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Ontario

February 9, 2021

Sent by Email: spatterson@deepriver.ca

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

Attention: Sean Patterson, Director of Public Works

Dear Sean:

Re: 2020-21 Inspection Report

The enclosed report documents findings of the inspection that was performed at the Deep River drinking water system on November 18, 2020.

Two sections of the report, namely "Non-compliance with Regulatory Requirements and Actions Required" and "Summary of Recommendations and Best Practice Issues", if found, may cite due dates for the submission of information or plans to my attention.

Please note that "Non-compliance with Regulatory Requirements and Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an act, a regulation, or site-specific approvals, licenses, permits, orders, or instructions. Such violations may result in the issuance of mandatory abatement instruments which could include orders, tickets, penalties, or referrals to the ministry's Environmental Enforcement and Compliance Office.

"Summary of Recommendations and Best Practice Issues" 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 continues to adhere to 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), appended to the inspection report, provides the ministry, the system owner and the local Public Health Unit 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, also appended to the inspection report, describes how the risk model was improved to better reflect any health related and administrative non-compliance issues that may be cited in our inspection reports. IRR ratings are published in the ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Charlie Primeau, Water Compliance Supervisor, at 613-521-3450 ext 239.

Section 19 of the Safe Drinking Water Act, 2002 (Standard of Care) cites a number of obligations of individuals who exercise decision-making authority over municipal drinking water systems. The ministry encourages individuals, particularly municipal councilors, to take steps to be well informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings.

Thank you for the assistance afforded to me 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,

Karine Bourgon
Water Inspector
Ministry of the Environment, Conservation and Parks
Drinking Water and Environmental Compliance Division
Ottawa District Office
Tel: 613-521-3450 ext. 230

ec:

- Christopher Carroll, Interim CAO/Treasurer, The Corporation of the Town of Deep River, 100 Deep River Road, Deep River, Ontario, K0J 1P0, ccarroll@deepriver.ca

- Brad Sweet, Operations Manager, Ontario Clean Water Agency – Ottawa Valley Hub, 560 Abbie Lane, Petawawa, ON K8H 2X2, bsweet@ocwa.com

- Brenda Royce, Process & Compliance Technician, Ontario Clean Water Agency – Ottawa Valley Hub, 560 Abbie Lane, Petawawa, ON K8H 2X2, broyce@ocwa.com

- Mike Grace, Manager, Environmental Health, Renfrew County and District Health Unit, 7 International Dr., Pembroke, ON K8A 6W5, mgrace@rcdhu.com

- John Swick, District Manager, Ministry of Natural Resources, Pembroke District Office, 31 Riverside Dr., Pembroke, ON K8A 8R6, john.swick@ontario.ca

c:

File SI-RE-DE-RI-540 (2020-2021)

Ontario

Ministry of the Environment, Conservation and Parks

DEEP RIVER DRINKING WATER SYSTEM

Inspection Report

Site Number:	220000923
Inspection Number:	1-NWTZG
Date of Inspection:	Nov 18, 2020
Inspected By:	Karine Bourgon

Ontario

Table of Contents:

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

CONTACT INFORMATION

Type:	Owner	**Name:**	Sean Patterson
Phone:	(613) 584-2000 x108	**Fax:**	(613) 584-3237
Email:	spatterson@deepriver.ca		
Title:	Director of Public Works, Town of Deep River		

Type:	Operating Authority	**Name:**	Brad Sweet
Phone:	(613) 687-2141	**Fax:**	(613) 687-7138
Email:	bsweet@ocwa.com		
Title:	Operations Manager, OCWA, Laurentian View Cluster		

Type:	Operating Authority	**Name:**	Stephen Bird
Phone:	(613) 584-3141	**Fax:**	(613) 584-2534
Email:	sbird@ocwa.com		
Title:	Operator, OCWA, Ottawa Valley Hub		

Type:	Operating Authority	**Name:**	Brenda Royce
Phone:	(613) 687-2141	**Fax:**	(613) 687-7138
Email:	broyce@ocwa.com		
Title:	Process & Compliance Technician, OCWA - Ottawa Valley Hub		

INSPECTION DETAILS:

Site Name:	DEEP RIVER DRINKING WATER SYSTEM
Site Address:	177 RIVER Road DEEP RIVER ON K0J 1P0
County/District:	DEEP RIVER
MECP District/Area Office:	Ottawa District
Health Unit:	RENFREW COUNTY AND DISTRICT HEALTH UNIT
Conservation Authority:	
MNR Office:	Pembroke District Office
Category:	Large Municipal Residential
Site Number:	220000923
Inspection Type:	Announced
Inspection Number:	1-NWTZG
Date of Inspection:	Nov 18, 2020
Date of Previous Inspection:	Jan 23, 2020

COMPONENTS DESCRIPTION

Site (Name): MOE DWS Mapping
Type: DWS Mapping Point **Sub Type:**

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 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 by Jp2g Consultants Inc. (December 2004). 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.

Site (Name): LOW LIFT PUMPING STATION
Type: Source **Sub Type:** Pumphouse
Comments:
The intake works for the Deep River WTP is located at the Low Lift Pumping Station and consists of a 750 mm diameter intake extending approximately 91m into the Ottawa River terminating at a depth of approximately 9 m below the surface.

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 three (3) submersible pumps (3 duty, controlled by hours of operation), each rated at 83.1 L/s at 25 m TDH; and a raw water main from the low lift pumping station to the water treatment plant.

Site (Name): WATER TREATMENT PROCESS
Type: Treated Water POE **Sub Type:** Treatment Facility
Comments:
The Deep River WTP 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 m^3/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;

• three (3) dual media sand and anthracite filters with a total area of 56.7 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;

• two (2) clear wells, one with a capacity of 1,364 m^3, and a second with a capacity of 1,507 m^3; and two (2) pump wells, one with a capacity of 90 m^3 and the other with a capacity of 110 m^3;

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

• a gaseous chlorine disinfection system consisting of one (1) bank of four (4) 68.2 kg cylinders;

• 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 (PAS8) feed system consisting of two (2) liquid coagulant tanks, , one (1) tank is 51,200 L capacity and one (1) day tank is 6,600 L, and two (2) chemical feed metering pumps (one duty, one standby) with a flow capacity of 80 L/hr and chemical feed line prior to the Actiflo® units;

• pH/alkalinity adjustment consisting of two (2) tanks, one (1) is 51,200 L and one (1) day tank of 3,400 L, of liquid caustic soda and four (4) chemical feed metering pumps (two duty, two standby) each with a flow capacity of 60 L/hr 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 two (2) dry polymer preparation systems each consisting of 3,400 L dissolving tank with mixer; four (4) chemical feed metering pumps (three duty, one standby) each with a flow capacity of 45 L/hr and chemical feed lines to the three package treatment units injection chambers;

• coagulant aid for the wastewater clarifier unit consisting of two (2) dry polymer preparation systems each consisting of 3,400 L dissolving tank with mixer; three (3) chemical feed metering pumps (two duty, one standby) each with a flow capacity of 45 L/hr 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 (1) dry polymer preparation systems each consisting of 3,400 L dissolving tank with mixer; two (2) chemical feed metering pumps (one duty, one standby) each with a flow capacity of 90 L/hr and chemical feed lines to the sludge dewatering centrifuge inlet; and,

• dechlorination chemical (sodium bisulfite) feed system, which is currently not operational and; • hydrofluosilicic acid feed system consisting of a 210 L storage tank and two (2) chemical feed metering pumps (one duty, one standby) each with a flow capacity of 4 L/hr and chemical feed line to the distribution header.

Process instrumentation for the WTP consists of seven (7) turbidimeters continuously monitoring the raw water, Actiflo® units (clarified water), filter effluent, treated water and the wastewater clarifier supernatant; one (1) pH meter 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; one (1) chlorine analyzer monitoring prior to

clearwell #1 to provide early indication of changes in residual; 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 (not in use); and a fluoride ion analyzer continuously monitoring the fluoride residual in the treated water on the distribution header.

The WTP is further equipped with a standby 600 kW diesel generator complete with fuel storage tank for back-up power.

Site (Name): ELEVATED STORAGE TANK
Type: Other **Sub Type:** Reservoir
Comments:
The Town of Deep River stores treated water in a 1,513 m³ elevated water storage tank (30.5 m) 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.

Site (Name): DISTRIBUTION SYSTEM
Type: Other **Sub Type:** Other
Comments:
The Deep River drinking water system services a population of approximately 4,109 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.

Deep River DWS is also connected to CNL with approximately 9,000 m of 300 mm diameter watermain pipe from the booster pumping station to the CNL site.

The water mains are constructed of mostly cast iron, ductile iron and polyvinyl chloride (PVC), and range in diameter from 38 mm (1.5 inches) to 406 mm (16 inches). There is approximately 75 km of water mains within the distribution system and approximately 242 hydrants and hydrant valves.

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). The filter backwash wastewater and Actiflo® wastewater discharge to the wastewater surge tanks and the wastewater lamella tube settlers clarifier; while the Actiflo® overflow, clearwell overflow and filter to waste discharge directly to the ditch and the river. The hydrocyclone waste discharges to the lamella clarifier.

The residue management facility (wastewater treatment) consists of two (2) filter backwash wastewater surge tanks, each approximately 113 m³, equipped with two (2) 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. The screw conveyor was extended to allow emptying into a dump truck for disposal.

There is a sodium bisulfite feed system that is operational but it is not being used. There is currently 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.

Site (Name): BOOSTER PUMPING STATION
Type: Other **Sub Type:** Other
Comments:
Booster Pumping Station (new), located at Balmer Bay Road, next to the hospital:
- three (3) horizontal pumps each rated at 26 L/s at 69.7 m TDH;
- two (2) chemical feed pumps;
- One (1) 338 L storage tank for the re-chlorination system;
- Two (2) HACH chlorine analyzers, one (1) located on the watermain;
- Sodium hypochlorite carboys with secondary containment pallet; and,
- 113 kW diesel generator and fuel storage tank.

