Drinking-Water System Number:	**220000406**
Drinking-Water System Name:	North Bay Water Drinking Water System
Drinking-Water System Owner:	The Corporation of the City of North Bay
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2012 to December 31, 2012

Complete if your Category is Large Municipal Residential or Small Municipal Residential	***Complete for all other Categories.***
Does your Drinking-Water System serve more than 10,000 people? Yes [X] No [ ] **Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]** **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** The Corporation of the City of North Bay P.O. Box 360 200 McIntyre Street East North Bay, ON P1B 8H8	**Number of Designated Facilities served:** **Did you provide a copy of your annual report to all Designated Facilities you serve?** **Yes [ ] No [ ]** **Number of Interested Authorities you report to:** **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?** **Yes [ ] No [ ]**

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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

Drinking Water System Name	Drinking Water System Number
N/A	

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.

[X] Public access/notice via the web

[X] Public access/notice via a newspaper

Describe your Drinking-Water System

The City of North Bay water treatment plant (WTP), water distribution facilities and water distribution piping system are owned and operated by the Corporation of the City of North Bay.

The City of North Bay Water Treatment System is classified as a "Large Municipal Residential" Drinking-Water System, Class 3 Water Treatment Plant and Class 4 Water Distribution System with Drinking-Water System Number: 220000460. The WTP, located at 248 Lakeside Drive in North Bay, treats water from Trout Lake which is part of the Mattawa River watershed. The WTP services a population of approximately 54,000 and the permit to take water permits consumption up to 79,500 cubic meters per day.

The water distribution facilities consist of the following:

Ellendale Reservoir, High lift Pump Station & Re-chlorination Facility;
CFB Reservoir;
Canadore Pumping Station;
Judge Avenue Valve Chamber & Re-chlorination Station;
Birches Road Standpipe and Re-chlorination Station; and
Airport Road Standpipe, Booster Pumping Station and Re-chlorination Facility.

The membrane filtration water treatment plant has the design capacity of 79,500 cubic meters per day. The plant is a SCADA controlled membrane filtration system with ultraviolet and chlorine disinfection systems. The plant also includes fluoride addition along with caustic pH adjustment prior to delivery to the distribution system.

The membrane filtration plant meets the Ontario Drinking Water Standards requirements for the removal/disinfection of 3-log Giardia Lambia, 2-log Cryptosporidium and 4-log Viruses. The membrane filtration Primary Barrier provides for a 3-log Giardia removal, 2-log Cryptosporidum removal. The chlorine/UV disinfection Secondary Barrier provides for a 0.5 UV Giardia removal, 0.5-log UV Cryptosporidum removal and a 4 log chlorine virus removal.

In general the North Bay WTP can be described as follows:
Intake
A 1200mm diameter series 45 polyethylene intake pipe, with a capacity of 80,000 cubic meters per day. The pipe, constructed in 1973, extends approximately 300 meters into Delaney Bay of Trout Lake and includes an intake structure consisting of a steel inlet bell mouth with fibre reinforced plastic (FRP) cage and is in approximately 21.5 metres of water at low water level.
Membrane Feed Pump Well/Prescreening
Two (2) parallel sub-surface well chambers with level monitoring containing, two (2) 6mm mesh manual prescreen in series, five (5) vertical turbine pumps (4 duty and one standby) rated at 20 m3/d feeing the primary membrane system.

Membrane Feed Strainers
Five (5) 300 micron automatic membrane feed strainers (four duty and one standby).

Treatment Plant Process Areas
A building housing the following process components:

- **primary and secondary membrane filtration system;**
- **primary and secondary UV disinfection system;**
- **split chlorine contact tank;**
- **split highlift pump well**
- **three (3) chemical storage and delivery rooms housing membrane cleaning and neutralization chemical systems, pre-chlorination system, primary disinfection chemical system, residual chlorination chemical system, alkalinity adjustment system, and fluoride addition system;**
- **highlift pumping;**
- **Generator room;**
- **Electrical room.**
- **compressor/blower room**

Administration Area
Two floor administrative area including laboratory/control room, server room, multipurpose training room, offices, washrooms, women's and men's locker rooms, janitor room, building mechanical room and storage room.

