosing system
Equipment	One (1) 1,000 L calcium thiosulfate storage tank and tote, spill containment
	Two (2) peristaltic dosing pumps (one duty, one standby) for membrane cleaning neutralization capable of delivering the appropriate dosage
	Two (2) peristaltic dosing pumps (one duty, one standby) for emergency plant overflow dechlorination capable of delivering the appropriate dosage
Notes	N/A

Chlorine

Description	A chlorine gas system used for primary and secondary disinfection
Primary Feed Point	The chlorine contact tank inlet at surface water treatment plant
Secondary Feed Point	The high lift discharge header prior to entry to the distribution system at the surface water treatment plant
Equipment	Chlorine gas held in one tonne cylinders and stored in a chlorine storage room
	A dry type chlorine gas scrubber capable of neutralizing 200 kg/min of chlorine gas or one (1) complete one tonne chlorine gas cylinder
Notes	N/A

Groundwater Wells

Well 5, John Street

Location	217 John Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 602923 m and Northing 4914271 m
WWR No.	5700271
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	660 mm diameter, 106 m deep
Equipment	One vertical turbine well pump rated at 75.7 L/s, 76.8 m TDH, located in the well pumphouse with a 200 mm diameter discharge line connected to the well pump header and magnetic flow meter prior to entry into the distribution system
	Continuous online free chlorine residual and turbidity analyzers (raw water), including alarms and pump interlocks. Free chlorine residual is monitored prior to entry into the distribution system.
	Appurtenances and process piping, including a pump to waste connection, magnetic flowmeter and chemical injection points, prior to entry into the distribution system.
	Associated SCADA, electrical, mechanical and controls for an operable system
UV Primary Disinfection	Primary disinfection provided by a UV system (for a groundwater raw water supply in accordance with O. Reg. 170/03) composed of a UV reactor and a UV control cabinet. The UV reactor is a 300 mm cross flow design with four (4) medium pressure high intensity (MPHI) lamps, each MPHI lamp is equipped with a dedicated UV intensity sensor calibrated for 254 nm wave length. The MPHI lamps are housed in a quartz sleeve fitted with an automatic cleaning mechanism. The UV disinfection system is designed to provide a dosage of 40 mJ/cm^2 with a minimum UV transmittance of 85% and a maximum flow rate of 75.7 L/s. The UV control cabinet contains four (4) ballasts (1 ballast per each MPHI lamp) and maintains the UV dosage including controls and alarms to monitor continuous UV disinfection prior to entry into the distribution system including interlock between the UV monitors and vertical turbine well pump to shut down the vertical turbine well pump on low UV disinfection
Chlorine Secondary Disinfection	A secondary compound loop disinfection system in a separate room in the well pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators injector, an automated control valve and a feed line and chlorine booster pump discharging into the well pump header in the well pumphouse prior to entry into the distribution system
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system in the well pumphouse, utilizing a sodium silicate sequestering agent, consisting of a 4,540 L capacity double wall storage tank, with vacuum monitoring for secondary containment, and one automated chemical metering pump with a feed line system discharging into the pump header prior to the entry into the distribution system.
Stand-by Power	A 130 kW standby diesel generator complete with automatic transfer switch Standby power provided is sufficient to maintain full operation of the facility
Notes	N/A

Well 7, Sarjeant Drive

Location	44 Sarjeant Drive, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 602484 m and Northing 4914187 m
WWR No.	5709125
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	762 mm diameter, 100.7 m deep
Equipment	One vertical turbine well pump rated at 75.7 L/s at a TDH of 82.3 m located in the well pumphouse with a 200 mm diameter discharge line connected to the well pump header and magnetic flow meter prior to entry into the dedicated Chlorine Contact Pipe
	Continuous online free chlorine residual and turbidity analyzers (raw water), including alarms and pump interlocks. Free chlorine residual is monitored after the chlorine contact pipe
	Appurtenances including pump control valve and process piping
	Associated SCADA, electrical, mechanical and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the well pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators injector, an automated control valve and a feed line and chlorine booster pump discharging into the pump header prior to entry into the dedicated chlorine contact pipe
	An in-ground dedicated Chlorine Contact Pipe, 2,100 mm diameter and 27.4 m long, located adjacent to the well pumphouse, including five (5) perforated baffle walls, vandal proof water tight access hatchways; dedicated to provide the required CT prior to the first customer
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system in the well pumphouse, utilizing a sodium silicate sequestering agent, consisting of a 4,540 L capacity double wall storage tank, with vacuum monitoring for secondary containment, and one automated chemical metering pump with a feed line system discharging into the well pump header in the well pumphouse prior to the entry into the dedicated Chlorine Contact Pipe
Stand-by Power	A 130 kW standby diesel generator complete with automatic transfer switch Standby power provided is sufficient to maintain full operation of the facility
Notes	N/A

Well 9, Johnson Street

Location	168 Johnson Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 607034 m and Northing 4917647 m
WWR No.	5712496
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	610 mm diameter, 93 m deep
Equipment	A vertical turbine well pump, rated at 75.7 L/s at a TDH of 56.45 m, with a 250 mm diameter discharge line and magnetic flowmeter connected to the well pump header to the Chlorine Contact Chamber
	One (1) vertical turbine high lift water pump, with a rated capacity of 75.7 L/s at a TDH of 85 m with a 200 mm diameter discharge line and magnetic flowmeter, shared with the Well 13 high lift pump, connected to the distribution system
	Continuous online free chlorine residual and turbidity analyzers (raw water), including alarms and pump interlocks. Free chlorine residual is monitored after the chlorine contact chamber
	Appurtenances including pump control valve and process piping
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the well pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators injector, an automated control valve with an injector discharging into the well pump header in the well pumphouse prior to entry into the chlorine contact chamber
	A twin cell, in-ground Chlorine Contact Chamber having a minimum one (1) cell usable storage volume of 182 m^3 including baffle walls, dedicated to Well 9 that provides the required CT prior to the first customer
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of an 8,000 L capacity storage tank, shared with Well 13, within a concrete crib for secondary containment, and one (1) dedicated automated chemical metering pump with a feed line system discharging into the pump header prior to entry into the chlorine contact chamber
Stand-by Power	A 300 kW standby diesel generator operated for either the Well 9 or Well 13 well pump and their associated systems (the other will be locked out), complete with automatic transfer switch located in the Well 13 pumphouse.
Notes	Second cell of in-ground chlorine contact chamber is dedicated to Well 13 treatment under normal operating conditions

Well 11, Heritage Park

Location	5 Simcoe Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604692 m and Northing 4915824 m
WWR No.	5719264
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	610 mm diameter, 61.2 m deep
Equipment	A vertical turbine well pump, rated at 105.3 L/s at a TDH of 114.9 m with a 250 mm diameter discharge line and magnetic flowmeter connected to the well pump header to the supply main through a chlorine contact chamber of 18.3 m in length and 2.1 m in diameter
	Continuous online free chlorine residual and turbidity analyzers (raw water), including alarms and pump interlocks. Free chlorine residual is monitored after the chlorine contact chamber
	Appurtenances including gate valve and process piping
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the well pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators injector, an automated control valve and a feed line and chlorine booster pump discharging into the pump header prior to entry into the chlorine contact chamber
	An in-ground chlorine contact chamber, 2.1 m diameter and 19.8 m long equipped with baffles and vandal proof water tight hatchway, located approximately 22 m north of the well
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of a 2,788 L capacity storage tank, within a fabricated steel crib for secondary containment and one (1) automated chemical metering pump with a feed line system discharging into the well pump header prior to entry into the Chlorine Contact Chamber
Stand-by Power	A 350 kW standby diesel generator operated for either the Well 11 or Well 14 well pump and their associated systems (the other will be locked out), complete with automatic transfer switch located in Well 14 pumphouse. Standby power provided is sufficient to maintain full operation of Well 11 or Well 14 but not both
Notes	N/A

Well 12, Centennial Park

Location	85 Lakeshore Drive, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604479 m and Northing 4914589 m
WWR No.	5720696
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	762 mm diameter, 84 m deep
Equipment	A vertical turbine well pump, rated at 105.3 L/s at a TDH of 127.1 m, with a 300 mm diameter discharge line and magnetic flowmeter connected to the well pump header to the Chlorine Contact Pipe
	Continuous online turbidity analyzers (raw water), including alarms and pump interlocks.
	Appurtenances and process piping including a pump to waste connection, magnetic flowmeter and chemical injection points, prior to entry into the dedicated chlorine contact pipe
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators, an automated control valve and with an injector and chlorine booster pump (located in the pump room) with a feed line discharging into the well pump header prior to entry into the Chlorine Contact Pipe
	A minimum of 823 m of 600 mm diameter transmission main which is utilized as a Chlorine Contact Pipe with a combined rated pump capacity of approximately 316 L/s
Chlorine Monitoring	Continuous online free chlorine residual including alarms and pump interlocks. Free chlorine residual is continuously monitored prior to entry into the chlorine contact pipe
	An established chlorine depletion algorithm, integrated into SCADA, is used to estimate the chlorine residual at the end of the chlorine contact pipe in the CT calculation.
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of a 4,200 L capacity storage tank, within a fabricated steel crib for secondary containment, and one (1) automated chemical metering pump with a feed line system discharging into the well pump header prior to entry into the Chlorine Contact Pipe
Stand-by Power	A 210 kW standby diesel generator complete with automatic transfer switch Standby power provided is sufficient to maintain full operation of the facility
Notes	N/A

Well 13, Johnson Street

Location	168 Johnson Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 607016 m and Northing 4917663 m
WWR No.	5724686
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	610 mm diameter, 97.8 m deep
Equipment	A vertical turbine well pump, rated at 75.7 L/s at a TDH of 73.1 m, with a 250 mm diameter discharge line connected to the well pump header and magnetic flowmeter to a separate Chlorine Contact Chamber beneath the pumphouse building as referenced for Well 9 with a dedicated cell for the Well 13 supply
	One (1) sand separator rated at 75.7 L/s
	One (1) vertical turbine high lift water pump, with a rated capacity of 75.7 L/s at a TDH of 85 m with a 200 mm diameter discharge line and magnetic flowmeter, shared with the Well 9 high lift pump, connected to the distribution system
	Continuous online free chlorine residual and turbidity analyzers (raw water), including alarms and pump interlocks. Free chlorine residual is monitored after the chlorine contact chamber
	Appurtenances including pump control valve with isolation valve and process piping
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the pumphouse, shared with Well 9, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators, an automated control valve, and with an injector (located in the pump room) with a feed line discharging into the well pump header prior to entry into the Chlorine Contact Chamber
	A twin cell, in-ground Chlorine Contact Chamber having a minimum one (1) cell usable storage volume of 182 m^3 including baffle walls, dedicated to Well 13 that provides the required CT prior to the first customer
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of an 8,000 L capacity storage tank, shared with Well 9, within a concrete crib for secondary containment, and one (1) dedicated automated chemical metering pump with a feed line system discharging into the pump header prior to entry into the chlorine contact chamber
Stand-by Power	A 300 kW standby diesel generator operated for either the Well 9 or Well 13 well pump and their associated systems (the other will be locked out), complete with automatic transfer switch located in Well 13 pumphouse. Standby power provided is sufficient to maintain full operation of Well 9 or Well 13 but not both
Notes	First cell of in-ground chlorine contact chamber is dedicated to Well 9 treatment, under normal operating conditions

