Ministry of the Environment

Safe Drinking Water Branch

Ottawa District Office
2430 Don Reid Dr.
Ottawa ON K1H 1E1

Ministère de l'Environnement

Direction du contrôle de la qualité de l'eau potable

Bureau du district d'Ottawa
2430, chemin Don Reid
Ottawa (Ontario) K1H 1E1

Ontario

December 13, 2010

Ms. Michelle Larose
CAO/ Clerk
The Town of Deep River
P. O. Box 400
100 Deep River Road
Deep River, Ontario
K0J 1P0
Email: mlarose@deepriver.on.ca

Attention: Ms. Michelle Larose, CAO/Clerk

Dear Ms. Larose:

Re: Drinking-Water System Inspection Program - 2010-11 Inspection Report
The Deep River Drinking Water System – Inspection Number 1- 8CZR5

The enclosed report documents findings of an inspection that was performed at the Deep River Drinking Water System on October 19, 2010 to assess compliance with applicable drinking water Acts and Regulations.

Your attention is directed to the section "*Summary of Best Practices Issues and Recommendations"* (commencing on page 23). One action is recommended at this time.

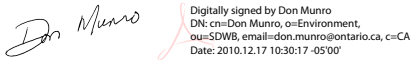
"Recommended Actions" convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the fulsome availability of information to consumers, and conformance with existing and emerging industry standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

In order to measure individual inspection results, the ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Rating Record (IRR), included as Appendix E of the inspection report, provides the ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. Please note the IRR methodology document, included as Appendix F, describes how the risk rating model was improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the ministry's Chief Drinking Water

Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Jim Mahoney, Drinking Water Program Supervisor, at 613-548-6902.

Thank you for the assistance afforded to me by the Deep River water plant staff during the conduct of the compliance assessment. Should you have any questions regarding the content of the enclosed report, please do not hesitate to contact me.

Yours truly,



Don Munro
Drinking Water Inspector/Provincial Officer
Ministry of the Environment
Safe Drinking Water Branch
Ottawa District Officer
Phone: (613) 521-3450 ext. 255
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DM/cd

Enclosure

ec: Mr. Bob Schreader, Manager, Environmental Health, Renfrew County and District Health Unit, 7 International Drive, Pembroke, ON K8A 6W5, Email: bschreader@rcdhu.com
- Mr. Paul Moreau, District Manager, Ministry of Natural Resources, Pembroke District Office, 31 Riverside Drive, Pembroke, Ontario K8A 8R6, Email: paul.v.moreau@ontario.ca
- Mr. Bob McLaren, Public Works Manager, Public Works Department, The Corporation of the Town of Deep River, 100 Deep River Road, PO Box 400, Deep River, ON K0J 1P0, Email: bmclaren@deepriver.ca
- Mr. Dennis McMahon, WDS Overall Responsible Operator, Public Works Department, The Corporation of the Town of Deep River, 100 Deep River Road, PO Box 400, Deep River, ON K0J 1P0, c/o Email: jmellon@deepriver.ca
- Mr. Brian Symondson, Operations Manager, Ottawa Valley Hub, Ontario Clean Water Agency, 122 Patterson Crescent, Carleton Place, ON K7C 4P3, Email: bsymondson@ocwa.com
- Mr. Brad Sweet, Cluster Manager, Ottawa Valley Hub, Ontario Clean Water Agency, 560 Abbie Lane, Petawawa, ON K8H 2X2, Email: bsweet@ocwa.com
- Mrs. Brenda Royce, Process and Compliance Technician, Ottawa Valley Hub, Ontario Clean Water Agency, 560 Abbie Lane, Petawawa, ON K8H 2X2, Em ail: broyce@ocwa.com

c: File SI-RE-DR-RI-540 (2010)

Ontario

Ministry of the Environment

DEEP RIVER DRINKING WATER SYSTEM

Drinking Water System Inspection Report

DWS Number:	220000923
Inspection Number:	1-8CZR5
Date of Inspection:	Oct 19, 2010
Inspected By:	Don Munro

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OWNER INFORMATION:

Company Name:	DEEP RIVER, THE CORPORATION OF THE		
Street Number:	100	**Unit Identifier:**	
Street Name:	DEEP RIVER ROAD Rd		
City:	DEEP RIVER		
Province:	ON	**Postal Code:**	K0J 1P0

INSPECTION DETAILS:

DWS Name:	DEEP RIVER DRINKING WATER SYSTEM
DWS Address:	177 RIVER RD
County/District:	Deep River
District/Area Office:	Ottawa District
DWS Category:	Large Municipal Residential
DWS Number:	220000923
Inspection Type:	Announced
Inspection Number:	1-8CZR5
Date of Inspection:	Oct 19, 2010
Date of Previous Inspection:	Nov 25, 2009

DRINKING WATER SYSTEM COMPONENTS DESCRIPTION

Site (Name): SOURCE WATER

Type: Source **Sub Type:** Surface Water

Comments:

The Deep River Water Treatment Plant (WTP) obtains raw water from the Ottawa River. The Ottawa River watershed comprises an extensive drainage basin (approximately 146,000 square kilometers) with approximately 40% of the watershed entering the river upstream of the town. Land use upstream of Deep River is predominantly undeveloped forest with limited agricultural, forestry and mining activity. The communities upstream of Deep River include Rolphton, Stonecliffe, Deux Rivieres, Mattawa and Temiskaming. Other activities include the Rapides-des-Joachims (Da Swisha) Hydroelectric Generating Station, the Mattawa Hydroelectric Generating Station, Driftwood Provincial Park, Ottawa Valley Railway and Trans Canada Highway No. 17.

The Ottawa River water quality is characterized by low turbidity (0.8 - 5.3 NTU), moderate to high colour (4 - 60 TCU), and low alkalinity (9 - 34 mg/L as CaCO3), which is typical for Northern Ontario, as stated in the Design Brief (December 2004) by Jp2g Consultants Inc. Results of sampling and testing between January 2000 and March 2003 indicate the pH ranges between 6.72 and 7.78; and Dissolved Organic Carbon (DOC) ranges from 5 - 7.4. With respect to microbiological contamination of the raw water, the Engineer's Report prepared by Azurix North America Engineering Corp. (January 2001) outlines that sewage bypassing at upstream municipalities is of concern. Azurix concludes that E. coli is present in approximately 50% of raw water samples, and total coliforms are present in about 75% of samples. The intake works for the Deep River Water Treatment Plant consists of a 750 mm diameter intake extending approximately 91 metres into the Ottawa River terminating at a depth of approximately 9 metres below the surface.

Site (Name): LOW LIFT PUMPING STATION

Type: Source **Sub Type:** Pumphouse

Comments:

Raw water from the Ottawa River is supplied to the WTP by the Low Lift Pumping Station. The low lift pumping station consists of a 9.14 m by 1.52 m by 5.64 m deep low lift pump well and above ground building, equipped with two (2) vertical turbine pumps, one nominal capacity 71 L/s or 6,100 m3/d and one nominal capacity 141 L/s or 12,200 m3/d, and one (1) submersible pump nominal capacity of 83.1 L/s at 25 metres TDH or 7,171 m3/d; and a raw water main from the low lift pumping station to the water treatment plant.

Two stainless steel coarse screens are in place, but unused and unserviceable, at the intake of the wet well. The Amendment to the Design Brief (December 2007) states that cost overruns necessitated a re-design of the low lift pumping station. The revised design incorporates two existing vertical turbine pumps plus adding a new submersible low lift pump. As noted in the Design Brief (December 2004), the floor of the existing pump house is below the 100 year flood level. Flood proofing of the pumping facility will be accomplished by (i) installing all new electrical gear above the 100 year flood elevation and (ii) providing a continuous wall around the building with top above 100 year flood level. The raw water wet well has reasonably tight hatches to prevent surface water from entering from the top in this building. It was reported that the firm raw water capacity of this plant, with the largest pump out of service, is approximately 14,340 m3/d, with a net treated water capacity of 13,638 m3/d.

It appears that the above changes have been implemented within the low lift pumping station.

Site (Name): WATER TREATMENT PROCESS

Type: Treated Water POE **Sub Type:** Treatment Facility

Comments:

The original Deep River WTP (circa. 1945) was located at 176 River Road (which is now the low lift pumping station), and consisted of coarse screening with chlorine disinfection. The treatment process was upgraded to a conventional filtration plant with three pre-fabricated package units with chlorine and chlorine dioxide disinfection in 1972. This plant was decommissioned and dismantled during the upgrades in July 2007.

The new water treatment plant now comprises of the following:

- an in-line static mixer, 300 mm diameter;
- three (3) package flocculation and clarification (Actiflo) units, each rated at raw water flow rate of 4,773 m3/d, consisting of: a rapid mixing basin, an injection chamber, a maturation chamber and a high rate ballasted settling basin, scraper and inclined tube settlers; four (4) sand recirculation pumps (three duty and one standby); three (3) hydrocyclones; electrical and mechanical equipment and control;
- 3 dual media sand and anthracite filters each with a surface area of 18.9 m2; for a total area of 56.7 m2;
- two (2) air scour blowers equipped with 18.6 kW motor (one duty, one standby);
- two (2) backwash variable speed vertical turbine pumps (one duty, one standby) each rated at 236 L/s at a TDH of 22 m;
- piping and control to facilitate filter to waste;
- electrical and mechanical equipment and control;
- two clear wells, one with a capacity of 1,364 m3, and a second with a capacity of 1,507 m3; and two pump wells, one with a capacity of 90 m3 and the other with a capacity of 110 m3;
- four (4) vertical turbine high lift pumps (three duty, one standby), each rated at 87 L/s at a TDH of 82 m;

• a gaseous chlorine disinfection system consisting of two (2) banks of four (4) 68.2 kg cylinders (one bank duty, one bank standby) and eight (8) weigh scales, three (3) V-notch chlorinators;

• chlorine solution lines, one leading to an injection point at the filter outlet header prior to the clear wells, and the other leading to an injection point in the pump well upstream of the high lift header; and,

• a chlorine gas scrubber system.

The chemical storage and feed systems consist of the following:

• a primary coagulant (Alum) feed system consisting of one (1) 6,600 L tank and one (1) 21,200 L capacity liquid coagulant tank, one (1) 3100 L day tank and two (2) (one duty, one standby) chemical feed metering pumps with a flow capacity of 40 L/hr and chemical feed line prior to the Actiflo units;

• pH/alkalinity adjustment consisting of two (2) 51,200 L per tank capacity liquid caustic soda, two (2) 3100 L day tanks and four (4) (two duty, two standby) chemical feed metering pumps with a flow capacity of 60 L/hr each and chemical feed lines to the raw water pipe (pre-alkalinity) just upstream of the static mixer, and to the distribution header;

• coagulant aid for the water treatment clarifiers consisting of 2 dry polymer preparation systems each consisting of 3100 L dissolving tank with mixer; 4 (3 duty, 1 standby) chemical feed metering pumps with a flow capacity of 90 L/hr each and chemical feed lines to the three package treatment units injection chambers;

• coagulant aid for the wastewater clarifier unit consisting of 2 dry polymer preparation systems each consisting of 3100 L dissolving tank with mixer; 3 (2 duty, 1 standby) chemical feed metering pumps with a flow capacity of 45 L/hr each and chemical feed lines to the hydrocyclones reject pipe, and to surge tank pumps discharge pipe;

• coagulant aid for the dewatering centrifuge consisting of one 3100 L dissolving tank with mixer, 2 dry polymer preparation systems each consisting of 2 (1 duty, 1 standby) chemical feed metering pumps with a flow capacity of 90 L/hr each and chemical feed lines to the sludge dewatering centrifuge inlet; and,

• dechlorination chemical (sodium bisulfite) feed system (which is currently not operational) consisting of one 210 L storage tank and 2 (one duty, one standby) chemical feed metering pumps with a flow capacity of 2 L/hr each and chemical feed line to the wastewater clarifier supernatant discharge pipe; and,

• hydrofluosilicic acid feed system consisting of one 210 L storage tank and two (one duty, one standby) chemical feed metering pumps with a flow capacity of 4 L/hr each and chemical feed line to the distribution header.

It was reported that the chemical feed metering pumps are flow-paced; and that they are not equipped with automatic switchover capabilities.

Process instrumentation for the WTP consists of nine (9) turbidimeters continuously monitoring the raw water, Actiflo units (clarified water), filter effluent, treated water and the wastewater clarifier supernatant; six (6) pH meters continuously monitoring the raw water feed to clarifiers after the static mixer, Actiflo units (at the end of each unit prior to the filters), treated water prior to and after final pH adjustment; two (2) chlorine residual analyzers continuously monitoring the treated water at the end of the clear wells and before leaving the WTP (on the discharge header); one sulfite ion monitor continuously monitoring the wastewater clarifier supernatant discharge pipe; and a fluoride ion analyzer continuously monitoring the fluoride residual in the treated water on the distribution header.

The residue management facility (wastewater treatment) consists of two filter backwash wastewater surge tanks, each approximately 113 m3, equipped with two transfer pumps; wastewater tube settlers clarifier with supernatant discharge line to the river; and a sludge thickener tank equipped with two sludge pumps that convey the thickened sludge to a dewatering centrifuge with supernatant discharge to wastewater surge tanks.

Site (Name): WATER TREATMENT SYSTEM
Type: Treated Water POE **Sub Type:** Treatment Facility

Comments:

The WTP is equipped with a standby 600 kW diesel generator complete with fuel storage tank to run the generator for 24 hours under full load; a Human Machine Interface (HMI); and a SCADA system connected to all project PLCs, with supervising personnel computer located in the office.

It was reported that the WTP is equipped with a loop for the pH adjustment, and that the operating authority has been having issues with adjusting the pH of the raw water. It was reported that the optimum range for pH in the raw water entering the Actiflo units is 6.5 to 6.8; and that the Actiflo units will not convey water to the next stage in the treatment process if the pH target is not met. The pH target can be achieved by pace to flow or with a control loop.

