Ontario

Ministry of the Environment
Drinking Water System Inspection Report

Township of South Glengarry

LANCASTER DRINKING WATER SYSTEM

Report Prepared
By

The Drinking Water Inspection Program
Safe Drinking Water Branch

February 2004

Inspected On: July 9 & 10, 2003

Ontario

Ministry of the Environment
Drinking Water Inspection Report

LANCASTER DRINKING-WATER SYSTEM INSPECTION REPORT

INSPECTION DETAILS

Location:	The water treatment plant including low lift pumping station, unit processes, high lift pumping station and reservoir are located at Concession 1, Part of Lot 35 in South Glengarry Township, United Counties of Stormont, Dundas & Glengarry.
Water Works Type:	Conventional Water Treatment Plant With Distribution
Water Works Number:	260006867
Inspection Type:	Announced
Date of Inspection:	July 9 & 10, 2003
Date of Previous Inspection:	June 19, 2002
Inspection Number:	413

CONTACT INFORMATION

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SECTION 1 INTRODUCTION

1.1 INSPECTION OBJECTIVES

The primary focus of this inspection is to confirm compliance with Ministry of the Environment legislation and control documents, as well as conformance with Ministry drinking water-related policies. This compliance assessment will concentrate on the time frame spanning from the date of the preceding inspection (June 19, 2002) to the date of the inspection that is the subject of this report (July 9 & 10, 2003).

Specifically, this compliance evaluation will include a review and assessment of operating practices in relation to the following documents:

- Drinking Water Systems Regulation (O. Reg. 170/03, as amended) which came into force on June 1, 2003; and its predecessor the Drinking Water Protection Regulation (O. Reg. 459/00, as amended) which was in force between August 26, 2000 and May 31, 2003);
- Operator Certification Regulation (O. Reg. 435/93, as amended);
- Certificate of Approval (CofA) No. 2146-4HLSL9, issued May 12, 2000;
- Certificate of Approval No. 7180-4JRR64, issued April 28, 2000;
- Permit to Take Water (PTTW) No. 00-P-4046, issued May 5, 2000;
- Preceding Ministry inspection report, dated June 19, 2002;
- Lancaster Water Treatment Plant Pre-Design Report, dated March 2000; and,
- Documents, records, and correspondence contained within files maintained at the Ministry's Cornwall Area Office and the Eastern Regional Office in Kingston.

The ministry is implementing a rigorous and comprehensive approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as water system management practices. This inspection will therefore assess the operation of the drinking-water system industry best practices.

Table 1 AUTHORIZING AND CONTROL DOCUMENTS REVIEWED

CERTIFICATES OF APPROVAL		
Certificate #	**Date Issued**	**Description**
2146-4HLSL9	May 12, 2000	Approval for the design, construction and operation of the Lancaster Surface Water Treatment Plant having a rated capacity of 1,440 cubic metres per day (m^3/d).
7180-4JRR64	April 28, 2000	Approval for the installation of one standby natural gas fired generator set, having a rating of 125 kilowatts.
PERMIT TO TAKE WATER (PTTW)		
Permit #	**Expiry Date**	**Description**
00-P-4046	May 1, 2007	Permit authorizing the taking of water from Lake St. Francis located on Lot 35, Concession I, Township of South Glengarry for a communal water supply for the Village of Lancaster and the Hamlet of South Lancaster. Rate of taking shall not exceed 1,000 litres per minute (L/min) or 1,440 litres per day (L/d). PTTW N0. 00-P-4046 includes one Special Condition requiring records with respect to the measurement and reporting criteria defined under General Condition 3(d) to be kept daily by the Permit Holder at the offices of The Corporation of the Township of South Glengarry, 6 Oak Street, Lancaster, ON, until the Ministry requests them to be submitted or states otherwise.
PREVIOUS ORDERS		
Order #	**Date Issued**	**Description**
Not Applicable	Not Applicable	There were no orders in force at the time of inspection.

A copy of the Certificates of Approval described above are provided in **Appendix A.**

A copy of Permit To Take Water No. 00-P-4046 is provided in **Appendix B.**

SECTION 2 EXISTING WATER SYSTEM DESCRIPTION

2.1 WATER SOURCE

The Lancaster Drinking-Water System draws raw water from Lake St. Francis which is part of the St. Lawrence River. The "Lancaster Water Treatment Plant Pre-Design Report, March 2000" prepared by Totten Sims Hubicki Associates for the Township of South Glengarry includes a partial raw water characterization. This partial characterization compared the raw water quality to selected Schedule 1 Microbiological Standards and Schedule 2 Chemical Standards set out in Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards, hereafter referred to as "the ODWQ Standards", and operational guidelines set out in the Ministry publication "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2003". Schedule 3 Radiological Standards were not examined by the characterization. Based on this limited characterization, the raw water meets the ODWQ Standards with the exception of total coliform and E. Coli and/or fecal coliform. The characterization also identified turbidity as a parameter of concern.

Raw water is delivered to the treatment process through a 450 millimetre (mm) diameter high density polyethylene intake pipe and transmission line. The intake is located approximately 1300 metres (m) offshore southeast of a land mass known as Faulkner's Point. The intake is located in a water depth of 10 m and the bell mouth opening is situated approximately 2 m off the lake bottom. The transmission line extends 265 m further north from the shore line to the treatment process building.

A diffuser and chemical feed line is installed within the intake and transmission line to provide control of Zebra Mussels. A raw water sample line is also installed within the intake.

GPS coordinates for the source can be found in **Appendix C**.

2.2 TREATMENT PROCESSES

The drinking-water system's water treatment process is commonly referred to as conventional treatment, and includes twin process trains consisting of coagulation-flocculation, sedimentation, filtration and disinfection unit processes. One process train employs granular activated carbon filtration; while the other uses dual media (anthracite and sand) filtration. The sedimentation process is also equipped with lamella settling tubes. Lamella settling tubes provide maximum surface settling rate while minimizing the footprint of the sedimentation tanks.

The treatment process employs acidified alum for coagulation-flocculation, sodium carbonate (soda ash) for post pH adjustment and distribution system corrosion control and sodium hypochlorite for Zebra mussel control, primary and secondary disinfection.

The treatment process is housed within a single treatment building. The building also houses a raw water low lift pumping station consisting of two stationary coarse screens and three low lift (raw water) pumps, and a high lift pumping station consisting of three high lift pumps and a twin-celled, baffled clear well/chlorine contact chamber having a total working volume of 274 cubic metres (m^3).

The treatment process is monitored using continuous monitoring equipment consisting of:

- five magnetic flow meters used to measure raw water, filter influent, treated water, filter backwash water and process wastewater flow rates;
- two continuous chlorine residual analyzers, one used to monitor total chlorine residual in the raw water for the purpose of Zebra Mussel control, and the second used to monitor free chlorine residual at the location where the intended contact time is achieved, prior to entering the distribution system;
- four continuous turbidimeters, one used to monitor raw water turbidity, a second and third located on each of the filter effluent lines to monitor the effluent from each filter, and a fourth to monitor treated water turbidity;
- two continuous pH analyzers to monitor the pH of the raw and treated water;
- ultrasonic level detectors in all tanks; and
- a Supervisory Control and Data Acquisition (SCADA) system.

The drinking-water system has been designed to treat water a maximum flow rate of 1440 m^3/day.

Details on the treatment process can be found in the facility Certificate of Approval included in **Appendix A.**

GPS coordinates for the process building (low lift station, treatment and high lift station) can be found in **Appendix C.**

2.3 DISTRIBUTION SYSTEM

The Lancaster distribution system services a population of approximately 1218, equivalent to 406 service connections. The system is constructed of Class 160 polyvinyl chloride (PVC) piping ranging in diameter from 150 mm to 300 mm. The total length of distribution system piping is approximately 7.0 kilometres (km). Details with respect to the number of fire hydrants were not available for the system. One steel standpipe provides an elevated storage capacity of 1455 m^3.

2.4 SYSTEM DIAGRAM (where available)

A process schematic of the Lancaster Water Treatment Plant and schematic of the distribution system is provided in **Appendix F**. The process and distribution system schematics were taken from the "Township of South Glengarry Lancaster Water Treatment Plant Pre-Design Report, March 2000" prepared by Totten Sims Hubicki Associates.

SECTION 3 INSPECTION FINDINGS

3.1 OPERATIONS

3.1.1 Source/Supply

The drinking-water system's intake is located in lake St. Francis approximately 1300 m offshore of Faulkner's Point in 10 m of water. The intake is located approximately 10 km, 20 km and 30 km downstream of the Glen Walter, City of Cornwall and Domtar wastewater treatment plant out falls, respectively. Lake St. Francis forms part of the St. Lawrence Seaway and is subjected to shipping traffic. A number of marinas equipped with fueling stations are located along the shores of the St. Lawrence River. The intake may therefore be potentially subjected to liquid spills from freighters and fuel spills from other water craft and fueling stations.

Condition 3.1 of Certificate of Approval No. 2146-4HLSL9 for the DWS states,

"The Owner shall endeavour to take all necessary steps, within the Owner's authority, to ensure protection of the source of water supply Lake St. Francis from contamination."

Source protection measures may include for example: identifying local high risk sources of contamination to the raw water source; preparing a response procedure to address potential

contamination; development and delivery of an education and outreach program to the users of the DWS and the water source to describe how individuals may take precautions to protect the source (proper disposal/recycling of household hazardous waste).

According to Shawn Killoran, a contingency procedure has been developed to address a spill to the raw water source; however a formal written source protection plan has not been developed by the Township of South Glengarry. Furthermore, it was identified during discussions held between Mr. Killoran, Mr. Marcel Lapierre and the inspector, that the municipality is awaiting guidance from the Ministry of the Environment with respect to the required format and content prior to developing a source protection plan/program.

The zebra mussel control system is normally operated during the breeding season for the mussels; this period is typically when the raw water temperature is above 12 degrees Celsius (°C). The control system injects sodium hypochlorite into the intake only when the raw water pumps are operating. The raw water temperature on the day of the inspection was 20 °C and the zebra mussel control system was operating.

Permit to Take Water Assessment

PERMIT TO TAKE WATER ASSESSMENT				
PERMIT NUMBER	**RENEWAL DATE**	**SOURCE**	**PERMITTED AMOUNT OF TAKING**	**UNITS**
00-P- 4046	May 1, 2007	Lake St. Francis	1,000	Litres/min
00-P- 4046	May 1, 2007	Lake St. Francis	1,400,000	Litres/day

PERMIT TO TAKE WATER EXCEEDANCES/MAXIMUM RATE OF TAKING			
DATE	**FLOW L/MIN**	**FLOW L/DAY**	**LOCATION**
November 8, 2002	663	-	Lot 35, Concession I, Township of South Glengarry
November 14, 2002	-	664,000	Lot 35, Concession I, Township of South Glengarry
The rates of taking shown in table are the maximum rates of taking reported since the DWS was last inspected. The permitted maximum instantaneous and maximum daily rates of taking were not exceeded.			

Permit to Take Water Number 00-P-4046, hereafter referred to as "the PTTW" or "the Permit" was issued to the Township of South Glengarry on May 5, 2000. The PTTW authorizes the taking of water from Lake St. Francis for the purpose of a communal water supply for the Village of Lancaster and the Hamlet of South Lancaster at a maximum instantaneous rate not to exceed 1,000 litres per minute (L/min), or a maximum daily rate of taking (volume per day) not to exceed 1,440,000 litres per day (L/day).

The Permit imposes two special conditions 14 and 15 upon the Township of South Glengarry.

Special condition 14 states:

" Records with respect to the measurement and reporting criteria defined under General Condition 3(d) listed above shall be kept daily by the Permit Holder at the offices of The Corporation of the Township of South Glengarry, 6 Oak Street, Lancaster, ON, until this Ministry requests them to be submitted or states otherwise."

Special condition 15 states:

"No water shall be taken under authority of this Permit after May 1, 2007."

For reasons of interpretation of special condition 14 above, general condition 3 of the Permit is provided below. General condition 3 states:

"The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit Holder to undertake any of the following actions. The Permit Holder shall comply with any such notice:

(a) To establish such a system and to record measurement of the quantities of water taken;
(b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
©) To return to the Director records made pursuant to clause 3(b) at such times or with such frequency as the Director may specify; and
(d) To keep records made pursuant to clause 3(b) available for inspection until such time as they are returned to the Director pursuant to clause 3©)."

Records required by special condition 14 are recorded as "Annual Records of Water Taking" and can be found at the offices of The Corporation of the Township of South Glengarry, located at 6 Oak Street in the Village of Lancaster and at the operational administrative office for the Lancaster drinking-water system, located in Glen Walter.

The inspector reviewed detailed flow records for the drinking-water system for the period since the last inspection. The maximum instantaneous rate of raw water taking for the period occurred on November 8, 2002; the reported rate of taking is 663 L/min. The maximum daily rate of raw water taking for the period occurred on November 14, 2002; the reported rate of taking is 644,000 L/day. The maximum rates of taking identified in the Permit were not exceeded since the previous inspection.

General condition 4 of the permit states:

"The Permit Holder shall immediately notify the Director of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint."

Shawn Killoran reported that there have been no notices concerning interferences with downstream uses of water or with the natural functions of Lake St. Francis in relation to the taking of water for the operation of the Lancaster drinking-water system.

According to Shawn Killoran, the daily raw and treated water average daily flow rates are monitored and compared to typical values expected at the drinking-water system for that time of year. Where a significant difference exists between the actual and a typical rate of flow, the cause is investigated. There were no significant fluctuations in the quantity of raw water consumed during the period examined by this inspection. The ratio of flow for summer to winter months for the drinking-water system is 1.07. This value indicates that the quantity of raw water taken remains relatively consistent throughout the year.

Upon request, the inspector was provided with copies of all municipal by-laws that pertain to the drinking-water system. The by-laws provided include:

The Corporation of the Township of South Glengarry By-Law 59-01 for the Year 2001, being a by-law to require owners of buildings to connect such buildings to water works within the Lancaster/South Lancaster Service Area in the Township of South Glengarry and to regulate the connection of individual water services to the municipal potable water system, hereafter referred

to as By-Law 59-01; and

The Corporation of the Village of Lancaster By-Law No. 12-76, being a by-law to enact rules and regulations for the maintenance and operation of a system of water works in the Village of Lancaster, hereafter referred to as By-Law 12-76.

The inspector reviewed the by-laws and noted that neither by-law addresses water conservation measures to limit water usage when necessary. However, the Township in cooperation with the Raisin Region Conservation Authority has offered water conservation devices free of charge to residents. The per capita flow rate for the Lancaster drinking-water system is approximately 421 litres per person per day (average of 2002 and 2003). This figure is slightly less than the provincial average consumption rate of 455 litres per person per day.

A copy of the PTTW can be found in **Appendix B.**

3.1.2 Treatment Processes

The Township of South Glengarry has ensured that the water treatment equipment is installed, operated and maintained in accordance with Ontario Regulation 170/03, as amended, the *Safe Drinking Water Act* and applicable Certificates of Approval. Daily records kept by the operational staff were reviewed by the inspector and demonstrate that the water treatment equipment is in operation whenever water is being obtained or supplied and is operated in a conscientious manner to achieve the required design capabilities.

Assessment with Rated Maximum Day Flow Rate Capacity

TREATED WATER CAPACITY ASSESSMENT			
	2001	**2002**	**2003**
Average Day Flow (m^3/d)	303.7	327.6	307.3
Maximum Day Flow Rate (m^3/d)	992	644	480
Rated Maximum Day Flow Rate (m^3/d)	1440	1440	1440
% of Rated Maximum Day Flow Rate	68.89 %	44.72 %	33.33 %

The average day and maximum day flow rate figures for 2001 through 2003 provided in the preceding table were obtained from the previous Ministry of the Environment Communal Drinking Water Inspection Report and the daily operational records for the drinking-water system. The rated maximum day flow rate capacity of 1440 m^3/day is identified in the current

Certificate of Approval Number 2146-4HLSL9.

The Lancaster water treatment equipment was commissioned in March 2001; therefore, the flow rate data provided for 2001 represents data collected from April to December. The flow rate data for 2003 represents data collected from January to June. There have been no reported exceedences of the maximum rated flow capacity for the water treatment equipment since commissioning.

A sufficient number of flow meters have been installed to measure the flow rate of water being conveyed to and through the water treatment equipment and the daily quantity of water supplied to the Lancaster distribution system. Five magnetic flow meters used to measure raw water, treated water, intermediate processes and process wastewater were last calibrated by Ken Harris Instrumentation and Control Limited on October 16, 2002. According to the previous Ministry of the Environment Communal Drinking Water Inspection Report, the five flow meters were previously calibrated on April 3 and April 4, 2002, by the same contractor. The information contained within the calibration reports verifies that the flow meters have been calibrated in accordance with condition 2.1 of Certificate of Approval Number 2146-4HLSL9.

The are no locations within drinking-water system where chlorine demand has been found to vary appreciably over short durations. Currently, continuous chlorine residual monitoring is conducted on the raw water to verify adequate prechlorination for zebra mussel control and in the treatment process at or near the location where the intended contact time has just been completed. Shawn Killoran reported that the intermittent operation of the prechlorination system results in a cyclical degradation of chlorine residual in the intake. This mode of operation has made it difficult to properly calibrate the prechlorination residual analyzer.

The continuous chlorine analyzer used to verify primary disinfection is provided with low and high level alarms to ensure that continuous disinfection takes place. The low level alarm is set at 0.5 mg/L free chlorine; while the high level alarm is set at 5.0 mg/L free chlorine. These alarm set points are not consistent with the free chlorine residual required to achieve primary disinfection (1.0 mg/L under worst case operational conditions for the Lancaster water treatment equipment) and the maximum free chlorine residual (4.0 mg/L) within a distribution as recommended by the "Procedure for Disinfection of Drinking Water in Ontario, revised April 16, 2003". Measurements of chlorine residuals have been taken with the required accuracy stipulated in condition 2.1 ©) (I) of Certificate of Approval Number 2146-4HLSL9 and section 6-5 (1) of Schedule 6 of Ontario Regulation 170/03, as amended. The Township of South Glengarry was not meeting the requirements of subsection 7-2 (2) of Schedule 2 of Ontario Regulation 170/03,

as amended. On November 27, 2003, the Township had installed continuous monitoring equipment to sample and test the free chlorine residual in the Lancaster distribution system.

Each filter effluent line is continuously monitored for turbidity using HACH 1720D turbidimeters that measure and display turbidity in Nephelometric Turbidity Units (NTU). The HACH 1720D turbidimeters measure turbidity with the required accuracy specified in condition 2.1 ©) (ii) of Certificate of Approval Number 2146-4HLSL9 and Schedule 6-5 (1) of Ontario Regulation 170/03, as amended.