Membrane Filtration
Eleven (11) pressurized primary membrane racks treating water from the membrane feed strainers, two(2) pressurized secondary membrane racks treating non-chemical backwash water from the primary membrane racks. The primary racks have a maximum production flow rate of 78.7 MLD based on raw water flow rate of 79.5 MLD, Ancillary systems including backwash pumps, instrument air for operating valves and integrity testing membranes, process blowers, and chemical cleaning and neutralization systems.

UV Disinfection Systems
Three (3) 600mm UV reactors (two duty and one standby) treating water from the eleven (11) pressurized primary membrane racks and two (2) secondary membrane racks. Each reactor contains medium pressure high intensity lamps housed in quartz sleeve and equipped with self cleaning mechanism and intensity sensor.

Chemical systems for:
Primary disinfection
Secondary (residual) disinfection
Fluoride Dosing
Alkalinity Adjustment
Membrane cleaning
Membrane cleaning solutions neutralization
Chlorine Contact Tank #1 and #2

Two (2) baffled chlorine contact tanks in series with storage volumes of 688 cubic meters (tank #1) and 502 cubic meters (tank #2).

High Lift Pump Well #1 and #2
High lift pump well #1 has a capacity of approximately 240 cubic meters and is equipped with one (1) variable speed and two (2) constant speed vertical turbine high lift pumps each rated at 20 MLD. High lift pump well #2 has a capacity of approximately 240 cubic meters and is equipped with one (1) variable speed and one (1) constant speed vertical turbine high lift pump each rated at 20 MLD.

Generator Room
One (1) dual fuel generator set (NG/Diesel) with a rating of 2050KW, to provide power during peak hours and emergency situations.

Wastewater Disposal System
Primary Membrane Backwash Tank
Tank with a volume of approximately 310 cubic meters,
Two (2) membrane feed pumps supplying water to the Secondary Membrane System.

Secondary Waste Tank
Tank with a volume of approximately 130 cubic meters,
Two (2) pumps, one duty and one standby, to deliver water to the sanitary sewer.

Neutralization Tank #1 and #2
Two (2) tanks each with a volume of 150 cubic meters, pH and Chlorine Residual analyzers.

Sanitary Sewage Disposal
One sump with two (2) submersible pumps in the Administration Area and two (2) sumps and two (2) submersible pumps in the Process Area discharging to the sanitary sewer along Lakeside Drive

The treated water is pumped to the distribution system.

The water distribution facilities can be described as follows:

Ellendale Reservoir, Highlift Pumping Station and Re-chlorination Facility
The facility is a reinforced concrete at-grade, double cell, un-baffled, treated water reservoir, located at the east end of Ellendale Drive. The reservoir has an approximate capacity of 18,200 cubic meters, with dimensions of 71 meters by 38 meters by 7 meters. The facility is equipped with a sodium hypochlorite re-chlorination system, on-line continuous water quality analyzers for free chlorine and turbidity and a standby generator to operate the facility during power outages.
Birchs Road Standpipe and Re-chlorination Station
The facility consists of one (1) 39 meter high, 19 meter diameter, 11,775 cubic meter capacity, steel, un-baffled, treated water standpipe, located near the southwest corner

of Birchs Road and Booth Road. The facility is equipped with sodium hypochlorite re-chlorination system, on-line continuous water quality analyzers for free chlorine and turbidity and fixed 7.5kW, 120/240 Volt single phase, diesel powered generator to power the re-chlorination and SCADA communications during prolonged power outages.

Judge Avenue Valve Chamber and Re-chlorination Station
The facility consists of a valve and re-chlorination station, located near the northeast corner of Judge Avenue and Lakeshore Drive, equipped with on-line continuous water quality analyzers for free chlorine and turbidity, a fixed 7.5kW 120.240 Volt single phase, diesel powered generator to power the re-chlorination and SCADA communications during prolonged power outages, and valve control that is integrated with Birches Standpipe.

