

# **2020 Annual Report**

## **North Bay Wastewater Treatment System**

### **Description of the Works**

#### Wastewater Treatment Plant:

The original sewage plant was built in 1961-62 providing secondary treatment for 18,160 cubic meters/day. The plant was expanded in 1973 to a capacity of 36,320 cubic meters/day, and in 1984 the plant was expanded again to its present capacity of 54,500 cubic meters/day. Phosphorus removal was included in the 1984 expansion/upgrade. In order to protect spawning grounds, the plant operates a discontinuous chlorination program (chlorination period is May 15th to October 15th).

The North Bay Wastewater Treatment Plant is a conventional activated sludge facility, using biological oxidation, anaerobic sludge digestion than centrifugation for sludge dewatering. The plant treats urban wastewater and discharges the processed effluent water into Lake Nipissing. The solid sludge material produced through primary settlement and the biological secondary treatment process "activated sludge process", is stabilized through anaerobic digestion which reduces its organic content and renders it non-putrescible. The anaerobically digested sludge is thickened by centrifugation with polymer addition. Dewatered sludge with an approximate solids concentration of 19-24% is hauled from the Wastewater Treatment Plant and utilized at the Merrick Landfill Site as sections are closed and used as a topping material.

#### The works consist of:

##### Preliminary Treatment

- A raw sewage pumping station with two (2) debris grinders and four variable speed raw sewage pumps, two(2) rated at 72,640 m<sup>3</sup>/d against 10.4 m TDH. Two (2) upgraded variable speed raw sewage pumps each rated at 95,904 m<sup>3</sup>/d against 10.9m TDH
- Two (2) mechanically cleaned bar screen.
- One (1) screening screw conveyor and dewatering press
- Two (2) vortex grit removal tanks with a total peak flow capacity of flow of 108,960 m<sup>3</sup>/d.
- Two (2) 2.83 m<sup>3</sup>/min. blowers and three (3) 1.42 m<sup>3</sup>/min blowers
- One (1) grit classifier and dewatering screw

### Primary Treatment

- Four (4) primary clarifiers each with surface area of 250.25 m<sup>2</sup> providing a total surface area of 1001 m<sup>2</sup> and two (2) large primary clarifiers each with a surface area of 613.7 m<sup>2</sup> providing a total surface area of 1227 m<sup>2</sup>;
- Four (4) waste sludge pumps, two (2) with rated capacity of 18.9 L/s for clarifiers 1-4 and two (2) with rated capacity of 22.5 L/s for clarifiers 5 & 6.

### Secondary Treatment

- Three (3) aeration tanks providing a total volume of 10,150 m<sup>3</sup> with each tank equipped with fine bubble diffused aeration system, and Six (6) positive displacement lobe type blowers, each rated at 500 c.f.m. at a maximum of 14 p.s.i.;
- Four secondary clarifiers (#1-4) each with volume of 3,383m<sup>3</sup> providing a total surface area of 1,340 m<sup>2</sup> and two (2) large rectangular clarifiers (#5-6) each with surface area of 739 m<sup>2</sup> providing a total surface area of 1,478 m<sup>2</sup>.
- One (1) constant speed waste activated sludge (WAS) pump for secondary clarifiers #1-4 having a rated capacity of 27.6 L/s at 24.7 m TDH.
- Two (2) return activated sludge (RAS) pumps with Variable frequency drives for secondary clarifier's #1-4, each having a rated capacity of 415 L/s.
- Five (5) RAS/WAS sludge pumps for secondary clarifiers #5-6, each having a rated capacity of 76 L/s at 9.1 m TDH.
- Two (2) chemical metering pumps for chemical addition for phosphorus removal, each having a rated capacity of 18 - 32 L/hr.
- Two industrial effluent water pumps (one duty and one standby) each rated at 3.5 L/s at 59.8 m TDH.

### Disinfection & Discharge

- A chlorine disinfection system consisting of two chlorine contact tanks, one providing a volume of 764 m<sup>3</sup> and a second chlorine contact tank providing a total volume of 784 m<sup>3</sup>.
- Two 3,200L CAPTOR storage tanks.
- A dechlorinating system consisting of two chemical metering pumps each rated at 12.3 liters per hour, and three oxidation reduction potential (ORP) probes to monitor chlorine residuals.
- Approximately 322 m of 1500 mm diameter discharge/outfall pipe, discharging from an overflow chamber into Lake Nipissing.

