Presented To:	Special City Council
Presented:	Tuesday, Mar 20, 2018
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For Information Only

2017 Water Works Summary Report

Resolution

For Information Only

Relationship to the Strategic Plan / Health Impact Assessment

This report refers to a priority identified in the 2015-2018 Corporate Strategic plan under Responsive, Fiscally Prudent, Open Govenrnance. More specifically, this report continues a service which is designed to communicate to the citizens and Council on water treatement performance.

Report Summary

Attached is the 2017 Water Works Summary report for Council's information. The Safe Drinking Water Act requires that by March 31, of the following year that a summary report be give to Council for review and then made available for public viewing which, for each of the systems operated, must:

• List the requirements of any Act, Regulation, System Approval or Order that the system failed to meet at any time during the period covered by the report;

• The duration of any such failure; and

• For each failure, provide a description of the corrective action taken.

The summary report must also include the following information for the purpose of enabling council to assess the capabilities of each system in meeting existing and planned usages. Specifically:

• A summary of the quantities and flow rate of the water supplied during the period covered by the report, including monthly averages, maximum daily flows, and daily instantaneous peak flow rates; and

• A comparison of the summary of the above flows to the rated capacity and flow rates approved in the system approval.

Signed By

Report Prepared By
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Manager Water Treatment
Digitally Signed Mar 2, 18

Manager Review
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Acting Director of Water/Wastewater Services
Digitally Signed Mar 2, 18

Financial Implications
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Recommended by the Department
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Recommended by the C.A.O.
Ed Archer
Chief Administrative Officer
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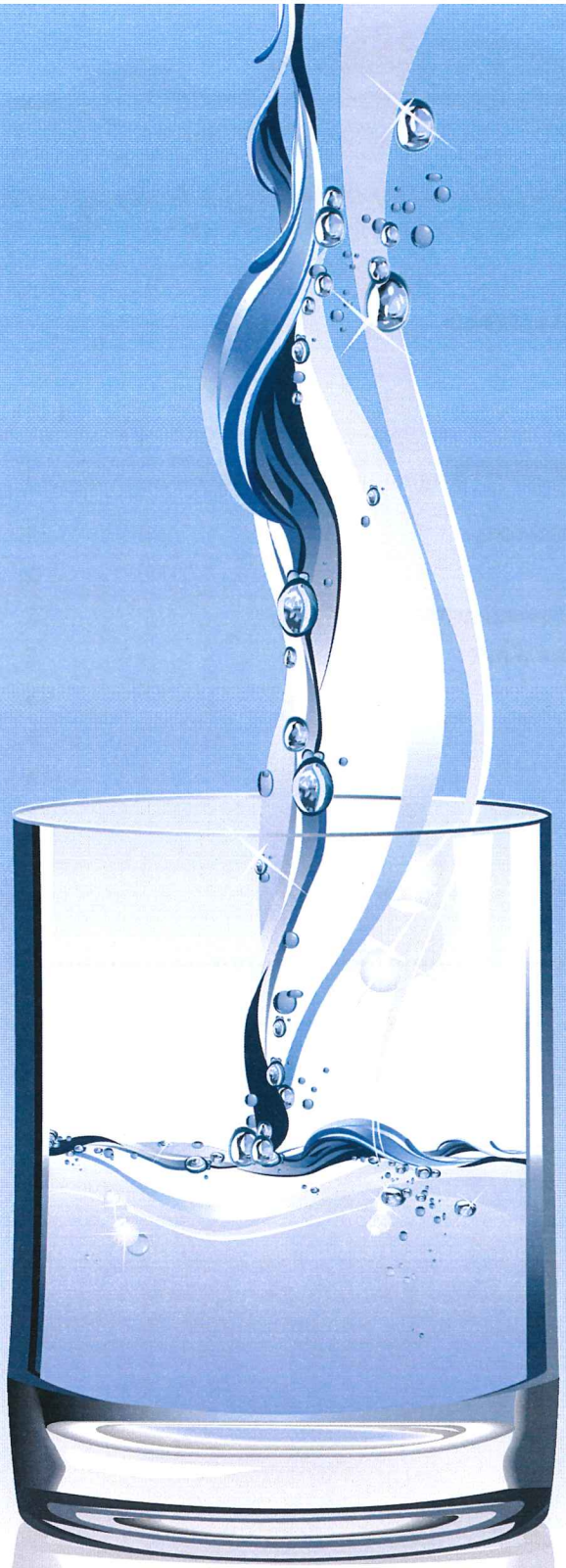
Financial Implications

There are no financial implications associated with this report.



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2017 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.

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Executive Summary

The production and delivery of potable water in Ontario is regulated by the Ministry of the Environment and Climate Change (MOECC) under the **Safe Drinking Water Act, 2002, S.O. 2002, c. 32** (formerly the Ontario Water Resources Act). Regulated systems must meet the requirements of the **Safe Drinking Water Act, 2002, S.O. 2002, c. 32** and its regulations. Most notably: the Drinking Water Systems Regulation Ontario Regulation (O.Reg.) 170/03 sets out treatment and testing requirements for all categories of regulated water systems; O.Reg. 169/03 covers the Ontario Drinking Water Quality Standards; and O.Reg 128/04 covers the necessity for Certification of Drinking Water System Operators and Water Quality Analysts.

Since the implementation of the Act, several amendments to O. Reg. 170/03 have taken place. There are amendments requiring additional resources and costs, such as the Community Lead Testing initiative and Quality Management Systems, while others streamlined legislative requirements to make the new regulations feasible for the vast majority of municipalities.

Among other obligations, the O.Reg. 170/03 prescribes the need for all owners of licensed water works to produce an Annual Summary Report as indicated in Schedule 22. This Summary Report is filed annually for the previous calendar year (January 1st through December 31st) and must contain the following information:

- List of requirements of the Safe Drinking Water Act (SDWA), the regulations, the system's approval, drinking water works permits and the municipal drinking water license
- Any orders applicable to the system that were not met at any time during the period covered by the report. If any failures were identified, specify the duration of the failure and describe the measures taken to correct the situation;
- Summary of quantities and flow rates of the water supplied during the reporting period, including monthly averages and maximum daily flows; and
- A comparison of the summary of quantities and flow to the rated capacities and flows approved in the systems approval, drinking water works permit or municipal drinking water license.

An Annual 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 of Greater Sudbury's website (http://www.greatersudbury.ca/living/sewer-and-water/water-source/water-quality-reports/) and notices have been posted in local newsprint for those that do not have access to a computer, one can be accessed at any of the CGS Citizen Service Centers to view.

The City of Greater Sudbury is listed as the Owner of five large municipal, residential drinking water systems and one independent distribution system. The one distribution system (Vermilion) receives its water from a "donor system" which is operated by Vale. The City of Greater Sudbury is supplied from this "donor system" wherein water is purchased by the CGS from Vale and supplied to consumers through a CGS owned distribution system. The following reports are written to comply with the Condition that each of these facilities produces an Annual Summary Report as per Schedule 22 of O. Reg. 170/03. Table 1 provides a summary of the various water systems throughout the City.