CFB North Bay Reservoir and Re-chlorination Facility
The facility consists of one (1) 1820 cubic meter capacity, un-baffled reservoir and a re-chlorination facility located at the north end of Manston Crescent. The facility is equipped with on line continuous water quality analyzer for free chlorine and a standby power.

Canadore Pumping Station
The facility is equipped with highlift pumps and pressurized cushion tanks to maintain pressure in the 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 200kW, 347/600 Volt, 3 phase diesel generator to provide power and SCADA communications during prolonged power outages.

Airport Standpipe, Booster Pumping Station
This 4,000 cubic meter water storage standpipe, booster pumping station and re-chlorination facility was constructed in 2009. With the standpipe, high lift pumps and pressurized cushion tanks this facility maintains pressure in the pressurized zone of the distribution system servicing the Airport and Carmichael Drive areas. The overall system consists of pressure zones 4 and 5 which accommodate a total of nine pumps, including three booster pumps (2 duty and 1 standby) for Zone 4, four booster pumps (3 duty and 1 standby) and two fire pumps for Zone 5. The water standpipe is connected to the zone 4 distribution header to provide zone 4 fire flow and peak hour demand. It is also connect to the zone 5 fire pumps suction header to provide zone 5 fire demand. Zone 5 is equipped with four (4) 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 mitigate the potential for negative pressure in the distribution system.

List all water treatment chemicals used over this reporting period

Sodium Hydroxide
Sodium Hypochlorite
Hydrofluosilicic Acid

Were any significant expenses incurred to?

[X] Install required equipment
[X] Repair required equipment
[X] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

Major repair and replacement to ensure reliable treatment and distribution of water to the water system.
The major capital repairs and replacements include:

- **New reporting software installed at WTP**
- **A number of valves and actuators replaced on membrane filtration system.**
- **Birch's Standpipe concrete beam and floor deterioration investigation. Repair to occur 2013**
- **Level sensor installed at Airport Standpipe**
- **Isolation valve replacement at Ellendale Reservoir**
- **New chlorine storage tank installed at Ellendale Reservoir**
- **New fence installed at Ellendale Reservoir**
- **Ellendale Reservoir generator switchgear repair**
- **Third party flow meter calibration at all water system sites**
- **Annual hoist and crane inspections for all equipment at all water systems facilities.**
- **Annual maintenance of generators at all water facilities**
- **Installed 150mm watermain from Vanhorne to Strathcona along City easement**
- **Installed 50mm loop (directional bore) from the end on Herman Cr. to the 150mm watermain in the easement between Vanhorne and Strathcona.**
- **Installed 50mm loop (directional bore) from the dead end of Delaware to the 150mm watermain on O'Brien**
- **Installed new 150mm water main from 150mm dead end on Vanier to the 150mm water main on Angus**
- **Installed new 150mm water main on Shea from Park to Duncan**
- **Installed new 200mm water main on McIntyre W from Murray to Harvey**
- **Installed 300mm water main on Sage from Donald to Camelot**
- **Replacement of 385m of 200mm watermain on the easement from Jessup's Creek to Birch's Road.**
- **Replaced 40m of 150mm watermain on Surrey Drive.**
- **Installed 300m of 200mm watermain on Lakeshore Dr. from Morgan to Birch's**
- **Replaced 180m of 150mm watermain on Pearce St.**
- **Installed 10m of 300mm and 20 m of 400mm watermain on Pearce St.**
- **Installed 3000m of 300mm watermain at the Aerospace Business Park**
- **Installed 350m of 250mm watermain at the Trillium Woods Subdivision**

- **Replaced 50m of 150mm, 500m of 200mm, 15m of 300mm and 600m of 400mm watermain on Main St.**
- **Cathodic protection was installed on 350m of 500mm watermain and 158m of 300mm watermain on Booth Rd between Marshall Ave and Lakeshore Dr.**
-

