Ministry of the Environment

CORNWALL WATER TREATMENT PLANT

Drinking Water System Inspection Report

DWS Number:	220001049
Inspection Number:	1-RAZZ
Date of Inspection:	Jan 18, 2005
Inspected By:	Don Munro

Ministry of the Environment

Safe Drinking Water Branch

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Ministère de l'Environnement

Direction du contrôle de la qualité de l'eau potable

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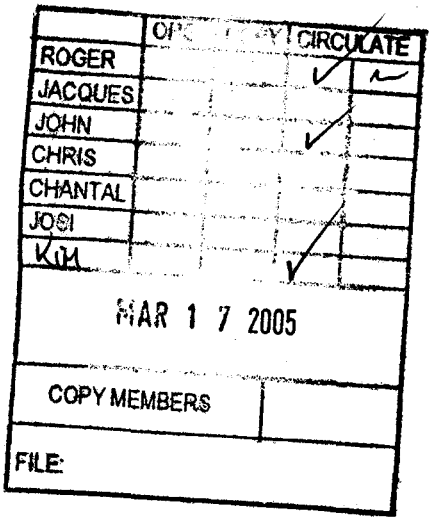
Ontario

March 14, 2005



Mr. Morris McCormick, P. Eng
Division Manager
Environmental Services
City of Cornwall
P. O. Box 877
861 Second Street West
Cornwall, Ontario
K6J 1H5

Dear Mr. McCormick:

Re: Ministry of the Environment Drinking Water Inspection – 2005
Cornwall Drinking Water System

The Cornwall Drinking Water System was inspected on January 18 and 19, 2005 to assess compliance with applicable Acts, Regulations and site-specific authorizing and control documents. The report is also based upon a review of in-house and laboratory analytical results for samples collected between August, 2003 and January 2005 and interviews held with operational personnel. Enclosed is a copy of the inspection report for your review. A copy will also be sent to Ms. Denise Labelle-Gelinas, who is the Clerk for the City of Cornwall and Ms. Betty de Haan, who is designated as the Clerk for the Township of South Stormont and to whom your Drinking Water System supplies potable water. Copies will also be sent to the Local Medical Officer of Health and the Raisin Region Conservation Authority Manger as the appointed Conservation Authority.

Your attention is directed to the sections "Actions Required" and "Recommended Actions" of the report. Please provide an Action plan by no later than April 29, 2005, describing how the municipality plans to address these issues.

.../2

Should you have any questions pertaining to this report, please do not hesitate to contact me at this office at extension 231.

Yours truly,

Don Munro
Inspector / Provincial Officer
Safe Drinking Water Branch
Cornwall Office

Dhm/

Encl.

cc: Ms. Denise Labelle-Gelinas, City of Cornwall, 360 Pitt Street, Cornwall, Ontario K6J 3P9

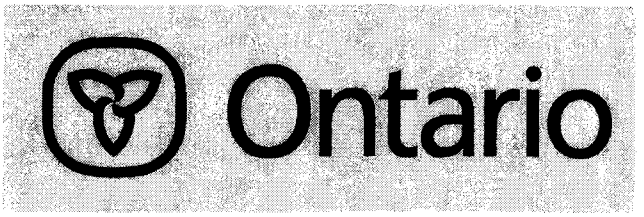
Mr. Tom Gemmell, Water/Sewer Supervisor, Public Works, City of Cornwall, 1225 Ontario Street, P.O. Box 877, Cornwall, Ontario K6H 4E1

Ms. Betty de Haan, Clerk-Treasurer, Township of South Stormont, 4949 County Road No. 14, Ingleside, Ontario K0C 1M0

Dr. Robert Bourdeau, MD, Medical Officer of Health, Eastern Ontario Health Unit, 1000 Pitt Street, Cornwall, Ontario K6J 5T1

Mr. Mirek Tybinkowski, P. Eng., Water and Wastewater Specialist, MOE Environmental Assessment and Approvals Branch, 2 St. Clair Ave, West, Floor 12 A, Toronto, Ontario M4V 1L5

Mr. Roger Houde, Manager, Raisin Region Conservation Authority, P. O. Box 429, 18045 County Road No. 2, Cornwall, Ontario K6H 5T2



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OWNER INFORMATION:

Company Name:	Cornwall, The Corporation Of The City Of		
Street Number:	861	**Unit Identifier:**	
Street Name:	Second St W		
County/District:	United Counties of Stormont, Dundas & Glengarry		
District/Area Office:	Cornwall		
City:	Cornwall		
Province:	ON	**Postal Code:**	K6H 5T9

INSPECTION DETAILS:

DWS Name:	Cornwall Water Treatment Plant
DWS Category:	Large Municipal Residential
DWS Number:	220001049
Inspection Type:	Unannounced
Inspection Number:	1-RAZZ
Date of Inspection:	Jan 18, 2005
Date of Previous Inspection:	Aug 27, 2003

DWS COMPONENT LOCATIONS

Site (Name): RAW WATER
Type: Source **Sub Type:**
Comments:

The intake structure is located in the west-face of the R.H. Saunders Dam, 15 m below the level of Lake St. Lawrence. The intake structure consists of a flared concrete bell, oriented west and protected by a steel screen that prevents large objects from entering the raw water transmission line. The intake screen consists of 20 vertical steel bars starting at an elevation of 54 m (177 ft), reaches an elevation of 59 m (194 ft) and is 2 m (6.6 ft) wide. The capacity of the intake is 157 cu. metres (31,869 IG) with a hydraulic retention time (HRT) of 2.3 minutes based on a rated capacity of 100, 000 cu. m/day(22 MGD). A valve house with a flow control valve (butterfly) is situated at the base of the dam and it is always open but the flow is regulated at the screen house of the water plant. Adjacent to the valve house, is an enclosed building that houses the zebra mussel control system. The zebra mussel control system consists of two raw water recirculation pumps (one duty, one standby), one scale, one chlorinator, one 90 kg chlorine gas feeder, one chlorine residual analyzer, a computerized control system with a telemetry link to the water treatment plant SCADA system and a chlorine solution line extending from the chlorinator to the diffuser device at the raw water intake structure. Raw water then flows via a 1066 mm diameter 3.2 km transmission line from the control station to the water treatment plant by gravity.When the temperature of the raw water exceeds 10 degrees Celsius (as measured at the treatment plant filters), chlorine is then injected into the raw water pipeline to control the zebra mussels. The zebra mussel control chlorination system is monitored and controlled through the SCADA System located at the water treatment plant. When in use, the target for the zebra mussel control operation is to impart a Total Chlorine residual of 0.1 mg/L in the raw water. In 2005, our inspection revealed the Zebra Mussel chlorination system works continuously.

Site (Name): TREATED WATER
Type: Treated Water POE **Sub Type:**

Comments:

The elevation of the water level in Lake St. Lawrence provides the hydrostatic pressure to deliver water through the intake line to the Water Treatment Plant. The output of the raw water is controlled by a motorized butterfly valve positioned on the raw water pipeline. A venturi meter installed in 1956 measures the plant's influent water. A manually controlled by-pass valve in the screen house connects the intake line to the mixing tank conduit piping. The existing plant SCADA control system monitors the flow rate and controls the motorized butterfly valve. It is here that the raw water is injected with PAC (Polyhydroxyl-Aluminum Chloride) a coagulant employed to improve the sedimentation process which removes the suspended solids and reduces the sediment loading on the filters. The water in the screen house is also pre-chlorinated by injecting a chlorine solution into the screen tank. The PAC treated water is then screened by a US filter travelling water screen after flowing into a 1.3 x 1.3 x 4.5 m tank. The travelling screen has a 0.2 m (7.9 in) frame and consists of a series of approximately 910 mm (3 ft) wide screens. The screens are linked together to form a long screen that travels around two shafts, one at the bottom of the tank and one directly above the tank. The screen is powered by a 1.1 kW (1.5 hp) motor. The screen material is 304 Stainless Steel with 188 sq. mm (0.29 sq. in) openings and 1.8 mm (0.07 in) thick wiring. At 8 hour time intervals or upon a head loss of 0.2 m, the travelling screen is activated automatically or manually operated by the operators for 2 or 3 minutes every shift. After rotating, the screens are automatically rinsed with treated water. The rinse water is discharged to the backwash sewer which ultimately discharges to the sanitary sewer at Brookdale Avenue. Downstream of the travelling screen, the water flows into one of two mixing tanks (combined volume of 179 cu. m). The mixing tanks are operated in parallel and each consists of three chambers equipped with stationary baffles. There are no mechanical agitator devices installed, instead the kinetic energy of incoming water flow is used for coagulation and flocculation processes. Water from the mixing tanks is gravity fed into one of the two settling tanks (volume of 1873 cu. m) that are operated in parallel. Downstream of the settling tanks, water is gravity fed onto four Rapid Gravity Filter-Adsorber units that are operated in parallel. All four filters are dual media, consisting of granular activated carbon and sand. The filters are equipped with surface agitators that are activated prior to backwashing. Backwash water is pumped from the clear well and through the filters. Backwash water is discharged to the sanitary sewer. The filtered water flows into a clear well (volume of 1363 cu. m) located at the treatment plant. Fluoride is added to the water in the clear well through a diffuser. From the clearwell, the filtered water overflows into a reservoir (volume of 3182 cu. m) from which the water is pumped into the distribution system by one of five high lift pumps (three duty and two standby) that discharge to a common header. Of the five pumps, three are electric, one is diesel and one is diesel-electric. The treated water is chlorinated prior to being pumped into the distribution system. Instrumentation at this facility, includes, seven flow metering devices(one on the raw water intake pipe, one on each filtrate line, and two on the high lift pump common discharge; two chlorine residual analyzers (one at the settled water common discharge header and the other at the high lift pump common discharge header), six turbidimeters (one on the raw water intake pipe, one on each filtrate line and one on the high lift pump common discharge header); one fluoride analyzer at the high lift pump common discharge header. A pH meter at the screen house records the pH of the raw water.

