2019 Annual Wastewater Report

Mar 24, 2020 v.1.0

2019
Annual Wastewater Report

v. 1.0

Reviewed by:

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Manager of Wastewater Treatment

24-MAR-2020
Date

Approved by:

Mike Jensen
Director, Water/Wastewater Treatment & Compliance

24 MAR 2020
Date

Introduction to the Annual Wastewater Report

Under Environmental Compliance Approval (ECA) agreements issued by the Ministry of Environment, Conservation & Parks (MECP), the City is required to report annually on the values/parameters indicated in the ECA and must make this report publicly available within 90 days of January 1st for the year preceding the current year. Specifically the annual report is to include:

a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in conditions described in the Approval, including an overview of the success and adequacy of the Works;

b) a description of any operating problems encountered and corrective actions taken;

c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;

d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment;

f) a description of efforts made and results achieved in meeting the Effluent Objectives of the Approval;

g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

i) a summary of all by-pass, plant overflow, overflow, spill or abnormal discharge events;

j) any other information the Water Supervisor requires from time to time; and

k) a copy of all Notices of Modification submitted to the Water Supervisor.

To address these requirements, this report contains the following sections;

1. **Operating Issues & Corrective Actions**; Measured values resulting in a non-compliance with respect to a parameter listed within an ECA and the corrective actions taken to resolve the issue.
2. **Maintenance & Capital Improvements**; All major maintenance, modifications and capital works completed at the facility within the reporting period.
3. **Calibrations & Maintenance**: Details on the calibration and maintenance carried out on all effluent monitoring equipment.
4. **Sludge Disposal**; The volume of sludge received and treated at the Sudbury Biosolids facility from the Sudbury WWTP, other wastewater treatment facilities and licensed septage haulers.
5. **Customer Complaints (ACR)**; Any complaints received regarding Wastewater Treatment facilities through the City of greater Sudbury 311 (ACR) system during the reporting period and any steps taken to address the complaints.
6. **Plant Bypasses and Overflows**; A listing of all bypasses, spills and overflows at the facility during the reporting period.
7. **Effluent Quality & Control Measures**; A summary and interpretation of all monitoring data collected and a comparison to the parameters and limits given in the ECA for each facility.
8. **Individual Plant Annual Data Reports**; Tables showing all required reporting values and parameters for each wastewater treatment plant of which the City of Greater Sudbury is the owner, including a graphical representation of flows through the plant.

Definitions

- *Alkalinity*: a measurement of the ability of water to neutralize acid by absorbing hydrogen ions;
- *Average Concentration*: the mean of all Single Sample Results of the concentration of a contaminant in a given stream (influent/effluent) measured during a specified time period;
- *Average Flow*: the cumulative total influent or effluent flow measured during a defined time period (annual, monthly, etc.) divided by the number of days during that specified period;
- *Average Loading*: the value obtained by multiplying the Average Concentration of a contaminant in a given stream (influent/effluent) by the Average Flow for that stream;
- *BOD_5*: the five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demands;
- *Bypass*: the diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities;
- *$CBOD_5$*: the five day carbonaceous biochemical oxygen demand of biological organisms in the material, without the impact of oxygen depletion by nitrogenous bacteria;
- *E. coli*: coliform bacteria that possess the enzyme beta-glucuronidase and are capable of cleaving a fluorogenic or chromogenic substrate with the corresponding release of a fluorogen or chromogen, that produces fluorescence under long wavelength (366 nm) UV light, or color development, respectively. Data are reported as colony forming units (CFU) per 100 mL;
- *Event*: an action or occurrence, at a given location within the Works that causes a Bypass or Overflow. An Event ends when there is no recurrence of Bypass or Overflow in the 12-hour period following the start of the event;
- *Final Effluent*: effluent that is discharged to the environment through the approved effluent disposal facilities, including all Bypasses, that are required to meet the compliance limits stipulated in the Approval for the Sewage Treatment Plant at the Final Effluent sampling point(s);
- *Influent*: flows to the Sewage Treatment Plant from the collection system. Flows can fluctuate according to weather conditions and high flows are commonly due to Inflow and Infiltration, a condition that allows rain and/or snow melt to enter the sanitary sewer.;
- *Monthly Geometric Mean Density*: the mean of all Single Sample Results of E. coli measurement in the samples taken during a calendar month, calculated and reported as per the methodology specified by the MECP;
- *Nitrite*: the amount of nitrogen present in the effluent as the NO2- anion;
- *Nitrate*: the amount of nitrogen present in the effluent as the NO3- anion;
- *Overflow*: a discharge to the environment at location(s) other than the approved effluent discharge;
- *pH*: the potential of hydrogen measured on a 14 point scale where 0 represents highly acidic material, 14 represents highly acidic material and 7 represents neutral material (such as water);
- *Rated Capacity*: the Annual Average Daily Influent Flow for which the facility is designed to process;
- *T Amm*: the total ammonia measured in the final effluent;
- *TKN*: Total Kjeldahl Nitrogen; the total concentration of organic nitrogen & ammonia in the effluent;
- *TP*: Total Phosphorous; the total amount of phosphorous measured in the final effluent;
- *TSS*: Total Suspended Solids; the total amount of residual solid matter in the final effluent;
- *Un-ionized Amm*: the calculated amount of un-ionized ammonia in the final effluent;
- *Sludge*: the residual material produced through the wastewater treatment process.