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
07-May-12	Failure of SCADA DATA Collection & Trending	N/A	N/A	This incident was not a true adverse water quality incident however a non-compliance notification to the MOE was made through MOE SAC. MOE SAC issued an AWQI# when notification was made to them. The SCADA system failed upon rebooting following some new programming. Additional reboots were required to reactivate the data recording and trending. A gap in data collection/trending resulted from the period from 14:29 hrs to 17:50 hrs on 07 May 2012. Notification made to the MOE as required. AWQI# 105883	07-May-12
28-June-12	Chlorine Residual	0.03	mg/L	Reported to MOE and MOH as required. Flushed and re-sampled on 28-06-2012. Results were 0.11 mg/L free chlorine which met Ontario Drinking Water Quality Standards. Two consecutive sets of bacteria samples were taken 24 and 48 hours apart and met Ontario Drinking Water Quality Standards. AWQI #106750	28-June-12

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli (#)-(#)	Range of Total Coliform Results (#)-(#)	Number of samples Background Colony Counts	Range of Back-ground Colony Counts	Number of HPC Samples	Range of HPC Results (#)-(#)
Raw	52	0-6	0->200	52	35->200	N/A	N/A
Treated	52	0-0	0-0	52	0-31	52	0-43
Distribution Fixed Sites	364	0-0	0-0	364	0-18	104	0-96
Distribution Random Sites	520	0-0	0-0	520	0-7	156	0-96

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 #)**
Turbidity	**188**	**0.075 – 0.322 NTU**
Chlorine	**221**	**0.77 – 1.41 mg/L**
Fluoride (If the DWS provides fluoridation)	**43**	**0.30 – 0.56 mg/L**

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

Distribution Free Chlorine Grab Samples	**Number of Grab Samples**	**Range of Results (min #)-(max #)**
Chlorine Fixed Sites	**3710**	**0.1 – 1.71 mg/L**
Chlorine Random Sites	**520**	**0.14-1.49 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**	**0.02 – 0.89 mg/L**
Chlorine	**8760**	**0.78 – 2.44 mg/L**
Fluoride (If the DWS provides fluoridation)	**8760**	**0.12 - 0.64 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 sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	26 Mar 12	<0.5	ug/L	no
Arsenic	26 Mar 12	<1	ug/L	no
Barium	26 Mar 12	10.9	ug/L	no
Boron	26 Mar 12	<2	ug/L	no
Cadmium	26 Mar 12	<0.1	ug/L	no
Chromium	26 Mar 12	<1	ug/L	no
Mercury	26 Mar 12	<0.0001	mg/L	no
Selenium	26 Mar 12	<1	ug/L	no
Sodium	07 Mar 11	12	mg/L	no
Uranium	26 Mar 12	<1	ug/L	no
Nitrite	09 Jan 12 26 Mar 12 20 June 12 26 Sept 12	<0.004 <0.004 <0.05 <0.05	mg/L mg/L mg/L mg/L	no
Nitrate	09 Jan 12 26 Mar 12 20 June 12 26 Sept 12	0.2 0.3 0.15 0.18	mg/L mg/L mg/L mg/L	no

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

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 (min#) – (max #)	Unit of Measure	Number of Exceedances
Round 1 Dec 15 2011 to Apr 15 2012	**Plumbing**	**44**	**<0.001 – 0.009**	**mg/L**	**0**
	Distribution	**8**	**<0.001 – 0.004**	**mg/L**	**0**
Round 2 June 15 2012 to Oct 15 2012	**Plumbing**	**44**	**<0.001 – 0.008**	**mg/L**	**0**
	Distribution	**8**	**<0.001 – 0.001**	**mg/L**	**0**