Site (Name): DISTRIBUTION (WATER INSPECTION)

Type: Other **Sub Type:**

Comments:

Water is pumped through two discharge pipes to the distribution system. The east outlet discharge pipe feeds the north portion of the City as well as the elevated storage tank. The South outlet discharge pipe feeds the east and west sections of Cornwall and the Boundary Road Reservoir.

The distribution system consists of approximately 209 kilometres of various sized pipes and mains. It also consists of two remote reservoirs, the Boundary Road Reservoir and Tollgate Elevated Storage Tank.

The Boundary Road Reservoir was constructed in 1973 to augment the pressure in the eastern portion of the City and to provide storage for fire protection. The Boundary Road Reservoir stores treated water in two compartments which have a capacity of 9,091 cu. meters and is equipped with a sodium hypochlorite feed system to increase disinfectant residual levels in the distribution system.

Three electric high lift pumps transfer treated water from the reservoir to the distribution system. Both incoming and outgoing residual chlorine levels are monitored with the aid of 2 residual chlorine analyzers. The reservoir is also chlorinated with sodium hypochlorite solutions. A natural gas generator provides power for emergency purposes. Overflow from the reservoir is channelled into a nearby drainage ditch.

An elevated water tank with a capacity of 4545 cubic meters is located on Tollgate Road between McConell Avenue and Pitt Street. The elevated tank was built and commissioned in 1991 to act as an emergency reservoir and to maintain the system pressure. In 1991, water service was also extended to Rosedale Terrace and St. Andrews in the Township of South Stormont (former Township of Cornwall), the elvated tank assists in maintaining pressure in those areas. Typically, the tank is filled during the night and water is then drawn from the tank throughout the day. Overflow discharges are channelled into a drainage ditch that empties into the South Branch of the Raisin River.

INSPECTION SUMMARY

INTRODUCTION

* **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 for the inspection period.**

  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.

  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 for the inspection period. Specifically, this includes a review and assessment of operating practices as they relate to the following documents:

  - The Safe Drinking Water Act, 2002
  - Drinking Water Systems Regulation (O. Reg. 170/03)
  - Operator Certification Regulation (Water Works and Sewage Works - O. Reg. 128/04)
  - Certificates of Approval
  - Permits to Take Water
  - Previous Ministry Compliance Inspection Report
  - Engineer's Report dated November 2000

  The ministry has implemented a rigorous and comprehensive approach to the inspection of water systems that focuses on source, treatment, and distribution components as well as water system management practices. This inspection report includes the findings from the Inspection of the Cornwall Water Treatment Plant and Distribution System. Findings pertaining to the St.Andrews/Rosedale Distribution System are provided in a separate compliance inspection report for that facility.

LMR - SOURCE/SUPPLY -SURFACE

* **A zebra mussel control system is required by the Certificate of Approval or other direction.**

  The original Zebra Mussel facility was installed as a City Initiative about 15 years ago and not as a requirement of any Certiifcate of Approval issued to the City. However, it is now consolidated in the new Draft C of A recently issued for the water plant upgrades which are now underway.

  The Zebra Mussel control system is located at the valve house at the base of the R.H.Saunders dyke, approximately 135 m (443 ft) east of the intake. The zebra mussel system consists of a chlorinator and pumps housed in a small brick building, and a diffuser located at the dyke. The zebra mussel system originally injected hypochlorite to the diffuser. In 1998, the hypochlorite system was converted to a gaseous chlorine system. This modification had not been reflected in the previous Certificate of Approval. However, an amended C of A issued in June, 2002 now includes this modification to chlorine gas.

  Chlorine gas is stored in two (one duty and one standby) one tonne cylinders. The rate of chlorine gas flowing to the venturi is controlled by Capital Controls vacuum regulators and check units. The rate of water flowing through the venturi is controlled by the rate of raw water flow in the diversion pipe. The diversion pipe draws water from the raw water line at the valve house and re-injects the chlorine solution to the zebra mussel diffuser. The chlorination facility is operated year round and serves to pre-chlorinate the raw water.

LMR - SOURCE/SUPPLY -SURFACE

* **The zebra mussel control system is installed and/or operating in accordance with the Certificate of Approval or other direction.**

  See above comments

* **Trends in source water quality are being monitored by the owner/operating authority.**

  The Salnt Lawrence River Training Institute is now conducting a comprehensive study of the raw water characterisitics of Lake St. Lawrence which is the source of raw water for the City. The City is providing funding for this study. An evaluation of the water quality effects of the Lake will be performed by the Institute staff as part of this study.

LMR - PERMIT TO TAKE WATER

* **A PTTW is required and exists for the system.**

  The Cornwall Water Treatment Plant was constructed in 1957 pre-dating requirements to possess a Permit To Take Water (PTTW). As specified under Section 34 (3) (b) of the Ontario Water Resources Act, Water Plants that commenced operations prior to March 29, 1961 did not require a PTTW. However, the City applied for and received a permit on July 21, 2003. The permit authorizes a rate of taking up to 125,000 litres/min or 100,000,000 L/day.

* **All of the production sources are identified on the PTTW.**

* **There are no PTTWs which are beyond their expiry date.**

* **The maximum water takings are in accordance with those allowed under the PTTW during the inspection review period.**

* **Trends in water quantity/takings are being monitored by the owner/operating authority.**

* **The owner complied with the special conditions in the PTTW during the inspection review period.**

* **Records of actions required of the Permit Holder as a result of conditions on the PTTW have been maintained in accordance with the requirements of the PTTW.**

LMR - CAPACITY ASSESSMENT

* **Flow rates were maintained below the maximum flow rates or the rated capacity identified in the CofA.**

* **Only certified operators make adjustments to the treatment equipment.**

* **The annual average daily flow was less than 80% of the capacity of the plant.**

* **The owner is monitoring demand and population trends in order to determine whether the facilities are capable of meeting maximum daily demands, or whether there is a need to upgrade or expand the system.**

  The City is currently upgrading the existing water purification plant by constructing of a new inlet chamber, chemical storage facilities, stand-by power, UV disinfection facilities, clear well reservoir baffles, filter backwash facilities, modifications to the existing plant instrumentation and electrical systems. No changes are contemplated to the overall plant design capacity. A new roof is also to be constructed over the existing buildings.

LMR - CAPACITY ASSESSMENT

* **The number of installed flow measuring devices is sufficient to meet the requirements of the PTTW or CofA.**

  The water plant currently has seven flow meters installed at the site; one on the influent (raw water), one on each of the filtrate lines (4) and one on each of the two plant discharge lines (treated water effluent). All of these are connected to the Plant SCADA system. In addition to these seven flow meters, the City also has flow meters installed at Mack Street and Headline Road/ Hwy 138 to record flow quantities discharged to the St. Andrews and Rosedale Water Distribution Systems respectively. Only one of these flow meters (Headline Road/ Hwy 138) is connected to the Plant SCADA system, the other (Mack Street) is read manually using a portable reading device. A tenth flow meter is installed at the Boundary Road reservoir and is linked to the Plant SCADA system. No other flow meters were noted during the inspection.

* **The flow measuring devices are calibrated to the specifications of the manufacturer or at regular intervals not exceeding one year.**

  During our inspection of the plant copies of the calibration certificates were obtained for these meters and are included in our files.

LMR - TREATMENT PROCESSES

* **Records reviewed during the inspection indicate that the drinking-water system provides the required minimum level of treatment at all times.**

  Plant upgrades are currently underway to provide additional disinfection through the installation of UV and baffling in the clear well to provide the necessary CT values in the water system. This will ensure that minimum levels of treatment are maintained.

* **A valid Certificate of Approval exists for the facility.**

  A "DRAFT" Certificate No. 8156-64MND3 was issued in 2004 pursuant to an application dated August 25, 2004 to perform the necessary upgrades to this plant. C of A No. 9502-5THLKG issued in April, 2004 was the approval that was in effect when the January 18, 2005 inspection was performed. Amended C of A No. 9553-65GJXV was issued on January 26, 2005.

* **The owner has ensured that water treatment equipment is installed in accordance with regulatory requirements and the CofA.**

  Plant upgrades are currently underway to provide additional disinfection through the installation of UV and baffling in the clear well to provide the necessary CT values in the water system. This will ensure that minimum levels of treatment are maintained.