### Sludge Processing

- A sludge digestion and storage system consisting of: one (1) anaerobic digester (primary digester) providing a digestion volume of 3,434 m<sup>3</sup> and two (2) anaerobic digesters (secondary digesters), each having the volume of 2,060 m<sup>3</sup> to provide a total digestion volume of 7,580 m<sup>3</sup>;

and one (1) digested sludge holding tank having a volume of approximately 1,500 m<sup>3</sup>.

- One Bird Model 3700 dewatering centrifuge and one Andritz Model sludge dewatering centrifuge capable of dewatering sludge up to 680 kg/h of dry solids.

#### Back-up Power and Electrical Equipment

- Two (2) 750 kW, 347/600V diesel driven power generator. Each generator containing an attached 6,840 L double walled fuel tank provides partial emergency power to the raw sewage pumps and critical plant processes during power outages. Sized for future addition of secondary treatment equipment.
- All other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works.

### Registration of the Wastewater Works:

Municipal Location	City of North Bay
Works Number	110000533
Facility Classification	WWC Level II, Certificate #1447
	issued 21 September, 1990
	WWTP Level IV, Certificate #154
	issued 17 January, revised 2012
	upgraded to a class 4
Certificate of Approval	Certificate of Approval #7304-9KPKKK
Population Served	54,000 people

### Wastewater Collection System Pumping Station Descriptions:

The Barber (Coreen/Wickstead) sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 30 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 125 KVA standby diesel gen set to provide emergency power. A small building on site houses the pump controls and the standby gen set.

The Booth Road sewage lift pumping station Is a wet well type station without an overflow. It has two (2) 20 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 62.5 KVA standby gen set to provide emergency power. A small building on site houses the pump controls and the standby gen set.

The Chapais Street sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 3.5 HP, 220 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 50 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Foran sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 5 HP, 220 Volt, 3 Phase, Flygt submersible pumps. This station does not have a permanently installed standby gen set to provide emergency power. A mobile gen set must be used to provide emergency power when required. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Gertrude Road sewage lift pumping station Is a factory built 3.6m diameter by 7.7m deep wet well/dry well station. It has two (3) 12 HP Flygt submersible pumps capable of a peak flow of 76 l/s. It is also equipped with a 32.5 KVA standby gen set to provide emergency power. Site is equipped with a Kohler 80KW standby power diesel generator with sound dampening enclosure. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade well.

The Judge Street sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 20 HP, 575 Volt, 3 Phase, Flygt pumps. It is also equipped with a 75 KVA standby gen set to provide emergency power. A small building at this site houses the pump controls and the standby gen set.

The Lakeside pumping station Is a dry well/wet well type station without an overflow. It has two (2) 3.5 HP, 220 Volt, 3 Phase, Flygt submersible pumps. This pumping station does not have a permanently installed standby gen set to provide emergency power. A mobile 32.5 KVA standby gen set stored at the Public works must be transported to the site and used to provide emergency power to this station when required. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade dry well.

The Lake Heights sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 29 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 62 KVA standby gen set to provide emergency power. A small building at this site houses the pump controls and the standby gen set.

The Marsh Drive sewage lift pumping station Is a wet well type station without an overflow. It has two (2) 30 HP, 575 Volt, 3 Phase, and Gorman Rupp above ground pumps. This pumping station is located at the Marsh Landfill site and collects the leachate and pumps it into the municipal sewage system. This station does not have a permanently installed standby gen set to provide emergency power. A mobile gen set must be transported to the site and used to provide emergency power when required. A small building at this site houses the above ground pumps with suction piping extending into the wet well and pump controls.

The Marshall Sewage lift pumping station is a wet well type station without an overflow. It has (3) dry submersible pumps, (1) 75 HP, 575 Volt, 3 Phase, Crane Deming dry pit pump and (2) 85 Hp Flygt pumps with a 240 L/s capacity respectively. The station is also equipped with a 150KW 600/347 volt standby generator to provide emergency power. The structure houses the pump controls and the standby gen set in the above ground level of the

building and also the dry well pumps in a below ground (basement) level. Access is provided via a separate external door to a staircase which leads down to a screening unit for wastewater entering the stations wet well.

