



Wastewater Annual Report 2022



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2022 Annual Wastewater Report

Version 1.0

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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 (CRM);** Any complaints received regarding Wastewater Treatment facilities through the City of greater Sudbury 311 (CRM) 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;

BOD₅: 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;

cBOD₅: 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 basic 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.

WSER: Wastewater Systems Effluent Regulations, as defined in the Fisheries Act

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Revision History

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1. Operating Issues & Corrective Actions

Date	Facility	Parameter	Probable Cause	Corrective Actions Taken
Jan 2022	Lively WWTP	CBOD5	Abnormally high flows (weather)	Reseeded and restarted process
Jan 2022	Lively WWTP	TSS	Abnormally high flows (weather)	Reseeded and restarted process
Mar 2022	Azilda WWTP	Ammonia	Drained plant for maintenance	Monitored and improved by end of month
Apr 2022	Azilda WWTP	Ammonia	Lack of air supply to aeration tanks	Started second blower running both at 100%
May 2022	Valley East WWTP	Total Suspended Solids	High flows due to Run off	Reduce clarifier blankets & flows are subsiding
May 2022	Azilda WWTP	Total Cl2 residual	Partially clogged strainer	Increased feed rate and flushed strainer
Aug 2022	Coniston WWTP	CBOD5	Maint. At Lift Station (Flushing)	Increased wasting and sludge haulage. Vactoring grease
Aug 2022	Coniston WWTP	Total Suspended Solids	Maint. At Lift Station (Flushing)	Increased wasting and sludge haulage. Vactoring grease
Aug 2022	Azilda WWTP	pH	Hot weather Temperature issues	Added liquid Lime and resampled
Aug 2022	Valley East WWTP	pH	Plant upset due to capital upgrades	Added liquid Lime and resampled
Aug 2022	Azilda WWTP	pH	Hot weather Temperature issues	Added liquid Lime and resampled
Sept 2022	Azilda WWTP	pH	Hot weather Temperature issues	Added liquid Lime and resampled
Oct 2022	Azilda WWTP	Total Cl2 residual	Partially clogged strainer	Increased feed rate and flushed strainer
Nov 2022	Azilda WWTP	Total Cl2 residual	Plugged Strainer	Cleaned Strainer
Dec 2022	Coniston WWTP	TSS	unknown	Monitored and sampled

2. Maintenance & Capital Improvements

Facility	Maintenance Completed	Capital Improvements Completed
Azilda WWTP	- Reconfigure Piping to Chlorine booster pumps	- No major capital work completed
Chelmsford WPCP	- Replaced Grit auger liner - Raw Sewage pump #1 repaired - Rebuilt #2 Ras pump - Installed new motor Sludge loading pump - C plant WAS line replaced in B sludge tank	- No major capital work completed
Capreol Lagoons	- None	- Addition of Ferric Sulphate chemical treatment - Rebuilt bypass chamber between North and South cells
Coniston WWTP	- Silencer/Muffler installed. - New roof put on the generator building.	- No major capital work completed
Dowling WWTP	- RAS #2 rebuild - Installed 2 VFDs for blowers - Control upgrades for RAS pumps	- No major capital work completed
Falconbridge WWTP	- None	- No major capital work completed
Levack WWTP	- Replaced radiator on generator - Replaced underground wiring to head house	- No major capital work completed
Lively WWTP	- Clean CL2 Chamber - Install New comminutor	- No major capital work completed
Sudbury WWTP	- Repair and Install gearbox for #2 Clarifier. (Belanger) - Install new gate valve to replace butterfly valve (202 valve) (Jeppesen) - Repairs done to Pump 1A - 300hp pump in pumpstation (Zylem) - Rebuilt Spare WAS pump for Sudbury plant. - RV dump - Cantaloupe System installed. - Cleaning of Substation.	- No major capital work completed
Valley East WWTP	- Replaced chlorinator tubing - Replaced sludge valve actuator - Replaced cooling line for generator - Repaired cross collector and longitudinal chains in secondary clarifier - Replaced Drive chain and idler sprocket in primary clarifier - Replaced #3 blower VFD	- 2 new blowers with VFDs - Replaced piping and diffusers for both aeration tanks
Wahnapitae Lagoons	- Road work completed around the cells	- No major capital work completed
Walden WWTP	- Seasonal tank cleaning - Clean CL2 Chamber - Lime Discharge pipe reconfigured	- No major capital work completed

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 neighboring 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 2022, the Sudbury Biosolids facility treated a total of 112,229.88 m³ of material, containing approximately 3661.96 tonnes of solids. Of this total, approximately 18,429 m³ was from septic tanks, 44,415 m³ was sludge from other CGS facilities and 4,795 m³ was sludge received from the Espanola Wastewater Treatment Plant.

5. Customer Complaints (CRM)

Date	Case ID	Location	Issue	Resolution
26-Jan-22	220126-000379	Falconbridge WWTP	High snowbank	Removed Snowbank
02-Mar-22	220302-000090	Dufferin LS	Resident plowed in	Removed Snowbank
11-Mar-22	220311-000334	RR 24 LS	Station in alarm	Sent crew to check and clear alarm
22-Mar-22	220322-00023	Fourth Ave. LS	Generator Running	Crew dispatched to investigate
21-Apr-22	220421-000012	Levesque LS	Broken Fence	Crew investigated . Fence repaired
16-May-22	220516-000055	Levack WWTP	Information session	Spoke to citizen about plant
16-May-22	220516-000197	Lively WWTP	Odour from plant	Supervisor gone to site to investigate
31-May-22	220531-000188	Wahnapiatae Lagoon	Inquiry about installing a security fence	Supervisor investigated. Fence will be repaired
18-Jun-22	220618-000047	Second Ave. stormwater	Sewer Odour	Investigated and rebuilt pump
22-Jul-22	220722-000441	Walden WWTP	Sewer Odour	Investigated to see if it a plant issue
28-Jul-22	220728-000187	Valley East WWTP	RV Dump site inquiry	Spoke to citizen and explained situation
02-Aug-22	220802-000132	Jeanne D'Arc LS	Exhaust coming out of building	Crew sent to investigate
05-Aug-22	220805-000028	Garson Lagoon	Sewer odour in area	Supervisor did site and area investigation
07-Aug-22	220807-000023	Nickel LS	Sewer odour in area	Sent crew to investigate
11-Aug-22	220811-000278	Sudbury WWTP	RV Dump site issue	Operator checking out issue at site
01-Sep-22	220901-000524	Fourth Ave. LS	Sewer odour in area	Crew sent to site to investigate
16-Sep-22	220916-000204	Oriole LS	Sewer Odour in area	Crew sent to area to investigate
22-Sep-22	220922-000381	Cerilli LS	Work being done at station	Completed work at station
07-Oct-22	221007-000161	Walford East LS	Discuss issues at station	Supervisor spoke to citizen and put together work plan
18-Oct-22	221018-000402	Landry LS	Door open at station	Crew sent to close and secure station
14-Nov-22	221114-000379	Valley East WWTP	Permission to survey Hydro poles	Permission given to go on site
06-Dec-22	221206-000500	Lively WWTP	Sewage on Road	Contacted contractor to have area cleaned

6. Plant Bypasses and Overflows

Date	Time (24 HR)	Duration (hrs)	Location	Type of Occurrence
21-Feb-22	n/a	n/a	Lively WWTP	Plant Overflow
06-Mar-22	13:25	2	Valley East WWTP	Plant Overflow
06-Mar-22	13:01	2	Lively WWTP	Plant operating over design capacity
06-Mar-22	14:00	6.5	Coniston WWTP	Plant operating over design capacity
17-Mar-22	14:40	1.5	Levack WWTP	Plant Bypass
17-Mar-22	18:05	56	Coniston WWTP	Plant operating over design capacity
20-Mar-22	14:27	5.5	Chelmsford WWTP	Plant operating over design capacity
31-Mar-22	18:00	6.5	Sudbury WWTP	Plant operating over design capacity
31-Mar-22	12:10	6.0	Lively WWTP	Plant operating over design capacity
31-Mar-22	20:33	8.0	Walden WWTP	Plant operating over design capacity
31-Mar-22	14:30	3.0	Levack WWTP	Plant operating over design capacity
31-Mar-22	13:00	2.0	Chelmsford WWTP	Plant operating over design capacity
31-Mar-22	13:00	3.0	Azilda WWTP	Plant operating over design capacity
31-Mar-22	12:30	7.1	Coniston WWTP	Plant Bypass
31-Mar-22	09:30	12	Coniston WWTP	Plant operating over design capacity
27-May-22	24:00	24	Valley East WWTP	Plant Bypass
30-May-22	11:30	0.2	Coniston WWTP	Plant Bypass
24-Jul-22	18:03	4.7	Coniston WWTP	Plant operating over design capacity
28-Jul-22	09:40	4.95	Coniston WWTP	Plant operating over design capacity
07-Aug-22	15:31	7.7	Coniston WWTP	Plant operating over design capacity
09-Aug-22	16:12	8.6	Coniston WWTP	Plant operating over design capacity
17-Oct-22	21:00	16	Coniston WWTP	Plant operating over design capacity
26-Dec-22	11:15	n/a	Chelmsford WWTP	Plant Bypass
30-Dec-22	14:10	3.25	Coniston WWTP	Plant operating over 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 m³/day	
		Average Daily Flow:	1,650 m³/day	

CBOD ₅		Value		ECA Limit
Annual Average Daily Loading	Influent	212.9	kg/day	< 33 kg/day < 10 mg/L
	Effluent	4.42	kg/day	
Monthly Effluent Concentration	Average	2.83	mg/L	
	Minimum	1.60	mg/L	
	Maximum	4.20	mg/L	
Plant Removal		208	kg/day	
		97.90	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	224.1	kg/day	< 33 kg/day < 10 mg/L
	Effluent	10.44	kg/day	
Monthly Effluent Concentration	Average	6.82	mg/L	
	Minimum	4.70	mg/L	
	Maximum	9.60	mg/L	
Plant Removal		213.7	kg/day	
		95.02	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	6.34	kg/day	< 2.0 kg/day < 0.6 mg/L
	Effluent	0.29	kg/day	
Monthly Effluent Concentration	Average	0.19	mg/L	
	Minimum	0.13	mg/L	
	Maximum	0.27	mg/L	
Plant Removal		6.05	kg/day	
		95.45	%	

Total Ammonia (as Nitrogen)		Value		ECA Limit
Annual Average Daily Loading	Influent	35.14	kg/day	< 16.5 kg/day < 5 mg/L
	Effluent	2.21	kg/day	
Monthly Effluent Concentration	Average	2.27	mg/L	
	Minimum	0.13	mg/L	
	Maximum	10.53	mg/L	
Plant Removal		32.93	kg/day	
		92.58	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.42		6.0 to 9.5 at all times
Effluent Measurements	Average	6.54		
	Minimum	6.30		
	Maximum	7.00		

E. coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	16	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	52	CFU/100mL	< 200 CFU/100mL

Capreol Lagoon

Influent Flow				
		Design Capacity: 5,000 m ³ /day		
		Average Daily Flow: 2,312 m ³ /day		

BOD ₅		Value		ECA Limit
Annual Average Daily Loading	Influent	187.3	kg/day	< 30 mg/L
	Effluent	58.22	kg/day	
Monthly Effluent Concentration	Average	25.63	mg/L	
	Minimum	11.0	mg/L	
	Maximum	48.0	mg/L	
Plant Removal		129.1	kg/day	
		66.4 %		

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	304.0	kg/day	< 40 mg/L
	Effluent	66.93	kg/day	
Monthly Effluent Concentration	Average	29.20	mg/L	
	Minimum	18.00	mg/L	
	Maximum	56.00	mg/L	
Plant Removal		237.1	kg/day	
		66.9 %		

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	4.55	kg/day	< 1.38 mg/L
	Effluent	3.69	kg/day	
Monthly Effluent Concentration	Average	1.74	mg/L	
	Minimum	0.33	mg/L	
	Maximum	2.76	mg/L	
Plant Removal		2.00	kg/day	
		10.6 %		

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:	3552 m ³ /day

CBOD₅			
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	476.0 kg/day	< 106.5 kg/day < 15 mg/L
	Effluent	29.89 kg/day	
Monthly Effluent Concentration	Average	6.80 mg/L	
	Minimum	3.10 mg/L	
	Maximum	11.30 mg/L	
Plant Removal		447 kg/day	
		93.7 %	
Seasonal Discharge – May 1 to October 31		Value	ECA Limit
Annual Average Daily Loading	Influent	289 kg/day	< 49.7 kg/day < 7 mg/L
	Effluent	6.97 kg/day	
Monthly Effluent Concentration	Average	2.63 mg/L	
	Minimum	1.60 mg/L	
	Maximum	3.20 mg/L	
Plant Removal		282 kg/day	
		97.60 %	

TSS – Total Suspended Solids			
Seasonal Discharge – November 1 to April 30		Value	ECA Limit
Annual Average Daily Loading	Influent	1046 kg/day	< 106.5 kg/day < 15 mg/L
	Effluent	42.56 kg/day	
Monthly Effluent Concentration	Average	9.32 mg/L	
	Minimum	7.10 mg/L	
	Maximum	11.90 mg/L	
Plant Removal		1003 kg/day	
		95.90 %	
Seasonal Discharge – May 1 to October 31		Value	ECA Limit
Annual Average Daily Loading	Influent	675.0 kg/day	< 49.7 kg/day < 7 mg/L
	Effluent	14.95 kg/day	
Monthly Effluent Concentration	Average	5.55 mg/L	
	Minimum	4.00 mg/L	
	Maximum	7.30 mg/L	
Plant Removal		660.0 kg/day	
		97.80 %	

TP – Total Phosphorous				
Seasonal Discharge – November 1 to April 30			Value	ECA Limit
Annual Average Daily Loading	Influent	13.00	kg/day	< 3.55 kg/day < 0.5 mg/L
	Effluent	0.47	kg/day	
Monthly Effluent Concentration	Average	0.29	mg/L	
	Minimum	0.21	mg/L	
	Maximum	0.42	mg/L	
Plant Removal		4.82	kg/day	
		91.00%		
Seasonal Discharge – May 1 to October 31			Value	ECA Limit
Annual Average Daily Loading	Influent	7.89	kg/day	< 2.13 kg/day < 0.3 mg/L
	Effluent	1.17	kg/day	
Monthly Effluent Concentration	Average	0.18	mg/L	
	Minimum	0.15	mg/L	
	Maximum	0.22	mg/L	
Plant Removal		7.42	kg/day	
		94.10 %		

Total Ammonia (as Nitrogen)				
Seasonal Discharge – November 1 to April 30			Value	ECA Limit
Annual Average Daily Loading	Influent	62.65	kg/day	< 28.4 kg/day < 4 mg/L
	Effluent	6.41	kg/day	
Monthly Effluent Concentration	Average	1.42	mg/L	
	Minimum	0.54	mg/L	
	Maximum	2.65	mg/L	
Plant Removal		56.24	kg/day	
		89.80	%	
Seasonal Discharge – May 1 to October 31			Value	ECA Limit
Annual Average Daily Loading	Influent	50.13	kg/day	< 14.2 kg/day < 2 mg/L
	Effluent	2.78	kg/day	
Monthly Effluent Concentration	Average	1.16	mg/L	
	Minimum	0.09	mg/L	
	Maximum	4.94	mg/L	
Plant Removal		47.35	kg/day	
		94.40	%	

pH				
Both Seasonal Discharge Periods			Value	ECA Limit
Influent Measurements	Average	7.31		6.0 to 9.5 at all times
Effluent Measurements	Average	6.77		
	Minimum	6.40		
	Maximum	7.30		

<i>E. coli</i>				
Summer Discharge Period Only – May 1 to October 31		Value		ECA Limit
Monthly Geometric Mean Density	Average	25.0	CFU/100mL	< 200 CFU/100mL
	Minimum	13.0	CFU/100mL	< 200 CFU/100mL
	Maximum	39.0	CFU/100mL	< 200 CFU/100mL

Coniston Wastewater Treatment Plant

Influent Flow				
		Design Capacity:	3,000 m ³ /day	
		Average Daily Flow:	1,476 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	110.0	kg/day	< 35 kg/day < 20 mg/L
	Effluent	16.57	kg/day	
Monthly Effluent Concentration	Average	11.0	mg/L	
	Minimum	2.1	mg/L	
	Maximum	55.9	mg/L	
Plant Removal		93	kg/day	
		84.9	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	143.6	kg/day	< 35 kg/day < 20 mg/L
	Effluent	20.85	kg/day	
Monthly Effluent Concentration	Average	13.50	mg/L	
	Minimum	6.10	mg/L	
	Maximum	26.0	mg/L	
Plant Removal		122.7	kg/day	
		85.48	%	

pH		Value		ECA Limit
Influent Measurements	Average	8.10		6.0 to 9.5 at all times
Effluent Measurements	Average	6.98		
	Minimum	6.70		
	Maximum	7.10		

<i>E. coli</i>		Value		ECA Limit
Monthly Geometric Mean Density	Average	88	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	1770	CFU/100mL	< 200 CFU/100mL

Dowling Wastewater Treatment Plant

Influent Flow				
		Design Capacity:	3,200 m ³ /day	
		Average Daily Flow:	1,506 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	41.91	kg/day	< 80 kg/day < 25 mg/L
	Effluent	4.63	kg/day	
Monthly Effluent Concentration	Average	2.93	mg/L	
	Minimum	1.70	mg/L	
	Maximum	5.90	mg/L	
Plant Removal		37.30	kg/day	
		84.0	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	67.00	kg/day	< 80 kg/day < 25 mg/L
	Effluent	7.05	kg/day	
Monthly Effluent Concentration	Average	4.62	mg/L	
	Minimum	2.70	mg/L	
	Maximum	8.20	mg/L	
Plant Removal		60.00	kg/day	
		89.50	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	1.62	kg/day	< 3.2 kg/day < 1.0 mg/L
	Effluent	0.66	kg/day	
Monthly Effluent Concentration	Average	0.44	mg/L	
	Minimum	0.37	mg/L	
	Maximum	0.53	mg/L	
Plant Removal		0.96	kg/day	
		59.4	%	

pH		Value		ECA Limit
Influent Measurements	Average	6.78		6.0 to 9.5 at all times
Effluent Measurements	Average	6.57		
	Minimum	6.40		
	Maximum	6.80		

<i>E. coli</i>		Value		ECA Limit
Monthly Geometric Mean Density	Average	17	CFU/100mL	< 200 CFU/100mL
	Minimum	4	CFU/100mL	< 200 CFU/100mL
	Maximum	36	CFU/100mL	< 200 CFU/100mL

Falconbridge Wastewater Treatment Plant

Influent Flow			
		Design Capacity:	909 m ³ /day
		Average Daily Flow:	308 m ³ /day

BOD₅		Value		F-10-1
Annual Average Daily Loading	Influent	56.30	kg/day	
	Effluent	0.50	kg/day	
Monthly Effluent Concentration	Average	1.72	mg/L	
	Minimum	0.20	mg/L	
	Maximum	3.10	mg/L	
Plant Removal		55.81	kg/day	
		99.12	%	

TSS – Total Suspended Solids		Value		F-10-1
Annual Average Daily Loading	Influent	6.50	kg/day	
	Effluent	0.97	kg/day	
Monthly Effluent Concentration	Average	3.33	mg/L	
	Minimum	2.40	mg/L	
	Maximum	3.90	mg/L	
Plant Removal		5.52	kg/day	
		85.02	%	

TP – Total Phosphorus		Value		F-10-1
Annual Average Daily Loading	Influent	1.83	kg/day	
	Effluent	0.07	kg/day	
Monthly Effluent Concentration	Average	0.20	mg/L	
	Minimum	0.02	mg/L	
	Maximum	1.70	mg/L	
Plant Removal		1.76	kg/day	
		96.40	%	