The design calculations contained in the March 2000 Pre-design Report for the Lancaster Water Treatment Plant identified that under worst case operating conditions an adequate CT of 74 mg/L·min would be achieved if a target free chlorine residual of 1.0 mg/L is maintained. The operating staff are not aware of the minimum required CT for the DWS, and CT is not routinely used in process calculations concerning the disinfection process. The disinfection system is operated to maintain the target free chlorine residual of 1.0 mg/L or higher with a goal of maintaining a free chlorine residual of 0.4 mg/L at the Ontario Provincial Police detachment on Pine Street; the point in the distribution system furthest from the water treatment plant. The disinfection procedures used at the DWS appear to have enabled the required CT to be met. Disinfection procedures are applied in accordance with Certificate of Approval Number 2146-4HLSL9 and the "Procedure of Disinfection of Drinking Water in Ontario". Process equipment is operated in a manner to assure that chlorine residuals are maintained in the distribution system in accordance with Ontario Regulation 170/03, as amended.

Operational records indicate that 418.8 kg of sodium hypochlorite, calculated as chlorine and 2,064 litres of ClarIon acidified alum were used to treat 130,950 cubic metres of water. The operational records indicate that acidified alum was consistently dosed while the treatment equipment was in operation. The coagulant feed system is equipped with an alarm and control interlock to automatically shut down the treatment equipment in the event there is a total failure of the chemical feed system. The sodium hypochlorite solution is listed as meeting the requirements of ANSI/NSF 60. The acidified alum meets the requirements of AWWA/ANSI Standard B403-98 and ANSI/NSF 60. Fluoridation is not practiced at the Lancaster Drinking-Water System.

In addition to filter effluent turbidity, filter operation is monitored continuously or daily for loss of head, filter run time and volume of backwash water used. Settled water turbidity is not routinely monitored for the purpose of optimizing coagulant dosage and filter performance. Filter influent flow is monitored and the rate of filtration is constantly maintained using effluent

rate control valves.

The Township of South Glengarry has not established any specific documented internal water quality goals beyond the requirements of Ontario Regulation 169/03 and Ontario Regulation 170/03. In the June 24, 2003 "Staff Report" addressed to the Township's Council, wording is provided which states, "The water department will continue to maintain and ensure safe and potable water to meet or exceed Ministry standards." In addition to the sampling and testing requirements in Certificate of Approval Number 2146-4HLSL9, the Township conducts monthly sampling of the raw and treated water for *clostridium perfringens*. *Clostridium perfringens* is an indicator organism for recent fecal contamination and the presence of Cryptosporidium oocyts.

Pesticides are not stored or applied around, over, or in the immediate vicinity of the drinking-water system. Private and commercial applicators of pesticides are not permitted to fill dilution tanks or mix pesticide concentrates on the premises of the water treatment facility.

According to design documents for the drinking-water system, the water treatment facility's plumbing system has been designed in compliance with "Part 7 - Plumbing" of the Ontario Building Code, made under the *Building Code Act*. Part 7 requires the installation of backflow prevention devices on any fixture or tank that is not subject to pressures above atomospheric pressure; where a potable water supply is connected to a boiler, tank, cooling jacket, lawn sprinkler system or other device where a non-potable fluid may be under pressure that is above atomospheric or the water outlet may be submerged in a non-potable fluid, and where a potable water system serves a fire protection system.

Sanitary, laboratory, sampling station and floor drain wastes within the water treatment facility drain to a packaged duplex sump pump station. The wastes are then directed to the process wastewater sludge force main which connects to the Lancaster sanitary sewer system.

The Lancaster drinking-water system and associated equipment appeared to be maintained in accordance with section 11 (1) of the *Safe Drinking Water Act* and condition 3.4 of Certificate of Approval Number 2146-4HLSL9.

3.1.3 Process Wastewater

Process wastewater is generated through regular backwashing of the granular activated carbon and dual media filters, filter to waste cycles and desludging of the sedimentation tanks. Filter backwashing and sedimentation tank desludging occur automatically based on head loss and

timed cycles. There is no provision in the treatment process to recycle sedimentation desludge or backwash water supernatant.

The process wastewater is directed to a settling tank installed below the floor of the water treatment facility building. The tank has been designed to treat up to 150 cubic metres per day, based on a worst case scenario of all filters backwashing on the same day. Settled sludge is pumped from the settling tank to the Lancaster sanitary sewer system by a 7 litre per second capacity submersible pump. Supernatant is decanted from the settling tank to a supernatant/overflow line discharging to Lake St. Francis using a 10 litre per second capacity centrifugal pump. The wastewater settling tank is equipped with liquid level controls and alarms, and access hatches for inspection and cleaning.

The effluent (supernatant) from the process wastewater treatment facility is sampled monthly using a composite sampler and tested for suspended solids. The annual average effluent suspended solids concentration for the period inspected is less than 2.3 mg/L. The process wastewater equipment has been operated, sampled and tested in compliance with conditions 1.5 and 2.1 (f) and 2.1 (g) of Certificate of Approval Number 2146-4HLSL9.

3.1.4 Distribution System

Maintenance Programs

Plans for the original Village of Lancaster distribution system and the newer South Lancaster distribution system are available to operating staff at the Glen Walter administrative office. The operational log book and maintenance log are used to document repairs and maintenance in the distribution system. Repairs and maintenance of the distribution system are either performed by, or coordinated and supervised by licenced operators.

The Township of South Glengarry has not developed or adopted formal standards for the design, material selection and plumbing requirements for the purpose of maintaining distribution system integrity. According to the original design specifications and tender documents for the distribution system, all original materials used in its construction were to have met AWWA Standards.

The Township of South Glengarry has prepared a contingency procedure to address water main breaks. A formal document has not been prepared to provide standards for flushing, disinfection and testing of new and repaired water mains and water storage structures within the drinking

water system. The procedure does not reference or adopt ANSI/AWWA C651-99 Standard for Disinfecting Water Mains, ANSI/AWWA C652-02 Standard for Disinfection of Water-Storage Facilities and ANSI/AWWA C653-97 Standard for Disinfection of Water Treatment Plants. During the site inspection Mr. Killoran obtained a copy of ANSI/AWWA C651-99 Standard for Disinfecting Water Mains and modified the Township's water main break procedure to reference this Standard.

Formal documented standards or procedures have not been adopted or prepared to address water main flushing and swabbing. The Township of South Glengarry flushes water mains once per year in the fall. The Township has not implemented a water main swabbing program. According to Mr. Killoran conditions, such as varying or excessive chlorine demand have not been observed in the distribution system to warrant swabbing.

Water pressure is continuously monitored using a pressure transmitter and recorded at the point of entry to the distribution system by the SCADA equipment; routine pressure readings within the distribution system itself are not conducted. The Township of South Glengarry has not identified any low pressure zones within the distribution system. There have been no recorded complaints concerning water pressure.

The Township has not established a formal documented valve inspection, exercising and repair program based on the AWWA C500 series Standards. Valves are inspected and exercised annually when water main flushing is performed. A formal fire hydrant inspection, operation and repair program based on Part 6 (Fire Protection Equipment), Section 6.6 (Water Supplies for Fire Protection) of Ontario Regulation 388/97, as amended, made under the *Fire Protection and Prevention Act* has not been established by the Township. Hydrants are inspected, operated and winterized each fall.

Wastewater generated as a result of distribution system maintenance and flushing activities is usually directed to the sanitary sewer or to ground where there is no access to the sanitary sewer system.

The Township of South Glengarry does not have a capital works program specific to the replacement of water mains and associated appurtenances. Water main replacement is generally conducted on an emergency repair basis. The Township does not have a proactive, distribution system leak detection program; however, operating staff routinely observe drinking water system flow rates for abnormal conditions and investigate for possible leaks based on their observations and public reports. All consumers of treated water within the Lancaster Drinking Water System

service area are metered. Unaccounted water (difference between the quantity of water treated and supplied to the distribution system and quantity of water billed expressed as a percentage of the total quantity of treated water) figures were not available for the Lancaster Drinking Water System.

Cross Connection and Backflow Prevention

Private and commercial pesticide applicators are not permitted to access hydrants within the Township of South Glengarry for the purpose of mixing and diluting pesticide concentrates. Section 50 of By-Law No.12-76 prohibits unauthorized access to hydrants. By-Law 59-01 requires the owners of certain buildings in the Lancaster Drinking Water System service area to install backflow prevention devices. Section 12 of By-Law 59-01 requires all abandoned wells, or wells not being utilized for the supply and delivery of water to a building to be sealed to the satisfaction of the Municipality. Sections 53 and 54 of By-Law 12-76 prohibits connections between the Lancaster Drinking Water System and any cisterns, wells, privies, privy vaults or cess-pools and a private pressure pump. The Township of South Glengarry inspects residential and commercial water meters annually; during these inspections the plumbing is examined for evidence of illegal cross connections.

There are no major industries located within the Lancaster service area; therefore, the Township of South Glengarry has not included requirements for vacuum backflow prevention devices in its current By-Laws.

Storage Structure and Booster Station Assessment

The standpipe within the distribution system was last cleaned and inspected approximately three years ago during construction of the new water treatment plant. According to Shawn Killoran the clear well/reservoir is inspected biannually and cleaned as required. Pesticides are not applied or stored around, over or in the immediate vicinity of the standpipe.

3.2 WATER SYSTEM MANAGEMENT PRACTICES

3.2.1 Operational Manuals

The Lancaster Water Treatment Plant Operations and Maintenance manual and associated equipment installation and maintenance manuals are maintained at the water treatment plant. Copies are also maintained at the Glen Walter administration office. The operational staff are

aware of the manuals, their location and contents. According to John Cameron, Operator, the manuals are referred to as required when more expertise or details are required for the operation and maintenance of a unit process or particular piece of equipment.

The manual has been prepared in a standardized format in accordance with the Ministry of the Environment publication, "The Master Model Operations Manual for Water Supply Systems, 1992" and contains the following topics: Plant Overview, Detailed Unit Operations (source, raw water handling, particulate removal, disinfection, other processes, storage & transmission and common utilities), Certificates of Approval, Permit to Take Water, Conversion Tables, Directories, Forms, Glossary, Pertinent Regulations, Safety Procedures, Emergency Procedures, SCADA, Process Diagrams, Sampling Procedures and Material Safety Data Sheets. The manual is broken down further into sections that provide: functional overviews, operational descriptions, safety procedures, emergency provisions and monitoring and reporting as applicable. The manual is dated June 2001 and was last reviewed on March 10, 2003.

As built plans/drawings for the drinking water system are available at the water treatment plant and at the Glen Walter administrative offices. The most recent plans for the water treatment plant and the South Lancaster distribution system, the original Lancaster distribution system and standpipe are dated January 2000, November 1973 and January 1978, respectively. The most recent plans and the operations and maintenance manual are up-to-date and are consistent with the current Certificate of Approval.

The operations and maintenance manual includes sections outlining daily, weekly, monthly and annual operational and maintenance checks for each major unit process. In addition, the Township of South Glengarry has developed a daily checklist for the purpose of monitoring and inspection of the water treatment plant. Process adjustments are made based on the daily checks and in-house testing. This information is recorded in the log book for the drinking-water system.

The operations manual contains information concerning the frequency of sediment removal from the clarification process. Sediments are removed during each drain-down cycle that occurs each time a filter backwash cycle is initiated. The operations manual also specifies that the sedimentation tanks should be removed from service and completely cleaned once per year.

With respect to filter operation, the operations manual recommends backwashing a filter when the head loss reaches 2.1 to 2.4 metres (7 to 8 feet). Head loss is measured by a head loss gauge on each filter. Only one filter may be backwashed at a time. Post-backwash turbidity spiking is addressed at the facility trough a filter-to-waste cycle that directs the first 7 cubic metres of filter

effluent to waste following a backwash. Filter turbidity spikes are also minimized by maintaining a constant rate of filtration through the use of automatic filtration rate control valves on each filter effluent line.

The drain-down and backwash cycles are entirely automatic and may be manually overridden as necessary.

The manual does not present information regarding a sampling plan, including: a sampling schedule, sampling procedures, and specific sample locations; however, the Township of South Glengarry has prepared a sampling schedule consistent with Schedules 10 and 13 of Ontario Regulation 170/03, as amended.

An Operations and Maintenance Manual does not exist for the distribution system.

3.2.2 Logbooks

A single all-encompassing logbook is not maintained for the Lancaster drinking-water system. Instead, operational records are recorded using several means including: a daily operational check record; bench sheets for recording information concerning operational tests; a daily operational data report produced by the water treatment plant's SCADA system; real time data trended and recorded within the plant's SCADA computer, a bound attendance logbook, a bound, numbered-page system logbook and a maintenance log.

The daily operational check record contains hand-written entries with respect to raw and treated water flow rates, raw water characteristics (pH, turbidity, colour, temperature and prechlorination residual), treated water characteristics (pH, colour, turbidity, temperature, free and total chlorine residual, aluminum residual), process chemical dosages and quantities used, filter run hours, and backwash water volume.

Plant flow data and continuous water quality monitoring equipment data (pre and post chlorine residuals, raw and treated water pH, temperature, and turbidity, and filter effluent turbidity) is recorded and trended by the drinking-water system's SCADA computer. The data recorded and trended by the SCADA system is reviewed daily or within 72 hours of collection by the operational staff. The data archiving capability of the SCADA computer is not known, nor is the data routinely backed up from the SCADA computer's hard drive.

The Township of South Glengarry has no all-encompassing system in place for recording

required operational test information including: the date and time each sample is taken, the location from which each sample is taken, the name(s) of the person(s) who took the each sample and/or conducted each test, the time each test was conducted and the results of each test. All of this information is generally available in the drinking-water system's logbook, operational test bench sheets, SCADA records, and laboratory submission and chain of custody forms. However, the bench sheets used for the purpose of recording information concerning operational tests do not include the time each sample was taken; the time each sample was tested and the name(s) of the person(s) who took the sample and conducted the test. The initials of person(s) performing chlorine residual testing and taking regulatory samples is recorded in the bound logbook for the drinking-water system. All the required information is recorded on the laboratory submission and chain of custody forms. Although not specifically identified on the bench sheets, all operational testing at the drinking-water system has been conducted by certified operators.

There are two separate logbooks for the Lancaster drinking-water system. A bound attendance logbook is maintained at the Glen Walter administrative office for recording the names of operational staff on duty and the periods worked. The attendance log book also serves as a daily record of the amount of time each operator spends working as an operator-in-charge. The Township of South Glengarry operates three drinking-water systems and three wastewater systems and maintains that any operator on duty, other than an operator-in-training, is an operator-in-charge.

A bound drinking-water system logbook is maintained at the Lancaster treatment plant for recording details specific to the operation of that system. The daily operating status of equipment is recorded in the system logbook when the equipment malfunctions or when it is removed from service; normal equipment operational status is not usually recorded. Where equipment has malfunctioned or ceased to operate, details with respect to actions taken to repair and return the equipment to service have been documented. The Lancaster drinking-water system is staffed daily with one shift only; the operational status of equipment is available at the end of the daily shift. The operators on duty during a shift are recorded in the attendance logbook. The operators on duty at the Lancaster drinking-water system are also denoted in the system logbook by each operator's initials. A legend has been provided in the front of the system logbook depicting the name of each operator with their hand-written initials opposite each name. The identity of the operator-in-charge for the drinking-water system on any given day is not clearly identified in the system logbook. All entries in the system logbook have been made by licenced operators employed by the Township. The system logbook entries appear to have been made chronologically. Each operator making an entry into the system logbook is generally identified by their initials. There have been no instructions provided to the operational staff to depart from

normal operating procedures, nor has there been situations where the operators have departed from normal operating procedures. Abnormal or unusual conditions and observations, including adverse water conditions and corrective actions have been recorded in the system logbook.

Maintenance records are made in a tabular maintenance schedule/log. The log is bound in a duotang type folder. The maintenance tasks and frequency have been outlined in a schedule. The schedule appears to be based on the equipment and operations manuals for the Lancaster drinking-water system and the operations staff's experience in operating the system. The schedule contains weekly, monthly and annual maintenance tasks for key equipment and components of the treatment plant and distribution system. All maintenance and repairs on the drinking-water system are conducted or supervised by certified operators.

3.2.3 Contingency and Emergency Planning

The Township has developed a contingency plan for dealing with emergency and upset conditions that may occur from time to time at the drinking-water system. Copies of the plan are kept at the Lancaster water treatment plant and at the Glen Walter administrative office. The plan contains emergency procedures for the following scenarios:

- Power Failure
- Stand-by Power Generator Malfunction
- Sodium Hypochlorite Leak
- High Lift Pump Low Discharge
- High Lift High/Low Level
- High Lift Pump Failure
- Low Lift Low Level
- Low Lift Pump Failure
- Illegal Entry
- Low Chlorine Residual
- Programmable Logic Controller (PLC) Malfunction
- Water Main Break
- Backwash Pump Failure
- Raw Water Intake Contamination
- Adverse Water Quality
- High Turbidity
- Filter Train Failure
- Treated Water Reservoir Contamination

- Consumer Complaints

The Township of South Glengarry has established an off duty-hours call out procedure to address emergency and alarm conditions at the drinking-water system. In the event of an emergency situation or alarm condition an on-call operator generally responds immediately to the system to investigate and address the situation. If the issue can not be resolved additional staff, including the operator-in-charge with overall responsibility for the operation of the system is consulted or called-in to assist.

The contingency plan does not include a procedure for addressing periods where the operator in overall responsibility for the drinking-water system is absent or unable to act for a period of time, including direction to notify the Director (Ministry of the Environment, Human Resources) if the absence exceeds 59 days. In the event that Shawn Killoran is absent, responsibility for the overall operation of the drinking-water system shifts to John Cameron. Mr. Cameron holds licences equivalent in classification to the water treatment and distribution systems. Overall responsibility for the operation of the drinking-water system may also be delegated to George Romanko for up to 150 days in any 12-month period. Mr. Romanko holds a licence in water treatment one class lower than the class of the water treatment plant, and has recently been successful in obtaining his Class 2 water distribution licence.

The Water Main Breaks and Treated Water Reservoir Contamination contingency procedures do not reference or adopt ANSI/AWWA Standard C651-99 for Disinfecting Water Mains, ANSI/AWWA C652-02 for Disinfection of Water-Storage Facilities and ANSI/AWWA C653-97 for Disinfection of Water Treatment Plants.

The Adverse Water Quality contingency procedure references Ontario Regulation 459/00 and associated forms for providing written notice and does not reference legislative changes that came into effect with the promulgation of the *Safe Drinking Water Act* and Ontario Regulation 170/03, as amended.

The contingency plan includes an after-hours contact list for essential drinking-water system personnel and a contact list for suppliers and contractors that may be called to assist during an emergency or upset condition. The contingency plan does not contain a comprehensive list and location of emergency equipment and supplies available at the drinking-water system or immediately available to the Township in the event of emergency or upset conditions. Individual contingency procedures do not reference key emergency equipment required to invoke the procedure and the location of such equipment. Backups for all essential treatment and supply

equipment (including low lift pumps, coagulant feed pumps, coagulation-flocculation, sedimentation, filtration, hypochlorite feed pumps and high lift pumps) are available in the event of emergency or upset conditions.