At the time of the inspection, it was reported that the water treatment plant is only operating two of the three Actiflo units due to low demand in the system. The operating authority rotates the operation of the three Actiflo units.

It was reported that AECL purchased one of the Actiflo units for the Deep River Water Treatment Plant.

It was reported that approximately one to two bags (each bag is 20 kg) of microsand are used each week, as the treatment system loses approximately 5% of the microsand due to the plugging of the hydrocyclones. The Actiflo process is a high rate settling process that combines the advantages of ballasted flocculation and lamella clarification; and is comprised of a rapid mixing basin in the first chamber to start coagulation; a second chamber where microsand and polymer are injected to allow, with a vigorous mixing, a high probability of contact between the coagulated solids and the polyelectrolyte-microsand. Finally, a slower mixing occurs in the third chamber, which enables the maturation and thickening of the flocs. These three stages occur in a total contact time of only 8 minutes. They are followed by a high velocity lamella clarification by ballasting the flocs with microsand. Separation of the sludge from the microsand is achieved by using hydrocyclones. The heavier microsand particles are discharged through the underflow of the hydrocyclones and re-injected in the second chamber. The fines and lighter sludge particles move up with the major fraction of the water out through the vortex overflow and are discharged to the wastewater lamella clarifier.

The new water treatment plant came on-line producing water in July 2007.

It was reported that the following chemicals are used in the water treatment process:

- Liquid Alum (aluminum sulphate) supplied by Kemira Water Solutions Inc;

- Sodium Hydroxide (Caustic Soda) supplied by ClearTech;

- Fluoride supplied by Min-Chem Canada;

- Caustic soda supplied by ClearTech;

- Microsand supplied by U.S. Silica Sand (John Meunier);

- Chlorine Gas supplied by Brenntag; and,

- Actiflo Polymer (Magnifloc LT27AG) supplied by CIBA Specialty.

The Amendment to the Design Brief shows that the coagulant dosage required is 30 mg/L; chemical feed pump flow specified is 40 L/hr; and a maximum dose achievable of 41.7 mg/L.

At the time of this inspection, it was reported that the fluoridation system is operational; but that the sodium bisulfite feed system was not being used even though the process wastewater treatment system is operational. It was reported that there is no need to dechlorinate the supernatant being discharged to the Ottawa River as there is no chlorine present in the supernatant being discharged to the river. Operators should ensure the sulfite ion monitor is operational to ensure that there is no chlorine in the supernatant discharged to the river. The operators may want to also test the supernatant for total chlorine residual to ensure that there is no chlorine present in the supernatant.

During the inspection, it was observed that the coagulant metering pumps are operating at the upper limit of the pump's capacity (>80%), and that the pumps can lose efficiency at this setting. In addition, if the WTP operates at higher flows than it currently is, the pumps might not be able to keep up with the demand, so a larger coagulant feed pump will be required if the WTP is expected to operate near full capacity. It was also observed that the caustic soda metering pumps were operating at a low

stroke setting, which may indicate that they are undersized. Although a metering pump generally can be adjusted to pump at any flow rate between 0 and its maximum capacity, its accuracy is measured over a range determined by the pump's turndown ratio. It is recommended that the owner and operating authority track chemical metering pump performance.

It was reported that the operating authority may try using soda ash instead of caustic soda for pH adjustment; that they are considering moving the fluoride injection point to before the clear wells; that they may move the continuous water quality analyzers from inside the lab to outside of the lab into the chemical room; and that they need to isolate the pH meter in order to calibrate it (pressure reducing valve). It was advised that the pH meter has to be shutdown in order to perform any maintenance activities on it, so they need to move the pH meter from its current location in order to operate it properly. Please note that the owner and operating authority will need to consider making the above-noted changes to the Certificate of Approval before they proceed with making the changes.

It was reported that the diesel generator is tested under full load monthly by operators; and that this testing is recorded in the log book for the WTP and in OCWA's Hansen / WMMS System. The diesel generator is also inspected / serviced annually by Gen Rep.

Site (Name): ELEVATED STORAGE TANK

Type: Other **Sub Type:** Reservoir

Comments:

The Town of Deep River stores treated water in a 1,513 cubic metres (m3) elevated (30.5 metres) water storage tank (water tower) located on the corner of Deep River Road and Highway 17, south of the water treatment plant. Treated water flows by gravity from the tower into the municipal distribution system. Water level sensors contained within the elevated storage tank activate/deactivate operation of the high lift pumps. The reservoir is contained within a locked security perimeter fence. A small cinder block structure located near the base of the tower and within the perimeter fencing contains all valves necessary for draining and isolating the tower.

It was previously reported that the elevated storage tank (water tower) was inspected by Landmark in 2007. During this inspection, it was reported that the water tower was inspected on June 10, 2009, and that it was confirmed that the air vent for the tower is screened, the overflow pipe for the tower is screened, that the tower is provided with security fencing and that the access hatch is locked.

Site (Name): DISTRIBUTION SYSTEM

Type: Other **Sub Type:** Other

Comments:

The Deep River Water Treatment Plant drinking-water system services a population of approximately 4,216 persons. Construction of the Town of Deep River's Water Distribution System was initiated in 1945, and has seen numerous extensions and modifications over the past sixty years. The Town's consumers are not provided with individual water meters. The 2008 residential water use per person, based on a total amount of water taking of 1,155,785.2 cubic metres (3,166.5 m3/d), was approximately 751 L/p/d. For the period of January 1, 2009 to November 30, 2009, the residential water use per person, based on a total amount of water taking of 1,196,052.5 cubic metres (3,276.8 m3/d), was approximately 777 L/p/d. Please note that the total amount of water taking used is based on the raw water flow and not the treated water flow (water entering the distribution system). The average treated water flow for the inspection period (December 3, 2008 to November 27, 2009) was 2,733.5 m3/d. According to Environment Canada's 2004 statistics, the average residential water use per person was 329 L/d.

It was reported that the water mains are constructed of mostly cast iron, ductile iron and polyvinyl chloride (PVC), and range in diameter from 102 mm (4-inches) to 406 mm (16-inches). It was

reported that there is 75 km of water mains within the distribution system; approximately 202 hydrants and 202 hydrant valves. It was reported that approximately 12 new hydrant valves were installed in 2009 and about the same number in 2010. In addition, the Town received an Infrastructure grant, which assisted in replacing water mains and valves on the east side of the Town near the Wastewater Treatment Plant.

Site (Name): DEEP RIVER & DISTRICT HOSPITAL

Type: Other **Sub Type:** Other

Comments:

This sampling location is used to collect drinking-water samples for testing of trihalomethanes as it is considered to be one of the farthest ends in the distribution system and has the elevated potential for the formation of trihalomethanes.

Site (Name): SCADA SYSTEM

Type: Other **Sub Type:** Other

Comments:

It was reported that there is one (1) computer for the WTP's SCADA system (Rockwell RS View); and that there is a Human Machine Interface (HMI) (datalogger) that acts as a backup to the SCADA system. It was reported that the HMI is a mirror of the SCADA system and that it is a completely separate backup to the SCADA system, so if the SCADA system fails, then all of the data / trending is saved by the HMI. It was reported that the HMI is backed up to disks, and that one disk holds a year's worth of data. It was also reported that Stroma downloads and saves the data once every 3 months. It was reported that OCWA backs up (saves) the data from the SCADA system on the local hard drive. However, it was reported that the OCWA operators are unsure of how and how often the HMI is backed up; and that the OCWA Cluster Manager is the only operator who knows how to download the data from the HMI to a disk/CD. Our 2010 inspection confirmed that all Operators have now been trained on how to download the data and perform this on a regular basis.

It was advised that the critical alarms are tested monthly, while the auxiliary alarms are tested on a quarterly basis.

Site (Name): PROCESS WASTEWATER

Type: Other **Sub Type:** Other

Comments:

Process wastewater is generated from filter backwashing, filter to waste activities and from the sand residuals and drainage from the Actiflo treatment process (Actiflo waste). It was reported that the filter backwash wastewater and Actiflo wastewater discharge to the wastewater surge tanks and the wastewater lamella tube settlers clarifier; while the Actiflo overflow, clear well overflow and filter to waste discharge directly to the ditch and the river. It was also reported that the hydrocyclone waste discharges to the lamella clarifier.

Certificate of Approval No. 2201-7ARPRY describes the residue management system (wastewater treatment), including two filter backwash wastewater surge tanks; wastewater tube settlers clarifier with dechlorinated supernatant discharge line to the river; and a sludge thickener tank equipped with two sludge pumps that convey the thickened sludge to a dewatering centrifuge with supernatant discharge to the wastewater surge tanks. During this inspection, it was reported that the process wastewater treatment system is operational as the dewatering centrifuge is working, but that the dechlorination system is not operational.

Conditions 5.5 and 5.6 of Certificate of Approval No. 2201-7ARPRY prescribe that a monthly composite sample from the effluent pipe discharging to the Ottawa River, consisting of the mean of three samples taken during the discharge event, with at least one sample taken immediately following

the commencement of the discharge, one sample taken approximately at the mid-point of the discharge event and one sample taken immediately before the discharge ceases, be taken and tested for suspended solids. A review of the records provided by OCWA on behalf of the Town of Deep River for the inspection period found that a composite sampler was installed with a solenoid valve and a timer to take a monthly composite sample for TSSs during the discharge events at the Deep River WTP. This was completed on May 11, 2010. was previously advised that process microsand tends to plug the pumps leading to problems with the treatment process. It was reported that the dewatered sludge is trucked to the local landfill for disposal.

INSPECTION SUMMARY

INTRODUCTION

* **The primary focus of this inspection is to confirm compliance with Ministry of the Environment legislation and authorizing documents such as Orders and Certificates of Approval, as well as evaluating conformance with Ministry drinking water related policies and guidelines during the inspection period.**

  The Ministry is implementing a rigorous and comprehensive approach in the inspection of drinking water systems that keys on the source, treatment and distribution components of the system as well as management practices.

  This report is based on a "focused" inspection of your system. Although the inspection involved fewer activities than those normally undertaken by a detailed inspection, it contained most of the elements required to assess key compliance issues.

  Your system was chosen for a focused inspection during this inspection cycle because inspection findings over the past three years were such that the number of violations were minimal or non existent, there were few or no orders issued to you that were of significance in the maintenance of water potability and there were no deficiencies as defined in O. Reg. 172/03. The undertaking of a focused inspection at your drinking water system during this year's inspection cycle does not ensure that a similar type of inspection will be conducted at any point in the future.

  The drinking-water inspection included a physical inspection of the Deep River Water Treatment Plant, the elevated storage reservoir and associated water distribution facilities. Oral interviews with the plant operators, Stephen Bird OIC, Jason Charette OIT and OCWA Process and Compliance Technician, Brenda Royce, were conducted both on October 19th and the 20th to determine their overall perception of the water plant and distribution system operation. A detailed document review for the inspection period from November, 2009 to October, 2010 was completed of the following -

  - Drinking Water Systems Regulation (O. Reg 170/03)

  - Certification of Drinking Water Systems Operators and Water Quality Analysts Regulation (Ontario Regulation 128/04)

  - Certificate of Approval 2201-7ARPRY, February 4, 2008

  - First Engineering Report (water treatment plant) 2003

  - Water Plant Inspection Report, March, 2010

  - 2008, 9 Annual/Summary Reports

  - By-Law No. 14-2001 respecting Deep River Water Works

  - Engineering report - second version, September, 2008

  - Plant Performance Monitoring, January to October 19 , 2010 (to date)

  - Permit to Take Water # 3664-63ZP3C

  - Annual Record of WaterTaking 2009/10

  - DWS Incidents January to October, 2010,

  - ProposedContol Upgrades Schematic

  - Application for an Amended Certificate of Approval

  - CT Calculation Records

  - Alarm setpoints

  - Deep River Operator's Log 2010 for both the water plant and distribution system

INTRODUCTION

- Deep River Distribution system Bacteriological data sheets
- Operator's Certifications/Licenses/training records - Water Treatment / Distribution
- Deep River Water Plant Operations Manual Table of Contents
- Deep River Contingency Plan
- Standard Operating Procedures - Deep River WTP
- Deep River Water Treatment Turbidity and Chlorine Analyzer logs
- Deep River Plant Certificates of Calibration
- Deep River Annual Reports, 2009, 2010
- Deep River March, 2010 Inspection report response, May 14, 2010
- Deep River Daily Report Sheets
- plus all records, documents, issue notes and other files/correspondence maintained both at the Ministry's Regional Office in Kingston, the Deep River drinking water system files and at the Town of Deep River Public Works Office.

SOURCE

* **Measures were in place to protect the water source in accordance with a Permit, Licence or Approval issued under Part V of the SDWA.**

The Deep River Water Treatment Plant is operated by staff from the Ontario Clean Water Agency (OCWA) who conduct daily rounds and monitor flows into the plant as well as the analysis of raw water temperature, colour, conductivity, pH, alkalinity and turbidity.

Using Exova Laboratories in Ottawa, microbiological and chemical samples are collected by the OCWA Plant staff, shipped and analyzed monthly as required by Schedules 10, 13 & 15.1 of the Ontario Drinking Water System Regulation (Ont. Reg 170/03) and section 5 of their Certiifcate of Approval (Monitoring and Recording).

CAPACITY ASSESSMENT

* **There was sufficient monitoring of flow as required by the Permit, Licence or Approval issued under Part V of the SDWA**

Section 5.1 in the current Certificate of Approval states that a sufficient number of flow-measuring devices must be installed within the drinking-water system to permit the measurement and recording of:

i. the daily flow rate and volume of water conveyed into the treatment system; and

ii. the daily flow rate and volume of water conveyed from the treatment system to the distribution system.