Table 1 - Overview of the City's Water Systems

Name	Owner	Type of Facility	Source of Water	Community Serviced
Sudbury Drinking Water System - Wanapitei	City of Greater Sudbury	Surface water conventional treatment plant and Ultraviolet irradiation, Fluoridation, Corrosion control added, Distribution system	Wanapitei River	Sudbury, Coniston, Wanapitei, Markstay, Garson
Sudbury Drinking Water System - David Street		Surface water Membrane Filtration and Ultraviolet irradiation, Fluoridation, Corrosion control added, Distribution system	Ramsey Lake	Sudbury (West and South sections)
Sudbury Drinking Water System - Garson		Wells with disinfection, Fluoridation, Distribution system	Groundwater	Garson (east of Penman Dr.)
Dowling Drinking Water System	City of Greater Sudbury	Wells with disinfection and Ultraviolet irradiation, Fluoridation, Distribution system	Groundwater	Dowling
Valley Drinking Water System	City of Greater Sudbury	Wells with disinfection and Ultraviolet irradiation, Fluoridation, Corrosion control added for supply to Capreol, Distribution system	Groundwater	Valley East, Azilda, Chelmsford & Capreol

Falconbridge Drinking Water System	City of Greater Sudbury	Wells with disinfection, Fluoridation, Corrosion control added, Distribution system	Groundwater	Falconbridge
Onaping /Levack Drinking Water System	City of Greater Sudbury	Wells with disinfection, Fluoridation, Corrosion control added, Distribution system	Groundwater	Onaping & Levack
Vermilion River Water Treatment Plant	Vale	Surface water conventional treatment plant, Fluoridation and Corrosion control added	Vermilion River	Vermilion Distribution System
Vermilion Distribution System	City of Greater Sudbury	Distribution System	Vermilion River WTP	Lively, Naughton, Whitefish, Copper Cliff, Walden Industrial Park

Due to the significant impact of the Drinking Water Protection Regulation and continuing Source Water Protection legislation, virtually all of the City's water works have had to undergo 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 at the City water works are necessary to reduce the risk of potable water contamination as deemed necessary by the MOECC. The level of acceptable risk is stipulated through mandatory compliance with O. Reg. 170/03.

The last several years have seen a number of upgrades at most CGS water facilities and throughout various sections of the distribution systems. It is important to understand that this is part of the required process of the Regulations and the MOECC's statutory Standard of Care to ensure all citizens have access to and receive safe drinking water. The regulation stipulates that water works owners will continually monitor water works performance, and review levels of treatment versus current standards and emerging technologies. The Ministry of the Environment and Climate Change (MOECC) is responsible for the enforcement of regulations and conducts regular, announced and unannounced, inspections of all of our facilities every year. MOECC inspections "grading" has given the CGS water systems a **99.52%** for the systems inspected to date through the 2017 inspection regimen. We are anticipating the results of the Wanapitei and David inspections that are currently in progress. The public expects that responsible Owners will be diligent in their duty to care for public water supplies.

The Community Lead Testing Initiative was mandated by the MOECC in 2007 and falls under O. Reg. 170/03, Schedule 15.1. Although there have been challenges in garnering enough volunteers for the

program, the City is continuing with the initiative. The City has completed sixteen periods of lead sampling to date. Results have been positive and demonstrated that lead is not a concern for the City of Greater Sudbury. The Onaping/Levack system has seen considerable improvement with the corrosion control additive and pH adjustment measures in which were upgraded to facilitate product capacity in 2017. To date, 3967 samples have been collected and analyzed, by a third party laboratory, throughout CGS owned Drinking Water Systems. There have been a combined total of 176 private residences, commercial establishments and distribution samples analyzed in the 2017 program. Within this round of sampling there have been two samples that were found to be in excess of the standard. These samples were taken from a commercial and residential volunteer and are representing approximately 1.14% of all samples. The lead sampling initiative will continue into the foreseeable future but the City has been able to act on new legislative provisions put forth by the MOECC. Drinking water systems that have demonstrated less than 10% of one half the Maximum Allowable Concentration (MAC) over six rounds of lead sampling will no longer be required to test in private residents or commercial establishments. Drinking Water Systems that have a population over 50,000 will continue to be required to test for Lead, but at a reduced number, providing the same criteria as listed above for half MAC have been met.

The City is well organized to manage the existing water works systems. Further, staff has been pro-active to ensure all necessary measures are taken to achieve compliance with the Regulations and the various Drinking Water Permits and Licenses. The water works owned and operated by the City have been managed with the standard of care expected by the public and as legislated by the government. All necessary upgrades have been completed or are being planned and implemented in accordance with applicable standards.

Reviewed by:

Date: March 1 2018

Julie Friel
Manager Water Treatment

Approved by:

Date: March 1 2018

Mike Jensen
Acting Director, Water and Wastewater Services

SECTION 1 – LEGISLATIVE AND REGULATORY REQUIREMENTS

Regulated systems must meet the requirements of Ontario's *Safe Drinking Water Act, 2002* and its regulations. Most notably, the Drinking Water Systems Regulation sets out treatment and testing requirements for all categories of regulated water systems, including non-municipal and municipal non-residential operations. Some of the CGS systems are classified as Class IV and therefore require Operators of the same level of Certification. Related regulations made under the Act:

1.1 O.REG. 128/04 CERTIFICATION OF DRINKING-WATER SYSTEM OPERATORS AND WATER QUALITY ANALYSTS

This Regulation was filed on May 14, 2004 (Last amendment: O.Reg. 466/10). 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, 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 MOECC Director using criteria which includes the following:

a. The training course must have documented learning objectives.

b. The training course must be planned and be provided by a qualified training provider.

c. The training course must include a means to verify that the participants have learned the material covered in the course

d. The training course must cover subject matter that is directly related to the duties typically performed by an operator.

The on-the-job practical training that is used to meet the training requirements must meet a criterion that includes the following:

a. The training must have documented learning objectives.

b. The training must be provided by a trainer with expertise in the subject matter that is being covered.

c. The training must be in respect of subject matter that is directly related to the duties typically performed by an operator

Note: The annual number of hours of training set out in Table 1 may be averaged over the three years during which an operator's certificate is valid but shall not be reduced or prorated for an operator who is employed on a part-time basis.

Table 1 – Annual Training for Operators

Type and Class of Subsystem in Which The Operator is Employed	Training Requirements	Minimum Total Hours
Limited Groundwater or Limited Surface Water	7 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	20
Class I Water Treatment or Class I Distribution or Class I Distribution and Supply	7 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	30
Class II Water Treatment or Class II Distribution or Class II Distribution and Supply	12 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	35
Class III Water Treatment or Class III Distribution or Class III Distribution and Supply	14 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	40
Class IV Water Treatment or Class IV Distribution or Class IV Distribution and Supply	14 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	50

O. Reg. 128/04, s. 29, Table 1

1.2 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 have been completed.

1.3 O. REG. 172/03 DEFINITIONS OF "DEFICIENCY" AND "MUNICIPAL DRINKING-WATER SYSTEM"

Ontario Regulation 172/03 (Last Amendment: O.Reg. 329/08), provides definitions of words and expressions within the Safe Drinking Water Act and associated Regulations.