The Merlin Street sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 3.5 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 35 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Northgate sewage lift pumping station Is a wet well type station without an overflow. It has two (2) 9.4 HP, 575 Volt, 3 Phase, Flygt submersible pumps. It is also equipped with a 75 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Premier Road sewage lift pumping station Is a factory built wet well/dry well station without an overflow. It has two (2) 2 HP, 575 Volt, 3 Phase, Allis Chalmers/Smith & Lovelace pumps. It is also equipped with a 35 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Tenth Street pumping station Is a wet well type station with an overflow. It has two (2) 5 HP, 600 Volt, 3 Phase, and Flygt submersible pump. (This station is operational in the summer months only) This station does not have a permanently installed standby gen set to provide emergency power. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade wet well.

The Timmins/Gorman sewage lift pumping station Is a wet well type station with an overflow. It has two (2) 7.5 HP, 230 Volt, 3 Phase, Flygt submersible pumps. This station does not have a permanently installed standby gen set to provide emergency power. A mobile gen set/thawing stored by the city must be transported to the site and used to provide emergency power when required. A very small building at this site houses the pump controls for the pumps which are located in a sub grade dry well/wet well.

The Wallace Road sewage lift pumping station Is a factory built dry well/wet well station without an overflow. It has two (2) 30 HP, 575 Volt, 3 Phase, Allis Chalmers pumps. It is also equipped with a 41.25 KVA standby gen set to provide emergency power. The gen set is an external, fixed pad mounted, self-contained unit. There is no building at this site, only an above ground pump control panel for the pumps which are located in a sub grade dry well.

The Waterfront Storm Water pumping station located at Community Waterfront Friends Waterfront Park in the City of North Bay, designed for peak flow of 113L/s, consisting of a 3.81m x 3.81m precast concrete structure wet well equipped with two (2) 20HP, 600 Volt, 3 Phase, Flygt Model 3153.181 LT submersible pumps, one for duty and one for standby, each pump has a rated capacity of 110 L/s at a total dynamic head of 8.2m, complete with electrical and electronic control systems, float control systems, discharge piping, valves, and all other appurtenances necessary to have a complete and operable pumping station, discharging to the proposed 1200mm diameter storm sewer via the proposed 300mm diameter storm water force main.

### **Summary & Interpretation of Sampling and Monitoring Data:**

The Certificate of Approval (C of A) #5207304-9KPXXX issued for the North Bay Wastewater Treatment Plant on July 31, 2014 requires the Owner to prepare and submit a performance report annually within (90) days following the period reported on.

The City of North Bay acts as the operating authority and operated the North Bay Wastewater Treatment Facility and the Wastewater Collection System in 2020. This Annual Wastewater System Report covers the period from 01 Jan 2020 to 31 December 2020.

### **Summary of Raw Sewage Sampling Data and Annual Flow Data**

The sewage treatment plant has the *Rated Capacity* of 54,480 m<sup>3</sup>/day with a secondary treatment Peak Flow Rate of 108,960 m<sup>3</sup>/day. In 2020 the average daily raw sewage flow was 32,357 m<sup>3</sup>/day. Therefore the annual average day flow was within the design capacity, with the average day flow running at 59% of the wastewater systems rated design capacity.

The annual minimum daily raw sewage flow was 22,308m<sup>3</sup>/day and occurred in February 2020. The maximum daily raw sewage flow was 83,978 m<sup>3</sup>/day and occurred in March 2020.

The total raw sewage flow for the year was 11,842,594 m<sup>3</sup>.

### Raw Sewage Sampling Summary:

The operator collects a composite sample of raw sewage on a monthly basis sending it to Near North Laboratories in North Bay for analysis for BOD<sub>5</sub>, Total Suspended Solids, TKN and Total Phosphorus as required by the ECA. The reported analysis results are forwarded to City of North Bay staff.

The average raw sewage BOD<sub>5</sub> concentration was 140.83 mg/L.

The average raw sewage Total Suspended Solids (TSS) concentration was 125.21 mg/L. (excluded August sample due to sample mix up)

The average raw sewage Total Phosphorus (TP) concentration was 3.08 mg/L

The average raw sewage Total Kjeldahl Nitrogen (TKN) concentration was 31.39 mg/L.