INSPECTION SUMMARY:

Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water related policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment and distribution components as well as management practices.**

  This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

  This report is based on a "focused" inspection of the system. Although the inspection involved fewer activities than those normally undertaken in a detailed inspection, it contained critical elements required to assess key compliance issues. This system was chosen for a focused inspection because the system's performance met the ministry's criteria, most importantly that there were no deficiencies as identified in O.Reg. 172/03 over the past 3 years. The undertaking of a focused inspection at this drinking water system does not ensure that a similar type of inspection will be conducted at any point in the future.

  This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

  An announced, detailed inspection of the Deep River Drinking Water System was conducted on November 18, 2020, under the authority of Section 81 of the Safe Drinking Water Act by Karine Bourgon, Water Inspector, herein also referred to as the "inspector".

  The Deep River Drinking Water System, herein also referred to as the "drinking water system", the "DWS", or the "system", is owned by the Corporation of the Town of Deep River, herein also referred to as the "Owner" and consists of the Deep River Water Treatment Plant (the "WTP") and the Deep River Distribution System (the "DS"). The DWS is operated by the Ontario Clean Water Agency (OCWA), herein also referred to as the "operating authority". The DWS was operated under Drinking Water Works Permit Number 189-201 (Issue Number 3) and Municipal Drinking Water Licence Number 189-101 (Issue Number 3) during the inspection period, herein referred to as the "DWWP" and "MDWL".

  The inspector was accompanied and assisted during the inspection by Randolph Cliche, Operator (OCWA), Stephen Bird, Operator (OCWA) and Brenda Royce, Process and Compliance Technician (OCWA).

  The scope of this inspection included a physical inspection of the Deep River Water Treatment Plant (WTP), the Booster Pumping Station, and the Elevated Storage Reservoir site. The inspection examined compliance with, but was not limited to the: Safe Drinking Water Act (SDWA) and its regulations including Ontario Regulation 170/03 Drinking Water Systems (O. Reg. 170/03); Ontario Regulation 169/03 Ontario Drinking Water Standards (O. Reg. 169/03), and Ontario Regulation 128/04 Certification of Drinking Water System Operators and Water Quality Analysts (O. Reg. 128/04); DWWP, MDWL; completed Form 1, Form 2 and Form 3 records of alterations, and Permit To Take Water (PTTW) # 8528-9ECQPJ.

  The following documents were also reviewed as part of the compliance assessment: Quality & Environmental Management System (QEMS), including Operations Manual and associated SOPs; Emergency Procedures Manual; logbooks and other record keeping mechanisms; reports/certificates of analysis for drinking water samples, and other records related to the operation of the drinking water system for the period January 1, 2020 to November

Introduction

18, 2020, inclusive, also herein referred to as the "inspection period". The report for the previous inspection # 1-L39K4 was also reviewed for the status of completing previous required actions and recommendations where applicable.

Source

- **The owner had a harmful algal bloom monitoring plan in place.**

- **The owner did have a harmful algal bloom monitoring plan in place that met the requirements of the Municipal Drinking Water Licence condition.**

  The Deep River DWS has Harmful Algal Bloom (HAB) monitoring plan established that includes details relating to:

  1) visual monitoring for HABs at or near the drinking water system intake(s),
  2) details relating to visual monitoring of shoreline for drinking water systems where the proximity of the intake(s) may be of concern;
  3) details relating to reporting the observed or suspected HAB;
  4) a sampling plan, including the identification of sample location(s) and frequencies and triggers that may increase the sampling frequency; and,
  5) up-to-date records documenting staff training on the HAB monitoring, reporting, and sampling procedures.

Capacity Assessment

- **There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.**

  Flow measuring and recording requirements are prescribed in Section 2.0 "Flow Measurement and Recording Requirements" of Schedule C to the MDWL.

  Flow measuring devices are installed in the raw water transmission line at the head of each Actiflo unit; the flows are totalized to measure the rate and daily volume of raw water entering the treatment system. Flow meters are also installed on each filter effluent line and one magnetic flow meter is located on the treated water discharge header to measure the rate and daily volume of treated water conveyed from the treatment system to the distribution system.

  The flow measurement data is continuously transmitted to and recorded by the WTP SCADA system.

- **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA.**

  The rated capacity for the Deep River WTP is prescribed in Table 1: Rated Capacity in Section 1.0 "System Performance" of Schedule C to the MDWL. According to Table 1, the Deep River WTP is licensed to produce a not-to-exceed maximum daily volume of treated water of 13,638 cubic metres per day (m3/d) based on flow from the treatment subsystem (WTP) to the distribution system.

  The reported maximum daily volume flowing from the WTP to the distribution system, during the inspection period, was 5,622.50 m3/d. This maximum volume was recorded in July 2020.

Treatment Processes

- **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

  On November 18, 2020, the inspector conducted a supervised tour of the Deep River WTP with Brenda Royce and Stephen Bird for the purposes of examining the equipment installed and comparing that equipment to the

Treatment Processes

equipment described in the DWWP.

The DWWP # 189-201 Issue Number 3 will expire on May 3, 2021. The operating authority provided the inspector with a DRAFT copy of the DDWP # 189-201 Issue Number 4. The inspector reviewed the document and observed that:

- All mistakes and omissions noted in the previous inspection report, where Schedule A did not reflect the equipment installed in the DWS, were addressed in the application of the permit renewal;
- A Schedule C document (Authorization to Alter the Drinking Water System) was generated to reflect the changes to the distribution system; and,
- Schedule D Process Flow Diagram was updated to reflect the continuous chlorine analyzer located at the beginning of clearwell #1 after pre-chlorination.

Based on observations made during the tour of the WTP, it appears that the equipment installed at the WTP matches that described in the DRAFT copy of the DDWP # 189-201 Issue Number 4.

- **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

  A "Form 2 - Record of Minor Modification or Replacements to the Drinking Water System" is used by the owner of a drinking water system to document minor modifications or replacements to the drinking water system that do not require a Schedule C application. These forms are required to be kept for a period of ten years and should be available for review by a Provincial Officer upon request.

  The inspector reviewed one Form 2 document that was prepared in accordance with the Drinking Water Works Permit during the inspection period:
  - The 250 mm WaterMaster FEW325 Electromagnetic meters were replaced with identical new factory calibrated meters on both Filter #1 and Filter #3.

  The Form 2 document appears to be properly completed and was readily available for review by the inspector.

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

  The Deep River WTP consists of a conventional filtration process that provides chemically assisted filtration, and is designed to be capable of achieving, at all times, primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario (also herein referred to in the report as "the Disinfection Procedure"), including 99 per cent (2-log) removal or inactivation of Cryptosporidium oocysts, at least 99.9 per cent (3-log) removal or inactivation of Giardia cysts, and at least 99.99 per cent (4-log) removal or inactivation of viruses by the time, water enters the distribution system. Primary disinfection is accomplished using free chlorination.

  In addition, to be credited in meeting or exceeding the log removal credits identified above, the WTP must be operated to meet the following criteria:

  - A chemical coagulant must be used at all times when the treatment plant is in operation;
  - The chemical dosages must be monitored and adjusted in response to variations in raw water quality;
  - Effective backwash procedures must be maintained, including filter-to-waste or an equivalent procedure during filter ripening to ensure that the effluent turbidity requirements are met at all times;
  - Filtrate (filter effluent) turbidity must be continuously monitored from each filter; and
  - 95% of the filtered water turbidity measurements must be 0.3 Nephelometric Turbidity Units (NTU) or less in each month.

Treatment Processes

A review of operational logs for the inspection period found:
- The water treatment equipment was operating whenever water was being supplied to the users of the DWS;
- Coagulant was dosed to the treatment process at all times when the WTP was operating;
- Chemical dosages were monitored, and adjusted in response to variations in raw water quality, particularly raw water turbidity and temperature;
- The maximum filter effluent turbidity from each of the three filters during the inspection period was 0.3 NTU, 0.28 NTU and 0.27 NTU;
- The filtered water turbidity was equal to or less than 0.3 NTU in at least 95 per cent of all samples taken in each month; and
- Each of the dual media filters used in the treatment process is equipped with a turbidimeter. Turbidity is recorded by the WTP's SCADA system and filter effluent turbidity alarms are monitored. The Deep River WTP is equipped with automatic filter-to-waste capability; whenever filter effluent is greater than 0.3 NTU it is automatically directed to waste.

Only certified operators made adjustments to the water treatment equipment.

- **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.**

  Records reviewed for the inspection period indicated the free chlorine residual for secondary disinfection was maintained between 0.08 mg/L and 1.94 mg/L within the distribution system.

- **Where an activity has occurred that could introduce contamination, all parts of the drinking water system were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

  The Procedure for Disinfection of Drinking Water in Ontario and Drinking Water Works Permits (Schedule B Condition 2.3.2) require that the provisions of a document listed in the DWWP (or an approved procedure) be followed when a system is added to, modified, replaced, extended or where an activity has occurred that could introduce contamination (e.g., repair / maintenance).

  It was reported that Filter #1 was taken out of service to repair the entire filter system including cracks in the foundation, bent piping and the issue with the media leaking out of the filter to the filter effluent valve. All related parts and equipment of the DWS were disinfected and the water was sampled and tested for the presence of bacteria as required by Schedule B Condition 2.3 of the DWWP.

Treatment Process Monitoring

- **Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.**

  Chlorine is injected prior to filtered water entering the clearwells; a chlorine analyzer is installed at that location to record chlorine dosing.

  Primary disinfection chlorine monitoring is performed using a continuous analyzer to monitor chlorination at the exit of clearwell #2. Log inactivation values are calculated from this free chlorine residual value, and the residence time in both clearwells, where the required disinfection is achieved.

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

  Each filter effluent line is equipped with a continuous water quality analyzer (HACH 1720E Low Range Turbidimeter) to continuously measure filter effluent turbidity and monitor filter performance. The turbidity results from the three (3) turbidimeters are transmitted to, trended and stored by the WTP SCADA system. The filters will

Treatment Process Monitoring

run-to-waste at an alarm setpoint of 0.3 NTU; the Actiflo units will shutdown and no water is directed to the clearwells.

At the time of physical inspection, the turbidimeters displayed the following instantaneous turbidity values:

Filter 1: 0.268 NTU
Filter 2: 0.165 NTU
Filter 3: 0.116 NTU

- **The secondary disinfectant residual was measured as required for the distribution system.**

  A continuous water quality analyzer is installed to sample, and test from the Booster Pumping Station, for the purpose of evaluating free chlorine entering the distribution system from the first zone, and following re-chlorination (if required). The test results from this analyzer are transmitted to the Deep River WTP's SCADA system, and recorded.