Levack Wastewater Treatment Plant

Influent Flow				
		Design Capacity: 2,270 m ³ /day		
		Average Daily Flow: 875 m ³ /day		

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	104	kg/day	< 56.75 kg/day < 25 mg/L
	Effluent	2.58	kg/day	
Monthly Effluent Concentration	Average	3.03	mg/L	
	Minimum	1.10	mg/L	
	Maximum	6.10	mg/L	
Plant Removal		102	kg/day	
		97.49	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	75	kg/day	< 56.75 kg/day < 25 mg/L
	Effluent	5.76	kg/day	
Monthly Effluent Concentration	Average	6.63	mg/L	
	Minimum	3.80	mg/L	
	Maximum	10.4	mg/L	
Plant Removal		69.0	kg/day	
		92.3	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	3.20	kg/day	< 3.1 kg/day < 1.0 mg/L
	Effluent	0.33	kg/day	
Monthly Effluent Concentration	Average	0.37	mg/L	
	Minimum	0.24	mg/L	
	Maximum	0.58	mg/L	
Plant Removal		2.88	kg/day	
		89.8	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.03		6.0 to 9.5 at all times
Effluent Measurements	Average	6.60		
	Minimum	6.30		
	Maximum	6.80		

<i>E. coli</i>		Value		ECA Limit
Monthly Geometric Mean Density	Average	4	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	8	CFU/100mL	< 200 CFU/100mL

Lively Wastewater Treatment Plant

Influent Flow				
		Design Capacity:	1,600 m ³ /day	
		Average Daily Flow:	1,752 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	169	kg/day	< 40 kg/day < 25 mg/L
	Effluent	9.95	kg/day	
Monthly Effluent Concentration	Average	6.64	mg/L	
	Minimum	0.70	mg/L	
	Maximum	37.0	mg/L	
Plant Removal		159.0	kg/day	
		92.0	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	428.0	kg/day	< 40 kg/day < 25 mg/L
	Effluent	17.52	kg/day	
Monthly Effluent Concentration	Average	10.62	mg/L	
	Minimum	4.30	mg/L	
	Maximum	29.00	mg/L	
Plant Removal		410.0	kg/day	
		92.0	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	15.54	kg/day	< 1.6 kg/day < 1.0 mg/L
	Effluent	0.71	kg/day	
Monthly Effluent Concentration	Average	0.44	mg/L	
	Minimum	0.18	mg/L	
	Maximum	0.97	mg/L	
Plant Removal		14.75	kg/day	
		92.20	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.16		6.0 to 9.5 at all times
Effluent Measurements	Average	6.69		
	Minimum	6.30		
	Maximum	7.30		

<i>E. coli</i>		Value		ECA Limit
Monthly Geometric Mean Density	Average	7	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	30	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:	49,299 m ³ /day	

CBOD₅		Value		ECA Limit
Annual Average Daily Loading	Influent	6498.0	kg/day	< 1990.6 kg/day < 25 mg/L
	Effluent	347.71	kg/day	
Monthly Effluent Concentration	Average	6.85	mg/L	
	Minimum	3.20	mg/L	
	Maximum	13.8	mg/L	
Plant Removal		6150.4	kg/day	
		94.65%		

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	11,182	kg/day	< 1990.6 kg/day < 25 mg/L
	Effluent	588.01	kg/day	
Monthly Effluent Concentration	Average	11.48	mg/L	
	Minimum	7.20	mg/L	
	Maximum	18.2	mg/L	
Plant Removal		10594	kg/day	
		94.71 %		

TP – Total Phosphorous				
Seasonal Discharge – October 1 to May 31		Value		ECA Limit
Annual Average Daily Loading	Influent	150.95	kg/day	< 79.6 kg/day < 1.0 mg/L
	Effluent	17.78	kg/day	
Monthly Effluent Concentration	Average	0.39	mg/L	
	Minimum	0.29	mg/L	
	Maximum	0.49	mg/L	
Plant Removal		133.16	kg/day	
		88.08%		
Seasonal Discharge – June 1 to September 30		Value		ECA Limit
Annual Average Daily Loading	Influent	175.01	kg/day	< 49.7 kg/day < 0.5 mg/L
	Effluent	33.65	kg/day	
Monthly Effluent Concentration	Average	0.67	mg/L	
	Minimum	0.48	mg/L	
	Maximum	0.82	mg/L	
Plant Removal		141.36	kg/day	
		80.5 %		

pH		Value		ECA Limit
Influent Measurements	Average	7.00		6.0 to 9.5 at all times
Effluent Measurements	Average	6.72		
	Minimum	6.60		
	Maximum	6.90		
E. coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	13	CFU/100mL	< 200 CFU/100mL
	Minimum	3	CFU/100mL	< 200 CFU/100mL
	Maximum	41	CFU/100mL	< 200 CFU/100mL
Chlorine Residual		Value		WSER Limit
Annual Average Daily Loading	Effluent	0.16	kg/day	< 0.02 mg/L
Monthly Effluent Concentration	Average	0.00	mg/L	

Valley East Wastewater Treatment Plant

Influent Flow				
		Design Capacity: 11,365 m ³ /day		
		Average Daily Flow: 4,376 m ³ /day		

CBOD ₅		Value		ECA Limit
Annual Average Daily Loading	Influent	576.0	kg/day	< 284 kg/day < 25 mg/L
	Effluent	33.46	kg/day	
Monthly Effluent Concentration	Average	6.75	mg/L	
	Minimum	3.20	mg/L	
	Maximum	16.3	mg/L	
Plant Removal		542.0	kg/day	
		92.6	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	879	kg/day	< 284 kg/day < 25 mg/L
	Effluent	51.29	kg/day	
Monthly Effluent Concentration	Average	9.92	mg/L	
	Minimum	4.20	mg/L	
	Maximum	29.2	mg/L	
Plant Removal		828.0	kg/day	
		94.4	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	18.61	kg/day	< 11.4 kg/day < 1.0 mg/L
	Effluent	2.83	kg/day	
Monthly Effluent Concentration	Average	0.63	mg/L	
	Minimum	0.49	mg/L	
	Maximum	0.83	mg/L	
Plant Removal		15.78	kg/day	
		84.90	%	

pH		Value		ECA Limit
Influent Measurements	Average	7.23		6.0 to 9.5 at all times
Effluent Measurements	Average	6.85		
	Minimum	6.50		
	Maximum	7.10		

E. coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	15	CFU/100mL	< 200 CFU/100mL
	Minimum	3	CFU/100mL	< 200 CFU/100mL
	Maximum	63	CFU/100mL	< 200 CFU/100mL

Wahnapiatae Lagoon

The Wahnapiatae Lagoon is subject to seasonal discharge requirements. The Spring discharge period commences after the liquid surface in the lagoon has become free of ice cover, terminating within 60 days thereafter, and continuing for not less than thirty (30) days for each lagoon cell released. 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.

INFLUENT MONITORING					
Rated Capacity: 1,246 m ³ /d		Average Daily Flow: 607 m ³ /d		Peak Flow: 1,352 m ³ /d	
		Q1	Q2	Q3	Q4
Quarterly Monitoring	BOD ₅ (mg/L)	30	15.2	41	34.5
	TSS (mg/L)	715	56	1063	287
	TKN (mg/L)	21.4	8.9	23.7	10.3
	TP (mg/L)	1.77	0.27	3.90	0.85

PRE-DISCHARGE MONITORING		Spring	Fall
Discharge Season Cell #1	CBOD ₅ (mg/L)	21.7	5.63
	TSS (mg/L)	44.2	72.5
	Total Ammonia Nitrogen (mg/L)	7.32	6.13
	TP(mg/L)	0.23	1.51
	Hydrogen Sulphide (mg/L)	0.08	0.06
	pH	6.71	7.3

PRE-DISCHARGE MONITORING		Spring	Fall
Discharge Season Cell #2	CBOD ₅ (mg/L)	2.9	3.66
	TSS (mg/L)	3.1	2.66
	Total Ammonia Nitrogen (mg/L)	4.58	2.47
	TP(mg/L)	0.06	0.01
	Hydrogen Sulphide (mg/L)	0.02	0.02
	pH	7.3	7.4

PRE-DISCHARGE MONITORING		Spring	Fall
Discharge Season Cell #3	CBOD ₅ (mg/L)	2.9	3.53
	TSS (mg/L)	2.9	16.88
	Total Ammonia Nitrogen (mg/L)	7.1	0.01
	TP(mg/L)	0.02	0.33
	Hydrogen Sulphide (mg/L)	0.02	0.02
	pH	7.01	7.83

EFFLUENT				
Seasonal Discharge – Spring (<60day after free of ice)		Average	ECA Objective	ECA Limit
Seasonal Average Concentration	CBOD ₅ mg/L	5.6	25	30
	TSS mg/L	18.2	30	40
	pH	7.20	6.0 - 8.5	6.0 - 9.5
	Monitoring Purposes	Average	Minimum	Maximum
	Total Ammonia Nitrogen mg/L	5.3	4.40	9.40
	TP mg/L	0.13	0.04	0.23
	E.coli CFU/100mL	4.95	2	10
Seasonal Discharge – Fall (Nov 1 – Dec 15)		Average	ECA Objective	ECA Limit
Seasonal Average Concentration	CBOD ₅ mg/L	3.4	25	30
	TSS mg/L	12.6	30	40
	pH	7.28	6.0 - 8.5	6.0 - 9.5
	Monitoring Purposes	Average	Minimum	Maximum
	Total Ammonia Nitrogen mg/L	4.60	0.01	7.53
	TP mg/L	0.21	0.03	0.33
	E.coli CFU/100mL	7.64	5	10

Walden Wastewater Treatment Plant

Influent Flow				
		Design Capacity:	4,500 m³/day	
		Average Daily Flow:	2,247 m³/day	

CBOD ₅		Value		ECA Limit
Annual Average Daily Loading	Influent	260.0	kg/day	< 112.5 kg/day < 25 mg/L
	Effluent	5.49	kg/day	
Monthly Effluent Concentration	Average	2.33	mg/L	
	Minimum	1.60	mg/L	
	Maximum	3.50	mg/L	
Plant Removal		254.0	kg/day	
		97.60	%	

TSS – Total Suspended Solids		Value		ECA Limit
Annual Average Daily Loading	Influent	412.0	kg/day	< 112.5 kg/day < 25 mg/L
	Effluent	16.61	kg/day	
Monthly Effluent Concentration	Average	7.38	mg/L	
	Minimum	4.90	mg/L	
	Maximum	9.80	mg/L	
Plant Removal		395	kg/day	
		94.40	%	

TP – Total Phosphorous		Value		ECA Limit
Annual Average Daily Loading	Influent	8.17	kg/day	< 4.5 kg/day < 1.0 mg/L
	Effluent	0.85	kg/day	
Monthly Effluent Concentration	Average	0.38	mg/L	
	Minimum	0.25	mg/L	
	Maximum	0.53	mg/L	
Plant Removal		7.32	kg/day	
		89.4	%	

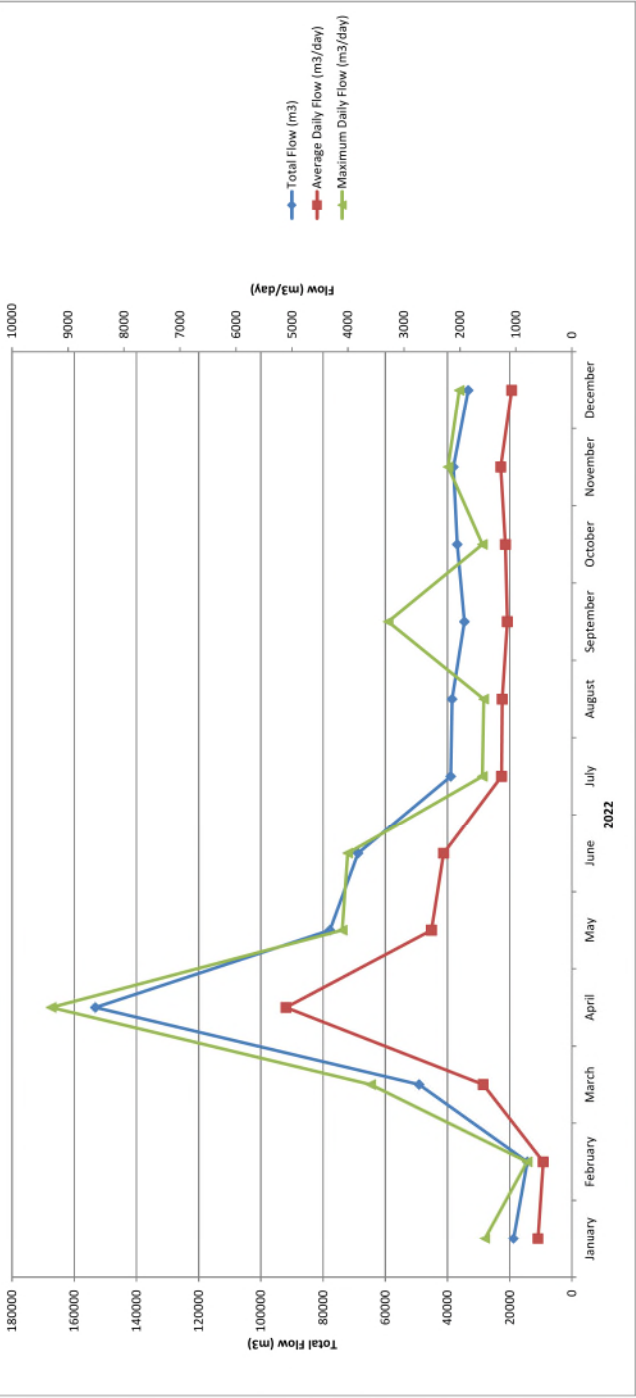
pH		Value		ECA Limit
Influent Measurements	Average	7.14		6.0 to 9.5 at all times
Effluent Measurements	Average	6.70		
	Minimum	6.40		
	Maximum	6.90		

E. coli		Value		ECA Limit
Monthly Geometric Mean Density	Average	3	CFU/100mL	< 200 CFU/100mL
	Minimum	2	CFU/100mL	< 200 CFU/100mL
	Maximum	6	CFU/100mL	< 200 CFU/100mL

8. Individual Plant Annual Data Reports

2022 Azilda Wastewater Treatment Plant Performance

Month	Flows			BOD ₅	CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia			Un-Ionized Ammonia	TKN		Nitrate		pH		Alkalinity		Sludge		Chlorine Residual	E.Coli/100ml							
	Total m ³	Avg Day m ³	Max Day m ³		Raw mg/L	Effluent mg/L	Plant mg/L	Raw mg/L	Effluent mg/L	Plant mg/L	Raw mg/L	Effluent mg/L	Plant mg/L	Raw mg/L	Effluent mg/L	Plant mg/L		Raw mg/L	Effluent mg/L	Raw mg/L	Effluent mg/L	Raw mg/L	Effluent mg/L	Raw mg/L	Effluent mg/L	Total m ³	Conc.			Total m ³	Total kg					
January	18751	605	1557	208	185	3.9	2.36	97.9%	116	9.0	5.44	92.2%	5.4	0.24	0.15	95.6%	34.35	4.35	2.63	87.3%	6.40	40.5	4.8	22.7	0.4	7.0	6.4	258	61.6	200	3.0	6.0	67.9	0.8	2	
February	14322	512	796	256	339	1.99	98.5%	160	8.8	4.50	94.5%	5.9	0.25	0.13	95.8%	40.53	10.53	5.39	74.0%	70.75	43.9	12.5	19.6	0.4	7.0	6.4	243	57.1	280	0.0	53.4	0.7	5			
March	49124	1585	3594	163	145	4.2	6.66	97.1%	93	9.6	15.21	89.7%	3.8	0.27	0.43	92.9%	23.86	7.28	11.54	69.5%	23.43	26.9	7.8	15.7	0.3	7.5	6.7	255	100.7	320	2.3	7.4	132.4	0.7	5	
April	153212	5107	9301	55	43	3.0	15.32	93.0%	68	6.1	31.15	91.0%	1.4	0.13	0.66	90.7%	4.18	0.13	0.66	96.9%	1.87	8.6	0.5	9.91	0.1	7.9	7.0	228	187.2	200	4.4	8.8	309.0	0.5	52	
May	77786	2509	4102	84	69	1.7	4.27	97.5%	124	4.7	11.79	96.2%	2.8	0.16	0.40	94.3%	16.43	0.30	0.75	98.2%	2.76	17.1	0.2	16.7	0.2	7.5	6.7	275	127.3	120	4.6	5.5	168.5	0.7	10	
June	68750	2292	4005	178	153	1.6	3.67	99.0%	128	4.7	10.77	96.3%	4.1	0.17	0.39	95.9%	20.35	0.14	0.32	99.3%	0.88	22.7	0.2	18.7	0.2	7.4	6.6	286	115.1	280	3.1	8.7	196.7	0.8	5	
July	38940	1256	1599	218	200	2.3	2.89	98.9%	241	5.0	6.28	97.9%	5.5	0.18	0.23	96.7%	28.92	0.27	0.34	99.1%	0.67	31.1	0.2	27.15	0.4	7.5	6.3	277	51.1	280	2.1	5.9	134.7	0.7	5	
August	38536	1243	1575	210	202	2.4	2.98	98.8%	188	6.9	8.58	96.3%	5.0	0.20	0.25	96.0%	39.66	0.30	0.37	99.2%	2.24	40.4	40.4	26.80	0.2	7.2	6.3	261	64.6	360	2.0	7.2	166.4	0.6	32	
September	34557	1152	3281	245	195	2.3	2.65	98.8%	205	7.4	8.52	96.4%	6.5	0.21	0.24	96.8%	39.65	1.17	1.35	97.0%	7.62	37.5	1.5	37.15	0.3	7.5	6.4	252	60.7	280	1.8	5.0	125.0	0.8	18	
October	36862	1189	1599	243	188	3.1	3.69	98.4%	214	7.8	9.27	96.4%	6.2	0.14	0.17	97.7%	37.03	0.96	1.14	97.4%	2.32	37.9	0.2	30.63	0.9	7.4	6.4	281	59.2	320	2.4	7.7	159.4	0.7	15	
November	38093	1270	2012	183	149	2.9	3.68	98.1%	179	5.6	7.11	96.9%	5.4	0.21	0.27	96.1%	23.32	0.32	0.41	98.6%	3.20	28.4	0.6	25.72	1.8	7.5	6.6	285	96.3	240	2.6	6.2	308.8	0.8	37	
December	33298	1074	2012	197	185	2.7	2.90	98.5%	171	6.2	6.66	96.4%	5.0	0.15	0.16	97.0%	26.25	1.48	1.59	94.4%	7.29	29.8	2.3	26.50	0.72	7.6	6.6	279	94.9	320	2.7	8.6	160.3	0.9	4	
Total	602231																																			
Average			1650								6.82	10.44	95.0%	4.75	0.19	0.29	95.5%	27.88	2.27	2.2	92.6%	10.8	30.38	5.92	22.26	0.49	7.42	6.54	265	90		2.82		77.0		16





2022 Azilda Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	160	10.8	10.8	233.0	247.0	5.0	147	32.9	19.5	84.1	96.7	42.2	91
Nitrate (as N)	0.80	1.62	2.94	0.25	0.25	1.47	0.74	0.49	0.05	0.25	0.25	0.25	0.8
Nitrite (as N)	0.5	0.05	0.44	0.25	8.57	0.05	0.05	0.05	0.05	1.50	3.97	0.25	1.3
Potassium	123	26	23	77	127	23	56	133	61	74	84	94	75
TKN	2000	220	214	1330	2840	242	792	288	1030	1140	1120	588	984
Total Phosphorus	760	93.5	7.19	572.0	566.0	105.0	136.0	112.0	411	247	223	42.7	273
Total Solids	28300	2690	3470	28600	36800	6190	25800	20500	18600	26600	24700	6550	19067
Arsenic	0.15	0.01	0.01	0.10	0.30	0.03	0.12	0.26	0.09	0.12	0.10	0.04	0.11
Cadmium	0.0276	0.0021	0.0018	0.0157	0.0368	0.0030	0.0237	0.0400	0.0169	0.0175	0.0148	0.0077	0.0173
Chromium	0.39	0.03	0.03	0.25	0.67	0.10	0.38	0.55	0.31	0.33	0.29	0.14	0.29
Cobalt	0.235	0.024	0.022	0.268	0.751	0.073	0.308	0.465	0.215	0.239	0.236	0.095	0.244
Copper	12.90	1.08	0.98	6.60	12.90	1.80	8.1	18.9	7.3	10.7	8.2	4.3	7.8
Lead	0.367	0.032	0.022	0.282	0.342	0.046	0.200	0.727	0.184	0.224	0.182	0.079	0.224
Mercury	0.006	0.001	0.001	0.002	0.007	0.001	0.001	0.010	0.003	0.006	0.004	0.003	0.004
Molybdenum	0.11	0.01	0.01	0.08	0.16	0.02	0.10	0.14	0.07	0.11	0.10	0.04	0.08
Nickel	1.50	0.11	0.08	1.28	4.40	0.29	1.05	10.50	0.77	0.84	0.84	0.50	1.85
Selenium	0.086	0.002	0.007	0.051	0.090	0.014	0.084	0.088	0.065	0.074	0.052	0.021	0.053
Zinc	13.60	1.02	0.94	6.11	12.20	1.70	8.30	14.70	8.30	10.80	8.00	4.63	7.53
Sample Date	Jan.5/22	Feb.2/22	Mar.2/22	Apr.6/22	May.4/22	Jun.1/22	Jul.6/22	Aug.3/22	Sep.7/22	Oct.4/22	Nov.2/22	Dec.7/22	#DIV/0!