Condition 5.2 speaks to the requirement of record keeping for the conditions outlined in 5.1 above and that maximun flow exceedances shall be recorded with respect to the volume exceeded, time, duration and the date.

This condition is met for the Deep River Water Treatment Plant. Flow is monitored throughout various processes, including:

-raw water

-filter flows

-treated flow

CAPACITY ASSESSMENT

-plant discharge flow

-backwash flow

-supernatant flow

There are two Magmaster flowmeters for the raw and treated water.

* **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit, Licence or Approval issued under Part V of the SDWA.**

Section 4.1 in the Certificate of Approval specifies that the drinking-water system shall not be operated to exceed the rated capacity for the maximum flow rate into the distribution system of 13,682 cubic metres per day.

In 2009, the maximum daily treated water flow was 5,196.50 cubic metres per day which occurred in July and is 38 % of the maximum flow, well below the maximum flow rate noted above.

In 2010, the maximum daily raw water flow reported to October 19th, 2010 was recorded in August, 2010 at 6,332.9 cubic metres which is below the allowable amount at 38 %. This exceeds last year's figure of 5,196.50 cu metres/day by 1.2 % and is likely due to the drier summer in 2010.

TREATMENT PROCESSES

* **The owner had ensured that all equipment was installed in accordance with the Permit, Licence or Approval issued under Part V of the SDWA.**

Sections 6.7, 6.8 and 6.9 of Part 6 - Operations and Maintenance in the existing facility Certificate of Approval address the need for up-to-date drawings for the treatment system and retention of these documents. The plant was newly constructed in 2007/8 and new drawings together with process schematics were completed at that time In conjunction with the new plant construction. A copy of the current process flow schematic is included in this report appendix. The exisiting water distribution plans were also reported to be revised this past year as a result of new water plant infrastructure construction on Ridge Road and Beach Avenue. Looping of the water mains and installation of new hydrants was also completed at that time.

The existing C of A also provides for a dechlorination system (bisulfite) for the dewatering centrifuge and chemical feed line to the wastewater clarifier supernatant discharge pipe. However, it was reported by OCWA that the dechlorination chemical feed system (sodium bisulfite) used to dechlorinate the wastewater clarifier supernatant discharge pipe is not in use; and it was reported that there is no chlorine in the supernatant discharge to the River. Operators routinely check the chlorine residual in the supernatant discharged to the river. A record of these chlorine residual anlyses is maintained in the operator's log and all results were reported below 0.00 mg/L.

* **Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

In order to achieve the design capabilities required under Ontario Regulation 170/03, the "Procedure for Disinfection of Drinking Water in Ontario" states that "All regulated drinking-water systems that obtain water from a raw water supply which is surface water or groundwater under the direct influence of surface water, must provide a minimum level of treatment consisting of chemically-assisted filtration and disinfection or other treatment capable of producing water of equal or better quality.

The Deep River WTP is a surface water treatment plant with chemically-assisted filtration and disinfection and is in the process of installing upgrades to the plant process treatment and control systems. A new Certificate of Approval was issued by the Ministry's Approval Branch, February 8, 2008 to permit these changes.

TREATMENT PROCESSES

In terms of disinfection, the Inspector reviewed trending data amassed since the date of the last MOE inspection in November, 2009. This trend is shown as a percentage of CT achieved and CT required. The design engineers created the CT calculation data for the on-line CT calculator (based on "real time") which is used to generate these numbers. The calculated log removal attributed to disinfection uses a model developed for the State of Montana's Department of Environmental Quality and AWWA's Guidance Manual for "Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using a Surface Water Source". This model is reported to to have the ability to include the two pathogens of Giardia and Viruses and the four disinfectants, Free Chlorine, Chlorine Dioxide, Chloramines and Ozone.

It is assumed the on-line CT calculator's indications of real time CT "required" and CT "achieved" are representative of the process conditrions and are well suited to the batch-process nature of this operation. On a continuous rated capacity operating basis, a free chlorine residual of 1.0 mg/L is required for the Deep River plant's limiting conditions as set out in the above model.

For the inspection period the percentage of CT achieved was always above 100%.

In order to meet or exceed the 2.5 log Giardia cyst removal, the 2.0 log Cyrptosporidium oocyst removal and 2.0 log virus removal credits, the filtration process must meet the following criteria:

-use a chemical coagulant at all times when the treatment plant is in operation;

-monitor and adjust chemical dosages in response to variations in raw water quality;

-maintain effective backwash procedures, including filter-to-waste or an equivalent procedure during filter ripening to ensure that the effluent turbidity requirements are met at all times;

-continuously monitor filtrate turbidity from each filter; and

-meet the performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month.

The Deep River WTP meets all the criteria to be considered direct filtration:

- PAS-8 has been used on a trial basis. Although Alum was in use during the inspection, PAS-8 Iis now iin use full time. A new in-line mixer provides excellent coagulant mixing and the newly installed SCADA provides more accurate dosing and control.

-coagulation is adjusted in accordance with changes in raw water quality as provided for in the Process Control Narrative manual and the coagulant metering section of the Operations Manual. Filter performance, as well as, on turbidity and aluminum carryover seen in the filter effluent stream are also monitored according to these two documents. Jar testing may be performed to determine optimum dosage.

-the plant is equipped with effective backwash procedures that includes filter-to-waste;

-there is a continuous on-line analyzer monitoring turbidity on each filter effluent line;

-The Ontario Clean Water Agency staff does a monthly calculation for each filter to ensure the effluent was less than 0.3 NTU 95% of the time. In all cases it was less than 0.3 NTU 95% of the time.

* **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

There is an on-line chlorine residual analyzer located at the elevated storage tower. The trends for the inspection period were reviewed. In addition, chlorine residuals are collected during weekly microbiological sampling in the treated water and distribution system.

TREATMENT PROCESSES

During the inspection period of November to December, 2009, free chlorine residuals on the distribution system ranged from 0.23 mg/L to </= 1.61 mg/L and for the inspection period in 2010 from January to October the chlorine residuals ranged from 0.07 mg/L to </= 1.02 mg/L.

These values met the recommended Ministry values of a minimum value of 0.05 mg/L and a maximum value of 4.00 mg/L.

* **The primary disinfection equipment was equipped with alarms or shut-off mechanisms that satisfied the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03.**

Our inspection revealed that the chlorination equipment is equipped with the necessary alarms and has automatic switchover to standby equipment. In addition, the SCADA system will automatically shut down the plant operation if any malfunction occurs.

* **The Operator-in-Charge had ensured that all equipment used in the processes was monitored, inspected, and evaluated.**

The SCADA system and intensive maintenance program by OCWA staff ensures that necessary equipment is inspected,monitored monthly and calibrated every three weeks. Daily walks around the plant ensure that operators report and repair any malfunctions.

With the SCADA instrumentation, the OIC receives daily reports on all aspects of the plant process, including alarms, equipment malfunctions, chemical dosage trends and can make immediate decisions to inspect and evaluate/correct plant operation problems. The SCADA system essentially performs daily plant operation by continous monitoring of plant process parameters such as turbidity, chlorine residuals, etc.

DISTRIBUTION SYSTEM

* **Backflow preventers were installed at each service connection to Industrial/Commercial/Institutional and agricultural process that were considered high hazard facilities.**

As there are very few industrial/commercial operations in the community, no backflow preventers have been installed to date. A dairy operation is located in the Town, however, the Public Works Superintendent reports that water is only used for washing operations and not the milk process.

OPERATIONS MANUALS

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

Our review of the current operations manual revealed that the operations manual contains the appropriate drawings, process schematics and equipment specifications required for the plant operations and is kept in the plant office in the bookshelf. An annual review of the manual is done by plant staff and any required changes are made at that time. A copy of the 2010 table of contents is contained on our files.

* **The operations and maintenance manuals did meet the requirements of the Permit, Licence or Approval issued under Part V of the SDWA.**

Our review of the Deep River Operations Manual revealed that the contents exceeded the requirements of the existing C of A Section 6.0 Operations and Maintenance, Sections 6.4 to 6.6 which outlines the minimum requirements of an Operations Manual for the water plant.

LOGBOOKS

LOGBOOKS

* **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

  The Daily Laboratory analysis is signed by the operator performing the tests. The chlorine analyzer, pH analyzer and turbidity verifications are documented and initialed by the operator performing the verifications. The Chain of Custody Record for samples are all signed by the operator collecting and shipping the samples. These items were verifed at the time of inspection and a copy of the microbiological/chemical analytical results (including Lead) and the Lab schedule of test was emailed to the writer. Our review confirmed that these plant records are completed monthly and maintained by certified personnel as required in O. Reg 170/03.

CONTINGENCY/EMERGENCY PLANNING

* **The contingency/emergency plan was available for reference by all staff as required by the Permit, Licence or Approval issued under Part V of the SDWA.**

  The contingency/emergency plans are maintained in the Facility Emergency Plan Binder which is kept at the Information Centre Board for reference.

SECURITY

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

  This was confirmed at the time of our inspection. All chemical storage vessels were contained in a concrete walled area with suitable containment, covered and secure. Similarly, all chemical inlet valves used for off-loading chemicals such as Alum are affixed to the Plant building and inside the locked fenced area. Chlorine gas cylinders are also contained in a secure well-ventilated room and chained together for safety and to prevent falling. The storage tank (dual wall) for the generator diesel fuel is also located under the separate building in which the generator also located inside the Plant's fenced area but outside the main plant building at the North -East corner. An intrusion alarm is installed as a further means of security protection from vandalism.

* **Air vents and overflows associated with reservoirs and elevated storage structures were equipped with screens.**

  Our inspection of the plant, clear well storage and tower overflow confirmed that all items are duly equipped with screens. In addition, the water plant building and tower are enclosed by a 6 foot high security fence which is locked when no one is present at the site as an additional measure of protection.

* **The owner had provided security measures to protect components of the drinking-water system.**

  The plant is fenced, equipped with an intrusion alarm, signed with "no trespassing" and locked when plant personnel are not on site. The elevated tower (standpipe) is fenced, the gate locked and the valve chamber building locked and alarmed.

CERTIFICATION AND TRAINING

* **The overall responsible operator had been designated for each subsystem.**

  The operating authority (OCWA) has prepared an ORO schedule for the plant and a copy is included in the water plant file. Jake DeWal is reported to be the overall responsible operator and is located at the Petawawa plant.

* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

CERTIFICATION AND TRAINING

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

There are only three certified operators dedicated to this plant and all are certified. Our inspection of plant records and log books confirmed this aspect.

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for distribution samples were being met.**

The microbiological water quality monitoring requirements for the Deep River drinking water system distribution system as specified in Regulation 170/03 are as follows:

Distribution System

• 16 to 24 samples per month (at least four per week) for microbiological analyses, including 100% of each batch for a heterotrophic plate count. A total of 210 samples were collected to date since November, 2009.

The operator collects a minimum of 16 samples per month (4 per week) from the distribution system and submits them to Exova Laboratories of Ottawa, Ontario for microbiological analyses. All samples were analyzed for E.Coli, Total Coliforms. All of the distribution samples were also analyzed for a heterotrophic plate count.

A review of the sampling schedule and laboratory analytical reports indicated that the Deep River Drinking Water System operated in compliance with the water quality sampling requirements of O.Reg 170/03. All water samples submitted for analyses during the aforementioned period were analyzed by a laboratory accredited for the specific parameter that was analyzed.

A review of the analytical results indicated that chlorine residual readings are being collected at the same time as microbiological samples. Values ranged from a Low of 0.07 mg/L to a high of 1.02 mg/L.

On October 19, 2010 the Ministry collected distribution system samples from various locations throughout the distribution system. At all of the above locations samples were also collected for the on-site analyses of total and free chlorine residual. A Hach Pocket Colorimeter was used to perform the analyses. Water samples were collected in laboratory prepared sample bottles containing the preservative sodium thiosulphate, and were subsequently submitted to the MOE Laboratory in Toronto for analyses of the following parameters: Total Coliforms, E. Coli, and a heterotrophic plate count.

The results from the on-site analyses of chlorine residual are provided in the following table.

Free Chlorine Results

Deep River Distribution System – October 19, 2010

Sampling Location	Free Chlorine (mg/L)
Deep River Hospital	0.36 mg/L
Town Hall	1.09 mg/L
Deep River Outfitters	0.40 mg/L
Deep River WTP	1.64 mg/L

The results of the on-site analyses of free chlorine residual in the Deep River distribution system indicated that the free chlorine residuals were well above the minimum required concentration of 0.05 mg/L required by O.Reg 170/03 Schedule 1-2.

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for treated samples were being met.**

The microbiological water quality monitoring requirements for the Deep River drinking water system treated water as specified in Regulation 170/03 are as follows:

Treated Water

• one sample per week for microbiological analyses;

Operators routinely collect weekly treated water samples from the sample port located in the laboratory sink.The Treated water samples are submitted to Exova Laboratories, of Ottawa, Ontario for microbiological analyses. All samples are analyzed for E.Coli and Total Coliforms.

The operating authority collects weekly treated water samples at the treatment plant, and submits them to Exova Laboratories of Ottawa, Ontario for microbiological analysis. Samples are analyzed for E.Coli, Total Coliforms and heterotrophic plate count.

A review of the sampling schedule and laboratory analytical reports indicated that the Deep River Drinking Water System operated in compliance with the water quality sampling requirements of O.Reg 170/03. All water samples submitted for analyses during the aforementioned period were analyzed by a laboratory accredited for the specific parameter that was analyzed.

A review of the analytical results indicated that chlorine residual readings are being collected at the same time as microbiological samples. Values in 2010 to the inspection date, ranged from a Low of 0.07 mg/L to a high of 1.02 mg/L and in 2009 from a low of 0.23 mg/L to a high of 1.61 mg/L.