  In addition, secondary disinfection free chlorine residual is tested at the same time and from the same locations where samples are collected for microbiological testing using a direct readout digital handheld colorimeter.

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

  A daily report of trending graphs from the continuous analyzer test results is produced each day by the SCADA system for operator review and analysis. The report is reviewed by the operator the next morning, within 24 hours during week days and within 72 hours during long weekends.

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

  Details concerning filter effluent turbidity, primary disinfection, secondary disinfection and fluoridation critical control limit alarms and response requirements are provided in the Deep River Procedures Binder "Plant Processes".

  According to information contained within the sources identified above, the Deep River DWS continuous monitoring equipment is equipped with appropriate alarms in such way that:

  a) free chlorine levels of 1.00 mg/L or less at the point where primary disinfection is meant to have been achieved will result in a shutdown of the lowlift pumps;
  b) free chlorine levels of 1.30 mg/L or less at the point where treated water leaves the DWP prior to entering the distribution system will result in an alarm; and,
  b) filter effluent turbidity of 0.3 NTU or greater will result in a shutdown of filter operation and will filter to waste.

  In all three scenarios, the alarms/lockouts prevent the distribution of partially treated water to users.

- **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 and recording data with the prescribed format.**

  The continuous monitoring analysers within the Deep River WTP and the Booster Pumping Station, sample and test instantaneously. The results are transmitted via the SCADA system immediately and recorded on OCWA's WISKI database in two (2) minute intervals. The data points represent the average value of instantaneous data collected over the two (2) minutes.

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

Treatment Process Monitoring

Continuous monitoring turbidimeters, continuous chlorine residual analysers and the continuous fluoride analyser are cleaned and calibrated once per month in house. In addition, the analysers are serviced and calibration verified by a third-party contractor on an annual basis.

Operations Manuals

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

  An examination of the Procedures Binder found that it contains a process narrative and process flow diagrams for the Deep River WTP and the distribution system.

- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**

  MDWL #189-101, Schedule B: General Conditions, 16.0 Operations and Maintenance Manual, 16.2 states:

  The operations and maintenance manual or manuals, shall include at a minimum:

  - The requirements of this licence and associated procedures;
  - The requirements of the drinking water works permit for the drinking water system;
  - A description of the processes used to achieve primary and secondary disinfection within the drinking water system;
  - A copy of the CT calculations that were used as the basis for primary disinfection under worst case operating conditions;
  - Procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water system.

  The inspector reviewed the Procedures Binder for the system and found that the documents included within met the requirements prescribed in Section 16.0 of Schedule B to the MDWL.

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.**

  A review of the Deep River Water Treatment Plant Daily Log sheets used for recording the results of operational tests; sample submission and chain of custody forms for samples submitted to the licensed laboratory used to provide drinking water testing services; and results of field testing for chlorine residual and pH, found that operational testing and other regulatory field testing was conducted by certified operators.

Security

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

  The inspector assessed site security at the Deep River WTP and the Low Lift Pumping Station, the Booster Pumping Station and the Elevated Storage Reservoir. The following observations were made:

  - The low lift building is equipped with a locked door, and contact switch wired to an active alarm dialer. The windows of the low lift building are equipped with metal grids. The access door is posted with signage to alert of no trespassing. The access door is normally locked.

  - All interior and exterior doors at the WTP are equipped with contact switches wired to an active dialer, and

Security

highsecurity locks. All doors are normally locked.

- The Booster Pumping Station is equipped with a locked access door. The access door is fitted with a contact switch wired to an active alarm dialer. The door is normally locked. The exterior of the booster station building is equipped with a "No Trespassing" sign.

- The Elevated Storage Reservoir site is equipped with perimeter security fencing posted with "No Trespassing" signs, complete with barbed wire, and a locked access gate. The access door to the control building/enclosure located at the base of the elevated storage tank is equipped with an alarm contact switch wired to an active dialer.

Certification and Training

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

  The Deep River WTP is a Class III Water Treatment plant and the distribution system is classified as a Class I Water Distribution system.

  The Overall Responsible Operator (ORO) is noted in the logbook each day. At the time of inspection, ORO position was held by Stephen Bird. The operator held a valid Class 3 Water Treatment Subsystem Certificate and a valid Class 2 Water Distribution Subsystem Certificate. These certifications are adequate to serve as the ORO for the Deep River DWS.

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

  The operating authority identifies/designates several operators as operators in charge (OIC) for the Deep River DWS. All OICs hold valid operator certificates and clearly identify themselves in the log book.

- **All operators possessed the required certification.**

  The inspector examined copies of original operator certificates for all personnel involved with the day-to-day operation of the Deep River DWS, verified the information against an operator certification database maintained by the Ontario Water Wastewater Certification Office (OWWCO), and found that all Water Systems Division operators held valid water treatment subsystem and/or water distribution and supply subsystem, or water distribution subsystem operator certificates.

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

  The inspector reviewed the facility logbooks for the inspection period and found that only certified operators made changes to the treatment processes and adjustments to the treatment equipment.

Water Quality Monitoring

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

  The Town of Deep River DWS supplies drinking water to the Deep River Water Distribution System, serving a population of 4,100.

  Based on a self reported population of approximately 4,100 people, at least 12 distribution samples must be taken each month, with at least one of the samples being taken each week, and tested for E. coli, and total coliforms, and at least 25% of all samples taken in each week tested for general bacteria population expressed as heterotrophic plate count (HPC).

  The inspector reviewed microbiological sampling, and testing records available for the inspection period for the distribution system and found that the regulatory requirements were met.

Water Quality Monitoring

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

  In the case of the Deep River DWS, where there is a single point of entry into the distribution system, one sample must be taken each week from the point where water enters the distribution system, and tested for E. coli, total coliforms, and HPC.

  The inspector reviewed microbiological sampling and testing records for the inspection period and found that one treated water sample was taken each week and submitted to a licensed laboratory for testing for E. coli, total coliforms, and HPC.

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

  The inspector reviewed chemical sampling and testing records for the inspection period and observed that water samples were taken on January 07, 2020, from the point where water enters the distribution system at the Deep River WTP and tested for the inorganic parameters listed in Schedule 23 to O. Reg. 170/03.

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

  The inspector reviewed chemical sampling and testing records for the inspection period and observed that water samples were taken on January 7, 2020, from the point where water enters the distribution system at the Deep River WTP and tested for the organic parameters listed in Schedule 24 to O. Reg. 170/03.

- **All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.**

  Effective January 1, 2017, new requirements came into effect for sampling and testing of haloacetic acids (a disinfection by-product of chlorination) in distribution samples during each calendar quarter.

  The inspector reviewed chemical sampling and testing records for the inspection period and observed that water samples were taken on January 7, April 7, July 7 and October 6, 2020, and submitted to a licensed laboratory for testing for haloacetic acids.

  The test results for the four (4) calendar quarters for the inspection period indicated haloacetic acids were present in concentration ranging from 32 to 71.4 micrograms per litre (ug/L). A new Ontario Drinking Water Quality Standard for haloacetic acids of 80 ug/L based on a running annual average concentration of quarterly results comes into effect on January 1, 2020.

  The running annual average haloacetic acid concentration for the inspection period was 46.4 ug/L.

- **All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.**

  THM sampling is required every three (3) months from a point in the distribution system that is likely to have elevated THM levels (ie. the farthest point) under Schedule 13-6. The inspector reviewed chemical sampling and testing records for the inspection period and observed that water samples were taken on January 7, April 7, July 7 and September 11, 2020. These samples were submitted to a licensed laboratory for testing for trihalomethane (THM) testing.

  The Ontario Drinking Water Quality Standard (ODWQS or the "Standard") for THMs is 100 ug/L based on a moving average of four quarterly sampling periods.

  The running annual average for THM during the inspection period was 91.78 ug/L.

Water Quality Monitoring

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

  The inspector reviewed records for the inspection period and found that samples were taken on January 8, April 7, July 7 and October 6, 2020, from the point where water enters the distribution system at the Deep River WTP and submitted to a licensed laboratory for nitrate and nitrite testing.

  The Standard for nitrate is 10 milligrams per litre (mg/L), and the Standard for nitrite is 1.0 mg/L. The nitrate concentration in the samples taken during the inspection period ranged from 0.16 to 0.22 mg/L. All nitrite sample results were equal to 0.1 mg/L.

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

  The inspector reviewed records for the inspection period and found that samples were taken at a minimum every 60 months, from the point where the treated water enters the distribution system at the Deep River WTP and submitted to a licensed laboratory for testing for sodium.

  During the inspection review period, no sodium samples were collected. The previous sample was collected on January 9, 2018. Sodium sampling is required again in 2023.

- **The required daily samples were being taken at the end of the fluoridation process.**

  Fluoride concentration is continuously monitored using a HACH brand, model CA610 continuous fluoride analyser and/or grab sampling once per day. Upon physical inspection, the fluoride analyser displayed a result of 0.06 mg/L.

  Additionally, operators perform daily grab samples for in-house analysis on weekdays (Monday-Friday). According to information reviewed for the inspection period, the fluoride concentration ranged between 0.47 and 0.5 mg/L.

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

  The inspector examined records for the inspection period and observed that free chlorine residual test results were taken at the same time and locations that microbiological samples were obtained and were recorded on laboratory Sample Submission and Chain of Custody Forms. The free chlorine residual test results were also transcribed by the licensed laboratory on to the Reports of Analysis for the microbiological samples.

Water Quality Assessment

- **Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

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 RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

Not Applicable

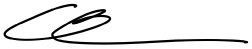
SIGNATURES

Inspected By: Karine Bourgon

Signature: (Provincial Officer)

Reviewed & Approved By: Charlie Primeau

Signature: (Supervisor)



Review & Approval Date: 01/24/2021

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

INSPECTION RATING RECORD AND METHODOLOGY

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2020-2021)

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:	November 18, 2020
Ministry Office:	Ottawa District

Maximum Question Rating: 440

Inspection Module	Non-Compliance Rating
Source	0 / 0
Capacity Assessment	0 / 30
Treatment Processes	0 / 81
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 42
Water Quality Monitoring	0 / 112
Treatment Process Monitoring	0 / 133
TOTAL	**0 / 440**

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 09-FEB-21 (Inspection ID: 1-NWTZG).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2020-2021)

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:	November 18, 2020
Ministry Office:	Ottawa District

Maximum Question Rating: 440

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 09-FEB-21 (Inspection ID: 1-NWTZG).