1.4 O. REG. 171/03 DEFINITIONS OF WORDS AND EXPRESSIONS USED IN THE ACT

Ontario Regulation 171/03 (Last amendment: O.Reg. 336/13) - Provides definitions of words and expressions within the Safe Drinking Water Act and associated Regulations.

1.5 O. REG. 170/03 DRINKING WATER SYSTEMS

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

1) Types of Drinking Water Systems
2) Required reports (annual, summary reports)
3) Retention of record
4) Treatment equipment requirements
5) Types of Treatment
6) Operational Checks, Sampling and Testing
7) Use of accredited laboratories
8) Maintenance and Operational Checks
9) Microbiological Sampling and Testing
10) Chemical Sampling and Testing
11) Reporting Adverse Test Results and Other Problems
12) Corrective Action
13) Engineers' Reports
14) Inorganic Parameters
15) Organic Parameters

1.6 O. REG. 248/03 DRINKING WATER TESTING SERVICES

Ontario Regulation 248/03 (Last amendment: O.Reg. 416/09) - Drinking-Water Testing Services is the regulation governing accredited laboratories that came into effect October 31, 2004.

1) Lists systems that do not require drinking-water testing license
2) Lists prescribed tests of the Safe Drinking Water Act
3) Lists person(s) to do water quality analysis
4) Lists the types of tests that can be conducted for the sole purpose of carrying out research or Criteria for drinking-water testing services
5) Conditions of drinking-water testing license
6) Handling samples
7) Testing records
8) Laboratory qualifications and accreditation

1.7 O. REG. 169/03 ONTARIO DRINKING WATER QUALITY STANDARDS

Ontario Regulation 169/03 (Last amendment: O.Reg 373/15). This regulation sets out standards in Schedules 1, 2 and 3 as prescribed drinking-water quality standards. Included in this regulation are the compliance standards.

1.8 O. REG. 453/07 FINANCIAL PLANS

Ontario Regulation 169/03 (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.

1) Financial plans must be approved by a resolution that is passed by a council
2) Financial plans must apply to a period of at least six years
3) Financial plans must include:

i. Details of the proposed or projected financial position of the drinking water system itemized by,
   A. total financial assets,
   B. total liabilities,
   C. net debt,
   D. non-financial assets that are tangible capital assets, tangible capital assets under construction, inventories of supplies and prepaid expenses, and
   E. changes in tangible capital assets that are additions, donations, write downs and disposals.

ii. Details of the proposed or projected financial operations of the drinking water system itemized by,
   A. total revenues, further itemized by water rates, user charges and other revenues,
   B. total expenses, further itemized by amortization expenses, interest expenses and other expenses,
   C. annual surplus or deficit, and
   D. accumulated surplus or deficit.

iii. Details of the drinking water system's proposed or projected gross cash receipts and gross cash payments itemized by,
   A. operating transactions that are cash received from revenues, cash paid for operating expenses and finance charges,
   B. capital transactions that are proceeds on the sale of tangible capital assets and cash used to acquire capital assets,
   C. investing transactions that are acquisitions and disposal of investments,

D. financing transactions that are proceeds from the issuance of debt and debt repayment,
E. changes in cash and cash equivalents during the year, and
F. cash and cash equivalents at the beginning and end of the year.

iv. Details of the extent to which the information described in subparagraphs i, ii and iii relates directly to the replacement of lead service pipes as defined in section 15.1- 3 of Schedule 15.1 to Ontario Regulation 170/03 (Drinking Water Systems), made under the Act.

4) Make the financial plan available to the public, free of charge.

SECTION 2 - PLANT SPECIFIC REVIEW

2.1 Plant Specific Requirements

This Section of the report provides details on measures taken by the City to ensure compliance with Terms and Conditions of the Municipal Drinking Water Licenses, Drinking Water Works Permits, Acts, Regulations or any MOECC orders the systems may have been under during the reporting period. This section of the report also provides details on the specifics of the systems, any non-compliance issues along with actions taken by the City to rectify the situations, as well as flow data with comparison to allowable limits. This flow comparison is to allow for a basic overview of the systems performance and allows for review and planning of possible future expansions if required.

A more detailed description of the water works is provided at the start of each sub-section. The description is provided for reference purposes only, and to ensure that the compliance measures remain in context. All non-compliance items and the corrective actions taken are summarized in table format and appended to the particular plant section in this report. The most recent Municipal Drinking Water License and Drinking Water Works Permit that was valid at the time of this report is also listed in the particular plant section.

Sudbury Drinking Water System - Wanapitei DWS# 210001111

Municipal Drinking Water License: 016-106
Issue Number: 4
December 12, 2017
Drinking Water Works Permit: 016-206
Issue Number: 5
May 24, 2017

The Wanapitei WTP is a surface water plant which draws water from the Wanapitei River. Proportionally, the plant supplies approximately 60% of the water for Sudbury; however, most of the water produced is delivered to New Sudbury, Coniston, Wanapitei, Markstay, and parts of downtown. Garson, west of Falconbridge Rd. and O'Neil Dr., is also supplied by this plant. The plant was constructed in the 1970's at the onset of Regional Government. Since the original construction, the plant has undergone upgrading to enhance treatment efficiency, increase production, and to reduce energy costs. Completed projects in 2017 and the associated approximate costs included:

- Alum tank inspections and cleaning $4,121
- Rehabilitation of the UV system $23,409
- Maintenance to both Reactivators $78,559
- Maintenance to Coniston Pressure Reducing Valve $10,021
- Watermain Lining $937,042
- Installation of two online turbidity monitoring on the Reactivators $15,085
- Potable Water Treatment pump #2 rehabilitation $29,026

The raw water supply for this plant is the Wanapitei River. The raw water quality is reasonably reliable but is, however, subject to some change, which is typical of most rivers. The watershed area for the Wanapitei River is vast with much in its natural state.

The river water quality varies depending on seasonal changes, upstream operations of dams, and local weather patterns. Some process parameters affected by these changes include: temperature, turbidity, organics and color

The changing raw water quality requires careful observation by the water plant operators to ensure necessary process and chemical adjustments are made to effectively treat the water and optimize the plants performance.

The Wanapitei WTP incorporates conventional technologies to treat the water. The raw water undergoes initial treatment with chlorine dioxide for taste and odor control and/or chlorine for pre-disinfection. Raw

water is further subjected to chemical coagulation with alum to form a floc. The coagulated water passes through one of two settling tanks, referred to as reactivators, for the flocculation and sedimentation process. The water then passes through one of four, dual media, filter beds. The filtered water is treated with hydrated lime for pH/alkalinity adjustment; with chlorine to maintain disinfection; with fluoride to comply with Sudbury and District Health Unit requirements; and with polyphosphate to reduce corrosion in the distribution system. The final process the finished water undergoes is irradiation by ultraviolet light. The plant is designed to be capable of achieving, at all times, at least 99.99% removal or inactivation of viruses by the time water enters the distribution system.

The distribution system incorporates a large diameter concrete pressure pipe to deliver water to Sudbury and Coniston. The communities are networked with an extensive distribution system including numerous booster stations. The system pressure is regulated by the water level in the Ellis Water Reservoir. Most of the pipes in the distribution system are less than 50 years old and much of the system is plastic pipe.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 2 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period since we are presently waiting for the 2017 inspection results.