* **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Our review of the Inorganic water quality monitoring requirements for 2009/10 as required by Schedule 13 of Ontario Drinking Water System Regulation, 170/03 reveals that the Deep River plant complies with the respective Schedule, the sampling tests and frequencies for VOCs, THMs, Nitrites, Nitrates, Sodium and Fluoride.

Under O. Reg. 170/03, the Deep River WTP is a large municipal residential system with the following chemical and physical sampling requirements:

• One treated water sample every month for fluoride, including daily in-house grab samples and monitoring of the fluoride residual routinely;

• One treated water sample for organics annually;

• One sample for THMs every 3 months from the distribution system at a location that is likely to have an elevated potential for formation of THMs;

• One treated water sample for inorganics annually;

• Community lead sampling

• One sample of sodium every 60 months;

• One treated water sample for nitrates and nitrites every 3 months;

• Sampling for chlorine residual in the distribution system;

• Continuous turbidity monitoring for each filter effluent line;

• Continuous monitoring for treated water free chlorine residual at the point where the intended contact time has just been completed; and,

WATER QUALITY MONITORING

• Grab sample simultaneously with microbiological sampling in the distribution system and tested for free chlorine residual.

Based on a review of laboratory analytical results all chemical and physical monitoring required by O. Reg. 170/03 was completed for the Deep River WTP.

Sampling for THMs and VOCs is usually conducted at the Deep River Hospital.

* **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Our review of the organic water quality monitoring requirements for 2009 and 2010 to date, as required by Schedule 13-4 of Ontario Drinking Water System Regulation, 170/03 reveals that the Deep River Plant complies with the respective schedule, the sampling tests and frequencies for the Organic samples. All results are provided in the Annual Report.

* **All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

All trihalomethanes water quality monitoring requirements prescribed by Schedule 13-6 of the Ontario Drinking Water System Regulation were being conducted within the required frequency as observed during the inspection and as described in the annual report for 2009.

However, exceedances have been recorded in the last inspection years and a recommendation to determine what is causing the elevated THMs was provided in the 2009-10 inspection report. As a result, the Town had employed the services of a chemical supplier (Kemira) to investigate and conduct jar test on the chemistry of the raw water to determine the cause for the increased THMs. This work is still underway and pilot testing of another process coagulant is underway. Changes have also been instituted in the the injection of the micro sand at different locations and the amount (%) of micro sand being added to the Actiflo treatment units. Also, the water plant staff announced during the preparation of this report that they are now to use the coagulant Phas routinely from now on. These actions coupled with changes to the coagulant and polymer dosages appears to have reduced THM levels.

The calculated annual running average for THMs over the four quarters from November, 2009 to October, 2010 was 111.3 ug/L. Since no adverse sample has been recorded in the July sampling and the last quarter of 2010, it appears that the above noted process changes may prove effective in reducing the elevated THM levels to meet Ministry Standards.

* **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

Again, our review of the Plant's Laboratory Analytical Sheets confirms that this sampling is being performed and all results complied with the Ontario Drinking Water Quality Standards Regulation.

* **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Again, our review of the Plant's Laboratory Analytical Sheets confirms that this sampling is being performed and all results complied with the Ontario Drinking Water Quality Standards Regulation. The sodium results were collected in 2009, are reported in the 2009 Annual Report and were below the Ontario Drinking Water Quality Standard (20 mg/L) at 16.0 mg/L. Sodium is required to be tested every 60 months and the next sampling is to be in 2014.

* **All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

The concentration of fluoride in the treated water is continuously monitored through the use of an on-line analyzer. The analyzer is equipped with a high level alarm reported to be set at 1.0 mg/L. There is no reported low level alarm setting. If the alarm is activated, the fluoride pump is automatically shut down. In 2010, fluoride levels ranged from 0.41 mg/L to 0.69 mg/L and in 2009, the values were 0.10 mg/L and 0.64 mg/L. respectively. The Ontario Drinking Water Quality Standard for fluoride is 1.5 mg/L. The Fluoride analyzer is connected to the plant's SCADA system

WATER QUALITY MONITORING

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 a separate room at the East side of the water plant and consists of a 210 Litre plastic storage tank and two (one duty and one standby) chemical metering pumps with a flow capacity of 4 L/hr each and a chemical feed line to the distribution header. The metering pumps pump the hydrofluorosilic acid from the solution tank and inject the acid into the distribution header. 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 as drums and placed into the solution tank manually. The inspector observed that no signs were posted on the tank advising the product was an acid and corrosive. This should be done.

Our review of the fluoride residual results from November, 2009 to October, 2010 revealed a range of results from 0. 41 mg/L TO 0. 69 mg/L. The average annual residual value was reported ro be 0. 57 mg/L. All results complied with the Ontario Drinking Water Quality Standards for Fluoride.

* **All water quality monitoring requirements imposed by the Permit, Licence or Approval issued under Part V of the SDWA were being met.**

A new C of A # 2201-7ARPRY was issued February 4, 2008 to the Deep River Water Treatment Plant. No Future Alterations (under Part 7) or Studies and Upgrades (under part 8) have been indicated. No changes In the C of A have been made to date nor to water monitoring requirements described under Part 5 - Monitoring and Recording.

* **All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

Our inspection confirmed that lead testing is being done. Copies of the lead testing letters and a summary of the lead testing was provided to the inspector during his visit. Over 40 samples have been collected to date from December 15, 2008 to April 15, 2009 (round 3). No adverses have been recorded.

* **All sampling requirements for alkalinity and pH prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

The collection of montlhy samples for both the water plant and distribution system for both pH and Alkalinity (total of 24) was confirmed during our inspection and the results are contained in an analytical spreadsheet contained on our files and on the Annual Report.

* **All continuous monitoring equipment utilized for sampling and testing required by O.Reg.170/03, or approval or order, were equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.**

All plant control analysers are equipped with analog alarms and if an alarm is enabled, will stay in an alarm state until turned off by an operator or remotely. Depending on the alarm circumstance, such as no chlorine disinifection, this alarm could close down the plant operation by shutting off the raw water pumps.

* **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

All flow meters were calibrated August 26, 2010 and their accuracy was confirmed to be within + or - 1% of their original factory calibration figure. Similarly, the chlorine analyser and all gas meters were calibrated on September 21, 2010 and were recorded to be accurate. These action items were recorded in the plant log book and confirmed by the writer. A summary document of all analyser/flow meter calibration work orders was provided to the writer in a PDF file and a copy is contained in our files.

WATER QUALITY MONITORING

* **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

  It was reported that the operators manually print the reports of the trending on a daily basis (every 24 hours) from the SCADA system, and that operators review the SCADA trending results (SCADA print outs "Deep River's Daily Report") for the past 24 hours on weekdays and 72 hours on Mondays for the weekend, and stamp on the print out "O. Reg. 170/03 Trend Review completed by: operator signature, date, and time."

  It was reported that the SCADA Daily Reports include the minimum, maximum, average and total values (treated water flows) for the raw water and treated water flows, levels, effluent free chlorine residual, clear well free chlorine residual, filter effluent turbidity, chemical dosages, other analyzer readings; if the filter effluent turbidity is greater than 0.3 NTU with the value in seconds; and if the filter effluent turbidity is greater than 1.0 NTU for more than 15 minutes with the value in seconds for each filter. The SCADA Daily Reports also include the effluent turbidity, maximum raw water flow in m3/d, and the wasted running total flow in m3/d. It was reported that operators now have the ability to view the historical trending for a specific date on the SCADA system. Operators will sometimes put a 'check mark' beside the values if they were verified by trending. It was also noted that operators print the trending graphs and attach them to the SCADA Daily Reports. It was reported that OCWA's OutPost5 system has not been installed at the Deep River WTP to act as a backup unit to the SCADA system. It was reported that the SCADA system saves all data to a hard drive, and that operators can access the daily reports by entering the date on this hard drive. It was advised that the hard drive can save data for up to one year or more. It was advised that OCWA was unsure how often the SCADA system is backed up to the hard drive. It was also advised that the HMI (Human Machine Interface) is a mirror of the SCADA system, and that it is a completely separate (independent) system from the SCADA system, so if the SCADA system fails, the data/trends are still available on the HMI. In addition, there is a drive located on the HMI panel that backs up the data. It was reported by the operator that this issue has now been resolved with changes to the current SCADA system and that all the WTP operators are now trained to download the data from the HMI panel to disk/CD. However, with the changes to the SCADA system , the system is not used as frequently.

* **Primary disinfection chlorine monitoring was being conducted at a location approved by Permit, Licence or Approval issued under Part V of the SDWA, or at/near a location where the intended CT had just been achieved.**

  The primary disinfection chlorine monitoring is conducted at a location approved by Certificate of Approval Number 2201-7ARPRY issued February, 4, 2008, at a point on the distribution header after final chlorine injection, outlined in Part 1 of the C of A under chlorine residual analysers.

* **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

  Our review of the Laboratory Analytical results and monthly water sheets for 2010 confirmed this to be true. The maximum value reported was 1.02 mg/L which is well below the 4.0 mg/L value and the minimum value was 0.07 mg/L just above the 0.05 mg/L minimum value limit.

* **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03.**

  With the current SCADA instrumentation, free chlorine residual sampling is conducted approximately every 2.5 minutes.

  Turbidity sampling is conducted continuously. These rates were observed by SCADA recorded results that fluctuated as quickly as those time periods. The frequency of sampling required under

WATER QUALITY MONITORING

O.Reg. 170/03 Schedule 6 is every 5 minutes for free chlorine residual and every 15 minutes for turbidity.

Operation details for the continuous monitoring devices/analyzers are clearly outined in Section 11 of the plant's O & M manual which are based on the manufacturer's operating procedures and complies with the O. Reg. 170/03 minimum frequency requirements specified in the Table in Schedule 6.

* **All continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was recording data with the prescribed format.**

Subsection 6-5 (1) of Schedule 6 to O. Reg. 170/03 stipulates that if a drinking-water system uses continuous monitoring equipment for sampling and testing that is required under this Regulation, or under an approval or order, for a parameter set out in the Table to this section, the owner of the system and the operating authority for the system shall ensure that the following standards are met:

1. The continuous monitoring equipment must, except when no water is being directed to users of water sampled by the equipment,

ii. record the date, time, sampling location and result of every test for the parameter with at least the minimum frequency referred to in subparagraph i.

2. If the continuous monitoring equipment tests for a parameter more often than is required by subparagraph 1 i, the equipment may, instead of complying with subparagraph 1 ii,

i. record the minimum, maximum and mean results of tests for the parameter for every period that is equal to the length of time referred to in subparagraph 1 i, along with the sampling location, the date of the tests conducted during the period and the time at the end of the period, and

ii. record the result of every test that causes an alarm to sound under paragraph 1 of subsection (1.1), along with the sampling location and the date and time of the test.

The free chlorine residuals and turbidity values tested by the HACH SC100 and HACH 1720E continuous analyzers are recorded by the SCADA system and include a record of the date, time, sampling location, and result of every test.

Since the HACH SC100 chlorine residual analyzer and HACH 1720E turbidimeters test for free chlorine residual and turbidity more often than the required minimum of 5 minutes and 15 minutes, respectively; the analyzers may, instead of complying with subparagraph 1 ii, record the minimum, maximum and mean results of tests for free chlorine residual for every 5 minutes and the minimum, maximum and mean results of tests for filter effluent turbidity for every 15 minutes, along with the sampling location, the date of the tests conducted during the period and the time at the end of the period. The SCADA system records the average, minimum and maximum free chlorine residuals and filter effluent turbidities. The operators also record the instantaneous readings for the free chlorine residual in the treated water and the filter effluent turbidity for each filter from the continuous analyzers during their rounds of the WTP.

It was confirmed that the SCADA system records the result of every test that causes an alarm to sound, along with the sampling location and the date and time of the test.

* **Continuous monitoring of each filter effluent line was being performed for turbidity.**

Each of the three sand/anthracite filters in use at the plant is equipped with a continuous recording turbidimeter (HACH Model 1720Cor B). On the day of inspection, the following filter values were recorded for the three filters - Filter # 1 = 0.134 NTU, Filter # 2 = 0.151 NTU and Filter # 3 = 0.096 NTU. The high level alarm setpoint is reported to set at 0.3 NTUs.

Waste water discharge from the turbidimeters is discharged to the backwash water tank.

WATER QUALITY MONITORING

* **Testing for parameters required by legislation, Order, or a Permit, Licence or Approval issued under Part V of the SDWA was conducted by laboratories in Ontario licenced to test for that parameter, or by eligible laboratories outside Ontario.**

  The Owner uses Exova Environmental Laboratories in Ottawa to conduct required tests.

WATER QUALITY ASSESSMENT

* **The inspector collected audit samples during the inspection.**

  The inspector collected bacteriological samples of the water plant effluent and from three locations on the water distribution system. In addition, samples were collected for THM, VOC and metal analyses.

* **Records show that all water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

  With the exception of an elevated Lead analytical result at the Deep River Hospital sample location, all other sample results collected complied with the Ministry's Drinking Water Quality Standards.

REPORTING & CORRECTIVE ACTIONS

* **Corrective actions (as per Schedule 17) were taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

  Our review of all AWQIs from November 2009 to the present indicates that all required corrective actions were taken for each event except for the THM exceedances. In this case, only re-samples could be taken, pilot testing of various chemical dosages and process operations were underway at the plant and until this study was completed, no changes could be implemented. Now that this study is complete, changes in Actiflo operation and coagulant/polymer dosages can be done. A review of THM values over the last quarter indicated that there are no THM exceedances, it appears that these process changes may have resolved the problem providing the corrective action for the past THM exceedances. These changes are to be implemented shortly once the appropriate approval is secured.

