Greater | Grand Sudbury
www.greatersudbury.ca

2019 Water Works Summary Report

Large Municipal Residential Systems

O. Reg. 170/03, Sch. 22; O. Reg. 249/03, s. 24; O. Reg. 253/05, s. 18.

Table of Contents

Executive Summary

In 2019 the City of Greater Sudbury (City) operated all six within its operational limits. Maximum water takings was not exceeded. Surface water plant operated at half their capacity with Wanapitei averaging 51% and David at 43% of their permit to take water (PTTW). All other systems have averaged at Onaping 38%, Dowling 14%, Garson 25% and Blezard Valley Capreol at 54% usage of their Ministry of the Environment, Climate and Parks (MECP) PTTW with the Falconbridge system having the most water taking using 75%.

Due to the significant impact of the Drinking Water Protection Regulation and continuing Source Water Protection legislation the City's water works systems have undergone some level of upgrading. It should not be assumed that these upgrades are the result of any detected incidents of poor water quality. The upgrades are necessary to reduce the risk of potable water contamination as deemed necessary through mandatory compliance known as the Statutory Standard of Care. The regulation stipulates that water works owners will continually monitor water works performance, and review levels of treatment versus current standards and emerging technologies. Studies are currently on going to reduce the amount of manganese and iron within the Blezard Valley Capreol system. These chemicals do not pose a health risk but can cause some esthetically unpleasing issues to our customers at high levels of concentration. An Environmental Assessment has been approved for the Garson Drinking water system. Tetrachloroethylene (TEC) was detected within two of the raw water. Levels are below half the provincial regulated limit. The City remains vigilant in assessing methods of providing an alternate source of water.

The MECP is responsible for the enforcement of regulations and conducts regular, annual, announced and unannounced inspections of all of our facilities. Inspections "grading" has given the City's water systems a 99.48% with most of the individual assessments being 100%. The non-conformance found during the inspections was within the Blezard Valley Capreol Drinking Water System. The non-conformance was samples taken outside the regulated time frame of no less the five days but no more than ten days from last samples submitted for analysis.

The Community Lead Testing Initiative was instilled in 2007 and falls under O. Reg. 170/03, Schedule 15.1. Although there have been challenges in garnering new volunteers for the program, the City continues to

meet sampling requirements. During the course of this biannual sampling; testing at 80 residential sites, 8 commercial sites and 38 distribution sites was completed. Results from these sampling rounds showed no lead issues in any of the sites visited. Lead residuals within our distribution systems ranged from a minimum of non-detection, a value below 0.1, to a maximum of 0.77 against the regulated requirement of 10 parts per billion (ppb). Seeing that our water quality has proven not to be an issue the City was granted relief by MECP from testing residential and commercial sites from all drinking water systems with the exception of the Sudbury David and Wanapetei systems. These sections must continue to sample not due to the quality of the water but to satisfy the section of the regulation stating minimum sampling requirement correlating to population served by specific systems. The City continues to sample for lead within the distribution water in each of the drinking water systems.

Water quality throughout system is monitored twenty-four hours a day 365 days a year. Regular sampling schedules are followed in accordance with O. Reg. 170/03 and our Municipal Drinking Water Licenses and Drinking Water Works Permits (MDWL & DWWP). The treated water is fluoridated to prevent tooth decay in all of the City's systems this is a health unit requirement. The residual is tested and a monthly average is reported to the Public Health Sudbury & District (PHSD).

Prepare by: March 24, 2020

Julie Friel **Date**

Manager Water Treatment

Approved by:

Mike Jensen 24 March 2020

Mike Jensen **Date**

Director, Water/Wastewater Treatment & Compliance

INTRODUCTION

The production and delivery of potable water in Ontario is regulated by Ontario Regulation (O.Reg.) 170/03 governed by the Ministry of the Environment, Conservation and Parks (MECP) under the Safe Drinking Water Act (SDWA), 2002, S.O. 2002, c. 32.

The purpose of this summary report is to provide system owners and municipal council information to satisfy the regulatory reporting required under Schedule 22 titled *Summary Reports for Municipalities* of the O. Reg. 170/03 Drinking Water Systems.

The information within the report must cover the following topics of the previous calendar year from January 1st through to December 31st.

- A description of the legislative requirements;
- A list of orders that were not met, the duration and any corrective actions needed;
- A brief description of the operations of the treatment systems;
- Quantities and flow rates of the water supplied during the reporting period, including monthly averages and maximum daily flows and
- A comparison of the quantities and flow to the rated capacities approved in the systems approval document the MDWL.

An Annual Water Quality Report, to fulfill Section 11 of Ontario Regulation 170/03, has been completed separately and details the drinking water quality of all of the CGS owned and operated drinking water systems. This annual report is available for viewing on the City's website (https://www.greatersudbury.ca/live/water-and-wastewater-services/projects-plans-reports-and-presentations/drinking-water-quality-reports/) and notices were posted in local papers to inform the public and ensure access to a computer is available at any of the CGS Citizen Service Centers to for residents to view.

Section 1 – Legislative and Regulatory requirements

1.1 O.Reg. 128/04 Certification of Drinking-Water System Operators and Water Quality Analysts

Section 29 lists Operator training requirements and the number of training hours required for operators. Class IV Water Treatment Operators will require 14 hours of continuing education with an additional 36 hours of on-the-job practical training (OJT), for a minimum of 50 hours total of annual training. The continuing education that is used to meet the training requirements must be approved by the MECP Director using criteria which includes the following:

- The training course must have documented learning objectives that cover subject matter directly related to the duties typically performed by an operator and
- Must be planned and be provided by a qualified training provider that include a means to verify that the participants have learned the material covered.
- The OJT practical training that is used to meet the training requirements must meet the following criteria:
- The training must have documented learning objectives and
- Provided by a trainer with expertise in the subject matter that is directly related to the duties typically performed by an operator.
- The operators may average their total annual required hours over the three years during which an operator's certificate is valid and must follow requirements for the highest system class operated. CGS Operators must follow requirement for Class IV.