Table 2 - Wanapitei Water Treatment Plant

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 3 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit. There were no adverse water quality incidences for this section of the system in 2017.

Table 3 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NA						

Annual Flow Summary

Table 4 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reportable period.

Table 4 - Annual Flow Summary (Sudbury Plants)

	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	670,396	21,626	24,224	358.38	54,000	45
February	634,304	22,654	24,544	428.76	54,000	45
March	714,240	23,040	24,360	408.24	54,000	45
April	661,752	22,058	23,016	321.45	54,000	43
May	627,976	20,257	22,560	314.11	54,000	42
June	696,632	23,221	25,638	474.49	54,000	47
July	749,152	24,166	26,272	395.23	54,000	49
August	755,288	24,364	28,368	390.22	54,000	53
September	744,968	24,832	27,344	386.87	54,000	51
October	739,152	23,844	26,480	354.06	54,000	49
November	728,496	24,283	26,400	356.04	54,000	49
December	723,560	23,341	25,176	336.85	54,000	47
Total	8,445,916					

Sudbury Drinking Water System - David Street
DWS# 220003537

Municipal Drinking Water License: 016-106
Issue Number: 4
December 12, 2017
Drinking Water Works Permit: 016-206
Issue Number: 5
May 24, 2017

The David St. WTP is a surface water plant, which draws water from Ramsey Lake. Proportionally, the plant services approximately 40% of Sudbury, however, most of the water produced at the David St. WTP is normally delivered to the south, west and downtown areas of Sudbury. The plant was originally over 100 years old but has undergone numerous upgrades to meet changing needs. The plant completed retrofits with Zenon membrane ultra filtration technologies and ultraviolet irradiation in 2004 to ensure the treatment system meets the requirements in O. Reg. 170/03. The plant is designed to be capable of achieving, at all times, at least 99.99% removal or inactivation of viruses by the time water enters the distribution system.

The raw water supply for the David St. WTP is Ramsey Lake. Under the Clean Water Act and careful review by the Source Water Protection Committee and City staff, provisions have been established to maintain and improve the source water quality.

The City is planning to have the David St. plant remain an integral part of the water works system for many years. The portion of the distribution system supplied by the David Street WTP includes parts of downtown Sudbury, the south and west ends of Sudbury. In addition, the Ellis Reservoir is part of the distribution network for Sudbury. The Ellis Reservoir is a 36.4 million liter, dual cell, water storage facility that is also fed by the treated potable water produced at the Wanapitei WTP. As is common with many older distribution networks, the Sudbury pipe system is prone to line breaks, complaints of discolored water and difficulties maintaining adequate chlorine residual. Projects completed for 2017 and the associated approximate costs included watermain lining within the distribution system at an approximate cost of $687,854.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 5 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period since we are presently waiting for the 2017 inspection results.

Table 5 - David Street Water Treatment Plant

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 6 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit. There were no adverse water quality incidences for this section of the system in 2017.

Table 6 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NONE						

Annual Flow Summary

Table 7 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reporting period.

Table 7 - Annual Flow Summary

	David Street Water Treatment Plant					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	470,454	15,176	18,405.44	408.40	40,000	46
February	352,016	12,572	15,761.53	323.11	40,000	39
March	363,429	11,724	17,539.54	322.50	40,000	44
April	354,944	11,831	15,840.22	321.91	40,000	40
May	421,803	13,607	17,637.33	343.04	40,000	44
June	409,447	13,648	20,446.49	322.33	40,000	51
July	389,977	12,580	17,801.19	321.93	40,000	45
August	378,055	12,195	18,564.03	322.50	40,000	46
September	384,209	12,807	17,569.42	338.58	40,000	44
October	379,859	12,254	19,289.89	322.81	40,000	48
November	343,308	11,444	13,726.37	322.01	40,000	34
December	342,908	11,062	14,064.72	321.33	40,000	35
Total	4,590,409					

Sudbury Drinking Water System - Garson

DWS# 220003485

Municipal Drinking Water License: 016-106
Issue Number: 4
December 12, 2017
Drinking Water Works Permit: 016-206
Issue Number: 5
May 24, 2017

The Garson water works is a communal groundwater system consisting of three wells, and servicing the community of Garson east of Penman Ave and O'Neil Dr East. The three wells are:

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

Garson Well No.2 is situated within a pump house on the east side of Falconbridge Highway at Spruce Street. The system includes a Variable Frequency Drive (VFD) vertical turbine well pump, disinfection with sodium hypochlorite and fluoride injection as mandated by the Sudbury and District Health Unit. There is no standby power at Garson Well No. 2. The City of Greater Sudbury operated the well pump house on behalf of Vale and now, as the sole owner/operator, the water is directly connected to the public distribution network.

The other two wells in Garson, No.'s 1 and 3, are situated on the south side of Falconbridge Road at Orell Street. The two wells are in close proximity to each other but are housed in separate buildings, both of which contain the vertical turbine well pumps. The discharges from the well pumps enter a common building which houses the disinfection and fluoride injection equipment. The well supply historically provided very good quality water with no record of bacteriological contamination. 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 Sudbury and District Health Unit and the Ministry of the Environment and Climate Change (MOECC), 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. Maintenance completed for 2017 and the associated approximate costs included well pump rehabilitation at an approximate cost of $9,066 and well rehabilitation at an approximate cost of $46,682.

The community of Garson 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. The pipe network is a combination of new and older pipes and frost penetration can be an issue in Garson.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 8 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2017 reportable period.

Table 8 - Garson Wells and Distribution System

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 9 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit. The AWQI results for 2017/03/22 were from a commercial site that was used as an alternate site since the sample station was not in service. After further sampling it was determined that it was the site in question and not the system. AWQI results for 2017/11/22 were determined to be a sampling error or lab error after further investigation since the chlorine residual for the samples were 0.97mg/L and subsequent samples from the same location along with upstream and downstream detected no presence of E.Coli or Total Coliforms.

Table 9 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
132704	2017/03/22	Total Coliform	32	CFU/100ml	Resample/Retest	2017/03/27
132719	2017/03/22	Total Coliform	21	CFU/100ml	Resample/Retest	2017/03/27
138153	2017/11/22	E.Coli	11	CFU/100ml	Resample/Retest	2017/11/24
138153	2017/11/22	Total Coliform	30	CFU/100ml	Resample/Retest	2017/11/24

Annual Flow Summary

Table 10 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reportable period.