Well 14, Heritage Park

Location	19 Simcoe Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604660 m and Northing 4915792 m
WWR No.	5727877
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	610 mm diameter, 61.1 m deep
Equipment	A vertical turbine well pump, rated at 105.3 L/s at a TDH of 114.3 m, with a 300 mm diameter discharge line and magnetic flowmeter connected to the well pump header to the dedicated Chlorine Contact Pipe
	One (1) sand separator rated at 106.1 L/s
	Continuous online turbidity analyzers (raw water), including alarms and pump interlocks.
	Appurtenances and process piping including a pump to waste connection, magnetic flowmeter and chemical injection points, prior to entry into the dedicated chlorine contact pipe
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales and automatic switchover regulators, an automated control valve, and with an injector and chlorine booster pump (located in the pump room) with a feed line discharging into the well pump header prior to entry into the dedicated chlorine contact pipe
	1152 m of dedicated chlorine contact pipe, comprising of 400 mm diameter and 450 mm diameter to provide the required CT prior to the first customer with a rated pump capacity of approximately 105 L/s
Chlorine Monitoring	Continuous online free chlorine residual including alarms and pump interlocks. Free chlorine residual is continuously monitored prior to entry into the chlorine contact pipe
	An established chlorine depletion algorithm, integrated into SCADA, is used to estimate the chlorine residual at the end of the chlorine contact pipe in the CT calculation.
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of a 2,788 L capacity storage tank, within a fabricated steel crib for secondary containment, and one (1) automated chemical metering pump with a feed line system discharging into the well pump header prior to entry into the dedicated Chlorine Contact Pipe
Stand-by Power	A 350 kW standby diesel generator operated for either the Well 11 or Well 14 well pump and their associated systems (the other will be locked out) complete with automatic transfer switch located in Well 14 pumphouse. Standby power provided is sufficient to maintain full operation of Well 11 or Well 14 but not both
Notes	N/A

Well 15, Centennial Park

Location	55 Lakeshore Drive, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604425 m and Northing 4915194 m
WWR No.	5728705
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	610 mm diameter, 61.1 m deep
Equipment	A vertical turbine well pump, rated at 105.3 L/s at a TDH of 127.1 m, with a 300 mm diameter discharge line and magnetic flowmeter connected to the well pump header to the dedicated Chlorine Contact Pipe
	Continuous online turbidity analyzers (raw water), including alarms and pump interlocks.
	Appurtenances and process piping including a pump to waste connection, magnetic flowmeter and chemical injection points, prior to entry into the dedicated chlorine contact pipe
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales and automatic switchover regulators, an automated control valve and with an injector and chlorine booster pump (located in the pump room) with a feed line discharging into the well pump header prior to entry into the dedicated chlorine contact pipe
	1411 m dedicated chlorine contact pipe, comprising of 500 mm diameter and 600 mm diameter to provide the required CT prior to the first customer with a combined minimum pump capacity of 210 L/s.
Chlorine Monitoring	Continuous online free chlorine residual including alarms and pump interlocks. Free chlorine residual is continuously monitored prior to entry into the chlorine contact pipe
	An established chlorine depletion algorithm, integrated into SCADA, is used to estimate the chlorine residual at the end of the chlorine contact pipe in the CT calculation.
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of a 2,788 L capacity storage tank, within a fabricated steel crib for secondary containment, and one (1) automated chemical metering pump with a feed line system discharging into the well pump header prior to entry into the dedicated Chlorine Contact Pipe
Stand-by Power	A 230 kW standby diesel generator complete with automatic transfer switch Standby power provided is sufficient to maintain full operation of the facility
Notes	N/A

Well 16, Brown Wood Drive

Location	101 Brown Wood Drive, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604025 m and Northing 4919588 m
WWR No.	5733545
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	600 mm diameter, 74.7 m deep
Equipment	A vertical turbine well pump, rated at 90.8 L/s at a TDH of 42.67 m, with a 300 mm diameter discharge line and magnetic flowmeter connected to the well pump header to the Chlorine Contact Chamber
	One (1) vertical turbine variable frequency drive high lift water pump, with a rated capacity of 90.8 L/s at a TDH of 82.55 m with a 250 mm diameter discharge line and magnetic flowmeter connected to the distribution system
	Continuous online free chlorine residual and turbidity analyzers (raw water), including alarms and pump interlocks. Free chlorine residual is monitored after the chlorine contact chamber
	Appurtenances including pump check valve and process piping
	Associated SCADA, electrical, mechanical, and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system in a separate room in the pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales and automatic switchover regulators, with an injector, an automated control valve, and a feed line discharging into the well pump header prior to entry into the chlorine contact chamber
	A single cell, in-ground Chlorine Contact Chamber having a minimum usable storage volume of 141 m^3 including baffle walls, ultrasonic liquid level transmitter with alarms, vents complete with insect screen overflow complete with air gap, vandal proof water tight access hatchways; dedicated to provide the required CT prior to the first customer
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system utilizing a sodium silicate sequestering agent, consisting of a 3,300 L capacity storage tank, within a fabricated steel crib for secondary containment, and one (1) automated chemical metering pump with a feed line system discharging into the well pump header prior to entry into the chlorine contact chamber
Stand-by Power	A 275 kW standby diesel generator complete with automatic transfer switch. Standby power provided is sufficient to maintain full operation of the facility
Notes	N/A

Well 17, Cross Street

Location	34 Cross Street, Barrie ON
UTM Coordinates	NAD 83 Zone 17 +/- 3 m, Easting 602045m and Northing 4913788m
WWR No.	5737406
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	600 mm diameter, 105.2 m deep
Equipment	A vertical turbine well pump rated at 130 L/s, 121 m TDH, located in the well pumphouse with a 250 mm diameter discharge line connected to the well pump header and magnetic flow meter prior to entry into the dedicated Chlorine Contact Pipe
	One sand separator rated at 130 L/s
	Continuous online turbidity analyzers (raw water), including alarms and pump interlocks.
	Appurtenances and process piping including a pump to waste connection, magnetic flowmeter and chemical injection points, prior to entry into the dedicated chlorine contact pipe
	Associated SCADA, electrical, mechanical and controls for an operable system
	Process piping, including magnetic flowmeter and chemical injection points, prior to entry into the dedicated chlorine contact pipe
Chlorine Disinfection	A compound loop disinfection system dedicated to Well 17, in a separate room shared with Well 18 works, in the well pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators injector, an automated control valve and with a feed line and chlorine booster pump discharging into the Well 17 well pump header in the well pumphouse prior to entry into the dedicated Chlorine Contact Pipe
	465 m of dedicated Chlorine Contact Pipe, comprising of 400 mm diameter, 600 mm diameter and 900 mm diameter, to provide the required CT prior to the first customer at the combined flow of 260 L/s from Well 17 and Well 18
Chlorine Monitoring	Continuous online free chlorine residual including alarms and pump interlocks. Free chlorine residual is continuously monitored prior to entry into the shared chlorine contact pipe for Wells 17 & 18
	An established chlorine depletion algorithm, integrated into SCADA, is used to estimate the chlorine residual at the end of the chlorine contact pipe in the CT calculation.
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system, in the well pumphouse, utilizing a sodium silicate sequestering agent, consisting of two 10,500 L capacity double walled storage tanks (one dedicated to Well 18), with vacuum monitoring for secondary containment, and two automated chemical metering pumps (one dedicated to Well 18), with a feed line system discharging into the Well 17 well pump header in the well pumphouse prior to entry into the dedicated chlorine contact pipe
Stand-by Power	A 400 kW standby diesel generator, operated for either the Well 17 or Well 18 well pump and their associated systems (the other will be locked out), complete with automatic transfer switch located in Well 17 pumphouse. Standby power provided is sufficient to maintain full operation of Well 17 or Well 18 but not both

Well 18, Cross Street

Location	34 Cross Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 602013 m and Northing 4918140 m
WWR No.	5739442
Description	Drilled groundwater well, pumphouse and appurtenances
Source Type	Non-GUDI
Dimensions	600 mm diameter, 106.1 m deep
Equipment	One vertical turbine well pump rated at 130 L/s at a TDH of 121 m located in the well pumphouse with a 250 mm diameter discharge line connected to 300 mm diameter yard piping discharging to process piping in the Well 17 pumphouse, including magnetic flowmeter, prior to entry into the dedicated Chlorine Contact Pipe
	Continuous online turbidity analyzers (raw water), including alarms and pump interlocks
	Appurtenances and process piping including a pump to waste connection, magnetic flowmeter and chemical injection points, prior to entry into the dedicated chlorine contact pipe
	Associated SCADA, electrical mechanical and controls for an operable system
Chlorine Disinfection	A compound loop disinfection system dedicated to Well 18 in a separate room, shared with Well 17 works, in the Well 17 pumphouse, consisting of two (2) chlorine gas cylinders including weigh scales, automatic switchover regulators injector, an automated control valve and with a feed line and chlorine booster pump discharging into the Well 18 pump header in the Well 17 pumphouse prior to entry into the dedicated chlorine contact pipe
	465 m of dedicated Chlorine Contact Pipe, comprising of 400 mm diameter, 600 mm diameter and 900 mm diameter, to provide the required CT prior to the first customer at the combined flow of 260 L/s from Well 17 and Well 18
Chlorine Monitoring	Continuous online free chlorine residual including alarms and pump interlocks. Free chlorine residual is continuously monitored prior to entry into the shared chlorine contact pipe for Wells 17 & 18
	An established chlorine depletion algorithm, integrated into SCADA, is used to estimate the chlorine residual at the end of the chlorine contact pipe in the CT calculation.
Iron and Manganese Sequestering	A paced to flow iron and manganese sequestering system in the Well 17 pumphouse, utilizing a sodium silicate sequestering agent, consisting of, under normal operating conditions, a 10,500 L capacity double wall storage tank, with vacuum monitoring for secondary containment, and an automated chemical metering pump with a feed line system discharging into the Well 18 well pump header in the well pumphouse prior to the entry into the dedicated chlorine contact pipe
Stand-by Power	A 400 kW standby diesel generator, operated for either the Well 17 or Well 18 well pump and their associated systems (the other will be locked out), complete with automatic transfer switch located in Well 17 pumphouse. Standby power provided is sufficient to maintain full operation of Well 17 or Well 18 but not both
Notes	N/A

City of Barrie Water Distribution System

Pumping Stations and Reservoirs

Anne Street North Booster Pump Station

Location	164 Anne Street North, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 602535 m and Northing 4916070 m
Equipment	Two (2) vertical turbine pumps rated at 67 L/s, 56 m TDH
	One (1) vertical turbine pump rated at 90 L/s, 60.3 m TDH
Standby Power	200 kW standby diesel generator (stationary)
Notes	N/A

Anne Street North At-Grade Reservoir

Location	164 Anne Street North, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 602535 m and Northing 4916070 m
Description	An at-grade concrete reservoir with two isolation cells designed for fire storage, equalization storage and emergency storage
Capacity	Operating capacity of 15,890 m^3
Equipment	Two (2) continuous on-line chlorine residual analyzers, including alarms, to control the compound loop chlorine injection; one prior to re-entry into the distribution system for Zone 1 and one prior to being pumped into the distribution system for Zone 2N
	One (1) magnetic direct bury flowmeter on the reservoir common draw/fill line to Zone 1 and one (1) venturi direct bury flow transmitter on the discharge main to Zone 2N
	All additional piping and appurtenances for the above-noted works
	Associated SCADA, electrical, mechanical and controls for an operable system
Rechlorination	A compound loop controlled re-chlorination system for the Zone 1 distribution system water consisting of two (2) chlorine gas cylinders (located in a separate room), with automatic switchover, weigh scale, gas chlorinator, regulators, injectors and automated control valve, complete with process piping to add chlorine at the Zone 1 discharge
	A compound loop controlled re-chlorination system for the Zone 2N distribution system water consisting of two (2) chlorine gas cylinders (located in a separate room), with automatic switchover, weigh scale, gas chlorinator, regulators, injectors and automated control valve, complete with process piping to add chlorine at the Zone 2N discharge
Standby Power	None
Notes	N/A