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 and associated regulations. 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 has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. 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.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

PIBS 6797e

Ontario

The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question 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.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. 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 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**.

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

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 regulatory inspection question is derived from an evaluation of every identified 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 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 related to regulatory compliance and input their "yes", "no" or "not applicable" responses 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).

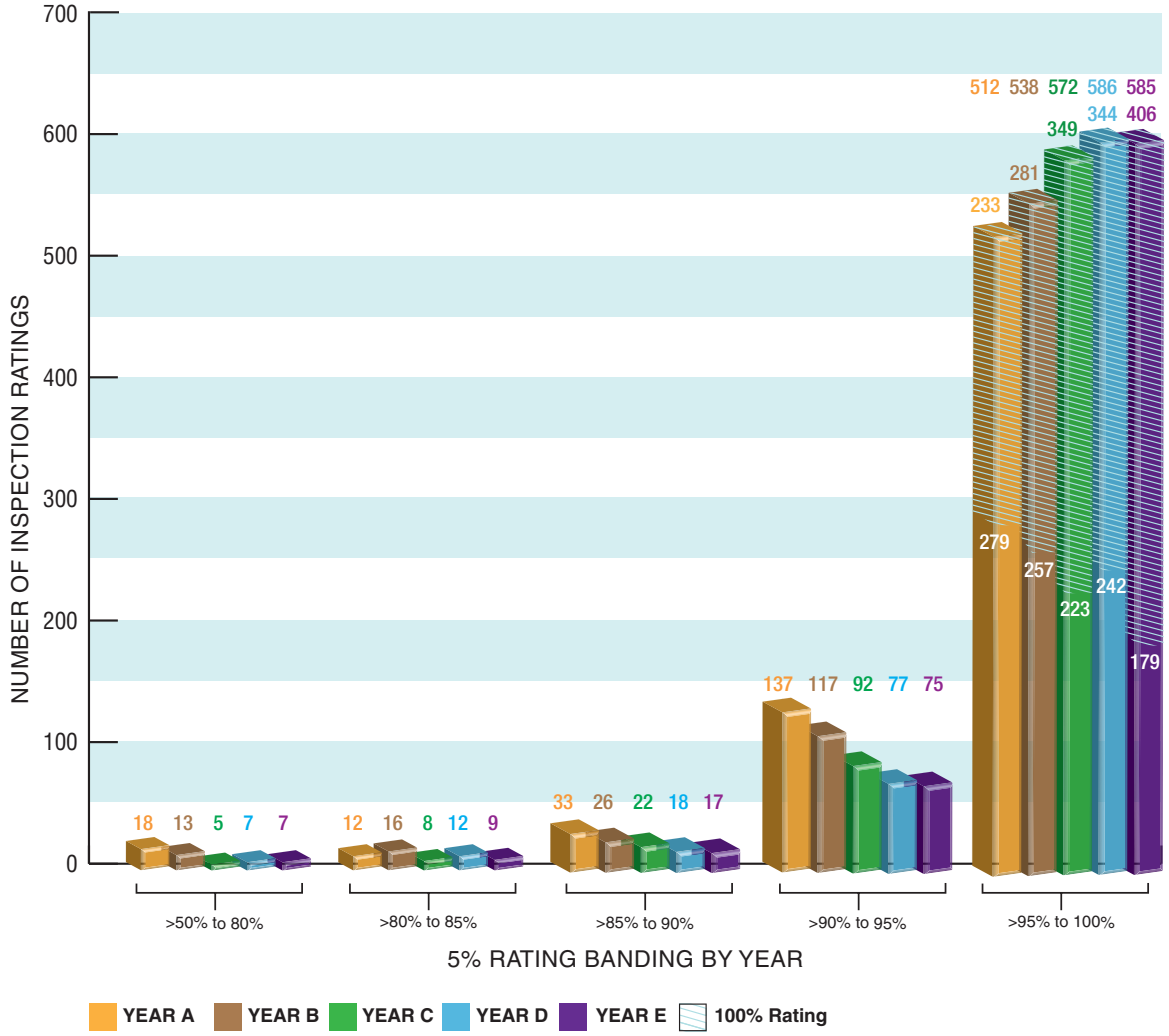
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 15 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

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

For further information, please visit **www.ontario.ca/drinkingwater**

APPENDIX B

DRINKING WATER LICENCE AND WORKS PERMIT

Ontario

MUNICIPAL DRINKING WATER LICENCE

Licence Number: 189-101
Issue Number: 3

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 municipal drinking water licence 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

100 River Road
Deep River Box 400
ON

For the following municipal residential drinking water system:

Deep River Drinking Water System

This municipal drinking water licence includes the following:

Schedule	Description
Schedule A	Drinking Water System Information
Schedule B	General Conditions
Schedule C	System-Specific Conditions
Schedule D	Conditions for Relief from Regulatory Requirements
Schedule E	Pathogen Log Removal/Inactivation Credits

DATED at TORONTO this 2nd day of May, 2017

Signature

Aziz Ahmed, P.Eng.
Director
Part V, *Safe Drinking Water Act*, 2002

Schedule A: Drinking Water System Information

System Owner	**Deep River, The Corporation of the Town of**
Licence Number	**189-101**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule A Issue Date	**May 2nd, 2017**

The following information is applicable to the above drinking water system and forms part of this licence:

Licence

Licence Issue Date	January 13, 2016
Licence Expiry Date	January 12, 2021
Application for Licence Renewal Date	July 12, 2020

Drinking Water Works Permit

Drinking Water System Name	Permit Number	Issue Date
Deep River Drinking Water System	189-201	January 13, 2016

Permits to Take Water

Water Taking Location	Permit Number	Issue Date
Deep River Water Treatment Plant	8528-9ECQPJ	2013/12/17

Financial Plans

The Financial Plan Number for the Financial Plan required to be developed for this drinking water system in accordance with O. Reg. 453/07 shall be:	189-301
Alternately, if one Financial Plan is developed for all drinking water systems owned by the owner, the Financial Plan Number shall be:	189-301A

Accredited Operating Authority

Drinking Water System or Operational Subsystems	Accredited Operating Authority	Operational Plan No.	Operating Authority No.
Deep River Water Treatment Plant	Ontario Clean Water Agency	189-401	189-OA2
Deep River Distribution System	Ontario Clean Water Agency	189-401A	189-OA2

Schedule B: General Conditions

System Owner	**Deep River, The Corporation of the Town of**
Licence Number	**189-101**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule B Issue Date	**May 2nd, 2017**

1.0 Definitions

1.1 Words and phrases not defined in this licence and the associated drinking water works permit shall be given the same meaning as those set out in the SDWA and any regulations made in accordance with that act, unless the context requires otherwise.

1.2 In this licence and the associated drinking water works permit:

"**adverse effect**", "**contaminant**" and "**natural environment**" shall have the same meanings as in the EPA;

"**alteration**" may include the following in respect of this drinking water system:

(a) An addition to the system,
(b) A modification of the system,
(c) A replacement of part of the system, and
(d) An extension of the system;

"**compound of concern**" means a contaminant that, based on generally available information, may be emitted from a component of the drinking water system to the atmosphere in a quantity that is significant either in comparison to the relevant point of impingement limit or if a point of impingement limit is not available for the compound, then based on generally available toxicological information, the compound has the potential to cause an adverse effect as defined by the EPA at a point of impingement;

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

"**drinking water works permit**" means the drinking water works permit for the drinking water system, as identified in Schedule A of this licence and as amended from time to time;

"emission summary table" means the table that was prepared by a Professional Engineer in accordance with O. Reg. 419/05 and the procedure document listing the appropriate point of impingement concentrations of each compound of concern emitted from a component of the drinking water system and providing comparison to the corresponding point of impingement limit;

"EPA" means the *Environmental Protection Act*, R.S.O. 1990, c. E.19;

"**financial plan**" means the financial plan required by O. Reg. 453/07;

"**licence**" means this municipal drinking water licence for the municipal drinking water system identified in Schedule A of this licence;

"**operational plan**" means an operational plan developed in accordance with the Director's Directions – Minimum Requirements for Operational Plans made under the authority of subsection 15(1) of the SDWA;

"**owner**" means the owner of the drinking water system as identified in Schedule A of this licence;

"**permit to take water**" means the permit to take water that is associated with the taking of water for purposes of the operation of the drinking water system, as identified in Schedule A of this licence and as amended from time to time;

"**point of impingement**" means any point in the natural environment that is not on the same property as the source of the contaminant and as defined by section 2 of O. Reg. 419/05;

"**point of impingement limit**" means the appropriate standard from Schedule 1, 2 or 3 of O. Reg. 419/05 and if a standard is not provided for a compound of concern, the appropriate criteria listed in the Ministry of the Environment and Climate Change publication titled "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)", dated February 2008, as amended;

"**procedure document**" means the Ministry of the Environment and Climate Change procedure titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July 2005, as amended;

"**Professional Engineer**" means a Professional Engineer who has been licenced to practice in the Province of Ontario;

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

"**publication NPC-300**" means the Ministry of the Environment and Climate Change publication titled "Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning" dated August 2013, as amended;

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

"**sensitive populations**" means any one or a combination of the following locations where the health effects of nitrogen oxides emissions from emergency generators shall be considered using the point of impingement limit instead of the Ministry of the Environment and Climate Change screening level for emergency generators:

(a) health care units (e.g., hospitals and nursing homes),
(b) primary/junior public schools,
(c) day-care facilities, and
(d) playgrounds;

"**subsystem**" has the same meaning as in Ontario Regulation 128/04 (Certification of Drinking Water System Operators and Water Quality Analysts);

"**surface water**" means water bodies (lakes, wetlands, ponds - including dug-outs), water courses (rivers, streams, water-filled drainage ditches), infiltration trenches, and areas of seasonal wetlands;

2.0 Applicability

2.1 In addition to any other requirements, the drinking water system identified above shall be established, altered and operated in accordance with the conditions of the drinking water works permit and this licence.

