

**PUBLIC UTILITIES COMMISSION
FOR THE MUNICIPALITY OF CHATHAM-KENT**

BLenheim SEWAGE TREATMENT PLANT

2020 PERFORMANCE REPORT

January 1 to December 31, 2020

Environmental Compliance Approval # 6023-APPN4Q

Plant Description

The Blenheim Sewage Treatment Plant provides treatment of wastewater for the former Town of Blenheim, and for Charing Cross, as well as for leachate from the Ridge Landfill. Wastewater is collected by a separate sanitary sewer system and conveyed by two raw pumping stations to the Treatment Lagoons. The final effluent is subsequently discharged to the Cameron Drain.

Following several modifications to the original works, approval was received in 1995 for modification of the existing waste stabilisation ponds to the New Hamburg Process, and for expansion of hydraulic capacity.

According to the Certificate of Approval, average daily flow of sewage into the treatment plant shall not exceed 4,045m³/day, and peak flow shall not exceed 12,046m³/day.

The present treatment system consists of:

- Two raw pumping stations
- One aeration cell
- Chemical phosphorous removal
- Five waste stabilisation cells
- One filter effluent pump station
- Four effluent sand filters

The underdrain pipes discharge to the outfall structure, and to the Cameron Drain.

REPORTING REQUIREMENTS UNDER Amended Environmental Compliance Approval # 6023-APPN4Q

Summary and Interpretation of Influent and Imported Sewage, Monitoring Data and Rated Capacity Condition 11.4 (a)

Table 1 of this section outlines a summary and interpretation of all Influent and Imported Sewage monitoring data, including sewage characteristics, flow rates and a comparison to the values used in the design of the Works;

Success and Adequacy of the Works

During the reporting period, the annual average daily flow was 2,211 m³/day, which represents approximately 55% of the rated capacity of 4,045 m³/day. The maximum daily flow was 5,472 m³/day, which is 45% of the Peak Flow Rate of 12,046 m³/day.

There were no flow exceedances based on the Average Daily Influent Flow or Peak Flow Rate during this reporting period.

The Annual Average Daily Influent Flow did not reach 80% of the Rated Capacity for the reporting period.

Table 1: Summary of Influent and Imported Sewage monitoring data as well as rated capacity to the sewage works

Plant Rated Capacity: 4,045 m³/day

Total sewage flow to the works during a calendar year divided by the number of days during which sewage was flowing to the works that year

Month	Total Monthly Raw Flow m ³	Total Monthly Imported Sewage Flow m ³	Avg Daily Raw Flow /Month m ³ /day	Avg Daily Raw Flow /Year m ³ /day	% of Plant Capacity	BOD ₅ mg/L	Total S.S. mg/L	Total P mg/L	Alkalinity mg/L	TKN mg/L
Limits:	None	Included in Raw Flow	None	4,045	100					
Jan	82,027	7,552	2,646			77	93	2.5	598	62
Feb	67,009	4,645	2,311			101	132	4.0	310	38
Mar	81,551	6,030	2,631			98	112	3.6	373	47
Apr	73,377	3,104	2,446			80	79	2.9	448	55
May	70,555	3,270	2,276			87	124	2.8	520	63
Jun	63,851	3,120	2,128			104	114	3.4	474	75
Jul	63,405	3,236	2,045			117	155	4.1	415	58
Aug	60,350	3,488	1,947			89	140	2.9	418	57
Sept	57,817	3,557	1,927			106	72	3.7	446	62
Oct	60,272	3,036	1,944			90	116	3.4	358	46
Nov	59,805	3,514	1,993			102	143	3.5	523	78
Dec	69,038	4,834	2,227			111	122	3.5	404	53
Year				2,211	55%					
	Yearly Total Flow m ³	Yearly Maximums								
	809,057	7,552	2,646			117	155	4.1	598	78

Summary and Interpretation of Final Effluent Monitoring Data and Rated Capacity Condition 11.4 (b) of the ECA

Tables 2 & 3 under this section outline a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;

Table 2: Summary of Monitoring Data and Comparison to Final Effluent Limits & Objective Concentrations