2022 Chelmsford Wastewater Treatment Plant Performance

Month	Flows			BOD ₅		CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia			Un-ionized Ammonia			TKN			Nitrate		pH		Alkalinity		Sludge		E.Coli # Col./100ml				
	Total m ³	Avg Day m ³ /d	Max Day m ³ /d	Raw mg/L	Effluent mg/L	Plant Loading kg/d	Efficiency	Raw mg/L	Effluent mg/L	Plant Loading kg/d	Efficiency	Raw mg/L	Effluent mg/L	Plant Loading kg/d	Efficiency	Raw mg/L	Effluent mg/L	Plant Loading kg/d	Efficiency	Raw mg/L	Effluent mg/L	Plant Loading kg/d	Efficiency	Raw mg/L	Effluent mg/L	Raw mg/L	Effluent mg/L	Total m ³ Hauled	Conc. %	Total m ³						
January	100710	3249	4190	346	240	11.3	36.71	95.3%	258	10.9	35.41	95.8%	5.0	0.42	1.36	91.6%	22.30	1.72	5.59	92.3%	3.23	41.90	3.35	25.30	0.69	7.6	7.0	279	129	1000	1.6	16.0	26363			
February	77452	2766	3030	240	170	9.8	27.11	94.2%	304	10.2	28.21	96.6%	5.9	0.42	1.16	92.9%	30.20	1.54	4.26	94.9%	6.24	36.10	2.30	20.60	0.67	7.6	6.7	262	51	880	0.0	0.0	2395			
March	147206	4749	10520	160	150	4.6	21.84	96.9%	320	8.6	40.84	97.3%	3.9	0.26	1.23	93.3%	28.50	2.65	12.58	90.7%	24.51	35.20	3.30	13.89	0.17	7.6	6.8	223	86	1160	2.1	24.4	10020			
April	255495	8517	15420	36	33	8.2	69.84	75.2%	151	11.9	101.35	92.1%	1.2	0.21	1.79	82.5%	3.00	1.38	11.75	54.0%	11.34	7.40	3.55	4.59	0.05	7.5	7.3	199	181	840	0.0	0.0	9013			
May	123895	3997	6340	54	58	2.4	9.59	95.9%	164	4.2	16.79	97.4%	2.5	0.16	0.64	93.6%	8.80	0.86	3.44	90.2%	8.77	10.70	0.85	9.92	0.56	7.2	7.1	223	154	1320	0.0	0.0	24			
June	101582	3386	5450	240	120	1.6	5.42	98.7%	333	5.4	18.28	98.4%	2.7	0.16	0.54	94.1%	12.90	0.09	0.30	99.3%	1.05	16.40	0.47	10.74	0.05	7.2	6.8	254	123	1040	1.7	17.7	18			
July	56130	1811	2070	120	120	3.2	5.79	97.3%	314	6.0	10.86	98.1%	3.2	0.20	0.36	93.8%	24.10	0.68	1.23	97.2%	1.18	25.60	0.25	17.30	2.33	7.4	6.5	223	48	880	1.8	15.8	13			
August	67690	2184	3180	260	180	2.6	5.68	98.6%	364	4.0	8.73	98.9%	3.8	0.15	0.33	96.1%	23.10	0.10	0.22	99.6%	0.63	26.10	0.20	16.95	0.05	7.4	6.6	247	56	1100	0.0	0.0	23			
September	64822	2161	2750	130	110	2.8	6.05	97.5%	155	6.4	13.83	95.9%	2.9	0.22	0.48	92.4%	27.20	4.94	10.67	81.8%	42.31	29.70	4.87	9.92	0.18	7.1	6.4	241	87	920	2.2	20.2	31			
October	89994	2903	3970	79	85	3.2	9.29	96.2%	195	7.3	21.19	96.3%	2.7	0.16	0.46	94.1%	23.80	0.29	0.84	98.8%	2.84	19.70	0.20	16.80	0.36	7.1	6.5	225	88	880	2.8	24.6	39			
November	106627	3554	4950	13	21	3.1	11.02	85.2%	199	7.2	25.59	96.4%	2.6	0.21	0.75	91.9%	3.40	0.69	2.45	79.7%	5.77	3.80	0.80	10.74	0.54	7.2	6.7	235	131	920	2.1	19.3	477			
December	104742	3379	4840	150	160	3.8	12.84	97.6%	320	7.1	23.99	97.8%	2.2	0.22	0.74	90.0%	13.90	0.54	1.82	96.1%	5.02	17.00	2.00	11.98	0.43	6.8	6.7	266	152	800	1.7	13.6	2921			
Total	1296345							95.2%				96.7%				92.1%							91.8%										11740		151.7	
Average		3552					121	4.72	18.43	94.0%	256	7.43	28.76	96.7%	3.22	0.23	0.82	92.2%	18.43	1.29	4.6	89.6%	9.4	22.47	1.85	14.06	0.51	7.31	6.77	240	107		2.00		4278	
Summer							2.63	6.97	97.8%		5.55	14.95	97.8%		0.18	0.47	94.1%	19.98	1.16	2.78																
Winter							6.80	29.89	93.7%		9.32	42.56	95.9%		0.29	1.17	91.0%	16.88	1.42	6.41																

Plant Type: Extended Aeration w/modified activated sludge for denitrification

Design Capacity: 7100 m³/day

Population Served: 7,147 (Plant & Lagoon)

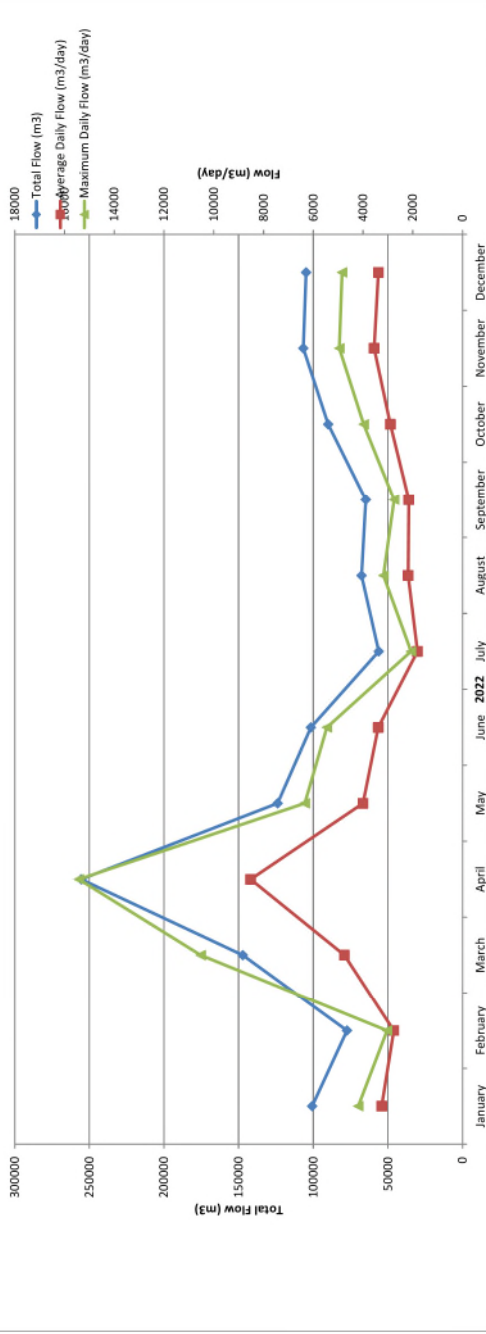
Compliance Parameters:

Summer - May 1 to October 31

	Conc.	Loading
CBOD	7.0 mg/L	49.7 kg/day
TSS	7.0 mg/L	Seasonal Average
Total Phosphorus	0.3 mg/L	Seasonal Average
Total Ammonia as N	2.0 mg/L	Monthly Average
E.Coli	200 col/100 ml	Seasonal Average
UV Disinfection	turned on.	Monthly Geometric Mean

Winter - November 1 to April 30

	Conc.	Loading
CBOD	15.0 mg/L	106.5 kg/day
TSS	15.0 mg/L	Seasonal Average
Total Phosphorus	0.5 mg/L	Seasonal Average
Total Ammonia as N	4.0 mg/L	Monthly Average
UV Disinfection	turned off.	Seasonal Average



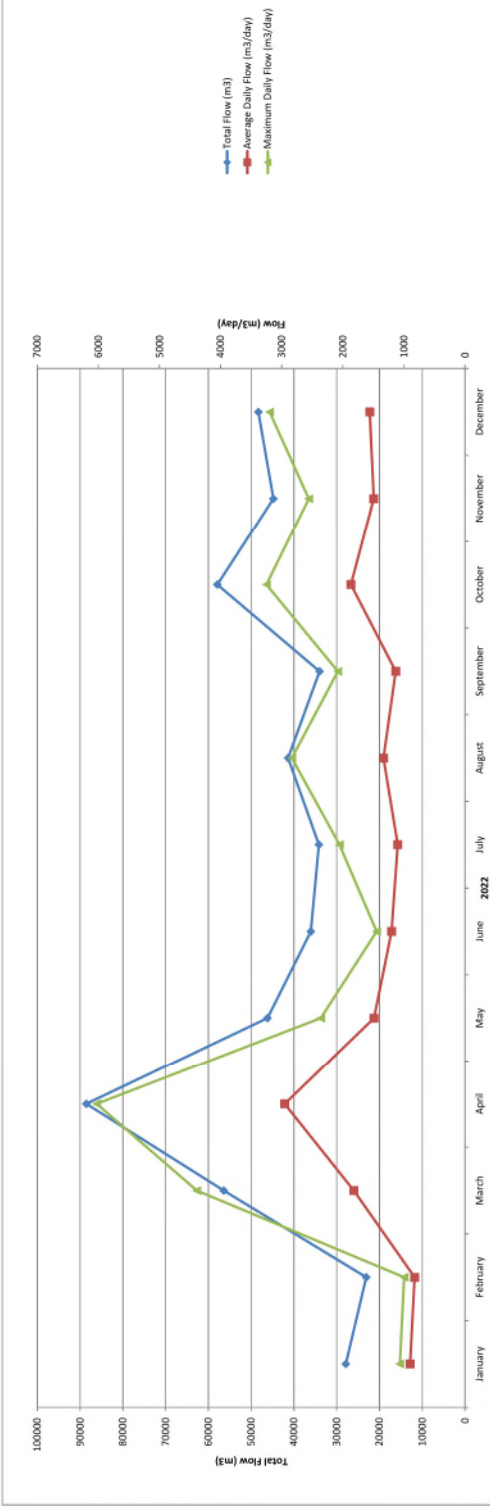


2022 Chelmsford Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	24.2	45.0	20.4	28.4	3.59	16.0	40.1	21.1	28.5	113.0	0.59	49.9	32.6
Nitrate (as N)	0.50	0.50	0.05	0.25	0.05	0.90	0.34	0.05	0.05	5.03	2.05	0.10	0.82
Nitrite (as N)	0.50	3.70	0.74	0.25	0.05	0.10	0.05	0.05	0.05	0.25	0.20	0.10	0.50
Potassium	79	88	62	36	12	54	55	17	62	57	12	35	47.42
TKN	1200	1260	720	271	38	915	324	34	893	174	137	191	513
Total Phosphorus	313.0	279.0	22.3	159.0	11.3	296.0	25.9	6.8	283	339	24.4	66.1	152
Total Solids	17200	15400	10800	10100	1300	17300	18200	860	16100	26400	1700	5790	11763
Arsenic	0.08	0.06	35.20	0.05	0.01	0.08	0.09	0.01	0.09	0.13	0.01	0.02	2.99
Cadmium	0.0106	0.0089	0.0047	0.0052	0.0004	0.0090	0.0148	0.0002	0.0121	0.0176	0.0007	0.0019	0.0072
Chromium	0.25	0.17	0.12	0.16	0.02	0.25	0.26	0.01	0.25	0.32	0.03	0.05	0.16
Cobalt	0.193	0.090	0.072	0.145	0.037	0.210	0.245	0.018	0.223	0.295	0.002	0.043	0.131
Copper	5.90	5.00	2.70	2.70	0.26	4.90	6.40	0.12	6.10	9.00	1.24	1.40	3.81
Lead	0.154	0.140	0.081	0.215	0.008	0.140	0.172	0.004	0.202	0.286	0.045	0.032	0.123
Mercury	0.004	0.018	0.024	0.012	0.001	0.008	0.006	0.001	0.010	0.021	0.001	0.002	0.009
Molybdenum	0.06	0.05	0.04	0.03	0.01	0.06	0.09	0.01	0.07	0.10	0.01	0.01	0.05
Nickel	0.96	0.49	0.27	0.79	0.17	1.40	0.93	0.03	0.66	1.01	0.03	0.21	0.58
Selenium	0.040	0.024	0.023	0.021	0.003	0.041	0.052	0.002	0.044	0.052	0.009	0.003	0.026
Zinc	4.81	4.00	2.37	2.40	0.21	4.34	5.49	0.13	5.60	9.00	0.36	1.32	3.34
Sample Date	Jan.5/22	Feb.2/22	Mar.2/22	Apr.6/22	May.4/22	Jun.1/22	Jul.6/22	Aug.3/22	Oct.7/22	Oct.5/22	Nov.2/22	Dec.7/22	#DIV/0!

2022 Coniston Wastewater Treatment Plant Performance

Month	Flows			BOD ₅			CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia			TKN		Nitrate		pH		Alkalinity		Sludge		Chlorine		E.coli																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Total m ³	Avg Day m ³ /d	Max Day m ³ /d	Raw mg/L	Effluent mg/L	Loading kg/d	Raw Loading kg/day	Removed kg/day	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Raw mg/L	Effluent mg/L	Efficiency	Ammonia mg/L	Effluent mg/L	Nitrite mg/L	Nitrate mg/L	Raw Effluent	Raw Effluent	Total m ³ Hauled	Conc. %	Total m ³	Residual mg/L																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
January	27870	859	1067	100	0.90	90	89	99.0%	86	2.1	1.89	77.3	75	97.6%	70	6.1	5.48	91.3%	3.7	1.28	1.15	65.4%	20.1	0.22	0.20	98.9%	0.49	0.70	10.80	0.05	7.40	6.9	149	71.3	354	0.4	1.4	34.2	0.8	4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
February	23094	825	996	130	10.0	8.25	107	99	92.3%	120	4.6	3.79	99.0	95	96.2%	84	6.9	5.69	91.8%	4.7	1.64	1.35	65.1%	27.4	0.33	0.27	98.8%	0.81	2.00	11.80	0.07	7.3	6.7	132	51.7	440	0.5	2.2	31.6	0.7	292																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
March	56416	1820	4389	120	2.6	4.73	218	214	97.8%	74	2.0	3.64	134.7	131	97.3%	133	11.1	20.20	91.7%	4.4	0.75	1.36	83.0%	26.3	0.99	1.80	96.2%	2.56	1.50	15.70	0.05	7.2	6.9	127	58.7	480	1.2	5.8	60.3	0.9	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
April	88545	2952	6028	59	17.0	50.18	174	124	71.2%	33	10.0	29.52	97.4	68	69.7%	52	17.6	51.95	66.2%	2.2	0.98	2.89	55.5%	4.5	4.15	12.25	7.8%	14.51	8.40	1.58	0.05	7.1	7.0	123	110.3	80	0.4	0.3	78.6	0.9	368																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
May	46182	1490	2361	75	13.4	19.96	112	92	82.1%	54	8.9	13.26	80.4	67	83.5%	82	13.3	20.56	83.2%	2.0	1.85	2.76	7.5%	8.7	3.42	5.09	60.7%	19.57	5.30	3.03	0.27	7.4	7.1	159	149.4	0	0.0	0.0	53.8	0.6	933																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
June	36049	1202	1447	77	13.0	15.62	93	77	83.1%	20	4.1	4.93	24.0	19	79.5%	82	13.3	15.98	83.8%	4.3	2.37	2.85	44.9%	9.8	4.00	4.81	59.2%	4.95	7.00	0.38	11.30	7.4	7.1	164	140.2	160	0.0	51.5	0.6	326																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
July	34159	1134	2033	110	23.7	26.12	121	95	78.5%	110	20.2	22.26	121.2	99	81.6%	147	26.0	28.65	82.3%	4.0	1.40	1.54	65.0%	14.8	0.10	0.11	31.8%	67.50	11.40	0.41	1.50	7.2	7.0	198	151.0	320	0.0	71.2	0.8	285																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
August	41369	1334	2833	50	7.2	9.61	67	57	85.6%	54	5.1	6.81	72.1	65	90.6%	111	9.0	12.01	91.9%	2.5	1.01	1.35	59.6%	13.00	0.09	0.12	99.3%	5.08	1.20	6.33	0.05	16.5	6.8	181	94.6	240	0.0	61.2	0.8	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
September	34020	1134	2081	170	6.7	7.60	193	185	96.1%	110	2.9	3.29	124.7	121	97.4%	151	6.8	7.71	95.5%	4.0	1.76	2.00	56.0%	19.9	0.81	0.92	95.9%	5.08	1.20	6.33	0.05	16.5	6.8	181	94.6	240	0.0	61.2	0.8	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
October	57921	1868	3250	130	13.4	25.04	243	218	89.7%	130	10.0	18.68	242.9	224	92.3%	103	9.7	18.12	90.6%	3.1	1.17	2.19	62.3%	16.6	0.46	0.86	97.2%	1.74	1.20	10.10	0.22	7.4	7.1	187	83.1	280	1.0	2.8	118.3	0.6	272																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
November	44792	1493	2556	62	4.3	6.42	93	86	93.1%	40	2.4	3.58	59.7	56	94.0%	96	18.1	27.02	81.1%	2.0	1.51	2.25	24.5%	11.9	0.15	0.22	98.7%	3.07	0.70	8.83	0.05	7.3	7.1	182	119.9	200	1.7	3.4	68.2	0.7	40																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
December	48333	1559	3197	130	81.8	127.54	203	75	37.1%	120	55.9	87.16	187.1	100	53.4%	101	23.6	36.80	76.6%	4.0	1.48	2.31	63.0%	16.6	12.30	19.18	25.9%	75.81	9.50	0.14	0.05	7.3	7.1	181	149.9	80	0.0	75.0	0.7	1770																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Total	538750																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														