*See the accompanying North Bay WWTP 2020 Monthly Data Summary for complete raw wastewater flow and analyses data.*

### Treated Sewage Sampling Summary

The annual average treated sewage effluent CBOD<sub>5</sub> was 4.41 mg/L.

The annual average treated sewage effluent Total Suspended Solids (TSS) was 8.72 mg/L.

The annual average treated sewage effluent Total Phosphorus (TP) was 0.57mg/L.

The average monthly geometric mean of treated sewage effluent E. coli during the period of chlorination was 64.56 CFU/100 mL.

The Ann. Avg. treated sewage effluent Total Chlorine residual during the period of chlorination was 0.56 mg/L.

The annual average treated sewage effluent pH was 6.66

The annual average sewage effluent temperature was 14.5 degrees C

### Effluent Chlorination and E Coli Levels:

The sewage treatment plant effluent is chlorinated using chlorine gas during the disinfection period of May 15 to October 15. In 2020 a total of 7,194.73kg of chlorine was used. The average dosage of Cl<sub>2</sub> applied in 2020 was 1.46 mg/L. The average chlorine residual in the effluent was 0.56 mg/L before



dechlorination. The minimum and maximum E Coli levels measured in the effluent during the period of chlorination were respectively 5 CFU/100ml and 770 CFU/100ml. The monthly geometric mean average for E Coli level in the effluent for 2020 was 64.56 CFU/100ml. The Monthly Geometric Mean Density Objectives of 150 counts/100 mL for E.coli *Effluent Limits* set in the ECA was achieved for all chlorination season of 2020.

Effluent Total Phosphorus Levels:

After primary treatment is completed the sewage ferric sulfate (iron salts) is added at the beginning of the secondary treatment process to reduce the Total Phosphorus level. The monthly averages for Total Phosphorus in the effluent ranged from 0.27 mg/L to 0.87 mg/L. The annual average Total Phosphorus level measured of the effluent was 0.57mg/L. Therefore the *Annual Average Effluent Objective of 0.8 mg/L* set in the ECA was achieved in 2020.

*See the accompanying North Bay 2020 Summary of Sewage Effluent Sampling Data and Annual Flow Data for complete wastewater effluent flow and analyses data.*

ECA Effluent Compliance Limits and Operational Objectives

Please see table below which shows the ECA effluent compliance limits, operational objectives and North Bay Wastewater Treatment Plant Effluent results for 2020.

<b>Effluent Parameter</b>	<b>Annual Average</b>	<b>Concentration</b>	
	(mg/L unless otherwise indicated)		
	<b>Compliance Limit</b>	<b>Operational Objective</b>	<b>2020 Results</b>
CBOD5	25	15	4.41
Total Suspended Solids (TSS)	25	15	8.72
Total Phosphorus (TP)	1	0.8	0.57
Total Ammonia Nitrogen	N/A	N/A	8.18
E. Coli * <sup>1</sup>	200 counts/100ml	150 counts/100ml	64.56
	(monthly Geometric Mean Density)	(Monthly Geometric Mean Density)	
Total Chlorine Residual* <sup>1</sup>	N/A	N/A	0.56
pH	6.0-9.5	6.5-8.5	6.66
Temperature	N/A	N/A	14.5

\*<sup>1</sup> During the disinfection period between May 15 to October 15, every year.

Weekly samples are taken immediately to Near North Laboratories in North Bay for analysis. Should the samples not be processed for analysis immediately, they are refrigerated at 4° C until analysed in the laboratory.

The ECA Annual Average Concentration Effluent Limits of 25.0 mg/L for CBOD<sub>5</sub> , 25.0 mg/L for Suspended Solids, 1.0 mg/L for Total Phosphorus were all met. Therefore, the plant was in compliance with the ECA. The pH of the effluent ranged between pH 5.78 to pH 7.92 and averaged pH 6.66. This met the ECA effluent limits except for one incident reading 5.78, pH was maintained between pH 6.0 to 9.5, inclusive at all times otherwise.

The ECA Effluent Objective concentrations of 15.0 mg/L for CBOD<sub>5</sub>, 0.8 mg/L for Total Phosphorus, 15.0 mg/L for Suspended and were achieved. The pH Objective of maintaining between 6.5 – 8.5 was achieved most of the time through the year with exception of a small percentage of days.