The contingency plan does not contain a procedure to adequately address a spill of sodium hypochlorite, alum or other coagulant, including the provision of materials to aid in the clean up of a spill. Adequate spill containment (secondary containment structures) is provided for potential spills of these process chemicals. The floor drains located throughout the treatment plant discharge to a packaged duplex sump pumping station. The sump discharges to the sludge force main which connects to the municipal sanitary sewer system. Liquid stationary power source fuels are not used or stored at the drinking-water system.

The contingency procedures are not routinely tested for the purposes of providing operational training and to evaluate their effectiveness. A record of testing and training is not included in the contingency plan. The plan does not include a record of revision.

The treated water reservoir and elevated storage tank have a combined storage volume of approximately 5.3 days at current demand and approximately 1.2 days at the design rated capacity for the works. The twin package water treatment trains are each sized to process one-half of the rated capacity of 720 cubic metres per day. A stationary, natural gas fired standby generator set capable of supplying power for the operation of the entire water treatment plant is available in the event of a power outage. The treatment facility is therefore capable to meet the current average consumer demand with the largest unit process out of service.

The standby generator set has a Certificate of Approval - Air, Number 7180-4JRR64, issued April 28, 2000. The Certificate does not contain any operational and maintenance conditions, including periodic testing of the equipment under load conditions. Page 6, section G. 40 of the Lancaster Water Treatment Plant Operations Manual recommends operation of the generator set one hour per week with as much load as possible. The operational checks presently in effect at the water treatment facility require the standby generator set to be tested monthly. The test includes operating the generator set under load. Operational conditions (AC volts, AC amps, Hertz, coolant temperature, oil pressure, oil level, RPM, operating hours, run time, and DC amps on the battery charger) are recorded on the record of testing. A review of the record of testing revealed that the tests for December 2002, and February, April, May and June 2003 were not recorded.

3.2.4 Security

Adequate security measures are provided at the Lancaster water treatment plant through provision of: perimeter fencing complete with barbed wired and locked security gates; secured entrances equipped with intrusion alarm devices, strategically placed motion detectors, alarm autodialer and central alarm monitoring. In the event of a process alarm and/or security alarm the autodialer communicates with a contracted alarm-paging company, who then pages an on-call operator. The perimeter security fence has been equipped with "No Trespassing" signs on all four sides of the fence.

The on-site treated water reservoir is located within the perimeter fence securing the treatment plant. The reservoir access hatch is equipped with a locked padlock and all reservoir air vents have been equipped with bird mesh.

The elevated storage tank is surrounded by a perimeter fence complete with barbed wire and a locked security gate. The gate is equipped with a sign to warn that trespassing is prohibited. The entrance door to the base of the elevated storage tank is locked. In addition, a valve box located within the base of the elevated storage tank is locked. Trees and brush have grown up along the security fence on three sides. The trees and brush obscure visibility and aid unwanted access within the fenced area.

There are no treatment or distribution system components located outside of the fenced properties that would require security measures. The water treatment plant is attended daily during the regular work week and monitored via alarms after hours.

3.2.5 Communication with Consumers

The Township has established written procedures for receiving and responding to complaints including a reporting system which records the steps taken to determine the cause of complaints and the corrective measures taken to alleviate the cause and prevent its reoccurrence. The procedures are included in Section 3, pages 18 to 20 of the Lancaster Water Treatment Plant Operations Manual and in the contingency plan for the system. The required information concerning complaints is recorded on a standardized complaint form (complainant's name, address and telephone number; date of the complaint, description of complaint, steps to investigate the complaint, cause of the complaint, corrective measures, and date of implementation/resolution).

The Township reports that only three complaints have been received concerning the drinking-water system since it was first commissioned in 2001. The complaints are random in nature, location and time of filing and do not indicate a common problem within the distribution system. Specifically, the complaints have included: musty odour, unknown odour, high chlorine, and the deposition of particles in water and a kettle.

The following documents are available during normal business hours at the Township of South Glengarry's administrative office, the Glen Walter administrative office and the Lancaster water treatment plant:

- all Reports of Analysis for tests required under Schedules 10 and 13 of Ontario Regulation 170/03, as amended;
- copies of every test result required under Schedules 6 and 7 of Ontario Regulation 170/03, as amended;
- copies of every test result obtained in respect of a test required under an approval or order;
- copies of every approval and every order, including *Ontario Water Resources Act* orders, that apply to the system and that are still in effect; and
- a copy of Ontario Regulation 170/03, as amended.

The Lancaster drinking-water system was newly constructed and commissioned on March 14, 2001. Ontario Regulation 459/00 required the owner ensure that an Engineers' Report for the drinking-water system is prepared and submitted to the Director no later than the third anniversary of the date of commissioning (March 14, 2004). The promulgation of the *Safe Drinking Water Act* and Ontario Regulation 170/03 on June 1, 2003 rescinds the preparation and submission requirements for an Engineers' Report under Ontario Regulation 459/00. Instead, Schedule 20-2 (5) of Ontario Regulation 170/03, as amended requires the owner to prepare and provide the first Engineers' Report to the Director not later than the fifth anniversary of the date the system began operation (March 14, 2006).

The first Annual Report required by Section 11 of the Regulation and Summary Report for Municipalities required by Schedule 22 of Ontario Regulation 170/03, as amended are due on February 28 and March 31, 2004, respectively. The Township of South Glengarry will ensure that the required reports will be completed and made available to the public in accordance with Sections 11 and 12 of the Regulation.

The Township informs the public of the availability of the reports by posting a notice on their

website at: (http://southglengarry.com/notices.htm).

3.2.6 Operator Certification and Training

The Lancaster drinking-water system is classed as a Class 2 Water Treatment System and a Class 2 Water distribution System. Classification certificates No. 2897 and No. 477 are framed and conspicuously displayed in the main entrance foyer of the water treatment plant.

The operator-in-charge with overall responsibility for the operation of the drinking-water system is Shawn Killoran. Mr. Killoran holds valid Class 2 water treatment and distribution system licences. In the event that Mr. Killoran is unable to act as the operator-in-charge with overall responsibility, the capacity shifts to John Cameron (WT 2, WD 2). George Romanko (WT 1, WD 2) may also act as the operator-in-charge with overall responsibility for the drinking-water system if neither Mr. Killoran or Mr. Cameron are available. Mr. Killoran was absent from his capacity as operator-in-charge with overall responsibility for the Lancaster drinking-water system during periods of vacation only. These absences did not exceed 60 days in any twelve-month period. During these periods Mr. Cameron was placed with responsibility for the overall operation of the drinking-water system.

Framed copies of the operators' licences are conspicuously displayed in the hallway leading from the main entrance to the Lancaster water treatment plant. The original water treatment system and distribution system operator licences are framed and conspicuously displayed on the walls of the Glen Walter administrative offices. A review of operator certification and licencing records maintained by the Ontario Environmental Training Consortium (OETC) on behalf of the Ministry revealed that all operators employed by the Township of South Glengarry hold valid water treatment and distribution system licences.

The inspector was provided with annual training records maintained by the Township of South Glengarry for the operators employed in the facility. The training records indicate that not all operators were provided with the minimum required 40 hours of training in 2002. Specifically, the records indicate that the Township of South Glengarry provided George Romanko 29.5 hours of training in 2002; however, it is noted that Mr. Romanko began employment with the Township part way through the 2002 calendar year. The training records provided for 2003 indicate that the Owner is making satisfactory progress in meeting the legislative training requirement of providing 40 hours of training to every licenced operator employed in the facility every year. The training provided included the types of training provided by way of example in subsection 17 (2) of Ontario Regulation 435/93, as amended. The detailed training records indicate that training did

not include operations manual and contingency/emergency training.

The training information for the Township of South Glengarry operators is provided in the following table:

Operator Name	2002		2003	
	Time Period	Hours of Training	Time Period	Hours of Training
John Cameron	Jan. 23 to Dec. 18	40.5	Mar. 18 to Jun. 19	31
Shawn Killoran	Jan. 23 to Dec. 18	41	Apr. 14 to Jun. 19	25
George Romanko	Jul. 12 to Dec. 18	29.5	May 28 to Jun. 19	22

A list of all operators and their certification details is located in **Appendix D**.

SECTION 4 WATER QUALITY MONITORING & ASSESSMENT

4.1 WATER QUALITY MONITORING

All monitoring programs required under the *Safe Drinking Water Act,* Schedules 6, 7, 10 and 13 of Ontario Regulation 170/03, as amended and Certificate of Approval Number 2146-4HLSL9 are being met in accordance with the specified frequencies with the following exceptions:

- The Township of South Glengarry has not ensured that a distribution system sample is taken at least once every day and is tested immediately for free chlorine residual in accordance with schedule 7-2 (3)(a) of Ontario Regulation 170/03, as amended.

There have been no other instances in which water quality monitoring programs required under Ontario Regulation 170/03, as amended and Certificate of Approval Number 2146-4HLSL9 have not been met.

Raw water samples are collected weekly prior to the application of process chemicals, disinfectant or treatment. The Township of South Glengarry meets the Schedule 10-4 and Certificate of Approval requirements for weekly sampling and of *Escherichia coli* (*E. coli*) and total coliforms. In addition, the raw water is sampled and tested daily for pH, Colour, Turbidity and Temperature and quarterly for Alkalinity, Hardness, Calcium, Sodium, Iron, Copper, Lead, Arsenic,

Aluminum, Manganese, Conductivity, Chloride, Sulphate, Total Kjeldahl Nitrogen, Nitrite, Nitrate, Dissolved Organic Carbon and Phenols in accordance with condition 2.1 (d) of Certificate of Approval Number 2146-4HLSL9.

The Township meets the Schedule 10-3 and Certificate of Approval requirements for weekly sampling and testing of treated water for *Escherichia coli* (*E. coli*), total coliforms and heterotrophic plate count. The Township meets the Schedule 13-7 requirements, exceeds the requirements of Schedules 13-8 and 13-9 of the Regulation and meets condition 2.1 (d) of Certificate of Approval Number 2146-4HLSL9. Treated water samples are taken and tested quarterly for Nitrate and Nitrite, Sodium and Fluoride. Treated water samples have been taken and tested quarterly for Inorganics (Schedule 23) and Organics (Schedule 24) with the exception of Antimony and Benzo(a)pyrene. Mr. Killoran has since verbally notified the inspector to confirm that samples had been collected in January 2004 for these parameters and tested in accordance with Schedules 13-2 and 13-4 of Ontario Regulation 170/03, as amended. In addition, the treated water is sampled and tested weekly for Turbidity, Colour, pH, twice daily for pH, Colour, Turbidity, Temperature, Free Chlorine Residual, Total Chlorine Residual and Aluminum Residual, and quarterly for Alkalinity, Hardness, Calcium, Iron, Copper, Lead, Arsenic, Aluminum, Manganese, Conductivity, Chloride, Sulphate, Ammonia + Ammonium Nitrogen, Total Kjeldahl Nitrogen, Dissolved Organic Carbon, Benzene, Carbon Tetrachloride, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, Dichloromethane, Ethylbenzene, Monochlorobenzene, Toluene, Trichloroethylene, Total Trihalomethanes and Xylene in accordance with condition 2.1 (d) of Certificate of Approval Number 2146-4HLSL9.

Schedule 10-2 (1) (a) requires nine (9) samples to be taken from the Lancaster distribution system every month, with at least one of the samples being taken in each week and tested for the prescribed microbiological parameters. The Township collects between 12 to 15 samples every month, with at least three (3) samples being taken in each week. The Township exceeds the Schedule 10-2 and Certificate of Approval requirements for weekly sampling and testing of distribution system samples for *Escherichia coli* (*E. coli*), total coliforms and heterotrophic plate count. Samples are taken at the same time and locations as the Schedule 10-2 samples and tested immediately for free and total chlorine residual in accordance with Schedule 6-3 of the Regulation and condition 2.1 (d) of Certificate of Approval Number 2146-4HLSL9. Distribution system sampling locations include extremities and dead ends to verify the adequacy of secondary disinfection. Quarterly samples are taken in the distribution system and tested for Trihalomethanes (monthly when zebra mussel control equipment is operational) and Lead in accordance with Schedules 13-3 and 13-6 of the Regulation and condition 2.1 (d) of Certificate of Approval Number 2146-4HLSL9. In addition, distribution system samples are taken and tested quarterly for Alkalinity, Hardness, Calcium, Sodium, Iron, Copper, Arsenic, Aluminum,

Manganese, Conductivity, Chloride, Sulphate, Ammonia + Ammonium Nitrogen, Total Kjeldahl Nitrogen, Nitrite, Nitrate, and Dissolved Organic Carbon in accordance with condition 2.1 (d) of Certificate of Approval Number 2146-4HLSL9.

The Township has sampled and tested drinking-water system samples in accordance with condition 2.5 of Certificate of Approval Number 2146-4HLSL9. During periods of zebra mussel control system operation raw water samples are taken and tested daily for Total Chlorine Residual, Free Chlorine Residual and Turbidity and treated water and distribution system samples are taken and tested monthly for Trihalomethanes.

The Lancaster drinking-water system has not been required to increase the frequency of monitoring in accordance with Schedule 13-5 of the Regulation as a result of any parameter exceeding half of the standard prescribed for the parameter in Schedule 2 of the Ontario Drinking Water Quality Standards. The drinking-water system has not been shutdown for a period of 60 or more days since the last inspection, thereby providing an opportunity for relief from the regulated monitoring requirements of Schedules 13-5, 13-6 and 13-7 of Ontario Regulation 170/03, as amended. All sampling locations, where practicable have been equipped with sample taps equipped with smooth nozzles.

Continuous free chlorine residual monitoring is provided in accordance with Schedule 7-2 (1) of the Regulation. The treated water header leaving the on-site clear well/reservoir serves as the location where the intended contact time has just been achieved. At the time of inspection, the Township of South Glengarry was not conducting daily testing of chlorine residual in the Lancaster distribution system. As of November 20, 2003 the Township of South Glengarry had complied with Schedule 7-2 (3)(a) of Ontario Regulation 170/03, as amended by installing continuous monitoring equipment to sample and test for free chlorine residual in the distribution system. Routine samples are taken from the Ontario Provincial Police detachment located on Pine Street in the Village of Lancaster for testing lead and trihalomethanes. This location is considered to represent the point of maximum residence time in the distribution system which is likely to have the potential of having elevated concentrations of both parameters. Fluoridation is not practiced at the drinking-water system.

The Township has conducted voluntary sampling and testing in addition to the regulatory requirements for raw and treated water. Until September 2003, the Township conducted voluntary sampling and testing for *Clostridium perfringens*. *Clostridium perfringens* is similar in size and resistance to chlorine as *Cryptosporidium* and may be used as an indicator organism for the presence of *Cryptosporidium parvum* and *oocysts*. This practice was discontinued when Ontario Regulation 248/03 Drinking-Water Testing Services came into effect on October 1, 2003.

At that time the Township was advised by its contracted laboratory to discontinue *Clostridium perfringens* sampling, since its Ministry issued licences did not allow testing for this parameter.

Additional parameters not included in Schedules 10, 13, 23 and 24 of the Regulation that require sampling and testing in accordance with Certificate of Approval Number 2146-4HLSL9 have not been identified in the Certificate of Approval as health-related parameters. Regardless, the Township of South Glengarry notified the laboratory and the Ministry's Laboratory Services Branch of these parameters in writing on September 17, 2001.

Information provided by the Township of South Glengarry indicates that laboratory services for the Lancaster drinking-water system are provided by:

- Accutest Laboratories Limited of Nepean, Ontario;
- Maxxam Analytics of Mississauga, Ontario;
- Maxxam Analytics of Waterloo, Ontario;
- University of Guelph, Lab Services Division of Guelph, Ontario, and
- Becquerel Labs of Mississauga, Ontario.

According to Ministry records all five laboratories are accredited to perform the drinking-water tests as documented on the Notification of Laboratory Services Provided to Water Works. As of October 1, 2003, the *Safe Drinking Water Act* and Ontario Regulation 248/03 requires all laboratories performing drinking water testing to obtain a licence. According to Ministry records, all but the University of Guelph, Lab Services Division are licenced to perform drinking water testing services. The Township updated their Laboratory Services Notification on January 28, 2004. The latest Notification identifies Accutest of Kingston and Nepean, Ontario and Maxxam of Mississauga, Ontario as providing drinking-water testing services. There is no record of any of the aforementioned laboratories subcontracting analytical services. Drinking water testing for the Lancaster system is not performed by laboratories located outside of Ontario. The Reports of Analysis and other records of tests required by Schedules 7, 10 and 13 have been retained in accordance with Schedule 13 of Ontario Regulation 170/03, as amended and condition 2.4 of Certificate of Approval Number 2146-4HLSL9.

4.2 WATER QUALITY ASSESSMENT

4.2.1 Bacteriological

A review was conducted of the Townships analytical records for microbiological sampling. The records indicated that the source is generally of good microbiological quality for surface water,

with *E. coli* results typically ranging from 0 to 10 colony forming units (CFU)/100 millilitre (mL), and total coliform results ranging from 0 to 100 CFU/100 mL, with occasional detections of total coliform in the 101 to 5000 CFU/100 mL range. The microbiological results for Ministry of the Environment audit samples of raw water collected on August 6, 2003 yielded an *E. coli* concentration of 8 CFU/100 mL and total coliform concentration of 6 CFU/100 mL. These results compare favourably with the Owner's raw water quality monitoring results. The Ministry audit samples of treated and distribution system water did not reveal an exceedence of any of the microbiological standards established by the Ontario Drinking Water Quality Standards.

4.2.2 Physical/Chemical

All treated water provided by the system to the point where the system is connected to the users' plumbing meets the requirements of the prescribed drinking-water quality standards as out in Ontario Regulation 169/03 - Ontario Drinking-Water Quality Standards). A review of the physical and chemical sampling results was conducted for the raw and treated water. The review did not identify any Adverse Water Quality Incidents (AWQIs) in addition to those reported to the Ministry by the Township. The Owner does not formally trend the analytical data it receives for physical and chemical parameters. The review undertaken as part of this inspection did not identify any trends with respect to health related parameters. The review found that in July and August 2002 the residual aluminum concentration was detected above the recommended operational guideline of 0.100 mg/L contained in Table 4 and described in detail on page 16 of the Ministry publication "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2003". The review also noted a corresponding increase in filter effluent and treated water turbidity during the period of elevated aluminum residual concentrations; however, the filtered water turbidity remained well below the prescribed drinking-water quality standard of 1.0 NTU at all times. The test results for Ministry audit samples collected on August 6, 2003 did not detect any parameters in excess of the prescribed drinking-water quality standards for those parameters. The audit test results did confirm a residual aluminum concentration (0.131 mg/L) in the treated water in excess of the operation guideline.

There has been no recorded instances in which the free chlorine residual exceeded the maximum concentration of 4.0 mg/L in the treated water leaving the water treatment plant. The maximum free chlorine residual in the treated water entering the distribution system reported since the previous inspection was 2.19 mg/L, in November 2002. Since the last inspection there has been no recorded circumstances in which the results of free chlorine residual testing in the distribution system revealed concentrations less than 0.05 mg/L. The minimum free chlorine residual concentration reported in the distribution system since the previous inspection was 0.20 mg/L. During the inspection the free chlorine residual at the furthest location from the treatment plant

(Ontario Provincial Police detachment located on Pine Street) was measured as 0.51 mg/L. The Owner's records indicate that there are no significant variations in free chlorine residual concentrations throughout the distribution system.