* **The owner has up-to-date plans for the drinking water system.**

  The inspector has just reviewed the recently issued plans prepared for the soon to be upgraded facility but the "As Built" plans will not be fully completed until the plant re-construction work is complete.

* **The chlorine residual in water entering the distribution system is maintained at the level identified in the Operations Manual as the level required to achieve adequate disinfection.**

  Residuals recorded during the plant inspection were as follows -

  FREE - 0.94 mg/L (MOE test kit) and 0.89 mg/L (plant analyzer unit)

  TOTAL - 1.10 mg/L (MOE test kit)

LMR - TREATMENT PROCESSES

* **The facility and equipment appear to be maintained and in a fit state of repair.**

  All plant equipment and process lines appear to be extremely well maintained and operating.

* **The filters are monitored and/or inspected.**

  The filters are routinely monitored and inspected visually daily by operating staff.

* **There are no reports that raise concerns with respect to the reliability of the transmission line from the plant to the distribution system, in terms of its being able to provide a continuous supply of water from the treatment plant.**

  The owner reports no reports have been received to date.

* **It is not possible for raw water or partially treated water to bypass key treatment units.**

* **The owner has evidence indicating that all chemicals used in the treatment process and all materials contacting the water have met the AWWA and ANSI standards in accordance with the CofA.**

  Yes, certificates of ANSI or AWWA approval were provided to the inspector during the inspection.

* **The floor drains are placed in such a manner that contaminants cannot come in contact with or impact upon the source water, the treated water, or the natural environment.**

* **The operator is aware of the required CT value and the CT value is used in process calculations and process control.**

  The operators are aware of the required CT values for the plant. Changes are being made to the plant in the upcoming upgrade project to satisfy the required CT requirement. The plant SCADA system will be used to ensure the operators perform the necessary changes to the process on a daily basis to maintain the the required CT values.

  The Engineer's Report (November 2000) concluded that the facility was not in compliance with the MOE's Procedure B13-3 "Chlorination of Potable Water Supplies in Ontario". Section 7.1 of the Engineer's Report provided a summary of the calculation of the chemical disinfection CT values for the treatment process. The Engineer calculated that a CT of 55 was required for removal or inactivation of giardia cysts and a CT of 6 for removal or inactivation of viruses. The Engineer calculated that a CT of 3.4 was being provided.

  Conditions 8.1 and 8.2 of the C of A issued in January, 2005 requested that the City implement specific physical improvements and upgrades to the works in keeping with the Engineer's Report and related MOE correspondence. A tender has now been awarded by the City to a contractor to proceed with this work that is scheduled to commence in the Spring of 2005.

* **The owner has initiated measures to address potential cross-connections at the treatment plant.**

  Yes, it is reported by the plant manager that backflow preventors are to be installed at the time of the upcoming plant upgrade.

* **Pesticides are not applied, stored, or mixed in the immediate vicinity of water intakes, treatment facilities or storage structures.**

  No pesticides are used at the plant or any part of the water supply system.

LMR - PROCESS WASTEWATER

LMR - PROCESS WASTEWATER

* **The facility generates process wastewater.**

  All process waste water is discharged to the sanitary sewer system. Process waste waters are discharged from the filters (backwash water), the screen house (screenings), sedimentation tanks (drained twice a year), the clear well (overflows), analyzer drains (chlorine, turbidimeter and fluorine), eyewash units, all drains located in the high lift and backwash pump area.

* **The discharge quality complies with the requirements established in a Certificate of Approval, Order or other authorizing or control documents.**

* **Since the date of the last inspection, there have been no reports of adverse surface water quality as a result of the discharge of backwash waste water.**

* **Process wastewater was discharged in such a manner that an environmental impact did not occur.**

  Process wastewater is dischareged to the sanitary sewer.

* **Residual solids/sludge are being generated as part of the treatment process or maintenance activities.**

  All residual solids or sludges are directed to the sanitary sewer.

* **Sludge is being monitored and is being regularly withdrawn from clarifiers as per equipment manufacturers' specifications.**

  A minimum amount of sludge is produced at the plant and the sedimentation tanks are cleaned twice a year. All the residual solids are discharged to the sanitary sewer.

LMR - DISTRIBUTION SYSTEM

* **The owner has been able to maintain proper pressures in the distribution system.**

  The Boundary Road Reservoir is located on the east side of Boundary Road north of Second Street. It stores treated water in two compartments and serves to augment pressure. Three high lift distribution pumps feed the distribution system from the reservoir.

  These three electric pumps provide high lift pumping to the east end of the City water distribution system and the Industrial Park. No problems are reported. The pressure is normally 65 psi.

* **No cross connections with other water sources such as wells, cisterns or surface water are known to exist.**

  The City advises that there are no known connections.

* **There is a by-law in place to prohibit the creation of cross connections.**

  By-law No. 024-1987. Section 4 (sections 4.1 through 4.4) (Cross-connection and Backflow prevention) clearly stipulates prohibition of any cross-connections to the water supply and discusses the installation of back flow prevention.

* **The owner has a proactive leak detection program in place.**

  The City has no formal leak detection plan in place. The inspector was advised tha the City targets the worst 20 per cent of the distribution system annually for evaluation. This approach is conducted annually according to that protocol and leak detection evaluations are then conducted in those areas.

LMR - DISTRIBUTION SYSTEM

* **More than 90% of the total amount of water distributed by the system is accounted for.**

  There is actually no way of accounting for this water loss, since usage metering is not undertaken.

* **The owner has maintained the integrity of the system by using standards or procedures for design and material selection and by using plumbing code requirements.**

  The City employs qualified Engineering Consultants who use current Provincial OPSS engineering design standards for construction activities associated with the water treatment plant and water distribution system.

* **The disinfection of new or repaired water mains or facilities is conducted in accordance with procedures equivalent to the applicable AWWA standards.**

  A procedure is in place and a copy of this document is retained in our files.

* **Repairs to the distribution system are performed by authorized personnel.**

  All work is reported to be done by a certiifed operator.

* **There is a program for the flushing and/or swabbing of watermains per AWWA standards.**

  The works department advises that swabbing is only conducted on an "as required basis" However, the water mains and hydrants are flushed twice a year.

* **Pesticides are applied and stored away from the immediate vicinity of the storage works in the distribution system.**

LMR - OPERATIONS MANUALS

* **Operators and maintenance personnel have ready access to comprehensive operations and maintenance manuals.**

  The operations and maintenance manual for the Cornwall treatment plant is available to all water plant staff in the plant control room. The last revisions to the manual were made in October, 2004 and significant revisions will be required to the manual as a result of the plant upgrade to commence in March, 2005

  The operations and maintenance manuals for the water distribution system are currently maintained in the Public Works shop facility, easily accessible to the water distribution works staff.

* **The operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

* **A procedure is in place that is followed to ensure that all equipment used in the processes is monitored, inspected, tested and evaluated.**

  The plant has recently engaged a new SCADA computer technician who has developed a new preventive maintenance program which assigns work tasks for maintenance on various plant equipment units and their components on a scheduled basis.

LMR - LOGBOOKS

LMR - LOGBOOKS

* **Logs or other record keeping mechanisms are provided to record information concerning the subsystems which comprise the system.**

  Log books are maintained at the water plant, the Zebra Mussel facility, the Boundary Road Reservoir and the Elevated Tower. These logs are all maintained chronologically, signed by the OIC and generally contain hand written comments on the status of each facility as observed during the visit.

* **Log books confirm that only certified operators, trained persons or water quality analysts are performing operational testing not performed by continuous monitoring equipment.**

* **For every required operational test and for every required sample, a record is made of the date, time location and name of the person who performed the test and the result of the analysis.**

* **Logbooks identify who is serving as Operator-in-Charge.**

* **Logbook entries are made in chronological order.**

* **Entries in the logbook are made only by the overall responsible operator or an operator in charge or by a person authorized to make an entry by the owner, the operating authority, the overall responsible operator or an operator in charge.**

* **For each operating shift, the log records the date, time of day the shift began and ended and the number or designation of the shift.**

  There are no shift periods at this plant. Operators work a five day week and are called in if problems occur on the weekend.

* **The record system allows the reader to unambiguously identify the person making the logbook entry.**

* **Departures from normal operating procedures are documented along with the time they occurred.**

  All unusual events, repairs, adverse water quality incidents, sampling/testing, diesel start-ups, chemical deliveries and calibrations are recorded in the log. All plant alarms, chlorine cylinder changes, dosage adjustments and filter backwashes are recorded.

* **Unusual or abnormal conditions observed at the facility are recorded in the logbook along with action taken.**

* **If equipment was taken out of service or equipment ceased to operate during the shift, that removal from service or cessation was recorded in the logbook along with action taken to maintain or repair the equipment.**

* **Logs and other record keeping methods are available for at least 5 years.**

* **There is consistency between the information contained in the adverse reports and the records maintained in logs or information provided in reports.**

* **Records are maintained of the amount of time each operator works as Operator-in-Charge.**

  The records are maintained but calculated on a shift basis according to who is assigned as the OIC. There is no annual roll-up done.The time each operator works as operator-in-charge (OIC) is calculated from the time sheets and rolled up manually.