The Monthly Geometric Mean Density of 150 counts/100 mL for E.coli Effluent Objective set in the ECA was achieved all chlorination months. The average monthly geometric mean for the sewage effluent E. Coli during the period of chlorination was 64.56 CFU/100 mL.

#### Tabulation of the Volume of Sludge Generated

Sludge that settles to the bottom of the primary clarifier tanks, referred to as primary sludge is drawn from the tanks and pumped to the primary digester for reduction through the primary and secondary sludge digestion processes. The digested sludge is then processed through centrifugation to thicken the sludge to reduce water content. Thickened sludge (19 to 23% solids) is then hauled away from the wastewater facility. The sludge is hauled to Merrick Landfill site and is then mixed with sand and used as a topping material to cover closed out sections of the landfill. The sludge blended with the sand is nutrient rich and promotes vegetative growth to cover the closed out sections of the landfills

In 2020 the volume of primary sludge produced was 53,856 m<sup>3</sup>. The total volume of digested sludge that was processed through dewatering after the digestion process was 22,399 m<sup>3</sup>. The total weight of dewatered sludge that was hauled away from the WWTP was 2,718,200 Kg which was taken to the Merrick Landfill site to be blended with sand and used for top cover which stimulates rapid vegetation growth.

Sludge was removed on a regular basis for the sewage effluent CBOD<sub>5</sub>, Suspended Solids and total phosphorus to meet compliance criteria.

The total treated sewage effluent flow for the year 2020 was 11,842,594.0m<sup>3</sup> minus 2,718,200 Kg of sludge with an approximate 23 - 26 % solids concentration which was hauled away from the facility for disposal.

*See the accompanying North Bay 2020 Summary of Sewage Sludge Volumes and Disposal Data for complete wastewater effluent flow and analyses data.*

#### Summary of Effluent Quality Assurance or Control Measures Taken:

In 2020 as ongoing efforts to ensure optimal operation of the treatment process and best possible effluent quality the following measures were followed:

- Routine data reviews to identify trends or developing process problems
- In-house sampling in addition to regulatory sampling required by the ECA
- Routine maintenance on all equipment
- Process changes to optimize treatment effectiveness
- On-going training of operators
- Upgrading equipment where needed to increase effectiveness of plant

#### Operational Problems and Corrective Actions

- Occasional issues with the wastewater plant final effluent's pH being below the objective of 6.5. The plant adjusted the wasting of old sludge to address this issue. There was one adverse condition on December 11, 2020 with a pH of 5.78 in the effluent. This was determined to be the plant carrying too much biology with inadequate food supply. In order to bring the pH back up wasting was increased to reduce the biology. The non-compliance was reported to Spills Action Center and Ministry of Health on December 11, 2020 in Ref# 8331-BW7SKX.

#### **Summary of Plant Sewage By-passes or Abnormal Discharge Events**

There were four secondary bypasses that occurred from the North Bay Wastewater Treatment Plant during the 2020 reporting period. The secondary by-passes were initiated by operations staff to avoid losing the biomass due to solids being flushed out of the aeration tanks and secondary clarifiers during high flow conditions. The events were reported to the Ministry of the Environment as required and samples were collected for analysis throughout the events.

1. A secondary by-pass of the plant process occurred March 26<sup>th</sup>-27<sup>th</sup>, 2020 between 013:15hrs March 26<sup>th</sup> and 00:20 on March 27<sup>th</sup>. It is estimated that 14,268m<sup>3</sup> of sewage was released due to heavy rain and snow melt. The by-pass sewage was chlorinated before release; samples were collected during the event and sent to the lab. MECP Spill Action Centre was notified with reference #904217

2. A secondary by-pass of the plant process occurred March 29<sup>th</sup> - 30<sup>th</sup>, 2020 between 13:55hrs on March 29<sup>th</sup> and 07:10 March 30<sup>th</sup>. It is estimated that 14,699m<sup>3</sup> of sewage was released due to heavy rain and snow melt. The by-pass sewage was chlorinated before release; samples were collected during the event and sent to the lab. MECP Spill Action Centre was notified with reference #904247
3. A secondary by-pass of the plant process occurred March 30<sup>th</sup> - April 2, 2020 between 16:30hrs on March 30<sup>th</sup> and 008:15 April 2. It is estimated that 31,562m<sup>3</sup> of sewage was released due to heavy rain and snow melt. The by-pass sewage was chlorinated before release; samples were collected during the event and sent to the lab. MECP Spill Action Centre was notified with reference #904269
4. A secondary by-pass of the plant process occurred June 10<sup>th</sup>, 2020 between 20:05 and 22:35 April 2. It is estimated that 10,050m<sup>3</sup> of sewage was released due to heavy rain and thunderstorm. The by-pass sewage was chlorinated before release; samples were collected during the event and sent to the lab. MECP Spill Action Centre was notified with reference #904453