Big Bay Point Booster Pump Station

Location	20 Big Bay Point Road, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604960 m and Northing 4911520 m
Equipment	Two (2) centrifugal pumps rated at 100 L/s, 47 m TDH
	Two (2) centrifugal pumps rated at 150 L/s, 47 m TDH
	A continuous on-line chlorine residual analyzer, including alarms, to monitor and record free chlorine residuals prior to being pumped into the distribution system for Zone 3S
	Associated SCADA, electrical mechanical controls for an operable system.
Standby Power	325 kW standby diesel generator (stationary)
Notes	N/A

Codrington Booster Pump Station

Location	64 Codrington Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604815 m and Northing 4916510 m
Equipment	Two (2) vertical turbine pumps rated at 63 L/s, 51.8 m TDH
	A continuous on-line chlorine residual analyzer, including alarms, to monitor and record free chlorine residuals prior to being pumped into the distribution system for Zone 2N
	Associated SCADA, electrical mechanical controls for an operable system.
	Control valve and process piping.
Standby Power	None
Notes	N/A

Harvie Road Booster Pump Station

Location	90 Harvie Road, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 603850 m and Northing 4911175 m
Equipment	Four (4) vertical turbine pumps (3 duty, 1 standby) each rated at 133.3 L/s at 45 m TDH with a discharge line and flowmeter connected to the distribution system
	Three (3) continuous on-line chlorine residual analyzers including alarms to monitor and record free chlorine residual; one on the discharge line to Zone 3S, one on the line drawing from Well 17 and Well 18, and one drawing from the inlet line from Zone 2 South
	A storage reservoir (clear well) with a total volume of approximately 500 m^3
	Appurtenances including pump control valve, and process piping
	Associated SCADA and instrumentation including three (3) chlorine residual analyzers and three (3) magnetic flowmeters, electrical, mechanical and controls for an operable system.
Standby Power	A 450 kW stand-by diesel generator set complete with automatic transfer switch
Notes	N/A

Harvie Road At-Grade Water Reservoir

Location	90 Harvie Road, Barrie ON
UTM Coordinates	NAD 83, Zone 17, Easting 603890 m and Northing 4911170 m
Description	An at-grade concrete reservoir with six (6) isolation cells designed for fire storage, equalization storage and emergency storage
Capacity	Total capacity of 27,300 m^3
Equipment	Continuous on-line chlorine residual analyzer including alarms, to control the compound loop chlorine injection prior to re-entry into the distribution system
	Appurtenances include one magnetic flowmeter, drain to waste connection with isolation valve, and process piping
	Associated SCADA, electrical, mechanical and controls for an operable system
Rechlorination	A compound loop controlled rechlorination system consisting of two (2) chlorine gas cylinders, located in a separate room, with automatic switchover, weigh scale, gas chlorinator, regulators and process piping to the injectors
	An injector with an automated control valve and feed line discharging into the outflow header located in the valve room
Standby Power	None
Notes	N/A

Innisfil Booster Pump Station

Location	380 Innisfil Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604170 m and Northing 4913500 m
Equipment	Three (3) vertical turbine pumps rated at 70 L/s, 73.5 m TDH
	A continuous on-line chlorine residual analyzer, including alarms, to monitor and record free chlorine residuals prior to being pumped into the distribution system for Zone 2S.
	Associated SCADA, electrical mechanical controls for an operable system.
Standby Power	None
Notes	N/A

Leacock Booster Pump Station

Location	319 Leacock Drive, Barrie ON
UTM Coordinates	NAD 83, Zone 17, +/- 3 m, Easting 604160 m and Northing 4913510 m
Equipment	One (1) vertical turbine pump rated at 20 L/s, 82 m TDH
	One (1) vertical turbine pump rated at 45 L/s, 82 m TDH
	Two (2) vertical turbine pumps rated at 75 L/s, 82 m TDH
	A continuous on-line chlorine residual analyzer, including alarms, to monitor and record free chlorine residuals prior to being pumped into the distribution system for Zone 3N
	Associated SCADA, electrical mechanical controls for an operable system.
Standby Power	A 200 kW standby diesel generator (stationary) complete with automatic transfer switch
Notes	N/A

Sunnidale Booster Pumping Station

Location	245 Sunnidale Road, Barrie ON
UTM Coordinates	NAD 83, Zone 17, Easting 602487 m and Northing 4916953 m
Equipment	Four (4) in-line vertical turbine pumps (three duty, one standby), each rated at 63 L/s for Zone 2 North supply.
	Associated SCADA, electrical mechanical controls for an operable system.
Firm Pumping Capacity	189 L/s
Chlorination	Two gas chlorination systems complete with emergency cylinder valve closure system: one for Zone 2 North pressure zone; one for Zone 1 pressure zone. Chlorination rates are controlled by compound loop control and chlorine residual set points
	Two (2) injection points, one at the discharge header (Zone 2 North) and one at the Reservoir inlet/outlet pipe (Zone 1)
	Two (2) 150 pounds per day vacuum chlorinators, one for Zone 2 North pressure zone and one for Zone 1 pressure zone
	Two (2) chlorine booster pumps (one duty, one standby) for injecting chlorine solution at the Zone 2 North discharge header. Injection at the Reservoir inlet/outlet controlled by a solenoid valve.
	A dry type chlorine gas scrubber
Stand-by Power	One (1) 300 kW diesel generator set which provides standby power for the three (3) operating vertical turbine pumps, chlorination and building services
Notes	N/A

Sunnidale Park Reservoir

Location	245 Sunnidale Road, Barrie ON
UTM Coordinates	NAD 83, Zone 17, Easting 602487 m and Northing 4916953 m
Description	Two (2) cells, each measuring 38.5 m x 45.5 m x 6.0 m depth and each providing a working capacity of 10,500 m^3
Notes	The two cells are capable of working independently or jointly

Elevated Storage Tanks

Bayfield Elevated Water Reservoir

Location	444 Bayfield Street, Barrie ON
UTM Coordinates	NAD 83, Zone 17, Easting 602834 m and Northing 4918140 m
Description	An elevated reservoir designed for fire storage, equalization storage and emergency storage
Dimensions	Total capacity of 4,536 m^3
Equipment	Continuous on-line chlorine residual analyzer, including alarms, to control the compound loop chlorine injection prior to reentry into the distribution system
	Appurtenances include one magnetic flowmeter and process piping
	Associated SCADA, electrical, mechanical and controls for an operable system
Rechlorination	A compound loop controlled rechlorination system in a separate room in the tower consisting of two (2) chlorine gas cylinders, including weigh scales, automatic switchover regulators, an automated control valve and with an injector and chlorine booster pump with a feed line discharging into the discharge header
	An injector, chlorine booster pump with a feed line discharging into the inflow/outflow header located in the main valve room
Standby Power	None
Notes	N/A

Ferndale North Elevated Water Reservoir

Location	434 Ferndale Drive North, Barrie ON
UTM Coordinates	NAD 83, Zone 17, Easting 600840 m and Northing 4916060 m
Description	An elevated reservoir designed for fire storage, equalization storage and emergency storage
Dimensions	Total capacity of 5,700 m^3
Equipment	Continuous on-line chlorine residual analyzers, including alarms, to control the compound loop chlorine injection prior to reentry into the distribution system
	Appurtenances include one magnetic flowmeter, drain to waste connection with isolation valve and process piping
	Associated SCADA, electrical, mechanical and controls for an operable system
Rechlorination	A compound loop controlled rechlorination system in a separate room in the tower consisting of two (2) chlorine gas cylinders, including weigh scales, automatic switchover regulators, an automated control valve and with an injector and chlorine booster pump with a feed line discharging into the discharge header, weigh scale, gas chlorinator, regulators and process piping to the injectors
	An injector, chlorine booster pump with a feed line discharging into the inflow/outflow header located in the main valve room
Standby Power	None
Notes	N/A

Mapleview Elevated Water Reservoir

Location	65 Mapleview Drive West, Barrie ON
UTM Coordinates	NAD 83, Zone 17, Easting 604350 m and Northing 4909684 m
Description	An elevated reservoir designed for fire storage, equalization storage and emergency storage
Dimensions	Total capacity of 5,455 m^3
Equipment	Continuous on-line chlorine residual analyzer including alarms, to control the compound loop chlorine injection prior to reentry into the distribution system
	Appurtenances include one magnetic flowmeter and process piping
	Associated SCADA, electrical, mechanical and controls for an operable system
Rechlorination	A compound loop controlled rechlorination system in a separate room in the tower consisting of two (2) chlorine gas cylinders, including weigh scales, automatic switchover regulators, an automated control valve and with an injector and chlorine booster pump with a feed line discharging into the discharge header
	An injector, chlorine booster pump with a feed line discharging into the inflow/outflow header located in the main valve room
Standby Power	None
Notes	N/A

Fuel Oil Systems

Well 5 Fuel Storage

Location	Well 5 217 John St, Barrie NAD 83, Zone 17, +/- 3m, Easting 602923m and Northing 4914271m
Description	One (1) 1,100 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 7 Fuel Storage

Location	Well 7 44 Sarjeant Drive, Barrie NAD 83, Zone 17, +/- 3m, Easting 602484m and Northing 4914187m
Description	One (1) 1,100 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 11 Fuel Storage

Location	Well 11 5 Simcoe Street, Barrie NAD 83, Zone 17, +/- 3m, Easting 604692m and Northing 4915824m
Description	One (1) 1,135 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 12 Fuel Storage

Location	Well 12 85 Lakeshore Drive, Barrie NAD 83, Zone 17, +/- 3m, Easting 604479m and Northing 4914589m
Description	One (1) 900 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 13 Fuel Storage

Location	Well 13 168 Johnson Street, Barrie NAD 83, Zone 17, +/- 3m, Easting 607016m and Northing 4917663m
Description	One (1) 1,035 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 14 Fuel Storage

Location	Well 14 19 Simcoe Street, Barrie NAD 83, Zone 17, +/- 3m, Easting 604660m and Northing 4915792m
Description	One (1) 1,100 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 15 Fuel Storage

Location	Well 15 55 Lakeshore Drive, Barrie NAD 83, Zone 17, +/- 3m, Easting 604425m and Northing 4915194m
Description	One (1) 1,100 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 16 Fuel Storage

Location	Well 16 101 Brown Wood Drive, Barrie NAD 83, Zone 17, +/- 3m, Easting 604025m and Northing 4919588m
Description	One (1) 1,360 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Well 17 Fuel Storage

Location	Well 17 34 Cross Street, Barrie NAD 83, Zone 17, +/- 3m, Easting 602045m and Northing 4913788m
Description	One (1) 2,270 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 10 Moderate risk

Anne Street North Booster Pump Station Fuel Storage

Location	Anne Street North Booster Pump Station 164 Anne Street North, Barrie NAD 83, Zone 17, +/- 3m, Easting 602535m and Northing 4916070m
Description	One (1) 2,270 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 2 Low risk

Big Bay Point Booster Pump Station Fuel Storage

Location	Big Bay Point Booster Pump Station 20 Big Bay Point Road, Barrie NAD 83, Zone 17, +/- 3m, Easting 604960m and Northing 4911520m
Description	One (1) 2,270 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	N/A

Harvie Road Booster Pump Station Fuel Storage

Location	Harvie Road Booster Pump Station 90 Harvie Road, Barrie NAD 83, Zone 17, +/- 3m, Easting 603850m and Northing 4911175m
Description	One (1) 2,200 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	N/A

Leacock Booster Pump Station Fuel Storage

Location	Leacock Booster Pump Station 319 Leacock Drive, Barrie NAD 83, Zone 17, +/- 3m, Easting 604160m and Northing 4913510m
Description	One (1) 900 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 4 Low risk

Sunnidale Booster Pump Station Fuel Storage

Location	Sunnidale Booster Pump Station 245 Sunnidale Road, Barrie NAD 83, Zone 17, +/- 3m, Easting 602487m and Northing 4916953m
Description	One (1) 1,135 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 2

Surface Water Treatment Plant Fuel Storage

Location	Surface Water Treatment Plant 20 Royal Parkside Drive, Barrie NAD 83, Zone 17, +/- 3m, Easting 4913080m and Northing 609500m
Description	One (1) 25,000 L double walled above grade fuel storage tank
Fuel Type	Diesel
Source Protection Area	Lake Simcoe and Couchiching/Black River Source Protection Area and Nottawasaga Valley Source Protection Area
Notes	Vulnerability score 8 Moderate risk

Watermains

1.2 Watermains within the distribution system comprise:

1.2.1 Watermains that have been set out in each document or file identified in column 1 of Table 1.

Table 1: Watermains

Column 1 Document or File Name	Column 2 Date
Distribution_System_Map.pdf	April 25, 2024

1.2.2 Watermains that have been added, modified, replaced or extended further to the provisions of Schedule C of this drinking water works permit on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

Schedule B: General

System Owner	**The Corporation of the City of Barrie**
Permit Number	**014-201**
Drinking Water System Name	**Barrie Drinking Water System**
Permit Effective Date	**November 7th, 2025**

1.0 Applicability

1.1 In addition to any other applicable legal requirements, the drinking water system identified above shall be altered and operated in accordance with the conditions of this drinking water works permit and the licence # 014-101.