3.0 Licence Expiry

3.1 This licence expires on the date identified as the licence expiry date in Schedule A of this licence.

4.0 Licence Renewal

4.1 Any application to renew this licence shall be made on or before the date identified as the application for licence renewal date set out in Schedule A of this licence.

5.0 Compliance

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

6.0 Licence and Drinking Water Works Permit Availability

6.1 At least one copy of this licence and the drinking water works permit shall be stored in such a manner that they are readily viewable by all persons involved in the operation of the drinking water system.

7.0 Permit to Take Water and Drinking Water Works Permit

7.1 A permit to take water identified in Schedule A of this licence is the applicable permit on the date identified as the Schedule A Issue Date.

7.2 A drinking water works permit identified in Schedule A of this licence is the applicable permit on the date identified as the Schedule A Issue Date.

8.0 Financial Plan

8.1 For every financial plan prepared in accordance with subsections 2(1) and 3(1) of O. Reg. 453/07, the owner of the drinking water system shall:

8.1.1 Ensure that the financial plan contains on the front page of the financial plan, the appropriate financial plan number as set out in Schedule A of this licence; and

8.1.2 Submit a copy of the financial plan to the Ministry of Municipal Affairs and Housing within three (3) months of receiving approval by a resolution of municipal council or the governing body of the owner.

9.0 Interpretation

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

9.1.1 The SDWA*;*

9.1.2 A condition imposed in this licence that explicitly overrides a prescribed regulatory requirement;

9.1.3 A condition imposed in the drinking water works permit that explicitly overrides a prescribed regulatory requirement;

9.1.4 Any regulation made under the SDWA;

9.1.5 Any provision of this licence that does not explicitly override a prescribed regulatory requirement;

9.1.6 Any provision of the drinking water works permit that does not explicitly override a prescribed regulatory requirement;

9.1.7 Any application documents listed in this licence, or the drinking water works permit from the most recent to the earliest; and

9.1.8 All other documents listed in this licence, or the drinking water works permit from the most recent to the earliest.

9.2 If any requirement of this licence or the drinking water works permit is found to be invalid by a court of competent jurisdiction, the remaining requirements of this licence and the drinking water works permit shall continue to apply.

9.3 The issuance of and compliance with the conditions of this licence and the drinking water works permit does not:

9.3.1 Relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including the *Environmental Assessment Act*, R.S.O. 1990, c. E.18; and

9.3.2 Limit in any way the authority of the appointed Directors and provincial officers of the Ministry of the Environment and Climate Change to require certain steps be taken or to require the owner to furnish any further information related to compliance with the conditions of this licence or the drinking water works permit.

9.4 For greater certainty, nothing in this licence or the drinking water works permit shall be read to provide relief from regulatory requirements in accordance with section 46 of the SDWA, except as expressly provided in the licence or the drinking water works permit.

10.0 Adverse Effects

10.1 Nothing in this licence or the drinking water works permit shall be read as to permit:

10.1.1 The discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or

10.1.2 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.

10.2 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.

10.3 Fulfillment of one or more conditions imposed by this licence or the drinking water works permit does not eliminate the requirement to fulfill any other condition of this licence or the drinking water works permit.

11.0 Change of Owner or Operating Authority

11.1 This licence is not transferable without the prior written consent of the Director.

11.2 The owner shall notify the Director in writing at least 30 days prior to a change of any operating authority identified in Schedule A of this licence.

11.2.1 Where the change of operating authority is the result of an emergency situation, the owner shall notify the Director in writing of the change as soon as practicable.

12.0 Information to be Provided

12.1 Any information requested by a Director or a provincial officer concerning the drinking water system and its operation, including but not limited to any records required to be kept by this licence or the drinking water works permit, shall be provided upon request.

13.0 Records Retention

13.1 Except as otherwise required in this licence or the drinking water works permit, any records required by or created in accordance with this licence or the drinking water works permit, other than the records specifically referenced in section 12 of O. Reg. 170/03, shall be retained for at least 5 years and made available for inspection by a provincial officer, upon request.

14.0 Chemicals and Materials

14.1 All chemicals and materials used in the alteration or 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, NSF/61 and NSF/372.

14.1.1 In the event that the standards are updated, the owner may request authorization from the Director to use any on hand chemicals and materials that previously met the applicable standards.

14.1.2 The requirement for the owner to comply with NSF/372 shall come into force no later than January 30, 2018.

14.2 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 ("ANSI") 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.

14.3 Conditions 14.1 and 14.2 do not apply in the case of the following:

14.3.1 Water pipe and pipe fittings meeting AWWA specifications made from ductile iron, cast iron, PVC, fibre and/or steel wire reinforced cement pipe or high density polyethylene (HDPE);

14.3.2 Articles made from stainless steel, glass, HDPE or Teflon®;

14.3.3 Cement mortar for watermain lining and for water contacting surfaces of concrete structures made from washed aggregates and Portland cement;

14.3.4 Gaskets that are made from NSF approved materials;

14.3.5 Food grade oils and lubricants, food grade anti-freeze, and other food grade chemicals and materials that are compatible for drinking water use; or

14.3.6 Any particular chemical or material where the owner has written documentation signed by the Director that indicates that the Ministry of the Environment and Climate Change is satisfied that the chemical or material is acceptable for use within the drinking water system and the chemical or material is only used as permitted by the documentation.

15.0 Drawings

15.1 All drawings and diagrams in the possession of the owner that show any treatment subsystem as constructed shall be retained by the owner unless the drawings and diagrams are replaced by a revised or updated version showing the subsystem as constructed subsequent to the alteration.

15.2 Any alteration to any treatment subsystem shall be incorporated into process flow diagrams, process and instrumentation diagrams, and record drawings and diagrams within one year of the substantial completion of the alteration.

15.3 Process flow diagrams and process and instrumentation diagrams for any treatment subsystem shall be kept in a place, or made available in such a manner, that they may be readily viewed by all persons responsible for all or part of the operation of the drinking water system.

16.0 Operations and Maintenance Manual

16.1 An up-to-date operations and maintenance manual or manuals shall be maintained and applicable parts of the manual or manuals shall be made available for reference by all persons responsible for all or part of the operation or maintenance of the drinking water system.

16.2 The operations and maintenance manual or manuals, shall include at a minimum:

16.2.1 The requirements of this licence and associated procedures;

16.2.2 The requirements of the drinking water works permit for the drinking water system;

16.2.3 A description of the processes used to achieve primary and secondary disinfection within the drinking water system, including where applicable:

a) A copy of the CT calculations that were used as the basis for primary disinfection under worst case operating conditions; and

b) The validated operating conditions for UV disinfection equipment, including a copy of the validation certificate;

16.2.4 Procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water system;

16.2.5 Procedures for the operation and maintenance of monitoring equipment;

16.2.6 Contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown;

16.2.7 Procedures for 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;

16.3 Procedures necessary for the operation and maintenance of any alterations to the drinking water system shall be incorporated into the operations and maintenance manual or manuals prior to those alterations coming into operation.

16.4 The operations and maintenance manual or manuals shall be updated within three months of any change to the treatment process that results in a change to the CT calculations.

16.5 The requirement for the owner to comply with condition 16.2.3 shall come into force on July 30, 2016.

Schedule C: System-Specific Conditions

System Owner	**Deep River, The Corporation of the Town of**
Licence Number	**189-101**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule C Issue Date	**May 2nd, 2017**

1.0 System Performance

Rated Capacity

1.1 For each treatment subsystem listed in column 1 of Table 1, the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed the value identified as the rated capacity in column 2 of the same row.

Table 1: Rated Capacity

Column 1 Treatment Subsystem Name	Column 2 Rated Capacity (m^3/day)
Deep River Water Treatment Plant	13,638

Maximum Flow Rates

1.2 For each treatment subsystem listed in column 1 of Table 2, the maximum flow rate of water that flows into a treatment subsystem component listed in column 2 shall not exceed the value listed in column 3 of the same row.

Table 2: Maximum Flow Rates

Column 1 Treatment Subsystem Name	Column 2 Treatment Subsystem Component	Column 3 Maximum Flow Rate (L/s)
Not Applicable	Not Applicable	Not Applicable

1.3 Despite conditions 1.1 and 1.2, a treatment subsystem may be operated temporarily at a maximum daily volume and/or a maximum flow rate above the values set out in column 2 of Table 1 and column 3 of Table 2 respectively for the purposes of fighting a large fire or for the maintenance of the drinking water system.

1.4 Condition 1.3 does not authorize the discharge into the distribution system of any water that does not meet all of the requirements of this licence and all other regulatory requirements, including compliance with the Ontario Drinking Water Quality Standards.

Residue Management

1.5 In respect of an effluent discharged into the natural environment from a treatment subsystem or treatment subsystem component listed in column 1 of Table 3:

1.5.1 The annual average concentration of a test parameter identified in column 2 shall not exceed the value in column 3 of the same row; and

1.5.2 The maximum concentration of a test parameter identified in column 2 shall not exceed the value in column 4 of the same row.

Table 3: Residue Management

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Annual Average Concentration (mg/L)	Column 4 Maximum Concentration (mg/L)
Deep River Water Treatment Plant	Suspended Solids	25	Not Applicable

UV Disinfection Equipment Performance

1.6 For each treatment subsystem or treatment subsystem component listed in column 1 of Table 4, and while directing water to the distribution system:

1.6.1 The UV disinfection equipment shall be operated such that a continuous pass-through UV dose is maintained throughout the life time of the UV lamp(s) that is at least the minimum continuous pass-through UV dose set out in column 2 of the same row at the maximum design flow rate for the equipment;

1.6.2 In addition to any other sampling, analysis and recording that may be required, the ultraviolet light disinfection equipment shall test for the test parameters set out in column 4 of the same row at a testing frequency of once every five (5) minutes or less and record the test data at a recording frequency of once every four (4) hours or less;

1.6.3 If there is a UV disinfection equipment alarm, the test parameters set out in column 4 of the same row shall be recorded at a recording frequency of once every five minutes or less until the alarm condition has been corrected;

1.6.4 A monthly summary report shall be prepared at the end of each calendar month which sets out the time, date and duration of each UV equipment alarm, the volume of water treated during each alarm period and the actions taken by the operating authority to correct the alarm situation;

Table 4: UV Disinfection Equipment			
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	**Column 2 Minimum Continuous Pass-Through UV Dose (mJ/cm^2)**	**Column 3 Control Strategy**	**Column 4 Test Parameter**
Not Applicable	Not Applicable	Not Applicable	Not Applicable

2.0 Flow Measurement and Recording Requirements

2.1 For each treatment subsystem identified in column 1 of Table 1 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:

2.1.1 The flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system.

2.1.2 The flow rate and daily volume of water that flows into the treatment subsystem.

2.2 For each treatment subsystem component identified in column 2 of Table 2 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for the flow rate and daily volume of water that flows into the treatment subsystem component.