There were three spills and ten bypasses at lift stations in 2020:

1. On March 26, 2020 there was a sewage overflow at the Gertrude Rd. Lift Station releasing approximately 3,010m<sup>3</sup> of sewage due to rain and snow melt causing high flows, Chlorine disinfection pucks were used to disinfect spill. Notified MECP SAC reference #904215
2. On March 29, 2020 there was a sewage overflow at the Gertrude Rd. Lift Station releasing approximately 1,125m<sup>3</sup> of sewage due to rain and snow melt causing high flows, Chlorine disinfection pucks were used to disinfect spill. Notified MECP SAC reference #904258
3. On November 6, 2020 there was a call from a local MECP inspector identified a source of pooling water in a ditch along Booth Rd. 30-40m North of Lakeshore Dr., this liquid had a strong odour of sewage. Water and Sewer operators were dispatched to site; the MECP inspector had taken samples November 10, 2020 which identified high numbers of e-coli. The inspector had notified us on December 2, 2020 to make us aware of testing identifying this as human waste, crews were dispatched to investigate. On December 3, 2020 an excavation verified a sewer force main was leaking in area, pooled sewage was cleaned up by vac trucks and dumped into sewer over night until force main could be isolated. All contaminated soils were transported to Merrick Landfill as contaminated soils. When replacement part arrived from the USA; the force main was repaired and put back on line. Notified MECP SAC reference #8827-BVEMK7.

## **Flow Measurement & Annual Calibration**

The annual calibrations of the raw sewage flow meters were completed in November 2020. In addition other flow meters throughout the sewage treatment plant were calibrated at the same time.

## **Documentation and Reporting**

An emergency SOP manual with procedures to deal with emergencies and complaints is kept updated and is stored for easy reference at the North Bay Wastewater Treatment Plant; along with SDS data sheets for the treatment chemicals. The Certificate of approval ECA for the facility is posted at the facility along with copies of the Facility Classification certificate. A copy of the wastewater treatment plant manual with process descriptions, procedures, checklists, treatment calculations and pertinent information for the operation of the facility is readily available for reference for the operators.

Plant logbooks, daily and monthly data record sheets are completed and retained as required by the ECA. Process treatment records and lab analysis report data are entered into a spreadsheet. The annual report will be filed with the Ministry of the Environment as required by the ECA

## **Facility Maintenance**

Certified electricians, SCADA technician, mechanics and operators, who operate the treatment facility and conduct maintenance of the appurtenances of the wastewater treatment system.

## **Summary of 2020 Major Maintenance Activities , Capital Upgrades or Equipment Replacement at the Facility:**

- Rebuilt Secondary Clarifier #6, replacing all chain/wear shoes and 4 sprockets. Also built up metal on floor and side rails and added antiwear strips.
- Installed two new large gate valves for aeration tank cells # 1&2.
- Cleaned rag blanket which accumulated in head end wet well.
- Cleaning of accumulated grit in bottom of aeration cells, all air stones were cleaned while tanks were empty. Repaired broken stones.
- Rebuilt Andritz centrifuge and replaced defective VFD.
- Rebuilt Moyno cake pump in the Centrifuge building.
- Fabricated new stub shaft and repaired gear box for Secondary Clarifier #2.
- Concrete repairs on new contact tank and installation of 6 new gate valves.
- Replaced 110m of 250mm sanitary sewer on Douglas St.