1.2 The definitions and conditions of licence # 014-101 are incorporated into this permit and also apply to this drinking water system.

2.0 Alterations to the Drinking Water System

2.1 Any document issued by the Director to be incorporated into Schedule C to this drinking water works permit shall provide authority to alter the drinking water system in accordance with the applicable conditions of this drinking water works permit and licence # 014-101.

2.2 All documents issued by the Director as described in condition 2.1 shall form part of this drinking water works permit.

2.3 All parts of the drinking water system in contact with drinking water that are added, modified, replaced, extended shall be disinfected in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:

a) The ministry's Watermain Disinfection Procedure, dated August 1, 2020;
b) Subject to condition 2.3.2, any updated version of the ministry's Watermain Disinfection Procedure;
c) Subject to condition 2.3.3,
    i. AWWA C652 – Standard for Disinfection of Water-Storage Facilities;
    ii. AWWA C653 – Standard for Disinfection of Water Treatment Plants; and,
    iii. AWWA C654 – Standard for Disinfection of Wells.

2.3.1 For greater certainty, where an activity has occurred that could introduce contamination, including but not limited to repair, maintenance, or physical / video inspection, all equipment that may come in contact with the drinking water system shall be disinfected in accordance with the requirements of condition 2.3. above.

2.3.2 Updated requirements described in condition 2.3 b) are effective six months from the date of publication of the updated Watermain Disinfection Procedure.

2.3.3 Requirements described in condition 2.3 c) are effective until:

a) In the case of AWWA C652, six months after the issue date of the ministry's Water Storage Facility Disinfection Procedure;

b) In the case of AWWA C653, six months after the issue date of the ministry's Water Treatment Plant Disinfection Procedure; and,

c) In the case of AWWA C654, six months after the issue date of the ministry's Wells Disinfection Procedure.

2.3.4 The ministry documents described in condition 2.3.3 shall be implemented within the timeframe specified in condition 2.3.3 and once implemented all parts of the drinking water system in contact with drinking water that are added, modified, replaced or extended shall be disinfected in accordance with the applicable provisions of the document or a procedure approved by the Director.

2.3.5 After the initial issue date, any updated requirements are effective six months from the date of publication of the updated Water Storage Facility Disinfection Procedure, Water Treatment Plant Disinfection Procedure or Wells Disinfection Procedure.

2.3.6 For greater certainty the timeframes described in conditions 2.3.2, 2.3.3 and 2.3.5 are intended to provide a period for transition. Implementation may occur at any point within the identified timeframe in these conditions.

2.4 The owner shall notify the Director in writing within thirty (30) days of the placing into service or the completion of any addition, modification, replacement, removal or extension of the drinking water system which had been authorized through:

2.4.1 Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;

2.4.2 Any document to be incorporated in Schedule C to this drinking water works permit respecting works other than watermains; or

2.4.3 Any approval issued prior to the issue date of the first drinking water works permit respecting works other than watermains which were not in service at the time of the issuance of the first drinking water works permit.

2.5 The notification required in condition 2.4 shall be submitted using the "Director Notification Form" published by the Ministry.

2.6 For greater certainty, the notification requirements set out in condition 2.4 do not apply to any addition, modification, replacement, removal or extension in respect of the drinking water system which:

2.6.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03;

2.6.2 Constitutes maintenance or repair of the drinking water system; or

2.6.3 Is a watermain authorized by condition 3.1 of Schedule B of this drinking water works permit.

2.7 The owner shall notify the legal owner of any part of the drinking water system that is prescribed as a municipal drinking water system by section 2 of O. Reg. 172/03 of the requirements of the licence and this drinking water works permit as applicable to the prescribed system.

2.8 For greater certainty, the owner may only carry out alterations to the drinking water system in accordance with this drinking water works permit after having satisfied other applicable legal obligations, including those arising from the *Environmental Assessment Act*, *Niagara Escarpment Planning and Development Act*, *Oak Ridges Moraine Conservation Act, 2001* and *Greenbelt Act, 2005*.

3.0 Watermain Additions, Modifications, Replacements and Extensions

3.1 The owner may alter the drinking water system, or permit it to be altered by a person acting on the owner's behalf, by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:

3.1.1 The design of the watermain addition, modification, replacement or extension:

a) Has been prepared by a licensed engineering practitioner;

b) Has been designed only to transmit water and has not been designed to treat water;

c) Satisfies the design criteria set out in the Ministry publication "Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – June 2012", as amended from time to time; and

d) Is consistent with or otherwise addresses the design objectives contained within the Ministry publication "Design Guidelines for Drinking Water Systems, 2008", as amended from time to time.

3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.

3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.

3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.

3.1.6 The owner of the drinking water system consents in writing to the watermain addition, modification, replacement or extension.

3.1.7 A licensed engineering practitioner has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.

3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.

3.2 The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:

3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;

3.2.2 Has a nominal diameter greater than 1,200 mm;

3.2.3 Results in the fragmentation of the drinking water system; or

3.2.4 Connects to another drinking water system, unless:

a) Prior to construction, the owner of the drinking water system seeking the connection obtains written consent from the owner or owner's delegate of the drinking water system being connected to; and

b) The owner of the drinking water system seeking the connection retains a copy of the written consent from the owner or owner's delegate of the drinking water system being connected to as part of the record that is recorded and retained under condition 3.3.

3.3 The verifications required in conditions 3.1.7 and 3.1.8 shall be:

3.3.1 Recorded on "Form 1 – Record of Watermains Authorized as a Future Alteration", as published by the Ministry, prior to the watermain addition, modification, replacement or extension being placed into service; and

3.3.2 Retained for a period of ten (10) years by the owner.

3.4 For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

3.4.2 Constitutes maintenance or repair of the drinking water system.

3.5 The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be

updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.

3.6 The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

3.7 Despite clause (a) of condition 3.1.1 and condition 3.1.7, with respect to the replacement of an existing watermain or section of watermain that is 6.1 meters in length or less, if a licensed engineering practitioner has:

3.7.1 inspected the replacement prior to it being put into service;

3.7.2 prepared a report confirming that the replacement satisfies clauses (b), (c) and (d) of condition 3.1.1 (i.e. “Form 1 – Record of Watermains Authorized by a Future Alteration” (Form 1), Part 3, items No. 2, 3 and 4); and

3.7.3 appended the report referred to in condition 3.7.2 to the completed Form 1,

the replacement is exempt from the requirements that the design of the replacement be prepared by a licensed engineering practitioner and that a licensed engineering practitioner verify on Form 1, Part 3, item No. 1 that a licensed engineering practitioner prepared the design of the replacement.

3.8 For greater certainty, the exemption in condition 3.7 does not apply to the replacement of an existing watermain or section of watermain if two or more sections of pipe, each of which is 6.1 meters in length or less, are joined together, if the total length of replacement pipes joined together is greater than 6.1 meters.

4.0 Minor Modifications to the Drinking Water System

4.1 The drinking water system may be altered by adding, modifying or replacing the following components in the drinking water system:

4.1.1 Coagulant feed systems in the treatment system, including the location and number of dosing points:

a) Prior to making any alteration to the drinking water system under condition 4.1.1, the owner shall undertake a review of the impacts that the alteration might have on corrosion control or other treatment processes; and

b) The owner shall notify the Director in writing within thirty (30) days of any alteration made under condition 4.1.1 and shall provide the Director with a copy of the review.

c) The notification required in condition 4.1.1 b) shall be submitted using the “Director Notification Form” published by the Ministry

4.1.2 Instrumentation and controls, including new SCADA systems and upgrades to SCADA system hardware;

4.1.3 SCADA system software or programming that:

a) Measures, monitors or reports on a regulated parameter;
b) Measures, monitor or reports on a parameter that is used to calculate CT; or,
c) Calculates CT for the system or is part of the process algorithm that calculates log removal, where the impacts of addition, modification or replacement have been reviewed by a licensed engineering practitioner;

4.1.4 Filter media, backwashing equipment, filter troughs, and under-drains and associated equipment in the treatment system;

4.1.5 Spill containment works; or,

4.1.6 Coarse screens and fine screens

4.2 The drinking water system may be altered by adding, modifying, replacing or removing the following components in the drinking water system:

4.2.1 Treated water pumps, pressure tanks, and associated equipment;

4.2.2 Raw water pumps and process pumps in the treatment system;

4.2.3 Inline booster pumping stations that are not associated with distribution system storage facilities and are on a watermain with a nominal diameter not exceeding 200 mm;

4.2.4 Re-circulation devices within distribution system storage facilities;

4.2.5 In-line mixing equipment;

4.2.6 Chemical metering pumps and chemical handling pumps;

4.2.7 Chemical storage tanks and associated equipment;

4.2.8 Measuring and monitoring devices that are not required by regulation, by a condition in the Drinking Water Works Permit, or by a condition otherwise imposed by the Ministry.

4.2.9 Chemical injection points.

4.2.10 Valves;

4.2.11 Fuel storage tanks and spill containment works, and associated equipment or,

4.2.12 Any other component(s) where the Director has provided authorization in writing to proceed with the alteration.

4.3 The drinking water system may be altered by replacing the following:

4.3.1 Raw water piping, treatment process piping or treated water piping within the treatment subsystem;

4.3.2 Measuring and monitoring devices that are required by regulation, by a condition in the Drinking Water Works Permit or by a condition otherwise imposed by the Ministry.