Table 10 - Flow Summary (Garson Wells)

	Garson Well #1					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	9,291	300	621.08	16.31	1,572	39
February	7,496	268	516.93	15.77	1,572	33
March	8,177	264	579.11	15.72	1,572	37
April	7,497	250	602.92	17.83	1,572	38
May	7,662	247	540.09	18.09	1,572	34
June	4,217	141	317.03	18.66	1,572	20
July	6,606	213	415.89	17.72	1,572	26
August	9,095	293	705.42	17.91	1,572	45
September	8,148	272	515.62	16.59	1,572	33
October	8,651	279	613.77	16.39	1,572	39
November	8,658	289	611.18	17.85	1,572	39
December	8,306	268	401.98	17.34	1,572	26
Total	93,804					

Table 10 - Flow Summary (Garson Wells) continued

	Garson Well #3					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	8,452	273	837.28	32.69	3,275	26
February	7,495	268	860.86	36.88	3,275	26
March	6,313	204	308.02	31.47	3,275	9
April	6,499	217	659.94	31.13	3,275	20
May	5,876	190	489.43	33.15	3,275	15
June	1	0	1.42	40.00	3,275	0
July	9,052	292	856.01	39.47	3,275	26
August	7,774	251	811.79	36.37	3,275	25
September	6,303	210	709.32	32.56	3,275	22
October	7,154	231	569.19	35.90	3,275	17
November	6,915	231	859.07	32.61	3,275	26
December	5,205	168	302.96	34.88	3,275	9
Total	77,039					

	Garson Well #2					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	15,608	503	772.44	32.17	2,981	26
February	14,214	508	748.72	28.51	2,981	25
March	17,523	565	850.94	33.04	2,981	29
April	17,048	568	804.38	29.44	2,981	27
May	22,132	714	1,239.03	34.54	2,981	42
June	32,449	1,082	1,414.50	34.40	2,981	47
July	23,492	758	1,197.66	33.24	2,981	40
August	19,113	617	839.65	31.74	2,981	28
September	19,597	653	956.46	33.45	2,981	32
October	19,485	629	855.24	34.77	2,981	29
November	16,868	562	988.00	32.48	2,981	33
December	20,292	655	115.51	35.12	2,981	4
Total	237,821					

Dowling Wells and Distribution System
DWS# 210001665

Municipal Drinking Water License: 016-103
Issue Number: 3
May 24, 2017
Drinking Water Works Permit: 016-203
Issue Number: 4
May 24, 2017

The Dowling water works is a communal groundwater system, which supplies water to the community of Dowling. The water works includes two wells with well pump houses, a distribution network of in-ground piping and an elevated water storage tank. The entire water system was developed with subsidy from the MOECC in the 1970's. The ownership and operation of the water works was transferred to the Regional Municipality of Sudbury and it is now owned and operated by the City of Greater Sudbury.

The Riverside well and pump house includes a vertical turbine supply pump, disinfection with gas chlorine, ultraviolet irradiation along with fluoride injection as mandated by the Sudbury and District Health Unit. The Lionel well and pump house has similar facilities plus a diesel generator for standby power. Both facilities have automatic valving to waste raw water for a few minutes upon start-up of a well pump.

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 MOECC has characterized the water source as potentially groundwater under the direct influence of surface water (potentially 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 MOECC 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 MOECC criteria for "potentially under the influence of surface water", adequate natural filtration of the water exists. Based on the conclusions by the MOECC, the well systems have had ultraviolet irradiation added to enhance disinfection to comply with the treatment requirements of the ODWS.

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. Projects completed for 2017 and the associated approximate costs included well pump rehabilitation at an approximate cost of $5,164 along with the well rehabilitation at $49,840.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 11 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during 2017 reportable period.

Table 11 - Dowling Wells and Distribution System

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 12 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit.

Table 12 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NONE						

Annual Flow Summary

Table 13 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reportable period.

Table 13 - Flow Summary (Dowling Wells)

	Lionel Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	6,751	218	540.42	24.74	3,640	15
February	4,855	173	557.33	25.57	3,640	15
March	6,581	212	511.50	24.74	3,640	14
April	6,227	208	538.84	25.98	3,640	15
May	10,531	340	825.08	25.15	3,640	23
June	13,042	435	938.21	25.15	3,640	26
July	11,703	378	635.22	24.74	3,640	17
August	7,211	233	453.18	24.33	3,640	12
September	2,661	89	418.17	24.33	3,640	11
October	5,880	190	433.72	23.92	3,640	12
November	5,733	191	490.22	23.92	3,640	13
December	1,006	32	472.03	23.92	3,640	13
Total	82,181					
	Riverside Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	3,965	128	605.10	30.52	3,640	17
February	5,391	193	472.34	30.10	3,640	13
March	5,097	164	471.42	30.52	3,640	13
April	5,836	195	520.85	32.16	3,640	14
May	2,531	82	523.53	30.52	3,640	14
June	0	0	0.00	0.00	3,640	0
July	1,807	58	477.39	39.59	3,640	13
August	4,071	131	399.85	35.05	3,640	11
September	7,852	262	604.58	35.05	3,640	17
October	4,314	139	405.43	36.70	3,640	11
November	3,788	126	501.51	36.29	3,640	14
December	9,719	314	513.84	36.29	3,640	14
Total	54,371					

Blezard Valley/Capreol Drinking Water System
DWS# 210000737

Municipal Drinking Water License: 016-105
Issue Number: 4
May 24, 2017
Drinking Water Works Permit: 016-205
Issue Number: 3
May 24, 2017

In 2010, the Blezard Valley and Capreol well supply systems were considered to be one complete system as both of the systems are connected. As such, one Drinking Water System (DWS) number and one Municipal Drinking Water License and Works Permit has been 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 Caron, McCrea Heights, Azilda and Chelmsford. Eleven groundwater wells are situated throughout the Valley and each are located in well pump houses. The communities are interconnected with distribution piping and three water storage tanks located in each of Val Caron, Azilda and Chelmsford.

The water works were originally constructed by the MOECC in the 1970's then transferred to the Regional Municipality of Sudbury. With amalgamation, the ownership was transferred to the City of Greater Sudbury. All upgrades from the original MOECC system were constructed by the City.

Each well pump house contains a vertical turbine well pump, gas chlorine disinfection equipment and fluoride injection equipment as mandated by the Sudbury and District Health Unit. Some of the well pump houses incorporate standby diesel generators, summarized as follows:

- Well A – Deschene;
- Well B – Kenneth;
- Well C – Philippe;
- Well D – Frost;
- Well E - Notre Dame
- Well Q - Chenier; and
- Well R – R Well.

The water supply source is a common groundwater aquifer characterized as a shallow sand and gravel aquifer. 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 as not under the direct influence of surface water. Due to the shallow nature of the aquifer and the lack of a confining clay layer the MOECC requested further study.

The GUDI study was submitted in August of 2002. An amended PTTW was received on February 23, 2003. The amended PTTW acknowledged the opinion of the hydrogeology study, which states that the wells are not GUDI. As such, no additional filtration is required and the wells may supply water provided they meet MOECC Procedures for Disinfection of Drinking Water.

The wells in the Valley system did not meet chemical disinfection CT (Concentration (mg/L) x Time (minutes)) requirements, therefore, all the wells were upgraded in 2007 to incorporate ultraviolet irradiation to deal with CT issues.

As previously noted, the Valley well system is a relatively shallow aquifer and the community has developed extensively around the wells. Some of the wells are located immediately adjacent to residential homes, commercial establishments and major arterial roadways. Two new water wells were developed (Wells Q and R) and commissioned in 2012, increasing the capacity to supply the additional demands in Blezard Valley.