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	26 Mar 12	<0.5	ug/L	no
Aldicarb	26 Mar 12	<0.5	ug/L	no
Aldrin + Dieldrin	26 Mar 12	<0.004	ug/L	no
Atrazine + N-dealkylated metobolites	26 Mar 12	<1	ug/L	no
Azinphos-methyl	26 Mar 12	<0.3	ug/L	no
Bendiocarb	26 Mar 12	<1	ug/L	no
Benzene	26 Mar 12	<0.2	ug/L	no
Benzo(a)pyrene	26 Mar 12	<0.009	ug/L	no
Bromoxynil	26 Mar 12	<0.5	ug/L	no
Carbaryl	26 Mar 12	<1	ug/L	no
Carbofuran	26 Mar 12	<1	ug/L	no
Carbon Tetrachloride	26 Mar 12	<0.2	ug/L	no
Chlordane (Total)	26 Mar 12	<0.004	ug/L	no
Chlorpyrifos	26 Mar 12	<0.3	ug/L	no
Cyanazine	26 Mar 12	<0.3	ug/L	no
Diazinon	26 Mar 12	<0.3	ug/L	no
Dicamba	26 Mar 12	<0.2	ug/L	no
1,2-Dichlorobenzene	26 Mar 12	<0.2	ug/L	no
1,4-Dichlorobenzene	26 Mar 12	<0.2	ug/L	no
Dichlorodiphenyltrichloroethane (DDT) + metabolites	26 Mar 12	<0.02	ug/L	no
1,2-Dichloroethane	26 Mar 12	<0.2	ug/L	no
1,1-Dichloroethylene (vinylidene chloride)	26 Mar 12	<0.2	ug/L	no
Dichloromethane	26 Mar 12	<4.5	ug/L	no
2-4 Dichlorophenol	26 Mar 12	<0.05	ug/L	no
2,4-Dichlorophenoxy acetic acid (2,4-D)	26 Mar 12	<1	ug/L	no
Diclofop-methyl	26 Mar 12	<0.2	ug/L	no
Dimethoate	26 Mar 12	<0.3	ug/L	no
Dinoseb	26 Mar 12	<0.05	ug/L	no
Diquat	26 Mar 12	<7	ug/L	no
Diuron	26 Mar 12	5	ug/L	no
Glyphosate	26 Mar 12	<20	ug/L	no
Heptachlor + Heptachlor Epoxide	26 Mar 12	<0.004	ug/L	no
Lindane (Total)	26 Mar 12	<0.0006	ug/L	no
Malathion	26 Mar 12	<0.3	ug/L	no
Methoxychlor	26 Mar 12	<0.001	ug/L	no
Metolachlor	26 Mar 12	<0.23	ug/L	no
Metribuzin	26 Mar 12	<0.23	ug/L	no
Monochlorobenzene	26 Mar 12	<0.1	ug/L	no
Paraquat	26 Mar 12	<1	ug/L	no

Parathion	**26 Mar 12**	**<0.2**	**ug/L**	**no**
Pentachlorophenol	**26 Mar 12**	**<0.05**	**ug/L**	**no**
Phorate	**26 Mar 12**	**<0.3**	**ug/L**	**no**
Picloram	**26 Mar 12**	**<0.05**	**ug/L**	**no**
Polychlorinated Biphenyls(PCB)	**26 Mar 12**	**<0.004**	**ug/L**	**no**
Prometryne	**26 Mar 12**	**<0.23**	**ug/L**	**no**
Simazine	**26 Mar 12**	**<0.34**	**ug/L**	**no**
THM (NOTE: show latest annual average)	**26 Mar 12**	**78.2**	**ug/L**	**no**
Temephos	**26 Mar 12**	**<14**	**ug/L**	**no**
Terbufos	**26 Mar 12**	**<0.23**	**ug/L**	**no**
Tetrachloroethylene	**26 Mar 12**	**<0.2**	**ug/L**	**no**
2,3,4,6-Tetrachlorophenol	**26 Mar 12**	**<0.05**	**ug/L**	**no**
Triallate	**26 Mar 12**	**<0.23**	**ug/L**	**no**
Trichloroethylene	**26 Mar 12**	**<0.2**	**ug/L**	**no**
2,4,6-Trichlorophenol	**26 Mar 12**	**<0.5**	**ug/L**	**no**
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	**26 Mar 12**	**<0.05**	**ug/L**	**no**
Trifluralin	**26 Mar 12**	**<0.23**	**ug/L**	**no**
Vinyl Chloride	**26 Mar 12**	**<0.2**	**ug/L**	**no**