4.3.3 Coagulants and pH adjustment chemicals, where the replacement chemicals perform the same function;

a) Prior to making any alteration to the drinking water system under condition 4.3.3, the owner shall undertake a review of the impacts that the alteration might have on corrosion control or other treatment processes; and

b) The owner shall notify the Director in writing within thirty (30) days of any alteration made under condition 4.3.3 and shall provide the Director with a copy of the review.

c) The notification required in condition 4.3.3 b) shall be submitted using the "Director Notification Form" published by the Ministry

4.4 Any alteration of the drinking water system made under conditions 4.1, 4.2 or 4.3 shall not result in:

4.4.1 An exceedance of a treatment subsystem rated capacity or a treatment subsystem component maximum flow rate as specified in the licence;

4.4.2 The bypassing or removal of any unit process within a treatment subsystem;

4.4.3 The addition of any new unit process other than coagulation within a treatment subsystem;

4.4.4 A deterioration in the quality of drinking water provided to consumers;

4.4.5 A reduction in the reliability or redundancy of any component of the drinking water system;

4.4.6 A negative impact on the ability to undertake compliance and other monitoring necessary for the operation of the drinking water system; or

4.4.7 An adverse effect on the environment.

4.5 The owner shall verify in writing that any addition, modification, replacement or removal of drinking water system components in accordance with conditions 4.1, 4.2 or 4.3 has met the requirements of the conditions listed in condition 4.4.

4.6 The verifications and documentation required in condition 4.5 shall be:

4.6.1 Recorded on "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System" published by the Ministry, prior to the modified or replaced components being placed into service; and

4.6.2 Retained for a period of ten (10) years by the owner.

4.7 For greater certainty, the verification requirements set out in conditions 4.5 and 4.6 do not apply to any addition, modification, replacement or removal in respect of the drinking water system which:

4.7.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

4.7.2 Constitutes maintenance or repair of the drinking water system, including software changes to a SCADA system that are not listed in condition 4.1.3

4.8 The owner shall update any drawings maintained for the drinking water system to reflect the modification or replacement of the works, where applicable.

5.0 Equipment with Emissions to the Air

5.1 The drinking water system may be altered by adding, modifying or replacing any of the following drinking water system components that may discharge or alter the rate or manner of a discharge of a compound of concern to the air:

5.1.1 Any equipment, apparatus, mechanism or thing that is used for the transfer of outdoor air into a building or structure that is not a cooling tower;

5.1.2 Any equipment, apparatus, mechanism or thing that is used for the transfer of indoor air out of a space used for the production, processing, repair, maintenance or storage of goods or materials, including chemical storage;

5.1.3 Laboratory fume hoods used for drinking water testing, quality control and quality assurance purposes;

5.1.4 Low temperature handling of compounds with a vapor pressure of less than 1 kilopascal;

5.1.5 Maintenance welding stations;

5.1.6 Minor painting operations used for maintenance purposes;

5.1.7 Parts washers for maintenance shops;

5.1.8 Emergency chlorine and ammonia gas scrubbers and absorbers;

5.1.9 Venting for activated carbon units for drinking water taste and odour control;

5.1.10 Venting for a stripping unit for methane removal from a groundwater supply;

5.1.11 Venting for an ozone treatment unit;

5.1.12 Natural gas or propane fired boilers, water heaters, space heaters and make-up air units with a total facility-wide heat input rating of less than 20 million kilojoules per hour, and with an individual fuel energy input of less than or equal to 10.5 gigajoules per hour; or

5.1.13 Emergency generators that fire No. 2 fuel oil (diesel fuel) with a sulphur content of 0.5 per cent or less measured by weight, natural gas, propane, gasoline or biofuel, and that are used for emergency duty only with periodic testing.

5.2 The owner shall not make an addition, modification, or replacement described in condition 5.1 in relation to an activity that is not related to the treatment and/or distribution of drinking water.

5.3 The emergency generators identified in condition 5.1.13 shall not be used for non-emergency purposes including the generation of electricity for sale or for peak shaving purposes.

5.4 The owner shall ensure that the criteria outlined for standby power sources in s.20.4 of O. Reg. 419/05 (Air Pollution – Local Air Quality) are met for all discharge that occurs from the use of emergency generators added, modified or replaced under condition 5.1.13.

Performance Limits

5.5 The owner shall ensure that a drinking water system component identified in conditions 5.1.1 to 5.1.13 is operated at all times to comply with the following limits:

5.5.1 For equipment other than emergency generators, the maximum concentration of any compound of concern at a point of impingement shall not exceed the corresponding point of impingement limit;

5.5.2 For emergency generators, the maximum concentration of nitrogen oxides at sensitive receptors shall not exceed the applicable point of impingement limit, and at non-sensitive receptors shall not exceed the Ministry half-hourly screening level of 1880 ug/m^3 as amended; and

5.5.3 The noise emissions comply at all times with the limits set out in publication NPC-300, as applicable.

5.6 The owner shall verify in writing that any addition, modification or replacement of works in accordance with condition 5.1 has met the requirements of the conditions listed in condition 5.5.

5.7 The owner shall document how compliance with the performance limits outlined in condition 5.5.3 is being achieved, through noise abatement equipment and/or operational procedures.

5.8 The verifications and documentation required in conditions 5.6 and 5.7 shall be:

5.8.1 Recorded on “Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere”, as published by the Ministry, prior to the additional, modified or replacement equipment being placed into service; and

5.8.2 Retained for a period of ten (10) years by the owner.

5.9 For greater certainty, the verification and documentation requirements set out in conditions 5.6 and 5.8 do not apply to any addition, modification or replacement in respect of the drinking water system which:

5.9.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

5.9.2 Constitutes maintenance or repair of the drinking water system.

5.10 The owner shall update any drawings maintained for the works to reflect the addition, modification or replacement of the works, where applicable.

6.0 Previously Approved Works

6.1 The owner may add, modify, replace or extend, and operate part of a municipal drinking water system if:

6.1.1 An approval was issued after January 1, 2004 under section 36 of the SDWA in respect of the addition, modification, replacement or extension and operation of that part of the municipal drinking water system;

6.1.2 The approval expired by virtue of subsection 36(4) of the SDWA; and

6.1.3 The addition, modification, replacement or extension commenced within five years of the date that activity was approved by the expired approval.

7.0 System-Specific Conditions

7.1 Not Applicable.

8.0 Source Protection

8.1 Not Applicable.

Schedule C: Authorization to Alter the Drinking Water System

System Owner	**The Corporation of the City of Barrie**
Permit Number	**014-201**
Drinking Water System Name	**Barrie Drinking Water System**
Permit Effective Date	**November 7th, 2025**

1.0 General

1.1 Table 2 provides a reference list of all documents to be incorporated into Schedule C that have been issued as of the date that this permit was issued.

1.1.1 Table 2 is not intended to be a comprehensive list of all documents that are part of Schedule C. For clarity, any document issued by the Director to be incorporated into Schedule C after this permit has been issued is considered part of this drinking water works permit.

Table 2: Schedule C Documents

Column 1 Issue #	Column 2 Issued Date	Column 3 Description	Column 4 Status	Column 5 DN#
Sch. C Issue 1	April 12, 2010	Transmission Watermain Installation	Archived	DN#20
Sch. C Issue 2	December 8, 2011	Construction of Sunnidale BPS and Reservoir	Archived	DN # 6
Sch. C Issue 3	June 1, 2021	Construction of new booster pumping system	In Progress	NA

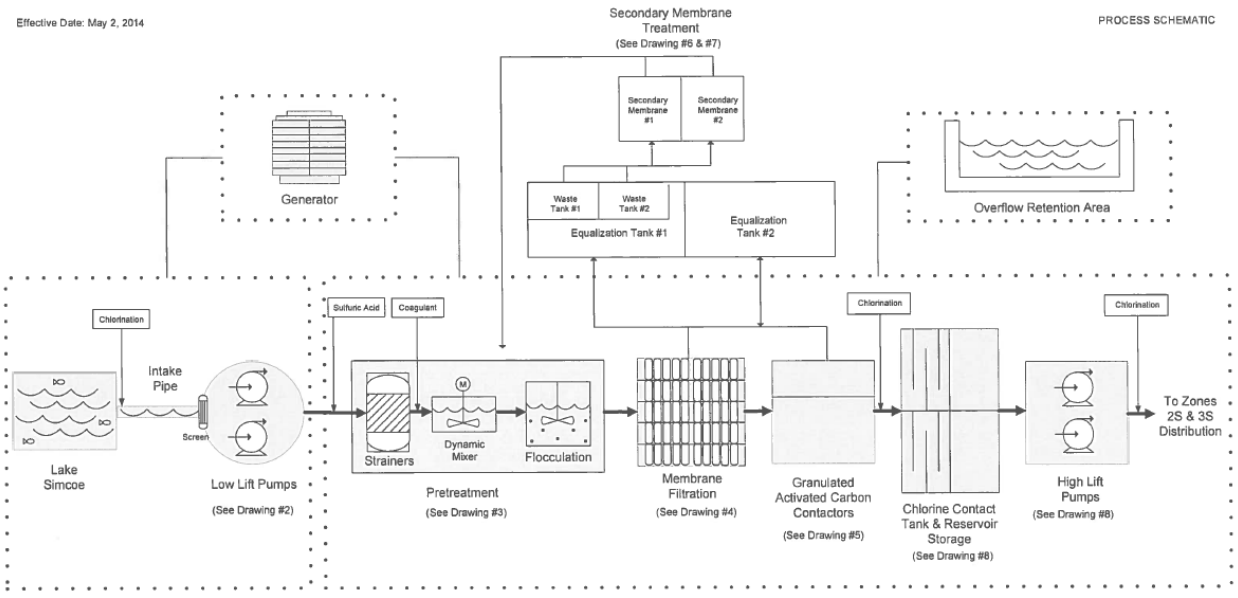
1.2 For each document described in columns 1, 2 and 3 of Table 2, the status of the document is indicated in column 4. Where this status is listed as 'Archived', the approved alterations have been completed and relevant portions of this permit have been updated to reflect the altered works. These 'Archived' Schedule C documents remain as a record of the alterations.

Schedule D: Process Flow Diagrams

System Owner	**The Corporation of the City of Barrie**
Permit Number	**014-201**
Drinking Water System Name	**Barrie Drinking Water System**
Permit Effective Date	**November 7th, 2025**