The table below provides details on training requirements dependent on the type and class of a water treatment (WT), water distribution (WD) or water distribution and supply (DS)

Table 1: Annual Training for Operators

Type and Class of Subsystem	Training Requirements Mandated per Operator's	Minimum Total Hours
Class I WT or Class I WD or Class I DS	7 hours or more of continuing education (CEU), with the remaining hours as on-the-job practical training (OJPT)	30
Class II WT or Class II WD or Class II DS	12 hours or more of CEUs, with the remaining hours OJPT	35
Class III WT or Class III WD or Class III DS	14 hours or more of CEUs, with the remaining hours OJPT	40
Class IV WT or Class IV WD or Class IV DS	**14 hours or more of CEUs, with the remaining hours OJPT**	**50**

1.2 O. Reg. 169/03 Ontario Drinking Water Quality Standards

This Regulation (Last amendment: O.Reg 457/16). This regulation sets out standards in Schedules 1, 2 and 3 as prescribed drinking-water quality standards (DWQS). Included in this regulation are the compliance standards for water quality.

1.3 O. Reg. 170/03 Drinking Water Systems

This Regulation was filed in 2004 (Last amendment: O.Reg. 374/15) and outlines the requirements for:

- Types of Drinking Water Systems;
- Required reports and retention time;
- Types of treatment, equipment requirements, maintenance and operational Checks,
- Sampling requirements, parameter testing and use of accredited laboratories;
- Reporting adverse test results and corrective actions and
- Engineers' Reports;

1.4 O. Reg. 171/03 DEFINITIONS of Words and Expressions Used in the Act

This Regulation (Last amendment: O.Reg. 336/13), Provides definitions of words and expressions within the SDWA and associated Regulations.

1.5 O. Reg. 172/03 Definitions of "Deficiency" and "Municipal Drinking-Water System"

This Regulation (Last Amendment: O.Reg. 209/19), provides definitions of words and expressions within the SDWA and associated Regulations.

1.6 O. Reg. 188/07 Ontario Licensing of Municipal Drinking Water Systems

This Regulation (Last amendment: O.Reg. 325/08) requires all owners of a municipal drinking water system to obtain a license from the Director of MECP to operate their system. This includes providing:

- DWWP;
- An operational plan documenting the drinking water quality management system (DWQMS);
- A financial plan (O. Reg. 453/07) and
- Proof of third party accreditation by audits for DWQMS audits.

1.7 O. Reg. 205/18 Municipal Residential Drinking Water Systems in Source Protection Areas

This Regulation ensures sources of raw water for new, upgraded or altered drinking water systems are protected before being used as potable water treatment.

1.8 O. Reg. 242/05 Compliance and Enforcement

This Regulation (Last amendment: O.Reg. 328/08) lists the requirements for inspections, what to do when deficiencies and contraventions are found. This regulation also deals with enforcement, investigations and notices required once investigations are completed.

1.9 O. Reg. 248/03 Drinking Water Testing Services

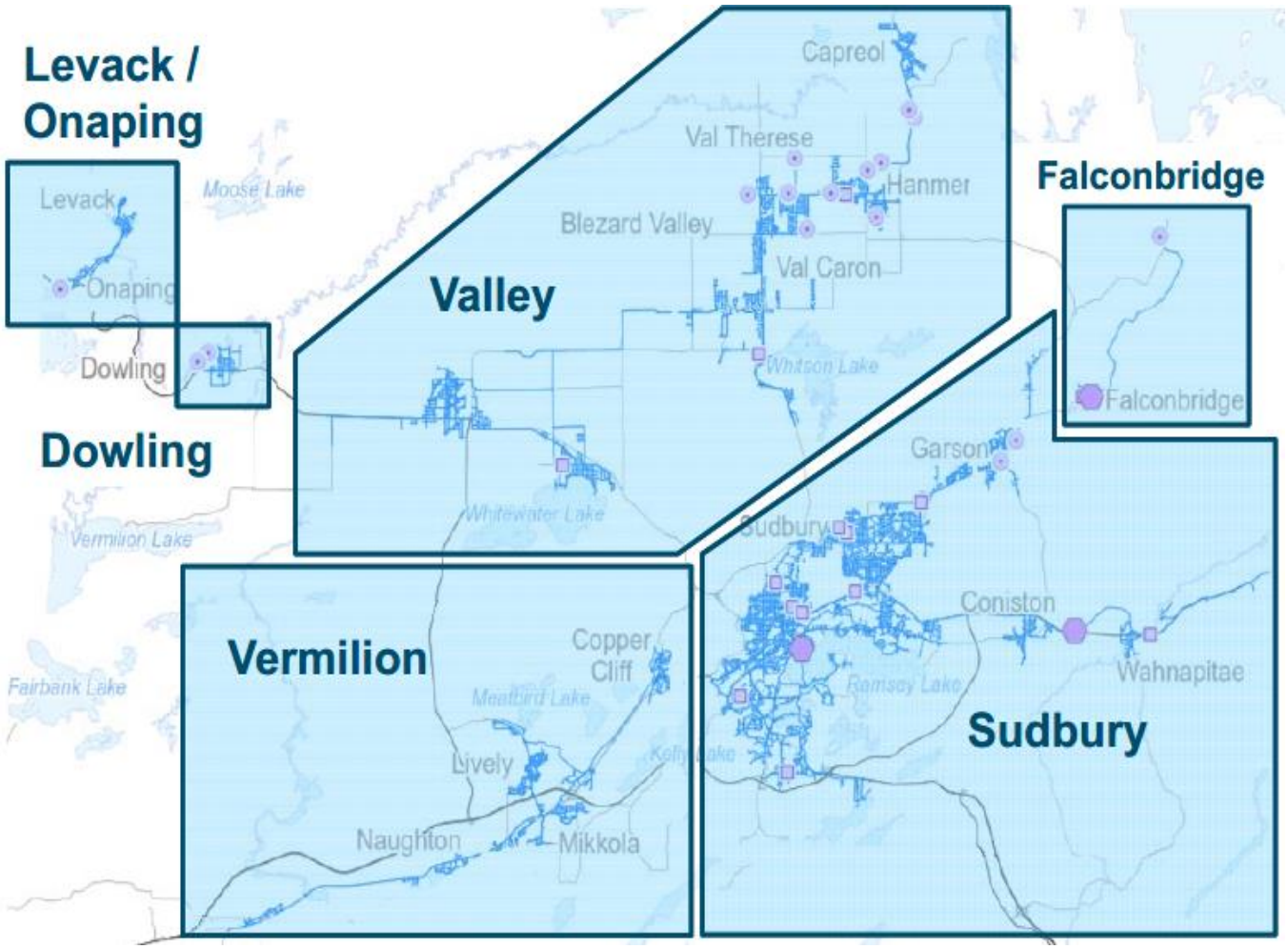
This Regulation (Last amendment: O.Reg. 508/17) governs accredited laboratories that came into effect October 31, 2004.