2.3 Where a rated capacity from Table 1 or a maximum flow rate from Table 2 is exceeded, the following shall be recorded:

2.3.1 The difference between the measured amount and the applicable rated capacity or maximum flow rate specified in Table 1 or Table 2;

2.3.2 The time and date of the measurement;

2.3.3 The reason for the exceedance; and

2.3.4 The duration of time that lapses between the applicable rated capacity or maximum flow rate first being exceeded and the next measurement where the applicable rated capacity or maximum flow rate is no longer exceeded.

3.0 Calibration of Flow Measuring Devices

3.1 All flow measuring devices that are required by regulation, by a condition in the Drinking Water Works Permit, or by a condition otherwise imposed by the Ministry of the Environment and Climate Change, shall be checked and calibrated in accordance with the manufacturer's instructions.

3.2 If the manufacturer's instructions do not indicate how often to check and calibrate a flow measuring device, the equipment shall be checked and calibrated at least once every 12 months during which the drinking water system is in operation.

3.2.1 For greater certainty, if condition 3.2 applies, the equipment shall be checked and calibrated not more than 30 days after the first anniversary of the day the equipment was checked and calibrated in the previous 12-month period.

4.0 Additional Sampling, Testing and Monitoring

Drinking Water Health and Non-Health Related Parameters

4.1 For each treatment subsystem or treatment subsystem component identified in column 1 of Tables 5 and 6 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 at the sampling frequency listed in column 3 and at the monitoring location listed in column 4 of the same row.

Table 5: Drinking Water Health Related Parameters

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Table 6: Drinking Water Non-Health Related Parameters

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Environmental Discharge Parameters

4.2 For each treatment subsystem or treatment subsystem component identified in column 1 of Table 7 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 using the sample type identified in column 3 at the sampling frequency listed in column 4 and at the monitoring location listed in column 5 of the same row.

4.3 For the purposes of Table 7:

4.3.1 Manual Composite means the mean of at least three grab samples taken during a discharge event, with one sample being taken immediately following the commencement of the discharge event, one sample being taken approximately at the mid-point of the discharge event and one sample being taken immediately before the end of the discharge event; and

4.3.2 Automated Composite means samples must be taken during a discharge event by an automated sampler at a minimum sampling frequency of once per hour.

4.4 Any sampling, testing and monitoring for the test parameter Total Suspended Solids shall be performed in accordance with the requirements set out in the publication "Standard Methods for the Examination of Water and Wastewater", 21st Edition, 2005, or as amended from time to time by more recently published editions.

Table 7: Environmental Discharge Parameters

Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sample Type	Column 4 Sampling Frequency	Column 5 Monitoring Location
Deep River Water Treatment Plant	Suspended Solids	Composite	Monthly	Effluent pipe discharging to Ottawa River

4.5 Pursuant to Condition 10 of Schedule B of this licence, the owner may undertake the following environmental discharges associated with the maintenance and/or repair of the drinking water system:

4.5.1 The discharge of potable water from a watermain to a road or storm sewer;

4.5.2 The discharge of potable water from a water storage facility or pumping station:

4.5.2.1 To a road or storm sewer; or

4.5.2.2 To a watercourse where the discharge has been dechlorinated and if necessary, sediment and erosion control measures have been implemented.

4.5.3 The discharge of dechlorinated non-potable water from a watermain, water storage facility or pumping station to a road or storm sewer;

4.5.4 The discharge of raw water from a groundwater well to the environment where if necessary, sediment and erosion control measures have been implemented; and

4.5.5 The discharge of raw water, potable water or non-potable water from a treatment subsystem to the environment where if necessary, the discharge has been dechlorinated and sediment and erosion control measures have been implemented.

5.0 Studies Required

5.1 Not applicable

6.0 Source Protection

6.1 Not applicable

Schedule D: Conditions for Relief from Regulatory Requirements

System Owner	**Deep River, The Corporation of the Town of**
Licence Number	**189-101**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule D Issue Date	**May 2nd, 2017**

1.0 Lead Regulatory Relief

1.1 Any relief from regulatory requirements previously authorized by the Director in respect of the drinking water system under section 38 of the SDWA in relation to the sampling, testing or monitoring requirements contained in Schedule 15.1 of O. Reg. 170/03 shall remain in force until such time as Schedule 15.1 of O. Reg. 170/03 is amended after June 1, 2009.

2.0 Other Regulatory Relief

Not applicable

Schedule E: Pathogen Log Removal/Inactivation Credits

System Owner	**Deep River, The Corporation of the Town of**
Licence Number	**189-101**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule E Issue Date	**May 2nd, 2017**

1.0 Primary Disinfection Pathogen Log Removal/Inactivation Credits

Deep River Water Treatment Plant

Deep River [SURFACE WATER]

Minimum Log Removal/ Inactivation Required	Cryptosporidium Oocysts	Giardia Cysts [a]	Viruses [b]
Deep River Water Treatment Plant	2	3	4

[a] At least 0.5 log inactivation of Giardia shall be achieved by the disinfection portion of the overall water treatment process.
[b] At least 2 log inactivation of viruses shall be achieved by disinfection.

Log Removal/Inactivation Credits Assigned [c]	Cryptosporidium Oocysts	Giardia Cysts	Viruses
Conventional Filtration	2	2.5	2
Chlorination [CT]	-	0.5+	2+

[c] Log removal/inactivation credit assignment is based on each treatment process being fully operational and the applicable log removal/inactivation credit assignment criteria being met.

Treatment Component	Log Removal/Inactivation Credit Assignment Criteria
Conventional Filtration	1. A chemical coagulant shall be used at all times when the treatment plant is in operation; 2. Chemical dosages shall be monitored and adjusted in response to variations in raw water quality; 3. Effective backwash procedures shall be maintained including filter-to-waste or an equivalent procedure during filter ripening to ensure that effluent turbidity requirements are met at all times; 4. Filtrate turbidity shall be continuously monitored from each filter; and 5. Performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month shall be met for each filter.
Chlorination	1. Sampling and testing for free chlorine residual shall be carried out by continuous monitoring equipment in the treatment process at or near a location where the intended contact time has just been completed in accordance with the Ministry's *Procedure for Disinfection of Drinking Water in Ontario*; and 2. At all times, CT provided shall be greater than or equal to the CT required to achieve the log removal credits assigned.
Primary Disinfection Notes	

Ontario

DRINKING WATER WORKS PERMIT

Permit Number: 189-201
Issue Number: 3

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 drinking water works permit 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

100 Deep River Road
Box 400
Deep River, ON K0J 1P0

For the following municipal residential drinking water system:

Deep River Drinking Water System

This drinking water works permit includes the following:

Schedule	Description
Schedule A	Drinking Water System Description
Schedule B	General
Schedule C	All documents issued as Schedule C to this drinking water works permit which authorize alterations to the drinking water system
Schedule D	Process Flow Diagrams

DATED at TORONTO this 3rd day of May, 2019

Signature

Aziz Ahmed, P.Eng.
Director
Part V, *Safe Drinking Water Act*, 2002

Schedule A: Drinking Water System Description

System Owner	**The Corporation of the Town of Deep River**
Permit Number	**189-201**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule A Issue Date	**May 3rd, 2019**

1.0 System Description

1.1 The following is a summary description of the works comprising the above drinking water system:

Overview

The **Deep River Drinking Water System** consists a conventional, chemically assisted water treatment plant and a distribution system serving the Town of Deep River.

Deep River Water Treatment Plant

Source	Ottawa River
Plant Location	177 River Road, County of Renfrew
UTM Coordinates	(NAD 83: UTM Zone 18: 307335.00 m E., 5109295.00 m N.)
Notes	

Low Lift Works

Intake Crib

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

Low Lift Pumping Station

Description	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
Location	(NAD 83: UTM Zone 18: 307445.00m E, 5109325.00m N)
Equipment	Three (3) Submersible Pumps (3 duty, no standby) each rated at 83.1 L/s at 25 m of TDH
Notes	raw water main from the low lift pumping station to the water treatment plant

Treatment Plant

Mixing

Description	an in-line static mixer, 300 mm diameter;
Notes	

Flocculation and Clarification

Description	three (3) package flocculation and clarification (Actiflo) units, each rated at raw water flow rate of 4,733 m^3/day, consisting of:
Equipment	• 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 one stand by) • three (3) hydrocyclones; • electrical and mechanical equipment and control.
Notes	

Filtration

Description	three (3) dual media sand anthracite filters each with a surface area of 18.9 m^2; for a total area of 56.7 m^2
Equipment	• 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.
Notes	

Treated Water Storage

Clearwells	• one (1) clearwell with a capacity of 1,364 m^3; • one (1) clearwell with a capacity of 1,507 m^3;
Pump Wells	• one (1) pump well with a capacity of 90 m^3; • one (1) pump well with a capacity of 110 m^3
Notes	

High Lift Pumps

Description	four (4) vertical turbine high lift pumps, (one duty, three standby) each rated at 87 L/s at a TDH of 82 m.
Notes	Rotated by hours (lowest hours start first).