2022 Coniston Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	**May	June	July	August	September	October	November	December	Average
Ammonia (as N)	12.2	0.1	1.6	9.0		20.1	20.5	6.8	15.6	5.3	42.5	19.5	13.9
Nitrate (as N)	0.5	0.1	0.05	0.05		0.05	0.05	0.05	0.05	0.18	0.05	0.05	0.11
Nitrite (as N)	0.50	1.20	0.05	0.05		0.05	0.05	0.05	0.05	0.05	1.05	0.05	0.29
Potassium	52	46	41	12		10	19	63	24	47	113	12	39.9
TKN	265	263	436	61.4		29.9	125	729	222	737	1340	28	385
Total Phosphorus	118.0	75.1	7.76	17.90		8.79	34.2	4.35	49.2	119.0	235	6.19	61
Total Solids	6440	3900	4650	200		910	5030	13100	3760	9200	17100	740	5912
Arsenic	0.01	0.01	0.01	0.01		0.01	0.01	0.09	0.02	0.05	0.12	0.01	0.03
Cadmium	0.0038	0.0037	0.0030	0.0016		0.0006	0.0078	0.0223	0.0055	0.0127	0.0394	0.0004	0.0092
Chromium	0.05	0.05	0.04	0.02		0.01	0.07	0.25	0.07	0.14	0.35	0.05	0.10
Cobalt	0.102	0.075	0.062	0.030		0.008	0.041	0.306	0.121	0.215	0.378	0.018	0.123
Copper	1.70	2.00	1.90	0.63		0.20	2.8	8.2	2.5	6.1	6.8	0.19	3.0
Lead	0.053	0.060	0.052	0.031		0.013	0.142	0.300	0.085	0.197	0.447	0.005	0.126
Mercury	0.001	0.001	0.001	0.001		0.001	0.001	0.001	0.001	0.002	0.004	0.001	0.001
Molybdenum	0.01	0.02	0.01	0.01		0.01	0.02	0.05	0.02	0.04	0.08	0.01	0.03
Nickel	0.98	0.55	0.38	0.63		0.22	1.06	5.10	1.40	3.20	4.00	0.40	1.63
Selenium	0.009	0.002	0.011	0.004		0.002	0.017	0.069	0.021	0.037	0.084	0.005	0.024
Zinc	1.37	1.49	1.19	0.44		0.22	3.30	8.10	2.42	6.12	4.80	0.14	2.69
Sample Date	Jan.5/22	Feb.1/22	Mar.12/22	Apr.5/22		Jun.17/22	Jul.5/22	Aug.9/22	Sep.8/22	Oct.4/22	Nov.1/22	Dec.13/22	

Work Order

452148

454304

456215

458998

466694

468636

473095

476063

478792

481897

485894

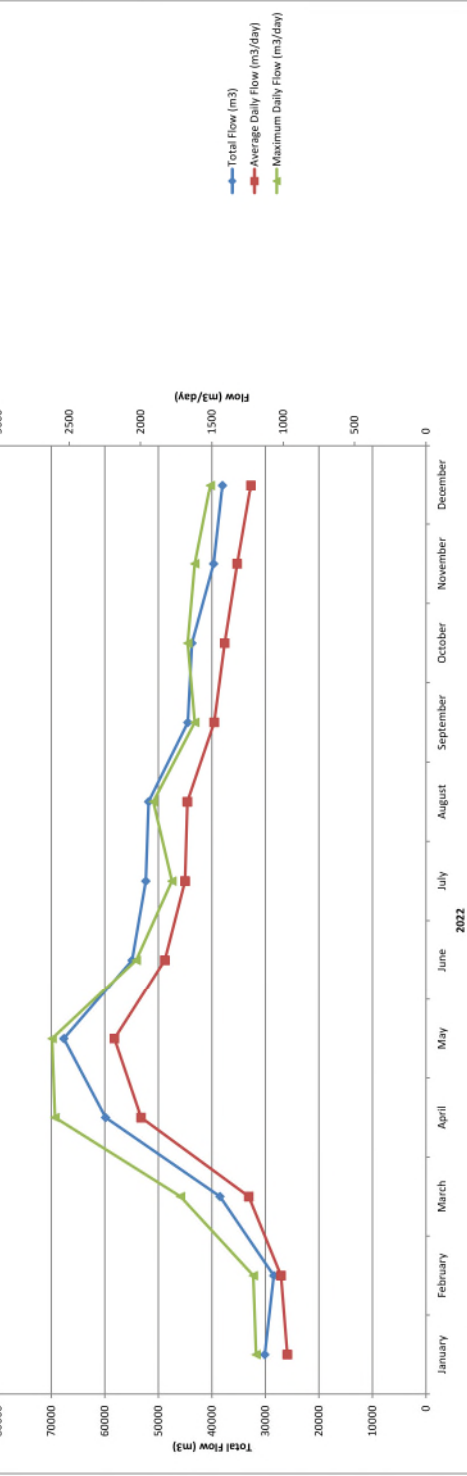
464350

May	ug/g
13700	ug/g
2.2	ug/g
0.2	ug/g
1500	ug/g
19200	mg/kg
NA	ug/g
18.5	%
3.7	ug/g
1.64	ug/g
13.6	ug/g
5.95	ug/g
363	ug/g
13.1	ug/g
0.11	ug/g
1.8	ug/g
238	ug/g
3.1	ug/g
422	ug/g
May.30/22	

**Note: Sludge sample units were changed due to thickness

2022 Dowling Wastewater Treatment Plant Performance

Month	Flows			BOD ₅			CRD			Total Suspended Solids			Total Phosphorus			Total Ammonia			Unabsorbed Ammonia	TKN		Nitrate		pH		Alkalinity		Sludge		Chlorine		E.Coli			
	Total m ³	Avg Day	Max Day	Raw mg/L	Effluent mg/L	Loading kg/day	Raw kg/day	Efficiency	Plant mg/L	Raw mg/L	Effluent mg/L	Loading kg/day	Raw mg/L	Effluent mg/L	Loading kg/day	Raw mg/L	Effluent mg/L	Loading kg/day		Raw mg/L	Effluent mg/L	mg/L	mg/L	Raw	Effluent	Raw	Effluent	Total m ³	Total m ³	Kg	Residual		Count/Gram		
January	30095	971	1190	61	4.1	3.98	93.3%	46	2.7	2.6	44.7	42	94.1%	50	3.9	3.79	92.2%	1.4	0.42	0.41	70.0%	0.44	1.60	5.34	0.29	6.8	6.6	78	50.5	160	0.0	136.1	0.7	9	
February	28431	1015	1210	51	3.8	3.86	92.5%	38	1.8	1.8	38.6	37	95.3%	39	2.8	2.84	92.8%	1.4	0.40	0.41	71.4%	0.19	1.10	5.36	0.44	6.8	6.6	65	48.0	160	0.0	117.2	0.5	15	
March	38491	1242	1720	38	3.4	4.22	81.1%	7	1.7	2.1	8.7	7	75.7%	44	3.3	4.10	92.5%	0.9	0.45	0.56	50.0%	0.88	1.00	5.19	0.12	6.7	6.5	74	51.2	200	1.4	2.8	152.2	0.6	8
April	59851	1996	2600	25	4.1	8.18	83.6%	14	2.4	4.8	27.9	23	82.9%	35	5.2	10.38	85.1%	0.7	0.39	0.78	44.3%	0.79	2.40	4.28	0.05	6.9	6.5	75	49.6	160	1.6	2.6	171.6	0.5	28
May	67676	1830	2030	62	2.9	5.31	95.3%	49	2.8	5.1	89.7	85	94.3%	40	2.7	4.94	93.3%	1.2	0.53	0.97	55.8%	0.84	1.30	4.70	0.05	6.8	6.6	76	53.8	160	1.1	1.8	174.5	0.5	36
June	54900	1830	2030	62	2.9	5.31	95.3%	49	2.8	5.1	89.7	85	94.3%	40	2.7	4.94	93.3%	1.2	0.53	0.97	55.8%	0.84	1.30	4.70	0.05	6.8	6.6	76	53.8	160	1.1	1.8	174.5	0.5	36
July	52345	1689	1780	16	3.8	6.42	76.3%	11	2.5	4.2	18.6	14	77.3%	39	3.2	5.40	91.8%	1.0	0.37	0.62	63.0%	0.14	0.60	6.45	0.05	6.7	6.6	69	46.3	200	1.3	2.6	165.0	0.7	4
August	51828	1672	1910	98	6.0	10.03	93.9%	32	3.3	5.5	53.5	48	89.7%	42	5.3	8.86	87.4%	0.8	0.39	0.65	51.3%	0.03	0.30	5.04	0.05	6.6	6.4	73	51.1	160	1.2	1.9	169.6	0.7	5
September	44489	1483	1620	29	3.0	4.45	89.7%	9	3.1	4.6	13.3	9	65.6%	49	5.1	7.56	89.6%	1.3	0.48	0.71	63.1%	0.29	0.30	6.33	0.05	6.7	6.5	75	47.8	240	0.0	154.4	0.7	21	
October	43723	1410	1670	20	5.1	7.19	74.5%	9	3.3	4.7	12.6	8	62.9%	61	8.2	11.57	86.6%	1.2	0.53	0.75	55.8%	0.34	0.20	5.52	0.13	6.7	6.5	83	53.3	160	0.0	165.1	0.7	11	
November	39674	1222	1620	78	4.2	5.55	94.6%	62	1.9	2.5	82.0	79	96.9%	43	5.1	6.74	88.1%	1.3	0.45	0.60	65.4%	2.39	0.60	13.50	0.48	6.8	6.7	107	65.3	160	0.0	153.6	0.6	30	
December	38024	1227	1510	36	4.7	5.76	86.9%	48	3.8	4.7	58.9	39	92.1%	39	4.9	6.01	87.4%	1.3	0.47	0.58	63.8%	0.05	2.00	6.23	0.05	7.0	6.8	79	50.2	200	0.0	167.1	0.5	23	
Total	50957																																		
Average	1506			43	4.16	6.29	90.1%	29	2.93	4.63	41.91	37.3	84.0%	45	4.62	7.05	89.7%	1.12	0.44	0.66	59.4%	1.03	1.00	5.86	0.17	6.78	6.57	77	52	8	1880.4	0.6	17		





2022 Dowling Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	1.50	0.41	0.10	1.80	0.97	1.90	0.75	0.97	0.20	0.93	142	0.01	12.63
Nitrate (as N)	0.15	1.73	0.48	1.15	0.14	0.69	1.03	0.84	1.36	2.14	0.25	1.95	0.99
Nitrite (as N)	0.66	0.26	0.78	0.05	0.05	3.91	0.05	0.25	0.05	0.14	4.72	0.48	0.95
Potassium	13	10	9	9	10	12	17	13	10	9	86	12	17.5
TKN	133	98.4	94	87	97	103	123	117	6.8	7.1	422.0	81.0	114.1
Total Phosphorus	20.6	16.80	3.41	18.8	21.4	29.5	24.8	23.0	14.5	3.8	117.0	22.3	26.3
Total Solids	2570	1800	1400	1600	2100	2000	2210	2720	1500	1300	24400	2000	3800
Arsenic	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.02
Cadmium	0.0007	0.0008	0.0008	0.0005	0.0008	0.0007	0.0007	0.0009	0.0012	0.0008	0.0130	0.0008	0.0018
Chromium	0.01	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.02	0.27	0.03	0.05
Cobalt	0.0020	0.0020	0.0040	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.264	0.002	0.025
Copper	1.06	1.60	2.00	0.90	0.91	0.99	1.30	1.7	1.4	1.01	7.4	1.5	1.81
Lead	0.0160	0.0210	0.020	0.046	0.018	0.016	0.020	0.021	0.027	0.011	0.178	0.018	0.034
Mercury	0.0010	0.0010	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.008	0.001	0.002
Molybdenum	0.010	0.010	0.010	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.01	0.02
Nickel	0.020	0.030	0.060	0.03	0.04	0.04	0.04	0.04	0.04	0.02	1.09	0.03	0.12
Selenium	0.0020	0.0060	0.0070	0.004	0.005	0.006	0.007	0.004	0.009	0.004	0.046	0.002	0.009
Zinc	0.400	0.420	0.41	0.33	0.35	0.36	0.38	0.50	0.43	0.29	6.01	0.45	0.86
Sample Date	Jan.5/22	Feb.9/22	Mar.2/22	Apr.6/22	May.4/22	Jun.1/22	Jul.6/22	Aug.3/22	Sep.7/22	Oct.5/22	nov.2/22	Dec.7/22	

Work order

452308 454874 456370 459168 461729 464781 468645 472465 475943 479009 482013 485361

2022 Falconbridge Wastewater Treatment Plant Performance

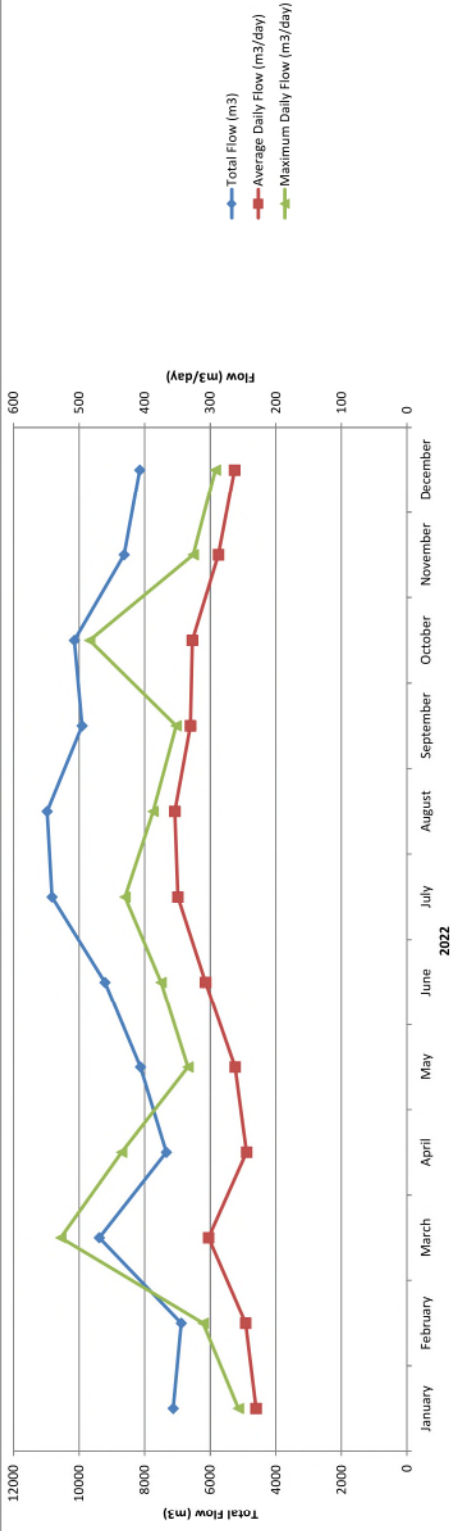
Month	Flows			BOD ₅				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized Ammonia µg/L	TKN mg/L	Nitrate mg/L	Nitrite mg/L	pH		E.Coli #/coliform	
	Total m ³ /d	Avg Day m ³ /d	Max Day m ³ /d	Raw mg/L	Effluent mg/L	Loading kg/d	Raw Loading kg/day	Removed kg/day	Efficiency	Plant mg/L	Raw mg/L	Effluent mg/L	Loading kg/d	Plant mg/L	Raw mg/L	Effluent mg/L	Loading kg/d	Plant mg/L	Efficiency					Raw mg/L	Effluent mg/L		Raw
January	7132	230	257	240	1.2	0.28	55	55	99.5%	143	3.3	0.76	8	7	90.3%	9.7	0.20	0.05	97.9%	59.10	0.75	0.17	0.43	0.05	7.5	6.9	14000
February	6884	246	311	180	3.1	0.76	44	43	98.3%	237	3.8	0.93	10	9	90.9%	4.7	0.11	0.03	97.7%	27.70	0.50	0.12	0.30	0.05	7.4	6.7	10000
March	9381	303	528	190	1.7	0.51	57	57	99.1%	121	3.2	0.97	7	6	86.0%	8.1	0.04	0.01	99.5%	37.80	0.59	0.18	0.30	0.05	7.8	6.9	4000
April	7338	245	435	170	0.9	0.22	42	41	99.5%	129	2.4	0.59	5	5	89.0%	7.3	0.20	0.05	97.3%	32.90	0.22	0.05	0.30	0.05	7.6	7.0	1000
May	8127	262	334	200	1.8	0.47	52	52	99.1%	135	3.4	0.89	7	6	87.3%	6.4	0.03	0.01	99.5%	38.20	0.13	0.03	0.14	0.05	7.6	7.0	650
June	9210	307	375	260	2.5	0.77	80	79	99.0%	82	3.6	1.11	6	5	83.0%	6.9	0.02	0.01	99.7%	129.00	0.14	0.04	0.05	0.05	7.6	7.1	200
July	10828	349	430	94	1.3	0.45	33	32	98.6%	70	3.0	1.05	2	1	53.8%	5.5	1.70	0.59	69.1%	37.50	0.08	0.03	0.05	0.05	7.4	6.9	40
August	10975	354	387	120	1.4	0.50	42	42	98.8%	111	3.5	1.24	5	3	73.4%	1.7	0.06	0.02	96.5%	9.00	0.01	0.00	0.10	0.10	7.1	6.8	1080
September	9908	330	352	170	1.6	0.53	56	56	99.1%	109	3.9	1.29	6	5	78.8%	6.0	0.03	0.01	99.5%	36.10	0.07	0.02	0.05	0.05	7.3	7.1	48
October	10147	327	484	306	1.9	0.62	100	100	99.4%	93	3.1	1.01	9	8	89.0%	7.5	0.02	0.01	99.7%	40.90	0.14	0.05	0.20	0.05	7.3	7.1	56
November	8628	288	326	220	0.2	0.06	63	63	99.9%	111	3.3	0.95	7	6	86.5%	6.3	0.02	0.01	99.7%	42.00	0.15	0.04	0.20	0.10	7.3	7.1	154
December	8148	263	292	190	3.0	0.79	50	49	98.4%	98	3.4	0.89	5	4	81.4%	6.6	0.02	0.01	99.7%	43.90	0.19	0.05	0.20	0.10	6.99	6.9	314
Total	106706						676	670	99.1%				78	66	85.0%				96.4%								
Average		292		195	1.72	0.50	56.30	55.81	99.12%	120	3.33	0.97	6.50	5.52	85.02%	6.40	0.20	0.07	96.4%	44.51	0.25	0.07	0.22	0.06	7.41	6.95	2629

Plant Type: Trickling Filter
Design Capacity: 909 m³/day
Population Served: 754

Compliance Parameters:

Conc.
BOD₅ 15 mg/L
TSS 15 mg/L

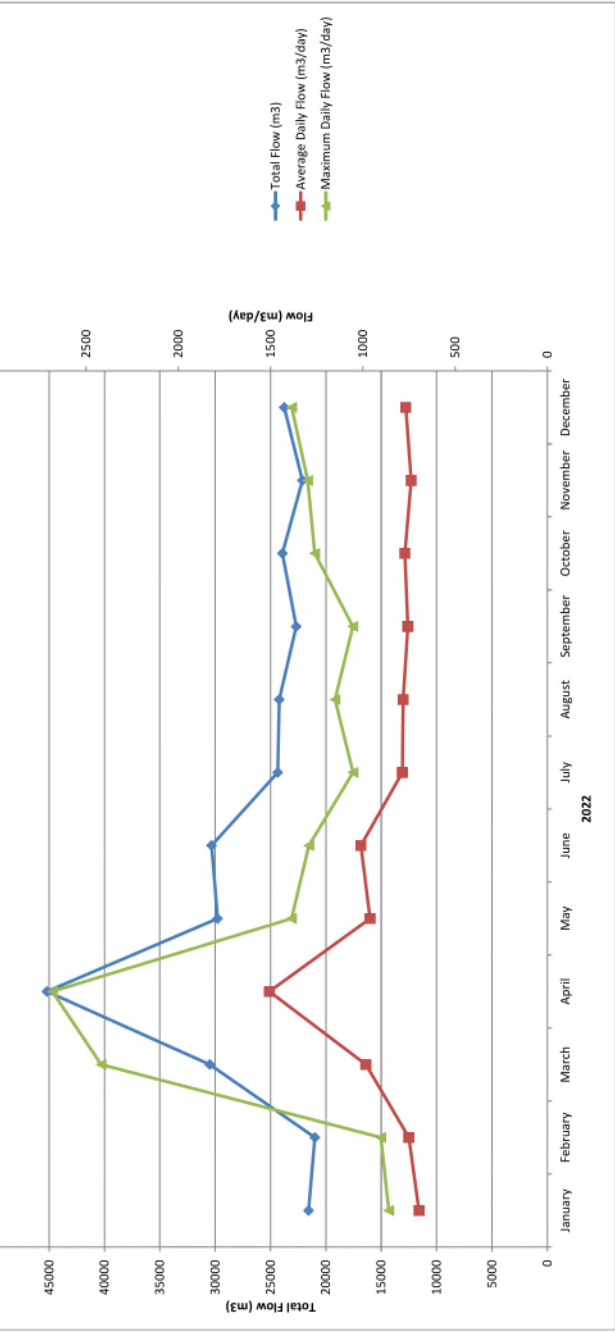
Loading
Annual Avg.
46 kg/day
46 kg/day





2022 Levack Wastewater Treatment Plant Performance

Month	Flows			CBOD		Total Suspended Solids		Total Phosphorus		Total Ammonia		Un-ionized Ammonia		TKN		Nitrate		pH		Alkalinity		Sludge		Chlorine		E.Coli												
	Total m ³	Avg Day m ³ /d	Max Day m ³ /d	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	µg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	mg/L	Effluent mg/L	Raw	Effluent	mg/L	Effluent	Total m ³	Conc. %	Total m ³	kg	Total Residual	# col/100mL										
January	21559	695	859	120	6.1	4.24	94.9%	114	3.8	2.64	96.7%	4.1	0.43	0.30	0.30	0.48	0.36	88.8%	26.90	1.81	1.72	91.5%	9.29	2.33	36.3	1.40	23.40	0.08	7.0	6.5	199	67.27	160	0.12	0.2	94.9	0.8	3
February	20994	750	902	170	4.7	3.52	97.2%	147	9.7	7.27	93.4%	4.3	0.48	0.36	0.36	0.54	0.53	88.8%	26.90	2.29	2.17	91.5%	9.29	3.12	31.2	3.30	21.10	0.05	7.0	6.4	161	50.00	120	1.6	1.9	74.8	0.9	2
March	30486	983	2418	200	6.5	6.39	96.8%	138	8.0	7.87	94.2%	3.5	0.54	0.36	0.36	0.84	0.63	84.6%	16.30	7.30	7.18	55.2%	19.15	36.0	7.50	16.70	16.70	0.05	7.0	6.6	161	50.00	120	1.6	1.9	74.8	0.9	2
April	45191	1506	2683	95	1.9	2.86	98.0%	90	6.1	9.19	93.2%	3.0	0.40	0.60	0.60	0.60	0.60	86.7%	17.30	0.61	0.92	96.5%	2.84	18.1	0.20	16.00	16.00	0.05	6.3	140	57.67	80	1	0.8	113.8	0.6	2	
May	29779	961	1386	100	1.7	1.63	98.3%	53	6.2	5.96	88.3%	3.6	0.27	0.26	0.26	0.26	0.26	92.5%	16.80	0.11	0.11	99.3%	0.13	19.0	0.70	17.30	17.30	0.05	7.0	6.7	148	43.33	40	1.7	0.7	115.1	0.6	3
June	30321	1011	1292	95	1.7	1.72	98.2%	44	5.2	5.26	88.2%	3.3	0.28	0.28	0.28	0.28	0.28	91.5%	16.40	0.14	0.14	99.3%	0.15	17.8	0.20	20.20	20.20	0.05	7.0	6.6	166	63.75	80	3.6	2.9	126.4	0.6	4
July	24354	786	1053	69	1.1	0.86	98.4%	55	4.9	3.85	91.1%	3.6	0.26	0.20	0.20	0.26	0.26	92.8%	22.00	0.05	0.04	99.8%	0.17	26.0	0.20	21.20	21.20	0.05	6.8	180	68.78	120	0.0	0.0	139.8	0.6	2	
August	24206	781	1150	69	1.8	1.41	97.4%	41	5.6	4.37	86.3%	4.1	0.34	0.27	0.27	0.34	0.27	89.0%	20.10	0.15	0.12	99.3%	0.73	19.2	0.20	20.30	20.30	0.05	7.0	6.7	169	79.82	160	0.0	0.0	148.6	0.6	6
September	22674	756	1054	57	2.4	1.81	95.8%	51	5.0	3.78	90.2%	3.5	0.29	0.22	0.22	0.35	0.29	91.7%	28.50	0.15	0.11	99.5%	1.27	30.2	0.20	20.80	20.80	0.05	7.0	6.7	185	94.33	160	1.4	2.2	224.9	0.7	3
October	23927	772	1260	110	2.2	1.70	98.0%	45	4.5	3.47	90.0%	4.4	0.24	0.19	0.19	0.44	0.19	94.5%	26.90	0.10	0.08	99.6%	0.27	24.3	0.20	24.70	24.70	0.05	7.0	6.7	196	88.38	160	0.0	0.0	138.2	0.6	3
November	22125	738	1298	150	2.8	2.07	98.1%	118	10.4	7.67	91.2%	4.0	0.35	0.26	0.26	0.35	0.26	91.3%	29.40	1.92	1.42	93.5%	19.01	31.0	0.20	28.60	28.60	1.20	7.0	6.5	181	59.13	200	0.0	0.0	124.2	0.6	8
December	23756	766	1385	210	3.5	2.68	98.3%	145	10.2	7.82	93.0%	4.4	0.58	0.44	0.44	0.58	0.44	86.8%	22.70	0.03	0.02	99.9%	0.17	25.0	2.00	23.50	23.50	0.05	7.1	6.7	179	74.00	160	0.0	0.0	121.6	0.8	3
Total	319372	875	875	120	3.03	2.58	97.5%	87	6.63	5.76	92.3%	3.73	0.37	0.33	0.33	0.37	0.33	89.8%	22.53	1.22	1.09	94.3%	4.63	76.18	1.36	21.15	21.15	0.15	7.03	6.60	174	68	157	8.7	8.7	0.7	4	
Average	875	875	875	120	3.03	2.58	97.5%	87	6.63	5.76	92.3%	3.73	0.37	0.33	0.33	0.37	0.33	89.8%	22.53	1.22	1.09	94.3%	4.63	76.18	1.36	21.15	21.15	0.15	7.03	6.60	174	68	157	8.7	8.7	0.7	4	





2022 Levack Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	Nov.8/22	Nov.16/22	December	Average
Ammonia (as N)	27.90	152.00	40.40	34.60	137.00	0.90	219.00	15.40	27.80	0.33	11.00	4.68	3.2	51.9
Nitrate (as N)	6.66	0.50	0.10	0.10	0.25	9.35	0.99	0.05	0.05	20.50	0.52	24.00	19.90	6.38
Nitrite (as N)	2.43	0.48	3.20	0.10	2.50	0.05	0.05	0.05	1.33	0.36	0.05	1.38	2.11	1.08
Potassium	43	111	105	111	103	15	63	27	73	16	24	18	18	56
TKN	382	1350	1520	1530	1120	73	1400	273	1180	42	236	15	42	705
Total Phosphorus	170	406	48.8	50.9	354.0	30.1	32.0	121.0	408.0	18.0	86.9	4.92	22	135
Total Solids	7440	17600	21200	22200	16200	2290	23700	5710	23200	1350	4790	750	1600	11387
Arsenic	0.01	0.02	0.02	0.07	0.06	0.01	0.06	0.01	0.04	0.01	0.01	0.01	0.01	0.03
Cadmium	0.0046	0.0122	0.0142	0.0245	0.0232	0.0011	0.0347	0.0036	0.0269	0.0007	0.0044	0.0002	0.0009	0.0116
Chromium	0.09	0.19	0.20	0.51	0.32	0.03	0.41	0.07	0.42	0.01	0.06	0.01	0.01	0.18
Cobalt	0.029	0.059	0.061	0.206	0.169	0.019	0.335	0.069	0.351	0.014	0.050	0.005	0.014	0.106
Copper	2.83	7.30	7.40	10.60	8.30	0.70	14.5	2.40	15.9	0.47	2.80	0.10	0.54	5.68
Lead	0.172	0.465	0.450	0.963	0.570	0.046	0.805	0.154	0.917	0.025	0.150	0.006	0.024	0.365
Mercury	0.001	0.008	0.006	0.015	0.009	0.001	0.006	0.001	0.019	0.001	0.004	0.001	0.001	0.006
Molybdenum	0.02	0.05	0.06	0.07	0.07	0.01	0.07	0.01	0.09	0.01	0.01	0.01	0.01	0.04
Nickel	0.61	1.60	1.50	3.10	2.60	0.26	4.60	0.73	4.60	0.16	0.70	0.10	0.19	1.60
Selenium	0.009	0.025	0.029	0.050	0.044	0.004	0.060	0.007	0.050	0.004	0.002	0.002	0.002	0.022
Zinc	2.02	5.76	6.00	10.60	5.30	0.51	12.10	1.99	12.70	0.39	2.22	0.05	0.45	4.62
Sample Date	Jan.12/22	Feb.8/22	Mar.2/22	Apr.13/22	May.10/22	Jun.1/22	Jul.6/22	Aug.3/22	Sep.21/22	Oct.26/22	Nov.8/22	Nov.16/22	Dec.7/22	

2022 Lively Wastewater Treatment Plant Performance

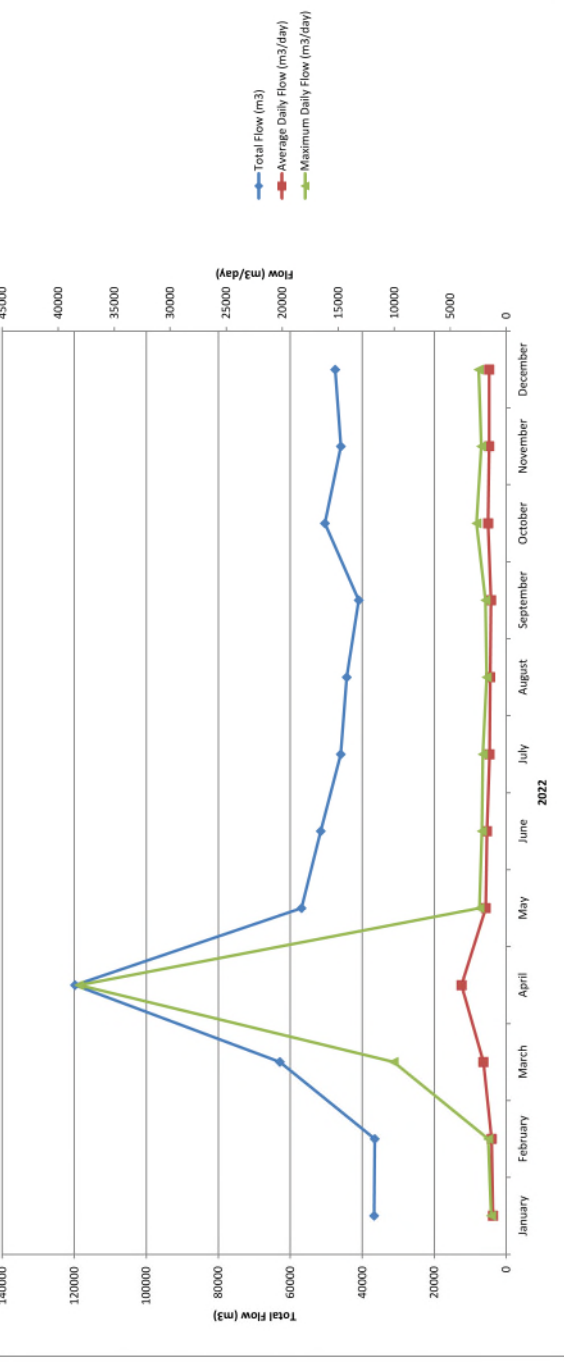
Month	Flows			BOD ₅	CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia			Un-ionized Ammonia	TKN			Nitrate			pH	Alkalinity		Sludge		Total Chlorine	E.Coli						
	Total m ³	Avg Day m ³	Max Day m ³		Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency		Raw µg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L		Raw mg/L	Effluent mg/L	Total m ³	Conc.			Total m ³	Residual				
January	36712	1184	1344	1284	100	83	37.0	43.82	55.4%	163	29.0	34.34	84.3%	5.5	0.97	1.15	84.5%	32.90	25.30	29.96	32.2%	44.91	39.0	31.60	0.27	0.05	7.0	6.9	196	78	120	0.0	65.9	1.1	13	
February	36522	1304	1602	547	180	140	6.3	8.22	95.5%	204	16.3	19.83	93.9%	8.9	0.85	1.11	92.2%	56.90	34.10	44.81	51.2%	151.64	60.2	36.20	0.59	0.05	7.4	6.7	213	73	200	0.0	51.9	0.9	2	
March	62875	2028	10054	6922	250	200	3.4	6.90	98.3%	168	8.2	16.63	99.0%	5.5	0.27	0.55	95.0%	37.70	35.90	72.81	80.8%	200.75	66.0	37.50	0.42	0.10	7.0	6.7	187	67	360	0.0	55.2	0.9	2	
April	119815	3994	38128	12895	42	21	2.3	9.19	89.0%	26	6.7	26.76	97.3%	97.3%	1.3	0.22	0.88	98.7%	13.40	13.40	53.52	89.5%	43.22	13.7	13.50	1.15	0.05	6.9	6.6	117	102	400	0.0	76.2	0.8	30
May	56867	1834	2387	7224	69	45	3.8	6.97	91.6%	45	21.2	38.89	63.8%	2.7	0.43	0.79	87.8%	18.40	16.60	30.45	30.7%	136.93	19.2	13.00	0.09	0.29	6.9	6.9	166	80	240	0.0	72.4	0.8	10	
June	51535	1718	2168	5219	130	110	18.0	30.92	83.6%	74	13.7	23.53	85.3%	3.0	0.67	1.45	82.3%	19.70	19.80	34.01	20.4%	113.29	19.9	18.10	0.92	0.05	7.2	6.8	154	86	200	0.0	69.0	1.0	3	
July	45958	1483	2095	6156	190	72	1.2	1.78	98.3%	111	4.9	7.26	96.8%	3.1	0.29	0.43	93.4%	21.20	1.28	1.90	95.7%	0.40	25.0	1.40	16.90	0.05	7.2	6.4	165	43	360	0.0	108.7	0.8	3	
August	44321	1430	1746	5120	140	140	0.7	1.00	99.5%	129	4.3	6.15	97.3%	3.2	0.18	0.26	95.4%	20.30	0.05	0.07	99.8%	0.04	26.1	0.20	19.10	0.05	7.0	6.3	162	35	320	0.0	121.2	0.8	3	
September	40958	1365	1861	2275	170	150	1.0	1.37	99.3%	149	4.5	6.14	97.8%	3.3	0.40	0.55	91.1%	31.80	0.30	0.41	99.3%	1.33	25.7	0.20	26.90	0.24	7.1	6.3	162	35	320	0.0	139.0	0.8	3	
October	50367	1625	2647	3101	110	120	1.0	1.62	99.2%	121	5.2	8.45	97.4%	3.5	0.23	0.37	96.0%	42.70	0.39	0.63	99.4%	2.28	42.9	0.20	24.60	0.40	7.5	6.5	181	49	320	0.0	145.7	0.6	11	
November	45940	1531	2231	2752	170	100	2.1	3.22	97.9%	182	5.9	9.03	97.8%	4.0	0.22	0.34	96.2%	23.70	0.05	0.08	99.9%	0.15	24.0	0.20	21.60	0.05	7.0	6.6	196	53	240	0.0	142.5	0.7	5	
December	47498	1532	2456	2210	77	83	2.9	4.44	96.5%	73	8.6	13.18	92.7%	3.9	0.60	0.92	90.4%	23.40	11.40	17.47	69.6%	107.84	24.0	9.00	7.45	0.48	7.7	7.3	175	113	160	0.0	59.4	1.0	3	
Total	639368								94.1%				95.9%				95.4%																			
Average		1752			136	105	6.64	9.95	92.0%	120	10.62	17.52	92.0%	3.99	0.44	0.71	92.2%	28.51	13.21	23.8	72.4%	66.90	32.14	13.43	10.08	0.16	7.16	6.69	172	68	267	0.0	85	1.0	7	

Plant Type: Extended Aeration
Design Capacity: 1600 m³/day
Population Served: 2,761

Compliance Parameters:

	Conc.	Loading
BOD ₅	25 mg/L	40 kg/day
TSS	25 mg/L	40 kg/day
Total Phosphorus	1.0 mg/L	1.6 kg/day
E.Coli	200 col/100 mL	

* Annual average of any consecutive 12 month period.





2022 Lively Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	0.1	37.3	23.4	3.94	26.8	22.8	6.9	4.3	1.97	6.4	1.27	8.0	11.9
Nitrate (as N)	0.5	0.31	0.34	0.09	0.25	1.0	0.83	0.24	0.16	0.19	6.51	1.63	1.0
Nitrite (as N)	0.5	0.33	0.05	0.05	3.05	12.4	0.05	0.05	0.05	0.05	0.34	0.72	1.5
Potassium	47	16	28	10	66	94	77	72	77	56	24	28	50
TKN	1420	43.2	417	86	1400	1820	489	800	6.1	340	144	111	590
Total Phosphorus	876	5.58	146	30	197	814	156	383	321	90.3	45.9	48.1	259
Total Solids	43600	710	10000	1600	32200	38700	31900	39000	1700	20000	3640	3490	18878
Arsenic	0.13	0.01	0.02	0.01	0.12	0.21	0.15	0.14	0.10	0.07	0.06	0.01	0.09
Cadmium	0.0496	0.0002	0.0092	0.0020	0.0591	0.0775	0.0751	0.0547	0.0335	0.0238	0.0079	0.0040	0.0331
Chromium	0.52	0.01	0.11	0.03	0.50	0.97	0.78	0.77	0.61	0.40	0.13	0.07	0.41
Cobalt	0.446	0.012	0.098	0.026	0.444	0.661	0.461	0.433	0.342	0.242	0.211	0.037	0.284
Copper	17.5	0.1	3.4	0.78	13.8	23.9	19.4	16.8	12.8	10.0	2.8	1.9	10.3
Lead	0.654	0.004	0.123	0.212	0.525	0.832	0.851	0.758	0.635	0.479	0.088	0.080	0.437
Mercury	0.012	0.001	0.003	0.001	0.017	0.013	0.010	0.014	0.009	0.011	0.001	0.002	0.008
Molybdenum	0.10	0.01	0.03	0.01	0.07	0.14	0.12	0.09	0.06	0.04	0.05	0.01	0.06
Nickel	5.30	0.05	0.67	0.38	5.70	8.00	5.70	4.80	2.90	2.40	1.70	0.48	3.173
Selenium	0.070	0.002	0.019	0.005	0.061	0.122	0.105	0.097	0.069	0.053	0.018	0.002	0.052
Zinc	20.20	0.12	3.22	0.73	12.10	21.50	22.20	15.20	9.70	8.50	1.88	1.52	9.74
Sample Date	Jan.5/22	Feb.2/22	Mar.4/22	Apr.5/22	May.3/22	Jun.1/22	Jul.5/22	Aug.3/22	Sep.13/22	Oct.4/22	Nov.9/22	Dec.6/22	#DIV/0!