Results of the Ministry audit samples are provided in **Appendix G.**

4.2.3 Reporting, Notification & Corrective Action

The Township of South Glengarry has been diligent in providing notice and taking appropriate corrective action in accordance with Schedules 16 and 17 of Ontario Regulation 170/03, as amended. There is no evidence or recorded instances of the Township failing to provide notice under Section 18 of the *Safe Drinking Water Act* or failing to take appropriate corrective action in response to an AWQI.

Since the last inspection there has been one instance where notice was required under Section 18 of the *Safe Drinking Water Act*. On July 4, 2003, a notice was made for a distribution system sample collected on July 2, 2003 in which a total coliform concentration of 4 CFU/100 mL was detected. The notice was provided in accordance with Schedule 16 of the Regulation; however, the written portion of the notice was initially provided by forms prescribed by Ontario Regulation 459/00. The inspector identified the use of the incorrect forms to Mr. Killoran and directed him to the "Notice of Adverse Test Results and Other Problems/Notice of Issue Resolution at Drinking Water Systems" forms prescribed for Ontario Regulation 170/03, as amended, located on the Ministry's public web site. Mr. Killoran resubmitted the written notice and the Notice of Issue Resolution for the incident on July 10, 2003 using the Ontario Regulation 170/03 forms. Corrective action was undertaken by the Township of South Glengarry in accordance with Schedule 17-6 for this incident. The Notice of Issue Resolution was submitted within seven days of resolving the issue of July 4th, as mandated by Schedule 16-9 of the Regulation.

There have been no other reportable observations other than the aforementioned adverse test result since the last inspection. There have been no instances where the Township has not complied with the microbiological sampling requirements. All alarms originating from continuous water quality monitoring equipment are responded to by licenced operators and receive appropriate corrective action in accordance with Schedule 6-5 of the Regulation.

The Township of South Glengarry has prepared and submitted all quarterly reports as required under Ontario Regulation 459/00 for 2002 and for the first quarter of 2003. The promulgation of the *Safe Drinking Water Act* and Ontario Regulation 170/03 on June 1, 2003 rescinds the requirements for quarterly reporting. The Engineers' Report for the drinking-water system is not

due until March 14, 2006. The Township has provided the Ministry's Laboratory Services Branch with the names of all laboratories utilized by the drinking-water system.

Condition 4.3 of Certificate of Approval Number 2146-4HLSL9 requires the Township to prepare an "Annual Performance Report" for the system within 90 calendar days following the end of each calendar year being reported upon. The Township of South Glengarry has not prepared a report identified specifically as an Annual Performance Report. Rather, the Township has prepared a report dated January 13, 2003 that outlines the details concerning the operation of the zebra mussel control system for the 2002 calendar year and appears to have combined the Annual Performance Report requirements with the fourth quarter report for 2002 required by Ontario Regulation 459/00. The combined report contains the following:

- a summary and discussion of the quantity of the water supplied during the reporting period compared to the design capacity for the treatment system, including maximum and average monthly flow rates;
- a summary of the analytical results and the drinking-water quality standard limit for physical and chemical parameters for the fourth quarter only;
- a general summary of the number of "safe" and "unsafe" microbiological sample collected during the reporting period;
- a description of an upset condition with respect to the operation and repair of the raw water sample line;
- a discussion summarizing the treatment chemicals used including the quantities used and the average dosage rates for the reporting period.

Peak flow rates are not discussed in relation to the design capacity of the system and serviced population. A summary of all analytical results for physical and chemical parameters for the reporting period and details concerning the types of microbiological test results included in the summary are not included in the report. The report does not include an interpretation of the analytical results. The information contained in the report concerning emergency or upset conditions was not provided in a tabular format. There was no reference in the report concerning abnormal usage or dosage rates for process chemicals for the reporting period. The combined report was prepared within the required time frame following the end of the 2002 calendar year. Certificate of Approval Number 2146-4HLSL9 does not specifically require that a resolution of the Township of South Glengarry Council be passed as evidence that the content of the Annual Performance Report has been reviewed with the Council. However, "Staff Reports" concerning the operation of the Lancaster Drinking-Water System are presented to the Council at least twice annually. Resolutions are passed for each of these reports.

SECTION 5 ASSESSMENT OF PREVIOUS INSPECTION ISSUES

The preceding inspection report documented the findings of the 2002 Communal Drinking Water Inspection completed on June 19, 2002 by Shannon Hamilton-Browne, Inspector/Provincial Officer. The findings of regulatory non-compliance and recommendations concerning best management practices made by the previous inspection and their present status have been summarized in the following tables.

5.1 NON COMPLIANCE WITH REGULATORY REQUIREMENTS

	Details
Finding	The raw water samples being collected are not truly representative because the raw water sampling line is broken. As a result, raw water samples are not being collected upstream of the chlorination line, but instead are being collected from the low lift well. The raw water samples are chlorinated, and do not truly represent the quality of the raw water. The zebra mussel chlorination line was damaged in September 2001 when the operating staff realized the line was probably blocked. Confirmation that the line was damaged was received on October 19, 2001, when divers were sent down by TSH Engineering, to the low lift well to inspect it. The operations manager stated that the engineering consultant, TSH Engineering, was supposed to repair both the raw water sampling line and the zebra mussel chlorination line. These issues are still pending with them. Both lines must be repaired as soon as possible by TSH Engineering for the water works to achieve compliance with the Certificate of Approval and Ontario Regulation 459/00.
Status	**RESOLVED: According to the 2002 Zebra Mussel Control System Annual Report and the combined Annual Performance/Fourth Quarter Report for 2002, the raw water sample line and the zebra mussel control system chlorine solution line have been repaired. The repairs were made in November 2002.**

Item	Details
Finding	Shawn Killoran, Operations Manager, has the appropriate level of certification under Ontario Regulation 435/93 to have overall responsibility for the water works. However, Mr. Killoran shall work towards receiving his Class 2 Water Distribution System certification, and John Cameron shall work towards receiving his Class 2 Water Treatment System and Water Distribution System certifications. The new water works has not been classified for the Water Distribution System, however, the old water works was classified as a Class 2 Water Distribution System. The municipality should follow-up with the OETC on the status of their request to have the water works classified as a water distribution system.
Status	**RESOLVED: Shawn Killoran and John Cameron have attained licencing/certification as Class 2 Water Treatment System and Class 2 Water Distribution System operators. Details concerning licencing / certification are included in Appendix D of this report.**
Finding	The 2001 Annual Report for the Zebra Mussel Control System was submitted to the Ministry by the municipality on January 30, 2002, as required by Condition No. 4 of Certificate of Approval No. 2146-4HLSL9. The annual report that was submitted includes a summary of the quantity of water supplied during the reporting period, a summary of analytical results, and a summary of treatment chemicals used. However, the report does not include a discussion of the quantity of water supplied, an interpretation of analytical results, a tabulation and description of any emergency or upset conditions which occurred during the period being reported upon, and/or a summary listing treatment chemicals including average dosage rates with special reference to any abnormal usages. The owner must include the above to achieve compliance with Condition 4.3 of Certificate of Approval No. 2146-4HLSL9.

Status	**UNRESOLVED: The 2002 Annual Performance Report required by Condition 4.3 of Certificate of Approval Number 2146-4HLSL9 does not include a discussion concerning peak flow rates in relation to the design capacity of the system and serviced population. A summary of all analytical results for physical and chemical parameters for the reporting period (the 2002 calendar year) and details concerning the types of microbiological test results included in the summary are not included in the report. The report does not include an interpretation of the analytical results. The information contained in the report concerning emergency or upset conditions was not provided in a tabular format (tabulation).**
Finding	The operations manual is dated September 2000, and therefore due for a review and update, as per section 16 (2) of Ontario Regulation 435/93, which stipulates that "The owner shall ensure that the manuals (operations and maintenance) are reviewed and updated at least once every two years".
Status	**RESOLVED: The Operations Manual for the Lancaster Water Treatment Plant is dated June 2001 (last revision) and is stamped as having been last reviewed on March 10, 2003.**
Finding	At the time of inspection, the motor that drives the flocculator was broken and needed to be replaced. The operations manager stated that a new motor was being delivered later that day. The municipality should confirm that the motor for the flocculator was in fact replaced and is operational.
Status	**RESOLVED: The Township of South Glengarry has replaced the flocculator drive motor. Both units were capable of operating if needed on the dates of the most recent inspection.**

Item	Details
Finding	Condition No. 3.5 of Certificate of Approval No. 2146-4HLSL9 stipulates that the Owner shall ensure that all chemicals used in the treatment process and all materials contacting the water are of "Food Grade" quality and meet both the AWWA quality criteria as set out in AWWA standards and the ANSI safety criteria as set out in ANSI standard NSF/60 or NSF/61. In addition the Owner shall have, for water treatment chemicals and for water contacting materials, either evidence of current product registration by a testing institution accredited by the ANSI or documents showing the Ministry is satisfied that information provided by the product manufacturer indicates the product will meet both the AWWA and ANSI standards criteria. ClarIon is NSF certified to the AWWA/ANSI B403-98 standard and the ANSI/NSF Standard 60. The owner shall confirm that the sodium hypochlorite, and any other chemical not mentioned here, that is used in the treatment process complies with this condition, and provide the Ministry with evidence that they meet the AWWA and ANSI standards.
Status	**RESOLVED: On September 19, 2002, the Township of South Glengarry provided evidence to the Ministry that the sodium hypochlorite supplied by Brenntag Canada Inc. and used in the water treatment process at the Lancaster drinking-water system conforms to the ANSI/NSF Standard 20 and the AWWA B300-92 Standard for Hypochlorite. The current inspection found that the Owner had evidence to demonstrate that all chemicals used in the treatment process met the applicable AWWA and ANSI/NSF standards.**

5.2 BEST MANAGEMENT PRACTICES RECOMMENDATIONS

Finding	In the water works' chemical room, there are four (4) chemical metering pumps used to inject sodium hypochlorite into the water for pre-, zebra mussel control, post-, and trim chlorination. There are spare pumps on-line, however, there is no automatic switch over for when a duty pump fails to switch over to a spare pump. Currently, this is done manually. It is recommended that automatic switch over to the spare pump(s) from the duty pump(s) be provided.
Status	**RESOLVED: The hypochlorination system is interlocked with the water treatment plant's control system to automatically shut down the plant in the event of chemical feed pump failure. In addition, an alarm is activated to alert an on-call operator of the failure. The on-call operator is required to respond within short time frame. During such a failure, treated water is supplied to the service area from the elevated storage tank.**
Finding	The municipality should seriously consider exploring the causes of intermittent aluminum concentration exceedances, and determine if alterations to the water treatment plant (operations or treatment components) is necessary to ensure that the water quality meets the regulatory requirements at all times. Aluminum found in coagulant treated water is due to the presence of aluminum left over from use of the coagulant. Optimization of treatment should be applied to reduce this residual aluminum to under the operational guideline of 0.1 mg/L. High residual aluminum can cause coating of the pipes in the distribution system resulting in increased energy requirements for pumping, and flocculation in the distribution system (Ontario Drinking Water Standards, August 2000).
Status	**UNRESOLVED: The Owner's analytical test results for July and August 2002 for residual aluminum concentration in the treated water indicate residual aluminum in excess of the operational guideline recommended in the Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2003. Ministry audit samples (Aug. 6, 2003) detected residual aluminum in the treated water at a concentration of 0.131 mg/L, 31% higher than the operational guideline of 0.100 mg/L.**

SECTION 6 SUMMARY OF NON COMPLIANCE ISSUES & ACTIONS REQUIRED

The following paragraphs summarize the findings of non compliance identified during the inspection. The action the owner/operating authority is required to take follows the finding in bolded text.

1. Upon inspection, the Township of South Glengarry was not meeting the requirements of Schedule 7-2 (3) (a) of Ontario Regulation 170/03. Schedule 7-2 (3) (a) states, *"The owner of a drinking-water system that provides secondary disinfection and the operating authority for the system shall ensure that a distribution sample is taken at least once every day and is tested immediately for, free chlorine residual, if the system provides chlorination and does not provide chloramination."* On November 27, 2003, the Township had installed continuous monitoring equipment to sample and test the free chlorine residual in the Lancaster distribution system. **No action is required, the owner has addressed this finding of non compliance since the site inspection was performed. It should be noted however, that in the event the continuous analyzer malfunctions or a power interruption renders the analyzer incapable of testing for and recording free chlorine residual, a grab sample must be taken from the distribution system each day and immediately tested for free chlorine using an electronic direct readout colorimetric analyzer, ameperometric analyzer or equivalent device.**

2. The operating staff are not aware of the minimum required CT for the DWS. The minimum alarm standard for the continuous monitoring equipment used for measuring free chlorine residual at or near the point where primary disinfection is completed is not in compliance with Schedule 6-5 (2) of O. Reg. 170/03. In order for the minimum alarm standard to be met, the operating staff must be knowledgeable of the minimum free chlorine residual required to meet the CT requirements under worst case operational conditions (minimum temperature, maximum pH, minimum clear well/reservoir level, maximum flow rate). **The Township of South Glengarry and its operating authority shall ensure that the minimum free chlorine residual alarm is set in accordance Schedule 6-5 (2) of Ontario Regulation 170/03, as amended. The Township of South Glengarry and its operating authority shall ensure that operational staff are aware of the CT requirements for the Lancaster DWS.**

3. The bench sheets used for the purpose of recording information concerning operational tests do not include the time each sample was taken; the time each sample was tested and the name(s) of the person(s) who took the sample and conducted the test. **The Township of South Glengarry and its operating authority shall ensure that all records of sampling and testing, including operational process control tests are maintained in accordance with Schedule 6-10 of Ontario Regulation 170/03, as amended.**

4. The Annual Performance Report required by condition 4.3 of Certificate of Approval Number 2146-4HLSL9, and prepared for 2002, was not prepared in accordance with conditions 4.1 (a) through (d) of the Certificate. Specifically, the 2002 Annual Performance Report does not include: a discussion concerning peak flow rates in relation to the design capacity of the system and serviced population; a summary of all analytical results for physical and chemical parameters for the reporting period and details concerning the types of microbiological parameters tested for; and an interpretation of the analytical results. The information contained in the report concerning emergency or upset conditions was not provided in a tabular format. There was no reference in the report concerning abnormal usage or dosage rates for process chemicals for the reporting period. **The Township of South Glengarry shall prepare a Summary Report for Municipalities in accordance with Schedule 22-2 of Ontario Regulation 170/03, as amended. If the Township of South Glengarry complies with the requirements of Schedule 22-2, Schedule 22-3 of the Regulation exempts the Township from preparing the Annual Performance Report required by condition 4.3 of Certificate of Approval Number 2146-4HLSL9.**

By no later than Wednesday, March 31, 2004, provide the undersigned Provincial Officer with an Action Plan that specifies how the Owner/Operating Authority intends to address issues numbered 2 through 4 cited above in a manner that ensures that they will be resolved and not repeated, complete with implementation dates.

SECTION 7 SUMMARY OF BEST PRACTICE RECOMMENDATIONS

Legislated requirements have been identified in the previous section. In the interest of continuous improvement, we provide the following suggestions:

1. CT is not routinely used in process calculations concerning the disinfection process. **The Township of South Glengarry and its operating authority should develop a Standard Operating Procedure that includes the calculation of CT as part of process control in**

the operation of the disinfection process, to evaluate the effectiveness of primary disinfection at the system and to demonstrate that the required disinfection has been achieved.

2. The Township of South Glengarry has not developed or adopted formal standards for the design, material selection and plumbing requirements for the purpose of maintaining distribution system integrity. According to the original design specifications and tender documents for the distribution system, all original materials used in its construction were to have met AWWA Standards. **The Township of South Glengarry and its operating authority should develop formal standards that adopt the AWWA Standards for the design, material selection and plumbing requirements for the purpose of maintaining distribution system integrity. These standards should be used when selecting or purchasing all supplies and materials for distribution system upgrades, repairs, replacement and when tendering work for new extensions to the distribution system and the replacement or repair of existing distribution system components.**

3. The Township of South Glengarry has prepared a contingency procedure to address water main breaks. A formal document has not been prepared to provide standards for flushing, disinfection and testing of new and repaired water mains and water storage structures within the drinking water system. The procedure does not reference or adopt ANSI/AWWA C651-99 Standard for Disinfecting Water Mains, ANSI/AWWA C652-02 Standard for Disinfection of Water-Storage Facilities and ANSI/AWWA C653-97 Standard for Disinfection of Water Treatment Plants. During the site inspection Mr. Killoran obtained a copy of ANSI/AWWA C651-99 Standard for Disinfecting Water Mains and modified the Township's water main break procedure to reference this Standard. **The Township of South Glengarry and its operating authority should purchase and adopt the following standards as its disinfection procedures: ANSI/AWWA C652-02 Standard for Disinfection of Water-Storage Facilities and ANSI/AWWA C653-97 Standard for Disinfection of Water Treatment Plants.**

4. Formal documented standards or procedures have not been adopted or prepared to address water main flushing and swabbing. The Township of South Glengarry flushes water mains once per year in the fall. The Township has not implemented a water main swabbing program. According to Mr. Killoran conditions, such as varying or excessive chlorine demand have not been observed in the distribution system to warrant swabbing. **The Township of South Glengarry and its operating authority should ensure that its water main flushing program is based on the AWWA recommended unidirectional water main flushing approach and should formally document its flushing procedures in writing. The flushing procedures should include the maintenance of records for**

each flushing and define the type, content and format for the records.