Contents

1. Operating Issues & Corrective Actions

Date	Facility	Parameter	Probable Cause	Corrective Actions Taken
01-Feb-19	Dowling WWTP	BOD5	Error in 3rd party lab results; BOD in plant influent lower than in effluent	Additional sampling to prove plant is within ECA limits
29-Mar-19	Azilda WWTP	Total Suspended Solids (TSS)	Testing of new pumps at Laurier Lift Station caused abnormal flows to plant.	Testing completed
02-Apr-19	Lively WWTP	Total Suspended Solids (TSS)	Baffles separating aeration tank from effluent channel leaking	Baffles repaired
18-Apr-19	Chelmsford WPCP	Total Suspended Solids (TSS)	Project work at facility causing process disruptions	Work completed
23-Apr-19	Chelmsford WPCP	Ammonia - Seasonal Discharge 1-Jan-2018 to 30-Apr-2018 & 31-Oct-2018 to 31-Dec-2018	Project work at facility causing process disruptions	Upgrade work completed
23-Apr-19	Chelmsford WPCP	Ammonia - Seasonal Discharge 1May-2018 to 31-Oct-2018	Project work at facility causing process disruptions	Upgrade work completed
29-Apr-19	Azilda WWTP	Total Suspended Solids (TSS)	Spring run-off causing high flows	Spring run-off completed
30-Apr-19	Lively WWTP	E.coli	Spring run-off causing high flows	Increased chlorine residual
02-May-19	Azilda WWTP	E.coli	Spring run-off causing high flows	Increased chlorine residual
21-May-19	Azilda WWTP	Chlorine Residual	Plugged chlorine pump resulted in no Cl in effluent	Cleaned chlorine pump
10-Jun-19	Chelmsford WPCP	E.coli	UV disinfection system not functioning as required	Equipment supplier to complete repairs
21-Jul-19	Azilda WWTP	Chlorine Residual	Plugged chlorine pump resulted in no Cl in effluent	Cleaned chlorine pump
16-Aug-19	Azilda WWTP	pH	Liquid lime system plugged	Cleaned liquid lime system
01-Oct-19	Chelmsford WPCP	Total Phosphorus (TP)	Chemical feed pump not working	Pump repaired
07-Oct-19	Azilda WWTP	Ammonia	Mechanical equipment failure	Equipment repaired
07-Oct-19	Azilda WWTP	E.coli	Mechanical equipment failure	Equipment repaired
07-Oct-19	Chelmsford WPCP	E.coli	UV disinfection system not functioning as required	Equipment supplier to complete repairs
05-Nov-19	Chelmsford WPCP	E.coli	UV disinfection system not functioning as required	Equipment supplier to complete repairs
03-Dec-19	Chelmsford WPCP	Ammonia	High seasonal flows and plant maintenance	Additional planning for plant switchovers
30-Nov-19	Lively WWTP	E.coli	Return activated sludge pumping system failure	Equipment repaired
01-Dec-19	Lively WWTP	Total Phosphorus (TP)	Mechanical equipment failure	Diverted flow to Walden WWTP for repairs
01-Dec-19	Lively WWTP	E.coli	Mechanical equipment failure	Diverted flow to Walden WWTP for repairs
31-Dec-19	Coniston WPCP	E.coli - Annual Geomean Value	Various maintenance issues in 2019	Various repairs completed

2. Maintenance & Capital Improvements

Facility	Maintenance Completed	Capital Improvements Completed
Azilda WWTP	- Electrical infrastructure repaired (fire damage) - Clarifier gearbox repaired - Damaged blowers replaced/repaired	- Deflector plate installed on plant influent
Chelmsford WPCP	- UV disinfection system repaired	- Modifications made to chemical dosing systems
Capreol Lagoons	- No major maintenance required	- No capital work completed
Coniston WWTP	- Aeration air lines repaired	- No capital work completed
Dowling WWTP	- No major maintenance required	- No capital work completed
Falconbridge WWTP	- No major maintenance required	- No capital work completed
Levack WWTP	- No major maintenance required	- No capital work completed
Lively WWTP	- Tank baffles repaired - Return Activated Sludge pumping system repaired - Clarifier gearbox repaired	- No capital work completed
Sudbury WWTP	- Aeration tanks and chlorine contact chamber cleaned - Aeration system piping and membranes repaired - Effluent pumps repaired - #2 Clarifier gearbox repaired -Activated charcoal and UV blubs replaced in odour control units	- No capital work completed
Valley East WWTP	- Clarifier chain repaired - Raw and effluent pumps repaired/replaced as required - Concrete repairs completed on primary clarifier	- Supervisory Control and Data Acquisition (SCADA) system connected to network; can now be controlled from Sudbury plant
Wahnapitae Lagoons	- No major maintenance required	- No capital work completed
Walden WWTP	- Aeration tanks cleaned - Aeration piping and diffusers repaired - Blowers rebuilt and reinstalled	- Clarifier treated with internal coating to prolong operating life

3. Calibrations & Maintenance

All analyzers at all plants are calibrated as per manufacturer's recommendations, a minimum of once per year. Calibration Certificates are submitted and retained electronically for each unit.

All major plant equipment is maintained as per manufacturer's recommendations, with regular preventive maintenance checks completed as per established schedules.