THM Dist Sample Location 55 Aviation Ave & 201 Pinewood Park	**1st Quarter Result Value**	**2nd Quarter Result Value**	**3rd Quarter Result Value**	**4th Quarter Result Value**	**Unit of Measure**	**Excee-dance**
Date Sampled	**09 Jan 12**	**26 Mar 12**	**20 June 12**	**26 Sept 12**	**ug/L**	**No**
Bromodichloromethane	**4.3** **3.6**	**4.3** **4.7**	**4.6** **4.1**	**5.3** **5.2**	**ug/L**	**No**
Bromoform	**<0.4** **<0.4**	**<0.2** **<0.2**	**<0.1** **<0.1**	**<0.3** **<0.3**	**ug/L**	**No**
Chloroform	**67.8** **62.2**	**65.9** **74.1**	**58.8** **62.4**	**78** **87**	**ug/L**	**No**
Dibromochloromethane	**0.3** **<0.3**	**<0.2** **<0.2**	**<0.1** **<0.1**	**<0.2** **<0.2**	**ug/L**	**No**
Total Trihalomethanes	**72.4** **75.7**	**70.2** **78.8**	**63.4** **66.5**	**83** **92**	**ug/L**	**No**
Total Tirhalomethanes 4 Quarter Average				**78.2**	**ug/L**	**No**

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	26 Mar 12
*Benzo(a)pyrene	<0.009 lab detection limit	ug/L	0.005	0.01	07 Mar 11
Lead	0.009	mg/L	0.005	0.01	03-Jan-12

***In all the cases marked with * the analysis result value was less than the lab detection limit. However the lab detection limit is above the ½ MAC value.**

2012 SUMMARY REPORT
FOR THE
NORTH BAY WATER TREATMENT SYSTEM

This report is a summary of water quality information for the North Bay Water Treatment System, published in accordance with Schedule 22 of Ontario's Drinking-Water Systems Regulation for the reporting period of January 1, 2012 to December 31, 2012. This report is based on all information received within the stated reporting period and items that remained outstanding in the last reporting periods that have been carried forward.

The North Bay Water Treatment System is categorized as a Large Municipal Residential Drinking Water System. The City of North Bay is the Operating Authority for the Water Treatment Plant and water distribution system. The following table lists the requirements that the system failed to meet and the measures taken to correct the failure:

Drinking Water Legislation	List the requirement(s) the system failed to meet	Specify the duration of the failure (i.e. date(s))	Describe the measure taken to correct the failure	Status (complete or outstanding)
Exceedance with MDWL & the standards prescribed in O.Reg. 169/03 (ODWQS)	The following is a list of the adverse sampling results from the North Bay WTP & DS over the year of 2012.		Adverse Sample Notifications were made to the MOE and Health Unit as required and corrective actions were taken by the operations staff	Complete
	Failure of SCADA DATA Collection & Trending	07 May 2012	This incident was not a true adverse water quality incident however a non-compliance notification to the MOE was made through MOE SAC. MOE SAC issued an AWQI# when notification was made to them. The SCADA system failed upon rebooting following some new programming. Additional reboots were required to reactivate the data recording and trending. A gap in data collection/trending resulted from the period from 14:29 hrs to 17:50 hrs on 07 May 2012. Notification made to the local MOE office as required. AWQI# 105883	Complete
	C hlorine Residual	28- June 2012	Chlorine residual value of 0.03 in distribution sample which does not meet the Ontario Drinking Water Quality Standards. Reported to MOE and MOH as required. Flushed	

			and re-sampled on 28-06-2012. Results were 0.11 mg/L free chlorine which met Ontario Drinking Water Quality Standards. Two consecutive sets of bacteria samples were taken 24 and 48 hours apart and met Ontario Drinking Water Quality Standards. AWQI #106750	

The North Bay Water Treatment Plant (WTP) has the design capacity of 79,500 cubic meters of water per day. The WTP is a SCADA controlled membrane filtration system with ultraviolet and chlorine disinfection systems. The plant also includes fluoride addition along with caustic pH adjustment prior to delivery to the distribution. The WTP meets the Ontario Drinking Water Standards requirements for the removal/disinfection of 2-log Cryptosporidium oocysts, 3-log Giardia cysts, and 4-log Viruses.