* **Corrective actions as directed by the Medical Officer of Health had been taken by the owner and operating authority to address exceedances of the lead standard.**

  Our inspection of all adverse incidents recorded by the water plant authority/operator for the Deep River Water Supply system and our review of the DWIS data base for adverse incidents confirmed that all corrective actions were taken to address Lead exceedances in 2009/10. No exceedances were reported in 2010 except for a sample collected by the writer during his inspection and the appropriate corrective actions/notifications /re-sampling was completed.

* **All required notifications of adverse water quality incidents were immediately provided as per O.Reg. 170/03 16-6.**

  Our review of the past AWQIs from November to October 31, 2010 reveals that this has been done.

* **All reporting requirements for lead sampling were complied with as per schedule 15.1-9 of O.Reg. 170/03.**

  In accordance with subsection 15.1-9 of Schedule 15.1 to Ontario Regulation 170/03, if the operating authority for a drinking-water system or the owner of a drinking-water system receives a report of a test result for a test conducted on a sample taken from plumbing under section 15.1-4 or 15.1-5, the operating authority or owner shall, within seven days after receiving the report, give the following to the occupant of the premises served by the tap from which the sample was taken:

  1. A copy of the report.

  2. A statement of whether the report indicates a result that exceeds any Schedule 2 standard.

REPORTING & CORRECTIVE ACTIONS

3. If the report indicates a result described in paragraph 2, any advice given by the medical officer of health to the operating authority or owner with respect to any steps that the occupant should take.

4. The telephone number of a person who is available to answer questions about the report.

If a laboratory reports a test result to the operating authority for a drinking-water system under subsection (2), the operating authority shall, within 24 hours after receiving the report, give a copy of the report to the owner of the system.

If a laboratory reports a test result to the operating authority for a drinking-water system or the owner of a drinking-water system under subsection (2), the operating authority or owner shall, within 24 hours after receiving the report, give a copy of the report to the medical officer of health.

A written document that is given under subsection (2), (4), (5) or (6) may be delivered personally or sent by fax or by electronic mail.

Section 18 of the Act and Schedule 16 to this Regulation do not apply to a test of a sample taken from plumbing under section 15.1-4 or 15.1-5.

It was reported that letters to the occupant were delivered by hand within 7 days after receiving the lab report, and it was observed that the letters include a copy of the report; a statement of whether the report indicates a result that exceeds the lead standard; and the telephone number for the local health unit and for OCWA so as to answer questions about the report. It was noted that the letter to the occupant has been corrected to state that the standard for lead is 0.010 mg/L.

Our review of the 2009 Annual Report provided a summary of the Lead sampling in 2009 for Round # 3 (December 15/08 to April 15/09) and Round # 4 June 15/09 to October 15/09). Round # 4 was deemed unnecessary, as a reduced sampling will take place during the next sampling period from December 15, 2011 to 2012.

The routine in-house lead sampling on the distribution system was completed from July, 2010 to October, 2010. No exceedances were reported. The only lead exceedance reported in 2010 was from a sample collected by the writer at the Deep River Hospital and a re-sample was performed.

* **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

The requirements for response to alarms generated by continuous water quality analyzers are prescribed in subsection 6-5 (1) (paragraph 5) and subsection 6-5 (1.1) of Schedule 6 to O. Reg. 170/03. Subsection 6-5 (1.1) stipulates that the standards referred to in paragraph 5 of subsection 6-5 (1) are the following:

1. The continuous monitoring equipment must cause an alarm to sound immediately at the following locations if the equipment malfunctions or loses power or a test result for a parameter is above the maximum alarm standard or below the minimum alarm standard specified in the Table to this section for the parameter:

i. The location where the equipment conducts tests.

ii. A location where a person is present, if a person is not always present at the location where the equipment conducts tests.

3. An operator must promptly be dispatched to the location where tests are conducted to take appropriate action if no operator is at that location and, i. an alarm sounds under paragraph 1, unless an operator determines that, (A) the alarm sounded because a test result for a parameter was above the maximum alarm standard or below the minimum alarm standard specified in the Table to this section for the parameter, and (B) within 2 minutes, a further test result indicated that the parameter was no longer above the maximum alarm standard or below the minimum alarm standard, as the case may be. Therefore, if an operator is required to attend to the sound of an alarm immediately and dispatch an operator promptly, then subsection 6-5 (1.1) applies. Please note that if the system cannot meet the requirements of subsection 6-5 (1.1), then the system must

REPORTING & CORRECTIVE ACTIONS

have a shut-off feature as per subsection 6-5 (1). The system must comply with either subsection 6-5 (1.1) or subsection 6-5 (1). The word used for alarms in the regulation is “immediately”; there is no provision for a delay in the regulation. The alarm should sound immediately, and so the alarm should not be delayed 5 minutes or 15 minutes before it is heard by a live person, as this is not in accordance with the regulatory requirements.

Our review of the water plant records and log books indicate that OCWA operators have responded to alarms in relation to a continuous water quality analyzer in a timely manner and have taken the appropriate corrective actions as required. Alarm responses have been documented in the log book for the Deep River WTP and they are also recorded on the "Call-In/Overtime Report". Log book entries concerning alarms include the nature/details of the alarm, alarm origin, corrective action taken to address the alarm and the name / initials of the operator-in-charge or the on-call operator who responded to the alarm. OCWA's SOP for Alarm Response meets the requirements of Schedule 6 to O. Reg. 170/03. OCWA's Alarm Response Procedure states that alarms from the WTP's SCADA system are sent to the on-call pager; the on-call operator then has 10 minutes to acknowledge the alarm page; if the alarm page is not acknowledged within 10 minutes, then the system will move down the call list (phone list) to the next pager on the list and page it; and if that alarm page is not acknowledged then a call will be placed to Brad Sweet, Cluster Manager.

OTHER INSPECTION FINDINGS

* **The following issues were also noted during the inspection:**

The inspector observed that no signs were posted on the fluoride tank advising the product was an acid and corrosive. This should be done.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

SUMMARY OF BEST PRACTICE ISSUES AND RECOMMENDATIONS

This section provides a summary of all best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. Best Management Practices are recommendations and not mandatory requirements, but may lead to safe drinking water for the consumer.

In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following practices and consider measures to implement them so that all drinking water systems continuously improve their processes.

1. **The following issues were also noted during the inspection:**

   The inspector observed that no signs were posted on the fluoride tank advising the product was an acid and corrosive. This should be done.

   Recommendation:
   No signs were posted on the fluoride tank advising the product was an acid and corrosive. This should be done.

SIGNATURES

Inspected By:	Signature: (Provincial Officer):
Don Munro	Digitally signed by Don Munro DN: cn=Don Munro, o=Environment, ou=SDWB, email=don.munro@ontario.ca, c=CA Date: 2010.12.17 10:28:36 -05'00'

Reviewed & Approved By:	Signature: (Supervisor):
James Mahoney	
Review & Approval Date:	

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.

APPENDIX A

DRINKING WATER SYSTEM COMPONENTS DESCRIPTION

DRINKING WATER SYSTEM COMPONENTS DESCRIPTION

Name: SOURCE WATER
Station Id #: 2200009237008
Type: Source
Sub Type: Surface Water

Street Number: 176 **Street Name:** River Road

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum: NAD 83
Geo-Referencing Method: GPS
Accuracy Estimate: 1-10 Meters (Good Quality GPS)
Location Reference: Near Object **UTM Zone:**
UTM Northing: 5109395 **UTM Easting:** 307563
Latitude: **Longitude:**

Name: LOW LIFT PUMPING STATION
Station Id #: 2200009237008
Type: Source
Sub Type: Pumphouse

Street Number: 176 **Street Name:** River Road

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum: NAD 83
Geo-Referencing Method: GPS
Accuracy Estimate: 1-10 Meters (Good Quality GPS)
Location Reference: Near Object **UTM Zone:**
UTM Northing: 5109325 **UTM Easting:** 307445
Latitude: **Longitude:**

Name: WATER TREATMENT PROCESS
Station Id #: 2200009237406
Type: Treated Water POE
Sub Type: Treatment Facility

Street Number: 177 **Street Name:** River Road

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum:	NAD 83		
Geo-Referencing Method:	GPS		
Accuracy Estimate:	1-10 Meters (Good Quality GPS)		
Location Reference:	Near Object	**UTM Zone:**	18
UTM Northing:	5109325	**UTM Easting:**	307445
Latitude:		**Longitude:**	

Name: WATER TREATMENT SYSTEM
Station Id #: 2200009237406
Type: Treated Water POE
Sub Type: Treatment Facility

Street Number:	177	**Street Name:**	River Road
Lot:		**Concession:**	
Part:		**Reference Plan:**	

Map Datum:	NAD 83		
Geo-Referencing Method:	GPS		
Accuracy Estimate:	1-10 Meters (Good Quality GPS)		
Location Reference:	Near Object	**UTM Zone:**	
UTM Northing:		**UTM Easting:**	
Latitude:		**Longitude:**	

Name: ELEVATED STORAGE TANK
Station Id #: 2200009238008
Type: Other
Sub Type: Reservoir

Street Number:		**Street Name:**	Highway 17
Lot:		**Concession:**	
Part:		**Reference Plan:**	

Map Datum:	NAD 83		
Geo-Referencing Method:	GPS		
Accuracy Estimate:	1-10 Meters (Good Quality GPS)		
Location Reference:	Near Object	**UTM Zone:**	18
UTM Northing:	5107982	**UTM Easting:**	307185
Latitude:		**Longitude:**	

Name: DISTRIBUTION SYSTEM
Station Id #: 2200009238008
Type: Other
Sub Type: Other

Street Number: **Street Name:** Not Applicable

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum: NAD 83
Geo-Referencing Method: GPS
Accuracy Estimate: 1-10 Meters (Good Quality GPS)
Location Reference: Near Object **UTM Zone:** 18
UTM Northing: **UTM Easting:**
Latitude: **Longitude:**

Name: DEEP RIVER & DISTRICT HOSPITAL
Station Id #: 2200009238008
Type: Other
Sub Type: Other

Street Number: 107 **Street Name:** McElligot Road

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum: NAD 83
Geo-Referencing Method: GPS
Accuracy Estimate: 1-10 Meters (Good Quality GPS)
Location Reference: Near Object **UTM Zone:**
UTM Northing: **UTM Easting:**
Latitude: **Longitude:**

Name: SCADA SYSTEM
Station Id #:
Type: Other
Sub Type: Other

Street Number: **Street Name:**

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum: NAD 83
Geo-Referencing Method: GPS
Accuracy Estimate: 1-10 Meters (Good Quality GPS)
Location Reference: Near Object **UTM Zone:**
UTM Northing: **UTM Easting:**
Latitude: **Longitude:**

Name: PROCESS WASTEWATER
Station Id #:
Type: Other
Sub Type: Other

Street Number: **Street Name:**

Lot: **Concession:**
Part: **Reference Plan:**

Map Datum: NAD 83
Geo-Referencing Method: GPS
Accuracy Estimate: 1-10 Meters (Good Quality GPS)
Location Reference: Near Object **UTM Zone:**
UTM Northing: **UTM Easting:**
Latitude: **Longitude:**

APPENDIX B

AUDIT SAMPLE RESULTS

Ontario Ministry of Environment
Central Laboratory - Resources Road
FINAL REPORT (manager)
Print date: Nov. 05, 2010 08:06 AM By REPORTADMIN

Login: **C180980**

**** REPRINTED ****

Program Code 130072402

Program: MOE OPERATIONS DIVISION
Study: WATER, COMMUNAL
Project: EASTERN REGION - OTTAWA DIST.
Activity: WTP NON-MUNIC INSP./ADVERSE
Organization: District Manager Cornwall

Org. Id: 4615

Mail this copy to :

MUNRO, DON
MOE - OTTAWA DISTRICT OFFICE
2430 DON REID DRIVE
OTTAWA,ONT
K1H 1E1

Final reports to : MAHONEY, JIM
DEBARROS, CAROL
MUNRO, DON

Approved for release by : RUSTY MOODY Manager, Spectroscopy Section
Approved date : Nov. 05, 2010

Inquires to : RUSTY MOODY
Telephone : 416-235-5863

PETER DROUIN
Telephone : 416-235-5850

LOGIN DESCRIPTION: 220000923 DEEP RIVER WTP DON MUNRO 613-521-3450

The results relate only to the items tested.
To provide customer service feedback on this report and/or other services provided by LaSB, please contact the LaSB HelpDesk at 416-235-6030 or the Customer Service Manager at 416-235-5831

Login: **C180980**

**** REPRINTED ****

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DM100	2200009237406	PLANT EFFLUENT TAP TREATED CHLORINATION	20 OCT 2010	10:00	5	

Sample ID: C180980-0001

MOE*LIMS Products Requested:

WD	E3226A	PA3226

Sample Comment Description

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DM103	2200009238008	DEEP RIVER HOSPITAL TREATED CHLORINATION	20 OCT 2010	09:00	5	

Sample ID: C180980-0004

MOE*LIMS Products Requested:

WD	E3144B	VOL3144	WD	E3226A	PA3226	WD	E3473	PB3473

Sample Comment Description

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DM102	2200009238008	DEEP RIVER OUTFITTERS TREATED CHLORINATION	20 OCT 2010	09:15	5	

Sample ID: C180980-0003

MOE*LIMS Products Requested:

WD	E3226A	PA3226

Sample Comment Description

Field Id	Station ID	Sample Location Description	Sampling Date	Time	Zone	Sampler Information
DM101	2200009238008	TOWN HALL TREATED CHLORINATION	20 OCT 2010	09:30	5	

Sample ID: C180980-0002

MOE*LIMS Products Requested:

WD	E3226A	PA3226

Sample Comment Description

Login: **C180980**

**** REPRINTED ****

Login: **C180980**

**** REPRINTED ****

Field ID:		DM100				DM101				DM102			
Sample ID:		C180980-0001				C180980-0002				C180980-0003			
MOE*LIMS ID:		2010WD42-00201				2010WD42-00202				2010WD42-00203			
Station ID:		2200009237406				2200009238008				2200009238008			
Collect Date:		20 OCT 2010				20 OCT 2010				20 OCT 2010			
Sample Location Description:		PLANT EFFLUENT TAP TREATED CHLORINATION				TOWN HALL TREATED CHLORINATION				DEEP RIVER OUTFITTERS TREATED CHLORINATION			
Sample Comments Description:													
Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1

Login: **C180980**

**** REPRINTED ****

Field ID:	DM103
Sample ID:	C180980-0004
MOE*LIMS ID:	2010WD42-00204
Station ID:	2200009238008
Collect Date:	20 OCT 2010
Sample Location Description:	DEEP RIVER HOSPITAL TREATED CHLORINATION
Sample Comments Description:	

Listid	Parmname	Value	Units	Qual	Rmk1
3144L1	Chloroethene				
	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	
	Diisopropylether	.05	ug/L	<=W	
	1,1-dichloroethane	.05	ug/L	<=W	
	cis-1,2-dichloroethene	.05	ug/L	<=W	
	Chloroform	68.5	ug/L		
	1,1,1-trichloroethane	.05	ug/L	<=W	
	Carbon tetrachloride	.2	ug/L	<=W	
	1,2-dichloroethane	.05	ug/L	<=W	
	Benzene	.05	ug/L	<=W	
	Trichloroethene	.05	ug/L	<=W	
	1,2-dichloropropane	.05	ug/L	<=W	
	Bromodichloromethane	10.2	ug/L		
	Dichloroacetonitrile	3.5	ug/L	<T	
	Toluene	.05	ug/L	<=W	
	1,1,2-trichloroethane	.1	ug/L	<=W	
	Tetrachloroethene	.05	ug/L	<=W	
	Dibromochloromethane	1.0	ug/L	<T	
	1,2-dibromoethane	.1	ug/L	<=W	
	Chlorobenzene	.05	ug/L	<=W	
	Ethylbenzene	.05	ug/L	<=W	
	m- and p-xylene	.05	ug/L	<=W	
	o-xylene	.05	ug/L	<=W	
	Styrene	.05	ug/L	<=W	
	Bromoform	.5	ug/L	<=W	
	1,1,2,2-tetrachloroethane	.2	ug/L	<=W	
	1,3-dichlorobenzene	.05	ug/L	<=W	
	1,4-dichlorobenzene	.05	ug/L	<=W	
	1,2-dichlorobenzene	.05	ug/L	<=W	
	Trihalomethanes; total	79.5	ug/L		
3473L3	Lead	13.5	ug/L	+/-1.10	ODW

CODE	DESCRIPTION
NDAT	NO DATA: ABSENT NT: TOTAL COLIFORMS
NDDN	NO DATA: NOT DETECTED NT: DETERIORATION INDICATORS
<T	A MEASURABLE TRACE AMOUNT:INTERPRET WITH CAUTION
<=W	NO MEASURABLE RESPONSE (ZERO): <REPORTED VALUE
ODW	ABOVE DRINKING WATER QUALITY STANDARD
NDAE	NO DATA: ABSENT NT: ESCHERICHIA COLI

NON-TARGET TEXTUAL RESULT

Sample ID	Listid	Parmname	Value:	Qual:	Remark:
C180980-0001	3226L1	NT: Total Coliforms		NDAT	
Absent					
C180980-0001	3226L1	NT: Escherichia coli		NDAE	
Absent					
C180980-0001	3226L1	NT: Deterioration Indicators		NDDN	
Not Detected					
C180980-0002	3226L1	NT: Total Coliforms		NDAT	
Absent					
C180980-0002	3226L1	NT: Escherichia coli		NDAE	
Absent					
C180980-0002	3226L1	NT: Deterioration Indicators		NDDN	
Not Detected					
C180980-0003	3226L1	NT: Total Coliforms		NDAT	
Absent					
C180980-0003	3226L1	NT: Escherichia coli		NDAE	
Absent					
C180980-0003	3226L1	NT: Deterioration Indicators		NDDN	
Not Detected					

Login: **C180980**

**** REPRINTED ****

Sample ID	C180980-0004	Listid : 3226L1	Parmname	NT: Total Coliforms	Value:	Qual:	NDAT	Remark:

Absent

Sample ID	C180980-0004	Listid : 3226L1	Parmname	NT: Escherichia coli	Value:	Qual:	NDAE	Remark:

Absent

Sample ID	C180980-0004	Listid : 3226L1	Parmname	NT: Deterioration Indicators	Value:	Qual:	NDDN	Remark:

Not Detected

TEXT COMMENTS

Product Completion

Sample ID	Matrix	Method	Product	Analytical Department	Completion Date
C180980-0001	WD	E3226A	PA3226	6510	25-OCT-10
C180980-0002	WD	E3226A	PA3226	6510	25-OCT-10
C180980-0003	WD	E3226A	PA3226	6510	25-OCT-10
C180980-0004	WD	E3144B	VOL3144	4410	04-NOV-10
C180980-0004	WD	E3226A	PA3226	6510	25-OCT-10
C180980-0004	WD	E3473	PB3473	6410	03-NOV-10

** End of Report **

APPENDIX C

CERTIFICATE(S) OF APPROVAL

Ontario

The Corporation of the Town of Deep River
PO Box 400, 100 Deep River Road
Deep River, Ontario
K0J 1P0

Site Location: Deep River Water Treatment Plant
177 River Road
Deep River Town, County of Renfrew

Pursuant to the Safe Drinking Water Act, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this approval is issued under Part V of the Safe Drinking Water Act, 2002, S.O. 2002, c. 32 to:

The Corporation of the Town of Deep River
PO Box 400, 100 Deep River Road
Deep River, Ontario
K0J 1P0

PART 1 - DRINKING-WATER SYSTEM DESCRIPTION

1.1 for a drinking-water system serving the Town of Deep River, located on River Road (NAD 83: UTM Zone 18: 307335.00 m E., 5109295.00 m N.), rated as set out in Part 4, consisting of the following:

Proposed Water Works
(as per Application for Approval dated December 14, 2004)

Low Lift Pumping Station

- a low-lift pumping station consisting of a 9.14 m by 1.52 m by 5.64 m deep low lift pump well and above ground building (NAD 83: UTM Zone 18: 307445.00m E, 5109325.00m N), equipped with three (3) submersible centrifugal pumps, each rated at 48.6 L/s at 23.1m TDH;
- a 300/350 mm diameter raw water main from the low lift pumping station to the water treatment plant;

Water Treatment Plant

Mixing
- an in-line static mixer, 300 mm diameter;

Flocculation and Clarification
- two (2) package flocculation and clarification (Actiflo) units, each rated at 4,000 m^3/day, consisting of:
- a rapid mixing basin, an injection chamber, a maturation chamber and a high rate ballasted settling basin, scraper and inclined tube settlers;
- three (3) sand recirculation pumps and two (2) hydrocyclones;
- electrical and mechanical equipment and control;

Rapid Sand Filtration
- two (2) dual media sand anthracite filters each with a surface area of 18.9 m^2;
- two (2) air scour blowers equipped with 18.6 kW motor (one duty, one standby),
- two (2) backwash variable speed vertical turbine pumps, (one duty, one standby) each rated at 236 L/s at a TDH of 22 m;
- piping and control to facilitate filter to waste;
- electrical and mechanical equipment and control;

Treated Water Storage
- one (1) clearwell with a capacity of 1,364 m^3 (existing);
- one (1) clearwell with a capacity of 1,507 m^3;
- one (1) pump well with a capacity of 90 m^3;
- one (1) pump well with a capacity of 110 m^3;

High Lift Pumping
- four (4) vertical turbine high lift pumps, (three duty, one standby) each rated at 87 L/s at a TDH of 82 m;

Disinfection System
- gaseous chlorine disinfection system consisting of 68.2 kg gas cylinders and two (2) weigh scales, three (3) V– notch chlorinators;
- chlorine solution lines, one leading to an injection point at the filter outlet header prior to the clearwell, and the other leading to an injection point in the pump well upstream the high lift header.
- Chlorine gas scrubber system;

Chemical Storage and Feed Systems
- Primary Coagulant feed system consisting of one (1) 6,600 L and one (1) 21,200 L capacity liquid coagulant, one (1) 3100 L day tank and two (2) (one duty, one standby) chemical feed metering pumps with a flow capacity of 40 L/hr;

- pH/Alkalinity Adjustment consisting of two (2) 51,200 L per tank capacity liquid caustic soda, two (2) 3100 L per tank day tanks and four (4) (two duty, two

standby) chemical feed metering pumps with a flow capacity of 60 L/hr each and chemical feed lines to raw water pipe (pre-alkalinity) just upstream of the static mixer, and to the distribution header;

- Coagulant aid for the water treatment clarifiers consisting of two (2) dry polymer preparation systems, each consisting of 3100 L dissolving tank with mixer, three (3) (two duty, one standby) chemical feed metering pumps with a flow capacity of 90 L/hr each and chemical feed lines to the two package treatment units injection chambers;

- Coagulant aid for the wastewater clarifier consisting of two (2) dry polymer preparation systems each consisting of 3100 L dissolving tank with mixer; three (3) (two duty, one standby) chemical feed metering pumps with a flow capacity of 45 L/hr each and chemical feed lines to the hydrocyclones reject pipe, and to surge tank pumps discharge pipe;

- Coagulant aid for the dewatering centrifuge consisting of two (2) dry polymer preparation systems each consisting of 800 L dissolving tank with mixer; two (2) (one duty, one standby) chemical feed metering pumps with a flow capacity of 90 L/hr each and chemical feed line to the sludge dewatering centrifuge inlet;

- Sodium bisulfite feed system consisting of one (1) 210 L storage tank and two (2) (one duty, one standby) chemical feed metering pumps with a flow capacity of 2 L/hr each and chemical feed line to the wastewater clarifier supernatant discharge pipe;

- Hydrofluosilicic acid feed system consisting of one (1) 210 L storage tank and two (2) (one duty, one standby) chemical feed metering pumps with a flow capacity of 4 L/hr each and chemical feed line to the distribution header;

<u>Process Instrumentation</u>

- turbidimeters - one (1) continuous turbidity monitor located on the inlet header to the water treatment plant; two (2) continuous turbidity monitors located on the clarifier discharge; two (2) continuous turbidity monitors located on the filter discharge; one (1) continuous turbidity monitor located on the wastewater clarifier supernatant discharge pipe and one (1) continuous turbidity monitor located on the distribution header;

- pH meters - two (2) continuous pH monitors located in the clarifiers; one (1) continuous pH monitor located on the distribution header prior to final pH adjustment and one (1) continuous pH monitor located on the distribution header after final pH adjustment;

- chlorine residual analysers - one (1) continuous chlorine analyser located on the distribution header prior to final chlorine injection; one (1) continuous chlorine analyser located on the distribution header after final chlorine injection;

- sulfite ion monitor - one (1) continuous sulfite ion analyser located on the wastewater clarifier supernatant discharge pipe;

- fluoride ion monitor - one (1) continuous fluoride ion analyser located on the distribution header;

Residue Management Facility (Wastewater Treatment)

- two (2) filter backwash wastewater surge tanks, each approximately 113 m^3, equipped with two transfer pumps;
- wastewater tube settlers clarifier having a surface area of 21,8 m^2 with dechlorinated supernatant discharge line to the river;
- a sludge thickener tank of 179 m^3 equipped with two (2) sludge pumps that convey the thickened sludge to a dewatering centrifuge with supernatant discharge to wastewater surge tanks;

Stand-By Power Facility

One (1) standby 600 kW diesel generator complete with fuel storage tank to run the generator for 24 hours under full load;

Miscellaneous

all associated piping, electrical and mechanical equipment, ventilation, monitoring, control, metering, alarm systems, and instrumentation and SCADA system connected to all project PLCs located in the control room of the water treatment plant building.

Decommissioning

Upon completion of the new works the following works are to be decommissioned:

- Existing package water treatment plant units and chemical systems
- Disinfection system including chlorine dioxide system
- Existing wastewater tank and sludge lagoons

Existing Water Works

(as per the Engineer's Report entitled Deep River Water Treatment Plant, dated January 26, 2001, prepared by Axurix North America Engineering Corp.)