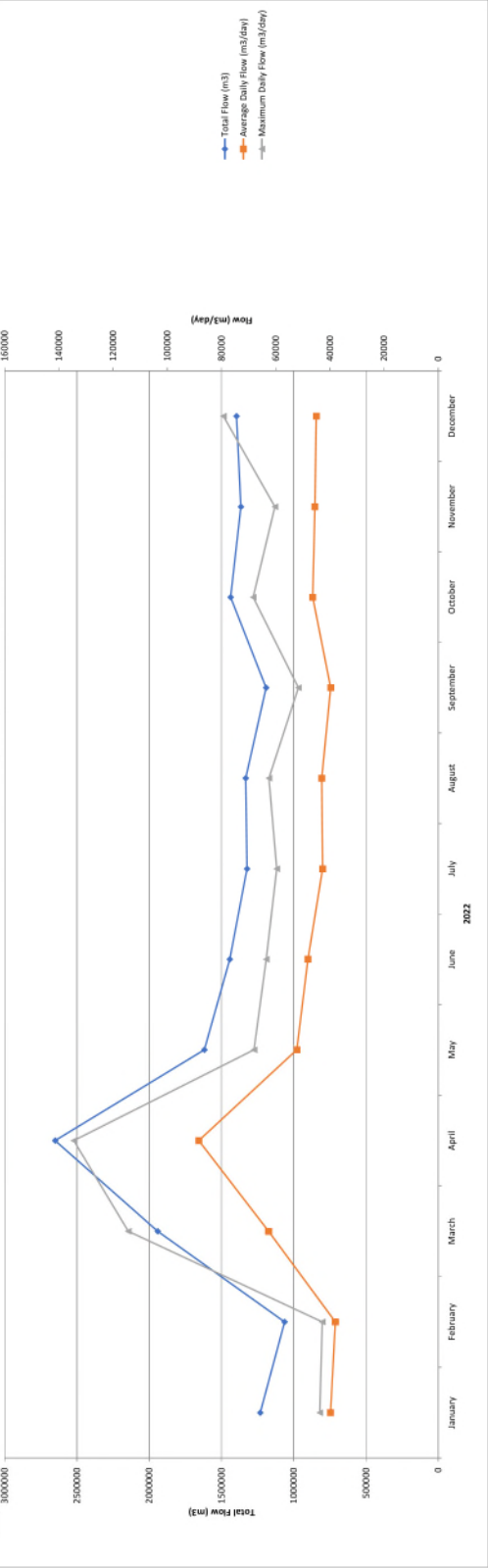
2022 Sudbury Wastewater Treatment Plant Performance

Month	Flows			BOD ₅			CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia			Un-ionized Ammonia			TKN			Nitrate Nitrite			pH			Alkalinity			Sludge			Chlorine			Dechlorination			E.Coli
	Total m ³	Avg Day m ³ /day	Max Day m ³ /day	Raw mg/L	Effluent mg/L	Loading kg/d	Raw kg/d	Effluent kg/d	Loading kg/d	Raw kg/d	Effluent kg/d	Loading kg/d	Raw kg/d	Effluent kg/d	Loading kg/d	Raw mg/L	Effluent mg/L	Loading kg/d	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency						
January	1231548	39727	43700	263	253	11.3	446.9	10051	9602	95.5%	211	10.4	413.2	8382	7969	95.1%	81.6%	28.1	21.85	868.0	22.2%	111.0	36.3	16.3	0.31	0.29	7.1	6.8	204	163.47	0	2065	0.5	0.002	0.08	12							
February	1061001	37968	42800	170	160	13.8	524.0	6075	5551	91.4%	284	14.8	561.9	10783	10221	94.8%	77.8%	22.7	23.43	889.6	-3.2%	165.9	31.5	25.1	0.25	0.05	7.1	6.9	190	159.77	0	1610	0.5	0.004	0.15	6							
March	1942100	62648	114400	195	165	11.7	733.0	10337	9604	92.9%	277	14.6	914.7	17354	16439	94.7%	82.9%	26.0	12.88	806.9	50.5%	60.8	45.1	13.3	0.67	0.05	7.0	6.7	183	142.80	0	2739	0.6	0.003	0.19	6							
April	2651100	88370	134500	92	81	9.3	821.8	7158	6336	88.5%	125	15.6	1378.6	11046	9668	87.5%	74.7%	4.1	5.14	454.2	-25.4%	28.2	14.9	9.9	0.38	0.05	7.0	6.6	167	148.81	0	3904	0.7	0.003	0.27	5							
May	1618800	52219	68000	120	110	4.5	235.0	5744	5509	95.9%	285	11.5	600.5	14883	14282	96.0%	86.1%	14.2	14.85	775.5	-4.6%	85.3	15.9	12.0	0.30	0.19	7.1	6.6	202	156.50	0	3141	0.7	0.002	0.10	3							
June	1423300	48077	63500	97	77	5.3	254.8	3702	3447	93.1%	196	18.2	875.0	9423	8548	90.7%	83.7%	4.5	12.98	624.0	-188.4%	84.4	14.8	11.6	0.34	0.12	7.0	6.7	199	167.56	0	2772	0.8	0.005	0.24	6							
July	1323300	42687	59600	165	133	3.8	162.2	5677	5515	97.1%	284	9.5	405.5	12123	11718	96.7%	89.7%	18.5	16.25	693.7	12.2%	125.4	26.0	13.8	0.35	0.19	7.0	6.7	216	157.33	0	1993	0.6	0.003	0.13	6							
August	1332800	42994	62500	205	155	5.3	227.9	6664	6436	96.6%	221	7.3	313.9	9502	9188	96.7%	90.8%	19.2	16.22	697.4	15.5%	125.9	21.9	14.8	0.33	0.10	7.0	6.8	178	142.46	0	1775	0.6	0.003	0.13	7							
September	1180900	39697	51600	180	150	3.2	127.0	5955	5827	97.9%	231	7.2	285.8	9170	8884	96.9%	92.8%	20.9	19.65	780.0	6.0%	176.1	21.2	15.5	0.41	0.26	6.9	6.8	201	139.60	0	1726	0.6	0.003	0.12	29							
October	1438300	46348	68300	105	75	3.8	176.1	3476	3300	94.9%	180	7.5	347.6	8343	7995	95.8%	85.9%	18.9	15.07	698.5	20.3%	141.6	19.8	11.8	0.34	0.25	7.0	6.7	185	144.42	0	2167	0.7	0.006	0.28	29							
November	1385500	45517	69300	175	165	5.0	227.2	7583	7283	97.0%	237	10.0	455.2	10787	10332	95.8%	83.5%	21.3	15.90	723.7	25.4%	113.2	26.5	13.4	0.34	0.25	6.9	6.6	201	163.82	0	2089	0.6	0.003	0.14	41							
December	1359300	45029	79300	155	125	5.2	234.2	5629	5384	95.8%	275	11.2	384.3	12383	11879	95.9%	84.2%	17.7	17.75	799.3	-0.3%	123.6	22.5	13.5	1.25	2.07	6.9	6.7	211	163.36	0	2134	0.6	0.002	0.09	9							
Total	1795148																																										
Average	49299																																										
May-Oct																																											
Nov-Apr																																											

Plant Type: High Rate
Design Capacity: 29535 m³/day
Population Served: 84609

Compliance Parameters:

Conc.	Loading
CBOD	25 mg/L
TSS	25 mg/L
Total P	1.0 mg/L
Total P	0.5 mg/L
E.Coli	200 col/100 mL
pH	6.0 to 9.5 inclusive, at all times
Dechlorination total chlorine residual 0.02 mg/L, 1.6 kg/L, Monthly Average	





2022 Sudbury Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May.2/22	May.30	June	July	August	September	October	November	December	Average
Ammonia (as N)	377	192	237	339	254	350	n/a	422	230	314	276	322	385	308
Nitrate (as N)	0.15	0.50	0.10	0.35	0.05	0.25	n/a	2.40	0.50	0.10	0.05	0.25	2.82	0.63
Nitrite (as N)	0.05	0.50	0.10	0.05	2.54	8.36	n/a	25.90	12.90	33.10	0.05	36.90	35.90	13.03
Potassium	190	180	147	158	124	149	n/a	150	130	141	110	132	159	148
TKN	2590	2740	2680	2750	2190	2730	n/a	2650	2800	2660	2720	2670	1360	2545
Total Phosphorus	781	833	77.2	563	427	736	n/a	400	614	622	510	577	225	530
Total Solids	30300	34900	33300	38200	33300	38200	n/a	32700	34900	34100	31000	30900	31400	33600
Arsenic	0.20	0.15	0.11	0.28	0.17	0.27	n/a	0.16	0.28	0.20	0.26	0.43	0.19	0.23
Cadmium	0.0359	0.0286	0.0203	0.0515	0.0387	0.0575	n/a	0.0392	0.0409	0.0351	0.0314	0.0723	0.0300	0.0401
Chromium	0.47	0.42	0.39	0.68	0.50	0.75	n/a	0.51	0.58	0.46	0.43	0.83	0.48	0.54
Cobalt	0.282	0.255	0.165	0.363	0.283	0.377	n/a	0.297	0.497	0.356	0.387	0.624	0.327	0.351
Copper	15.2	13.8	11.6	17.5	14.9	20.1	n/a	15.6	19.9	16.0	16.6	18.3	16.7	16.4
Lead	0.522	0.487	0.417	0.750	0.499	0.716	n/a	0.623	0.786	0.690	0.629	1.250	0.571	0.662
Mercury	0.006	0.007	0.002	0.004	0.004	0.005	n/a	0.003	0.009	0.006	0.009	0.015	0.006	0.006
Molybdenum	0.13	0.13	0.10	0.14	0.10	0.19	n/a	0.14	0.15	0.16	0.13	0.27	0.13	0.15
Nickel	4.9	3.5	2.7	7.1	6.2	6.4	n/a	4.7	11.1	5.8	7.0	6.0	6.4	6.0
Selenium	0.103	0.073	0.054	0.096	0.071	0.141	n/a	0.102	0.096	0.091	0.086	0.212	0.095	0.102
Zinc	12.50	11.20	8.90	13.50	9.10	19.10	n/a	17.70	16.10	16.70	14.60	14.30	15.30	14.08
Sample Date	Jan.4/22	Feb.2/22	Mar.1/22	Apr.4/22	May.2/22	May.30/22		Jul.4/22	Aug.2/22	Sep.6/22	Oct.3/22	Nov.1/22	Dec.5/22	

2022 Sudbury Wastewater Treatment Plant - Raw & Effluent Metals Analysis

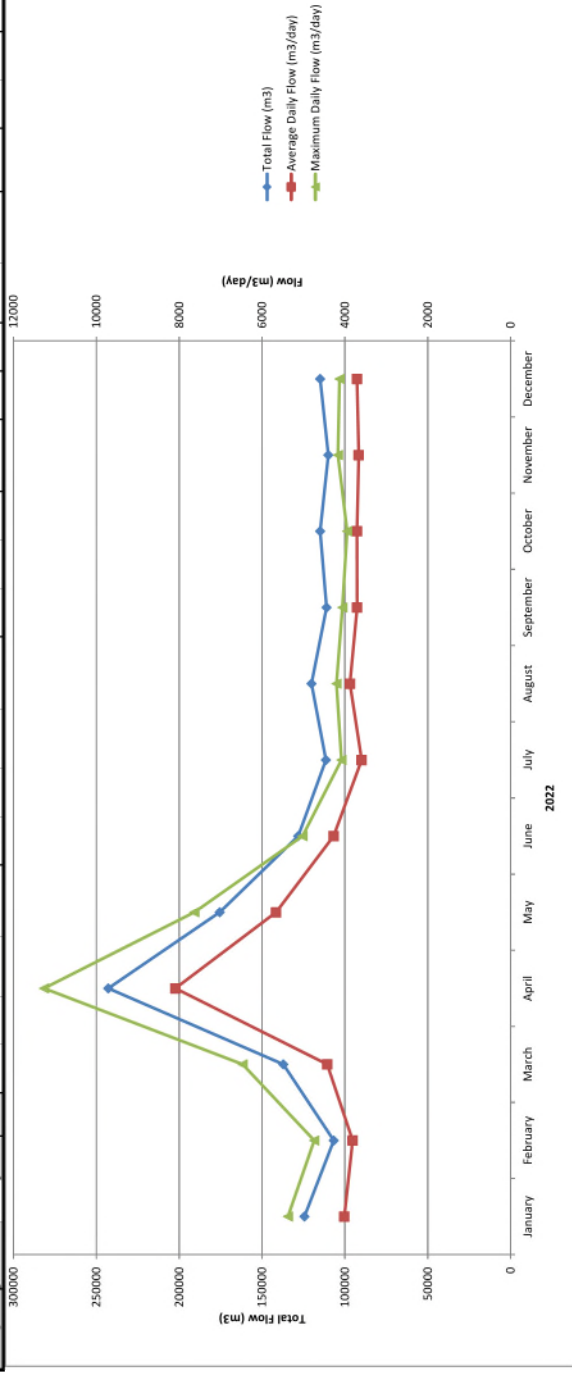
Parameter (mg/L)	Location	January	February	March	April	May.2/22	May.30/22	Jun	July	August	September	October	November	December	Average
Arsenic	Raw	0.0010	0.0010	0.0010	0.0030	0.0020	0.0020	n/a	0.0020	0.0010	0.0010	0.0010	0.0020	0.0010	0.0015
	Effluent	0.0010	0.0010	0.0010	0.0030	0.0020	0.0020	n/a	0.0020	0.0010	0.0030	0.0010	0.0020	0.0010	0.0017
Cadmium	Raw	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	n/a	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001
	Effluent	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	n/a	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Chromium	Raw	0.0020	0.0020	0.0020	0.0020	0.0010	0.0020	n/a	0.0030	0.0040	0.0020	0.0030	0.0010	0.0030	0.0023
	Effluent	0.0020	0.0010	0.0010	0.0010	0.0010	0.0010	n/a	0.0010	0.0010	0.0010	0.0010	0.0010	0.0020	0.0012
Cobalt	Raw	0.0039	0.0087	0.0033	0.0043	0.0040	0.0034	n/a	0.0027	0.0030	0.0021	0.0023	0.0024	0.0029	0.0036
	Effluent	0.0040	0.0044	0.0037	0.0048	0.0044	0.0034	n/a	0.0025	0.0027	0.0027	0.0020	0.0023	0.0031	0.0033
Copper	Raw	0.0020	0.0060	0.0040	0.0260	0.0080	0.0050	n/a	0.0020	0.0300	0.0510	0.0180	0.0210	0.0140	0.0156
	Effluent	0.0110	0.0110	0.0110	0.0130	0.0140	0.0100	n/a	0.0090	0.0060	0.0080	0.0090	0.0110	0.0070	0.0100
Lead	Raw	0.0001	0.0018	0.0005	0.0012	0.0009	0.0016	n/a	0.0017	0.0031	0.0029	0.0040	0.0007	0.0018	0.0017
	Effluent	0.0002	0.0003	0.0001	0.0002	0.0002	0.0004	n/a	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Mercury	Raw	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	n/a	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Effluent	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	n/a	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	Raw	0.0010	0.0270	0.0010	0.0010	0.0010	0.0020	n/a	0.0010	0.0020	0.0010	0.0010	0.0010	0.0020	0.0034
	Effluent	0.0020	0.0130	0.0010	0.0010	0.0010	0.0050	n/a	0.0010	0.0020	0.0010	0.0010	0.0010	0.0010	0.0025
Nickel	Raw	0.0800	0.1800	0.0590	0.1090	0.1160	0.0870	n/a	0.0660	0.0760	0.0450	0.0600	0.0590	0.0770	0.0845
	Effluent	0.0710	0.0780	0.0530	0.1070	0.1050	0.0690	n/a	0.0520	0.0550	0.0430	0.0450	0.0510	0.0630	0.0660
Selenium	Raw	0.0011	0.0013	0.0011	0.0010	0.0011	0.0011	n/a	0.0016	0.0008	0.0008	0.0014	0.0007	0.0007	0.0011
	Effluent	0.0006	0.0005	0.0006	0.0011	0.0010	0.0007	n/a	0.0008	0.0006	0.0005	0.0006	0.0006	0.0002	0.0007
Zinc	Raw	0.0100	0.0950	0.0760	0.0530	0.0640	0.0670	n/a	0.1250	0.0980	0.0980	0.0950	0.0280	0.0740	0.0736
	Effluent	0.0250	0.0330	0.0330	0.0320	0.0280	0.0200	n/a	0.0160	0.0210	0.0170	0.0180	0.0170	0.0220	0.0235