1.0 Process Flow Diagrams

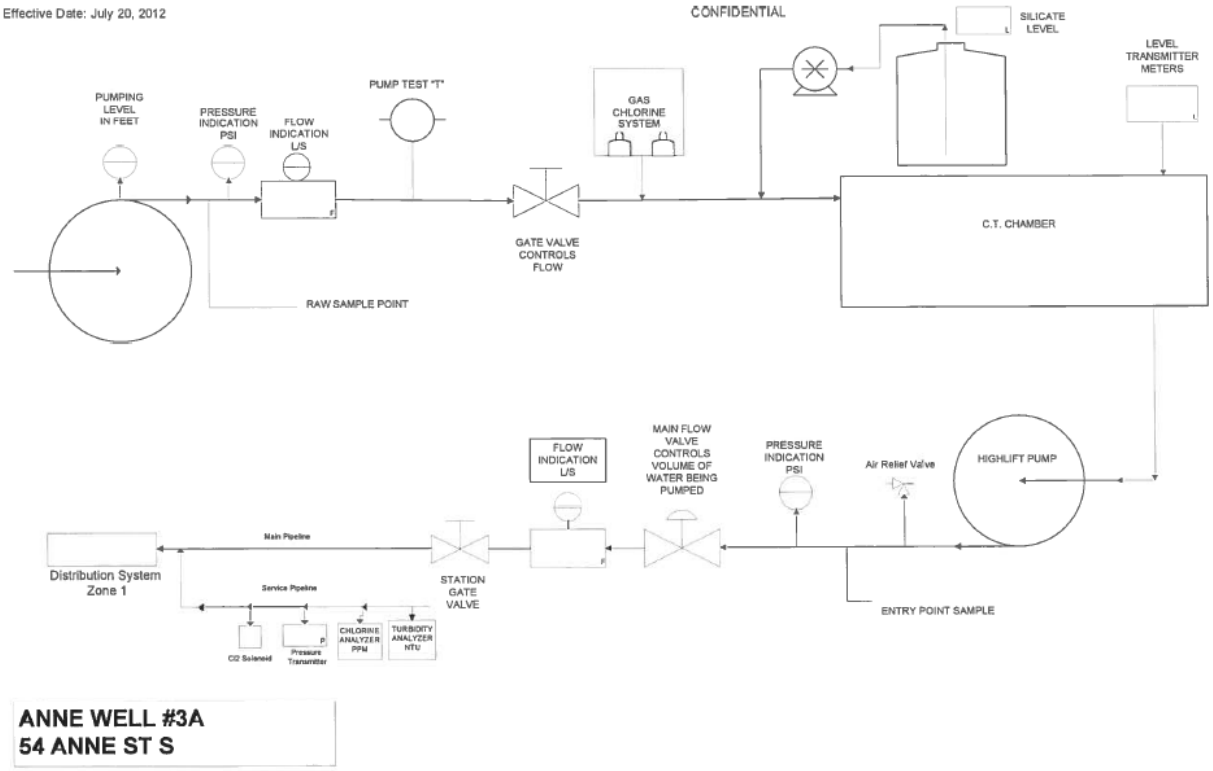
Surface Water Treatment Plant



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

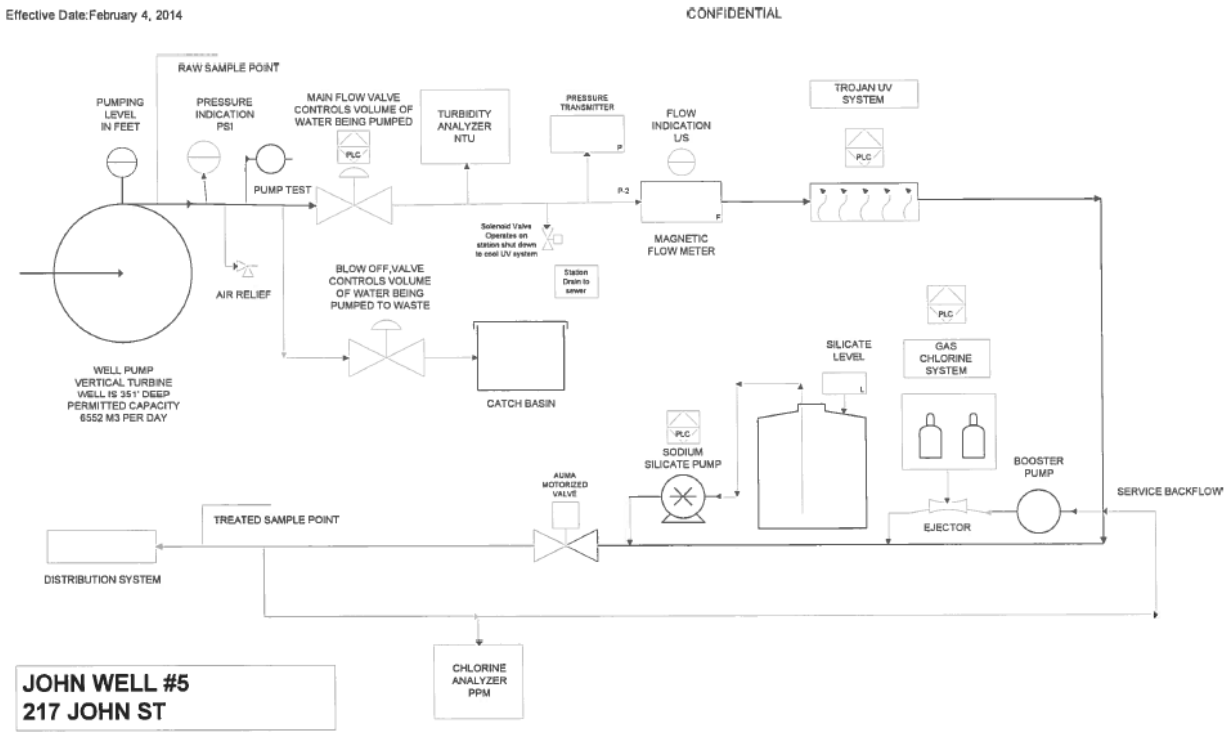
Well 3A, Anne Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

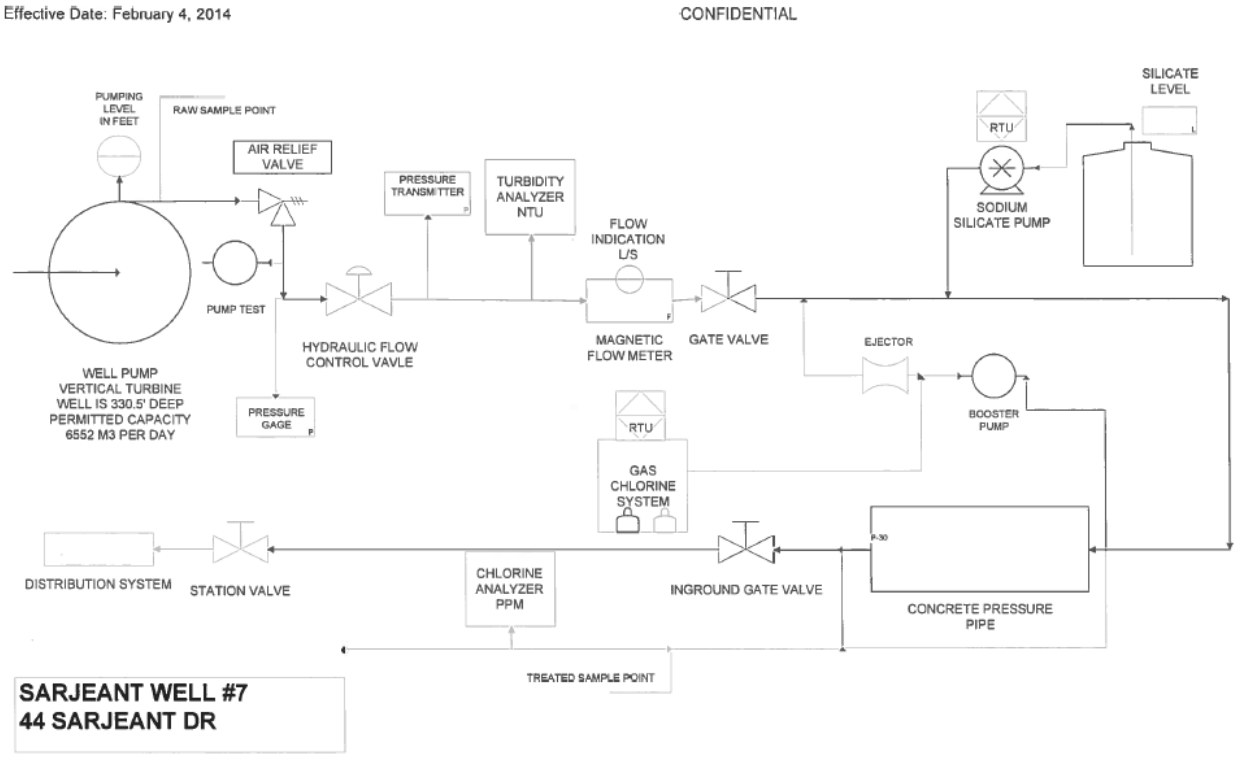
Well 5, John Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

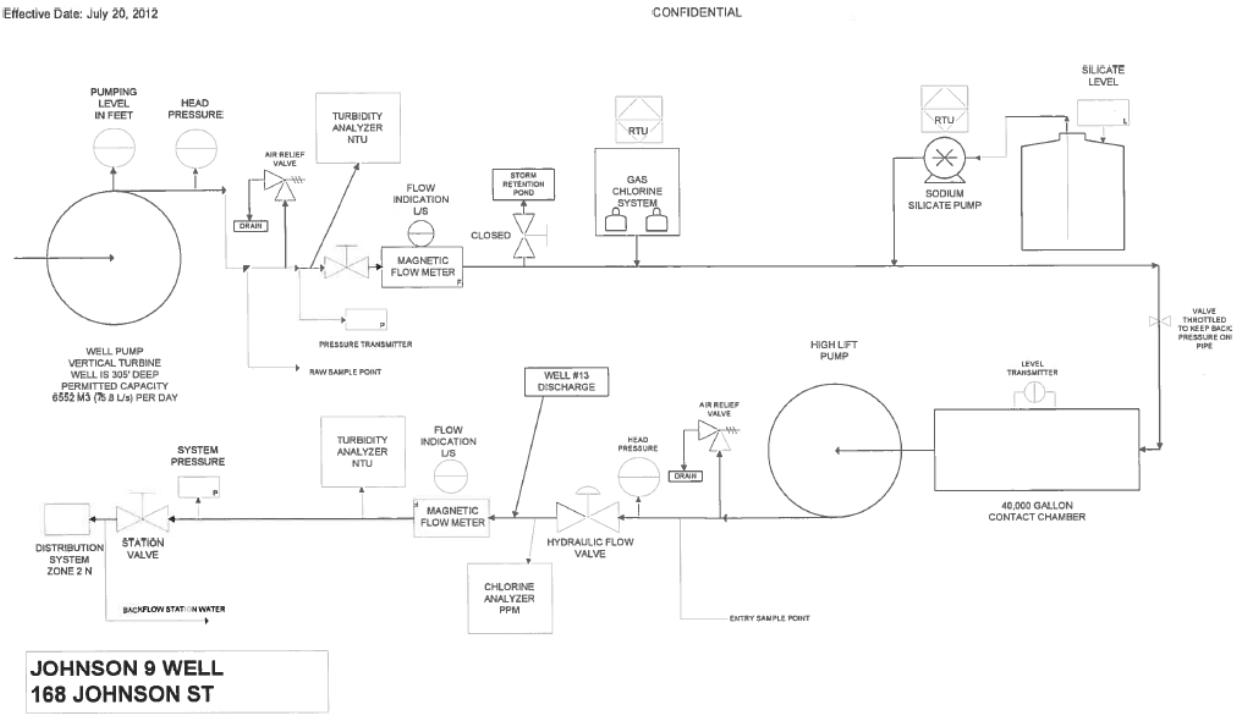
Well 7, Sarjeant Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

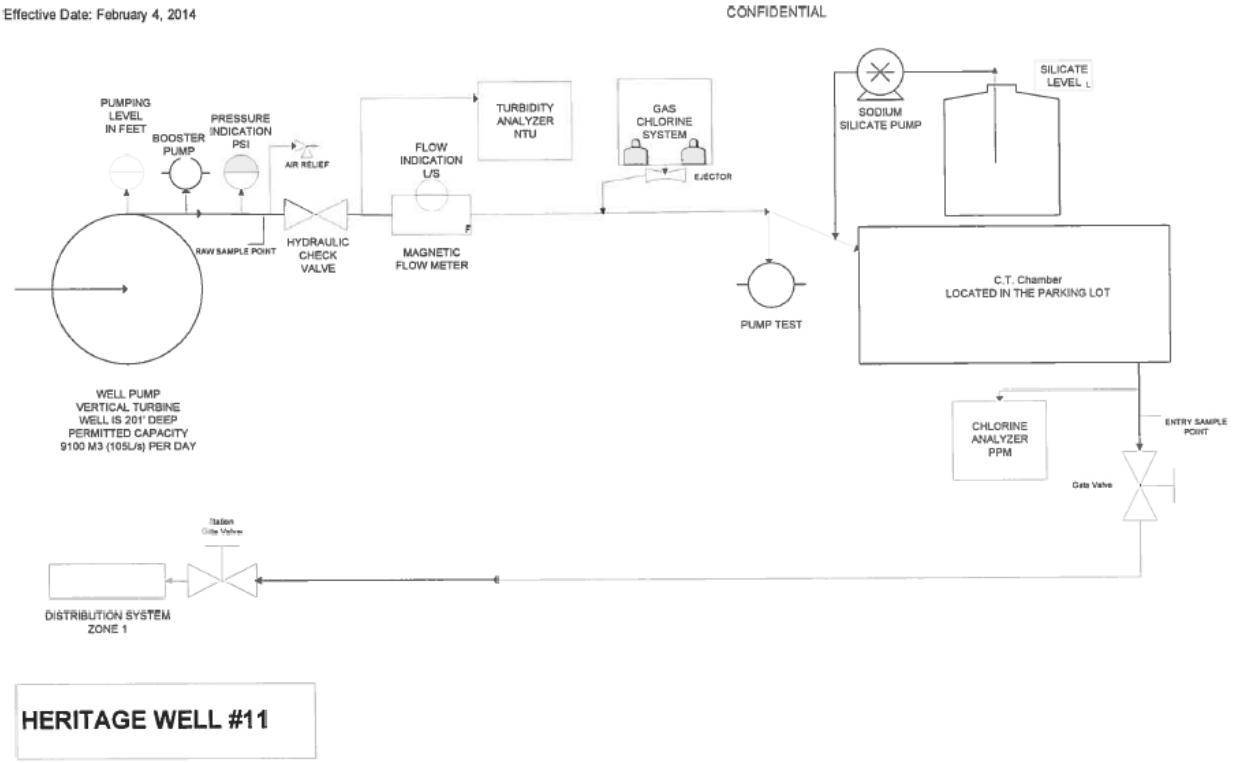
Well 9, Johnson Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

