

O. Reg. 170 SECTION 11 ANNUAL REPORT
**Part III Form 2
Section 11. ANNUAL REPORT.**

Drinking-Water System Number:	220000460
Drinking-Water System Name:	North Bay WTP
Drinking-Water System Owner:	City of North Bay
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 01, 2009 to December 31, 2009

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [X] No []</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The Corporation of the City of North Bay P.O. Box 360 200 McIntyre Street East North Bay, Ontario P1B 8H8</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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List all Drinking-Water Systems, which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
NA	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes No

Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web**
- Public access/notice via Government Office**
- Public access/notice via a newspaper**
- Public access/notice via Public Request**
- Public access/notice via a Public Library**
- Public access/notice via other method Noted on Utility billing.**

Drinking-Water System Description

The North Bay Water Treatment Plant is a pumping station which partially treats water from Trout Lake which is part of the Mattawa River watershed. It was originally placed in service in 1929. The process consists of pH adjustment (Sodium Hydroxide), fluoridation (since 1962 Hydrofluosilicic Acid) and disinfection (Sodium Hypochlorite). The chemical treatment facilities are housed in a separate building completed in 1984.

The Permit to Take Water permits consumption up to 79,500 cubic meters per day. The North Bay Water Treatment Plant serves a population of approximately 56,000. There is a 12 kW standby diesel gen set at the plant to power emergency lighting and the chemical feed pumps. There is also a 1000 kW portable gen set with a manual switch over to provide partial standby power to the facility during power outages.

The intake structure is a 1200 mm diameter series 45 polyethylene pipe, with the capacity of 80,000 m³/day, which extends approximately 300 meters into Delaney Bay of Trout Lake. The intake was constructed in 1973 and includes an intake crib in approximately 21.5 meters of water at low water level. The intake has a 90 degree elbow terminating with fiber reinforced plastic (FRP) cage. At the shore the polyethylene pipe connects to a concrete pressure pipe which runs to an intake chamber and then a junction chamber. The intake then discharges into a 1.8 m by 1.35 m high reinforced concrete channel to the screen area located inside the pumping station. The North Bay WTP is also equipped with another intake pipe and structure described as follows: a 900 mm iron intake (not in service) extending 122 m into Delaney Bay of Trout Lake at a depth of 7.6 meters meters off the lake bottom with a capacity of 50,000 m³/day.

Raw water is fed through the WTP without the aid of a low lift pumping station. Raw water is chlorinated at the intake structure. Water then enters the plant and passes through two stainless steel 6 mm mesh FRP framed screens in series followed immediately by the fluoride application point. The sodium hydroxide addition point for pH adjustment is also made at the screen well. The plant is also equipped with a 100 m³ wet well and four electrically driven high lift pumps, operating at the rated head of 83.8 m, with a firm capacity of 79,500 m³/d (with the largest pump - pump #3- out of service). The suction connections for each high lift pump are connected directly to the wet well. The water is also disinfected with the aid of ultraviolet disinfection units, located at the discharge of each high lift pump before being directed into the distribution system.

The treated water is pumped to the distribution system, which incorporates the following storage and pumping facilities:

The Ellendale Reservoir (also known as the High Lift Pumping Station (HLPS)) is a double cell 18,200 m³ capacity reservoir equipped with a sodium hypochlorite re-chlorination system. The facility is also has on-line continuous water quality analyzers for free chlorine and turbidity and a standby gen set to operate the entire facility during power outages.

The Canadian Forces Base (CFB) Reservoir and Re-chlorination Facility is an 1820 m³ capacity reservoir equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzer for free chlorine and a standby gen set added in 2007 to provide emergency power during power outages.