4. Sludge Disposal

Sludge produced and removed from all Wastewater Treatment Plants in the City of Greater Sudbury, along with hauled liquid waste from other sources, is processed at the Sudbury Biosolids facility. Hauled liquid waste is any domestic sewage collected & transported by licensed haulers that is suitable for treatment, including:

- Waste removed from cesspools, septic tanks, privy pits, chemical toilets, portable toilets or sewage holding tanks and grey water from residential activities;
- Sewage from on-board holding tanks (e.g. RVs, tour buses, boats, etc.), and;
- Sludge from wastewater treatment facilities in neighbouring municipalities (for example, Espanola).

This Biosolids facility, operated under a Public Private Partnership by Walker Industries and located on the grounds of the Sudbury Wastewater Treatment Plant, produces a soil amendment by mixing dewatered septage & sludge with cement kiln dust and/or quicklime, to attain pathogen pasteurization. The product is a granular material, which is applied to agricultural soils for nutrient and pH enhancement.

In 2019, the Sudbury Biosolids facility treated a total of 128,098 m^3 of material, containing approximately 3,727 tonnes of solids. Of this total, approximately 17,910 m^3 was from septic tanks, 38,888 m^3 was sludge from other CGS facilities and 4,035 m^3 was sludge received from the Espanola Wastewater Treatment Plant.

5. Customer Complaints (ACR)

Date	Case ID	Location	Issue	Resolution
01/03/19	851159	Walford East Lift Station	Snowbank at lift station causing line of sight issues	Snow bank removed.
01/11/19	853203	Walford East Lift Station	Snow being plowed on to resident's property	Snow bank removed.
02/04/19	857147	Walford East Lift Station	Snow being plowed on to resident's property	Snow bank removed.
03/12/19	867933	Capreol Lagoons	Hydro meter at lift station required replacement	Issue resolved by Hydro One
05/01/19	880778	Helene Lift Station	Debris left over from snow removal	Debris removed.
05/23/19	886271	Wahnapitae Lagoons	Driving concern	Issue discussed with employee, and coaching provided on proper driving techniques and habits.
05/29/19	887454	Nickel Lift Station	House vibrating due to lift station operation	Root cause of issue identified as debris in #2 pump. Pump taken offline and cleaned.

Date	Case ID	Location	Issue	Resolution
06/28/19	895692	Helene Lift Station	Debris left over from snow removal	Area cleaned up.
06/28/19	895743	Fourth Ave. Lift Station	Noise coming from lift station	Exhaust fan blades striking fan housing. Fan turned off until repairs could be completed.
07/12/19	899053	Laurier Lift Station	Lift station fence falling over	Fence repaired and other issues identified resolved.
07/12/19	899052	Laurier Lift Station	Lift station fence falling over	Concerns addressed in ACR 899053
07/24/19	901329	Brenda Lift Station	Lift station driveway not cleaned up	Debris removed.
08/06/19	903948	Nickel Lift Station	Light Flashing At Lift Station	Instrumentation issue causing false alarm. Level sensor repaired.
08/07/19	904417	Charette Lift Station	Water lift station - fence not closed	Gate closed by on call operator
08/14/19	906165	Falconbridge WWTP	Traffic constantly going into and out of plant property	Discussed concerns with resident. Fencing and additional security to be installed as part of capital project.
08/19/19	907268	Laurier Lift Station	Lift station odour	Issue resolved by modifying venting to lift station after verifying with design engineer.
08/23/19	908829	Sudbury WWTP	Driving concern	Issue discussed with employee, and coaching provided on proper driving techniques and habits.
08/28/19	910812	Lively WWTP	Treatment plant odour	Doors to inlet chamber at the facility were open. Operator closed doors to resolve issue.
09/05/19	913362	O'Neil Lift Station	Lift station odour	Odour due to some minor maintenance issues. Vacuum truck and Wastewater Operators resolved the following day.
09/19/19	918222	Fourth Ave. Lift Station	Noise coming from lift station	Maintenance performed on generator to resolve noise issue.
09/19/19	918296	Fourth Ave. Lift Station	Noise coming from lift station	High speed fan at lift station causing noise issue shut off until it can be serviced.
09/26/19	922122	Main St. Lift Station	Fence damage at lift station	Fencing repaired.
09/26/19	922506	Brenda Lift Station	Generator running at lift station	Generator did not shut off after power outage due to communications issue. Issue resolved by operators.
10/17/19	930565	Azilda WWTP	Drainage issues on residential lot	Issue not caused by Azilda WWTP. Issue forwarded to City Drainage Engineer.
11/07/19	937518	Vermillion Lift Station	Lift station electrical panel left open	Panel closed and locked.