LMR - LOGBOOKS

* **Where required, logbooks identify special instructions given to depart from normal operating conditions.**

  There are no shift periods as the plant operates on a five day basis but any concerns of an unusual nature, were observed to be highlighted in the log book such that the next OIC coming on shift is aware of the problem (ie alarms etc.).

* **Logbooks maintain monitoring and measurement records to verify that they meet procedures in Operations and Maintenance Manuals.**

  Sampling/testing, adverse water, dosage adjustments, filter backwashes, out of service equipment, alarms, diesel start-ups etc. are all flagged in the log book for comparative evaluation with procedures in the Operations and Maintenance manuals.

LMR - CONTINGENCY AND EMERGENCY PLANNING

* **The owner has developed a written contingency/emergency plan.**

  A Contingency Plan has been developed for the facility. Contingencies include: contaminated raw water, broken raw water main, bacterial contamination in clearwell, chlorination system failure, filter failure, and chemical spill containment. Also included in the Contingency Plan is a procedure for adverse water in the distribution system. The Contingency Plan is kept in the control room at the water treatment plant. The Contingency Plan is also reported to be under revision to accommodate the changes that will be made to the plant by the upgrade starting in March, 2005. A copy of the manual was reviewed at the time of the inspection but it will require updating when the plant upgrade currently underway is completed in 2006.

* **A system contingency procedure is in place for periods of time when the plant operator is absent or unable to act.**

  During the periods of time when no one is present at the plant, a pager system is in place. All plant alarms are directed to the portable pager unit and the operator in charge of carrying the pager at that time will come to the plant to investigate the problem.

* **Standby equipment is available for critical treatment processes where required.**

  A mobile standby generator is available for use in the event of a power outage and the plant has numerous spare parts on site for equipment and minor component repairs. A new stand-by generator is to be installed at the plant during the plant upgrade that is currently underway.

* **The treatment facility can achieve the required capacity with its largest unit out of service.**

  The treatment plant has the capacity to achieve the required capacity with the largest unit out of service unless all four filters failed at once. Usually three filters are in operation and the fourth one is maintained as a standby unit. No problems are anticipated from the high lift pumps.

* **Standby power generators are available, or not required.**

* **Standby power generators are tested under normal load conditions.**

  They are tested weekly.

LMR - SECURITY

LMR - SECURITY

* **All storage facilities are completely covered and secure.**

The water plant clear well reservoir is located north-east of the plant adjacent to Domtar Pulp and Paper land. The reservoir site is fenced off with security fencing and no access is available from the adjoining lands. The reservoir area and the perimeter of the plant is also monitored by video cameras.

Similarly, the elevated tower on Tollgate is accessed by a locked gate and the tower site is fenced with secuirty fencing. There are also security cameras located at the tower site.

The Boundary Road Reservoir and pump station is accessed through a locked door. However, the perimeter is not fenced. The pumphouse is alarmed and there are security cameras present. All reservoir hatches are locked.

With respect to the security cameras monitoring the remote sites (Elevated Tower and Boundary Rd. Reservoir), there is one shortcoming indentified. There is no provision for monitoring the above noted sites immediately by plant personnel. They must retrieve the actual video tapes from the cameras routinely and view the tape with a video recording machine after the fact. Therefore, if a security breach occurs, plant staff would only know about it after the fact. Daily monitoring of these facilitiies should be conducted by plant staff.

* **Air vents associated with reservoirs and elevated storage structures are equipped with screens.**
* **The owner has provided adequate security measures to protect wells, intakes, treatment facilities and components of the distribution system.**
* **Security measures are not in place and the facility is visited by system personnel at least daily.**

LMR - COMMUNICATION WITH CONSUMERS

* **A documented system exists that records consumer complaints, steps taken to determine the cause of the issue, and corrective measures taken to alleviate the cause and prevent its reoccurrence.**

A complaint log is maintained in the plant control room using a complaint record form.

In 2003, there were 8 calls. Three (3) of the calls were due to coloured or rusty water, two (2) were related to strong smell/chlorine odour, the remaining calls were for taste, white specks and one complained of a calcium deposit.

In 2004, there were 7 complaints with three (3) related to a strong chlorine smell and odour, one (1) a rotten egg smell, one (1) was due to coloured water, one (1) was smelly water (like marijuana) and one (1) was for poor water pressure.

LMR - COMMUNICATION WITH CONSUMERS

In 2005, there has been one call to date complaining about the strong chlorine in the water affecting their taste of coffee and tea.

The operators indicated that all complaints were addressed and samples collected where it was necessary to address the problem. In areas where complaints were received about the colored or rusty water, the operators advised that the lines were flushed.

* **Required documents are available free-of-charge, made available during normal business hours, and are at a location accessible to the public.**

* **The owner takes effective steps to advise consumers of the availability of Annual Reports.**

The annual reports are available on the City web site.

* **The drinking water system serves more than 10 000 people and the owner has posted the Annual Reports on the internet.**

LMR - OPERATOR CERTIFICATION AND TRAINING

* **The overall responsible operator has been designated and he/she possesses a certificate that is of the same class or higher than the class of the subsystem.**

The operator in overall responsibility for the Cornwall Water Treatment Plant is Morris McCormick P. Eng. Mr. McCormick possess a Class 3 Water Treatment Licence and Class 4 Water Distribution license. The Operator in overall responsibility of the Cornwall Distribution System is Tom Gemmel. Mr. Gemmel possesses a Class 3 Water Distribution license.

The operator in charge (OIC) for the plant is usually the designated operator on site that day.

The following list identifies the opertors who work at the Cornwall Water Treatment plant and at the Cornwall Public Works Department and their levels of certification for both treatment and distribution systems.

Cornwall Water Plant Operators

Morris McCormick - Class 3 (water treatment-9980) and Class 4 (water distribution-9981)

Medard Godard - Class 2 (water treatment - 10390)

Julien Chartrand - Class 2 (water treatment -9729) and Class 2 (water Distribution-14053)

Claude Ouellet - Class 3 (water treatment-11799) and OIT (water Distribution- 9818)

Bill de Witt - Class 2 (water treatment - 11337)

Gary Miller - Class 2 (water treatment - 7717)

Jim Bilmer - Class 2 (water treatment - 7716)

All operator's licences for the water plant are displayed in the plant control room.

Cornwall Public Works

Tom Gemmel - Class 3 (water distribution -7596 -expiry 2005)

LMR - OPERATOR CERTIFICATION AND TRAINING

Shawn O'Brien - Class 1(Water Distribution - 14850)

Paul DeJong - Class 2 (Water Distribution 1057)

Viet Hoang - Class 1 (Water Distribution - 15669)

Rob Hoard - OIT (Water Distribution - 11841 Expired April, 2003)

Kim Delorme - WDS 1(Water Distribution - 15555)

Russ Wylie - OIT (Water Distribution -18264)

Ron Merkley - OIT (Water Distribution - 18284)

Mike Roger - OIT (Water Distribution- 21459)

Richard Tompson - OIT (Water Distribution - 24397)

All public works locences are displayed in the Public Works Shop office at the works garage.

* **Personnel at the drinking water system are under the supervision of persons having the prescribed qualifications.**
* **All operators possess the required certification.**
* **Operators in charge have been designated for all subsystems which comprise the drinking water system.**
* **Operator and water quality analyst certificates are displayed in a conspicuous location at the workplace or at the premises from which the subsystem is managed.**

All operator certificates at the water plant are displyed in the Plant Operations Control Room.

All operator certificates for the water distribution system are displayed in the Public Works Garage.

* **The classification certificates of the subsystems which comprise the system are conspicuously displayed at the workplace or at premises from which the subsystem is managed.**
* **The owner has maintained every record or report related to a test required under an approval or order, the corresponding documents and records required under Reg. 170, and records or reports related to tests required under schedules 6, 7, 10, 11 and 22 and under sections 17-5 to 17-9 and 18-5 to 18-9 of Reg. 170 for at least 5 years.**
* **The owner has maintained for a period of at least 15 years those records and reports related to tests required under an approval or an order, every report prepared by a professional engineer or hydrogeologist pertaining to a determination whether a ground water supply is GUDI or groundwater, and records or reports required under schedule 13 and sections 17-10 to 17-13 and 18-10 to 18-13 of Reg. 170.**
* **Up-to-date, as-built plans of the water system are available and subsequent modifications, if any, have been noted on the drawings.**
* **The owner did comply with the requirement to seek change to the C of A where required, when changes were made.**

Water plant upgrades are scheduled to commence in March, 2005 and the City was issued a new Certifcate of Approval January 26, 2005.

LMR - OPERATOR CERTIFICATION AND TRAINING

* **It can be confirmed that there were no instances where the overall responsible operator was unable to act for more than 150 consecutive days.**

* **Every operator and water quality analyst employed in the subsystem has received the annual number of hours of training relative to that subsystem.**

  Training Records for both the water plant and the water distribution system operators were reviewed and no inconsistencies were observed.