The distribution system in the Valley is very extensive and contains many areas with dead-ends. System pressure is regulated by the level of the three storage tanks situated in Azilda, Chelmsford and Val Caron. During the reporting period the City operated the distribution system with good control of the chlorine residuals. This is due in part to the age of the distribution network, and the good source of raw water quality.

The Capreol Well portion of the system draws water from two (2) wells to service the community of Capreol. The wells include:

- Well J; and
- Well M.

In the event that these two wells fail and due to the fact that Capreol does not have backup water storage facilities, the Blezard Valley wells can supply water through the Capreol Boosters located on site at M well. This system, started in 2004, was completed and commissioned in 2007, ensuring a continued water supply to Capreol.

The source of water for the Capreol wells is groundwater. Wells J and M draw from a common unconfined aquifer comprised mostly of sands and gravels. Although neither of the wells have any record

of bacteriological contamination, the unconfined nature of the aquifer required these wells to be characterized as potentially groundwater under the influence of surface water (potentially GUDI).

Wells J and M are located within approximately 30 meters of each other on the east side of Greens Lake and west of MR 84. Wells J and M are housed in separate well houses and have vertical turbine well pumps. A common discharge from the wells undergoes treatment in the form of disinfection by gas chlorination, ultraviolet irradiation, and fluoridation, as mandated by the Sudbury and District Health Unit. Corrosion control for the system is accomplished with the addition of a polyphosphate. Both facilities have automatic valving to waste raw water for a few minutes upon start-up of a well pump. Standby power with an automatic transfer switch for Wells J and M is available from a diesel generator located in Well M pump house.

A previous PTTW for Capreol required further hydrogeological studies to be conducted in Capreol to determine if the wells were in fact under influence of surface water. The results of the study were necessary to determine if a filtration system would be required to ensure that the water quality remains in compliance with the ODWS at all times. The studies, referred to as GUDI studies, were completed for Wells M and J and submitted to the MOECC on June 30, 2002. The response from a review by MOECC found these wells to be potentially under influence of surface water with effective in situ filtration and as such required upgrades to meet the ODWS disinfection and log removal criteria. Upgrades have been completed and the system achieves the required log removals and enhanced the disinfection process.

The distribution system in Capreol was developed in conjunction with the growth of the industrial development. Some of the pipe network is therefore, relatively old. The frost depths in Capreol extend to extreme depths during cold winters, which impose additional stresses on the integrity of the distribution system. A second line was added to the distribution system so now two 350 mm water mains run in parallel along MR84 to the Town of Capreol. The distribution system is comprised of PVC, cast iron and ductile piping and serves approximately 3300 residents.

Completed projects in 2017 and the associated approximate costs included: Rehabilitation of the wells UV systems at a cost of $24,012, Capreol Iron and Manganese removal study $79,976, Val Caron booster upgrade design $59,614, rehabilitation of the Valley wells $193,496, rehabilitation of the Capreol wells $149,082 and replacement of a booster pump at the Centennial booster station $11,808.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 14 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2017 reportable period.

Table 14 - Blezard Valley/Capreol Wells Supply

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	Trending review was completed outside of the 72 hours mandated by O.Reg 170/03	Cause analysis completed and SOP reviewed with staff to ensure responsibilities were understood.
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 15 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit.

Table 15 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NONE						

Annual Flow Summary

Tables 16 and 17 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reportable period.

Table 16 – Annual Flow Summary (Valley Wells)

	Well "A" Deschene					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	12,674	409	952.34	18.81	1,798	53
February	13,223	472	959.33	21.15	1,798	53
March	19,923	643	1,464.14	18.34	1,798	81
April	10,434	348	721.56	18.69	1,798	40
May	13,331	430	972.52	18.75	1,798	54
June	13,371	446	1,258.29	18.67	1,798	70
July	14,969	483	921.34	18.73	1,798	51
August	9,596	310	476.72	18.85	1,798	27
September	11,172	372	848.24	18.88	1,798	47
October	15,793	509	834.06	19.05	1,798	46
November	18,194	606	953.50	19.25	1,798	53
December	17,334	559	1,097.68	19.26	1,798	61
Total	170,014					

	Well "B" Kenneth					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	15,525	501	1,038.01	17.85	2,288	45
February	6,434	230	648.13	18.09	2,288	28
March	4,457	144	670.13	18.38	2,288	29
April	12,199	407	1,194.02	18.11	2,288	52
May	5,577	180	612.29	18.11	2,288	27
June	10,774	359	992.65	17.64	2,288	43
July	13,752	444	879.91	17.76	2,288	38
August	9,063	292	1,006.09	17.31	2,288	44
September	12,228	408	773.56	17.52	2,288	34
October	10,989	354	762.26	17.20	2,288	33
November	16,040	535	886.52	17.31	2,288	39
December	6,485	209	728.47	17.52	2,288	32
Total	123,523					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "C" Phillipe					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	25,542	824	1,658.99	24.75	2,288	73
February	15,725	562	1,233.26	24.33	2,288	54
March	26,835	866	1,796.07	23.73	2,288	78
April	14,600	487	989.87	24.10	2,288	43
May	16,723	539	1,202.58	24.35	2,288	53
June	13,016	434	1,231.22	24.25	2,288	54
July	0	0	0.00	0.00	2,288	0
August	838	27	345.03	24.22	2,288	15
September	0	0	0.00	0.00	2,288	0
October	0	0	0.00	0.00	2,288	0
November	0	0	0.00	0.00	2,288	0
December	1,841	59	634.58	84.18	2,288	28
Total	115,120					

	Well "D" Frost					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	29,860	963	1,831.37	25.55	2,288	80
February	27,669	988	1,874.13	25.35	2,288	82
March	37,060	1,195	1,936.83	26.58	2,288	85
April	28,928	964	2,063.97	27.30	2,288	90
May	23,138	746	2,037.03	26.57	2,288	89
June	18,352	612	1,715.24	27.19	2,288	75
July	21,698	700	1,322.86	26.76	2,288	58
August	14,228	459	1,216.89	85.00	2,288	53
September	17,921	597	1,178.06	25.45	2,288	51
October	29,626	956	1,948.97	26.06	2,288	85
November	27,872	929	1,907.65	27.17	2,288	83
December	23,511	758	1,415.72	27.22	2,288	62
Total	299,863					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "E" Notre Dame					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	0	0	0.00	0.00	3,105	0
February	205	7	155.54	39.28	3,105	5
March	8,776	283	1,120.27	31.06	3,105	36
April	20,663	689	1,669.53	30.91	3,105	54
May	20,189	651	1,606.14	30.63	3,105	52
June	19,647	655	1,541.03	30.72	3,105	50
July	30,686	990	2,533.01	30.91	3,105	82
August	13,726	443	1,058.40	30.98	3,105	34
September	6,911	230	1,739.31	22.02	3,105	56
October	236	8	66.19	16.66	3,105	2
November	214	7	105.05	19.83	3,105	3
December	19,591	632	2,626.75	36.32	3,105	85
Total	140,844					