6. Plant Bypasses and Overflows

Date	Time (24 H Clock)	Duration	Location	Type of Occurrence
16-Oct-10	7:00	19.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
06-Feb-19	15:05	0.01 hrs.	Chelmsford WWTP	Plant overflow
19-Feb-19	13:44	31.0 hrs.	Azilda WWTP	Plant bypass
24-Feb-19	15:29	8.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
14-Mar-19	20:25	28.1 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
14-Mar-19	22:45	7.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
14-Mar-19	21:20	23.0 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
15-Mar-19	3:30	20.0 hrs.	Sudbury WWTP	Plant bypass
16-Mar-19	0:00	24.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
16-Mar-19	0:00	24.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
17-Mar-19	0:00	96.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
20-Mar-19	17:17	25.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
23-Mar-19	0:00	2472 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
27-Mar-19	15:00	4.05 hrs.	Chelmsford WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	16:15	22.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	18:55	4.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	18:30	13.0 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
28-Mar-19	17:40	4.25 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
02-Apr-19	14:00	696 hrs.	Wahnapitae Lagoon	Plant bypass: flow exceeds design capacity
05-Apr-19	17:41	535 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
07-Apr-19	18:10	422 hrs.	Azilda WWTP	Plant bypass: flow exceeds design capacity
07-Apr-19	17:30	6.7 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
08-Apr-19	8:00	57.0 hrs.	Coniston WWTP	Plant bypass
08-Apr-19	8:15	48.4 hrs.	Lively WWTP	Plant bypass
08-Apr-19	0:10	80.0 hrs.	Sudbury WWTP	Plant bypass
08-Apr-19	6:45	11.0 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
09-Apr-19	5:50	18.0 hrs.	Chelmsford WWTP	Plant bypass: flow exceeds design capacity
12-Apr-19	15:35	226.5 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	7:15	3.35 hrs.	Anderson LS	Collection system overflow
18-Apr-19	4:30	30.0 hrs.	Chelmsford WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	6:00	25.5 hrs.	Coniston WWTP	Plant bypass
18-Apr-19	3:39	3.4 hrs.	Levack WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	5:00	29.5 hrs.	Lively WWTP	Plant bypass
18-Apr-19	5:00	21.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
18-Apr-19	8:30	8.0 hrs.	Main St LS	Collection system overflow
18-Apr-19	7:18	50.5 hrs.	Sudbury WWTP	Plant bypass
18-Apr-19	7:30	8.0 hrs.	Valley East WWTP	Plant overflow
18-Apr-19	7:30	8.0 hrs.	Valley East WWTP	Plant bypass

Date	Time (24 H Clock)	Duration	Location	Type of Occurrence
18-Apr-19	6:00	2.0 hrs.	Walden WWTP	Plant bypass
18-Apr-19	3:00	15.4 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
21-Apr-19	12:00	44.0 hrs.	Dowling WWTP	Plant bypass: flow exceeds design capacity
09-May-19	16:05	16 hrs.	Coniston WWTP	Plant bypass
09-May-19	11:05	8 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
09-May-19	14:45	18 hrs.	Lively WWTP	Plant bypass
09-May-19	20:30	12 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
09-May-19	14:30	1.5 hrs.	Walden WWTP	Plant bypass: flow exceeds design capacity
13-May-19	17:55	17 hrs.	Azilda WWTP	Plant bypass: flow exceeds design capacity
19-May-19	20:15	92.5hrs	Coniston WWTP	Plant bypass: flow exceeds design capacity
20-May-19	18:00	2 hrs.	Other	Collection system overflow
27-May-19	9:15	22 hrs.	Azilda WWTP	Plant bypass: flow exceeds design capacity
10-Jun-19	13:45	59 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
13-Jun-19	19:15	1.75 hrs.	Coniston WWTP	Plant bypass
13-Jun-19	19:30	3.0 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
14-Jun-19	22:30	5.0 hrs.	Sudbury WWTP	Plant bypass
29-Jun-19	18:34	3.9 hrs.	Valley East WWTP	Plant overflow
29-Jun-19	18:34	3.9 hrs.	Valley East WWTP	Plant overflow
11-Jul-19	12:15	4.5 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
24-Jul-19	0:00	168.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
03-Sep-19	21:06	3.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
17-Sep-19	7:00	0.25 hrs.	Sudbury WWTP	Collection system overflow
22-Sep-19	20:00	5.6 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
22-Sep-19	19:30	15.5 hrs.	Sudbury WWTP	Collection system overflow
16-Oct-19	9:08	175.4 hrs.	Chelmsford WWTP	Plant bypass
16-Oct-19	9:15	9.8 hrs.	Coniston WWTP	Plant bypass
16-Oct-19	3:00	15.0 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
16-Oct-19	18:00	48.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
17-Oct-19	13:25	19.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	12:15	4.5 hrs.	Coniston WWTP	Plant bypass
27-Oct-19	17:50	7.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	11:20	4.0 hrs.	Lively WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	1:20	12.2 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity
27-Oct-19	11:30	12.0 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
28-Oct-19	0:01	816 hrs.	Valley East WWTP	Plant bypass: flow exceeds design capacity
04-Nov-19	16:25	22.0 hrs.	Coniston WWTP	Plant bypass: flow exceeds design capacity
04-Nov-19	23:15	4.5 hrs.	Sudbury WWTP	Plant bypass: flow exceeds design capacity

7. Effluent Quality & Control Measures

Data for each treatment facility within the City of Greater Sudbury is shown below. Values for average loading and material removed were calculated using laboratory results and plant influent flow data.

Azilda Wastewater Treatment Plant

Influent Flow	
Design Capacity:	3,300 m^3/day
Average Daily Flow:	2,238 m^3/day

$CBOD_5$		Value	ECA Limit
Annual Average Daily Loading	Influent	207.4 kg/day	
	Effluent	6.86 kg/day	< 33 kg/day
Monthly Effluent Concentration	Average	7.84 mg/L	< 10 mg/L
	Minimum	1.40 mg/L	
	Maximum	8.20 mg/L	
Plant Removal		200.5 kg/day	
		96.99 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	202.1 kg/day	
	Effluent	19.51 kg/day	< 33 kg/day
Monthly Effluent Concentration	Average	7.84 mg/L	< 10 mg/L
	Minimum	4.50 mg/L	
	Maximum	13.00 mg/L	
Plant Removal		182.6 kg/day	
		90.30 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	6.32 kg/day	
	Effluent	0.68 kg/day	< 2.0 kg/day
Monthly Effluent Concentration	Average	0.31 mg/L	< 0.6 mg/L
	Minimum	0.19 mg/L	
	Maximum	0.50 mg/L	
Plant Removal		5.65 kg/day	
		90.13 %	