The Airport Road Standpipe and Pumping Station is connected to the Zone 4 distribution header to provide Zone 4 fire flow and peak hour demand. It is also connected to the Zone 5 fire pumps suction header to provide Zone 5 fire flow demand. The standpipe having a capacity of 3862 m³ (13.7 m dia X 26.2 m high) and pumphouse serves the overall system consisting of pressure Zones 4 and 5. The pumping station accommodates a total of nine pumps, including three booster pumps (2 duty 1 standby) for Zone 4, and four booster pumps (3 duty and 1 standby) and two fire pumps for Zone 5. Zone 5 is equipped with four (4) hydro pneumatic tanks connected to the Zone 5 discharge header to mitigate minor pressure fluctuations within the distribution system, and to provide some volume of available storage during power interruptions before the standby power system engages. This will ensure that negative pressures do not develop in the distribution system at any time. The main PLC system is based on the Allen Bradley Control Logix5000 series utilizing RS Studio software for the Panelview 1500 Plus interface for the monitoring and control interface. At this time the new system does not include a SCADA Computer System for any reporting/data logging storage. To accommodate historical data logging or reporting it will be necessary to incorporate it into the future WTP SCADA System. This facility was constructed in 2009. It was commissioned and put into service in Oct 2009.

The Canadore Pumping Station is a facility equipped with high lift pumps and pressurized cushion tanks maintain to pressure in a pressurized zone of the distribution system servicing Canadore College and Nipissing University. There is an on-line continuous water quality analyzer to monitor free chlorine residual and a 200 kW,

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347/600 Volt, 3 phase, diesel powered gen set to provide power and SCADA communications during prolonged power outages

The Judge Avenue Valve Chamber and Re-chlorination Station is equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzers for free chlorine and turbidity, a fixed 7.5 kW, 120/240 Volt, single phase, diesel powered gen set to power the re-chlorination and SCADA communications during prolonged power outages.

The Birches Road Standpipe and Re-chlorination Station is an 11,775 m³ capacity steel un-baffled treated water standpipe equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzers for free chlorine and turbidity, a fixed 7.5 kW, 120/240 Volt, single phase, diesel powered gen set to power the standpipe systems and communications during prolonged power outages.

Commissioning of a new membrane filtration water plant to replace the existing pumping station (WTP) began in January 2010.

List all water treatment chemicals used over this reporting period

Sodium Hydroxide
Sodium Hypochlorite
Hydrofluosilicic Acid

Were any significant expenses incurred to?

- Install required equipment
 Repair required equipment
 Replace required equipment

Describe

- **Installed new Trout Lake Pumping Station (WTP) Chemical Pumps**
- **Replaced Ballasts for the UV reactors at Trout lake Pumping Station (WTP)**
- **Control board for gen-set replaced required Judge's Road valve chamber (required due to hit by lighting)**
- **CFB Pumping Station gen set- retro to make gen set mobile**
- **UPS power supply for CFB Pumping Station PLC control system replaced**
- **A new standpipe was constructed and put into service on Airport Road**
- **Ellendale Reservoir was drained and opened for structural inspection and cleaning**
- **Replaced the sodium hypochlorite pump for re-chlorination at Ellendale Reservoir**
- **Repairs to fuel tank system for emergency gen set at Ellendale pumping Stn to meet code**
- **Butterfly valves on Ellendale pumping Station pumps #2 & #4 replaced**
- **Replaced bearings on motor on Ellendale pumping station Pump #2**
- **Birches Road Standpipe was drained, cleaned & inspected including Cathodic Protection**

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- Two new butterfly valves were installed at Ellendale Reservoir
- Annual Hoist & crane inspections completed for all equipment at all water system facilities
- Replacement of the water main on Front Street (Second to Douglas)
- Replacement of the watermain on Galt Street (Front to Cedar)
- Replacement of the watermain on Ann Street (Front to High)
- Replacement of watermain on McLaren Street (Ann to Algonquin)
- Replacement of water main on Second Avenue (Front to Commercial)
- Replacement of watermain on Worthington Street (Cassels to Algonquin)
- Replacement of watermain on Algonquin Avenue (Copeland to Commercial)
- New watermain installation on Lakeside Drive (Trout Lake Road to Sage)
- New watermain installation on Oak St West (Foran to Memorial)
- Watermain Looping completed from Albert Street to O'Brien Ave
- Completion of watermain looping on Carmichael Dr (Airport to Littledown)
- Completed watermain replacement on Gormanville Road (Main to Canadore PS)
- Completed one of two watermain tie-ins at Lakeside Dr for new Water Plant