The North Bay WTP achieves the above performance criteria using membrane filtration (0.1 micron pore size), ultraviolet (UV) inactivation and chlorine disinfection.

The filtration process meets the criteria listed in the Procedure for Disinfection of Drinking Water in Ontario for membrane filtration, including;

1. Maintain effective backwash procedures, including filter-to-waste or an equivalent procedure, to ensure that the effluent turbidity requirements are met at all times;
2. Monitor integrity of the membrane by continuous particle counting or equivalent effective means (e.g., intermittent pressure decay measurements) (Note: intermittent pressure decay monitored at the North Bay WTP).
3. Continuously monitor filtrate turbidity; and,
4. Meet the performance criterion for filtered water turbidity of less than or equal to 0.1 NTU in 99% of the measurements each month.

The following is a breakdown of the pathogen removal credits for the North Bay WTP:

- Membrane filtration provides 3.0 log removal of Giardia, 2-log removal of Cryptosporidium
- UV inactivation provides 0.5-log removal of Giardia and 0.5-log removal of Cryptosporidium
- Chlorine disinfection provides 4-log removal of viruses

All of the filter rack effluent lines are equipped with continuously monitored, recorded and alarmed turbidity analyzers which will shut down the respective rack if a reading exceeds 0.1 NTU.

Filtered water is directed through the UV disinfection units prior to entering the contact chambers. The two chlorine contact tanks can be operated separately or in sequence and still provide the required 4 log disinfection. This facility is equipped with continuously monitored, recorded and alarmed CT calculation. The SCADA system also automatically takes data from several sources (flow, temperature,

free chlorine residual, pH, water depth in contact tanks, and which contact tank is in service) and calculates the log removal credits achieved for Giardia & Viruses.

The following information presents the Annual Record of Water Taking for the North Bay Water Treatment Plant and the treated water consumption.

Raw Water Taking

In overview some 11,804,231 cubic meters of water were taken from Trout Lake during the year of 2012. The average water taking for 2012 was 32,227 cubic meters per day. The maximum water taking per day was 51,963 cubic meters in July and this was 65% of the maximum 79,500 cubic meters per day allowed under the Permit to Take Water.

Raw Water Taking	Total Taking (m3/d)	Average Day (m3/d)	Max Day (m3/d)	Max Day % of PTTW allowable (79,500 m3/d)
2012	11,804,231	32,227	51,963	65%
2011	12,752,104	34,925	51,870	65%
2010	12,736,244	34,894	51,139	64%
2009	12,341,188	33,496	51,339	65%
2008	12,503,512	34,161	54,123	68%
2007	13,928,611	38,161	54,684	70%

The 2012 total raw water taking was down by 7% from 2011

Treated Water

In overview some 11,659,907 cubic meters of water were delivered to the distribution system during the year 2012. The average treated water delivered to the distribution system was 31,910 cubic metres per day for 2012. The maximum water delivered to the distribution system per day during 2012 was 51,534 cubic meters in July and this was 65% of the 78,700 cubic meters per day rated capacity of the plant.

Treated Water Taking	Total Taking (m3/d)	Average Day (m3/d)	Max Day (m3/d)	Max Day % of PTTW allowable (78,700 m3/d)
2012	11,659,907	31,910	51,534	65%
2011	12,563,903	34,408	51,450	65%
2010	12,584,670	34,479	50,820	65%
2009	12,341,188	33,496	51,339	65%
2008	12,503,512	34,161	54,123	68%
2007	13,928,611	38,161	54,684	70%

The 2012 total treated water volume delivered into the distribution system was down by 7% from 2010

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