Total Ammonia (as Nitrogen)		Value	ECA Limit
Annual Average Daily Loading	Influent	34.84 kg/day	
	Effluent	3.27 kg/day	< 16.5 kg/day
Monthly Effluent Concentration	Average	1.74 mg/L	< 5 mg/L
	Minimum	0.05 mg/L	
	Maximum	10.01 mg/L	
Plant Removal		31.58 kg/day	
		89.93 %	

pH		Value	ECA Limit
Influent Measurements	Average	7.59	
Effluent Measurements	Average	6.83	
	Minimum	6.50	6.0 to 9.5 at all times
	Maximum	7.10	

E. Coli		Value	ECA Limit
Monthly Geometric Mean Density	Average	56 CFU/100mL	< 200 CFU/100mL
	Minimum	6 CFU/100mL	< 200 CFU/100mL
	Maximum	234 CFU/100mL	< 200 CFU/100mL

Capreol Lagoon

Influent Flow	
Design Capacity:	5,500 m^3/day
Average Daily Flow:	2,332 m^3/day

BOD_5		Value	ECA Limit
Annual Average Daily Loading	Influent	164.5 kg/day	
	Effluent	31.13 kg/day	
Monthly Effluent Concentration	Average	16.10 mg/L	< 30 mg/L
	Minimum	0.50 mg/L	
	Maximum	31.10 mg/L	
Plant Removal		133.4 kg/day	
		79.27 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	204.9 kg/day	
	Effluent	44.92 kg/day	
Monthly Effluent Concentration	Average	20.14 mg/L	< 40 mg/L
	Minimum	25.30 mg/L	
	Maximum	9.67 mg/L	
Plant Removal		160.0 kg/day	
		69.60 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	5.41 kg/day	
	Effluent	3.48 kg/day	
Monthly Effluent Concentration	Average	1.62 mg/L	< 1.38 mg/L
	Minimum	0.50 mg/L	
	Maximum	2.57 mg/L	
Plant Removal		1.94 kg/day	
		23.06 %	

Chelmsford Water Pollution Control Plant

The ECA for the Chelmsford WPCP details different effluent limits based on two seasonal discharge periods; one from April 30th to November 1st and the other from May 1st to October 31st.

Disinfection of the final effluent and reporting of sample results for E. Coli is only required in the summer discharge period from May 1st to October 31st. The ECA limits for effluent pH are the same in both discharge periods.

Influent Flow	
Design Capacity:	7,100 m^3/day
Average Daily Flow:	5,030 m^3/day

$CBOD_5$			
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	478.5 kg/day	
	Effluent	19.03 kg/day	< 106.5 kg/day
Monthly Effluent Concentration	Average	3.93 mg/L	< 15 mg/L
	Minimum	2.10 mg/L	
	Maximum	5.90 mg/L	
Plant Removal		459.5 kg/day	
		96.02 %	
Seasonal Discharge – May 1 to October 31		Value	ECA Limit
Annual Average Daily Loading	Influent	545.9 kg/day	
	Effluent	15.22 kg/day	< 49.7 kg/day
Monthly Effluent Concentration	Average	3.08 mg/L	< 7 mg/L
	Minimum	1.10 mg/L	
	Maximum	4.80 mg/L	
Plant Removal		439.7 kg/day	
		96.65 %	

TSS – Total Suspended Solids			
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	593.5 kg/day	
	Effluent	42.84 kg/day	< 106.5 kg/day
Monthly Effluent Concentration	Average	7.78 mg/L	< 15 mg/L
	Minimum	6.10 mg/L	
	Maximum	10.40 mg/L	
Plant Removal		550.6 kg/day	
		92.78 %	
Seasonal Discharge – May 1 to October 31		Value	ECA Limit
Annual Average Daily Loading	Influent	676.6 kg/day	
	Effluent	32.78 kg/day	< 49.7 kg/day
Monthly Effluent Concentration	Average	7.33 mg/L	< 7 mg/L
	Minimum	5.80 mg/L	
	Maximum	10.50 mg/L	
Plant Removal		643.8 kg/day	
		95.16 %	

TP – Total Phosphorous			
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	13.11 kg/day	
	Effluent	1.49 kg/day	< 3.55 kg/day
Monthly Effluent Concentration	Average	0.28 mg/L	< 0.5 mg/L
	Minimum	0.15 mg/L	
	Maximum	0.41 mg/L	
Plant Removal		11.62 kg/day	
		88.64 %	
Seasonal Discharge – May 1 to October 31		Value	ECA Limit
Annual Average Daily Loading	Influent	14.41 kg/day	
	Effluent	0.98 kg/day	< 2.13 kg/day
Monthly Effluent Concentration	Average	0.22 mg/L	< 0.3 mg/L
	Minimum	0.11 mg/L	
	Maximum	0.41 mg/L	
Plant Removal		13.43 kg/day	
		93.21 %	