Month	Flows		BOD ₅		CBOD		Total Suspended Solids			Total Phosphorus			Total Ammonia			TKN		pH		Alkalinity		Sludge		Chlorine Residual	E.Coli									
	Month	Max Day	Raw	Effluent	Loading	Plant	Efficiency	Raw	Effluent	Loading	Plant	Efficiency	Raw	Effluent	Loading	Plant	Efficiency	Raw	Effluent	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L							
January	124390	4013	5374	210	170	7.0	28.09	95.9%	199	8.4	33.71	95.8%	4.0	0.69	2.77	82.8%	33.80	33.03	132.5	2.3%	275.3	37.2	33.6	1.59	0.57	7.3	7.1	228	193	1080	0.0	199.1	0.6	10
February	106714	3811	4742	230	6.0	24.39	97.0%	246	7.1	27.06	97.1%	4.2	0.63	2.49	87.4%	35.70	35.10	133.8	1.1%	434.6	40.1	36.0	1.65	1.77	7.3	7.1	223	183	1240	0.0	176.4	0.9	3	
March	137179	4425	6470	200	69	14.0	61.95	79.7%	220	17.4	77.06	92.1%	5.0	0.63	2.70	85.0%	36.50	35.30	112.0	31.1%	350.8	41.2	31.9	0.81	1.12	7.2	7.0	220	196	1160	0.0	215.1	0.8	15
April	242801	8093	112634	82	78	16.3	131.92	79.1%	126	29.2	236.33	76.8%	3.7	0.83	6.72	69.3%	21.10	29.10	83.3	51.2%	72.2	21.7	14.6	1.49	0.60	7.1	7.1	202	164	1080	0.0	334.9	0.6	9
May	175005	5661	7631	120	110	7.6	43.93	93.1%	159	12.8	72.47	91.8%	3.2	0.58	3.28	81.9%	18.70	20.38	115.4	-9.0%	230.0	19.2	20.9	1.39	0.55	7.1	6.9	217	177	1360	0.0	333.7	1.0	5
June	128188	4273	5021	130	28	5.3	22.65	81.1%	160	10.0	47.73	93.8%	3.6	0.69	2.95	80.8%	25.40	24.90	106.4	2.0%	355.7	25.6	21.0	2.30	1.82	7.2	7.0	219	172	1360	0.0	256.9	0.9	4
July	111441	3595	4081	150	150	3.2	11.60	79.3%	4.3	0.56	20.71	97.3%	4.3	0.56	20.71	87.0%	27.00	28.95	104.07	-7.2%	308.0	39.1	27.8	2.42	1.98	7.2	7.1	219	172	1320	0.0	209.1	0.8	20
August	120172	3877	4202	200	160	3.9	15.12	97.6%	236	4.2	16.28	98.2%	4.6	0.49	1.90	89.3%	31.90	19.0	42.25	65.8%	105.2	34.2	9.7	17.04	0.91	7.2	6.5	219	44	1280	0.0	285.7	0.6	63
September	111106	3704	4061	200	170	3.9	14.44	97.8%	246	6.1	22.59	97.5%	6.3	0.71	2.63	88.7%	31.70	10.60	39.26	66.6%	85.3	41.1	7.9	18.65	0.91	7.2	6.5	235	67	1200	0.0	307.5	1.0	19
October	114895	3706	3946	260	130	5.5	20.38	95.8%	242	5.8	22.10	97.6%	5.1	0.68	2.52	86.7%	37.60	18.80	69.68	50.0%	51.6	32.3	13.6	12.23	1.06	7.2	6.7	247	109	1280	0.0	234.4	1.0	19
November	109982	3666	4167	280	220	4.3	15.76	98.6%	243	7.5	25.66	97.1%	5.3	0.58	2.12	89.1%	38.90	16.70	61.72	53.6%	183.3	198.0	12.4	18.34	1.25	7.2	6.6	261	80	1280	0.0	204.0	0.9	7
December	114945	3708	4131	190	180	3.3	12.24	98.2%	238	5.5	20.39	97.1%	5.2	0.50	1.85	90.4%	38.90	24.20	89.73	37.8%	185.0	34.0	20.5	13.70	4.87	7.3	6.8	258	134	1200	0.0	210.8	1.0	3
Total	1597318							94.2%				94.2%				84.8%				30.7%												0.0		
Average								92.6%				94.4%				84.9%				90.8												246.47	0.8	15

Plant Type: Extended Aeration
Design Capacity: 11,400 m³/day
Population Served: 17,365

Compliance Parameters:

	Cont.	loading	Annual Average
CBOD	25 mg/L	284 kg/day	Annual Average
TSS	25 mg/L	284 kg/day	Annual Average
Total Phosphorus	1.0 mg/L	11.4 kg/day	Monthly Average
pH	6.0 to 9.5 inclusive, at all times		Monthly Geometric
E.Coli	200 col/100 mL		





2022 Valley East Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	220	216	216	340	46.8	271	192	156	184	115	205	84.3	187
Nitrate (as N)	0.50	0.50	0.25	1.10	0.10	19.30	1.10	0.5	0.1	1.2	0.5	1.9	2.3
Nitrite (as N)	33.9	0.5	15.3	8.6	7.4	1.3	10.4	0.5	22.4	12.0	0.5	25.2	11.5
Potassium	99	95	102	80	67	86	84	76	89	69	74	88	84
TKN	1350	1710	1680	1290	798	1290	803	1200	1390	1220	1360	1400	1291
Total Phosphorus	735	829	65	400	248	567	846	442	406	432	463	281	476
Total Solids	34000	30500	31900	25800	32600	42200	31600	34300	28900	32700	28500	25900	31575
Arsenic	0.07	0.07	0.06	0.08	0.08	0.12	0.11	0.08	0.09	0.08	0.06	0.06	0.08
Cadmium	0.0211	0.0178	0.0174	0.0147	0.0180	0.0262	0.0301	0.0161	0.0160	0.0169	0.0140	0.0094	0.0181
Chromium	0.34	0.28	0.33	0.35	0.43	0.45	0.36	0.31	0.38	0.21	0.19	0.16	0.32
Cobalt	0.096	0.216	0.134	0.126	0.130	0.114	0.230	1.090	0.189	0.131	0.090	0.146	0.2
Copper	10.6	9.8	10.3	7.1	7.3	11.8	12.3	8.9	8.6	8.1	7.2	7.8	9.2
Lead	0.285	0.232	0.219	0.232	0.275	0.294	0.272	0.235	0.237	0.212	0.301	0.152	0.246
Mercury	0.002	0.004	0.001	0.001	0.008	0.011	0.007	0.001	0.001	0.001	0.002	0.001	0.003
Molybdenum	0.07	0.09	0.06	0.05	0.05	0.07	0.08	0.05	0.08	0.06	0.07	0.04	0.06
Nickel	0.53	0.43	0.53	0.56	0.75	0.71	0.65	0.56	0.49	0.42	0.37	0.34	0.53
Selenium	0.041	0.037	0.040	0.041	0.032	0.055	0.063	0.047	0.065	0.028	0.025	0.008	0.040
Zinc	12.50	9.40	10.00	8.70	7.24	13.00	15.60	11.90	9.70	10.00	8.1	9.3	10.5
Sample Date	Jan.5/22	Feb.2/22	Mar.2/22	Apr.6/22	May.4/22	June.1/22	Jul.6/22	Aug.3/22	Sep.6/22	Oct.5/22	Nov.2/22	Dec.7/22	

2022 Walden Wastewater Treatment Plant Performance

Month	Flows			BOD ₅	CBOD				Total Suspended Solids				Total Phosphorus				Total Ammonia				Un-ionized				TKN		Nitrate		pH	Alkalinity	Sludge		Chlorine	E.Coli			
	Total	Avg Day	Max Day		Raw	Effluent	Loading	Removed	Plant	Raw	Effluent	Loading	Efficiency	Plant	Raw	Effluent	Loading	Efficiency	Plant	Raw	Effluent	Loading	Efficiency	Raw	Effluent	mg/L	mg/L	Total			Total	Residual			Gomman		
January	55351	1786	2128	120	99	2.0	3.57	177	173	98.0%	72	8.1	14.46	88.8%	3.6	0.51	0.91	85.8%	28.40	0.16	0.29	99.4%	0.08	34.10	0.20	30.65	0.05	6.8	6.7	203	49	320	0.0	170.9	0.8	2	
February	48365	1727	1989	230	180	2.2	3.80	311	307	98.8%	151	7.7	13.30	94.9%	4.1	0.53	0.92	87.1%	33.60	0.24	0.41	99.3%	0.38	41.60	0.35	30.65	0.05	7.4	6.4	198	40	320	0.0	176.0	0.8	2	
March	90952	2934	6831	170	140	3.5	10.27	411	400	97.5%	141	9.8	28.75	93.0%	3.5	0.46	1.35	86.9%	32.60	0.28	0.82	99.1%	0.95	34.70	0.50	25.93	0.05	6.9	6.5	181	59	400	0.0	183.5	0.7	3	
April	124704	4157	8980	140	86	3.2	13.30	357	344	96.3%	95	6.1	25.36	93.6%	1.7	0.32	1.33	81.2%	11.50	2.52	10.48	78.1%	10.20	15.00	6.10	7.11	0.05	7.0	6.7	145	113	320	0.0	203.7	0.8	4	
May	78783	2541	3820	100	38	1.9	4.83	97	92	95.0%	506	9.1	23.13	98.2%	4.6	0.49	1.25	89.3%	20.20	7.10	18.04	64.9%	37.31	20.70	7.50	8.06	0.55	7.0	6.6	184	82	360	0.0	146.3	0.8	2	
June	64226	2141	2745	140	140	2.9	6.21	300	294	97.9%	305	5.7	12.70	98.1%	4.2	0.45	0.96	89.3%	24.00	0.60	1.28	97.5%	2.10	24.20	0.88	21.08	0.05	7.3	6.9	192	65	400	0.0	153.5	0.8	2	
July	58754	1895	2680	330	190	1.8	3.41	360	357	99.1%	284	4.9	9.29	98.3%	4.5	0.29	0.55	93.6%	27.20	0.05	0.09	99.8%	0.06	41.00	0.20	26.80	0.05	7.2	6.8	197	44	440	0.0	160.8	0.7	2	
August	57741	1863	3131	74	71	2.3	4.28	132	128	96.8%	73	6.0	11.18	91.8%	2.8	0.28	0.52	90.0%	23.50	0.02	0.04	99.9%	0.12	29.70	0.20	25.27	0.05	6.9	6.7	197	56	520	0.0	169.5	0.8	2	
September	50957	1699	2178	230	180	2.0	3.40	306	302	98.9%	199	7.8	13.25	96.1%	3.6	0.30	0.51	91.7%	34.10	0.09	0.15	99.7%	0.64	28.90	0.20	29.10	0.05	7.0	6.8	196	59	480	0.0	142.6	0.8	6	
October	64866	2092	3248	220	170	2.6	5.44	356	350	98.5%	83	6.7	14.02	91.9%	3.1	0.26	0.54	91.6%	28.80	1.97	4.12	93.2%	14.53	30.30	2.45	10.56	0.14	7.3	6.7	201	83	520	0.0	152.3	0.7	5	
November	61612	2054	3038	60	56	1.6	3.29	115	112	97.1%	179	7.3	14.99	95.9%	5.6	0.25	0.51	95.5%	24.00	1.00	2.05	95.8%	2.38	17.00	0.60	20.15	0.57	7.0	6.7	221	60	520	0.0	149.3	0.7	2	
December	63870	2060	3828	110	96	2.0	4.12	198	194	97.9%	123	9.4	19.37	92.4%	4.2	0.40	0.82	90.5%	25.90	0.55	1.13	97.9%	0.95	26.00	2.33	22.43	0.65	7.9	6.8	205	48	400	0.0	223.4	0.5	2	
Total	820181																																				
Average	2247			160		2.33	5.49	260	254	97.6%	184	7.38	16.61	94.4%	3.79	0.38	0.85	89.4%	26.15	1.22	3.2	93.7%	5.81	28.60	1.79	21.48	0.19	7.14	6.70	193	63					0.7	3

Plant Type: Extended Aeration

Design Capacity: 4500 m³/day

Population Served: 3,313

Compliance Parameters:

Conc.

CBOD

TSS

Total Phosphorus

E.Coli

Loading

112.5 kg/day

112.5 kg/day

4.5 kg/day

200 col/100 mL

Annual Average

25 mg/L

25 mg/L

1.0 mg/L

200 col/100 mL

Monthly Average

112.5 kg/day

112.5 kg/day

4.5 kg/day

200 col/100 mL

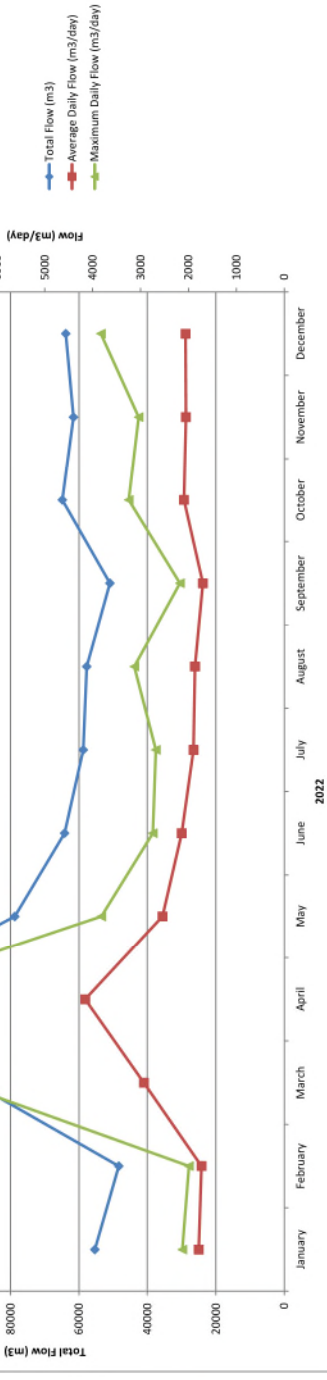
Monthly Geometric Mean

112.5 kg/day

112.5 kg/day

4.5 kg/day

200 col/100 mL



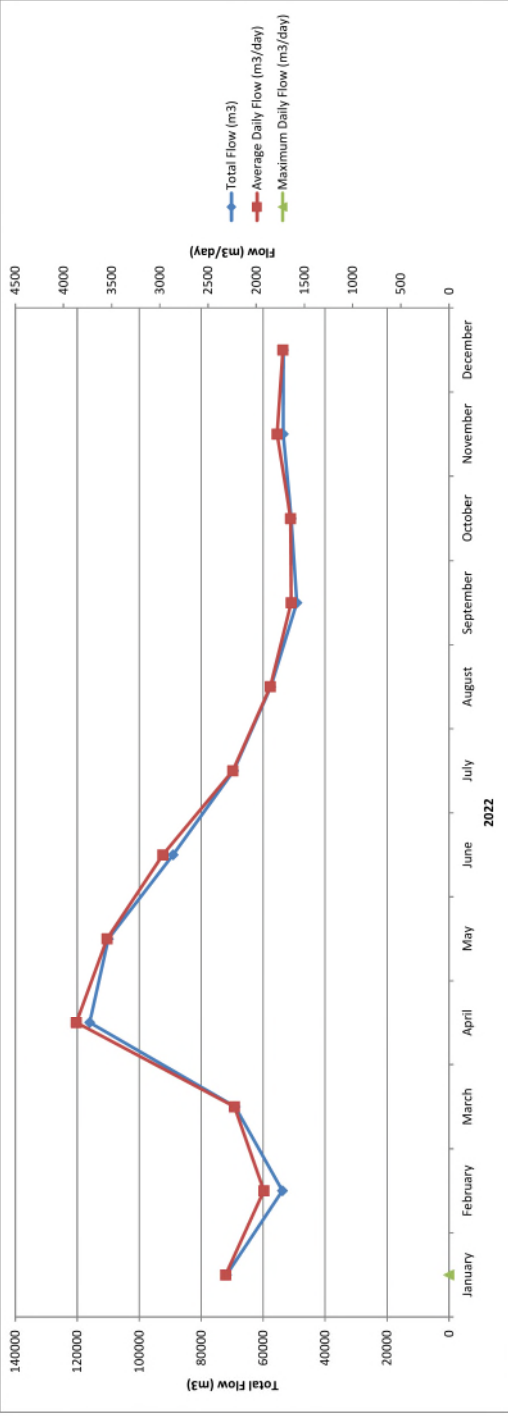


2022 Walden Wastewater Treatment Plant Waste Sludge Analysis

Parameter (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December	Average
Ammonia (as N)	1.9	1.2	2.4	15.3	14.0	3.5	7.2	8.8	0.79	117	8.2	4.5	15.4
Nitrate (as N)	11.6	14.10	2.87	0.16	0.08	5.79	0.56	0.19	13.30	0.64	0.20	1.49	4.25
Nitrite (as N)	0.10	1.00	0.05	0.05	0.05	0.05	0.05	0.05	0.60	0.05	0.05	0.49	0.22
Potassium	32	27	30	118	15	14	70	43	28	43	87	23	44
TKN	265	148	307	156	67	65	389	304	150	891	1400	156	358
Total Phosphorus	89.0	64.5	10.2	397.0	20.4	28.9	143.0	140.0	91.0	515.0	335.0	50.7	157.1
Total Solids	4010	3560	4160	25900	31000	1600	23100	9940	1600	41600	21000	5670	14428
Arsenic	0.03	0.01	0.02	0.16	0.01	0.01	0.10	0.06	0.02	0.22	0.10	0.03	0.06
Cadmium	0.0079	0.0039	0.0046	0.0392	0.0028	0.0024	0.0375	0.0158	0.0063	0.0634	0.0324	0.0054	0.0185
Chromium	0.08	0.04	0.05	0.51	0.04	0.03	0.43	0.24	0.08	0.72	0.53	0.13	0.24
Cobalt	0.242	0.135	0.196	1.200	0.063	0.044	0.771	0.502	0.156	1.240	0.287	0.150	0.416
Copper	2.20	1.08	1.5	11.0	0.88	0.72	10.3	5.6	1.6	17.000	11.8	2.0	5.5
Lead	0.078	0.037	0.052	0.474	0.028	0.027	0.372	0.192	0.054	0.576	0.632	0.132	0.221
Mercury	0.001	0.001	0.001	0.004	0.001	0.001	0.001	0.001	0.001	0.013	0.016	0.001	0.004
Molybdenum	0.04	0.03	0.04	0.16	0.01	0.01	0.20	0.08	0.03	0.24	0.06	0.03	0.08
Nickel	0.92	0.45	0.65	6.00	0.52	0.39	4.20	2.40	0.75	8.10	3.10	2.80	2.523
Selenium	0.021	0.002	0.021	0.100	0.006	0.005	0.084	0.041	0.016	0.156	0.055	0.048	0.046
Zinc	1.85	1.02	1.16	8.90	0.65	0.69	9.80	4.41	1.46	16.60	11.00	1.25	4.90
Sample Date	Jan.5/22	Feb.2/22	Mar.1/22	Apr.5/22	May.3/22	Jun.1/22	Jul.5/22	Aug.3/22	Sep.13/22	Oct.4/22	Nov.8/22	Dec.6/22	

2022 Capreol Wastewater Treatment Lagoon Performance

Month	Flows			BOD ₅			Total Suspended Solids			Total Phosphorus			Total Ammonia			Un-ionized Ammonia		TKN	
	Total m ³	Avg Day m ³ /day	Raw mg/L	Effluent mg/L	Loading kg/d	Raw Loading kg/day	Removed kg/day	Plant Efficiency	Raw mg/L	Effluent mg/L	Loading kg/d	Raw Loading kg/day	Removed kg/day	Plant Efficiency	Raw mg/L	Effluent mg/L	Plant Efficiency	Raw mg/L	Effluent mg/L
January	71830	2317	88	41.0	95.00	204	109	53.4%	114	32.0	74.15	264	190	71.9%	2.9	2.25	521	6.72	1.51
February	53777	1921	81	39.5	75.86	156	80	51.2%	416	26.0	49.94	799	749	93.8%	2.0	2.28	4.38	3.84	-0.54
March	69030	2227	93	48.0	106.89	207	100	48.4%	380	29.0	64.58	846	782	92.4%	4.2	2.76	6.15	9.33	3.18
April	116010	3867	36	22.0	85.07	139	54	38.9%	48	18.7	72.31	186	113	61.0%	0.4	0.33	1.28	1.55	0.27
May	109997	3548	49	19.0	67.42	174	106	61.2%	112	23.0	81.61	397	316	79.5%	1.3	1.04	3.69	4.65	0.96
June	89073	2969	140	18.0	53.44	416	362	87.1%	68	40.0	118.76	202	83	41.2%	1.8	1.32	3.92	5.34	1.43
July	69543	2243	95	15.1	33.87	213	179	84.1%	78	56.0	125.63	175	49	28.2%	2.0	1.70	3.81	4.49	0.67
August	57483	1854	87	26.0	48.21	161	113	70.1%	46	27.7	51.36	85	34	39.8%	0.9	1.70	3.16	1.69	-1.47
September	49122	1637	73	15.9	26.03	120	93	78.2%	102	30.0	49.12	167	118	70.6%	2.1	2.02	3.31	3.44	0.13
October	50938	1643	72	30.0	49.29	118	69	58.3%	188	32.0	52.58	309	256	83.0%	2.8	1.48	2.43	4.60	2.17
November	53490	1783	100	11.0	19.61	178	159	89.0%	70	18.0	37.09	125	93	74.3%	2.9	1.88	3.35	5.17	1.82
December	53423	1723	94	22.0	37.91	162	124	76.6%	54	18.0	31.02	93	62	66.7%	2.2	2.08	3.58	3.79	0.21
Total	843716.4																		
Average		2312	84	25.63	58.22	187	129	66.4%	140	29.20	66.93	304	237	66.9%	2.13	1.74	3.69	4.55	0.86



Lagoon Type: Effiltration
Design Capacity: 5000 m³/day
Population Served: 3,408

Compliance Parameters:

BOD₅ Concentration
30 mg/L Annual Avg
TSS 40 mg/L Annual Avg
Total Phosphorus 1.38 mg/L Annual Avg

Note: Effluent = North to South Cell Effluent
Annual Average of T.P. measured at the overflow culvert located between the north and south cell.