- Lists systems that do not require drinking water testing license;
- Lists prescribed tests of the SDWA;
- Lists person(s) to do water quality analysis;
- Lists the types of tests that can be conducted for the sole purpose of carrying out research or criteria for drinking-water testing services;
- Conditions of drinking water testing license and
- Handling samples, testing records and laboratory qualifications and accreditation.

1.10 O. Reg. 453/07 Financial Plans

This Regulation (Last amendment: O.Reg 69/08). This regulation sets out the requirement to produce and have approved by council of the municipality a financial plan. Included in this regulation are the requirements of the financial plan for license renewals. Financial plans must be approved by a resolution that is passed by a council, must apply to a period of at least six years and available to the public free of charge.

SUDBURY DRINKING WATER SYSTEMS OVERVIEW



Section 2 - Plant Specific Review

Services within the City of Greater Sudbury is a combination of municipally-owned/operated utility along with the purchase of potable water. The City of Greater Sudbury owns and operates two surface water treatment plants along with its distribution systems, six ground water well fields along with their own distribution systems and one distribution system providing purchased potable water from Vale's Vermilion Water Treatment Plant (Table 2).

Table 2 - Overview of the City's Water Systems

Drinking Water System	Type of Facility	Source of Water	Community Serviced
Sudbury Drinking Water System - Wanapitei	Class IV Surface water conventional treatment plant and Class IV Distribution system	Wanapitei River	Sudbury, Coniston, Wanapitei, Markstay, Garson
Sudbury Drinking Water System - David	Class III Surface water Membrane Filtration Plant and Class II Distribution system	Ramsey Lake	Sudbury (West and South sections)
Sudbury Drinking Water System - Garson	Class I Wells and Class II Distribution system	Groundwater	Garson (east of Penman Dr.)
Dowling Drinking Water System	Class I Wells and Class I Distribution system	Groundwater	Dowling
Valley Drinking Water System	Class I Wells and Class II Distribution system	Groundwater	Valley East, Azilda, Chelmsford & Capreol
Falconbridge Drinking Water System	Class I Wells and Class II Distribution system	Groundwater	Falconbridge
Onaping /Levack Drinking Water System	Class I Wells and Class II Distribution system	Groundwater	Onaping & Levack
Vermilion Distribution System	Class II Distribution System	Vermilion River WTP Owned and Operated by Vale	Lively, Naughton, Whitefish, Copper Cliff, Walden Industrial Park

Sudbury Drinking Water System - Wanapitei
DWS# 210001111

The Wanapitei WTP is a conventional surface plant located between Coniston and Wahnapitae. Its source water is from the Wanapitei River. The plant's rated capacity is 54,000 m^3/day and provides sixty percent of the City of Greater Sudbury's potable water. The treatment process follows these steps:

1. Chlorine gas or chlorine dioxide (seasonal) for pretreatment
2. Alum, lime and polymer addition
3. Sedimentation process
4. Filtration
5. Addition of hydrated lime, chlorine (secondary disinfection), fluoride and polyphosphate
6. UV inactivation

Raw river water is screened through coarse and fine screens. Five pumps convey the raw water several kilometers to the plant for treatment.

At the plant, the raw water is initially disinfected by chlorination. The water's pH and alkalinity are controlled by the addition of lime. A flocculent chemical is added to remove dissolved matter that is in suspension, which causes the matter to come out of solution and precipitate. Sedimentation is a separation by gravity of clarified water and sludge. The settled sludge waste is pumped to a nearby sewage lagoon for treatment and the clarified water is sent to four filters.

The filtration process is to remove smaller particles that tend not to settle. The filtration media is a mixture of silica sand and anthracite coal.

The filtered water flows into a reservoir where lime is added to adjust the final pH and alkalinity along with addition of a corrosion control chemical.

Chlorine is added at this stage to ensure final disinfection of finished water and to maintain a residual disinfectant within the distribution system.

The treated water is pumped through ultraviolet light disinfection units to provide extra inactivation of pathogens.

The treated water is pumped to the distribution system by six vertical turbine pumps and directs the water east towards the community of Markstay, west towards the community of Coniston, to the City of Greater Sudbury and the Ellis Reservoir.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.