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

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
1-Jan-09	UV Dosage	< 40	mj/cm ²	Low UV dose, #2 pump (23:06 hrs). Event lasted 2 min. 5 sec. Giardia and crypto objectives exceeded. Took #2 drive out of service until morning. Reviewed trends, hypo dosage did not go lower than 1.16 mg/L free. Changed pump configuration and restarted WTP. (# 2 drive is scheduled for sensor calibration Monday, Jan. 5, 2009) AWQI# 86016	2-Jan-2009
9-Jan-09	UV Dosage	< 40	mj/cm ²	Free chlorine measured at 1.48 mg/L after #3 reactors shut-down. #3 reactor re-started then tripped again so free chlorine was measured again: 2.00 mg/L. #2 reactor started and tripped out so free chlorine measured: 2.00 mg/L. #4 UV sensor sleeve was replace on #3 reactor. AWQI# 86090	10-Jan-2009
29-Jan-09	UV Dosage	< 40	mj/cm ²	UV #2 Reactor Maintenance: All four UV sensor sleeves cleaned. Changed # 4 UV lamp sleeve. New lamps for # 1-2-3-4-5-6 and 8 AWQI# 86323	30-Jan-09

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26-Feb-09	Lead	>0.010	mg/L	A distribution lead sample result measured 0.017 mg/L. AWQI # 86923	26-Feb-09
26-Mar-09	UV Dosage	< 40	mj/cm2	UV #2 Reactor tripped out due to low dosage. All four sensor sleeves were replaced, and #2 reactor was back on-line and working. Lowest free Cl ₂ was 1.36 mg/L. AWQI# 87323	26-Mar-09
2-Apr-09	Low Chlorine Residual		mg/L	A pressure loss in the Sodium Hypochlorite feed system caused the free Cl ₂ residual in the Raw intake to drop to 0.11 mg/L and activate a plant auto shutdown. The chlorine feed system was fully inspected and tested, suction and discharge lines were flushed & tested, line pressure was re-established and the water plant was restarted. The min treated free Cl ₂ during the event was 0.36 mg/L. AWQI # 87423	2-Apr-2009
6-Apr-09	UV Dosage	< 40	mj/cm2	Low UV dosage for 1 min 47 sec due to delayed valve closure while the plant was shutdown for the inspection of all UV units. UV systems disassembled and inspected. No defects detected and UV units put back on line. AWQI # 87463	6-Apr-09
20-Apr-09	Turbidity	> 1.0	NTU	Raw & Treated water turbidity at 1.0 NTU due to spring lake turnover and no filtration system at the facility. The turbidity started to trend downward and by 27 Apr 09 was down to 0.7NTU. The Health Unit was updated during the week on the status of the turbidity level in the lake. AWQI # 87683	27-Apr-2009
27-May-2009	THM	>100	ug/L	The THM concentration of the quarterly distribution THM sample collected on 27 May 09 was 115 ug/L which puts the 4 qtr running average concentration > 100 ug/L (up to 100.63ug/L). Re-sample collected on 04 Jun 09 had a THM value of 133 ug/L. The Health Unit was advised of the exceedance and of the 04 Jun 09 re-sample results. AWQI# 88249 & AWQI# 88329	16-Jun-2009

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26-Aug-2009	THM	>100	ug/L	Four quarter THM running average is 101.8 ug/L. THM samples collected during the third quarter are 91.8 ug/L and 85.2 ug/L, both below the 100 ug/L standard. Therefore, although the running average is adverse, the third quarter samples are not. No resample required. AWQI # 90797	27-Aug-2009
20-Nov-09	Fluoride	unstable	mg/L	On-line ABB Fluoride analyzer sample pump motor began faulting out causing analyzer to shut down. Fluoride feed system shut down as a precaution until the analyzer sample pump motor is replaced. Part placed on order. No AWQI notification required however made notifications to the MOH & MOE. AWQI# 92430	

Microbiological testing done under section 8-2 during this reporting period.