Total Ammonia (as Nitrogen)			
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	70.85 kg/day	
	Effluent	19.75 kg/day	< 28.4 kg/day
Monthly Effluent Concentration	Average	4.48 mg/L	< 4 mg/L
	Minimum	0.59 mg/L	
	Maximum	7.85 mg/L	
Plant Removal		51.10 kg/day	
		72.13 %	
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	105.1 kg/day	
	Effluent	12.25 kg/day	< 14.2 kg/day
Monthly Effluent Concentration	Average	2.09 mg/L	< 2 mg/L
	Minimum	0.12 mg/L	
	Maximum	5.23 mg/L	
Plant Removal		92.87 kg/day	
		88.34 %	

pH			
Both Seasonal Discharge Periods		Value	ECA Limit
Influent Measurements	Average	7.58	
Effluent Measurements	Average	6.87	
	Minimum	7.70	6.0 to 9.5 at all times
	Maximum	3.50	

E. Coli				
Summer Discharge Period Only – May 1 to October 31		Value		ECA Limit
Monthly Geometric Mean Density	Average	205	CFU/100mL	< 200 CFU/100mL
	Minimum	26	CFU/100mL	< 200 CFU/100mL
	Maximum	516	CFU/100mL	< 200 CFU/100mL

Coniston Wastewater Treatment Plant

Influent Flow	
Design Capacity:	3,000 m^3/day
Average Daily Flow:	1,730 m^3/day

BOD_5		Value		ECA Limit
Annual Average Daily Loading	Influent	167.1	kg/day	
	Effluent	14.96	kg/day	< 35 kg/day
Monthly Effluent Concentration	Average	9.45	mg/L	< 20 mg/L
	Minimum	3.00	mg/L	
	Maximum	18.00	mg/L	
Plant Removal		152.2	kg/day	
		91.05 %		

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	208.0	kg/day	
	Effluent	29.29	kg/day	< 35 kg/day
Monthly Effluent Concentration	Average	15.73	mg/L	< 20 mg/L
	Minimum	5.20	mg/L	
	Maximum	27.47	mg/L	
Plant Removal		178.7	kg/day	
		85.92 %		

pH		Value	ECA Limit
Influent Measurements	Average	7.28	
Effluent Measurements	Average	6.54	6.0 to 9.5 at all times
	Minimum	2.26	
	Maximum	7.20	

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	248	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	33000	CFU/100mL	< 200 CFU/100mL

Dowling Wastewater Treatment Plant

Influent Flow	
Design Capacity:	3,200 m^3/day
Average Daily Flow:	2,069 m^3/day

$CBOD_5$		Value	ECA Limit
Annual Average Daily Loading	Influent	86.07 kg/day	
	Effluent	15.23 kg/day	< 80 kg/day
Monthly Effluent Concentration	Average	8.93 mg/L	< 25 mg/L
	Minimum	3.70 mg/L	
	Maximum	50.60 mg/L	
Plant Removal		70.85 kg/day	
		82.31 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	81.16 kg/day	
	Effluent	14.57 kg/day	< 80 kg/day
Monthly Effluent Concentration	Average	6.84 mg/L	< 25 mg/L
	Minimum	3.80 mg/L	
	Maximum	9.90 mg/L	
Plant Removal		66.59 kg/day	
		82.70 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	2.69 kg/day	
	Effluent	1.05 kg/day	< 3.2 kg/day
Monthly Effluent Concentration	Average	0.54 mg/L	< 1.0 mg/L
	Minimum	0.38 mg/L	
	Maximum	0.65 mg/L	
Plant Removal		1.67 kg/day	
		60.83 %	

pH		Value	ECA Limit
Influent Measurements	Average	6.88	
Effluent Measurements	Average	6.73	6.0 to 9.5 at all times
	Minimum	6.50	
	Maximum	6.90	

E. Coli		Value	ECA Limit
Monthly Geometric Mean Density	Average	52 CFU/100mL	< 200 CFU/100mL
	Minimum	11 CFU/100mL	< 200 CFU/100mL
	Maximum	127 CFU/100mL	< 200 CFU/100mL

Falconbridge Wastewater Treatment Plant

Influent Flow	
Design Capacity:	909 m^3/day
Average Daily Flow:	950 m^3/day

BOD_5		Value	ECA Limit
Annual Average Daily Loading	Influent	190.5 kg/day	
	Effluent	2.04 kg/day	< 46 kg/day
Monthly Effluent Concentration	Average	3.28 mg/L	< 15 mg/L
	Minimum	1.30 mg/L	
	Maximum	20.00 mg/L	
Plant Removal		188.4 kg/day	
		98.93 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	21.45 kg/day	
	Effluent	3.33 kg/day	< 46 kg/day
Monthly Effluent Concentration	Average	3.56 mg/L	< 15 mg/L
	Minimum	2.48 mg/L	
	Maximum	4.80 mg/L	
Plant Removal		18.12 kg/day	
		84.48 %	

Levack Wastewater Treatment Plant

Influent Flow	
Design Capacity:	2,270 m^3/day
Average Daily Flow:	865 m^3/day

$CBOD_5$		Value		ECA Limit
Annual Average Daily Loading	Influent	120.6	kg/day	
	Effluent	2.34	kg/day	< 56.75 kg/day
Monthly Effluent Concentration	Average	2.88	mg/L	< 25 mg/L
	Minimum	0.80	mg/L	
	Maximum	4.40	mg/L	
Plant Removal		118.3	kg/day	
		98.06	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	166.5	kg/day	
	Effluent	5.08	kg/day	< 56.75 kg/day
Monthly Effluent Concentration	Average	6.15	mg/L	< 25 mg/L
	Minimum	3.40	mg/L	
	Maximum	10.10	mg/L	
Plant Removal		161.5	kg/day	
		96.95	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	3.12	kg/day	
	Effluent	0.38	kg/day	< 3.1 kg/day
Monthly Effluent Concentration	Average	0.45	mg/L	< 1.0 mg/L
	Minimum	0.36	mg/L	
	Maximum	0.67	mg/L	
Plant Removal		2.74	kg/day	
		87.89	%	

pH		Value	ECA Limit
Influent Measurements	Average	7.15	
Effluent Measurements	Average	6.74	
	Minimum	6.50	6.0 to 9.5 at all times
	Maximum	7.10	