Annual Flow Summary of Flow Rates VS Capacity

	Wanapitei Water Treatment Plant				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	795,538	25,663	29,828	54,000	55
February	696,338	24,869	28,465	54,000	53
March	757,578	24,438	26,031	54,000	48
April	730,134	24,338	28,705	54,000	53
May	741,489	23,919	26,842	54,000	50
June	792,133	26,404	28,270	54,000	52
July	822,253	26,524	28,971	54,000	54
August	827,456	26,692	30,310	54,000	56
September	710,064	23,669	28,110	54,000	52
October	664,670	21,441	24,110	54,000	45
November	681,510	22,717	25,082	54,000	46
December	716,588	23,116	26,662	54,000	49
Total	8,935,750			Average	51

Sudbury Drinking Water System - David Street
DWS# 220003537

The David St. WTP is a membrane ultra-filtration surface water treatment plant. The plant's rated capacity is 40,000 m^3/day and provides forty percent of the City of Greater Sudbury's potable water.

The raw water intake is located approximately three hundred meters distance from the shores of Ramsey Lake. The treatment process follows these steps:

1. Hypochlorite disinfection
2. Prescreening
3. Membrane filtration
4. Sodium hypochlorite disinfection, fluoride and polyphosphate
5. UV inactivation

Raw lake water is screened through coarse screens and two strainers. The water is initially disinfected by chlorination. Four pumps directs the water to membrane tank for ultrafiltration. The filtration process removes particles 0.02 microns in size or larger. The filtered water flows into a reservoir. Chlorine is added at this stage to ensure final disinfection of finished water and to maintain a residual disinfectant within the distribution system. Fluoride is added to prevent tooth decay along with corrosion control chemical.

The treated water is pumped through ultraviolet light disinfection units to provide extra inactivation of pathogens.

The treated water is pumped to the distribution system by four vertical turbine pumps and directs water to the south, west and downtown sections of the City of Greater Sudbury. Water from this plant is also used to fill the Ellis Reservoir.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.

Annual Flow Summary of Flow Rates VS Capacity

	David Street Water Treatment Plant				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	397,766	12,831	14,079.69	40,000	35
February	391,600	12,632	14,214.12	40,000	36
March	424,405	13,690	13,966.28	40,000	35
April	405,333	13,075	13,952.23	40,000	35
May	440,724	14,217	14,595.12	40,000	36
June	449,224	14,491	17,846.47	40,000	45
July	518,338	16,721	24,358.62	40,000	61
August	461,054	14,873	17,433.46	40,000	44
September	498,802	16,090	23,230.11	40,000	58
October	514,909	16,610	20,398.68	40,000	51
November	433,142	13,972	17,142.80	40,000	43
December	439,894	14,190	15,212.35	40,000	38
Total	5,375,189			Average	43

Sudbury Drinking Water System - Garson
DWS# 220003485

The Garson water works is a groundwater system consisting of three wells, and servicing the community of Garson east of Penman Ave and O'Neil Dr East up to old Skead Road.

The three wells are:

- Garson Well No.2;
- Garson Well No.1; and
- Garson Well No.3.

The treatment process follows these steps:

1. Hypochlorite disinfection
2. Fluoride addition

The system includes one vertical turbine well pump, disinfection with sodium hypochlorite and fluoride injection. The water is directly connected to the public distribution network. The distribution network extends from Skead Road at the north to Garson-Coniston Road at the south. The pipe network is connected to the water supply from Sudbury at the intersection of Falconbridge Road and O'Neil Drive West, therefore the community is serviced from the Sudbury Distribution system West of Penman Avenue. In the event that all of the three wells were to fail, the Garson system is connected to the Sudbury Distribution System by way of a pressure valve and would have water supplied from Sudbury.

During preparation of the First Engineers' Report, in March 2001, a hydrogeological assessment was made of each of the wells. It was concluded that it is unlikely that any of the wells are under the direct influence of surface water. The raw water was therefore found to be in general conformance with the ODWS. Notwithstanding the historical good water quality, the aquifer used in the Garson well supply has a recharge area which includes the developed area of Garson. With direction and consultation from the PHSD and the MECP, the CGS committed to undertaking a Groundwater Monitoring Program for Tetrachloroethylene. Although TCE levels found during audit sampling are well below regulatory limits, the City is proactively sampling and monitoring these levels. In 2012, four monitoring wells were drilled in the area and sampling and graphing of results is completed regularly by staff to augment historical data. Review of all data is undertaken by staff to ensure the safety of the water source and public. In 2017 CGS retained a consultant to provide feasibility options for treatment of TCE and the possibility of feeding this system directly from the two surface plants. We are currently in the research stage of this project and will be conducting an environmental assessment.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.

Annual Flow Summary of Flow Rates VS Capacity

	Garson Well #1				
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	MDWL Maximum Flow m^3/d	% Capacity
January	7,587	245	379.46	1,572	24
February	6,731	240	328.90	1,572	21
March	8,077	261	527.10	1,572	34
April	6,705	224	444.81	1,572	28
May	7,604	245	416.61	1,572	26
June	7,339	245	365.77	1,572	23
July	8,018	259	500.50	1,572	32
August	9,441	305	492.68	1,572	31
September	8,031	268	519.67	1,572	33
October	7,957	257	438.24	1,572	28
November	7,815	260	366.11	1,572	23
December	8,318	268	544.44	1,572	35
Total	93,623			Average	28

	Garson Well #3				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	1,873	60	402.09	3,275	12
February	696	25	247.23	3,275	8
March	2,090	67	302.49	3,275	9
April	859	29	226.29	3,275	7
May	1,624	52	250.09	3,275	8
June	1,456	49	170.78	3,275	5
July	3,703	119	775.68	3,275	24
August	2,129	69	392.21	3,275	12
September	942	31	194.22	3,275	6
October	1,229	40	311.93	3,275	10
November	1,912	64	359.00	3,275	11
December	1,960	63	508.52	3,275	16
Total	20,474			Average	11