	Well "F" Linden					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	37,481	1,209	2,268.42	29.77	3,269	69
February	51,191	1,828	2,454.20	29.61	3,269	75
March	48,190	1,555	2,457.38	36.96	3,269	75
April	36,170	1,206	2,202.91	80.00	3,269	67
May	54,165	1,747	2,399.61	29.79	3,269	73
June	70,158	2,339	2,399.44	29.05	3,269	73
July	51,348	1,656	2,374.04	29.21	3,269	73
August	66,574	2,148	2,364.64	28.99	3,269	72
September	57,508	1,917	2,336.53	28.84	3,269	71
October	50,989	1,645	1,945.22	28.95	3,269	60
November	56,442	1,881	2,405.50	37.69	3,269	74
December	42,131	1,359	1,953.66	28.96	3,269	60
Total	622,347					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "G" Pharand					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	14,354	463	1,366.29	26.42	2,290	60
February	12,228	437	1,223.47	23.68	2,290	53
March	27,734	895	1,901.63	23.98	2,290	83
April	12,417	414	877.39	26.07	2,290	38
May	9,986	322	1,222.76	26.82	2,290	53
June	6,769	226	1,231.17	27.73	2,290	54
July	0	0	0.00	0.00	2,290	0
August	5,867	189	621.88	35.89	2,290	27
September	19,169	639	1,304.65	27.74	2,290	57
October	19,627	633	1,145.81	26.84	2,290	50
November	20,691	690	1,359.91	25.75	2,290	59
December	20,016	646	1,408.38	26.43	2,290	62
Total	168,858					

	Well "H" Michelle					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	18,978	612	1,219.46	29.33	2,290	53
February	12,505	447	940.86	26.24	2,290	41
March	0	0	0.00	0.00	2,290	0
April	25,169	839	1,667.69	29.57	2,290	73
May	22,654	731	1,667.38	30.43	2,290	73
June	13,187	440	967.93	29.36	2,290	42
July	20,391	658	1,232.37	27.76	2,290	54
August	21,741	701	1,655.93	30.20	2,290	72
September	15,734	524	1,456.92	29.16	2,290	64
October	17,456	563	985.84	29.46	2,290	43
November	17,259	575	1,049.55	28.75	2,290	46
December	17,356	560	1,129.67	30.44	2,290	49
Total	202,430					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "Q" Chenier					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	30,529	985	1,681.00	25.71	2,333	72
February	39,078	1,396	1,902.00	25.99	2,333	82
March	46,623	1,504	1,901.88	25.45	2,333	82
April	43,702	1,457	1,901.75	25.43	2,333	82
May	47,699	1,539	1,901.88	25.59	2,333	82
June	45,024	1,501	1,901.88	26.57	2,333	82
July	39,402	1,271	1,901.25	25.74	2,333	82
August	45,567	1,470	1,902.00	25.56	2,333	82
September	45,037	1,501	1,902.00	25.43	2,333	82
October	47,745	1,540	1,902.00	25.56	2,333	82
November	50,642	1,688	1,902.00	25.38	2,333	82
December	52,748	1,702	1,902.25	25.28	2,333	82
Total	533,796					

	Well "R"					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	64,508	2,081	2,594.50	32.25	3,162	82
February	58,455	2,088	2,594.50	32.94	3,162	82
March	70,680	2,280	2,594.25	32.88	3,162	82
April	54,502	1,817	2,594.00	34.12	3,162	82
May	61,507	1,984	2,594.50	32.78	3,162	82
June	57,565	1,919	2,594.25	33.04	3,162	82
July	77,681	2,506	2,594.25	32.57	3,162	82
August	58,327	1,882	2,594.25	33.21	3,162	82
September	58,085	1,936	2,594.00	33.04	3,162	82
October	70,020	2,259	2,594.50	33.37	3,162	82
November	65,819	2,194	2,702.25	33.05	3,162	85
December	66,585	2,148	2,594.25	33.38	3,162	82
Total	763,734					

Table 16 – Annual Flow Summary (Valley Wells) continued

	WELL CURRENTLY NOT IN USE "I" Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January		0			1,973	0
February		0			1,973	0
March		0			1,973	0
April		0			1,973	0
May		0			1,973	0
June		0			1,973	0
July		0			1,973	0
August		0			1,973	0
September		0			1,973	0
October		0			1,973	0
November		0			1,973	0
December		0			1,973	0
Total	0					

Table 17 - Annual Flow Summary (Capreol Wells)

	"J" Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	55,934	1,804	1,954.81	29.43	3,273	60
February	11,348	405	1,674.16	26.43	3,273	51
March	0	0	0.00	0.00	3,273	0
April	0	0	0.00	0.00	3,273	0
May	11,267	363	1,605.10	36.42	3,273	49
June	34,301	1,143	1,758.20	36.57	3,273	54
July	22,649	731	1,827.33	36.71	3,273	56
August	37,702	1,216	1,764.75	37.52	3,273	54
September	21,049	702	1,502.67	36.10	3,273	46
October	17,687	571	1,527.46	37.09	3,273	47
November	7,911	264	1,543.10	33.33	3,273	47
December	21,003	678	1,556.83	30.68	3,273	48
Total	240,851					

	"M" Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	0	0	0.00	0.00	3,927	0
February	14,411	515	1,617.40	50.00	3,927	41
March	33,626	1,085	1,685.31	31.63	3,927	43
April	25,679	856	1,662.40	42.18	3,927	42
May	14,476	467	1,487.15	28.97	3,927	38
June	9,390	313	1,663.25	39.87	3,927	42
July	18,517	597	1,734.20	31.62	3,927	44
August	4,258	137	843.13	45.33	3,927	21
September	12,783	426	1,499.25	30.46	3,927	38
October	13,657	441	1,464.67	30.26	3,927	37
November	5,550	185	1,216.46	28.77	3,927	31
December	14,232	459	1,564.35	36.03	3,927	40
Total	166,579					

Falconbridge Drinking Water System
DWS# 240000020

Municipal Drinking Water License: 016-101
Issue Number: 3
May 24, 2017
Drinking Water Works Permit: 016-201
Issue Number: 3
May 24, 2017

In April 2009, the City of Greater Sudbury purchased the Falconbridge Wells and Storage Tank from Xstrata. The Falconbridge well system consists of 3 drilled wells:

- Falconbridge Well No. 5
- Falconbridge Well No. 6, and
- Falconbridge Well No. 7

Each well is equipped with a submersible pump. All three wells share a common treatment building that includes stand-by power, chlorine gas for disinfection, and a corrosion inhibitor. The wells are located north of the Sudbury Airport and were developed by Xstrata, now called Glencore. Water is supplied south to the Town of Falconbridge and north via the Western Main to the Greater Sudbury Airport and Glencore's Nickel Rim Mine reservoir. There is a booster pump for supplying water to Nickel Rim reservoir when a well pump is not operating. The City sells water to Glencore 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.

The distribution network in Falconbridge is relatively old and exposed to severe frost depths. Further, the elevated water storage provides a measure of security to the water system in the event of power interruptions and watermain breaks but its future is being explored. Other components of the distribution system include a fluoridation building, booster pumping station and a pressure regulating valve.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 18 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during 2017 reportable period.

Table 18 - Falconbridge Wells

Item	Non-Compliance	Corrective Measures Taken
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 19 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit.