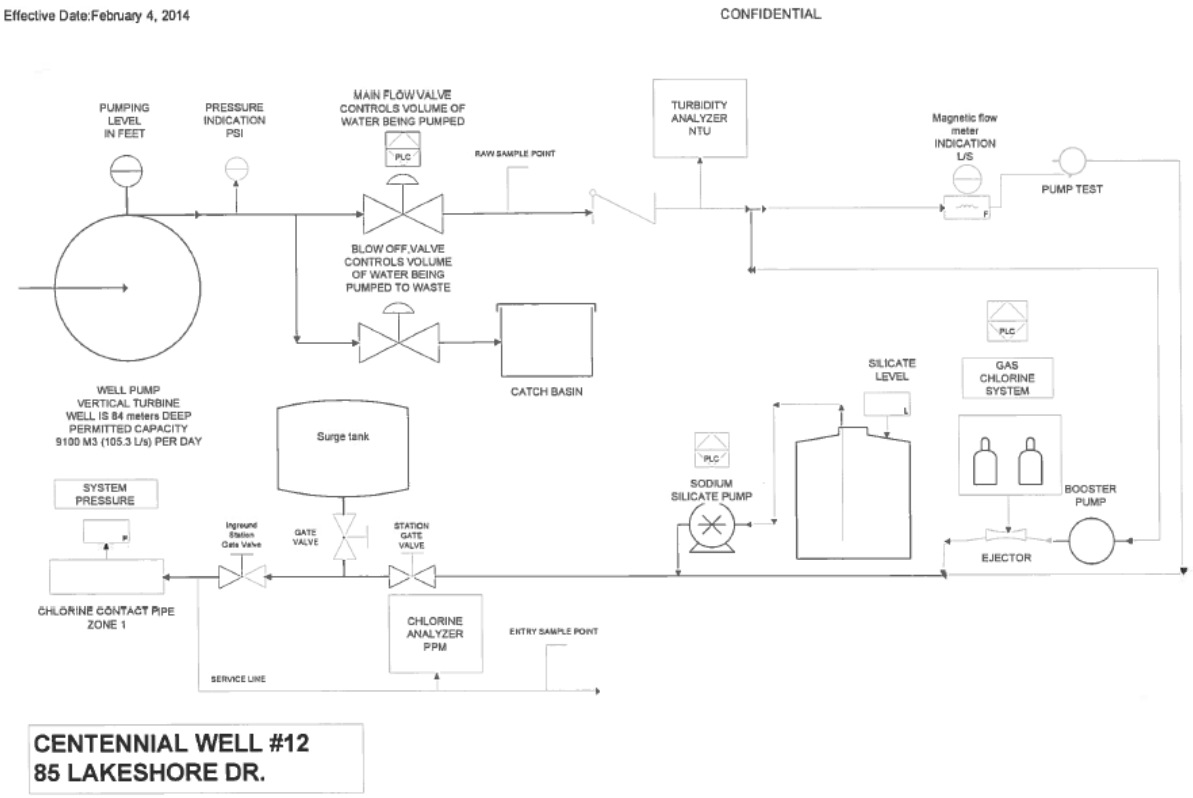
Well 11, Heritage Park



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

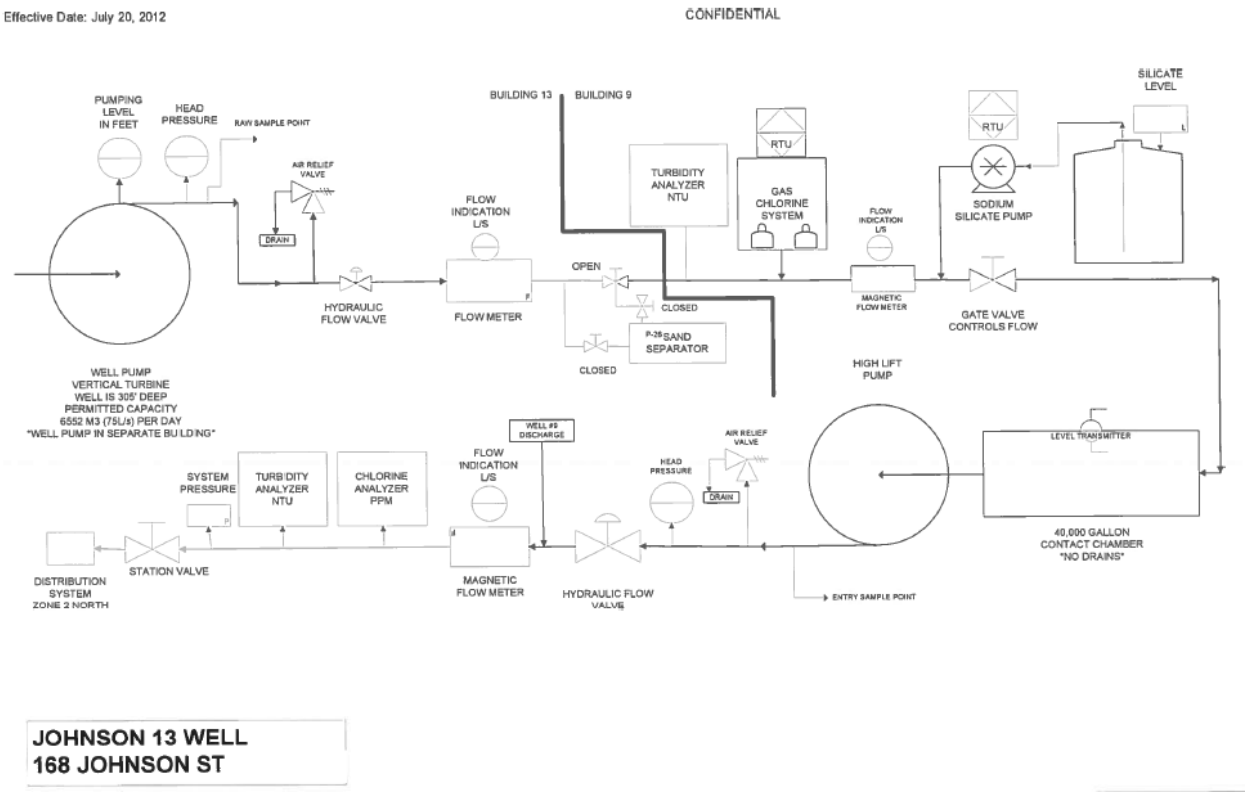
Well 12, Centennial Park



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

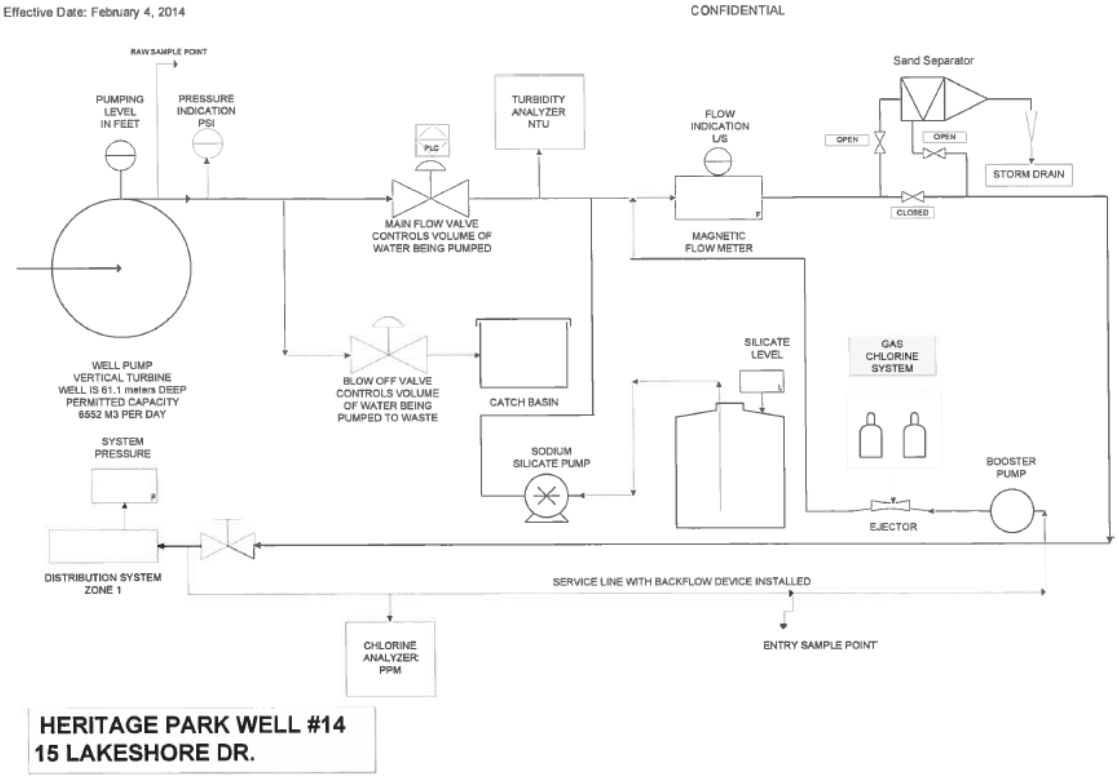
Well 13, Johnson Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