Annual Flow Summary of Flow Rates VS Capacity Continued

	Garson Well #2				
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	MDWL Maximum Flow m^3/d	% Capacity
January	25,528	823	1,064.64	2,981	36
February	22,839	816	982.49	2,981	33
March	24,085	777	1,093.10	2,981	37
April	22,084	736	922.28	2,981	31
May	24,734	798	1,144.61	2,981	38
June	27,417	914	1,245.38	2,981	42
July	28,690	925	1,318.05	2,981	44
August	25,050	808	1,059.57	2,981	36
September	23,835	794	1,004.96	2,981	34
October	25,879	835	1,053.92	2,981	35
November	23,600	814	974.25	2,981	33
December	25,980	838	1,111.20	2,981	37
Total	299,719			Average	36

Dowling Wells and Distribution System
DWS# 210001665

The water supply source for the Dowling wells is an unconfined aquifer of sand and gravel deposits located within the Onaping river watershed. Due to the unconfined nature of the soils and the proximity to the river, the MOE has characterized the water source as potentially groundwater under the direct influence of surface water (GUDI).

Studies were conducted in 2002 with the resulting submission of a GUDI study on July 1, 2002. This study was reviewed and accepted by the MOE and as a result, both wells were deemed to be GUDI with effective in situ filtration. As such, additional treatment and disinfection would be required. The prior recommendations of the consultant included that, while the wells have met the MOE criteria for

"potentially under the influence of surface water", adequate natural filtration of the water exists. Based on the conclusions by the MOE, the well systems have had ultraviolet irradiation added to enhance disinfection to comply with the treatment requirements of the ODWS.

The Dowling water works is a groundwater system. The water works includes two wells with well pump houses, a distribution network of in-ground piping and an elevated water storage tank.

The three wells are:

- Riverside well and
- Lionel well

The treatment process follows these steps:

1. Chlorine gas disinfection
2. Fluoride addition
3. UV inactivation

The system includes per well site, one vertical turbine well pump, disinfection with disinfection with chlorine gas, ultraviolet irradiation along with fluoride addition.

The distribution network in Dowling has been relatively reliable and is not exposed to as severe frost depths as other areas of the City. Further, the elevated water storage provides a measure of security to the water system in the event of power interruptions and watermain breaks.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.

Annual Flow Summary of Flow Rates VS Capacity

	Lionel Well				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	7,357	237	801.11	3,640	22
February	7,442	240	479.55	3,640	13
March	5,616	181	431.49	3,640	12
April	9,397	303	622.92	3,640	17
May	7,816	252	517.85	3,640	14
June	9,600	310	756.28	3,640	21
July	9,793	316	725.16	3,640	20
August	6,590	213	775.20	3,640	21
September	6,871	222	439.01	3,640	12
October	6,184	199	458.69	3,640	13
November	6,985	225	651.49	3,640	18
December	5,650	182	432.87	3,640	12
Total	89,302			Average	16

	Riverside Well				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	5,834	188	421.05	3,640	12
February	6,267	202	438.28	3,640	12
March	5,844	189	444.43	3,640	12
April	2,938	95	426.61	3,640	12
May	6,679	215	472.45	3,640	13
June	5,969	193	498.39	3,640	14
July	5,799	187	459.24	3,640	13
August	6,005	194	455.13	3,640	13
September	3,381	109	382.53	3,640	11
October	5,764	186	421.64	3,640	12
November	3,762	121	488.61	3,640	13
December	4,549	147	390.84	3,640	11
Total	62,791			Average	12

Blezard Valley/Capreol Drinking Water System
DWS# 210000737

In 2010, the Blezard Valley and Capreol well supply systems were considered to be one single system as both of the systems are connected. One MDWL and MDWP assigned to the entire system. This report will identify the works by geographical area where appropriate.

The Blezard Valley portion of the system is a multi-well groundwater system servicing the communities of Hanmer, Blezard Valley, Val Therese, Val Caron, McCrea Heights, Azilda and Chelmsford. Eleven groundwater wells are situated throughout the Hanmer and Val Therese area. The communities are interconnected with distribution piping and the system feeds three water storage tanks located in Val Caron, Azilda and Chelmsford. This well field extends approximately 7.5 km (west to east) from Val Therese to Hanmer. A preliminary hydrology study performed during the preparation of the First Engineers' Report classified all of the wells to not be under the direct influence of surface water (GUDI). Due to the shallow nature of the aquifer and the lack of a confining clay layer the MECP requested further study.

The GUDI study was submitted in August of 2002. An amended PTTW was received and acknowledged the opinion of the hydrogeology study and no additional filtration was required.

Some of the wells are located immediately adjacent to residential homes, commercial establishments and major arterial roadways. The water quality is beginning to show the effects of urban storm drainage such as sodium levels. Further, existing zoning by-laws appear inadequate to protect the wells from further development within the well capture zones. For these reasons, options are being considered to preserve the quality of the water over the long-term.

The Blezard wells are:

- Kenneth;
- Deschenes;
- Philippe;
- Frost;

- Michelle;
- Notre Dame;
- Chenier;
- R and
- I

The treatment process follows these steps:

1. Chlorine gas disinfection
2. Fluoride addition
3. UV inactivation

The system includes per well site, one vertical turbine well pump, disinfection with chlorine gas, ultraviolet irradiation along with fluoride addition.

The distribution network has been relatively reliable. It is to be noted that all the wells producing water are before the Val Caron tank. One trunk main feeds all the water production to the two other tanks. It would be an advantage to upgrade this system as it can pose a vulnerability in the event of a large break between the feed from Val Caron to the towns of Azilda and Chelmsford.

I well has not been in use for some time. Raw water quality has shown elevated iron and manganese that compromises the esthetic quality of the water. Studies are currently being conducted on methods of removal in order to re-introduce the well into production in the future.