Table 19 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NONE						

Annual Flow Summary

Table 20 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reportable period.

Table 20 – Annual Flow Summary (Falconbridge Wells)

	Falconbridge Well #5					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	7,079	228	916.83	16.16	1,417	65
February	11,245	402	953.65	16.17	1,417	67
March	5,164	167	917.84	15.99	1,417	65
April	9,560	319	890.79	16.09	1,417	63
May	7,927	256	874.45	16.46	1,417	62
June	7,169	239	838.34	15.90	1,417	59
July	9,626	311	935.75	15.85	1,417	66
August	1,445	47	729.14	15.71	1,417	51
September	5,412	180	839.09	15.70	1,417	59
October	14,300	461	976.37	15.64	1,417	69
November	11,739	391	1,216.53	15.88	1,417	86
December	4,049	131	1,024.85	15.93	1,417	72
Total	94,715					

	Falconbridge Well #6					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	10,624	343	939.17	14.31	1,417	66
February	6,651	238	871.12	14.23	1,417	61
March	5,643	182	841.70	14.37	1,417	59
April	6,385	213	812.04	14.34	1,417	57
May	6,393	206	849.67	14.32	1,417	60
June	3,619	121	726.41	14.19	1,417	51
July	7,850	253	916.47	14.13	1,417	65
August	6,261	202	855.07	14.36	1,417	60
September	8,994	300	958.72	14.22	1,417	68
October	6,467	209	986.81	14.18	1,417	70
November	9,996	333	1,095.75	14.08	1,417	77
December	10,480	338	1,013.43	14.14	1,417	72
Total	89,363					

Table 20 – Annual Flow Summary (Falconbridge Wells) continued

	Falconbridge Well #7					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	7,573	244	883.51	15.34	1,417	62
February	6,137	219	907.24	15.44	1,417	64
March	16,349	527	1,061.63	15.32	1,417	75
April	8,636	288	925.80	15.36	1,417	65
May	9,507	307	810.60	15.38	1,417	57
June	12,686	423	927.70	15.68	1,417	65
July	7,258	234	958.99	15.51	1,417	68
August	15,411	497	887.25	15.58	1,417	63
September	9,544	318	983.82	15.58	1,417	69
October	5,350	173	866.88	15.49	1,417	61
November	8,983	299	1,191.87	15.56	1,417	84
December	13,199	426	1,057.55	15.52	1,417	75
Total	120,633					

Onaping/Levack Drinking Water System
DWS# 220003519

Municipal Drinking Water License: 016-102
Issue Number: 3
May 24, 2017
Drinking Water Works Permit: 016-202
Issue Number: 3
May 24, 2017

In 2010, the Onaping well supply system, Onaping distribution and Levack distribution were considered to be one complete system as all of the systems are connected. As such, one Drinking Water System (DWS) number and one Certificate of Approval had been assigned to the entire system. The CofA has since been changed to the listed Drinking Water License and Works Permits. This report will identify the works by geographical area where appropriate.

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:

- Onaping Well No. 3,
- Onaping Well No. 4, and
- Onaping Well No. 5

Onaping Wells 3 and 4 are housed in a single pump house and Onaping Well 5 is in a separate building, but all feed into a common treatment building. The treatment building houses one well (Well 5) and provides chlorine gas injection for disinfection, fluoridation, as mandated by the Sudbury and District Health Unit, chemical addition for corrosion control and stand-by power. 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.

Completed projects in 2017 and the associated approximate costs included: rehabilitation of Well #3 at a cost of $59,075, an upgrade to the corrosion feed system, fluoride injection system and HVAC at a combined cost of $256,628.

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

Non-Compliance with Act, Regulations, Order or Approvals

Table 21 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2017 reportable period.

Table 21 – Onaping/Levack Wells

Item	Non-Compliance	Corrective Measures Taken
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 22 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit.

Table 22 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NONE						

Annual Flow Summary

Table 23 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2017 reportable period.

Table 23– Annual Flow Summary (Onaping/Levack Wells)

	Onaping Well #3					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	30,808	994	2431.21	29.77	5,184	47
February	23,326	833	2416.88	29.45	5,184	47
March	34,336	1,108	2422.06	29.46	5,184	47
April	20,169	672	2389.41	29.59	5,184	46
May	41,411	1,336	2413.14	29.48	5,184	47
June	15,880	529	2371.55	29.30	5,184	46
July	14,209	458	2439.86	29.17	5,184	47
August	5,642	182	1030.89	29.75	5,184	20
September	32,480	1,083	2412.87	29.48	5,184	47
October	13,052	421	1489.95	29.56	5,184	29
November	21,828	728	1775.45	29.30	5,184	34
December	202	7	153.87	51.19	5,184	3
Total	253,343					

	Onaping Well #4					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	7,626	246	2296.59	27.84	5,184	44
February	19,764	706	2233.47	27.51	5,184	43
March	23,717	765	2299.86	28.25	5,184	44
April	32,118	1,071	2293.82	27.61	5,184	44
May	27,239	879	2227.99	28.16	5,184	43
June	15,126	504	2181.32	31.97	5,184	42
July	25,372	818	2370.79	29.33	5,184	46
August	19,690	635	2388.65	29.11	5,184	46
September	16,898	563	2330.36	28.73	5,184	45
October	11,851	382	1825.11	29.78	5,184	35
November	12,335	411	1804.62	28.99	5,184	35
December	5,138	166	1365.68	29.25	5,184	26
Total	216,874					

Table 23– Annual Flow Summary (Onaping/Levack Wells) continued

	Onaping Well #5					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	36,231	1,169	2603.68	54.56	5,184	50
February	31,797	1,136	3075.76	45.40	5,184	59
March	29,326	946	3074.77	45.13	5,184	59
April	36,765	1,226	3508.48	55.45	5,184	68
May	32,013	1,033	3506.12	48.75	5,184	68
June	60,004	2,000	3962.01	55.24	5,184	76
July	51,865	1,673	3506.56	55.96	5,184	68
August	68,047	2,195	3505.86	50.54	5,184	68
September	19,691	656	3503.79	50.10	5,184	68
October	16,237	524	1339.97	50.55	5,184	26
November	10,295	343	1550.25	47.21	5,184	30
December	42,305	1,365	1940.59	43.95	5,184	37
Total	434,576					

Vermilion Distribution System
DWS# 260006789

Municipal Drinking Water License: 016-104
Issue Number: 3
May 24, 2017
Drinking Water Works Permit: 016-204
Issue Number: 4
May 24, 2017

The Vermilion 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 Vermilion water treatment facility, which acts as the donor for the CGS Vermilion 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 Anishnawbek, 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 MOECC regulations. Projects undertaken in 2017 were watermain lining at the approximate cost of $150,316.

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

Table 24 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2017 reportable period.

Table 24 - Vermilion Distribution System

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2017 Adverse Water Quality Incident Report

Table 25 provides details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre and the Sudbury and District Health Unit.

Table 25 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
132242	2017/01/17	Free Chlorine	>0.05	mg/L	Flush distribution lines to restore disinfectant residuals to regulatory requirements	2017/01/18

Annual Flow Summary – N/A