* **For that portion of the training consisting of on the job practical training, records have been retained for 5 years.**

* **For that portion of the training consisting of on the job practical training, the records include the names of the operators and water quality analysts who attended training sessions, the dates of training sessions, the method used for the training, the name of the instructor, the duration of each training session and the subjects covered.**

* **A review of the contingency plan verifies that it provides for delegation of an overall responsible operator's duties for periods of up to 150 days in any one year when the overall responsible operator is absent or unable to act.**

  The City has a contingency plan in place for the OIOR to delegate or put the OIC in charge of the plant in case of his absence or any situation which requires this transfer of responsibility.

LMR - WATER QUALITY MONITORING

* **All microbiological water quality monitoring required by the legislation is being conducted.**

* **All physical/chemical water quality monitoring required by the legislation is being conducted.**

  The City provided analytical results for the chemical monitoring except for one quarterly THM sample which appeared to be missing. However, the plant manager contacted the Lab who analyzed the chemical samples to ascertain if the THM sample was analyzed. It was detrermined that it had been analyzed and the results had not been forwarded to the City. The sample result was provided to us when they received it.

* **All the water quality monitoring required by authorizing or control documents is being conducted.**

* **No relief from water quality monitoring requirements has been granted.**

* **Samples of raw water can be collected prior to treatment from an acceptable tap with a smooth nozzle.**

* **Raw water samples are being collected and analyzed from the appropriate locations at the appropriate frequency.**

* **Testing for parameters required by legislation, CofA or order is being conducted by laboratories accredited to test for that parameter.**

* **The drinking water system owner has submitted all written notices to the Director providing the names of laboratories that are conducting tests for parameters required by legislation, CofA or Order.**

* **Samples are being taken and handled in accordance to instructions provided by the drinking water system's laboratories.**

LMR - WATER QUALITY MONITORING

* **Continuous water quality analyzers and indicators with alarm systems are installed at the prescribed locations.**

* **Continuous disinfectant residual analyzers are equipped with alarms to ensure continuous disinfection.**

* **Samples for chlorine residual analysis are tested using continuous monitoring equipment, an electronic direct read-out colourimetric or amperometric chlorine analyzer, or an equivalent device.**

* **Fluoridation is practiced and the required daily samples are being taken at the end of the fluoridation process.**

  The concentration of fluoride in the treated water is contiuously monitored through the use of an on-line analyzer. The analyzer is equipped with a high level alarm reported to be set at 1.2 mg/L and the low level alarm is set at 0.05 mg/L. If the alarm is activated, the fluoride pump is automatically shut down. In 2003, fluoride levels ranged from 0.57 mg/L to 0.69 mg/L and in 2004, the values were 0.42 mg/L and 0.78 mg/L. respectively. The Ontario Drinking Water Quality Standard for fluoride is 1.5 mg/L. The analyzer is connected to the plant SCADA system which provides a continuous record of the fluoride in the treated water as it is discharged from the plant.

  The fluoridation system is located in the basement of the water plant and consists of a 18,000 kilos (32 cu. metre) lined wooden solution tank, two control metering pumps (one duty, one standby). The metering pumps pump the hydrofluorosilic acid from the solution tank and inject the acid into the clearwell through a diffuser. Hydrofluorosilic (HFS) acid solution dosages are monitored by the SCADA system. The pump speed and stroke are adjusted according to the flow rate to obtain the optimum dosage of 1.0 mg/L. The liquid HFS is brought in by bulk and pumped into the solution tank. No handling of the chemical is reported by the operators.The inspector observed that no signs were posted on the tank advising the product was an acid and corrosive. This should be done. Finally, in a discussion with the water plant manager, the writer enquired if the City had been monitoring the operators for fluorosis by analyzing their urine annually to avoid overexposure. The manager reported that this precaution was not done. This testing is usually more important when using fluoride dust since one of the major causes of overexposure to fluoride is the inhalation of fluoride dust particles. Hower, in the case of the Cornwall plant, the fluoride in use is liquid and contained in a sealed vessel.

* **The required minimum levels of residual disinfectant are maintained throughout the *distribution* system.**

  Our review of the sample results collected for 2003 and 2004 revealed that no adverse residuals were recorded and free chlorine residuals ranged from a low of 0.20 (2003) to a high of 1.07 (2003) mg/L. The results recorded in 2004 fell within this range of values. Similarly the total chlorine residuals recorded were all within the satisfactory range and no adverse analyses were observed. The residual values recorded on the day of the inspection confirmed this observation and ranged from a low of 0.52 mg/L to a high of 0.86 mg/L for the free chlorine residual and from a low of 0.60 mg/L to a high of 0.98 mg/L for the Cornwall water distribution system.

* **Records confirm that the maximum free chlorine residual in the distribution system was less than 4.0 mg/L or that the combined chlorine residual was less than 3.0 mg/L.**

* **Monitoring equipment is capable of measuring chlorine residuals with the required accuracy.**

* **Continuous monitoring for turbidity is being performed at each filter effluent line.**

  Each of the four filters in use at the plant is equipped with a continuous recording turbidimeter (HACH Model 1720C). On the day of inspection, all units recorded below 0.06 NTUs. The high level alarm setpoint is reported to set at 0.8 NTUs. Waste water discharge from the turbidimeters is discharged to the sanitary sewer.

LMR - WATER QUALITY MONITORING

* **Turbidity testing is carried out using a meter that measures turbidity in Nephelometric Turbidity Units (NTUs).**

* **Turbidity testing is being carried out in accordance with the regulation.**

Turbidity readings are collected continuously with a Hach Model 1720C turbidimeter installed on the treated water effluent line. The turbidity on the day of inspection was recorded at 0.053 NTUs. The quality control band for this specific model of turbimeter is + or - 2% (ie:+ or- 0.02 at 1 NTU). The high level alarm is set at 0.8 NTU. Waste water discharge from the turbidimeter is discharged to the sanitary sewer.

* **Primary disinfection chlorine monitoring is being conducted at or near a location where the intended CT has just been achieved or at a point representing that location.**

For surface water sources, the MOE's Disinfection Procedure requires a minimum 2-log (99%) removal or inactivation of Cryptosporidum oocysts, a 3-log (99.9%) removal or inactivation of Giardia cysts and a 4-log (99.99%) removal or inactivation of viruses before the first consumer connection. At least 0.5 log removal or inactivation of Giardia cysts and 2-log removal or inactivation or viruses must be provided through the disinfection portion or the overall water treatment process. A review of the Engineer's Report (November 2000) indicated that the Engineer concluded that the facility was not in compliance with the MOE's Procedure B13-3 "Chlorination of Potable Water Supplies in Ontario". Section 7.1 of the Engineer's Report provided a summary of the calculation of the chemical disinfection CT values for the treatment process. The Engineer calculated that a CT of 55 was required for removal or inactivation of giardia cysts and a CT of 6 for removal or inactivation of viruses. The Engineer calculated that the CT of 3.4 was being provided. Conditions 8.1 and 8.2 of the C of A issued in January,2005 requested that the City implement specifc physical improvements and upgrades to the works in keeping with the Engineer's Report and related MOE correspondence. A tender has now been awarded by the City to a contractor to proceed with this upgrade work and will begin March, 2005.

* **Secondary disinfection chlorine residual monitoring is being conducted on a daily basis.**

* **Daily records of the measured disinfectant are maintained.**

* **The drinking water system is providing chlorination or chloramination.**

* **Trihalomethane samples are being collected as required.**

The required distribution samples for trihalomethanes are collected on a monthly basis at the elevated storage tank.

* **The trihalomethane samples are being collected from a point in the distribution system or in the connected plumbing system that is likely to have an elevated potential for the formation of trihalomethanes.**

The samples are collected from the elevated tower which is at the extreme north east part of the City.

* **Samples for lead analysis are being collected from a point in the distribution system, or the connected plumbing system that is likely to have an elevated concentration of lead.**

* **The owner is conducting sampling in addition to that required.**

The City of Cornwall continues to participate in the Ministry's Drinking Water Surveillance Program (DWSP).