The Capreol Well portion of the system draws water from two wells to service the community of Capreol.

The Capreol wells are:

- M and
- J

The treatment process follows these steps:

1. Chlorine Gas disinfection
2. Fluoride addition
3. Polyphosphate addition
4. UV inactivation

The Capreol portion of the system is a multi-well groundwater system servicing the community of Capreol. They are situated on the east side of Greens Lake. Hydrogeological studies found these wells to be potentially GUDI with effective in situ filtration and as such required UV irradiation.

The system includes per well site, one vertical turbine well pump, disinfection with chlorine gas, ultraviolet irradiation, polyphosphate along with fluoride addition.

Raw water quality has shown elevated iron and manganese that compromises the esthetic quality of the water. Studies are currently being conducted on methods for removal.

The Blezard Valley wells can supply water through the Capreol Boosters located onsite at the wells ensuring a continued water supply to Capreol in the event the two wells are unavailable. The distribution system in Capreol was developed in conjunction with the growth of the industrial development. Some of the pipe network is relatively old. The frost depths in Capreol extend to extreme depths during cold winters, which impose additional stresses on the integrity of the system. A second water main was added to the distribution system from the well as a contingency. The distribution system is comprised of PVC, cast iron and ductile piping and serves approximately 3500 residents

Non-Compliance with Act, Regulations, Order or Approvals

During 2019 there was one incident were samples were taken from the wells which did not fall within the five to ten days since last sampled scheduled. Trending of the systems data and distribution sampling showed not issues with the system. MECP was contacted and no extra precautions were required.

Annual Flow Summary of Flow Rates VS Capacity

	Well "A" Deschene				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	6,914	223	724.73	1,798	40
February	2	0	0.75	1,798	0
March	1	0	0.14	1,798	0
April	0	0	0.13	1,798	0
May	161	5	81.32	1,798	5
June	4,166	134	670.77	1,798	37
July	37,941	1,224	1,526.23	1,798	85
August	37,487	1,209	1,496.93	1,798	83
September	15,703	507	1,480.53	1,798	82
October	15,272	493	1,496.03	1,798	83
November	9,415	304	510.40	1,798	28
December	14,000	452	963.39	1,798	54
Total	141,062			Average	41

	Well "B" Kenneth				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	10,227	330	896.61	2,288	39
February	8,850	285	764.54	2,288	33
March	12,513	404	748.32	2,288	33
April	18,032	582	903.30	2,288	39
May	19,795	639	1,142.01	2,288	50
June	13,865	447	980.57	2,288	43
July	12,028	388	1,192.38	2,288	52
August	10,014	323	1,148.89	2,288	50
September	5,961	192	1,345.82	2,288	59
October	4,157	134	543.31	2,288	24
November	11,622	375	808.12	2,288	35
December	10,888	351	781.28	2,288	34
Total	137,953			Average	41

Annual Flow Summary of Flow Rates VS Capacity Continued

	Well "C" Philippe				
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	MDWL Maximum Flow m^3/d	% Capacity
January	14,133	456	852.86	2,288	37
February	13,774	444	1,020.05	2,288	45
March	21,135	682	1,108.02	2,288	48
April	23,901	771	1,239.95	2,288	54
May	25,059	808	1,223.18	2,288	53
June	18,526	598	1,240.09	2,288	54
July	0	0	0.00	2,288	0
August	277	9	104.68	2,288	5
September	2,449	79	827.35	2,288	36
October	12,018	388	621.82	2,288	27
November	9,998	323	924.02	2,288	40
December	17,924	578	1,236.21	2,288	54
Total	159,195			Average	38

	Well "D" Frost				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	16,075	519	1,165.28	2,288	51
February	16,403	529	1,200.71	2,288	52
March	23,569	760	1,136.89	2,288	50
April	27,134	875	1,510.42	2,288	66
May	19,560	631	1,374.26	2,288	60
June	21,556	695	1,472.26	2,288	64
July	26	1	0.86	2,288	0
August	580	19	189.64	2,288	8
September	15,428	498	1,841.75	2,288	80
October	15,258	492	1,120.55	2,288	49
November	13,697	442	1,162.05	2,288	51
December	15,505	500	774.36	2,288	34
Total	184,790			Average	47

Annual Flow Summary of Flow Rates VS Capacity Continued

	Well "E" Notre Dame				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	26,301	848	2,562.70	3,105	83
February	20,350	656	1,396.99	3,105	45
March	37,392	1,206	2,529.09	3,105	81
April	39,356	1,270	2,471.23	3,105	80
May	45,762	1,476	2,639.30	3,105	85
June	47,239	1,524	2,648.35	3,105	85
July	35,372	1,141	2,657.33	3,105	86
August	19,857	641	1,416.94	3,105	46
September	26,463	854	2,725.21	3,105	88
October	22,779	735	2,041.05	3,105	66
November	18,860	608	1,752.10	3,105	56
December	19,035	614	1,023.06	3,105	33
Total	358,767			Average	69

	Well "F" Linden				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	51,760	1,670	2,215.81	3,269	68
February	49,897	1,782	2,204.88	3,269	67
March	54,910	1,771	2,220.63	3,269	68
April	54,777	1,826	2,233.38	3,269	68
May	58,493	1,887	2,282.38	3,269	70
June	60,268	2,009	2,268.13	3,269	69
July	67,331	2,172	2,998.50	3,269	92
August	55,938	1,804	2,970.88	3,269	91
September	66,185	2,206	3,009.25	3,269	92
October	40,688	1,313	2,990.88	3,269	91
November	49,971	1,666	3,077.75	3,269	94
December	31,090	1,003	2,699.13	3,269	83
Total	641,306			Average	79