Disinfection System

Description	A gaseous chlorine disinfection system consisting of One (1) bank and four (4) weigh scales in Operation;
	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;
Notes	

Chemical Storage and Feed Systems

Coagulant	Primary Coagulant feed system consisting of one (1) 51,200 L capacity liquid coagulant, one (1) 6,600 L day tank and two (2) (one duty, one standby) chemical feed metering pumps each with a capacity of 80 L/hr;
pH Adjustment	pH/Alkalinity Adjustment consisting of one (1) 51,200 L capacity liquid caustic soda tank, one (1) 3,400 L day tank 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	Coagulant aid for the water treatment clarifiers – two (2) dry polymer preparation systems consisting of two (2) 3,400 L dissolving tanks with mixer; four (4) (three duty, one standby) chemical feed metering pumps with a flow capacity of 45 L/hr each and chemical feed lines to the three package treatment units injection chambers;
Wastewater Coagulant Aid	Coagulant aid for the wastewater clarifier consisting of two (2) dry polymer preparation system consisting of 3,400 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 one (1) dry polymer preparation systems each consisting of 3,400 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;
	Dechlorination chemical 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;
Fluoridation	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;
Notes	

Instrumentation and Controls

Turbidity	• one (1) continuous turbidity monitor located on the inlet header to the water treatment plant; • three (3) continuous turbidity monitors located on the clarifier discharge; • three (3) continuous turbidity monitors located on the filter discharge;
pH	• one (1) continuous pH monitor located on raw water feed to clarifiers after static mixer;
Chlorine	• one (1) continuous chlorine analyzer located at the beginning of clearwell #1 after pre-chlorination. • one (1) continuous chlorine analyzer located at the end of clearwell #2 as water enters the high lift pump well. • one (1) continuous chlorine analyzer located on the distribution header before water enters the distribution system.
Fluoride	• one (1) continuous fluoride ion analyzer located on the distribution header.
SCADA	SCADA system connected to all project PLCs, with supervising personnel computer located in the office of the water treatment plant building.
Notes	

Residue Management Facility (Wastewater Treatment)

Description	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 (Not in use);
	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;
Notes	

Standby Power

Description	One (1) standby 600 kW diesel generator complete with 1,500 L fuel storage tank to run the generator for 24 hours under full load;
	One (1) standby 113 kW diesel generator complete with 1,135 L fuel storage tank at the booster pumping station.
Notes	

Storage Reservoir

Description	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.
Notes	

Booster Pumping Station

Description	Booster Pumping Station located at 41 Balmer Bay Road
	• Three (3) horizontal pumps each rated at 26 Lis at 69. 7m TDH; • Two (2) chemical feed pumps; • One (1) 338 L storage tank for the re-chlorination system; • Two (2) HACH 17 chlorine meters, one (1) located on the watermain entering the Booster Pumping Station and one (1) on watermain leaving the Booster Pumping.
Notes	

Watermains

1.2 Watermains within the distribution system comprise:

1.2.1 Watermains that have been set out in each document or file identified in column 1 of Table 1.

Table 1: Watermains

Column 1 Document or File Name	Column 2 Date
Town of Deep River Distribution Map	September, 2015

1.2.2 Watermains that have been added, modified, replaced or extended further to the provisions of Schedule C of this drinking water works permit on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

Schedule B: General

System Owner	**Deep River, The Corporation of the Town of**
Permit Number	**189-201**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule B Issue Date	**May 3rd, 2019**

1.0 Applicability

1.1 In addition to any other requirements, the drinking water system identified above shall be altered and operated in accordance with the conditions of this drinking water works permit and the licence.

1.2 The definitions and conditions of the licence shall also apply to this drinking water works permit.

2.0 Alterations to the Drinking Water System

2.1 Any document issued by the Director as a Schedule C to this drinking water works permit shall provide authority to alter the drinking water system in accordance, where applicable, with the conditions of this drinking water works permit and the licence.

2.2 All Schedule C documents issued by the Director for the drinking water system shall form part of this drinking water works permit.

2.3

All parts of the drinking water system in contact with drinking water which are:

2.3.1 Added, modified, replaced, extended; or

2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination,

shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:

a) The ministry's Watermain Disinfection Procedure, effective June 1, 2016;
b) AWWA C652 – Standard for Disinfection of Water-Storage Facilities;
c) AWWA C653 – Standard for Disinfection of Water Treatment Plants; and
d) AWWA C654 – Standard for Disinfection of Wells.

2.4 The owner shall notify the Director within thirty (30) days of the placing into service or the completion of any addition, modification, replacement or extension of the drinking water system which had been authorized through:

2.4.1 Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;

2.4.2 Any Schedule C to this drinking water works permit respecting works other than watermains; or

2.4.3 Any approval issued prior to the issue date of the first drinking water works permit respecting works other than watermains which were not in service at the time of the issuance of the first drinking water works permit.

2.5 For greater certainty, the notification requirements set out in condition 2.4 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

2.5.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03;

2.5.2 Constitutes maintenance or repair of the drinking water system; or

2.5.3 Is a watermain authorized by condition 3.1 of Schedule B of this drinking water works permit.

2.6 The owner shall notify the legal owner of any part of the drinking water system that is prescribed as a municipal drinking water system by section 2 of O. Reg. 172/03 of the requirements of the licence and this drinking water works permit as applicable to the prescribed system.

2.7 For greater certainty, any alteration to the drinking water system made in accordance with this drinking water works permit may only be carried out after other legal obligations have been complied with including those arising from the *Environmental Assessment Act*, *Niagara Escarpment Planning and Development Act*, *Oak Ridges Moraine Conservation Act, 2001* and *Greenbelt Act, 2005*.

3.0 Watermain Additions, Modifications, Replacements and Extensions

3.1 The drinking water system may be altered by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:

3.1.1 The design of the watermain addition, modification, replacement or extension:

a) Has been prepared by a Professional Engineer;

b) Has been designed only to transmit water and has not been designed to treat water;

c) Satisfies the design criteria set out in the Ministry of the Environment and Climate Change publication “Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – June 2012”, as amended from time to time; and

d) Is consistent with or otherwise addresses the design objectives contained within the Ministry of the Environment and Climate Change publication “Design Guidelines for Drinking Water Systems, 2008”, as amended from time to time.

3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.

3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.

3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.

3.1.6 The owner of the drinking water system consents in writing to the watermain addition, modification, replacement or extension.

3.1.7 A Professional Engineer has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.

3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.

3.2 The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:

3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;

3.2.2 Has a nominal diameter greater than 750 mm;

3.2.3 Results in the fragmentation of the drinking water system; or

3.2.4 Connects to another drinking water system, unless:

a) Prior to construction, the owner of the drinking water system seeking the connection obtains written consent from the owner or owner's delegate of the drinking water system being connected to; and

b) The owner of the drinking water system seeking the connection retains a copy of the written consent from the owner or owner's delegate of the drinking water system being connected to as part of the record that is recorded and retained under condition 3.3.

3.3 The verifications required in conditions 3.1.7 and 3.1.8 shall be:

3.3.1 Recorded on "Form 1 – Record of Watermains Authorized as a Future Alteration", as published by the Ministry of the Environment and Climate Change, prior to the watermain addition, modification, replacement or extension being placed into service; and

3.3.2 Retained for a period of ten (10) years by the owner.

3.4 For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

3.4.2 Constitutes maintenance or repair of the drinking water system.

3.5 The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.

3.6 The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

4.0 Minor Modifications to the Drinking Water System

4.1 The drinking water system may be altered by adding, modifying or replacing the following components in the drinking water system:

4.1.1 Raw water pumps and treatment process pumps in the treatment system;

4.1.2 Coagulant feed systems in the treatment system, including the location and number of dosing points;

4.1.3 Valves;

4.1.4 Instrumentation and controls, including SCADA systems, and software associated with these devices;

4.1.5 Filter media, backwashing equipment and under-drains in the treatment system; or,

4.1.6 Spill containment works.

4.2 The drinking water system may be altered by adding, modifying, replacing or removing the following components in the drinking water system:

4.2.1 Treated water pumps and associated equipment;

4.2.2 Re-circulation devices within distribution system storage facilities;

4.2.3 In-line mixing equipment;

4.2.4 Chemical metering pumps and chemical handling pumps;

4.2.5 Chemical storage tanks (excluding fuel storage tanks) and associated equipment; or,

4.2.6 Measuring and monitoring devices that are not required by regulation, by a condition in the Drinking Water Works Permit, or by a condition otherwise imposed by the Ministry of the Environment and Climate Change.

4.3 The drinking water system may be altered by replacing the following:

4.3.1 Raw water piping, treatment process piping or treated water piping within the treatment subsystem;

4.3.2 Fuel storage tanks and spill containment works, and associated equipment; or

4.3.3 Coagulants and pH adjustment chemicals, where the replacement chemicals perform the same function;

a) Prior to making any alteration to the drinking water system under condition 4.3.3, the owner shall undertake a review of the impacts that the alteration might have on corrosion control or other treatment processes; and

b) The owner shall notify the Director in writing within thirty (30) days of any alteration made under condition 4.3.3 and shall provide the Director with a copy of the review.

4.4 Any alteration of the drinking water system made under conditions 4.1, 4.2 or 4.3 shall not result in:

4.4.1 An exceedance of a treatment subsystem rated capacity or a treatment subsystem component maximum flow rate as specified in the licence;

4.4.2 The bypassing of any unit process within a treatment subsystem;

4.4.3 A deterioration in the quality of drinking water provided to consumers;

4.4.4 A reduction in the reliability or redundancy of any component of the drinking water system;

4.4.5 A negative impact on the ability to undertake compliance and other monitoring necessary for the operation of the drinking water system; or

4.4.6 An adverse effect on the environment.

4.5 The owner shall verify in writing that any addition, modification, replacement or removal of drinking water system components in accordance with conditions 4.1, 4.2 or 4.3 has met the requirements of the conditions listed in condition 4.4.

4.6 The verifications and documentation required in condition 4.5 shall be:

4.6.1 Recorded on "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System", as published by the Ministry of the Environment and Climate Change, prior to the modified or replaced components being placed into service; and

4.6.2 Retained for a period of ten (10) years by the owner.

4.7 For greater certainty, the verification requirements set out in conditions 4.5 and 4.6 do not apply to any addition, modification, replacement or removal in respect of the drinking water system which:

4.7.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

4.7.2 Constitutes maintenance or repair of the drinking water system.

4.8 The owner shall update any drawings maintained for the drinking water system to reflect the modification or replacement of the works, where applicable.

