

2013 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, 2013 to December 31, 2013. 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:

The following is a list of the adverse sampling results from the North Bay WTP and Distribution System (DS) over the year of 2013.

List the requirement(s) the system failed to meet	Specify duration of the failure (i.e. date(s))	Describe the measures taken to correct the failure	Status (complete or outstanding)
Failure to meet secondary disinfection - chlorine residual	25 February 2013	Chlorine residual value of 0.04mg/L in distribution sample which does not meet the Ontario Drinking Water Quality Standards. Reported to MOE and MOH as required. Flushed and re-sampled immediately on 02-25-2013. Results were 0.52 mg/L free chlorine which met Ontario Drinking Water Quality Standards. AWQI #110100	Complete
Failure to meet secondary disinfection - chlorine residual	25 February 2013	Chlorine residual value of 0.02mg/L in distribution sample which does not meet the Ontario Drinking Water Quality Standards. Reported to MOE and MOH as required. Flushed and re-sampled immediately on 17-04-2013. Results met Ontario Drinking Water Quality Standards. AWQI #110597	Complete

List the requirement(s) the system failed to meet	Specify duration of the failure (i.e. date(s))	Describe the measures taken to correct the failure	Status (complete or outstanding)
Failure to meet secondary disinfection - chlorine residual	04 May 2013	Drop in chlorine residual at CFB reservoir on chlorine analyzer. Not a true adverse water quality event, however reported to MOE and MOH as precautionary measure. Operator confirmed that analyzer was reading values low by 0.08mg/L. Bacteriological samples taken at CFB and distribution system. Sample results met Ontario Drinking Water Quality Standard. AWQI #110924	Complete
Total Coliform	21 June 2013	Total Coliform value of 1 on bacteriological sample which does not meet the Ontario Drinking Water Quality Standards. Reported to MOE and MOH as required. Flushed watermain and two consecutive sets of bacteriological samples were taken 24 and 48 hours apart and met the Ontario Drinking Water Quality Standards. AWQI#11823	Complete
Lead	26 August 2013	Lead value of 0.024mg/L in the distribution system. Reported to MOE and MOH as required. Flushed and re-sampled on 26-Sept-2013. Results were 0.001 which met the Ontario Drinking Water Quality Standards. AWQI#114288	Complete
Loss of Water Pressure	09 October 2013	No water pressure in distribution system due to watermain repair. MOE and MOH notified as required and notice provided to affected consumers. Once repair was complete the system was flushed, chlorine restored and bacteriological samples taken which met Ontario Drinking Water Quality Standards. AWQI#114502	Complete

List the requirement(s) the system failed to meet	Specify duration of the failure (i.e. date(s))	Describe the measures taken to correct the failure	Status (complete or outstanding)
Loss of Water Pressure	22 November 2013	Pump failed at Canadore Pumping Station which in turn led to no water pressure up College Dr. Reported to MOE and MOH as required. Pump started back up and line was flushed. Two consecutive sets of bacteriological samples were taken 24 and 48 hours apart and met Ontario Drinking Water Quality Standards. AWQI #115153	Complete

The North Bay 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 10,713,683 cubic meters of water were taken from Trout Lake during the year of 2013. The average water taking for 2013 was 29,257 cubic meters per day. The maximum water taking per day was 43,560 cubic meters in August and this was 55% 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)
2013	10,713,683	29,257	43,560	55%
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%

The 2013 total raw water taking was down by 16% from 2012.

Treated Water

In overview some 10,578,115 cubic meters of water were delivered to the distribution system during the year 2013. The average treated water delivered to the distribution system was 28,962 cubic metres per day for 2013. The maximum water delivered to the distribution system per day during 2013 was 43,235 cubic meters in August and this was 55% 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)
2013	10,578,115	28,962	43,235	55%
2012	11,659,907	31,910	51,534	65%

Treated Water Taking	Total Taking (m3/d)	Average Day (m3/d)	Max Day (m3/d)	Max Day % of PTTW allowable (78,700 m3/d)
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%

The 2013 total treated water volume delivered into the distribution system was down by 16% from 2012.

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