Annual Flow Summary of Flow Rates VS Capacity Continued

	Well "G" Pharand				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	15,440	498	1,270.51	2,290	55
February	16,559	534	1,104.58	2,290	48
March	3,778	122	665.18	2,290	29
April	0	0	0.10	2,290	0
May	6,374	206	1,183.97	2,290	52
June	20,777	670	1,357.34	2,290	59
July	24,311	784	1,599.07	2,290	70
August	11,841	382	1,361.44	2,290	59
September	3,980	128	985.41	2,290	43
October	14,756	476	1,110.34	2,290	48
November	11,678	377	1,076.73	2,290	47
December	16,874	544	1,071.14	2,290	47
Total	146,366			Average	47

	Well "H" Michelle				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	11,270	364	693.24	2,290	30
February	12,219	394	848.19	2,290	37
March	17,473	564	805.26	2,290	35
April	21,134	682	1,265.78	2,290	55
May	22,361	721	1,280.20	2,290	56
June	20,568	663	1,280.38	2,290	56
July	22,957	741	1,237.09	2,290	54
August	9,801	316	1,114.63	2,290	49
September	14,001	452	1,584.47	2,290	69
October	15,036	485	854.79	2,290	37
November	25,538	824	1,980.55	2,290	87
December	28,260	912	1,956.28	2,290	85
Total	220,618			Average	54

Annual Flow Summary of Flow Rates VS Capacity Continued

	Well "Q" Chenier				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	44,668	1,441	1,902.25	2,333	82
February	47,999	1,714	1,902.00	2,333	82
March	49,433	1,595	1,902.00	2,333	82
April	51,530	1,718	1,902.00	2,333	82
May	50,410	1,626	1,902.25	2,333	82
June	42,853	1,428	1,902.00	2,333	82
July	52,439	1,692	2,152.75	2,333	92
August	43,619	1,407	2,159.75	2,333	93
September	39,046	1,302	2,161.00	2,333	93
October	58,466	1,886	2,155.75	2,333	92
November	38,308	1,277	2,142.75	2,333	92
December	46,793	1,509	2,161.50	2,333	93
Total	565,562			Average	87

	Well "R"				
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	MDWL Maximum Flow m^3/d	% Capacity
January	49,272	1,589	2,594.00	3,162	82
February	55,185	1,971	2,594.50	3,162	82
March	21,059	679	2,594.50	3,162	82
April	0	0	0.00	3,162	0
May	102	3	102.00	3,162	3
June	35,113	1,170	2,594.50	3,162	82
July	53,491	1,726	2,939.50	3,162	93
August	69,372	2,238	2,940.00	3,162	93
September	44,927	1,498	2,940.00	3,162	93
October	60,999	1,968	2,939.00	3,162	93
November	41,908	1,397	2,939.50	3,162	93
December	60,838	1,963	2,940.50	3,162	93
Total	492,262			Average	74

Annual Flow Summary of Flow Rates VS Capacity Continued

	"J" Well				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	52,992	1,709	2,453.48	3,273	75
February	32,856	1,060	2,496.39	3,273	76
March	37,972	1,225	2,136.30	3,273	65
April	45,759	1,476	2,068.62	3,273	63
May	32,619	1,052	1,799.72	3,273	55
June	18,393	593	1,893.95	3,273	58
July	41,605	1,342	2,076.50	3,273	63
August	45,760	1,476	1,988.47	3,273	61
September	22,064	712	1,724.82	3,273	53
October	27,151	876	1,742.25	3,273	53
November	23,824	769	1,979.55	3,273	60
December	14,767	476	1,660.06	3,273	51
Total	395,762			Average	61

	"M" Well				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	5,429	175	2,153.45	3,927	55
February	1,074	35	763.31	3,927	19
March	18,743	605	1,997.53	3,927	51
April	4,436	143	1,017.16	3,927	26
May	5,558	179	989.39	3,927	25
June	5,954	192	1,297.87	3,927	33
July	5,973	193	1,125.79	3,927	29
August	2,916	94	809.11	3,927	21
September	24,346	785	1,733.43	3,927	44
October	17,840	575	1,726.60	3,927	44
November	21,253	686	1,661.69	3,927	42
December	22,429	724	2,076.55	3,927	53
Total	135,951			Average	37

Falconbridge Drinking Water System
DWS# 240000020

The City of Greater Sudbury purchased the Falconbridge Wells and Storage Tank from Xstrata April of 2009.

The Falconbridge well system consists of 3 drilled wells:

- Well 5
- Well 6 and
- Well 7

The treatment process follows these steps:

1. Chlorine gas disinfection
2. Polyphosphate addition
3. Fluoride addition

The system includes three submersible pumps, disinfection with chlorine gas, along with polyphosphate addition.

The wells are located north of the Sudbury Airport and were developed by Xstrata. Water is supplied south to the Town of Falconbridge and north via the Western Main to the Greater Sudbury Airport and the Nickel Rim Mine reservoir. The City sells water to Xstrata and two industrial clients along the South transmission line and fluoridates the water, as mandated by the Sudbury and District Health Unit, before it enters the Falconbridge Municipal distribution system.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.