- Replaced 160m of 300mm sanitary sewer on Lavse Rd.
- Replaced 102m of 200mm sanitary line on Cassels between Chippewa St. to Duke St.
- Replaced 48m of 200mm sanitary line on Cassels between Chippewa St. and Chippewa Creek
- Replaced 76m of 375mm of Chippewa Trunk sanitary line to Cassels St.
- Replaced 96m of 375mm sanitary main on Cassels St. between Aubrey St. and Olive St.
- Replaced 102m of 300mm sanitary main on Cassels St. from Olive St. to Shaw St.
- Replaced 49m of 200mm sanitary main on Shaw St. from Food Basics to Cassels St.
- Replaced 17m of 300mm sanitary main on Aubrey St.
- Replaced 24m of 375mm sanitary main on Olive St.
- Installed 285m of 675mm sanitary main on Pinewood Park Dr. from Declare Rd. South toward Callendar.
- Replaced 121m of 300mm, 136m of 375mm and 38m of 525mm storm water main on Main St.W. between Gormanville Rd. and Mattawa St.
- Replaced 181.6m of 750mm and 100.5m of 675mm of storm water main on Cassels St. between Chippewa Creek and Princess St.
- Replaced 19m of 450mm of storm water main at Cassels St. & Duke St. intersection.
- Replaced 26m of 375mm and 12m of 300mm of storm water main at Cassels St. & Chippewa St. intersection.
- Installed a 30.2m of 7.5m x2.7m precast concrete rigid frame box culvert.
- Replaced 17.6m of 750mm and 90.8m of 600mm storm water main on Cassels St. between Chippewa Creek and Olive St.
- Replaced 24.5m of 450mm of storm water main at Cassels St. & Aubrey St. intersection.
- Replaced 23m of 675mm of storm water main at Cassels St. & Olive St. intersection.
- Replaced 50.5m of 300mm of storm water main on Shaw St. from Food Basics to Cassels St.
- Installed 176m of 375mm sanitary sewer from Knox Court to Gertrude lift station
- Installed 413m of 250mm sanitary force main from Gertrude lift station to outlet located at intersection of Gertrude St.E and Whitney St.

- Old Gertrude lift station was decommissioned.
- Install and commission of new Gertrude Lift Station, including pumps, generator, wet well and all electrical.
- Installed a new 85hp dry submersible flygt pump at Marshal Lift station

**Summary of Complaints Received and Steps Taken to Address Them:**

No Complaints were brought to our attention in 2020.

Report prepared by

Jonathan Dewey, C-tech.

Operations Supervisor Water & Wastewater Facilities

22 February 2020

**MONTHLY PROCESS DATA**

Facility: North Bay Waste Water Treatment Plant  
 Classification: Class 4 Treatment, Class 2 Wastewater Collection  
 Water Receiver: Lake Nipissing

Period: January 1, 2020 to December 31, 2020  
 Population Served: 54,000  
 Total Design Capacity (m3/d): 54,540

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Summary
<b>Raw Sewage</b>													
<b>Volume (m3/d)</b>													
<i>Avg</i>	25,363	22,954	41,516	41,808	33,635	42,489	28,236	28,563	34,925	35,183	33,054	29,721	<b>32,357.00</b>
<i>Max</i>	27,028	25,537	83,978	64,094	47,940	50,211	37,733	38,101	44,565	66,552	39,220	33,919	<b>83,978.00</b>
<i>Min</i>	23,930	22,308	23,164	31,119	28,246	27,077	25,873	24,855	27,598	27,831	30,378	27,020	<b>22,308.00</b>
<i>Sum</i>	786,239	685,666	1,286,980	1,254,224	1,042,682	974,661	875,308	885,443	1,047,751	1,090,674	991,624	921,342	<b>11,842,594.00</b>
<b>Peak Flow (M3/d)</b>													
<i>Max</i>	77,687	72,262	106,211	96,324	85,803	98,774	86,324	59,050	99,087	106,137	67,412	68,062	<b>106,211.0</b>
<b>BOD5</b>													
<i>Avg</i>	132.50	213.3	114.7	46.5	84.7	84.0	97.2	548.0	71.6	68.4	109.3	119.8	<b>140.83</b>
<b>Total Phosphorus (mg/L)</b>													
<i>Avg</i>	2.56	3.47	1.43	1.54	2.83	2.28	2.72	12.3	1.26	2.74	2.02	1.78	<b>3.08</b>
<b>TKN (mg/L)</b>													
<i>Avg</i>	43.94	124.0	17.36	23.57	15.41	20.0	37.11	28.69	16.19	17.24	19.70	13.58	<b>31.39</b>
<b>Suspended Solids (mg/L)</b>													
<i>Avg</i>	204.0	195.0	295.0	74.8	74.0	109.0	69.0	13,200	35.5	60.0	142.0	119.0	<b>125.21</b>