LMR - WATER QUALITY MONITORING

* **Records of water quality analyses are retained for the period of time prescribed by regulation.**
* **Operators are examining continuous monitoring test results and they are examining the results within 72 hours of the test.**

  All continuous monitoring test results are examined daily and the plant has a laboratory on site and tests are performed daily to cross check analyzer monitoring results. For the chlorine residual readings, an amperometric titrator is used to confirm these results. Similarly, laboratory bench testing equipment is used to verify analyzer testing for turbidity and fluoride analyzer readings. A Hach bench top turbidimeter (Hach 2100P) is used to confirm turbidity readings, a pH meter (Sension 3) confirms pH and a DR2010 spectrophotometer is used daily to confirm the fluoride test results and a bench top turbidimenter (Hach 2100P) for turbidity readings.
* **Audit samples were collected during the inspection.**

LMR - WATER QUALITY ASSESSMENT

* **The concentration of fluoride in the treated water is in accordance with regulatory requirements.**
* **The results of Ministry audit sampling shows compliance with Ontario Drinking Water Quality Standards (Regulation 169/03).**
* **The owner's monitoring results are comparable to the results of the Ministry's audit samples.**

LMR - REPORTING, NOTIFICATION & CORRECTIVE ACTION

* **A review of monitoring data provided by the operating authority confirms that the water provided by the system meets the requirements of the prescribed drinking water quality standards.**
* **All required notifications of adverse water quality incidents were provided to the Spills Action Centre and Medical Officer of Health.**

  Three notifications were completed in 2003. All were were reported on the distribution system (TCs ranging from 10 to 3 and one elevated HPC over 500). One was reported in May 2004 on the distribution system with a TC of 4. All were re-sampled, notifications completed, EOHU notified and the appropriate protocols followed.
* **Notice of issue resolution was provided within 7 days of the issue being resolved.**
* **Corrective actions have been taken to address exceedances and resampling provisions have been met including any other steps as directed by the Medical Officer of Health.**
* **When alarms for continuous monitoring equipment sounded, appropriate actions were taken in a timely manner by a qualified person.**

  All operators carry pagers and if an alarm goes off, an operator is dispatched to evaluate the problem.
* **When no one was at the location where/when the alarm sounded, a qualified person was promptly dispatched.**
* **The Engineer's Report/Engineering Evaluation Report was prepared and submitted within required time frames.**

LMR - REPORTING, NOTIFICATION & CORRECTIVE ACTION

* **Annual Reports have been completed, have been made available to the public on time, and contain the required information.**
* **Summary Reports have been completed on time and distributed in accordance with the regulatory requirements.**
* **The owner has complied with all requirements necessary for compliance since the date of the last inspection and relative to non compliance issues identified from that time to the present.**

NON COMPLIANCE WITH REGULATORY REQUIREMENTS

N/A

ACTIONS REQUIRED

1 The owner/operator should be tracking all chemical/bacteriological analytical results (such as in the case of the missing THM result) to confirm that all required monitoring has been performed.

SUMMARY OF BEST PRACTICE ISSUES

N/A

RECOMMENDED ACTIONS

1 It is strongly recommended that the operating authority review fluoride handling techniques with their staff to ensure that they are aware of the hazards of handling this compound and protect their health. Regular determination of fluoride in the plant effluent is reported to be performed daily. Operating staff also collect at least one sample from either the plant effluent or the distribution system and examine it in the on site laboratory daily. The former Certificate of Approval required that the fluoride concentrations in the treated water at the point of entrance to the distribution system must have a quality control band of plus or minus 0.1 mg/L and the ODWS standard is 1.0 mg/L. Fluoride dosing ranged from 0.57 mg/L in 2003 to 0. 69 mg/L and from 0.42 mg/L to 0. 78 mg/L in 2004. As the plant process control target is in a range from 0.5 - 0.8 mg/L, these dosages should be checked closely to ensure that they fall into that range or provide a reason for why this is not occurring. No fluoride sample results of the distribution system were provided. Fluoridation of the water requires the careful handling of a hazardous chemical and continued diligence with the use of this chemical will eliminate potential safety hazards to plant staff. However, in the planned expansion of this water treatment plant, it may be prudent to review the handling procedures involved with this fluoridation process and ensure that it meets current standards.

2 The Owner has indicated that the current operations manual is under revision to incorporate all the requirements of the new plant Certificate of Approval, Section 6.5 issued January, 2005 and ensure that all plant upgrades that are commencing March, 2005 are included in this manual. The operations manual will be kept up to date and the owner shall make it available for inspection by Ministry personnel. The inspector reviewed a draft copy of this SCADA/operator manual which is currently under preparation. It highlights all plant processes, including a plant description, plant overview and description of operations and a section by section description of each plant process. A formal revision log for each section is contained at the beginning of the manual detailing the date of revision.

3 The contingency plan does not allow for any emergency provisions should the the water transmission line from the raw water intake at the R.H. Saunders dam to the water treatment plant fail or require repairs. The owner advises that the City would only have about one day of water available for use by the residents from its elevated tower and Boundary Road reservoir. Provisions for water haulage or pumping directly from the St. Lawrence River somewhere downstream of the Dam should be considered.

4 It was also recommended at the time of the last inspection that the owner should organize regular meetings between Water Treatment Plant and Public Works along with representatives from the Township of South Stormont and their operating authority (Caneau Water Management Inc) to discuss water supply issues relating to the Cornwall Water Works and the St. Andrews/Rosedale Water Distribution System. This has not yet been done to date and it is recommended that a meeting be arranged to discuss mutual areas of concern.

5 Consumer water use is not fully metered. Water conservation is not currently practiced by the owner or operating authority. A water conservation plan is currently under review by the City to install meters on all industries and commercial outlets.

6 Additional sampling is being conducted (DWSP) and the information pertaining to these samples is not being included in the reports required by legislation or authorizing documents.

7 No formal leak detection program is in place on the water distribution system. However, City staff report that they usually review the worst case problems (about 20%) annually on an ad hoc basis. It is recommended that the City formalize this procedure and prepare a standard Operating Procedure (SOP) for this program on an annual basis.

8 No formal maintenance and repair record of the water distribution system or scheduled inspection/clean-out of water storage structures exists at this time for these components. Work is reported to be done on an as required basis. A formal replacement program is reported to be under preparation by the City's Engineering Services Section. A draft copy of this program should be provided to this Ministry for review once it has been finalized.

9 With respect to the operation of the City's Water Plant Dispensing Station, it was indicated at the the time of inspection, that the City employs the use of a check valve arrangement to prevent the flow of water returning back into the water plant from the vehicle tank which could potentially contain contaminants. The Ministry recommends that a backflow preventor be installed here during the upcoming plant upgrade to ensure no backsiphonage from the vehicle tank occurs here.

SIGNATURES

Inspected By:

Don Munro

Signature: (Inspector):

Don Munro

Reviewed & Approved By:

James Mahoney

Signature: (Supervisor):

J Mahoney

Review & Approval Date:

March 11, 2005

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.

Ministry of the Environment
Drinking Water Inspection Report

APPENDIX A

Ontario Ministry of Environment
Central Laboratory - Resources Road
FINAL REPORT(manager.rdf)
Mar. 01, 2005 10:28 PM

Login: **C122765**

Program Code 130072201

Program: MOE OPERATIONS DIVISION
Study: WATER, COMMUNAL
Project: EASTERN REGION - KINGSTON DIST
Activity: WTP MUNIC INSPECT/ADVERS NOTIF
Organization: District Manager Cornwall

Org. Id: 4615

Mail this copy to :

MUNRO, DON
MOE - CORNWALL AREA OFFICE
113 AMELIA STREET
CORNWALL,ONT
K6H 3P1

Final reports to : MUNRO, DON

Inquires to: RUSTY MOODY Telephone : 416-235-5863
PAUL YANG Telephone : 416-235-6004

LOGIN DESCRIPTION: 220001049 CORNWALL WTP DON MUNRO 613-933-7402

Login: **C122765**

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-100	2200010497002	RAW WATER	18 JAN 2005	01:05	5	
	Sample ID C122765-0001	Sample Comment Description				

MOE*LIMS Products Requested:

WD	E3172A	F3172	WD	E3196A	IBC3196	WD	E3217A	CAT3217	WD	E3274A	LIC3274
WD	E3364A	DISNUT3364	WD	E3371A	TCEC3371						

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-101	2200010497408	TREATED WATER	18 JAN 2005	11:00	5	
	Sample ID C122765-0002	Sample Comment Description				

MOE*LIMS Products Requested:

WD	E3051A	MET3051	WD	E3060B	HG3060	WD	E3119A	CPA3119	WD	E3144B	VOL3144
WD	E3172A	F3172	WD	E3196A	IBC3196	WD	E3226A	PA3226	WD	E3274A	LIC3274
WD	E3364A	DISNUT3364	WD	E3400A	OCS3400	WD	E3408A	PC3408	WD	E3415	GLY3415
WD	E3417	PAR3417	WD	E3435	TRI3435	WD	E3436	PHU3436	WD	E3437	OPS3437
WD	E3438	CAR3438									

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-102	2200010498010	RICHELIEU HOSIERY-SECOND ST. DISTRIBUTION	18 JAN 2005	11:10	5	
	Sample ID C122765-0003	Sample Comment Description				

MOE*LIMS Products Requested:

WD	E3226A	PA3226	WD	E3408A	PC3408

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-103	2200010498010	FIRE STATION 1351 SECOND ST. DISTRIBUTION	18 JAN 2005	11:20	5	
	Sample ID C122765-0004	Sample Comment Description				

MOE*LIMS Products Requested:

WD	E3226A	PA3226	WD	E3408A	PC3408

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-104	2200010498010	BOUNDARY ROAD DISTRIBUTION	18 JAN 2005	11:40	5	
	Sample ID C122765-0005	Sample Comment Description				

MOE*LIMS Products Requested:

WD	E3226A	PA3226	WD	E3408A	PC3408

Login: **C122765**

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-105	2200010498010 Sample ID C122765-0006	ESSO STATION, MARLEAU STREET DISTRIBUTION	18 JAN 2005	11:50	5	

MOE*LIMS Products Requested:

			Sample Comment Description		
WD	E3226A	PA3226	WD	E3408A	PC3408

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-106	2200010498010 Sample ID C122765-0007	ELEVATED TOWER TOLLGATE ROAD DISTRIBUTION	18 JAN 2005	12:00	5	