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	6	CFU/100mL	< 200 CFU/100mL
	Minimum	0	CFU/100mL	< 200 CFU/100mL
	Maximum	23	CFU/100mL	< 200 CFU/100mL

Lively Wastewater Treatment Plant

Influent Flow	
Design Capacity:	1,600 m^3/day
Average Daily Flow:	1,146 m^3/day

$CBOD_5$		Value		ECA Limit
Annual Average Daily Loading	Influent	133.1	kg/day	
	Effluent	5.74	kg/day	< 40 kg/day
Monthly Effluent Concentration	Average	4.66	mg/L	< 25 mg/L
	Minimum	0.50	mg/L	
	Maximum	8.50	mg/L	
Plant Removal		127.4	kg/day	
		92.39	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	385.6	kg/day	
	Effluent	15.62	kg/day	< 40 kg/day
Monthly Effluent Concentration	Average	12.21	mg/L	< 25 mg/L
	Minimum	2.38	mg/L	
	Maximum	32.40	mg/L	
Plant Removal		369.9	kg/day	
		95.04	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	9.36	kg/day	
	Effluent	0.58	kg/day	< 1.6 kg/day
Monthly Effluent Concentration	Average	0.51	mg/L	< 1.0 mg/L
	Minimum	0.10	mg/L	
	Maximum	1.52	mg/L	
Plant Removal		8.77	kg/day	
		90.82	%	

pH		Value	ECA Limit
Influent Measurements	Average	7.10	
Effluent Measurements	Average	6.86	
	Minimum	6.60	6.0 to 9.5 at all times
	Maximum	7.10	

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	115	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	433	CFU/100mL	< 200 CFU/100mL

Sudbury Wastewater Treatment Plant

The Sudbury WWTP is subject to seasonal discharge limits for Total Phosphorous and is required to completely de-chlorinate the effluent discharged into the receiving stream, Junction Creek.

Influent Flow	
Design Capacity:	79,625 m^3/day
Average Daily Flow:	60,629 m^3/day

$CBOD_5$		Value		ECA Limit
Annual Average Daily Loading	Influent	6637	kg/day	
	Effluent	351.8	kg/day	< 1990.6 kg/day
Monthly Effluent Concentration	Average	3.04	mg/L	< 25 mg/L
	Minimum	3.70	mg/L	
	Maximum	15.40	mg/L	
Plant Removal		6285	kg/day	
		94.70 %		

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	10294	kg/day	
	Effluent	730.5	kg/day	< 1990.6 kg/day
Monthly Effluent Concentration	Average	11.75	mg/L	< 25 mg/L
	Minimum	8.35	mg/L	
	Maximum	16.50	mg/L	
Plant Removal		9564	kg/day	
		92.76 %		

TP – Total Phosphorous				
Seasonal Discharge – October 1 to May 31		Value		ECA Limit
Annual Average Daily Loading	Influent	173.5	kg/day	
	Effluent	32.48	kg/day	< 79.6 kg/day
Monthly Effluent Concentration	Average	0.50	mg/L	< 1.0 mg/L
	Minimum	0.35	mg/L	
	Maximum	0.59	mg/L	
Plant Removal		141.0	kg/day	
		81.27 %		
Seasonal Discharge – June 1 to September 30		Value		ECA Limit
Annual Average Daily Loading	Influent	159.8	kg/day	
	Effluent	14.58	kg/day	< 49.7 kg/day
Monthly Effluent Concentration	Average	0.29	mg/L	< 0.5 mg/L
	Minimum	0.25	mg/L	
	Maximum	0.39	mg/L	
Plant Removal		145.2	kg/day	
		90.9%		

pH		Value	ECA Limit
Influent Measurements	Average	7.18	
Effluent Measurements	Average	6.98	
	Minimum	6.70	6.0 to 9.5 at all times
	Maximum	7.20	

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	27	CFU/100mL	< 200 CFU/100mL
	Minimum	3	CFU/100mL	< 200 CFU/100mL
	Maximum	186	CFU/100mL	< 200 CFU/100mL

Chlorine Residual		Value		ECA Limit
Annual Average Daily Loading	Effluent	0.0	kg/day	0 kg/day
Monthly Effluent Concentration	Average	0.0	mg/L	0 mg/L

Valley East Wastewater Treatment Plant

Influent Flow	
Design Capacity:	11,365 m^3/day
Average Daily Flow:	6,566 m^3/day

$CBOD_5$		Value		ECA Limit
Annual Average Daily Loading	Influent	742	kg/day	
	Effluent	45.65	kg/day	< 284 kg/day
Monthly Effluent Concentration	Average	6.53	mg/L	< 25 mg/L
	Minimum	3.60	mg/L	
	Maximum	11.60	mg/L	
Plant Removal		696.3	kg/day	
		93.80 %		