**MONTHLY PROCESS DATA**

Facility: North Bay Waste Water Treatment Plant  
 Classification: Class 4 Treatment, Class 2 Wastewater Collection  
 Water Receiver: Lake Nipissing

Period: January 1, 2020 to December 31, 2020  
 Population Served: 54,000  
 Total Design Capacity (m3/d): 54,540

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Summary
<b>Final Effluent</b>													
<b>Temp Grab (oC)</b>													
<i>Avg</i>	10.8	11.1	11.1	11.6	13.8	15.2	19.3	18.4	17.9	16.4	15.1	12.8	14.5
<i>Max</i>	12.3	15.1	15.4	14.3	17.1	18.7	21.2	20.0	21.5	19.0	19.1	14.4	21.5
<i>Min</i>	9.4	7.5	9.3	9.0	10.8	10.4	18.0	11.8	13.1	14.4	11.1	9.4	7.5
<b>NH3: Ammonia as N (mg/L)</b>													
<i>Avg</i>	13.58	16.23	15.88	9.43	17.08	8.22	2.44	1.86	0.68	7.16	2.91	2.64	8.18
<b>CBOD5 (mg/L)</b>													
<i>Avg</i>	3.63	3.15	2.28	3.32	4.13	4.74	5.35	9.08	2.58	5.74	5.08	3.82	4.41
<b>PH</b>													
<i>Avg</i>	6.90	7.16	6.91	6.72	6.79	6.72	6.46	6.31	6.44	6.84	6.39	6.31	6.66
<i>Max</i>	7.09	7.92	7.39	7.31	7.18	7.05	6.72	6.73	7.08	7.23	6.89	6.65	7.92
<i>Min</i>	6.62	6.73	6.42	6.22	6.45	6.50	6.02	6.05	6.11	6.48	6.0	5.78	5.78
<b>Total Phosphorus (mg/L)</b>													
<i>Avg</i>	0.66	0.50	0.65	0.49	0.37	0.59	0.78	0.87	0.66	0.45	0.27	0.49	0.57
<b>TKN (mg/L)</b>													
<i>Avg</i>	17.71	22.45	20.58	13.18	20.85	9.40	4.46	4.75	2.32	9.43	4.28	5.19	11.22
<b>Suspended Solids (mg/L)</b>													
<i>Avg</i>	7.6	8.45	6.58	15.08	9.73	10.1	9.68	9.38	8.55	8.70	5.10	5.64	8.72
<b>E-coli (cfu/100 mL)</b>													
<i>Geo Mean</i>					26.46	33.65	118.03	62.92	8.41	137.89			64.56
<i>Max</i>					70.0	240.0	770.0	560.0	10.0	690.0			770
<i>Min</i>					10.0	5.0	30.0	5.0	5.0	10.0			5
<b>Chlorine used (kg)</b>													
<i>Sum</i>					684.18	1101.06	973.69	1851.51	1898.4	721.89			7,194.73
<b>Chlorine Dosage (mg/L)</b>													
<i>Avg</i>					1.16	1.12	1.12	2.09	1.78	1.50			1.46
<b>Total Chlorine Res. (mg/L)</b>													
<i>Avg</i>					0.73	0.72	0.25	0.47	0.59	0.60			0.56

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<b>Sludge/Biosolids Handling</b>													
<b>Volume to Primary Digester (m3)</b>													
<i>Sum</i>	5,206	4,722	4,850	4,700	5,110	5,922	4,353	4,461	4,087	3,343	3,718	3,384	<b>53,856.00</b>
<b>Sludge (Liquid) Volume Processed (m3)</b>													
<i>Sum</i>	2,337	2,367	2,109	2,446	1,114	2,066	1,695	2,367	700	955	2,225	2,018	<b>22,399.00</b>
<b>Sludge (Thickened) Volume Hauled x 1,000 Kg</b>													
<i>Sum</i>	288.91	316.65	197.76	248.51	144.25	251.75	194.19	250.27	82.83	122.77	309.66	310.65	<b>2,718.20</b>
<i>loads</i>	17.00	24.00	15.0	16.0	8.0	16.0	11.0	18.0	4.0	8.0	23.0	18.0	