	Number of Samples	Range of E.Coli Results (#-#)	Range of Total Coliform Results (#-#)	Number of Samples Back-ground Colony Counts	Range of Results Background Colony Counts (#-#)	Number of Samples HPC Counts	Range of Results HPC Counts (#-#)
Raw	52	0 - 3	0 - 61	52	0 - >200	NA	NA
Treated	52	0 - 0	0 - 0	52	0 - 0	52	0 - 127
Distribution Fixed Sites (reservoirs & rechlorination)	311	0 - 0	0 - 0	306	0 - 2	104	0 - 54
Distribution Random Sites	516	0 - 0	0 - 0	516	0 - 11	154	0 - 9

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

POE Grab Samples	Number of Grab Samples	Range of Results (min #)-(max #)	<i>NOTE: For continuous monitors use 8760 as the number of samples.</i>
Turbidity	232	0.41 - 0.88 NTU	

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Chlorine	409	0.89 – 1.85 mg/L
Fluoride (If the DWS provides fluoridation)	32	0.21 – 0.61 mg/L

*NOTE: Record the unit of measure if it is **not** milligrams per litre.*

Distribution Grab Samples	Number of Grab Samples	Range of Results (min #)-(max #)
Chlorine Fixed Sites	2130	0.07 – 2.26 mg/L
Chlorine Random Sites	516	0.11 – 1.86 mg/L

NOTE: For continuous monitors use 8760 as the number of samples.

POE On-line Continuous Analyzers	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity	8760	0.00 – 1.00 NTU
Free Chlorine Residual	8760	0.00 – 1.61 mg/L
Fluoride	8760	0 – 0.78 mg/L

NOTE: For continuous monitors use 8760 as the number of samples.

Summary of Inorganic parameters tested during this reporting period or the most recent

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	18 Feb 09	<0.0005	mg/L	
Arsenic	18 Feb 09	<0.001	mg/L	
Barium	18 Feb 09	0.014	mg/L	
Boron	18 Feb 08	<0.010	mg/L	
Cadmium	18 Feb 09	<0.0001	mg/L	
Chromium	18 Feb 09	<0.005	mg/L	
Mercury	18 Feb 09	<0.0001	mg/L	
Selenium	18 Feb 09	<0.002	mg/L	
Sodium	18 Feb 09	14	mg/L	
Uranium	18 Feb 09	<0.0001	mg/L	
Fluoride	18 Feb 09	0.6	mg/L	
Nitrite	18 Feb 09	<0.01	mg/L	
	21 May 09	<0.01	mg/L	
	20 Aug 09	<0.01	mg/L	
	23 Nov 09	<0.01	mg/L	
	Average	<0.01	mg/L	
Nitrate	18 Feb 09	0.2	mg/L	
	21 May 09	0.2	mg/L	
	20 Aug 09	0.2	mg/L	
	23 Nov 09	0.1	mg/L	
	Average	0.18	mg/L	

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Summary of lead testing under Schedule 15.1 during this reporting period
 (applicable to the following drinking water systems; large municipal residential systems,
 Small municipal residential systems, and non-municipal year-round residential systems)

	Location Type	Number of Samples	Range of Lead Results mg/L (min#) – (max #)	Number of Exceedances
Round 1 Dec 15 2008 to Apr 15 2009	Plumbing	88	<0.001 – 0.012	4
	Distribution	17	<0.001 – 0.017	1
Round 2 June 15 2009 to Oct 15 2009	Plumbing	93	<0.001 – 0.031	10
	Distribution	16	<0.001 – 0.03	0

Summary of additional testing and sampling carried out in accordance with the requirement of an approval or order.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
NA				

Summary of Organic parameters sampled during this reporting period or the most recent

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	18 Feb 09	<0.5	ug/L	no
Aldicarb	18 Feb 09	<5	ug/L	DL > ½ MAC
Aldrin + Dieldrin	18 Feb 09	<0.01	ug/L	no
Atrazine + N-dealkylated metabolites	18 Feb 09	<1	ug/L	no
Azinphos-methyl (Guthion)	18 Feb 09	<2	ug/L	no
Bendiocarb	18 Feb 09	<2	ug/L	no
Benzene	18 Feb 09	<0.1	ug/L	no
Benzo(a)pyrene	18 Feb 09	<0.009	ug/L	DL > ½ MAC
Bromoxynil	18 Feb 09	<0.5	ug/L	no
Carbaryl	18 Feb 09	<5	ug/L	no
Carbofuran	18 Feb 09	<5	ug/L	no
Carbon Tetrachloride	18 Feb 09	<0.1	ug/L	no
Chlordane (Total)	18 Feb 09	<0.01	ug/L	no
Chlorpyrifos	18 Feb 09	<1	ug/L	no
Cyanazine	18 Feb 09	<1	ug/L	no
Diazinon	18 Feb 09	<1	ug/L	no
Dicamba	18 Feb 09	<1	ug/L	no
1,2-Dichlorobenzene	18 Feb 09	<0.2	ug/L	no
1,4-Dichlorobenzene	18 Feb 09	<0.2	ug/L	no