MOE*LIMS Products Requested:

			Sample Comment Description		
WD	E3226A	PA3226	WD	E3408A	PC3408

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DHM-107	2200010498010 Sample ID C122765-0008	CITY LIMITS, SOUTH BRANCH ROAD DISTRIBUTION	18 JAN 2005	12:10	5	

MOE*LIMS Products Requested:

			Sample Comment Description		
WD	E3226A	PA3226	WD	E3408A	PC3408

Ontario Ministry of Environment
Central Laboratory - Resources Road
FINAL REPORT(manager.rdf)
Mar. 01, 2005 10:28 PM

Login: **C122765**

Field ID:	DHM-100	DHM-101	DHM-102
Sample ID:	C122765-0001	C122765-0002	C122765-0003
MOE*LIMS ID:	2005WD3-00061	2005WD3-00062	2005WD3-00063
Station ID:	2200010497002	2200010497408	2200010498010
Collect Date:	18 JAN 2005	18 JAN 2005	18 JAN 2005
Sample Location Description:	RAW WATER	TREATED WATER	RICHELIEU HOSIERY-SECOND ST. DISTRIBUTION
Sample Comments Description:			

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3051L1	Copper					.9	ug/L	+/-0.50					
	Nickel					.8	ug/L	+/-0.40					
	Zinc					1	ug/L	+/-0.80					
	Cadmium					-.03	ug/L	+/-0.05					
	Chromium					1	ug/L	+/-0.50					
	Lead					.02	ug/L	+/-0.05					
	Iron					6	ug/L	+/-6.00					
	Manganese					.36	ug/L	+/-0.36					
	Aluminum					84.5	ug/L	+/-7.20					
	Vanadium					.33	ug/L	+/-0.08					
	Molybdenum					1.39	ug/L	+/-0.23					
	Silver					0	ug/L	+/-0.05					
	Barium					23.5	ug/L	+/-2.30					
	Beryllium					-.02	ug/L	+/-0.05					
	Strontium					191	ug/L	+/-18.00					
	Titanium					-.1	ug/L	+/-0.50					
	Thallium					0	ug/L	+/-0.05					
	Uranium					.17	ug/L	+/-0.05					
	Boron					26	ug/L	+/-4.00					
	Arsenic					.7	ug/L	+/-0.20					
	Selenium					1	ug/L	+/-1.00					
	Antimony					.77	ug/L	+/-0.18					
	Cobalt					.06	ug/L	+/-0.04					
3060L1	Mercury					.02	ug/L	<=W					
3119L1	2,4-dichlorophenol					2000	ng/L	<=W					
	2,4,6-trichlorophenol					20	ng/L	<=W					
	2,4,5-trichlorophenol					100	ng/L	<=W					
	2,3,4-trichlorophenol					100	ng/L	<=W					
	2,3,4,5-tetrachlorophenol					20	ng/L	<=W					
	2,3,4,6-tetrachlorophenol					20	ng/L	<=W					
	Pentachlorophenol					10	ng/L	<=W					
	Dicamba					50	ng/L	<=W					
	Bromoxynil					50	ng/L	<=W					
	2,4-D-propionic acid					100	ng/L	<=W					
	2,4-D					100	ng/L	<=W					
	Silvex					20	ng/L	<=W					
	2,4,5-T					50	ng/L	<=W					

Ontario Ministry of Environment
Central Laboratory - Resources Road
FINAL REPORT(manager.rdf)
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Login: **C122765**

Field ID:	DHM-100	DHM-101	DHM-102
Sample ID:	C122765-0001	C122765-0002	C122765-0003
MOE*LIMS ID:	2005WD3-00061	2005WD3-00062	2005WD3-00063
Station ID:	2200010497002	2200010497408	2200010498010
Collect Date:	18 JAN 2005	18 JAN 2005	18 JAN 2005
Sample Location Description:	RAW WATER	TREATED WATER	RICHELIEU HOSIERY-SECOND ST. DISTRIBUTION
Sample Comments Description:			

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3119L1	2,4-DB					200	ng/L	<=W					
	Dinoseb					20	ng/L	<=W					
	Picloram					100	ng/L	<=W					
	Diclofop-methyl					100	ng/L	<=W					
	MCPP,2-4Cl2MePhenoxy-Prop/					20	ng/L	<=W					
	MCPA,4Cl2MePhenoxy-AceticA					20	ng/L	<=W					
	MCPB,4Cl2MePhenoxy-Butyric/					20	ng/L	<=W					
3144L1	Chloroethene					.05	ug/L	<=W					
	1,1-dichloroethene					.05	ug/L	<=W					
	Dichloromethane					.2	ug/L	<=W					
	Tert-butyl methyl ether					.05	ug/L	<=W					
	trans-1,2-dichloroethene					.05	ug/L	<=W					
	1,1-dichloroethane					.05	ug/L	<=W					
	cis-1,2-dichloroethene					.05	ug/L	<=W					
	Chloroform					6.6	ug/L						
	1,1,1-trichloroethane					.05	ug/L	<=W					
	1,2-dichloroethane					.05	ug/L	<=W					
	Carbon tetrachloride					.2	ug/L	<=W					
	Benzene					.05	ug/L	<=W					
	1,2-dichloropropane					.05	ug/L	<=W					
	Trichloroethene					.05	ug/L	<=W					
	Bromodichloromethane					4.6	ug/L						
	Toluene					.05	ug/L	<=W					
	1,2-dibromoethane					.1	ug/L	<=W					
	1,1,2-trichloroethane					.1	ug/L	<=W					
	Dibromochloromethane					1.8	ug/L	<T					
	Tetrachloroethene					.05	ug/L	<=W					
	Chlorobenzene					.05	ug/L	<=W					
	Ethylbenzene					.05	ug/L	<=W					
	m- and p-xylene					.05	ug/L	<=W					
	Bromoform					.5	ug/L	<=W					
	Styrene					.05	ug/L	<=W					
	o-xylene					.05	ug/L	<=W					
	1,1,2,2-tetrachloroethane					.2	ug/L	<=W					
	1,4-dichlorobenzene					.05	ug/L	<=W					
	1,3-dichlorobenzene					.05	ug/L	<=W					
	1,2-dichlorobenzene					.05	ug/L	<=W					

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Sample Comments Description:			

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3144L1	Trihalomethanes; total					13.0	ug/L						
3172L3	Fluoride	0.09	mg/L			0.54	mg/L						
3196L1	Ion balance calculation		%	NDID			%	NDID					
	Anions		meq/L	NDID			meq/L	NDID					
	Cations	2.96	meq/L				meq/L	NDID					
	Conductivity Estimated		uS/cm	NDID			uS/cm	NDID					
	Solids; Dissolved Estimated		mg/L	NDID			mg/L	NDID					
3217L1	Calcium	33.2	mg/L										
	Magnesium	8.75	mg/L										
	Sodium	12.6	mg/L										
	Potassium	1.55	mg/L										
	Hardness	119.	mg/L										
3226L1	NT: Total Coliforms					See Non-Target Textual result				See Non-Target Textual result			
3274L1	Langeliers index calculation		none	NDID			none						
	Saturation pH Estimated		none	NDID			none						
3364L1	Nitrogen; ammonia+ammonium	0.004	mg/L	<T		.002	mg/L	<=W					
	Nitrogen; nitrite	0.003	mg/L	<T		.001	mg/L	<=W					
	Nitrogen; nitrate+nitrite	0.376	mg/L			0.377	mg/L						
	Phosphorus; phosphate	0.0035	mg/L			0.0009	mg/L	<T					
3371L7	Total coliform	9.0	c/100mL										
	Total Coliform Background	56.	c/100mL										
	Escherichia coli	0.0	c/100mL										
3400L4	Hexachloroethane					1	ng/L	<=W					
	1,3,5-trichlorobenzene					5	ng/L	<=W					
	1,2,4-trichlorobenzene					5	ng/L	<=W					
	Hexachlorobutadiene					1	ng/L	<=W					
	1,2,3-trichlorobenzene					5	ng/L	<=W					
	2,4,5-trichlorotoluene					5	ng/L	<=W					
	2,3,6-trichlorotoluene					5	ng/L	<=W					
	1,2,3,5-tetrachlorobenzene					2	ng/L	<=W					
	1,2,4,5-tetrachlorobenzene					1	ng/L	<=W					
	2,6-dichlorobenzyl chloride					10	ng/L	<=W					
	1,2,3,4-tetrachlorobenzene					1	ng/L	<=W					
	Pentachlorobenzene					1	ng/L	<=W					
	Hexachlorobenzene					1	ng/L	<=W					
	Heptachlor					1	ng/L	<=W					
	Heptachlor epoxide					2	ng/L	<=W					

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Sample Comments Description:			