5. The Township of South Glengarry has not established a formal documented valve inspection, exercising and repair program based on the AWWA C500 series Standards. Valves are inspected and exercised annually when water main flushing is performed. A formal fire hydrant inspection, operation and repair program based on Part 6 (Fire Protection Equipment), Section 6.6 (Water Supplies for Fire Protection) of Ontario Regulation 388/97, as amended, made under the *Fire Protection and Prevention Act* has not been established by the Township. Hydrants are inspected, operated and winterized each fall. **The Township of South Glengarry and its operating authority should formalize in writing, its procedures for the inspection, exercising and repair of valves. The program/procedures should be based on the AWWA C500 series Standards. The Township should formalize in writing, its procedures for fire hydrant inspection, operation and repair. The program/procedures should be based on Part 6 (Fire Protection Equipment), Section 6.6 (Water Supplies for Fire Protection) of Ontario Regulation 388/97, as amended, made under the *Fire Protection and Prevention Act.* The procedures recommended above should include the maintenance of records for the work performed and define the type, content and format for the records.**

6. Wastewater generated as a result of distribution system maintenance and flushing activities is usually directed to the sanitary sewer or to ground where there is no access to the sanitary sewer system. **The Township of South Glengarry and its operating authority must ensure that any chlorinated water used in the disinfection of repaired or new water mains, as well as, chlorinated water discharged as the result of flow testing or flushing fire hydrants is not directed to a storm sewer, drain, ditch or any other location that may allow the discharge to enter a water course without prior dechlorination. Dechlorination must be achieved by adding an adequate amount of reducing agent to water being disposed of in order to thoroughly neutralize the chlorine residual remaining in the water. The owner should ensure that its operational staff, contractors and consultants are aware of the prohibitions under s. 30. (1) of the *Ontario Water Resources Act*, s. 14. (1) of the *Environmental Protection Act* and s. 36. (3) of the *Federal Fisheries Act*, and practice proper dechlorination methods when disposing or discharging chlorinated water.**

7. The Township does not have a proactive, distribution system leak detection program; however, operating staff routinely observe drinking water system flow rates for abnormal conditions and investigate for possible leaks based on their observations and public reports. All consumers of treated water within the Lancaster Drinking Water System

service area are metered. Unaccounted water (difference between the quantity of water treated and supplied to the distribution system and quantity of water billed expressed as a percentage of the total quantity of treated water) figures were not available for the Lancaster Drinking Water System. **The Township of South Glengarry and its operating authority should implement a periodic leak detection survey for the Lancaster distribution system. Furthermore, the Township should calculate and trend unaccounted water to serve as a performance indicator for the distribution system.**

8. An Operations and Maintenance Manual does not exist for the distribution system. **The Township of South Glengarry and its operating authority should incorporate the recommendations made in items 3 though 8 above, into an operations manual for the Lancaster distribution system.**

9. The Lancaster Water Treatment Plant Operations and Maintenance Manual does not present information regarding a sampling plan, including: a sampling schedule, sampling procedures, and specific sample locations; however, the Township of South Glengarry has prepared a sampling schedule consistent with Schedules 10 and 13 of Ontario Regulation 170/03, as amended. **The Township of South Glengarry and its operating authority should incorporate a sampling plan consistent with Ontario Regulation 170/03, as amended, into the Lancaster Water Treatment Plant Operations and Maintenance Manual during the next review and revision of the manual. The sampling plan should include: a schedule, sampling procedures, including any directions given by the licenced laboratory under Schedule 6-8 of Ontario Regulation 170/03, as amended, and as a minimum, a copy of the Ministry publication "Practices for the Collection and Handling Of Drinking-Water Samples, Version 1.0, June 2003", and the identity of the sampling locations for all required raw water, filter effluent, treated water and distribution system samples.**

10. A bound attendance logbook is maintained at the Glen Walter administrative office for recording the names of operational staff on duty and the periods worked. The attendance log book also serves as a daily record of the amount of time each operator spends working as an operator-in-charge. Operator-in-charge credit is required to be submitted to the OETC when applying to renew or upgrade operator certification status. **The Township of South Glengarry should summarize, for each licenced operator, the total time spent working as an operator-in-charge, for each calendar year.**

11. The identity of the operator-in-charge for the drinking-water system on any given day is not clearly identified in the system logbook. **The Township of South Glengarry and its**

operating authority should ensure that the identity of the operator-in-charge for the Lancaster drinking-water system is clearly identified in the system logbook for each day.

12. The contingency plan does not include a procedure for addressing periods where the operator in overall responsibility for the drinking-water system is absent or unable to act for a period of time, including direction to notify the Director (Ministry of the Environment, Human Resources) if the absence exceeds 59 days. In the event that Shawn Killoran is absent, responsibility for the overall operation of the drinking-water system shifts to John Cameron. Mr. Cameron holds licences equivalent in classification to the water treatment and distribution systems. Overall responsibility for the operation of the water treatment plant and distribution system may also be delegated to George Romanko. Mr. Romanko holds a Class 1 water treatment licence and a Class 2 water distribution licence. **The Township of South Glengarry and its operating authority should prepare and include in the contingency plan for the Lancaster drinking-water system, a procedure for addressing periods where the operator in overall responsibility for the drinking-water system is absent or unable to act for a period of time, including direction to notify the Director (Ministry of the Environment, Human Resources) if the absence exceeds 59 days.**

13. The Adverse Water Quality contingency procedure references Ontario Regulation 459/00 and associated forms for providing written notice and does not reference legislative changes that came into effect with the promulgation of the *Safe Drinking Water Act* and Regulation 170/03, as amended. **The Township of South Glengarry and its operating authority must ensure that the above noted contingency procedure is updated to reflect the legislative changes introduced with the promulgation of the *Safe Drinking Water Act* and Ontario Regulation 170/03.**

14. The contingency plan does not contain a comprehensive list identifying the location of emergency equipment and supplies available at the drinking-water system or immediately available to the Township in the event of emergency or upset conditions. Individual contingency procedures do not reference key emergency equipment required to invoke the procedure and the location of such equipment. **The Township of South Glengarry and its operating authority should include a comprehensive list that identifies the location of emergency equipment and supplies available at the drinking-water system or immediately available to the Township in the event of emergency or upset conditions. Individual contingency procedures should be revised to reference key emergency equipment required to invoke the procedure and the location of such equipment.**

15. The contingency plan does not contain a procedure to adequately address a spill of sodium hypochlorite, alum or other coagulant, including the provision of materials to aid in the clean up of a spill. **The Township of South Glengarry and its operating authority should include a procedure to adequately address a spill of sodium hypochlorite, alum or other coagulant, including the provision of materials to aid in the clean up of a spill. The procedure should include references to regulatory agencies that must be contacted in the event of a spill and contact information, for example, the Ministry's Spills Action Centre at 1-800-268-6060.**

16. The contingency procedures are not routinely tested for the purposes of providing operational training and to evaluate their effectiveness. A record of testing and training is not included in the contingency plan. The plan does not include a record of revision. **The Township of South Glengarry and its operating authority should regularly test and train in the contingency procedures; create and maintain a record of testing and training in the contingency procedures, and create and maintain a record of revision for the contingency plan. Training provided to operators in the contingency plan may be used as credit toward satisfying the Owners responsibility for provision of training under section 17 of Ontario Regulation 435/93, as amended.**

17. Page 6 G. 40 of the Lancaster Water Treatment Plant Operations Manual recommends operation of the generator set one hour per week with as much load as possible. The operational checks presently in effect at the water treatment facility require the standby generator set to be tested monthly under load conditions. The test includes operating the generator set under load. Operational conditions (AC volts, Ac amps, Hertz, coolant temperature, oil pressure, oil level, RPM, operating hours, run time, and DC amps on the battery charger) are recorded on the record of testing. A review of the record of testing revealed that the tests for December 2002, and February, April, May and June 2003 were not recorded. **The Township of South Glengarry and its operating authority should verify either by consulting the manufacturer's operation and maintenance manuals for the standby generator set or consulting the manufacturer directly to determine the recommended frequency for testing under load conditions. After determining the recommended frequency for testing, alter the schedule of testing if required, to match that recommended by the equipment manufacturer. If necessary, the Lancaster Water Treatment Plant Operations Manual should be revised to reflect the manufacturer recommended frequency of testing.**

18. The elevated storage tank is surrounded by a perimeter fence complete with barbed wire and a locked security gate. The gate is equipped with a sign to warn that trespassing is prohibited. The entrance door to the base of the elevated storage tank is locked. In

addition, a valve box located with the base of the elevated storage tank is locked. Trees and brush have grown up along the security fence on three sides. The trees and brush obscure visibility and aid unwanted access within the fenced area. **The Township of South Glengarry and its operating authority should cut back and remove the brush that has grown up around the security fence and implement an ongoing maintenance program to ensure that vegetation is controlled along the security fence line.**

19. The training provided by the Township of South Glengarry to its licenced operators included the types of training provided by way of example in subsection 17 (2) of Ontario Regulation 435/93, as amended. The detailed training records indicate that training did not include operations manual and contingency/emergency training. **The Township of South Glengarry and its operating authority should include a regular review of the Lancaster Water Treatment Plant Operations Manual and the contingency plan procedures for the drinking-water system as part of the annual training the Township is required to provide to each operator.**

20. The review found that in July and August 2002 the residual aluminum concentration was detected above the recommended operational guideline of 0.100 mg/L contained in Table 4 and described in detail on page 16 of the Ministry publication "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2003". The review also noted a corresponding increase in filter effluent and treated water turbidity during the period of elevated aluminum residual concentrations; however, the filtered water turbidity remained well below the prescribed drinking-water quality standard of 1.0 NTU at all times. The test results for Ministry audit samples collected on August 6, 2003 did not detect any parameters in excess of the prescribed drinking-water quality standards for those parameters. The audit test results did confirm a residual aluminum concentration (0.131 mg/L) in the treated water in excess of the operation guideline. Trends showing patterns of increased filter effluent and treated water turbidity with elevated aluminum residual is an indicator that the effectiveness of the coagulation-flocculation process is being compromised. The coagulation-flocculation process is a key barrier to the multiple barrier approach to ensuring that drinking-water is free of microbial contamination including chlorine resistant parasites such as Giardia and Cryptosporidium. **The Township of South Glengarry and its operating authority should therefore optimize the dosage of the acidified alum (ClarIon) during the spring and summer months when the raw water temperature is at its peak, to ensure that the coagulation-flocculation process is operating efficiently at all times, and to maintain the residual aluminum concentration below the operational guideline of 0.100 mg/L. Optimization of the acidified alum dosage should include regular jar testing. Documentation of the jar tests should be maintained using a standard or typical jar**

test report form. If after attempting to optimize the coagulation-flocculation process, the aluminum residual remains above the operational guideline, the Township of South Glengarry and its operating authority should investigate the use of an alternative coagulant, and/or seek the assistance of a qualified professional experienced in coagulation chemistry and in improving process control at drinking-water systems.

21. Settled water turbidity is not routinely monitored for the purpose of optimizing coagulant dosage and filter performance. **The Township of South Glengarry and its operating authority should begin to conduct routine process control testing of the settled water turbidity (prior to filtration) as part of its operational checks of the facility. This data should be used in making process control decisions with respect to coagulant dosage, to minimize the settled water turbidity entering the filters.**

22. The data archiving capability of the SCADA computer is not known, nor is the data routinely backed up from the SCADA computer's hard drive. All records of results for required drinking-water tests recorded by continuous water quality analyzers must be retained for at least five years (s. 13 (1) Ontario Regulation 170/03, as amended). **The Township of South Glengarry and its operating authority shall determine the data archiving capability of the Lancaster drinking-water system's SCADA computer, and shall routinely back-up the data from the SCADA computer with such means and frequency necessary to ensure compliance with section 13 of the Regulation.**

By no later than Wednesday, March 31, 2004, provide the undersigned Provincial Officer with an Action Plan that specifies how the Owner/Operating Authority intends to address the 22 above cited recommendations, complete with implementation dates.

SIGNATURES

Inspected By: Daniel K. White	Signature: (Inspector):
Reviewed & Approved By: James Mahoney	Signature (Supervisor):
Review & Approval Date: (yyyy/mm/dd) 2004/02/06	

Note: *This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.*

cc: Mr. Marcel Lapierre, Administrator and Co-ordinator, Township of South Glengarry
Mr. Shawn Killoran, Operations Manager, Water/Wastewater Operations, Township of South Glengarry
Dr. Robert Bourdeau, Medical Officer of Health, Eastern Ontario Health Unit
Mr. Mirek Tybinkowski, Ministry of the Environment, Safe Drinking Water Branch
Mr. Roger Hood, General Manager, Raisin Region Conservation Authority
District Office File SI GL LN 510

APPENDIX A

CERTIFICATE OF APPROVAL

(AS ATTACHED)

Ontario

Ministry of the Environment | Ministère de l'Environnement

CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE WATER WORKS
NUMBER 2146-4HLSL9

Township of South Glengarry
6 Oak Street, P.O. Box 220
Lancaster, Ontario
K0C 1N0

Site Location: Concession 1, Part of Lot 35
South Glengarry Township, United Counties Of Stormont, Dundas & Glengarry

You have applied in accordance with Section 52 of the Ontario Water Resources Act for approval of:

the construction of the Lancaster Surface Water Treatment Plant obtaining water from Lake St. Francis having a rated capacity of 1,440 m3/d, located in the Township of South Glengarry, including the following works:

Zebra Mussel Control Facilities

a Zebra Mussel Control System (sodium hypochlorite) utilizing a prechlorination metering pump and solution tank. Installation includes one (1) - 25 mm and one (1) 15 mm diameter tube lines, inserted within a 450 mm diameter raw water intake pipeline and terminating inside of the intake with a multi-port diffuser, one of the tubes is to be used for the addition of sodium hypochlorite solution to the intake crib and the other tube for chlorine residual sampling, and all associated equipment;

Water Treatment Facility

a surface water treatment facility located on a site on Concession 1, Part of Lot 35, in the Township of South Glengarry, consisting of a twin package water treatment plant system taking water from Lake St. Francis, with pH adjustment/alkalinity adjustment/corrosion control and finished water disinfection, rated for total maximum day flow rate of 1,440 m3/d together with a control building to house low lift pumping equipment, chemical feed facilities, natural gas generator set, laboratory/control room, workshop, storage room including the installation of the following works:

- a 450 mm diameter raw water intake pipeline located in Lake St. Francis with bell mouth and crib sized for ultimate peak demand;

- a low lift raw water pump well consisting of an inground wet well housing two (2) stationary screens, three (3) submersible raw water pumps (two duty, one standby) each pump having a

rated capacity of 8.33 L/s at a TDH of 10.1 m and in parallel having a combined rated capacity of 16.7 L/s at a TDH of 10.1 m to satisfy the plant rated capacity, piping and valving, liquid level regulators and alarms,access hatchway, control panel and continuous turbidimeter, raw water sample tap, all within a separated Low Lift Pumping Station Room;

- a raw water discharge line from the low lift wet well to the Water Treatment Plant c/w magnetic flowmeter;

- a separated Electrical Room housing a 125 kW natural gas generator set, motor control center;

- an above grade Coagulation containment area housing an Acidified Alum feed system for coagulation, equipped with two (2) chemical feed metering pumps (one duty, one standby) and one (1) 15 m3 bulk chemical storage tank, one (1) 450 L day tank, a calibration chamber and associated piping and valving, solution injection line to raw water header;

-an above grade Soda Ash containment area housing a Sodium Carbonate feed system for post pH/alkalinity adjustment and as a corrosion inhibitor, equipped with two (2) chemical feed metering pumps (one duty, one standby), one (1) 160 L solution tank, volumetric screw feeder, mixer, a calibration chamber and associated piping and valving, solution injection line to the finished water header;

-a twin package water treatment plant system, each sized to process 1/2 of the rated capacity and each including:

a coagulation system including tank and mixer;

a flocculation system including tank and mixer;

a sedimentation system including a 1.8 m X 1.8 m X 2.5 m depth clarifier tank with lamella settling tubes;

one (1) dual media anthracite - sand gravity filter unit with backwash system having a surface area of 3.33 m^2 and a maximum filtration rate of 9.0 m/h for a maximum filtration rate of 8.33 L/s and a backwashing rate of 40.0 m/h, equipped with valves and piping, magnetic flowmeters, etc.;

one (1) gravity granular activated carbon (GAC) filter unit with backwash system having a volume of 2.42 m^3 designed for a maximum rate of 8.33 L/s and a backwashing rate of 30.0 m/h, equipped with valves and piping, magnetic flowmeters, etc.;

- an above grade Sodium Hypochlorite containment area housing a Sodium Hypochlorite feed system, equipped with four (4) chemical feed metering pumps (three duty, one standby) and two (2) 450 L chemical solution tank and associated piping and valving, four (4) application points for Sodium Hypochlorite include: 1) the intake for zebra mussel control (only during

breeding season), 2) raw water header for pre-chlorination 3) to the common filter effluent discharge line and 4) the high lift discharge header for post-chlorination trim;

- a below grade high lift pump well consisting of a wet well housing suction piping for the three (3) high lift vertical turbine water pumps, one (1) pump having a rated capacity of 6.3 L/s at a TDH of 42.6 m to satisfy average day demand and two (2) pumps (one duty, one standby) each having a rated capacity of 15.9 L/s at a TDH of 42.6 m to satisfy maximum day demand, finished water sample tap, piping and valving;

- a twin-celled final clearwell/chlorine contact chamber located below the water treatment plant having a combined minimum working storage volume of 274 m3, equipped with baffles, ultrasonic level transmitters and alarms, watertight access hatchways, floodproof overflow piping to manhole with air gap;

- a below grade backwash/wastewater tank to be installed below the water treatment plant having a volume of 150 m3, equipped with one (1) submersible sewage/sludge pump with a rated capacity of 7.5 L/s at a TDH of 15.0 m to pump settled sludge to the existing municipal sanitary sewer, one (1) centrifugal type pump with a rated capacity of 10.0 L/s at a TDH of 6.3 m to pump decant water to supernatant/overflow line discharging to Lake St. Francis together with composite sampler, liquid level regulators and alarms, access hatchways;

- an inground high lift pump wet well chamber having an available storage volume of approx. 130 m3, watertight access hatchways, goosenecked vents c/w insect screens;

- a separated lab/control room;

- two (2) continuous chlorine residual analyzers- for raw water sampling and for finished water sampling;

- four (4) continuous turbidimeters- one for raw water sampling, two for post filtration sampling and one for finished water sampling;

- two (2) continuous pH analyzers for raw water sampling and for finished water sampling;

- one (1) finished treated water flowmeter;

- ultrasonic level detectors in all tanks;

- SCADA control system;

- all associated appurtenances including site piping, valves, pressure gauges, electrical and control systems, heating and ventilation systems;

all in accordance with the pre-design report, plans, Environmental Study Report Volumes I & II and specifications prepared by Totten Sims Hubicki Associates, Consulting Engineers.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

(1) "certificate" means this entire certificate of approval document, issued in accordance with Section 52 of the *Ontario Water Resources Act*, and includes any schedules;

(2) "Director" means any Ministry employee appointed by the Minister pursuant to section 5 of the *Ontario Water Resources Act*;

(3) "Ministry" means the Ontario Ministry of the Environment;

(4) "Regional Director" means the Regional Director of the Eastern Region of the Ministry;

(5) "District Manager" means the District Manager of the Kingston District Office of the Ministry's Eastern Region;

(6) "Owner" means Township of South Glengarry and includes its successors and assignees;

(7) "works" means the water works described in the Owner's application, this certificate and in the supporting documentation referred to herein, to the extent approved by this certificate;

(8) "water treatment plant" means the entire water treatment system, including the water intake facilities;

(9) "water supply system" means all of the facilities and auxiliaries for the collection, treatment, storage and distribution of water from the source of supply to the service connection of the ultimate consumer;

(10) "Maximum Acceptable Concentration" means a limit applied to concentrations of substances in the drinking water above which there are known or suspected adverse health effects;

(11) "quarterly sampling" means sampling conducted on any such day within each consecutive three-month period that the time interval between consecutive quarterly sampling events is not less than 45 days.