5.0 Equipment with Emissions to the Air

5.1 The drinking water system may be altered by adding, modifying or replacing any of the following drinking water system components that may discharge or alter the rate or manner of a discharge of a compound of concern to the atmosphere:

5.1.1 Any equipment, apparatus, mechanism or thing that is used for the transfer of outdoor air into a building or structure that is not a cooling tower;

5.1.2 Any equipment, apparatus, mechanism or thing that is used for the transfer of indoor air out of a space used for the production, processing, repair, maintenance or storage of goods or materials, including chemical storage;

5.1.3 Laboratory fume hoods used for drinking water testing, quality control and quality assurance purposes;

5.1.4 Low temperature handling of compounds with a vapor pressure of less than 1 kilopascal;

5.1.5 Maintenance welding stations;

5.1.6 Minor painting operations used for maintenance purposes;

5.1.7 Parts washers for maintenance shops;

5.1.8 Emergency chlorine and ammonia gas scrubbers and absorbers;

5.1.9 Venting for activated carbon units for drinking water taste and odour control;

5.1.10 Venting for a stripping unit for methane removal from a groundwater supply;

5.1.11 Venting for an ozone treatment unit;

5.1.12 Natural gas or propane fired boilers, water heaters, space heaters and make-up air units with a total facility-wide heat input rating of less than 20 million kilojoules per hour, and with an individual fuel energy input of less than or equal to 10.5 gigajoules per hour; or

5.1.13 Emergency generators that fire No. 2 fuel oil (diesel fuel) with a sulphur content of 0.5 per cent or less measured by weight, natural gas, propane, gasoline or biofuel, and that are used for emergency duty only with periodic testing.

5.2 The owner shall not add, modify or replace a drinking water system component set out in condition 5.1 for an activity that is not directly related to the treatment and/or distribution of drinking water.

5.3 The emergency generators identified in condition 5.1.13 shall not be used for non-emergency purposes including the generation of electricity for sale or for peak shaving purposes.

5.4 The owner shall prepare an emission summary table for nitrogen oxide emissions only, for each addition, modification or replacement of emergency generators identified in condition 5.1.13.

Performance Limits

5.5 The owner shall ensure that a drinking water system component identified in conditions 5.1.1 to 5.1.13 is operated at all times to comply with the following limits:

5.5.1 For equipment other than emergency generators, the maximum concentration of any compound of concern at a point of impingement shall not exceed the corresponding point of impingement limit;

5.5.2 For emergency generators, the maximum concentration of nitrogen oxides at sensitive populations shall not exceed the applicable point of impingement limit, and at non-sensitive populations shall not exceed the Ministry of the Environment and Climate Change half-hourly screening level of 1880 ug/m^3 as amended; and

5.5.3 The noise emissions comply at all times with the limits set out in publication NPC-300, as applicable.

5.6 The owner shall verify in writing that any addition, modification or replacement of works in accordance with condition 5.1 has met the requirements of the conditions listed in condition 5.5.

5.7 The owner shall document how compliance with the performance limits outlined in condition 5.5.3 is being achieved, through noise abatement equipment and/or operational procedures.

5.8 The verifications and documentation required in conditions 5.6 and 5.7 shall be:

5.8.1 Recorded on “Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere”, as published by the Ministry of the Environment and Climate Change, prior to the additional, modified or replacement equipment being placed into service; and

5.8.2 Retained for a period of ten (10) years by the owner.

5.9 For greater certainty, the verification and documentation requirements set out in conditions 5.6 and 5.8 do not apply to any addition, modification or replacement in respect of the drinking water system which:

5.9.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

5.9.2 Constitutes maintenance or repair of the drinking water system.

5.10 The owner shall update any drawings maintained for the works to reflect the addition, modification or replacement of the works, where applicable.

6.0 Previously Approved Works

6.1 The owner may add, modify, replace or extend, and operate part of a municipal drinking water system if:

6.1.1 An approval was issued after January 1, 2004 under section 36 of the SDWA in respect of the addition, modification, replacement or extension and operation of that part of the municipal drinking water system;

6.1.2 The approval expired by virtue of subsection 36(4) of the SDWA; and

6.1.3 The addition, modification, replacement or extension commenced within five years of the date that activity was approved by the expired approval.

7.0 System-Specific Conditions

7.1 The following are authorized under this permit:

Not applicable.

8.0 Source Protection

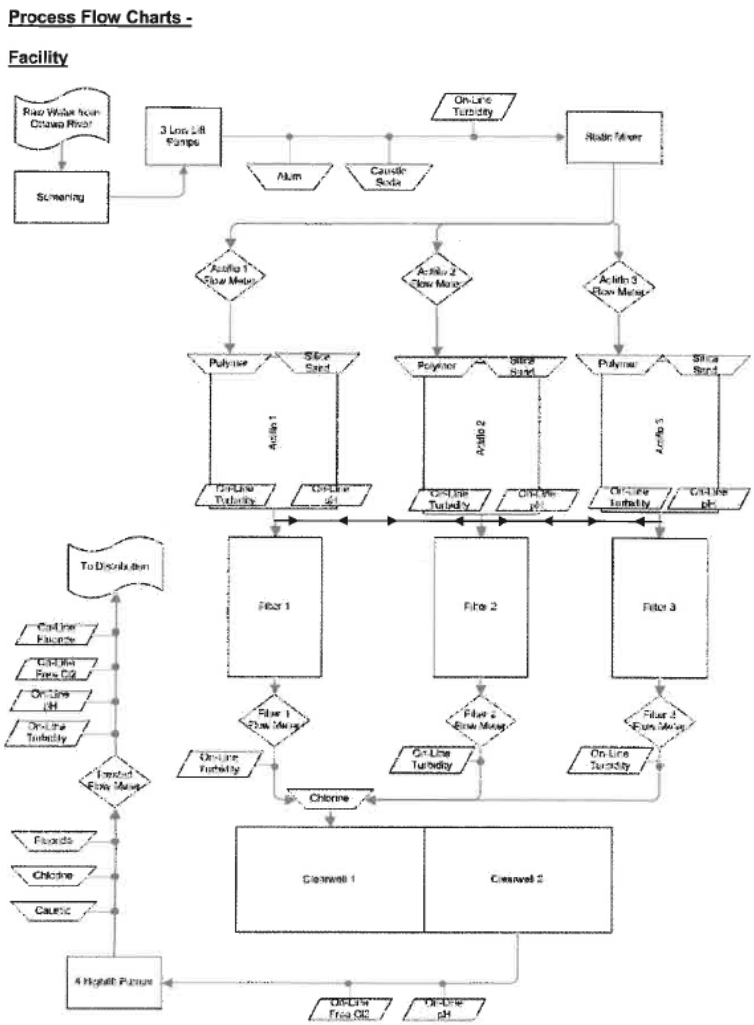
8.1 Not applicable.

Schedule D: Process Flow Diagrams

System Owner	**Deep River, The Corporation of the Town of**
Permit Number	**189-201**
Drinking Water System Name	**Deep River Drinking Water System**
Schedule D Issue Date	**May 3rd, 2019**

1.0 Process Flow Diagrams

Deep River Water Treatment Plant



Source: Operational Plan for the Deep River Drinking Water System, 9, November 28, 2014

APPENDIX C

PERMIT TO TAKE WATER

Ontario

Ministry of the Environment
Ministère de l'Environnement

PERMIT TO TAKE WATER
Surface Water
NUMBER 8528-9ECQPJ

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 Rd
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. 8528-9ECQPJ 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 September 23, 2013 and signed by Christopher Carroll, 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 any authority of the Ministry, a Director, or a Provincial Officer, including the authority 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 **December 31, 2023**. 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	12,274	24	15,911,000	365	18 307340 5109278
						Total Taking:	15,911,000		

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 (4).

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 and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

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

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;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 314-4506
Email: ERTTribunalsecretary@ontario.ca

AND

The Director, Section 34
Ministry of the Environment
1259 Gardiners Rd, PO Box 22032
Kingston, ON
K7P 3J6

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 Permit cancels and replaces Permit Number 3664-63ZP3C, issued on 2004/08/25.

Dated at Kingston this 17th day of December, 2013.

Gillian Dagg-Foster
Director, Section 34
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule “A” forms part of Permit To Take Water 8528-9ECQPJ, dated December 17, 2013.

APPENDIX D

STAKEHOLDER SUPPORT

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or waterforms@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater

PUBLICATION TITLE	PUBLICATION NUMBER
FORMS: Drinking Water System Profile Information Laboratory Services Notification Adverse Test Result Notification	 012-2149E 012-2148E 012-4444E
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	Website
Procedure for Disinfection of Drinking Water in Ontario	Website
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	Website
Filtration Processes Technical Bulletin	Website
Ultraviolet Disinfection Technical Bulletin	Website
Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments	Website
Certification Guide for Operators and Water Quality Analysts	Website
Guide to Drinking Water Operator Training Requirements	9802E
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	Website
Drinking Water System Contact List	7128E01
Ontario's Drinking Water Quality Management Standard - Pocket Guide	Website
Watermain Disinfection Procedure	Website
List of Licensed Laboratories	Website

Ontario

Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment. Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le ministère au 1-866-793-2588, ou encore à waterforms@ontario.ca si vous avez des questions ou besoin d'aide.

Pour plus de renseignements sur l'eau potable en Ontario, consultez le site www.ontario.ca/eaupotable

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Renseignements sur le profil du réseau d'eau potable Avis de demande de services de laboratoire Avis de résultats d'analyse insatisfaisants et de règlement des problèmes	012-2149F 012-2148F 012-4444F
Prendre soin de votre eau potable - Un guide destiné aux membres des conseils municipaux	Site Web
Marche à suivre pour désinfecter l'eau portable en Ontario	Site Web
Stratégies pour minimiser les trihalométhanes et les acides haloacétiques de sous-produits de désinfection	Site Web
Filtration Processes Technical Bulletin (en anglais seulement)	Site Web
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	Site Web
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable	Site Web
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	Site Web
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802F
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	Site Web
Liste des personnes-ressources du réseau d'eau potable	Site Web
L'eau potable en Ontario - Norme de gestion de la qualité - Guide de poche	Site Web
Procédure de désinfection des conduites principales	Site Web
Laboratoires autorisés	Site Web

Ontario