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Dichlorodiphenyltrichloroethane (DDT) + metabolites	18 Feb 09	<0.02	ug/L	no
1,2-Dichloroethane	18 Feb 09	<0.2	ug/L	no
1,1-Dichloroethylene (vinylidene chloride)	18 Feb 09	<0.1	ug/L	no
Dichloromethane	18 Feb 09	<0.5	ug/L	no
2-4 Dichlorophenol	18 Feb 09	<0.5	ug/L	no
2,4-Dichlorophenoxy acetic acid (2,4-D)	18 Feb 09	<1	ug/L	no
Diclofop-methyl	18 Feb 09	<0.9	ug/L	no
Dimethoate	18 Feb 09	<3	ug/L	no
Dinoseb	18 Feb 09	<1	ug/L	no
Diquat	18 Feb 09	<7	ug/L	no
Diuron	18 Feb 09	<10	ug/L	no
Glyphosate	18 Feb 09	<10	ug/L	no
Heptachlor + Heptachlor Epoxide	18 Feb 09	<0.01	ug/L	no
Lindane (Total)	18 Feb 09	<0.006	ug/L	no
Malathion	18 Feb 09	<5	ug/L	no
Methoxychlor	18 Feb 09	<0.02	ug/L	no
Metolachlor	18 Feb 09	<0.5	ug/L	no
Metribuzin	18 Feb 09	<5	ug/L	no
Monochlorobenzene	18 Feb 09	<0.1	ug/L	no
Paraquat	18 Feb 09	<1	ug/L	no
Parathion	18 Feb 09	<1	ug/L	no
Pentachlorophenol	18 Feb 09	<0.5	ug/L	no
Phorate	18 Feb 09	<0.5	ug/L	no
Picloram	18 Feb 09	<5	ug/L	no
Polychlorinated Biphenyls(PCB)	18 Feb 09	<0.05	ug/L	no
Prometryn	18 Feb 09	<5	ug/L	no
Simazine	18 Feb 09	<1	ug/L	no
THM (NOTE: show latest annual average) * not included in average (only the highest value for each quarter is used for the average)	18 Feb 09 27 May 09 20 Aug 09 23 Nov 09 Average	94.4 115 91.8 88.6 97.5	ug/L ug/L ug/L ug/L ug/L	04 June 09 resample result 133 ug/L
Temephos	18 Feb 09	<10	ug/L	no
Terbufos	18 Feb 09	<0.5	ug/L	DL > ½ MAC
Tetrachloroethylene	18 Feb 09	<0.1	ug/L	no
2,3,4,6-Tetrachlorophenol	18 Feb 09	<0.5	ug/L	no
Triallate	18 Feb 09	<1	ug/L	no
Trichloroethylene	18 Feb 09	<0.1	ug/L	no
2,4,6-Trichlorophenol	18 Feb 09	<0.5	ug/L	no
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	18 Feb 09	<1	ug/L	no
Trifluralin	18 Feb 09	<1	ug/L	no
Vinyl Chloride	18 Feb 09	<0.2	ug/L	no

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List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	½ MAC VALUE	MAC Value	Date of Sample
Aldicarb	<5 lab detection level	ug/L	4.5	9	18 Feb 09
Benzo(a)pyrene	<0.009 lab detection level	ug/L	0.005	0.01	18 Feb 09
Lead	<0.011 – 0.031	mg/l	0.05	0.010	Mar-Oct 09

Note! In all of the cases above the analysis result value was less than the lab detection limit. However the lab detection limit is above the ½ MAC value.