(12) "maximum flow rate" means the maximum rate of water flow for which the plant or process unit was designed;

(13) "contact time" means the detention time at which 90 percent of the water passing through the process unit, storage reservoir or pipe is retained within the process unit, storage reservoir or pipe;

(14) "E. Coli" refers to the thermally tolerant forms of Escherichia that can survive at 44.5 degrees Celsius.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. PERFORMANCE

1.1 The Owner shall construct and, subject to Condition 3, operate the entire water supply system in such a manner, and with such facilities that water supplied to the consumers serviced by the system satisfies the water quality objectives, guidelines and requirements set out in the publication entitled "Ontario Drinking Water Objectives" 1994, as amended from time to time by more recently published editions.

1.2 The Owner shall construct and, subject to Conditions 3.1 through 3.12, operate the water treatment plant to treat water at a rate not exceeding the maximum flow rate of 1,440 m3/d (total).

1.3 The introduction of flows into the water treatment plant in excess of the maximum flow rate shown in Condition 1.2 above is not approved under this certificate, except:

(a) where necessary to meet an unusual water demand for fighting a large fire, **or**

(b) where necessary for the purpose of maintenance of the water works and essential to its efficient operation,

provided that the quality requirements for the treated water are satisfied.

1.4 The Owner shall construct and operate the disinfection facilities in the water supply system in such a manner and with such facilities that the total chlorine residual in the treated water reaching the first consumer connection and the effective contact time between the main chlorination point and the first consumer connection are at all times maintained at levels equivalent to a minimum of 0.5 mg/L of total chlorine residual after a minimum of 60 minutes of contact time.

1.5 The Owner shall construct and operate the backwash/wastewater treatment facilities in such a manner that the annual average concentration of suspended solids in the backwash/wastewater treatment facilities' effluent discharged to Lake St. Francis does not exceed 25 mg/L.

2. MONITORING AND RECORDING

2.1 The Owner shall ensure that the following monitoring program is carried out upon commencement of operation of the works:

(a) A sufficient number of flow measuring devices, calibrated at regular intervals not exceeding one year to ensure their accuracy to within plus or minus 5% of actual rate of flow within the range of 10% to 100% of the full scale reading of the measuring devices, shall be installed,

maintained and operated in order to measure:

(i) the flow rate of water being conveyed to and through the water treatment plant (raw water), and

(ii) the daily quantity of treated water supplied to the distribution system.

(b) The time and duration of each event of flow rate in excess of that specified in Condition 1.2 shall be recorded along with the reasons for the occurrence.

(c) Continuous water quality analyzers and indicators with alarm systems, recalibrated as specified by the instrument manufacturer's instructions or at minimum intervals which ensure operation during at least 95% of plant operating time within the quality control band limits indicated below (using a control chart method as set out in Ministry publication "The principle of Control Charting" 1984, or as in "Standard Methods for the Examination of Water and Wastewater" 20th Edition, 1998, or a more recently published edition), shall be installed, maintained and operated to monitor the following parameters at the indicated locations:

(i) free or total chlorine residual in treated water at the point(s) of entrance to the distribution system (quality control band: ± 0.1 mg/L),

(ii) filtered water turbidity in each filter discharge line (quality control band: ± 0.1 NTU),

(d) Samples of raw water and treated water shall be collected and analyzed for at least the following parameters at the indicated frequency:

RAW WATER

Weekly

Total Coliform	Turbidity
E. Coli	Colour
	pH

In addition to the above routine weekly sampling program, process control on-site testing should be performed and results recorded, at the minimum frequency of once a day, for the following raw water parameters:

pH, Colour, Turbidity, Temperature.

Quarterly

Alkalinity	Zinc	Ammonia + Ammonium (N)

Hardness	Arsenic	Total Kjeldahl Nitrogen
Calcium	Aluminum	Nitrite Nitrogen
Sodium	Manganese	Nitrate Nitrogen
Iron	Conductivity	Dissolved Organic Carbon
Copper	Chloride	Phenols
Lead	Sulphate	

TREATED WATER

Weekly

Total Coliform	Turbidity
E. Coli	Colour
Heterotrophic Plate Count	pH

In addition to the above routine weekly sampling program, process control on-site testing shall be performed and results recorded, at the minimum frequency of twice a day, for the following treated water parameters:

pH, Colour, Turbidity, Temperature, Free Chlorine Residual, Total Chlorine Residual, Aluminum Residual

Quarterly

Alkalinity	Conductivity	1,4-Dichlorobenzene
Hardness	Chloride	Dichloromethane
Calcium	Sulphate	Ethylbenzene
Sodium	Ammonia + Ammonium	Monochlorobenzene
Iron	(N)	Toluene
Copper	Total Kjeldahl Nitrogen	Trichloroethylene
Lead	Nitrite Nitrogen	Total Trihalomethanes
Zinc	Nitrate Nitrogen	Xylene
Arsenic	Dissolved Organic Carbon	
Aluminum	Benzene	
Manganese	Carbon Tetrachloride	
	1,2-Dichlorobenzene	

DISTRIBUTION SYSTEM

(samples taken at locations remote from the point of treated water entry to the distribution system)

Weekly

Total Coliform

E. Coli
Heterotrophic Plate Count
Total Chlorine Residual
Free Chlorine Residual

The minimum number of bacteriological samples to be collected from different locations within the distribution system shall be as outlined in the "Ontario Drinking Water Objectives" 1994, as amended from time to time by more recently published editions.

Quarterly

Alkalinity	Zinc	Ammonia + Ammonium (N)
Hardness	Arsenic	Total Kjeldahl Nitrogen
Calcium	Aluminum	Nitrite Nitrogen
Sodium	Manganese	Nitrate Nitrogen
Iron	Conductivity	Dissolved Organic Carbon
Copper	Chloride	Total Trihalomethanes
Lead	Sulphate	

(e) Subject to Condition 2.2, once a year, the raw water, treated water and distribution system water samples shall be collected and analyzed for parameters as listed in Table 1, Table 3 and Table 4 of the "Ontario Drinking Water Objectives" 1994, as amended from time to time by more recently published editions.

(f) Samples of the backwash/wastewater treatment facilities' effluent discharged to Lake St. Francis shall be collected and analyzed for at least the following parameters at the indicated frequencies:

Parameter	Type of Sample	Frequency
Suspended Solids	Composite*	Monthly

* Composite sample means a sample made up of at least three (3) discrete samples collected at equal time intervals over a supernatant discharge period.

(g) The sampling and analyses required by clauses (d), (e) and (f) above shall be performed in accordance with the "Guide to the Collection and Submission of Samples for Laboratory Analysis", Ministry of the Environment, 1985, or as described in Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, or a more recently published edition.

2.2 Following review of any of the analytical results required by Condition 2.1 or any of the reports required by Condition 4.3 of this certificate, the District Manager may alter the frequencies and locations of sampling and parameters for analysis required by this condition if he/she considers it necessary for proper assessment of the quality of supplied water or if he/she is requested to do so by the Owner and considers it acceptable by the evidence of information submitted in support of

the request.

2.3 If the Owner monitors any of the parameters required by Condition 2.1, at designated locations and in accordance with Condition 2.1, more frequently than it is required by that condition, the analytical results of all such samples, both required and additional, shall be included in reporting of the values required by this certificate, and the increased frequency, or all dates of sampling, shall also be specified in the reports.

2.4 The Owner shall retain for a minimum of three years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this certificate.

2.5 The Owner shall ensure that the following monitoring program is carried out with regard to zebra mussel control during the chlorination period.

Samples of raw water and treated water shall be collected and analyzed for at least the following parameters at the indicated sampling locations and sampling frequency, unless otherwise notified by the District Manager.

Sampling Location: Raw Water (Prior to filter) during prechlorination for zebra mussel control

Parameter	Frequency
Total Chlorine Residual	daily/5 days/week
Free Chlorine Residual	daily/5 days/week
Turbidity	daily/5 days/week

Sampling Location: Treated Water (Prior to first domestic consumer)

Parameter	Frequency
Free Chlorine Residual	continuous
Total Trihalomethanes (use *NOTE below if applicable)	monthly
Turbidity	continuous

*** NOTE:**
An initial sample must be taken at the commencement of the chlorination period for zebra mussel control followed by monthly sampling for at least a two year period. A request for reduced sampling frequency may be made to the District Manager after two years, and be supported by results of THM analysis obtained during the pre-chlorination period for zebra mussel control.

Sampling Location: Various Points in Distribution System

Parameter	Frequency

Free Chlorine Residual	once/week
Total Trihalomethanes	monthly
(use *NOTE below if applicable)	
Total Chlorine Residual	once/week

*** NOTE:**

An initial sample must be taken at the commencement of the chlorination period for zebra mussel control followed by monthly sampling for at least a two year period. A request for reduced sampling frequency may be made to the District Manager after two years, and be supported by results of THM analysis obtained during the pre-chlorination period for zebra mussel control.

3. OPERATIONS AND MAINTENANCE

3.1 The Owner shall endeavour to take all necessary steps, within the Owner's authority, to ensure protection of the source of water supply Lake St. Francis from contamination.

3.2 Subsequent to construction of, or repairs to the works, and prior to utilization of the works for the supply of potable water, the Owner shall ensure that the works have been adequately disinfected in accordance with latest edition of the Ministry Bulletin "Chlorination of Potable Water Supply" or other superseding Disinfection Bulletin.

3.3 The Owner shall provide for the overall operation of the water treatment plant with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulations 435/93.

3.4 The Owner shall ensure that, at all times, the water works and related equipment and appurtenances which are installed or used to achieve compliance with this certificate are properly operated and maintained. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate laboratory and process controls, and the use of process chemicals and other substances that come in contact with water being treated, that are suitable for the process, compatible with each other and appropriate for drinking water.

3.5 Further to Condition 3.4, the Owner shall ensure that all chemicals used in the treatment process and all materials contacting the water are of "Food Grade" quality and meet both the AWWA (American Water Works Association) quality criteria as set out in AWWA standards and the ANSI (American National Standards Institute) safety criteria as set out in ANSI standard NSF/60 or NSF/61. In addition the Owner shall have, for water treatment chemicals and for water contacting materials, either evidence of current product registration by a testing institution accredited by the ANSI or documents showing the Ministry is satisfied that information provided by the product manufacturer indicates the product will meet both the AWWA and ANSI standards criteria.

3.6 The Owner shall discontinue use of any chemical found to have deleterious effects on finished

water quality upon being presented with reasonable evidence to that effect by the Ministry.

3.7 The Owner shall ensure that prior to commissioning of the water works, contingency plans and procedures are established and adequate equipment and material are available for dealing with emergencies, upset conditions and equipment breakdowns in the water works.

3.8 The Owner shall establish notification procedures to be used to contact the Medical Officer of Health, District Manager and other relevant authorities in the case of an emergency situation.

3.9 Based on the operational objectives stipulated above in Conditions 3.1 and 3.4, the Owner shall prepare an operations manual within six (6) months of commencement of operation of the water works and keep it up to date. Upon request, the Owner shall make the manual available for inspection by the Ministry personnel.

3.10 The Owner shall prepare and make available for inspection by Ministry personnel upon request, a complete set of drawings within one (1) year of substantial completion of the water works. The drawings shall show the water works as constructed at that time.

3.11 A complete set of the record drawings, incorporating any amendments made from time to time, shall be kept by the Owner at the site of the water works for as long as the water works are kept in operation.

3.12 The Owner shall establish procedures for receiving and responding to complaints including a reporting system which records what steps were taken to determine the cause of complaint and the corrective measures taken to alleviate the cause and prevent its reoccurrence.

4. REPORTING

4.1 The Owner shall notify the District Manager and the Medical Officer of Health forthwith in the event that unchlorinated water is directed to the distribution system.

4.2 The Owner shall notify the District Manager and the Medical Officer of Health forthwith if any analytical result exceeds any Maximum Acceptable Concentration of a health-related parameter, or shows deteriorating bacteriological water quality, as defined in the publication entitled "Ontario Drinking Water Objectives" 1994, as amended from time to time by more recently published editions.

4.3 The Owner shall prepare, and upon request, submit to the District Manager annual performance reports for the water supply system. The first such report shall cover the period from the commencement of operation of the water works to the end of the calendar year and shall be prepared within the following ninety (90) calendar days. Each subsequent annual report shall be prepared within ninety (90) calendar days following the completion of the calendar year being reported upon. The reports shall contain the following information in a format acceptable to the District Manager:

(a) a summary and discussion of the quantity of water supplied during the reporting period compared to the design values for the population serviced, including peak flow rates, maximum daily flows and monthly average daily flows;

(b) a summary and interpretation of analytical results obtained in accordance with Condition 2 of this certificate of approval;

(c) a tabulation and description of any emergency or upset conditions which occurred during the period being reported upon; and

(d) a summary listing treatment chemicals used including average dosage rates with special reference to any abnormal usages.

The reasons for the imposition of these terms and conditions are as follows:

1. Conditions 1.1 and 1.4 are included to ensure that the water quality delivered by the treatment plant satisfies the current "Ontario Drinking Water Objectives" in order to protect public health and to ensure that the water is aesthetically acceptable.

2. Conditions 1.2 and 1.3 are included to ensure that the flow rate of water through the works is within the approved treatment capacity of the works.

3. Condition 1.5 is imposed to set out the maximum concentration of suspended solids which is allowed in any waste discharge to the receiving water body. This limit is established to minimize the environmental impact to the receiver.

4. Conditions 2.1 through 2.4 related to the flow metering, sampling and monitoring program are imposed to ensure that all pertinent data are available for the water works performance evaluation and to ensure that the water works is operated and maintained at the level consistent with the design objectives, and is effective in producing water of an acceptable quality at all times.

5. Conditions 2.5 is included to ensure that the sampling and monitoring program data are available for assessing the effectiveness of the use of chlorine, as a short term control measure, on zebra mussel infestation of water taking facilities and on the formation of Total Trihalomethanes.

6. Conditions 3.1 through 3.12 are included to ensure that the works will be operated, maintained, funded, staffed and equipped in a manner enabling compliance with the terms and conditions of this certificate and that the Owner can deal with contingency and/or emergency situations.

7. Conditions 4.1 through 4.3 are included to ensure that all pertinent information is available for the evaluation of the performance of the water treatment plant in producing water of an acceptable quality at all times.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as

amended, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Appeal Board
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 52, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted water works are approved under Section 52 of the Ontario Water Resources Act.

DATED AT TORONTO this 12th day of May, 2000

Mohamed Dhalla, P.Eng.
Director
Section 52, *Ontario Water Resources Act*

JC/
c: District Manager, MOE Kingston - District
Cornwall Area Office
Clerk, Township of South Glengarry
Michael Gundry, P. Eng., Totten Sims Hubicki Associates

Ontario

Ministry of the Environment **Ministère de l'Environnement**

CERTIFICATE OF APPROVAL
AIR
NUMBER 7180-4JRR64

The Corporation of the Township of South Glengarry
6 Oak Street, P.O. Box 220
Lancaster, Ontario
K0C 1N0

Site Location: Lancaster Water Treatment Plant
Concession 1, Part of Lot 35
South Glengarry Township, United Counties Of Stormont, Dundas & Glengarry

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

- one (1) standby natural gas fired generator set, having a rating of 125 kilowatts, to provide power to the Lancaster Water Treament Plant during emergency situations, exhausting to the atmosphere at a maximum volumetric flow rate of 0.65 actual cubic metres per second at an approximate temperature of 649 degrees Celsius, through a stack having an exit diameter of 0.1 metre, extending 0.6 metre above the roof and 5.9 metres above grade;

all in accordance with the Application for a Certificate of Approval (Air), and all supporting information signed by M. Lapierre, Administrator and Coordinator, and dated March 6, 2000.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;

7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Appeal Board
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 28th day of April, 2000

Dave Staseff, P.Eng.
Director
Section 9, *Environmental Protection Act*

CL/

c: District Manager, MOE Kingston - District Office
Mike Gundry, P. Eng., Totten Sims Hubicki Associates

APPENDIX B

PERMIT TO TAKE WATER

(AS ATTACHED)

Ontario Ministry of the Environment / Ministère de l'Environnement

PERMIT TO TAKE WATER
Number 00-P-4046

Notice of Terms and Conditions
Section 100, Ontario Water Resources Act, R.S.O. 1990

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 permission is hereby granted

TO: The Corporation of the Township of South Glengarry
6 Oak Street
P.O. Box 220
Lancaster, ON
K0C 1N0

for the taking of water from Lake St. Francis located on Lot 35, Concession I, Township of South Glengarry, for the Village of Lancaster sewage treatment plant and communal water supply for the Hamlet of South Lancaster. The rate of taking shall not exceed 1,000 litres per minute, or 1,440,000 litres per day.

Except where modified by this Permit the water taking shall be in accordance with the application dated March 24, 2000, and signed by M. Lapierre.

You are hereby notified that this Permit is issued to you subject to the following Definitions, General Conditions and Special Conditions.

DEFINITIONS

1. (a) "Director" means a Director, Section 34, Ontario Water Resources Act, R.S.O. 1990.

(b) "Ministry" means Ontario Ministry of the Environment.

(c) "Permit" means this entire Permit to Take Water including its schedules, if any, issued in accordance with Section 34 of the Ontario Water Resources Act, R.S.O. 1990.

(d) "Permit Holder" means The Corporation of the Township of South Glengarry.

GENERAL CONDITIONS

2. This Permit shall be kept available at the offices of The Corporation of the Township of South Glengarry, 6 Oak Street, Lancaster, ON, for inspection by Ministry staff at all times.

3. The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit Holder to undertake any of the following actions. The Permit Holder shall comply with any such notice:

   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 3(b) at such times or with such frequency as the Director may specify; and
   (d) To keep records made pursuant to clause 3(b) available for inspection until such time as they are returned to the Director pursuant to clause 3(c).

4. The Permit Holder shall immediately notify the Director of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint.

5. For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

6. For Ground-Water Takings, if the taking of water is forecast to cause any negative impact, or is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent the forecast negative impact or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

7. Prior to the taking of water under the authority of this Permit to Take Water, the Permit Holder shall ensure that the works complies with Section 52 of the Ontario Water Resources Act, R.S.O. 1990.

8. Prior to the taking of water under the authority of this Permit to Take Water, the Permit Holder shall ensure that the discharge complies with Section 53 of the Ontario Water Resources Act, R.S.O. 1993.

9. The Permit Holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change. The Permit Holder shall not assign his rights under this Permit to another person without the written consent of the Director.

10. No water may be taken under authority of this permit after the expiry date of this Permit, unless the Permit is renewed, or after the expiry date shown on any subsequent renewal of this permit, unless it is likewise renewed.

11. This Permit does not release the Permit Holder from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

12. The Permit Holder must forthwith, upon presentation of credentials, permit Ministry personnel, or a Ministry authorized representative(s) to carry out any and all inspections authorized by Section 15, 16 or 17 of the Ontario Water Resources Act, R.S.O. 1990, Section 156, 157 or 158 of the Environmental Protection Act, R.S.O. 1990 of Section 19 or 20 of the Pesticides Act, R.S.O. 1990.