Intake Works

- a 750 mm diameter intake extending approximately 91 meters into the Ottawa River terminating at a depth of approximately 9 meters below the surface;

Low Lift Pumping Station

- a low-lift pumping station consisting of a 9.14 m by 1.52 m by 5.64 m deep low lift pump well and above ground building (NAD 83: UTM Zone 18: 307445.00 m E., 5109325.00 m N.), equipped with one (1) “summer” vertical turbine pump rated at 204 L/s at a TDH of 90 m equipped with a 150 kW motor, and one (1)

"winter" vertical turbine pump rated at 81 L/s at a TDH of 90 m equipped with a 75 kW motor;

- a 350 mm diameter watermain from the low lift pumping station to the water treatment plant;

Treatment Works consisting of the following:

Rapid Mix

- one (1) 2.25 kW in-line mechanical mixer located upstream of packaged treatment plants to provide rapid mixing of coagulant;

Flocculation, Clarification, Filtration

- three (3) prefabricated package treatment plants each rated at 4,546 m^3/d and each incorporating:
  - a 50.3 m^3 flocculation basin equipped with a 0.37 kW motorized mechanical flocculator;
  - a settling basin with 35.6 m^2 settling area, complete with inclined tubes to assist settling;
  - a rapid sand filter bed of filter area 15.4 m^2, having a rated filtration capacity of 4,546m^3/d;
  - a treated water discharge pump with butterfly control valve rated at 52.3 L/s at TDH of 12.2m;

Treated Water Storage

- one (1) 19.5 m by 22.6 m by 3.1 m SWD unbaffled clearwell, with total volume of 1,364 m^3

Disinfection System

- a chlorine gas feed system consisting of two (2) yoke mounted 113 kg/d chlorinators mounted on 68.2 kg cylinders, a dual-cylinder weight scales, rotometer and injector; with two chlorine solution lines, one leading to a pre-chlorination injection point located ahead of the rapid mix unit, and the other leading to the chlorine dioxide generation system described below;

  - a chlorine dioxide generation system employing chlorine gas and a sodium chlorite solution**;** consisting of one (1) chlorinator (same as above), one (1) 250 L sodium chlorite solution tank, one (1) sodium chlorite metering pump, a reaction chamber with random packed media, and a generated solution line leading to an injection point at the filter outlet header prior to the clearwell;

High Lift Pumping

- high lift pumping consisting of two (2) centrifugal pumps, one "summer" pump rated at 208 L/s at a TDH of 82 m equipped with a 187 kW motor, and one "winter" pump rated at 79.6 L/s at a TDH of 82 m equipped with a 93 kW motor; and

Backwash Pump

- one (1) backwash pump serving all three package treatment units rated at 219.7 L/s at a TDH of 10.7m

Wastewater Treatment

- a wastewater treatment system consisting of one (1) 113 m^3 backwash/process waste holding tank, equipped with one (1) submersible pump rated at 50 L/s, and two (2) 3.6 m deep concrete backwash/process waste settling ponds of 13.7 m^2 settling area, discharging into the Ottawa River;

Chemical Feed Systems

- a soda ash chemical feed system consisting of a dry chemical auger rated at 205 kg/d, a mixing solution tank, and an eductor to add the prepared solution into the process;
- a lime chemical feed system consisting of a dry chemical auger rated at 205 kg/d, a mixing solution tank, and an eductor to add the prepared solution into the process;
- an alum feed system consisting of a 22.7 m^3 storage tank and a chemical metering pump having a rated capacity of 78.8 L/h;
- a hydrofluorosilicic acid feed system consisting of two (2) 208 L drums, a chemical drum weigh scale and a chemical metering pump having a rated capacity of 5.72 L/h; and a spill containment area provided for the chemical drum in-use;

Process Instrumentation

- a free chlorine residual analyzer (measurement range 0 - 5 mg/L) installed on the treated water discharge line;
- three (3) on-line turbidity analyzers (measurement range 0 - 100 NTU), one located on the outlet of each filter;
- one (1) raw water flowmeter (measurement range 0 - 810 m^3/hr) located on the low lift discharge header;
- one (1) treated water flowmeter (measurement range 0 - 840 m^3/hr) located on the high lift discharge header;

Water Storage

a 1,513 m^3 elevated water tower located near the water treatment plant, on the corner of Deep River Road and Highway 17, south of the plant;

1.2 all in accordance with the applications and plans and other supporting documents listed in Schedule "A", and all other Schedules, which are attached to, and form part of this approval, except as specified in the conditions contained herein.

PART 2 - DEFINITIONS AND INFORMATION

2.1 Words and phrases not defined in this approval shall be given the same meaning as those set out in the *Safe Drinking Water Act, 2002,* S.O. 2002, c. 32 and any regulations made in accordance with that act, unless the context requires otherwise.

2.2 In this approval

"adverse effect", "contaminant", "impairment" and "natural environment" shall have the same meanings as in the *Environmental Protection Act*, R.S.O.1990, c. E.19 and the *Ontario Water Resources Act,* R.S.O.1990, c. O.40;

"approval" means this entire approval document, issued in accordance with section 36 of the *SDWA,* and includes any schedules to it;

"Director" means a Director appointed pursuant to s. 6 of the *SDWA* for the purposes of Part V of the *SDWA*;

"drinking-water system" includes the works set out in Part 1;

"provincial officer" means a provincial officer appointed pursuant to s. 8 of the *SDWA*;

"rated capacity" means the maximum flow rate of water which can be treated when operating the drinking-water system under design conditions;

"*SDWA"* means the *Safe Drinking Water Act, 2002, S.O. 2002, c. 32,* as amended.

2.3 The following information is applicable to this approval

"owner" is The Corporation of the Town of Deep River, its successors and assignees;

"operating authority" is Ontario Clean Water Agency (OCWA), its successors and assignees.

PART 3 - GENERAL

Compliance

3.1 The owner and operating authority shall operate the drinking-water system in accordance with the *SDWA*, any applicable regulations made thereunder, and this approval.

3.2 Despite any condition of this approval to the contrary, the owner and operating authority set out in Part 2 are jointly and severally liable to comply with all conditions of this approval.

3.3 The owner and operating authority shall ensure that any person authorized to carry out work on or operate any aspect of the drinking-water system has been informed of the *SDWA*, all applicable regulations made in accordance with that act, and this approval and shall take all reasonable measures to ensure any such person complies with the same.

3.4 A copy of this approval shall be kept in a conspicuous place so that it is available for reference by all persons responsible for all or part of the operation of the drinking-water system.

Build, etc. in Accordance

3.5 Except as otherwise provided by this approval, the drinking-water system shall be designed, developed, built, operated and maintained in accordance with Part 1 above and the documentation listed in Schedule “A".

Interpretation

3.6 Where there is a conflict between the provisions of this approval and any other document, the following hierarchy shall be used to determine the provision that takes precedence:

i. The *SDWA*;

ii. a condition imposed in this approval in accordance with s. 38 of the *SDWA*;

iii. any regulation made under the *SDWA*;

iv. this approval;

v. any application documents listed in Schedule "A" from most recent to earliest; and

vi. all other documents listed in Schedule "A" from most recent to earliest.

3.7 The requirements of this approval are severable. If any requirement of this approval, or the application of any requirement of this approval to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this approval shall not be affected thereby.

3.8 Nothing in this approval shall be read to provide relief from the need for strict compliance with the *Environmental Assessment Act,* R.S.O. 1990, c E.18.

Other Legal Obligations

3.9 The issuance of, and compliance with the conditions of, this approval does not:

i. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

ii. limit in any way the authority of the Ministry to require certain steps be taken or to require the owner to furnish any further information related to compliance with this approval.

3.10 For greater clarity, nothing in this approval shall be read to provide relief from regulatory requirements in accordance with section 38 of the *SDWA*, except as provided in Part 9.

Adverse Effects

3.11 Nothing in this approval shall be read as to permit: i) the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or ii) the discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters.

3.12 All reasonable steps shall be taken to minimize and ameliorate any adverse effect on the natural environment or impairment of the quality of water of any waters resulting from the operation of the drinking-water system including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

3.13 Fulfillment of one or more conditions imposed by this approval does not eliminate the requirement to fulfill any other condition of this approval or the requirements of any applicable statute, regulation, or other legal requirement resulting from any act or omission that causes or is likely to cause an adverse effect on the natural environment or the impairment of water quality.

Change of Owner

3.14 The owner or the operating authority, as the case may be, shall notify the Director, in writing, of any of the following changes within 30 days of the change occurring:

i. change of owner or operating authority;

ii. change of address;

iii. change of partners where the owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B17; or

iv. change of name of the corporation where the owner or operating authority is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C.39.

3.15 In the event of any change in ownership of the drinking-water system, other than change to a successor municipality, the owner shall notify the successor of and provide the successor with a copy of this approval, and the owner shall provide a copy of the notification to the district manager of the local office of the Ministry and the Director.

Inspections

3.16 No person shall hinder or obstruct a provincial officer in the performance of his or her duties, including any and all inspections authorized by the *SDWA*.

Information

3.17 Any information requested, by the Ministry, concerning the drinking-water system and its operation under this approval, including but not limited to any records required to be kept by this approval shall be provided to the Ministry, upon request.

3.18 Records required by or created in accordance with this approval, unless specifically referenced in s. 12 of O. Reg. 170/03, shall be retained for at least 5 years in a location where a provincial officer who is inspecting the treatment system can conveniently view them.

PART 4 - PERFORMANCE

Rated Capacity

4.1 The drinking-water system shall not be operated to exceed the rated capacity for the maximum flow rate into the treatment system of 5,556 L/min.

Increase to Rated Capacity

4.2 Despite condition 4.1, the drinking water system may be operated at a rate above the rated capacity set out in condition 4.1 where necessary for:

i. fighting a large fire; or

ii. the maintenance of the drinking-water system.

4.3 Condition 4.2 shall not be construed to allow drinking-water to be supplied that does not meet all other applicable standards and legal requirements.

Management of Residue

4.4 The annual average concentration of suspended solids in the effluent discharged from the backwash wastewater facilities shall not exceed 25 mg/L.

PART 5 - MONITORING AND RECORDING

Flow measuring devices

5.1 Install a sufficient number of flow-measuring devices within the drinking-water system to permit continuous measurement and recording of:

i. the flow rate and daily volume of water conveyed into the treatment system; and

ii. the flow rate and daily volume of water conveyed from the treatment system to the distribution system.

5.2 Records shall be maintained that set out the parameters recorded in accordance with condition 5.1, and where a measured flow rate into a treatment system, train, or stage exceeds the maximum flow rate set out for that treatment system, train, or stage in Part 4, the amount, date, time and duration of the exceedence shall also be recorded.

Calibration of flow measuring devices

5.3 All flow measuring devices must be checked and calibrated in accordance with the manufacturer's instructions.

5.4 If the manufacturer's instructions do not indicate how often to check and calibrate the flow measuring devices, the equipment must be checked and calibrated at least once every year during which the drinking-water system is in operation.

Additional Sampling - Management of Residue

5.5 In addition to any other sampling and analysis that may be required, sampling and analysis shall be undertaken for the parameters listed in **Table 5.1** at the listed frequencies and locations.

Table 5.1 Management of Residue Sampling

Item	Parameter	Frequency	Location
1.	Suspended Solids (composite)	Monthly	Ottawa River

5.6 For the purposes of **Table 5.1**, composite means the mean of three samples taken during the discharge event, with at least one sample taken immediately following the commencement of the discharge, one sample taken approximately at the mid-point of the discharge event and one sample taken immediately before the discharge ceases.

PART 6 - OPERATIONS AND MAINTENANCE

Chemical standards

6.1 All chemicals and materials used in the operation of the drinking-water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60 and NSF/61.

6.2 The most current chemical and material product registration documentation from a testing institution accredited by either the Standards Council of Canada or by the American National Standards Institution shall be available at all times for each chemical and material used in the operation of the drinking-water system that comes into contact with water within the system.

6.3 Condition 6.2 does not apply in the context of any particular chemical or material where the Owner has written documentation signed by the Director that indicates that the Ministry is satisfied that the chemical or material is acceptable for use within the drinking-water system and that chemical or material is only used as permitted by the documentation.

Operations manual

6.4 An up-to-date operations manual shall be maintained and available for reference by all persons responsible for all or part of the operation of the drinking-water system.

6.5 The operations manual shall include at a minimum:

i. the requirements of this approval and associated procedures;

ii. the operation and maintenance recommendations from the most recent engineers' report;

iii. procedures for the monitoring and recording of in-process parameters necessary for the control of the treatment system and assessing the performance of the drinking-water system;

iv. procedures for the operation and maintenance of monitoring equipment;

v. contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset and equipment breakdown;

vi. procedures for the dealing with complaints related to the drinking-water system, including the recording of the nature of the complaint and any investigation and corrective action taken in respect of the complaint;

6.6 Procedures necessary to the operation of any physical alterations of the drinking-water system shall be incorporated into the operations manual prior to the alterations coming into operation.

Drawings

6.7 Up-to-date Process Flow Diagrams (PFD) and Process and Instrumentation Diagrams (P&ID) for the treatment system shall be kept on site at the drinking water system.

6.8 All drawings and diagrams in the possession of the owner or operating authority that show the treatment system as constructed shall be retained.

6.9 An alteration to the treatment system shall be incorporated into Process Flow Diagrams (PFD), Process and Instrumentation Diagrams (P&ID), and record drawings and diagrams within one year of the substantial completion of the alteration and shall be retained and shall be made readily available for inspection by Ministry staff.

PART 7 - FUTURE ALTERATIONS

Approved future alterations

7.1 *Not Applicable*

Certificate of compliance

7.2 *Not Applicable*

PART 8 - STUDIES AND UPGRADES REQUIRED

8.1 Subject to Condition 8.2 below, the Owner shall implement the following physical improvements to the works, in keeping with recommendations of the Engineers' Report and related correspondence:

(a) All works and measures necessary to ensure that appropriate disinfectant residual and associated contact time calculated at the plant rated capacity with the unit processes providing contact time at a minimum operating level and under limiting temperature and pH conditions meet requirements of the "O.Reg. 170/03 and Procedure For Disinfection of Drinking Water in Ontario", including but not limited to:

i. All works necessary to ensure that the effective disinfectant contact time downstream of the filters is sufficient to provide 0.5 log inactivation of giardia cysts and 2 log inactivation of viruses**.**

ii. Provide an alarm system for low indicated disinfectant residual with automatic shutdown of the high lift pumps

iii. Provide an alarm system for low level in the clearwell with automatic shutdown of the high lift pumps

iv. Repair or replace the existing chlorine solution flow metering and proportioning equipment to allow accurate and continuous metering of chlorine solution; and provide and install a standby chlorinator with automatic switch-over in case the duty chlorinator fails

v. Replace the existing chlorine dioxide generation system with an approved (by Director) pre-manufactured chlorine dioxide generation system incorporating automatic control of chlorine dioxide production rate and concentration of produced solution, including control of reactant chemicals feed rate and ratio, integral pH control where required, and adequate venting system of reaction chamber. Spare parts shall be made available to replace parts subject to wear and breakage.

vi. Provide a standby chlorine dioxide generation system of equivalent or greater capacity than that of the duty generator with automatic switch-over in case the duty generator fails, or an equivalent standby system approved by the Director; and provide a second sodium chlorite solution tank and install it so it is capable of feeding the process directly.