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	969.1	kg/day	
	Effluent	61.46	kg/day	< 284 kg/day
Monthly Effluent Concentration	Average	7.97	mg/L	< 25 mg/L
	Minimum	4.50	mg/L	
	Maximum	18.90	mg/L	
Plant Removal		907.6	kg/day	
		94.35 %		

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	28.57	kg/day	
	Effluent	4.33	kg/day	< 11.4 kg/day
Monthly Effluent Concentration	Average	0.66	mg/L	< 1.0 mg/L
	Minimum	0.39	mg/L	
	Maximum	1.03	mg/L	
Plant Removal		24.24	kg/day	
		78.88 %		

pH		Value	ECA Limit
Influent Measurements	Average	7.38	
Effluent Measurements	Average	7.05	6.0 to 9.5 at all times
	Minimum	6.80	
	Maximum	7.20	

E. Coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	43	CFU/100mL	< 200 CFU/100mL
	Minimum	3	CFU/100mL	< 200 CFU/100mL
	Maximum	188	CFU/100mL	< 200 CFU/100mL

Wahnapitae Lagoons

The Wahnapitae Lagoons are subject to seasonal discharge requirements. The Fall discharge period is defined as any discharge with a minimum duration of 14 days starting not before November 1st and not after December 15th. The Spring discharge period is defined as any discharge with a minimum duration of 14 days starting not before March 15th and not after April 30th.

Due to the limited sampling performed at the Wahnapitae Lagoons, plant removal values are calculated using the previous available raw (influent) sample when one is not present in the same month as an effluent sample.

Influent Flow	
Design Capacity:	1,246 m^3/day
Average Daily Flow:	1,169 m^3/day

$CBOD_5$			
Seasonal Discharge – Fall		Value	ECA Limit
Annual Average Daily Loading	Influent	119.1 kg/day	
	Effluent	1.65 kg/day	
Monthly Effluent Concentration	Average	1.81 mg/L	< 30 mg/L
	Minimum	3.60 mg/L	
	Maximum	13.90 mg/L	
Plant Removal		117.5 kg/day	
		90.95 %	
Seasonal Discharge – Spring		Value	ECA Limit
Annual Average Daily Loading	Influent	71.41 kg/day	
	Effluent	13.27 kg/day	
Monthly Effluent Concentration	Average	9.23 mg/L	< 30 mg/L
	Minimum	1.02 mg/L	
	Maximum	2.60 mg/L	
Plant Removal		58.15 kg/day	
		90.93 %	

TSS – Total Suspended Solids			
Seasonal Discharge – Fall		Value	ECA Limit
Annual Average Daily Loading	Influent	155.3 kg/day	
	Effluent	4.25 kg/day	
Monthly Effluent Concentration	Average	2.96 mg/L	< 40 mg/L
	Minimum	4.30 mg/L	
	Maximum	33.15 mg/L	
Plant Removal		151.1 kg/day	
		85.65 %	
Seasonal Discharge – Spring		Value	ECA Limit
Annual Average Daily Loading	Influent	151.7 kg/day	
	Effluent	16.70 kg/day	
Monthly Effluent Concentration	Average	18.75 mg/L	< 40 mg/L
	Minimum	4.30 mg/L	
	Maximum	33.15 mg/L	
Plant Removal		135.0 kg/day	
		85.46 %	

pH		Value	ECA Limit
Effluent Measurements	Average	7.34	6.0 to 9.5 at all times
	Minimum	6.90	
	Maximum	7.70	

Walden Wastewater Treatment Plant

Influent Flow	
Design Capacity:	4,500 m^3/day
Average Daily Flow:	2,801 m^3/day

$CBOD_5$		Value	ECA Limit
Annual Average Daily Loading	Influent	325.8 kg/day	
	Effluent	7.34 kg/day	< 112.5 kg/day
Monthly Effluent Concentration	Average	2.68 mg/L	< 25 mg/L
	Minimum	0.50 mg/L	
	Maximum	13.60 mg/L	
Plant Removal		317.9 kg/day	
		97.54 %	

TSS – Total Suspended Solids		Value	ECA Limit
Annual Average Daily Loading	Influent	353.0 kg/day	
	Effluent	21.31 kg/day	< 112.5 kg/day
Monthly Effluent Concentration	Average	7.50 mg/L	< 25 mg/L
	Minimum	4.70 mg/L	
	Maximum	11.30 mg/L	
Plant Removal		331.7 kg/day	
		93.56 %	

TP – Total Phosphorous		Value	ECA Limit
Annual Average Daily Loading	Influent	8.44 kg/day	
	Effluent	1.07 kg/day	< 4.5 kg/day
Monthly Effluent Concentration	Average	0.38 mg/L	< 1.0 mg/L
	Minimum	0.19 mg/L	
	Maximum	0.56 mg/L	
Plant Removal		7.37 kg/day	
		87.63 %	

pH		Value	ECA Limit
Influent Measurements	Average	7.27	
Effluent Measurements	Average	6.79	
	Minimum	6.50	6.0 to 9.5 at all times
	Maximum	7.10	

E. Coli		Value	ECA Limit
Monthly Geometric Mean Density	Average	39 CFU/100mL	< 200 CFU/100mL
	Minimum	5 CFU/100mL	< 200 CFU/100mL
	Maximum	114 CFU/100mL	< 200 CFU/100mL

8. Individual Plant Annual Data Reports