13. The Director may, at times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in the taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect the right to appeal the notice to the Environmental Appeal Board under the Ontario Water Resources Act, Subsection 100(3).

SPECIAL CONDITIONS

14. Records with respect to the measurement and reporting criteria defined under General Condition 3(d) listed above shall be kept daily by the Permit Holder at the offices of The Corporation of the Township of South Glengarry, 6 Oak Street, Lancaster, ON, until this Ministry requests them to be submitted or states otherwise.

15. No water shall be taken under authority of this Permit after May 1, 2007.

The reason for the imposition of Special Condition 14 is to establish a record of water taking.

The reason for the imposition of Special Condition 15 is to ensure that this Ministry has an opportunity to review the continued availability of water to be taken under authorization by this Permit as it relates to interference with other established uses.

You may, by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each Term or Condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit number;
6. The date of the Permit;
7. The name of the Director;
8. The municipality within which the taking is located;

And the Notice should be signed and dated by the appellant.

This notice must be served upon:

The Secretary
Environmental Appeal Board
P.O. Box 2382
2300 Yonge Street, 12th Floor
TORONTO, Ontario
M4P 1E4

AND The Director
Section 34, Ontario Water Resources Act
Ministry of the Environment
133 Dalton Avenue, Box 820
KINGSTON, Ontario
K7L 4X6

Dated at Kingston this 5th day of May, 2000.

Original Signed by
C. HAMMOND

Director
Section 34, Ontario Water Resources Act
Ministry of the Environment.

APPENDIX C

GPS COORDINATES

GPS REFERENCING	
ITEM	**GLOBAL POSITIONING SYSTEM (GPS) COORDINATES**
MAP DATUM:	NAD27
UTM ZONE:	18
WATER INTAKE:	Not Determined
TREATMENT PLANT:	540900.00 m E, 4998418.00 m N
STORAGE TANK:	538861.00 m E, 4999113.00 m N

APPENDIX D

OPERATOR AND FACILITY CERTIFICATION DETAILS

PLANT CLASSIFICATION

Plant Name: Lancaster Drinking-Water System

Facility Level: Class 2 Water Treatment System, Class 2 Water Distribution System

Certificate Number: 2897 (WTS), 477 (WDS)

Date of Issue: December 1, 2000 (WTS), August 25, 1987 (WDS)

PLANT PERSONNEL

OPERATOR 1

Operator Name: Shawn Killoran

Title: Operations Manager

Certificate Number: 6882 (WT), 6883 (WD)

Expiry Date: September 30, 2005 (WT & WD)

Certification Level: WT2, WD2

OPERATOR 2

Operator Name: John Cameron

Title: Operator

Certificate Number:
12408 (WT), 14624 (WD), 11756 (WQA)

Expiry Date: July 31, 2005 (WT), September 30, 2006 (WD), March 31, 2004 (WQA)

Certification Level: WT2, WD2, WQA1

OPERATOR 3

Operator Name: George Romanko

Title: Operator

Certificate Number: 11215 (WT), OT5569 (WD)

Expiry Date: April 30, 2006 (WT), March 31, 2006

Certification Level: WT1, OIT WDS (NB. Mr. Romanko was notified on November 23, 2003 of his successful completion of the Class 2 WD exam. Mr. Romanko is awaiting the issuance of his Class 2 WDS licence.

APPENDIX E

CONTACT INFORMATION

Local Health Unit

1000 Pitt Street
Cornwall, ON
K6J 5T1

Medical Officer of Health: Dr. Bourdeau

Phone: (613) 933-1375
Fax: (613) 933-7930

Raisin Region Conservation Authority

P.O. Box 429
6589 Boundary Road
Cornwall, ON
K6H 5T2

Attention: Mr. Roger Hood, General Manager

Phone: (613) 938-3611
Fax: (613) 938-3221

Safe Drinking Water Branch

Ministry of the Environment
2 St. Clair Avenue West
Floor 12A
Toronto ON M4V 1L5

Attention: Mirek Tybinkowski
Water and Wastewater Specialist

Phone: 416-314-8202
Fax: 416-314-6935

Township of South Glengarry

Marcel Lapierre
Administrator & Coordinator
6 Oak Street
P.O. Box 220
Lancaster, ON
K0C 1N0

Phone: (613) 347-1166
Fax: (613) 347-3411

Shawn Killoran
Operations Manager
Glen Walter WTP
18352 County Road 2 (Hwy. 2 East)
Glen Walter, ON
K6H 5R5

Phone: (613) 931-3036
Fax: (613) 931-3340

Consultants or Other Key Contacts

Totten Sims Hubicki Associates
300 Water Street
Whitby, ON
L1N 9J2

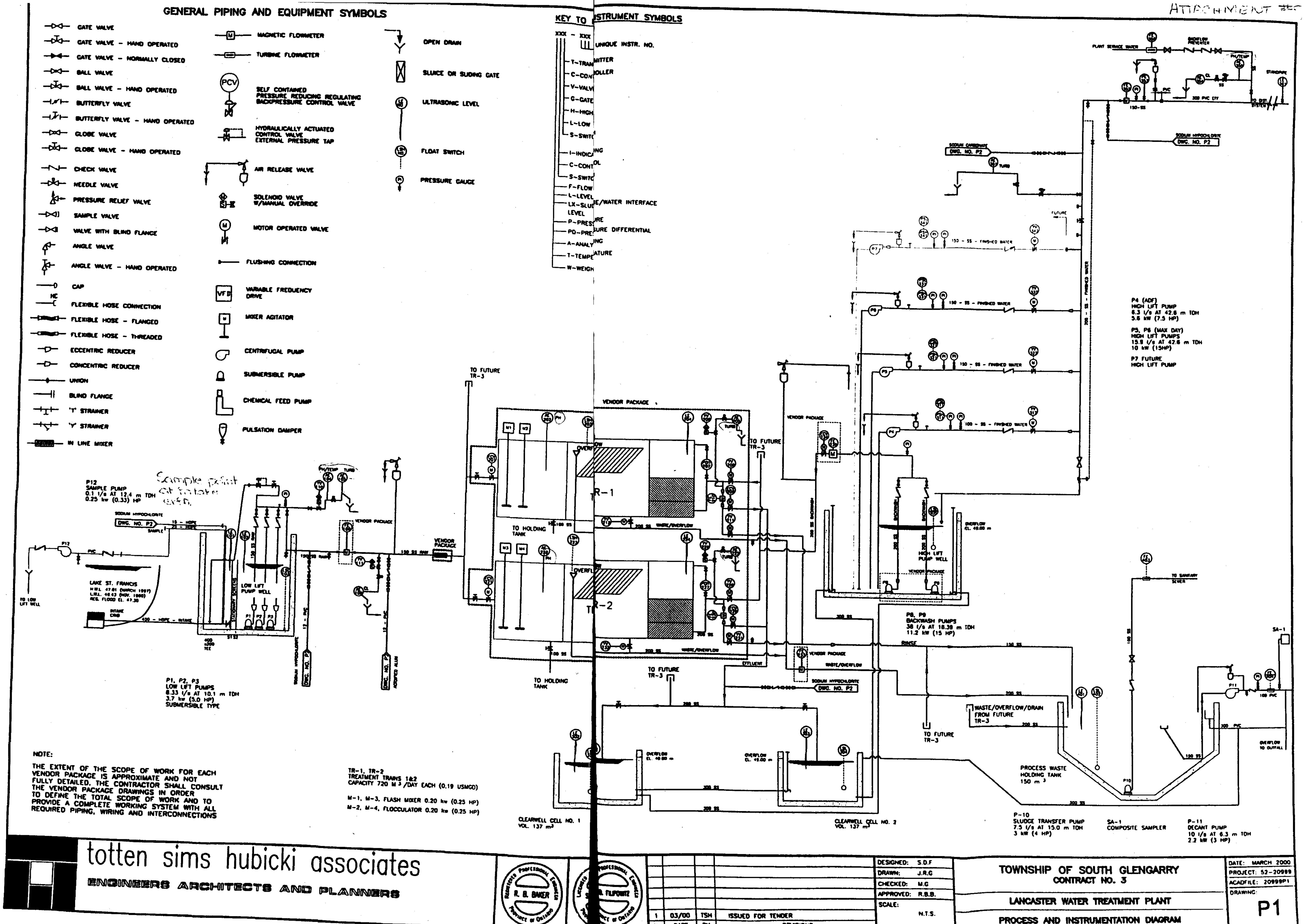
Attention: R.B. Baker, P. Eng.,
Project Manager

Phone: (613) 668-9363
Fax: (613) 668-0221

APPENDIX F

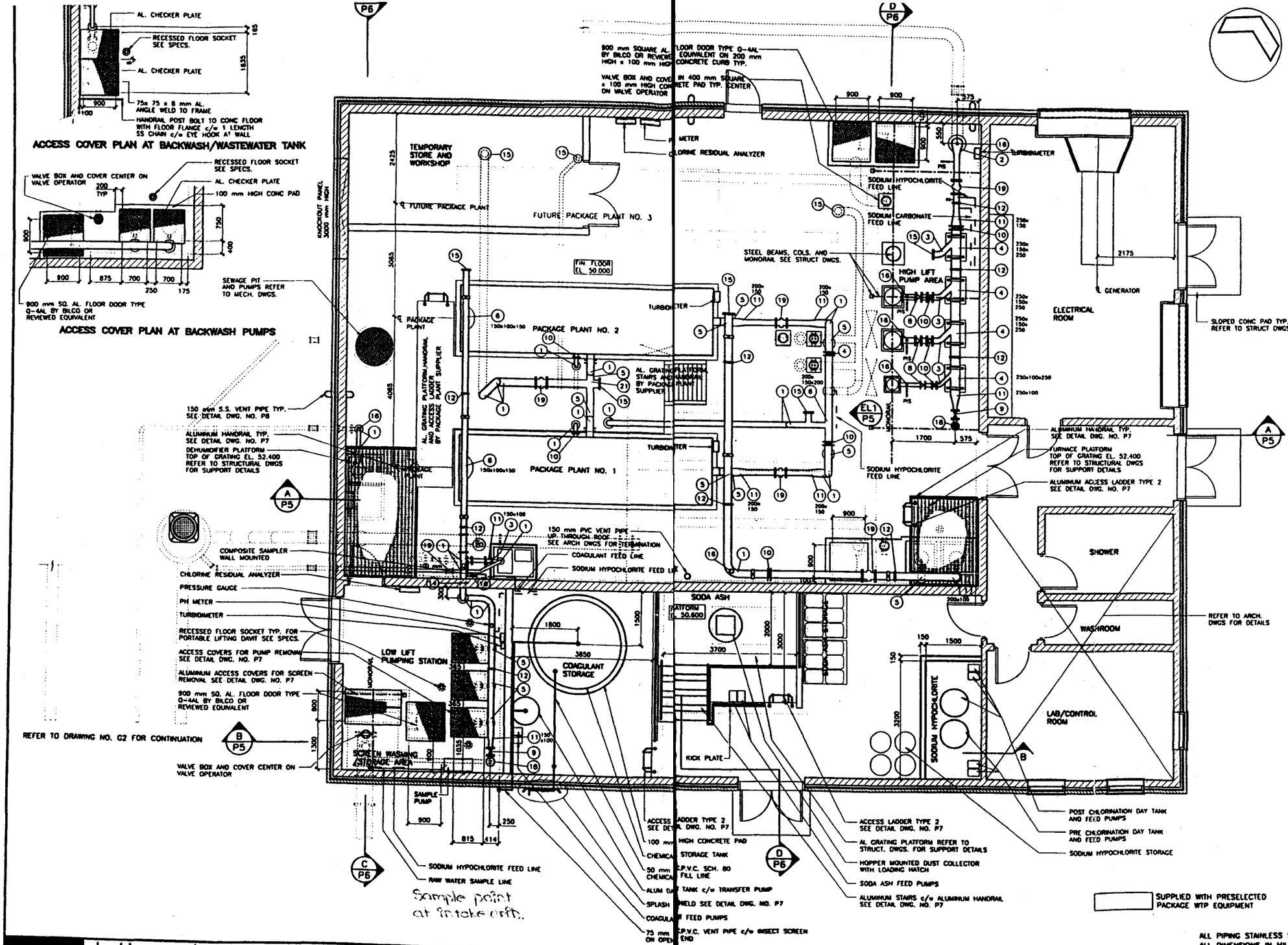
PLANT & DISTRIBUTION SYSTEM SCHEMATICS

(SEE ATTACHED)

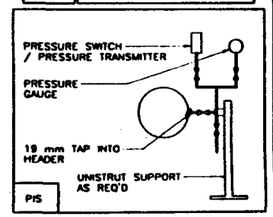

ATTACHMENT
GENERAL PIPING AND EQUIPMENT SYMBOLS
GATE VALVE
GATE VALVE - HAND OPERATED
GATE VALVE - NORMALLY CLOSED
BALL VALVE
BALL VALVE - HAND OPERATED
BUTTERFLY VALVE
BUTTERFLY VALVE - HAND OPERATED
GLOBE VALVE
GLOBE VALVE - HAND OPERATED
CHECK VALVE
NEEDLE VALVE
PRESSURE RELIEF VALVE
SAMPLE VALVE
VALVE WITH BLIND FLANGE
ANGLE VALVE
ANGLE VALVE - HAND OPERATED
CAP
FLEXIBLE HOSE CONNECTION
FLEXIBLE HOSE - FLANGED
FLEXIBLE HOSE - THREADED
ECCENTRIC REDUCER
CONCENTRIC REDUCER
UNION
BLIND FLANGE
'T' STRAINER
'Y' STRAINER
IN LINE MIXER
MAGNETIC FLOWMETER
TURBINE FLOWMETER
SELF CONTAINED PRESSURE REDUCING REGULATING BACKPRESSURE CONTROL VALVE
HYDRAULICALLY ACTUATED CONTROL VALVE EXTERNAL PRESSURE TAP
AIR RELEASE VALVE
SOLENOID VALVE W/MANUAL OVERRIDE
MOTOR OPERATED VALVE
FLUSHING CONNECTION
VARIABLE FREQUENCY DRIVE
MIXER AGITATOR
CENTRIFUGAL PUMP
SUBMERSIBLE PUMP
CHEMICAL FEED PUMP
PULSATION DAMPER
OPEN DRAIN
SLUICE OR SLIDING GATE
ULTRASONIC LEVEL
FLOAT SWITCH
PRESSURE GAUGE
KEY TO INSTRUMENT SYMBOLS
UNIQUE INSTR. NO.
LEVEL
P12 SAMPLE PUMP 0.1 l/s AT 12.4 m TDH 0.25 kw (0.33) HP
Sample point at intake
LAKE ST. FRANCIS
P1, P2, P3 LOW LIFT PUMPS 8.33 l/s AT 10.1 m TDH 3.7 kw (5.0 HP) SUBMERSIBLE TYPE
LOW LIFT PUMP WELL
TO FUTURE TR-3
VENDOR PACKAGE
TO HOLDING TANK
TR-1
TR-2
P4 (ADF) HIGH LIFT PUMP 6.3 l/s AT 42.6 m TDH 5.6 kW (7.5 HP)
P5, P6 (MAX DAY) HIGH LIFT PUMPS 15.8 l/s AT 42.6 m TDH 10 kW (15HP)
P7 FUTURE HIGH LIFT PUMP
P8, P9 BACKWASH PUMPS 38 l/s AT 18.39 m TDH 11.2 kW (15 HP)
HIGH LIFT PUMP WELL
WASTE/OVERFLOW/DRAIN FROM FUTURE TR-3
PROCESS WASTE HOLDING TANK 150 m³
CLEARWELL CELL NO. 1 VOL. 137 m³
CLEARWELL CELL NO. 2 VOL. 137 m³
P-10 SLUDGE TRANSFER PUMP 7.5 l/s AT 15.0 m TDH 3 kW (4 HP)
SA-1 COMPOSITE SAMPLER
P-11 DECANT PUMP 10 l/s AT 6.3 m TDH 2.2 kW (3 HP)
NOTE:
THE EXTENT OF THE SCOPE OF WORK FOR EACH VENDOR PACKAGE IS APPROXIMATE AND NOT FULLY DETAILED. THE CONTRACTOR SHALL CONSULT THE VENDOR PACKAGE DRAWINGS IN ORDER TO DEFINE THE TOTAL SCOPE OF WORK AND TO PROVIDE A COMPLETE WORKING SYSTEM WITH ALL REQUIRED PIPING, WIRING AND INTERCONNECTIONS
TR-1, TR-2 TREATMENT TRAINS 1&2 CAPACITY 720 M³/DAY EACH (0.19 USMGD)
M-1, M-3, FLASH MIXER 0.20 kw (0.25 HP)
M-2, M-4, FLOCCULATOR 0.20 kw (0.25 HP)
totten sims hubicki associates
ENGINEERS ARCHITECTS AND PLANNERS
R. B. BAKER
1 03/00 TSH ISSUED FOR TENDER
No. DATE BY REVISIONS
DESIGNED: S.D.F
DRAWN: J.R.G
CHECKED: M.C
APPROVED: R.B.B.
SCALE: N.T.S.
TOWNSHIP OF SOUTH GLENGARRY CONTRACT NO. 3
LANCASTER WATER TREATMENT PLANT
PROCESS AND INSTRUMENTATION DIAGRAM
DATE: MARCH 2000
PROJECT: 52-20999
ACADFILE: 20999P1
DRAWING: P1

ACCESS COVER PLAN AT BACKWASH/WASTEWATER TANK

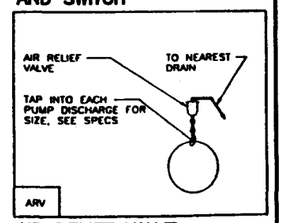
ACCESS COVER PLAN AT BACKWASH PUMPS



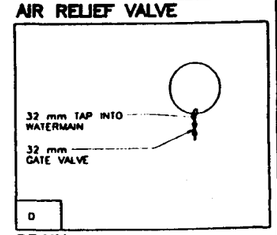
FITTING SCHEDULE	
MARK	DESCRIPTION
1	90° BEND
2	REDUCING 90° BEND
3	45° BEND
4	45° REDUCING LATERAL
5	TEE
6	REDUCING TEE
7	45° TRUE WYE
8	CHECK VALVE
9	GATE VALVE
10	BUTTERFLY VALVE
11	CONCENTRIC REDUCER
12	VICTAULIC COUPLING
13	DRESSER COUPLING
14	THRUST FLANGE
15	BLIND FLANGE
16	AIR RELIEF VALVE
17	QUICK COUPLING
18	SURGE RELIEF VALVE
19	FLOWMETER
20	IN LINE MIXER
21	CROSS
22	SWIVEL JOINT
23	45° LATERAL