(b) All works and measures necessary to ensure the effective treatment and integrity of the works, including but not limited to:

i. Permanently disconnect the raw water by-pass pipe to the distribution system, decommission the standby pumps, and restore firm pumping capacity

ii. Install a backflow preventer on the water supply line feeding the chlorinators and other in-plant uses to prevent backflow into the treated water at the high lift pump discharge

iii. Provide and install a standby mechanical flash mixer

iv. Provide and install a standby alum metering pump with automatic switch-over in case the duty pump fails

v. Provide and install a standby polymer metering pump with automatic switch-over in case the duty pump fails

vi. Provide a second storage tank or day tank for alum and install so it is capable of feeding the process directly

vii. Provide a second storage tank or day tank for polymer and install so it is capable of feeding the process directly

viii. Provide all necessary piping and controls to allow filter-to-waste capability at the end of each backwash and prior to bringing filters back on line

ix. Provide a standby backwash pump and install it in a manner such that it is ready for immediate use

x. Upgrade the chlorine gas facilities to meet safety and health related MOE Standards for the Design of Chlorination Facilities, including provision of a proper vestibule, chlorine gas leak alarm with light exterior to room, ventilation and an air scrubbing system, or an alternative disinfectant chemical feed system suitable for use in an area close to housing

xi. Provide one standby dry feeder and mixing tank (for the soda ash and/or lime feed system)

xii. Provide spill containment for all chemical storage systems

xiii. Provide a separate ventilated room for the hydrofluosilicic acid storage tanks, day tank and chemical metering pump

xiv. Install a standby generator sized to provide power for the entire plant

xv. Provide necessary upgrades at the low lift pumping station to ensure flooding protection of the equipment to prevent interruption of service caused by flood.

(c) Notwithstanding the physical improvements required under (a) and (b) above, the Owner may choose to supply water from an a new water treatment plant or an alternate water supply which complies with the Ontario Drinking Water Standards subject to a fully operational status of such alternate water supply by the date specified in Condition 9.1**.**

Requirement not an approval

8.2 The owner shall not construct any works required by this part until all associated approvals, licenses and permits have been obtained from the Ministry.

PART 9 - RELIEF FROM REGULATORY REQUIREMENTS

Relief from regulatory requirements

9.1 Notwithstanding the provision of O.Reg. 170/03, the Owner is not required to comply with Condition 8.1 until **December 31, 2007.**

Conditions in exchange for relief from regulatory requirements

9.2 The Owner shall during the interim period up to **December 31, 2006**, operate and apply appropriate measures to enhance and optimize the disinfection processes, including but not limited to:

i. maintain a free chlorine residual of at least 0.2 mg/L throughout the distribution system;

SCHEDULE - A

The following supporting documents form part of this approval.

1. Application for approval dated December 14, 2004
   - Correspondence from Jp2g Consultants Inc. dated April 26, 2005, May 12, 2005 and September 4, 2005
   - Final Plans and Specifications prepared by Jp2g Consultants Inc. dated December 2004.
   - Design Brief Rev. 1 (September, 2005) prepared by RAL Engineering Ltd.

2. Application for approval dated August 28, 2002 regarding time extension.

3. The original applications for approval, including design calculations, engineering drawings and reports, and other supporting documents prepared in support of any

previous certificate(s) of approval issued for any works now approved and replaced by this approval, unless this approval states otherwise.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 4857-5E6NN9 issued on February 28, 2003

All or part of this decision may be reviewable in accordance with the provisions of Part X of the SDWA. In accordance with Section 129(1) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 129(2) sets out a procedure upon which the 15 days may be extended by the Tribunal. Section 129(3) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, provides that the Notice requiring the hearing shall state:

1. The aspect of the decision, including the portion of the permit, licence, approval, order or notice of administrative penalty in respect of which the hearing is required; and
2. The grounds for review to be relied on by the person at the hearing.

Except with leave of the Tribunal, a person requiring a hearing in relation to a reviewable decision is not entitled to,

(a) a review of an aspect of the decision other than that stated in the notice requiring the hearing; or
(b) a review of the decision other than on the grounds stated in the notice

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 Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Part V, *Safe Drinking Water Act, 2002*
Ministry of Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

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

The above noted water works are approved under Part V of the Safe Drinking Water Act.

DATED AT TORONTO this 15th day of September, 2005

Girish Mehta, P.Eng.
Director
Part V *of the Safe Drinking Water Act, 2002*

GM/
c: District Manager, MOE Ottawa
Drinking Water Supervisor, MOE Ottawa
Mr. Joe Janota, Jp2g Consultants Inc.
Manager, Drinking Water, Wastewater and Watershed Standards Section, Standards Development Branch

APPENDIX D

PERMIT(S) TO TAKE WATER

Ontario

Ministry of the Environment

Ministère de l'Environnement

PERMIT TO TAKE WATER
Surface Water
NUMBER 3664-63ZP3C

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

The Corporation of the Town of Deep River
PO Box 400
Deep River, Ontario, K0J 1P0
Canada

For the water taking from: Ottawa River

Located at: 177 River Road
Deep River, County of Renfrew

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

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

(d) "District Office" means the Ottawa District Office.

(e) "Permit" means this Permit to Take Water No. 3664-63ZP3C including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means The Corporation of the Town of Deep River.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

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

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated November 18, 2003 and signed by Belo C. Somor
Town Superintendent, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way the authority of the Director or a Provincial Officer to require certain steps be
taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with 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.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **January 1, 2014**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1.	Ottawa River	River	Municipal	Water Supply	12274.00	24.00	15911000.00	365.00	18 258030 4836448
						Total Taking:	15911000.00		

4. Monitoring

4.1 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit. A separate record shall be maintained for each source. The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office 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. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 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. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (3).

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

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, ***Environmental Bill of Rights****, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a 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.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
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 Review Tribunal
2300 Yonge Street, 12th Floor
Toronto, Ontario M4P 1E4

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

The Director, Section 34
Ontario Water Resources Act,
RSO 1990,
Ministry of Environment
133 Dalton Ave
Kingston ON K7L 4X6
Fax: (613)548-6908

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

Dated at Kingston this 25th day of August, 2004.

Clyde Hammond

Clyde Hammond
Director, Section 34
Ontario Water Resources Act , R.S.O. 1990

APPENDIX E

INSPECTION RATING RECORD

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2010-2011)

DWS Name:	DEEP RIVER DRINKING WATER SYSTEM
DWS Number:	220000923
DWS Owner:	Deep River, The Corporation Of The
Municipal Location:	Deep River
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	October 19, 2010
Ministry Office:	Ottawa District

Maximum Question Rating: 575

Inspection Module	Non-Compliance Rating
Source	0 / 14
Capacity Assessment	0 / 30
Treatment Processes	0 / 98
Operations Manuals	0 / 28
Logbooks	0 / 14
Contingency/Emergency Planning	0 / 7
Certification and Training	0 / 28
Water Quality Monitoring	0 / 268
Reporting & Corrective Actions	0 / 88
TOTAL	**0 / 575**

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 14-DEC-10 (Inspection ID: 1-8CZR5).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2010-2011)

DWS Name:	DEEP RIVER DRINKING WATER SYSTEM
DWS Number:	220000923
DWS Owner:	Deep River, The Corporation Of The
Municipal Location:	Deep River
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	October 19, 2010
Ministry Office:	Ottawa District

Maximum Question Rating: 575

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 14-DEC-10 (Inspection ID: 1-8CZR5).

APPENDIX F

INSPECTION RATING RECORD METHODOLOGY

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the *Safe Drinking Water Act, 2002*, associated regulations and MOE Certificates of Approval. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which will be applied to the findings of the Ministry's MRDWS inspection results starting in fiscal year 2008/2009. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years to account for legislative and societal changes to acceptable risk levels. As a result of the

most recent review, the methodology has been modified to present an improved metric for the evaluation of the risk/safety of MRDWS operations.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of up to 122 regulatory questions. Those protocol questions are also linked to definitive guidance that Ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. Additionally, the inspection protocol contains many other non-regulatory questions.

A team of drinking water specialists in the Ministry have assessed each of the inspection protocol regulatory questions to determine the risk of having a response in the negative (i.e., not complying with the regulatory framework) that would compromise the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving an assigned risk rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the Ministry for each drinking water system.

A low inspection rating would not necessarily mean that the drinking water provided by that system is unsafe; however, it does indicate the degree to which there is room for improvement in meeting the province's regulatory requirements.

The inspection rating for a drinking water system will reflect the inspection results of the specific drinking water system for the reporting year. When the methodology is applied consistently over a period of years, it can serve as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public will be able to track the performance over time, which will encourage continuous improvement and allow systems to identify specific areas requiring attention.

This methodology for assessing inspection findings will be used as a tool to track progress towards the Chief Drinking Water Inspector's goal of achieving 100 per cent compliance with the regulatory framework on a province-wide basis.

Determining Potential to Compromise the Delivery of Safe Water

Each inspection protocol question was assessed by MOE drinking water specialists to determine the potential to compromise the delivery of safe water. These specialists used a risk management approach that is aligned with the Government of Ontario's Inspections, Investigations and Enforcement (II&E) Risk Management Framework which, in turn, is built on a universally accepted risk assessment method. Risk management is a systematic approach to identifying potential hazards; understanding the likelihood and consequences of the hazards; and taking steps to reduce their risk if necessary and as appropriate.

The Government of Ontario mandated the II&E Secretariat to address the specific challenges of managing risk in the context of Ontario's regulatory environment and across a variety of ministry program areas. The work of the II&E Secretariat resulted in the development of the II&E Risk Management Framework, which has subsequently been adopted as the definitive risk management tool in the Ontario Public Service.

The II&E Risk Management Framework provides a formula to be used in the determination of risk:

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the Ministry as outlined in **Table 2**.

The question risk rating for each legislative inspection question is derived from an evaluation of every possible consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The question risk rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 1:

Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:

Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

TABLE 3:

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?							
Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	**Major** Administrative Consequence	**Minor** Environmental Consequence	**Minor** Health Consequence	**Medium** Environmental Consequence	**Major** Environmental Consequence	**Medium** Health Consequence	**Major** Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely	L=3 (Likely)	L=2 (Possible)
R=4	**R=2**	**R=6**	**R=12**	**R=15**	**R=6**	**R=21**	**R=16**

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions that relate to regulatory compliance and input their responses as "yes", "no" or "not applicable" into the Ministry's Laboratory and Waterworks Inspection System (LWIS) database. A "no" response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone), type of inspection (i.e., focused, detailed), and source type (i.e., groundwater, surface water).

The question risk ratings of all non-compliant answers are summed (total question rating) and divided by the sum of the question risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Proposed Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings will be published, as a banded result, in the Ministry's Chief Drinking Water Inspector's Annual Report covering the current fiscal inspection year.

Figure 1 presents the results of the Fiscal 2007-2008 annual inspections using the 5% bands. Using this method, individual drinking water systems can determine how they compare against all the other inspected facilities without being exposed to individual facility results.

Reporting Results to MRDWS Owners/Operators

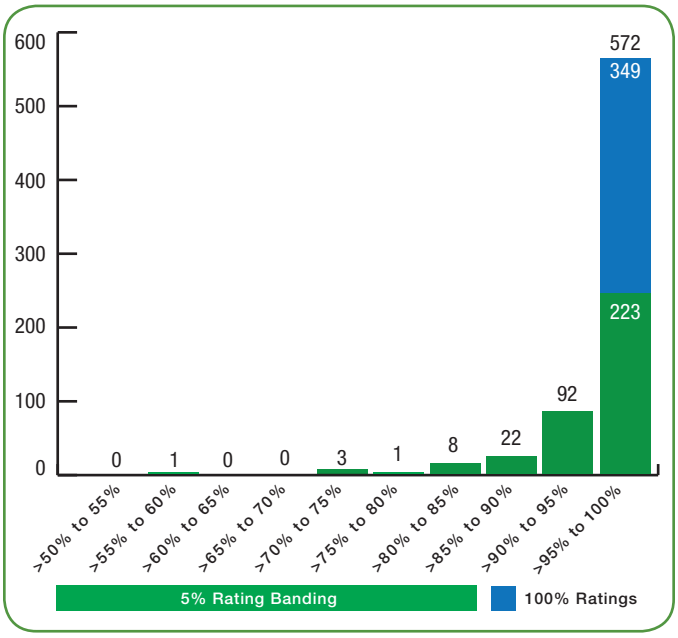
A summary of inspection findings for each system is generated in the form of a Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Process Wastewater
6. Distribution System
7. Operations Manuals
8. Logbooks
9. Contingency and Emergency Planning
10. Consumer Relations
11. Certification and Training
12. Water Quality Monitoring
13. Reporting, Notification and Corrective Actions
14. Other Inspection Findings

Changes to the IRR Methodology Relative to Previous Fiscal Inspection Years

The Ministry of the Environment assured stakeholders that the rating methodology would be reviewed every three years. This three-year period concluded with the beginning of the 2008/09 inspection year.

Figure 1: Fiscal Year 2007/08 Distribution of Ratings



A comprehensive evaluation of the inspection rating model used to date revealed numerous areas for improvement:

- Chronic administrative issues and high ratings
- Specific situations ("grey areas") required supervisor/manager intervention
- Inspection ratings did not fully integrate detailed risk management principles.

The consequence values that were assigned to each relevant regulatory question remained unchanged from April 1, 2005 to March 31, 2008. The rating methodology used over those three years has been modified based on continuous improvements to the program by the Ministry and now represents an improved metric for the evaluation the risk/safety of operations at MRDWS.

For further information, please contact your

Safe Drinking Water Branch

Drinking Water Supervisor