2022 Capreol Lagoon Groundwater Monitoring Wells

Parameter (mg/L)	OW #2		OW #3		OW #5		OW #8		OW #12a		OW #15		OW #16		Average
	May/July	Oct.18/22	May/July	Oct.18/22	May/July	Oct.18/22	May/July	Oct.18/22	May/July	Oct.18/22	May/July	Oct.18/22	May/July	Oct.18/22	
E.Coli (CFU/100 mL)															
Total Coliform	6	88	2	30	0	80	0	NDOGT	2	100	0	7	0	79	28
Alkalinity	119	128	181	156	20	25	148	94	123	139	14	24	13	20	86
Ammonia (as N)	3.41	6.50	16.7	16.30	0.01	0.04	0.62	2.04	1.24	1.27	0.01	0.01	0.01	0.01	3.44
Nitrate (as N)	0.05	0.05	0.05	0.05	0.05	0.05	3.19	0.20	0.05	0.05	0.05	0.05	0.09	0.05	0.29
Nitrite (as N)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
BOD ₅	8.1	1.5	6.8	2	0.5	0.6	1.3	2.7	3.0	1.3	0.5	1.1	0.5	0.8	2.2
D.O.C.	4.7	6.4	5.9	4.5	1.3	1.0	4.4	5.8	4.9	5.6	2.5	2.7	1.5	1.3	3.8
Hardness (as CaCO ₃)	87.5	96.6	85.7	88.8	9.0	18.1	124.0	94.8	91.6	121.0	27.3	27.5	9.2	13.3	63.9
Aluminum	0.012	0.010	0.015	0.0	0.023	0.074	0.011	0.010	2.760	0.512	0.055	0.023	0.017	0.052	0.256
Antimony	0.0050	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0008
Arsenic	0.003	0.005	0.005	0.009	0.001	0.001	0.002	0.007	0.013	0.011	0.001	0.001	0.001	0.001	0.004
Barium	0.064	0.076	0.100	0.106	0.008	0.012	0.022	0.028	0.210	0.100	0.018	0.019	0.005	0.0080	0.0554
Beryllium	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Cadmium	0.0002	0.0001	0.0006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Calcium	24.80	28.00	23.80	25.50	2.41	5.36	35.10	27.20	27.00	36.30	7.28	7.56	2.49	3.95	18.34
Chromium	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.007	0.002	0.001	0.001	0.001	0.0010	0.0015
Cobalt	0.0013	0.0012	0.0112	0.0069	0.0002	0.0017	0.0028	0.0158	0.0106	0.0055	0.0002	0.0001	0.0001	0.0003	0.0041
Copper	0.002	0.002	0.002	0.002	0.002	0.003	0.010	0.013	0.088	0.014	0.004	0.005	0.001	0.001	0.011
Iron	3.8	7.20	9.8	17.40	0.03	0.20	0.39	1.43	11.00	4.40	0.29	0.08	0.02	0.09	4.01
Lead	0.0028	0.0003	0.0072	0.0012	0.0003	0.0005	0.0004	0.0001	0.0124	0.0018	0.0004	0.0001	0.0002	0.0001	0.0020
Magnesium	6.210	6.480	6.390	6.100	0.717	1.150	8.730	6.530	5.860	7.380	2.220	2.100	0.722	0.841	4.388
Manganese	0.41	0.320	0.80	0.670	0.004	0.026	0.117	0.750	3.97	6.27	0.010	0.005	0.001	0.005	0.954
Mercury	0.0010	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Molybdenum	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.0010	0.0011
Nickel	0.003	0.002	0.006	0.004	0.004	0.004	0.004	0.010	0.010	0.005	0.002	0.002	0.001	0.0010	0.0041
Potassium	4.8	6.2	5.5	6.4	0.6	1.0	2.7	5.7	4.4	5.2	1.0	1.3	0.5	0.7	3.3
Selenium	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0004	0.0004	0.0005	0.0002	0.0002	0.0002	0.0002	0.0003
Silver	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Sodium	40.7	61.0	49.9	54.0	4.5	7.3	36.5	61.0	38.8	48.0	2.8	3.5	3.4	3.5	29.6
Tellurium	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Tin	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Zinc	0.005	0.001	0.055	0.010	0.002	0.003	0.002	0.002	0.013	0.003	0.002	0.002	0.001	0.0020	0.0074
pH															
pH (15 deg. C)	6.65	6.72	6.86	7.67	7.16	6.93	7.03	6.49	6.70	7.61	6.01	6.65	6.96	6.72	6.87
T.K.N.	4.0	4.7	11.9	12.0	0.2	0.2	0.4	1.6	1.7	1.0	0.2	0.2	0.2	0.2	2.8
Total Phosphorus	0.83	1.170	0.151	0.290	0.002	0.018	0.099	0.914	0.938	0.241	0.005	0.011	0.002	0.004	0.334

2022 Vermillion River Sampling

Parameter (mg/L)	Jun.2/22		Oct.18/22		Annual Average		Monthly Phosphorus Sampling		
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Sample Date	Upstream	Downstream
Alkalinity	16	15	27	27	22	21	May.18/22	0.002	0.002
Ammonia (as N)	0.01	0.05	0.01	0.01	0.0	0.0	Jun.2/22	0.002	0.002
Chloride	0.7	0.8	1.2	2.1	1.0	1.5	Jul.7/22	0.039	0.007
Sulphate	5.5	5.5	5.4	5.7	5.5	5.6	Aug.4/22	0.002	1.350
BOD ₅	0.5	0.5	1.4	1.5	1.0	1.0	Sep.6/22	0.005	0.008
Aluminum	0.041	0.039	0.019	0.020	0.030	0.030	Oct.5/22	0.008	0.010
Antimony	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	Oct.18/22	0.004	0.005
Arsenic	0.001	0.001	0.001	0.001	0.001	0.001	Nov.2/22	0.002	0.002
Barium	0.011	0.011	0.012	0.013	0.012	0.012			
Beryllium	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005			
Cadmium	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Calcium	4.79	4.86	8.35	8.57	6.57	6.72			
Chromium	0.001	0.001	0.001	0.001	0.001	0.001			
Cobalt	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Copper	0.002	0.002	0.001	0.001	0.002	0.002	Annual Average	0.008	0.173
Iron	0.11	0.11	0.28	0.29	0.20	0.20			
Lead	0.0002	0.0002	0.0001	0.0001	0.0002	0.0002			
Magnesium	1.130	1.210	1.840	1.890	1.485	1.550			
Manganese	0.024	0.025	0.019	0.024	0.022	0.025			
Mercury	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Molybdenum	0.001	0.001	0.001	0.001	0.001	0.001			
Nickel	0.003	0.003	0.002	0.002	0.003	0.003			
Potassium	0.5	0.5	0.8	0.8	0.7	0.7			
Selenium	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002			
Silver	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Sodium	1.0	1.1	1.6	2.2	1.3	1.7			
Tellurium	0.001	0.001	0.001	0.001	0.001	0.001			
Tin	0.001	0.001	0.001	0.001	0.001	0.001			
Zinc	0.002	0.002	0.002	0.001	0.002	0.002			
pH									
pH (15 deg. C)	7.29	6.27	6.98	6.89	7.14	6.58			
T.D.S.	150	140	50	90	100	115			
T.K.N.	0.2	0.2	0.2	0.2	0.2	0.2			
Total Phosphorus	0.002	0.002	0.004	0.005	0.003	0.004			

Compliance Parameters:

Downstream

Total Phosphorus, 0.03 mg/L Annual average
Annual average of CBOD5 and TKN can not exceed 15% of the Upstream annual average value.

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Total Phosphorus, 0.03 mg/L Annual average.
Annual average of CBOD5 and TKN can not exceed 15% of the Upstream annual average value.

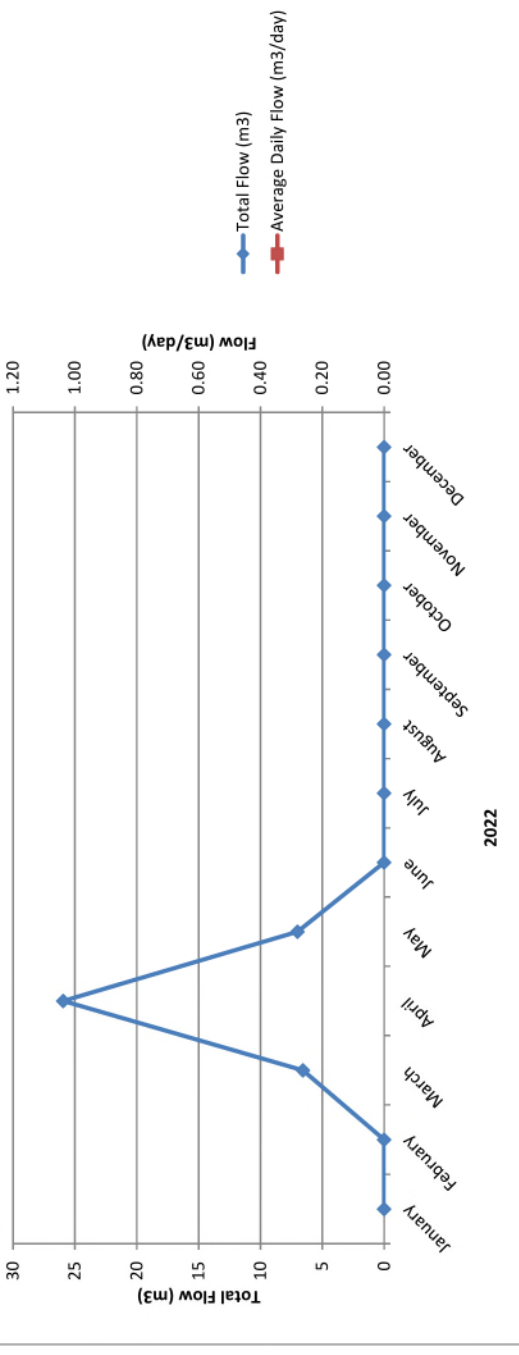
2022 Capreol Lagoon Ground/Surface Water Levels

* Depth in metres from top of casing to water

Well I.D.	Water Level (m)*	Measure Date	Water Level (m)*	Measure Date
OW#1	3.3	Jun.24/22	4.4	Oct.11/22
OW#2	3.0	Jun.24/22	3.5	Oct.11/22
OW#3	3.4	Jun.24/22	4.0	Oct.11/22
OW#5	5.5	Jun.24/22	7.0	Oct.11/22
OW#7	Dry	Jun.24/22	Dry	Oct.11/22
OW#8	4.7	Jun.24/22	5.8	Oct.11/22
OW#10a	6.5	Jun.24/22	7.3	Oct.11/22
OW#10b	5.7	Jun.24/22	Dry	Oct.11/22
OW#11	5.2	Jun.24/22	5.7	Oct.11/22
OW#12	2.55	Jun.24/22	2.8	Oct.11/22
OW#12a				Oct.11/22
OW#13a	5.3	Jun.24/22	6.0	Oct.11/22
OW#13b	5.3	Jun.24/22	6.1	Oct.11/22
OW#14	2.7	Jun.24/22	2.5	Oct.11/22
OW#15	6.7	Jun.24/22	7.4	Oct.11/22
OW#16	5.7	Jun.24/22	6.2	Oct.11/22
OW#21	3.0	Jun.24/22	3.7	Oct.11/22
OW#22	4.9	Jun.24/22	Dry	Oct.11/22
OW#23	5.6	Jun.24/22	6.3	Oct.11/22
OW#24	2.7	Jun.24/22	3.4	Oct.11/22
OW#25	4.2	Jun.24/22	4.8	Oct.11/22
OW#26	5.7	Jun.24/22	6.2	Oct.11/22
OW#28	3.1	Jun.24/22	2.6	Oct.11/22
OW#30	2.5	Jun.24/22	2.7	Oct.11/22
River @ Bridge	1.0	Jun.24/22	1 foot	Oct.11/22

2022 Chelmsford Wastewater Treatment Lagoon Performance

Month	Flows		CBOD			Total Suspended Solids			Total Phosphorus			Total Ammonia		TKN	
	Total m ³	Avg Day m ³ /d	Raw mg/L	Effluent mg/L	Loading kg/d	Raw mg/L	Effluent mg/L	Loading kg/d	Raw mg/L	Effluent mg/L	Loading kg/d	Raw mg/L	Effluent mg/L		
January	no results				0.00			0.00			0.00				
February	no results				0.00			0.00			0.00				
March	6,554		67		0.00	75		0.00	1.81		0.00				
April	25,940		13		0.00	11		0.00	1.15		0.00				
May	7,009		4.60		0.00	12		0.00	0.85		0.00				
June	no results				0.00			0.00			0.00				
July	no results				0.00			0.00			0.00				
August	no results				0.00			0.00			0.00				
September	no results				0.00			0.00			0.00				
October	no results				0.00			0.00			0.00				
November	no results				0.00			0.00			0.00				
December	no results				0.00			0.00			0.00				
Total	39,503														
Average		0	28	#DIV/0!	0.00	33	#DIV/0!	0.00	1.27	#DIV/0!	0.00	#DIV/0!	#DIV/0!		



2022 Wahnapitae Wastewater Treatment Lagoon Performance

Lagoon Type: Seasonal Retention
Design Capacity: 1,246 m³/day
Population Served: 1,136

Month	Raw Flow (Act meter)		Raw						
	Total m ³	Avg Day m ³ /d	CBOD mg/L	TSS mg/L	TP mg/L	TAN mg/L	TKN mg/L	BOD mg/L	
Nov-21	17193	573							
Dec-21	25350	818							
January	13763	444	32	188	0.5	7.40	8.60	30	
February	10702	382	46	57	0.3	21.60	23.70	73	
March	31275	1009	55	1900	4.5	15.30	32.00	58	
April	37891	1283	11	53	0.3	3.48	8.35	15	
May	24731	798	35	76	0.3	2.88	7.60	36	
June	16032	534	20	39	0.2	10.80	10.70	20	
July	12949	418	33	68	0.3	3.82	11.20	30	
August	14807	478	57	182	0.7	30.50	31.80	52	
September	10710	357	46	2940	10.7	11.80	28.00	54	
October	16440	530	38	540	1.5	15.50	14.20	49	
November	15013	500	8.5	34	0.2	7.50	6.40	20	
December	17397	561	NA	NA	NA	NA	NA	NA	
Total	221710								
Average			35	552	1.77	12.0	16.6	33	
Spring EFF	136174								
Fall EFF	95669		44	715	1.8	15.10	21.43	30	
Q1 RAW			22	56	0.3	5.72	8.88	15	
Q2 RAW			45	1063	3.9	15.37	23.67	41	
Q3 RAW			23	287	0.9	11.50	10.30	34.5	
Q4 RAW									

Pre Discharge Sampling - Spring									
		Cell #1		Cell #2		Cell #3			
Date	13-May-22	13-May-22	13-May-22	25-Apr-22	25-Apr-22	25-Apr-22	25-Apr-22	25-Apr-22	25-Apr-22
CBOD (mg/L)	62	2.1	0.9	2.3	2.8	3.6	2.4	3.2	3.2
TSS (mg/L)	130	2.00	0.67	1.70	4.30	3.30	2.30	4.00	2.30
TP (mg/L)	0.660	0.016	0.00	0.061	0.020	0.089	0.019	0.002	0.052
TAN (mg/L)	11.2	7.0	3.77	4.46	4.81	4.46	7.3	7.0	7.0
pH	6.8	7.1	7.1	7.4	7.2	7.2	7.2	7.0	6.9
H ₂ S (mg/L)	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Pre Discharge Sampling - Fall									
		Cell #1		Cell #2		Cell #3			
Date	22-Nov-22	22-Nov-22	22-Nov-22	22-Nov-22	22-Nov-22	25-Oct-22	25-Oct-22	25-Oct-22	25-Oct-22
CBOD (mg/L)		8.7	8.2	6.5	2.2	2.3	2.4	0.5	1.9
TSS (mg/L)		28.00	117.00	5.00	0.67	2.30	37.00	8.33	5.30
TP (mg/L)		0.034	2.99	0.025	0.002	0.004	0.019	0.025	0.952
TAN (mg/L)		11.0	7.40	6.62	0.09	0.70	0.0	0.0	0.0
pH		6.9	6.9	6.8	6.9	6.8	7.3	7.4	7.4
H ₂ S (mg/L)		0.02	0.10	0.02	0.02	0.02	0.02	0.02	0.02

Spring Discharge									
		Cell #1		Cell #2		Cell #3			
Date	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End
CBOD (mg/L)	2.7	1.6	3	4.6	25.0	1.8	2.6	5.6	1.4
TSS (mg/L)	1	2.70	4.00	5.3	2.30	2.7	2.00	5.3	16.00
TAN (mg/L)	3.95	4.74	9.40	1.0	2.45	2.53	7.80	6.90	0.4
TP (mg/L)	0.135	0.834	0.078	0.049	0.003	0.484	0.045	0.034	0.066
pH	7.3	6.9	7.2	6.7	6.9	7.0	7.4	7.1	8.2
E.Coli	8	19.00	2.00	2.00	4.00	16.00	2.00	4.00	16.00

Fall Discharge									
		Cell #1		Cell #2		Cell #3			
Date	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End
CBOD (mg/L)	7.2	3.5	6	1.0	1.0	1.4	3.1	1.5	1.1
TSS (mg/L)	78	17.70	35.70	0.67	5.30	0.67	16.30	7.67	39.70
TAN (mg/L)	0.23	7.29	7.76	0.4	0.27	0.27	0.14	0.01	0.0
TP (mg/L)	0.100	0.018	0.036	0.348	0.002	0.002	0.031	0.179	0.053
pH	7.3	7.3	6.5	6.7	6.8	6.9	7.6	7.7	8.9
E.Coli	36	4.00	6.00	2.00	4.00	2.00	10.00	2.00	16.00

Spring Pre Discharge Averages				
Cell #1	Cell #2	Cell #3		
CBOD (mg/L)	21.7	2.9	2.9	2.9
TSS (mg/L)	44.22	3.10	2.87	2.87
TP (mg/L)	0.227	0.057	0.024	0.024
TAN (mg/L)	7.32	4.58	7.10	7.10
pH	7.0	7.3	7.0	7.0
H ₂ S (mg/L)	0.08	0.02	0.02	0.02

Fall Pre Discharge Averages				
Cell #1	Cell #2	Cell #3		
CBOD (mg/L)	8.5	3.7	1.6	1.6
TSS (mg/L)	72.50	2.66	16.88	16.88
TP (mg/L)	1.512	0.010	0.332	0.332
TAN (mg/L)	9.20	2.47	0.01	0.01
pH	6.9	6.8	7.4	7.4
H ₂ S (mg/L)	0.06	0.02	0.02	0.02

Spring Discharge Dates:				
Cell #1	Cell #2	Cell #3		
May 20 - Jun 3 2022	May 3 - May 17 2022	Apr 27 - May 12 2022		
Approx. Discharge Volume - 1347,863 m ³				

Fall Discharge Dates:				
Cell #1	Cell #2	Cell #3		
Nov 29 - Dec 13 2022	Nov 8 - Nov 22 2022	Nov 1 - Nov 15 2022		
Total amount discharged approximately 93,593 m ³				