PRESSURE GAUGE AND SWITCH



AIR RELIEF VALVE



DRAIN

ALL PIPING STAINLESS STEEL UNLESS OTHERWISE NOTED
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED

totten sims hubicki associates
ENGINEERS ARCHITECTS AND PLANNERS

R. B. BAKER — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

S.D.F. — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

No.	DATE	BY	REVISIONS
1	03/00	TSH	ISSUED FOR TENDER

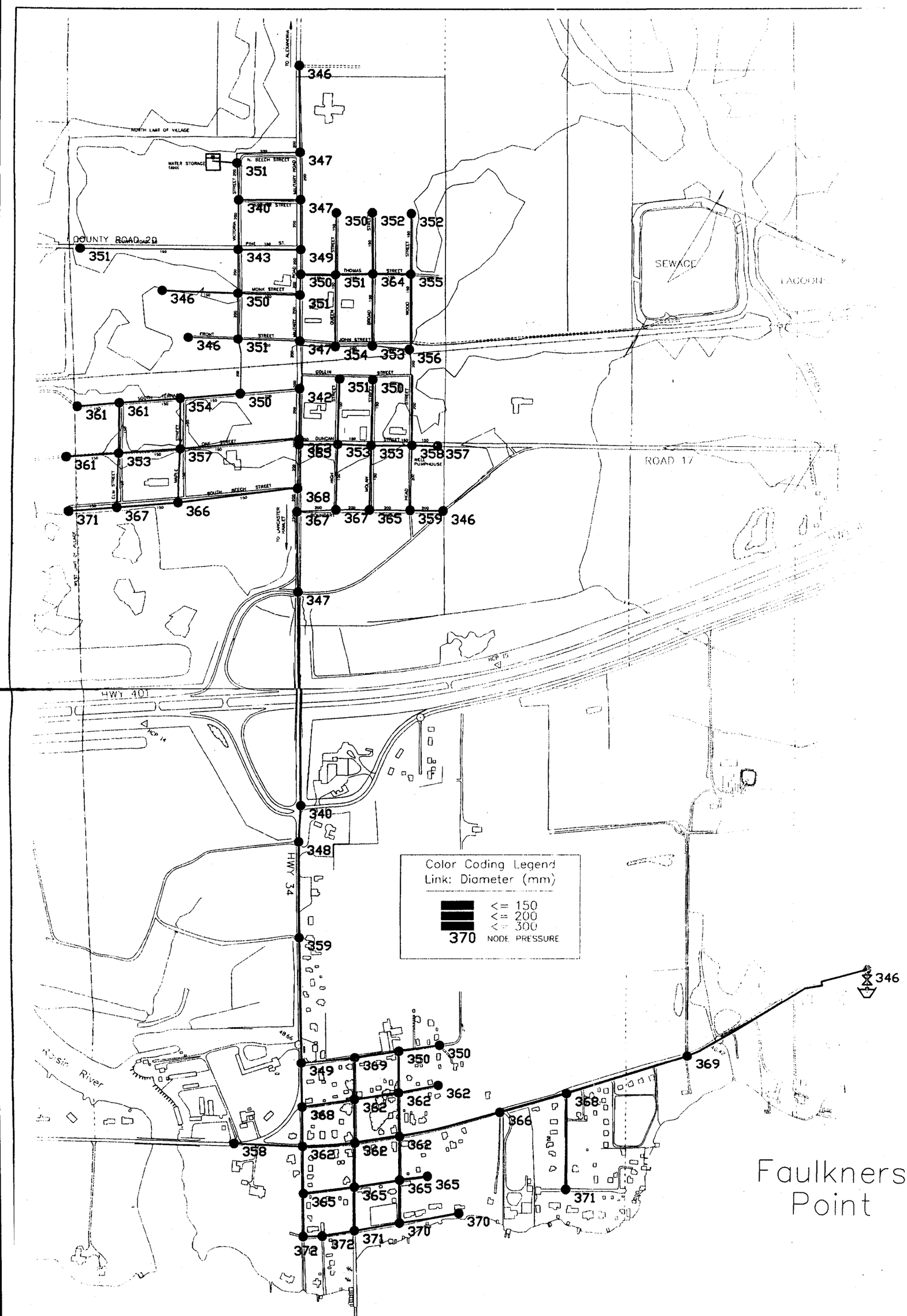
DESIGNED:	S.D.F.
DRAWN:	M.J.A.
CHECKED:	M.G.
APPROVED:	R.B.B.
SCALE:	1:50

TOWNSHIP OF SOUTH GLENGARRY
CONTRACT NO. 3

LANCASTER WATER TREATMENT PLANT

GROUND FLOOR PLAN

DATE: MARCH 2000
PROJECT: 52-20999
ACADFILE: 20999P3
DRAWING: P3



totten sims hubicki associates
ENGINEERS ARCHITECTS AND PLANNERS

NO.	DATE	BY	REVISIONS

DESIGNED S.T.
DRAWN R.J.W.
CHECKED S.T.
APPROVED M.C.
SCALE N.T.S.

VILLAGE OF LANCASTER
WATER SUPPLY SYSTEM
MAXIMUM DAY FLOW SYSTEM PRESSURE WTP CAPACITY SYSTEM

APPENDIX G

MINISTRY AUDIT SAMPLE RESULTS

(SEE ATTACHED)

APPENDIX
Table 1
LANCASTER WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 06-AUG-2003
CHEMICAL / PHYSICAL PARAMETERS - HEALTH RELATED

Sample # 1 - (REG) TREATED WATER
Sample # 2 - (REG) ROZON INSURANCE DISTRIBUTION

Parameter	Units	MAC [1]	IMAC [2]	AO [3]	SAMPLE # 1	SAMPLE # 2
2,3,4,6-TETRACHLOROPHENOL	NG/L	100000			20 <=W	
2,4-DICHLORO PHENOL	NG/L	900000			2000 <=W	
24 DICHLOROPHENOXYACETIC	NG/L		100000		100 <=W	
245 TRICHLOROPHNOXYACETIC	NG/L	280000			50 <=W	
ALDICARB	NG/L	9000			2500 <=W	
ALDRIN	NG/L	700			1 <=W	
ALDRIN+DIELDRIN	NG/L	700			3 <=W	
AMINOMETHYLPHOSPHONIC ACID	UG/L		280		5 <=W	
ANTIMONY, UNFILTERED TOTAL	UG/L		6		.57 +/-0.15	
ARSENIC, UNFILTERED TOTAL	UG/L		25		.5 +/-0.10	
ATRAZINE	NG/L		5000		50 <=W	
ATRAZINE+DE-ALKYLATEDATRAZINE	NG/L		5000		200 <=W	
ATRAZINE,DEETHYLATED	NG/L		5000		200 <=W	
BARBAN	NG/L	90000			2000 <=W	
BARIUM, UNFILTERED TOTAL	UG/L	1000			23.9 +/-2.30	
BENDIOCARB	NG/L	40000			1500 <=W	
BLADEX	NG/L		10000		100 <=W	
BORON, UNFILTERED TOTAL	UG/L		5000		22 +/-4.00	
BROMOXYNIL	NG/L	5000			50 <=W	
CADMIUM, UNFILTERED TOTAL	UG/L	5			0 +/-0.05	
CARBOFURAN	NG/L	90000	a		2000 <=W	
CHLORDANE,ALPHA	NG/L	7000			2 <=W	
CHLORDANE,GAMMA	NG/L	7000			2 <=W	
CHROMIUM, UNFILTERED TOTAL	UG/L	50			1.5 +/-0.50	
DDT TOTAL	NG/L	30000			17 <=W	
DIAZINON	UG/L	20			.2 <=W	
DICAMBA	NG/L	120000			50 <=W	
DICLOFOP-METHYL	NG/L	9000			100 <=W	
DIELDRIN	NG/L	700			2 <=W	
DIMETHOATE	UG/L		20		.5 <=W	
DIQUAT	UG/L	70			.1 <=W	
DIURON	NG/L	150000			2000 <=W	
DMDT METHOXYCHLOR	NG/L	900000			5 <=W	
DURSBAN (CHLORPYRIFOS)	UG/L	90			.1 <=W	
FLUORIDE, UNFILTERED REACTIVE	MG/L	1.5 b			.1	
GLYPHOSATE	UG/L		280		2 <=W	
GUTHION	UG/L	20			.05 <=W	
HEPTACHLOR	NG/L	3000			1 <=W	
HEPTACHLOR+HEPT. EPOXIDE	NG/L	3000			3 <=W	
HEPTACHLOREPOXIDE	NG/L	3000			2 <=W	

APPENDIX
Table 1
LANCASTER WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 06-AUG-2003
CHEMICAL / PHYSICAL PARAMETERS - HEALTH RELATED

Sample # 1 - (REG) TREATED WATER
Sample # 2 - (REG) ROZON INSURANCE DISTRIBUTION

Parameter	Units	MAC [1]	IMAC [2]	AO [3]	SAMPLE # 1	SAMPLE # 2
HEXACLOROCYCLOHEX,GAMMA-BHC	NG/L	4000			1 <=W	
LASSO	NG/L		5000		500 <=W	
LEAD, UNFILTERED TOTAL	UG/L	10 c			.03 +/-0.05	.27 +/-0.27
MALATHION	UG/L	190			.5 <=W	
MERCURY, UNFILTERED TOTAL	UG/L	1			.02 <=W	
METALACHLOR	NG/L		50000		500 <=W	
NITRATES TOTAL, UNFIL.REAC	MG/L	10 d			.207	
NITRITE, UNFILTERED REACTIVE	MG/L	1 d			.001 <=W	
OP-DDT	NG/L	30000			5 <=W	
PARAQUAT	UG/L		10		.1 <=W	
PARATHION	UG/L	50			.1 <=W	
PCB TOTAL	NG/L		3000		20 <=W	
PENTACHLOROPHENOL	NG/L	60000			10 <=W	
PHORATE (THIMET)	UG/L		2		.1 <=W	
PICLORAM	NG/L		190000		100 <=W	
PP-DDD	NG/L	30000			5 <=W	
PP-DDE	NG/L	30000			2 <=W	
PP-DDT	NG/L	30000			5 <=W	
PROMETRYNE	NG/L		1000		50 <=W	
SELENIUM, UNFILTERED TOTAL	UG/L	10			0 +/-1.00	
SENCOR	NG/L	80000			100 <=W	
SIMAZINE	NG/L		10000		50 <=W	
SIMAZINE, DIETHYL	NG/L		10000		200 <=W	
TECH. CHLORDANE (TOTAL)	NG/L	7000			6 <=W	
TEMEPHOS	UG/L		280		.1 <=W	
TERBUFOS	UG/L		1		.2 <=W	
TRIALLATE	NG/L	230000			1500 <=W	
TRICHLOROPHENOL 2,4,6	NG/L	5000			20 <=W	
TRIFLURALIN	NG/L		45000		5 <=W	
TRIHALOMETHANES, TOTAL	UG/L	100 e			33	41
URANIUM, UNFILTERED TOTAL	UG/L	20			.09 +/-0.05	

Shortforms:

<T	-	A measurable trace amount; interpret with caution	NA	-	Result not available
<W	-	No measurable response (zero) : < Reported value	NS	-	Not sampled
<=W	-	No measurable response (zero) : < Reported value	NG/L	-	Nanograms per litre
<	-	Actual result is less than reported value	UG/L	-	Micrograms per litre
ND	-	Not detected	MG/L	-	Milligrams per litre
!NP	-	No appropriate procedure available			

Footnotes:

1 Maximum Acceptable Concentration

2 Interim Maximum Acceptable Concentration

3 Aesthetic Objective

4 Includes *alpha*-chlordane, *gamma*-Chlordane and Oxychlordane

5 Includes *p,p'*-DDE, o,p'-DDT, *p,p'*-DDD and *p,p'*DDT

a) Total toxic equivalents when compared with 2,3,7,8,-TCDD (tetrachlorodibenzo-p-dioxin)

b) Where fluoride is added to drinking water, it is recommended that the concentration be adjusted to 0.5 - 0.8 mg/L, the optimum level for control of tooth decay. Where supplies contain naturally occurring fluoride at levels higher than 1.5 mg/L but less than 2.4 mg/L the Ministry of Health and Long Term Care recommends an approach through local boards of health to raise public and professional awareness to control excessive exposure to fluoride from other sources. Levels above the MAC must be reported to the local Medical Officer of Health.

c) This standard applies to water at the point of consumption. Since lead is a component in some plumbing systems, first flush water may contain higher concentrations of lead than water that has been flushed for five minutes.

d) Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).

e) The standard is expressed as a running annual average of quarterly samples measured at a point reflecting the maximum residence time in the distribution system.

APPENDIX
Table 2
LANCASTER WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 06-AUG-2003
MICROBIOLOGICAL PARAMETERS - HEALTH RELATED

Sample # 1 - (REG) TREATED WATER
Sample # 2 - RAW WATER
Sample # 3 - (REG) DAIRY QUEEN DISTRIBUTION
Sample # 4 - (REG) ROZON INSURANCE DISTRIBUTION

Parameter	Units	MAC[1]	AO[2]	SAMPLE # 1	SAMPLE # 2
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200			200 >
COLIFORM, TOTAL MF	C/100ML	0			6
ESCHERICHIA COLI MF	C/100ML	0			8
HETEROTROPH MF 35 C	C/ML	500		10 <	
NT: DETERIORATION INDICATORS	C/100ML		0	NOT DETECTED	
NT: ESCHERICHIA COLI	C/100ML	0		ABSENT	
NT: TOTAL COLIFORMS	C/100ML	0		ABSENT	

APPENDIX
Table 2
LANCASTER WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 06-AUG-2003
MICROBIOLOGICAL PARAMETERS - HEALTH RELATED

Sample # 1 - (REG) TREATED WATER
Sample # 2 - RAW WATER
Sample # 3 - (REG) DAIRY QUEEN DISTRIBUTION
Sample # 4 - (REG) ROZON INSURANCE DISTRIBUTION

Parameter	Units	MAC [1]	AO [2]	SAMPLE # 3	SAMPLE # 4
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200			
COLIFORM, TOTAL MF	C/100ML	0			
ESCHERICHIA COLI MF	C/100ML	0			
HETEROTROPH MF 35 C	C/ML	500		< 10	< 10
NT: DETERIORATION INDICATORS	C/100ML		0	NOT DETECTED	NOT DETECTED
NT: ESCHERICHIA COLI	C/100ML	0		ABSENT	ABSENT
NT: TOTAL COLIFORMS	C/100ML	0		ABSENT	ABSENT

Notes:

- Escherichia coli is a more definitive indicator of fecal contamination than fecal coliforms or total coliforms.
- At elevated levels, the general bacterial population may interfere with the detection of coliforms. This general population can be estimated from either background colony counts on the total coliform membrane filters or heterotrophic plate counts (HPC).

Shortforms:

C/100mL - Count per 100 millilitre

C/mL - Count per millilitre

Footnotes:

1. Maximum Acceptable Concentration
2. Aesthetic Objective

According to section 16-3 of O.Reg. 170/03,the following are prescribed as adverse results of a drinking-water test for the purpose of section 18 of the Safe Drinking Water Act 2002:

1. A result that exceeds any of the standards prescribed by Schedule 1, 2 or 3 to the Ontario Drinking-Water Quality Standards, other than the standard for fluoride, if the result is from a sample of drinking water.

2. A result indicating the presence of Aeromonas spp., Pseudomonas aeruginosa, Staphylococcus aureus, Clostridium spp. or fecal streptococci (Group D streptococci) in a sample of drinking water.

3. A result indicating the presence of a pesticide not listed in Schedule 2 to the Ontario Drinking-Water Quality Standards in a sample of drinking water, at any concentration.

4. A result indicating that the concentration of free chlorine residual is less than 0.05 milligrams per litre in a distribution sample, if the drinking-water system provides chlorination and does not provide chloramination.

5. A result indicating that the concentration of combined chlorine residual is less than 0.25 milligrams per litre in a distribution sample, if the drinking-water system provides chloramination.

6. If the drinking-water system is required to provide filtration and a report under subsection 18 (1) of the Act has not been made in respect of turbidity in the preceding 24 hours, a result indicating that turbidity exceeds 1.0 Nephelometric Turbidity Units (NTU) in,

i. a grab sample of water taken from a filter effluent line, or

ii. two samples of water from a filter effluent line that are tested by continuous monitoring equipment, if the two samples were taken 15 minutes or more apart and the later of the two samples was the first sample that was taken 15 minutes or more after the earlier sample.

7. If an approval or order, including an OWRA order, identifies a parameter as a health-related parameter and establishes a maximum concentration for the parameter, a result indicating that the parameter exceeds the maximum concentration in a sample of drinking water.

8. A result indicating that the concentration of sodium exceeds 20 milligrams per litre in a sample of drinking water, if a report under subsection 18 (1) of the Act has not been made in respect of sodium in the preceding 60 months.

9. A result indicating that the concentration of fluoride exceeds 1.5 milligrams per litre in a sample of drinking water, if,

i. the drinking-water system provides fluoridation and a report under subsection 18 (1) of the Act has not been made in respect of fluoride in the preceding 24 hours, or

ii. the drinking-water system does not provide fluoridation and a report under subsection 18 (1) of the Act has not been made in respect of fluoride in the preceding 60 months.

APPENDIX
Table 3
LANCASTER WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 06-AUG-2003
CHEMICAL / PHYSICAL PARAMETERS - NOT HEALTH RELATED

Sample # 1 - (REG) TREATED WATER
Sample # 2 - (REG) ROZON INSURANCE DISTRIBUTION

Parameter	Units	OBJECTIVE	TYPE OF OBJECTIVE	SAMPLE # 1	SAMPLE # 2
ALUMINIUM, UNFILTERED TOTAL	UG/L	100	OG	131 +/-11.00	
AMMONIUM, TOTAL UNFIL.REAC	MG/L	a	a	.002 <=W	
COPPER, UNFILTERED TOTAL	UG/L	1000	AO	.8 +/-0.50	
IRON, UNFILTERED TOTAL	UG/L	300	AO	6 +/-6.00	
MANGANESE,UNFILTERED TOTAL	UG/L	50	AO	.52 +/-0.52	
TURBIDITY	FTU	5 e	AO	.05 <=W	
XYLENE-M C8H10	UG/L	300	AO		.05 <T
XYLENE-P C8H10	UG/L	300	AO		.05 <=W
ZINC, UNFILTERED TOTAL	UG/L	5000	AO	1 +/-0.80	

Shortforms:

<T	-	A measurable trace amount; interpret with caution
<W	-	No measurable response (zero) : < Reported value
<=W	-	No measurable response (zero) : < Reported value
<	-	Actual result is less than reported value
ND	-	Not detected
NA	-	Result not available
NS	-	Not sampled
DEG	-	Degree celsius
AO	-	Aesthetic Objective
OG	-	Operational Guideline
FTU = NTU	-	Nephelometric Turbidity Unit
TCU	-	True Colour Units
NG/L	-	Nanograms per litre
UG/L	-	Micrograms per litre
MG/L	-	Milligrams per litre

Footnotes:

a) No limit has been established for this parameter.

b) Organic Nitrogen = (Total Kjeldahl Nitrogen - Ammonia)

c) The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

d) When sulphate levels exceed 500 mg/L, water may have a laxative effect on some people.

e) Applicable for all water at the point of consumption.