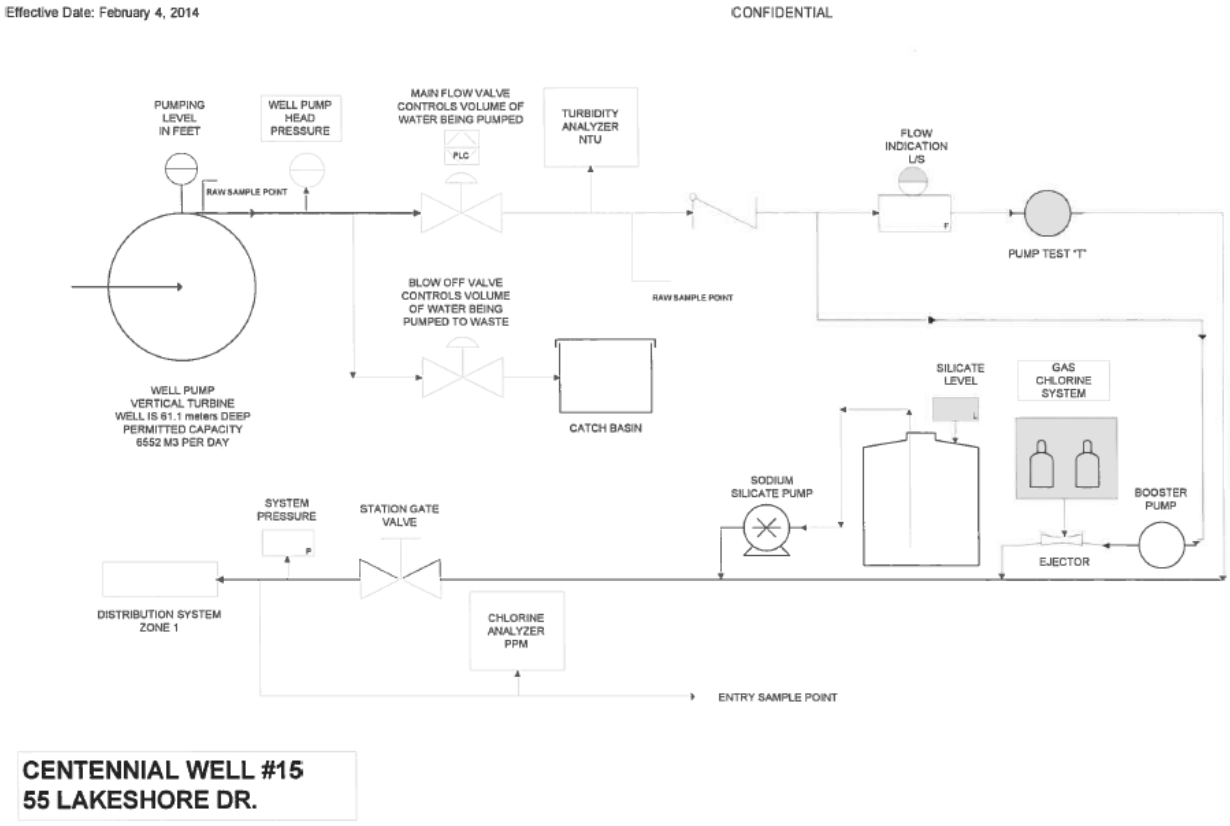
Well 14, Heritage Park



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

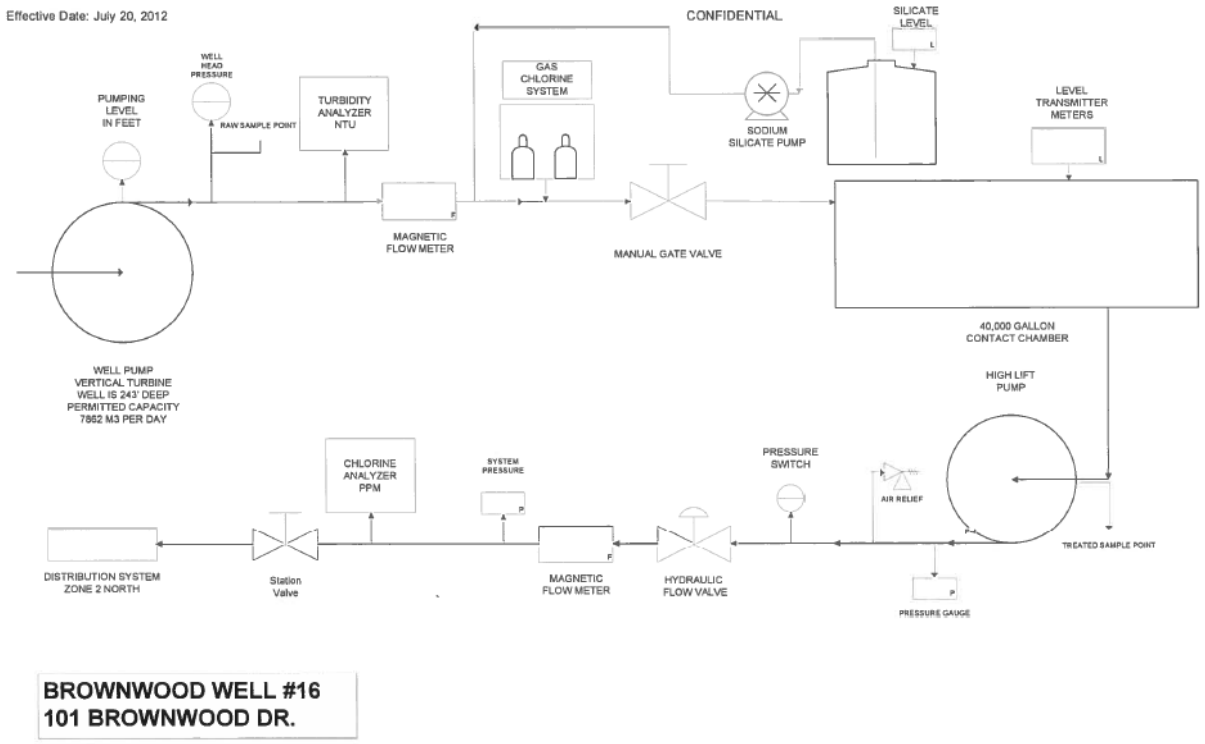
Well 15, Centennial Park



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

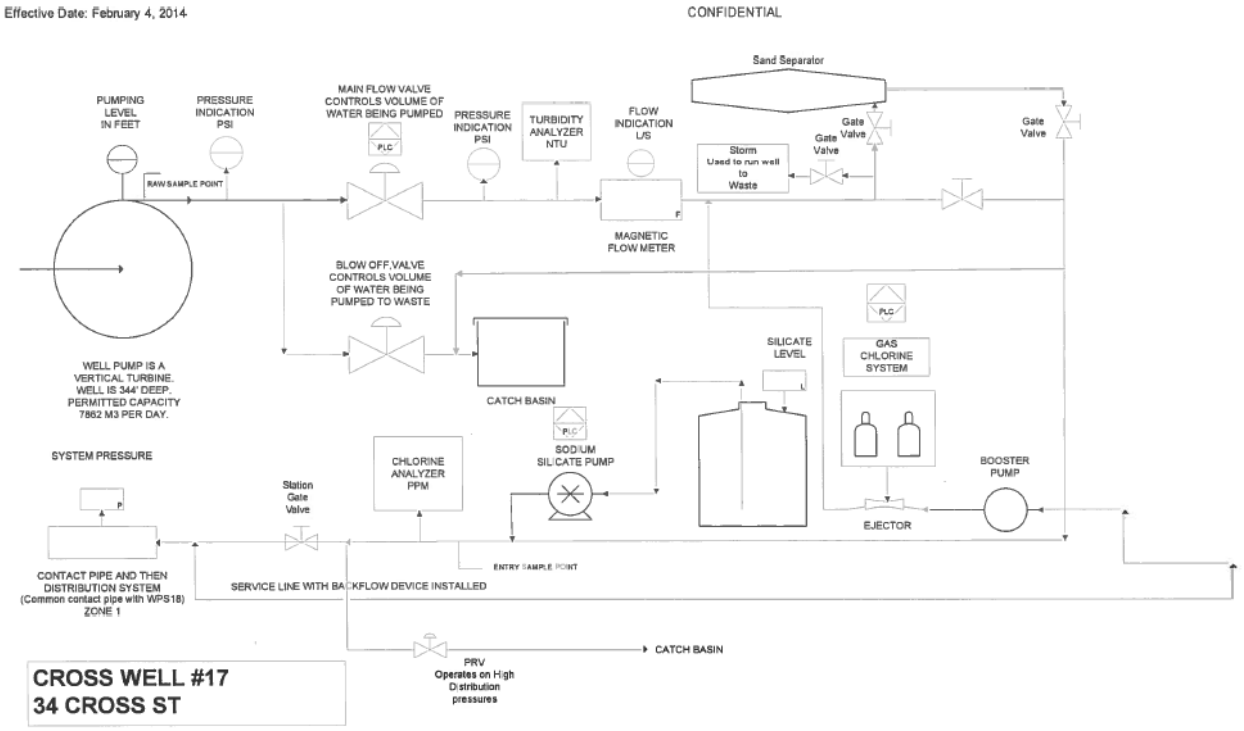
Well 16, Brown Wood Drive



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

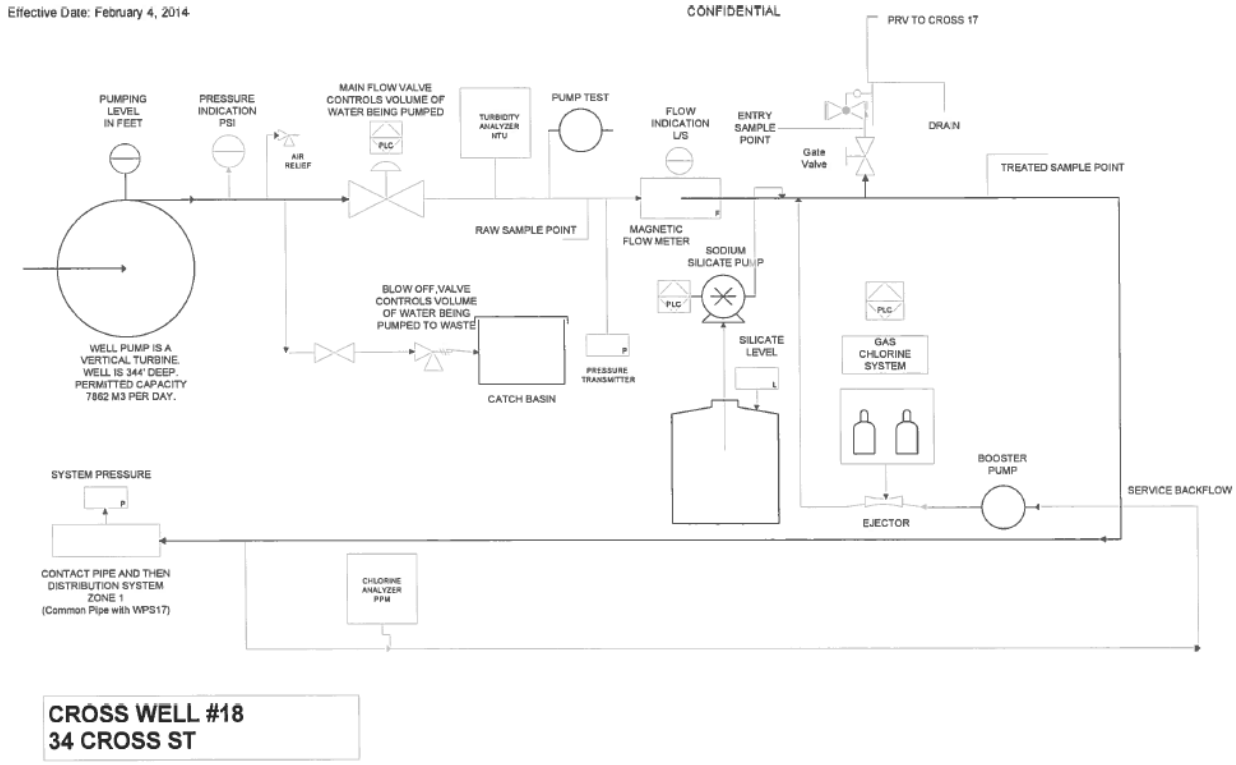
Well 17, Cross Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.

Well 18, Cross Street



[Source: City of Barrie Drinking Water System Operational Plan, Revision 5.57, May 9, 2014]

Note: This process flow diagram is for reference only, and represents a high level overview of the system as of October 17, 2024.