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3400L4	Heptachlor+Heptachlor Epoxide					3	ng/L	<=W					
	Aldrin					1	ng/L	<=W					
	Dieldrin					2	ng/L	<=W					
	Aldrin+Dieldrin					3	ng/L	<=W					
	Mirex					5	ng/L	<=W					
	a-BHC (hexachlorocyclohexane)					1	ng/L	<=W					
	Trifluralin					5	ng/L	<=W					
	g-BHC (hexachlorocyclohexane)					1	ng/L	<=W					
	a-Chlordane					2	ng/L	<=W					
	g-Chlordane					2	ng/L	<=W					
	Oxychlordane					2	ng/L	<=W					
	Chlordane; total					6	ng/L	<=W					
	pp-DDE					2	ng/L	<=W					
	op-DDT					5	ng/L	<=W					
	pp-DDT					5	ng/L	<=W					
	pp-DDD					5	ng/L	<=W					
	DDT; total					17	ng/L	<=W					
	Methoxychlor					5	ng/L	<=W					
	Endosulphan I					2	ng/L	<=W					
	Endrin					5	ng/L	<=W					
	Endosulphan II					5	ng/L	<=W					
	Endosulphan sulphate					5	ng/L	<=W					
	Octachlorostyrene					1	ng/L	<=W					
	Toxaphene					500	ng/L	<=W					
	PCB; total					20	ng/L	<=W					
	Hexachlorocyclopentadiene					10.0	ng/L						
	b-BHC (hexachlorocyclohexane)					2	ng/L	<=W					
	Pyrethrin 1					100	ng/L	<=W					
	Piperonyl Butoxide					100	ng/L	<=W					
	Permethrin					100	ng/L	<=W					
	Pyrethrin 2					100	ng/L	<=W					
3408L1	Heterotrophic bacteria (HB35)					10.	c/mL	<		10.	c/mL	<	
3415L1	Glyphosate					2	ug/L	<=W					
	Aminomethylphosphonic acid					5	ug/L	<=W					
3417L1	Diquat					0.10	ug/L	<=W					
	Paraquat					0.10	ug/L	<=W					
3435L1	Cyanazine					100	ng/L	<=W					

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Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3435L1	Prometone					50	ng/L	<=W					
	Propazine					50	ng/L	<=W					
	Atrazine					50	ng/L	<=W					
	Metribuzin					100	ng/L	<=W					
	Prometryne					50	ng/L	<=W					
	Atratone					50	ng/L	<=W					
	Ametryne					50	ng/L	<=W					
	Simazine					50	ng/L	<=W					
	Metolachlor					500	ng/L	<=W					
	Alachlor					500	ng/L	<=W					
	De-ethylated atrazine					200	ng/L	<=W					
	De-ethylated simazine					200	ng/L	<=W					
	Atrazine+de-alkylatedatrazine					200	ng/L	<=W					
	Butachlor					200	ng/L	<=W					
	Terbutryne					200	ng/L	<=W					
3436L1	Linuron					2000	ng/L	<=W					
	Monuron					2000	ng/L	<=W					
	Diuron					2000	ng/L	<=W					
	Chlorotoluron					2000	ng/L	<=W					
	Fluometuron					2000	ng/L	<=W					
	Monolinuron					2000	ng/L	<=W					
	Chlorobromuron					2000	ng/L	<=W					
	Metoxuron					2000	ng/L	<=W					
	Metobromuron					2000	ng/L	<=W					
	Siduron					2000	ng/L	<=W					
	Difenoxuron					2000	ng/L	<=W					
	Neburon					2000	ng/L	<=W					
3437L1	Dimethoate					.5	ug/L	<=W					
	Mevinphos					.2	ug/L	<=W					
	Dichlorvos					.5	ug/L	<=W					
	Azinphos-methyl					.05	ug/L	<=W					
	Methylparathion					.2	ug/L	<=W					
	Malathion					.5	ug/L	<=W					
	Parathion					.1	ug/L	<=W					
	Diazinon					.2	ug/L	<=W					
	Phorate					.1	ug/L	<=W					
	Reldan					.5	ug/L	<=W					

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Collect Date:	18 JAN 2005	18 JAN 2005	18 JAN 2005
Sample Location Description:	RAW WATER	TREATED WATER	RICHELIEU HOSIERY-SECOND ST. DISTRIBUTION
Sample Comments Description:			

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3437L1	Ronnel					.1	ug/L	<=W					
	Terbufos					.2	ug/L	<=W					
	Temephos					.1	ug/L	<=W					
	Chlorpyrifos					.1	ug/L	<=W					
	Ethion					.2	ug/L	<=W					
3438L1	Aldicarb					2500	ng/L	<=W					
	Propoxur					2000	ng/L	<=W					
	Carbofuran					2000	ng/L	<=W					
	Bendiocarb					1500	ng/L	<=W					
	Carbaryl					200	ng/L	<=W					
	Propham					2000	ng/L	<=W					
	Chlorpropham					2000	ng/L	<=W					
	Barban					2000	ng/L	<=W					
	Eptam					2000	ng/L	<=W					
	Diallate					2000	ng/L	<=W					
	Butylate					2000	ng/L	<=W					
	Triallate					1500	ng/L	<=W					

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Field ID:	DHM-103	DHM-104	DHM-105
Sample ID:	C122765-0004	C122765-0005	C122765-0006
MOE*LIMS ID:	2005WD3-00064	2005WD3-00065	2005WD3-00066
Station ID:	2200010498010	2200010498010	2200010498010
Collect Date:	18 JAN 2005	18 JAN 2005	18 JAN 2005
Sample Location Description:	FIRE STATION 1351 SECOND ST. DISTRIBUTION	BOUNDARY ROAD DISTRIBUTION	ESSO STATION, MARLEAU STREET DISTRIBUTION
Sample Comments Description:			

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3226L1	NT: Total Coliforms	See Non-Target Textual result				See Non-Target Textual result				See Non-Target Textual result			
3408L1	Heterotrophic bacteria (HB35)	10.	c/mL	<		10.	c/mL	<		10.	c/mL	<	

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Field ID:	DHM-106	DHM-107
Sample ID:	C122765-0007	C122765-0008
MOE*LIMS ID:	2005WD3-00067	2005WD3-00068
Station ID:	2200010498010	2200010498010
Collect Date:	18 JAN 2005	18 JAN 2005
Sample Location Description:	ELEVATED TOWER TOLLGATE ROAD DISTRIBUTION	CITY LIMITS, SOUTH BRANCH ROAD DISTRIBUTION
Sample Comments Description:		

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3226L1	NT: Total Coliforms	See Non-Target Textual result				See Non-Target Textual result			
3408L1	Heterotrophic bacteria (HB35)	10.	c/mL	<		10.	c/mL	<	

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CODE	DESCRIPTION
<	ACTUAL RESULT IS LESS THAN THE REPORTED VALUE
<=W	NO MEASURABLE RESPONSE (ZERO): <REPORTED VALUE
<T	A MEASURABLE TRACE AMOUNT:INTERPRET WITH CAUTION
BG	BACTERIAL GROWTH DETECTED AT 48 HR. NO ACID/GAS
NDAE	NO DATA: ABSENT NT: ESCHERICHIA COLI
NDAT	NO DATA: ABSENT NT: TOTAL COLIFORMS
NDDN	NO DATA: NOT DETECTED NT: DETERIORATION INDICATORS
NDID	NO DATA: INSUFFICIENT DATA TO PERFORM CALC.
UPS	UNRELIABLE:PRESERVED SAMPLE RECOMMENDED

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NON-TARGET TEXTUAL RESULT

Sample ID	Listid	Parmname	Value:	Qual:	Remarks
C122765-0002	3226L1	NT: Total Coliforms		NDAT	
Absent					
C122765-0002	3226L1	NT: Escherichia coli		NDAE	
Absent					
C122765-0002	3226L1	NT: Deterioration Indicators		NDDN	
Not Detected					
C122765-0003	3226L1	NT: Total Coliforms		NDAT	
Absent					
C122765-0003	3226L1	NT: Escherichia coli		NDAE	
Absent					
C122765-0003	3226L1	NT: Deterioration Indicators		NDDN	BG
Not Detected					
C122765-0004	3226L1	NT: Total Coliforms		NDAT	
Absent					
C122765-0004	3226L1	NT: Escherichia coli		NDAE	
Absent					
C122765-0004	3226L1	NT: Deterioration Indicators		NDDN	
Not Detected					
C122765-0005	3226L1	NT: Total Coliforms		NDAT	
Absent					
C122765-0005	3226L1	NT: Escherichia coli		NDAE	
Absent					
C122765-0005	3226L1	NT: Deterioration Indicators		NDDN	

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Not Detected

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0006	3226L1	NT: Total Coliforms			NDAT		

Absent

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0006	3226L1	NT: Escherichia coli			NDAE		

Absent

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0006	3226L1	NT: Deterioration Indicators			NDDN		

Not Detected

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0007	3226L1	NT: Total Coliforms			NDAT		

Absent

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0007	3226L1	NT: Escherichia coli			NDAE		

Absent

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0007	3226L1	NT: Deterioration Indicators			NDDN		

Not Detected

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0008	3226L1	NT: Total Coliforms			NDAT		

Absent

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0008	3226L1	NT: Escherichia coli			NDAE		

Absent

Sample ID	Listid	Parmname		Value:	Qual:		Remarks
C122765-0008	3226L1	NT: Deterioration Indicators			NDDN		

Not Detected

TEXT COMMENTS

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** End of Report **