Annual Flow Summary of Flow Rates VS Capacity

	Falconbridge Well #5				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	14,966	483	1,227.64	1,417	87
February	20,172	651	1,316.76	1,417	93
March	15,612	504	1,229.46	1,417	87
April	1,828	59	891.64	1,417	63
May	0	0	0.01	1,417	0
June	0	0	0.01	1,417	0
July	44	1	44.31	1,417	3
August	5,723	185	1,231.30	1,417	87
September	9,762	315	1,190.02	1,417	84
October	29,942	966	1,278.63	1,417	90
November	13,401	432	1,213.98	1,417	86
December	11,917	384	1,205.51	1,417	85
Total	123,367			Average	64

	Falconbridge Well #6				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	3,004	97	1,270.29	1,417	90
February	515	17	136.22	1,417	10
March	559	18	184.38	1,417	13
April	12,113	391	1,124.81	1,417	79
May	16,861	544	1,238.84	1,417	87
June	17,099	552	1,149.89	1,417	81
July	16,130	520	1,204.48	1,417	85
August	21,996	710	1,194.01	1,417	84
September	10,044	324	1,090.96	1,417	77
October	15,042	485	1,323.67	1,417	93
November	11,447	369	1,317.03	1,417	93
December	11,816	381	1,348.68	1,417	95
Total	136,626			Average	74

Annual Flow Summary of Flow Rates VS Capacity Continued

	Falconbridge Well #7				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	21,269	686	1,257.58	1,417	89
February	15,960	515	1,357.56	1,417	96
March	22,742	734	1,265.92	1,417	89
April	18,480	596	1,186.86	1,417	84
May	17,489	564	1,221.56	1,417	86
June	15,767	509	1,227.39	1,417	87
July	18,820	607	1,216.82	1,417	86
August	6,980	225	1,128.96	1,417	80
September	14,673	473	1,250.45	1,417	88
October	11,326	365	1,342.29	1,417	95
November	18,112	584	1,310.93	1,417	93
December	22,438	724	1,263.99	1,417	89
Total	204,057			Average	88

Onaping/Levack Drinking Water System
DWS# 220003519

The Onaping Potable Water System was constructed in 1971 and owned by Xstrata. In 2009 the City of Greater Sudbury purchased the system from Xstrata and completed all major upgrades required to supply potable water to the communities of Onaping and Levack. The system was commissioned in November of 2009. The new Onaping/Levack system includes three drilled wells:

The Onaping wells are:

- Well 3
- Well 4 and
- Well 5

The treatment process follows these steps:

1. Chlorine gas disinfection
2. Sodium Hydroxide addition
3. Polyphosphate addition
4. Fluoride addition

The system includes three vertical turbine pumps, disinfection with chlorine gas, sodium hydroxide for pH adjustment, polyphosphate addition for corrosion control along with fluoride addition. The City continues to monitor sodium on a monthly basis on the raw water. All three wells have been exposed to road salt as a major highway is above grade.

Wells 3 and 4 are housed in a single pump house and Onaping Well 5 is in a separate building and all feed into a common treatment building. The treatment building houses chlorine gas injection for disinfection, fluoridation, chemical addition for corrosion control and sodium hydroxide for pH adjustment. An elevated storage tank with re-chlorination capabilities, a Pressure Control/Booster building with stand-by power, a Pressure control facility on Fraser Crescent and the distribution piping complete the system.

The Levack distribution system was a recipient of water from the Vale wells in the Levack area but that changed with the acquisition of the Onaping wells and commissioning in November 2009. Water is no longer supplied from Vale and the connection has been terminated. Water is entirely provided by the Onaping wells and both Onaping and Levack distribution systems are connected.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.

Annual Flow Summary of Flow Rates VS Capacity

	Onaping Well #3				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	5,273	170	2010.38	5,184	39
February	5,356	173	2132.85	5,184	41
March	10,471	338	2016.60	5,184	39
April	12,802	413	1990.26	5,184	38
May	41,138	1,327	2181.87	5,184	42
June	31,513	1,017	2310.32	5,184	45
July	30,101	971	2126.75	5,184	41
August	23,816	768	1985.47	5,184	38
September	18,537	598	2027.46	5,184	39
October	13,754	444	1697.80	5,184	33
November	29,642	956	2076.92	5,184	40
December	24,777	799	2191.18	5,184	42
Total	247,180			Average	40

	Onaping Well #4				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	17,087	551	2387.74	5,184	46
February	30,235	975	2377.67	5,184	46
March	8,580	277	2102.67	5,184	41
April	11,887	383	1920.37	5,184	37
May	468	15	101.00	5,184	2
June	378	12	190.64	5,184	4
July	218	7	68.89	5,184	1
August	17,156	553	1857.44	5,184	36
September	10,043	324	1936.76	5,184	37
October	17,732	572	2212.37	5,184	43
November	10,996	355	1957.29	5,184	38
December	13,330	430	2044.55	5,184	39
Total	138,111			Average	31

Annual Flow Summary of Flow Rates VS Capacity Continued

	Onaping Well #5				
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	38,562	1,244	2396.98	5,184	46
February	22,803	736	2199.45	5,184	42
March	40,631	1,311	2561.67	5,184	49
April	28,142	908	1966.18	5,184	38
May	16,787	542	2230.93	5,184	43
June	27,829	898	2478.67	5,184	48
July	36,759	1,186	4785.84	5,184	92
August	9,863	318	1804.72	5,184	35
September	21,828	704	1869.70	5,184	36
October	18,828	607	1807.76	5,184	35
November	10,840	350	1634.44	5,184	32
December	17,978	580	1986.34	5,184	38
Total	290,849			Average	45

Vermilion Distribution System
DWS# 260006789

The Vermillion distribution system is a standalone distribution system that receives water from a “donor” system. The City of Greater Sudbury purchases water from Vale, the owner of the Vermillion water treatment facility, which acts as the donor for the CGS Vermillion distribution system. Vale has responsibility for the treatment facility and must also comply with O. Reg. 170/03. The Vale water treatment facility is not the subject of this report.

The City owns and operates the distribution network in the communities of Copper Cliff, Lively, Naughton and Whitefish. The system also includes the Walden Water Storage Tank and Walden Metering Chamber. Additional service was provided in 2005 to supply Atikameksheng Anishinabek, formerly known as the

Whitefish Lake First Nation Reserve. The City has obligations to test, maintain and report on this distribution system as part of the MOE regulations.

Water quality throughout the distribution systems is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

None to report.