Month	Total Monthly Effluent Flow m ³	Avg Daily Effluent Flow /Month m ³ /day	Avg Daily Flow /Year m ³ /day	CBOD ₅ mg/L	Total S.S. mg/L	Total Ammonia mg/L	Total P mg/L	Dissolved Oxygen mg/L	E.Coli /100mL CFU GeoMean	pH
Limits: (Nov. 1– Apr.30)	None	None	None	10	10	5.0	0.5	4.0	200 (May 15 – Sep.15)	6.0 – 9.5
Limits: (May 1 – Oct.31)	None	None	None	10	10	3.0	0.5	4.0	200 (May 15 – Sep.15)	6.0 – 9.5
Objectives: (Nov. 1– Apr.30)	None	None	None	5.0	5.0	4.0	0.3	5.0	150 (May 15 – Sep.15)	6.5 – 8.5
Objectives: (May 1 – Oct.31)	None	None	None	5.0	5.0	2.0	0.3	5.0	150 (May 15 – Sep.15)	6.5 – 8.5
Jan	0									
Feb	0									
Mar	0									
Apr	35,904	1,381		0.33	0.31	0.03	0.05	8.6	8	8.00
May	58,732	1,895		0.50	0.25	0.02	0.08	9.2	10	8.05
Jun	172,078	5,736		0.37	0.23	0.13	0.07	7.2	55	7.96
Jul	132,483	4,274		0.40	0.45	0.11	0.08	6.6	28	8.08
Aug	104,671	3,376		0.50	0.31	0.02	0.09	7.4	18	7.90
Sept	99,703	3,323		0.40	0.32	0.03	0.08	8.1	23	8.03
Oct	111,578	3,599		0.40	0.30	0.03	0.08	8.8	16	8.08
Nov	95,268	3,176		0.50	0.38	0.05	0.08	9.8	14	8.08
Dec	47,740	3,183		0.33	0.61	0.06	0.04	9.8	13	8.00
Year			3,365							
	Yearly Total Flow m³	Yearly Maximums						Yearly Minimum	Yearly Maximums	
	858,155	5,736		0.50	0.61	0.13	0.09	6.6	55	8.08

Table 3: Summary of Monitoring Data and Comparison to Final Effluent Loading Limits

Year	Avg Daily Effluent Flow /Year m³/day	CBOD₅ kg/day	Total S.S. kg/day	Total P kg/day	Total Ammonia kg/day
Limits: May 1 – Oct 31	None	40.4	40.4	2.0	12.1
Limits: Nov – April 30	None	40.4	40.4	2.0	20.2
2020	3,365	1.39	1.18	0.24	0.18

Success and Adequacy of the Works

No criteria were exceeded during this reporting period for the effluent limits as outlined in Schedule C – Concentration Limits and Loading Limits of the ECA.

Table 4 under this section outlines a summary of Final Effluent monitoring of Imported Sewage data with regards to quarterly analysis of the Final Effluent for Leachate Related parameters.

Table 4.1: Summary of Final Effluent Monitoring – Leachate Related from Outlet Structure

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Arsenic					0.0028	0.0038	0.007	0.0033	0.0058	0.0040	0.0030	0.0022
Barium					0.022	0.023	0.026	0.027	0.024	0.022	0.019	0.018
Boron					0.750	0.84	0.95	0.77	0.91	0.75	0.87	0.80
Cadmium					<0.0001	<0.0001	<0.0001	<0.0001	0.0015	<0.0001	<0.00009	<0.00009
Calcium					78	70	59	68	65	61	67	69
Chloride					0.30	280	290	300	340	370	350	320
Chromium					<0.0005	<0.0005	<0.0001	<0.0005	<0.005	<0.005	<0.005	<0.005
Copper					0.0038	0.0049	0.0011	0.0005	0.0063	0.0041	0.0034	0.0030
Iron					<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1
Lead					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Magnesium					24	21	28	25	27	27	28	28
Manganese					0.0043	0.013	0.25	0.024	0.082	0.012	0.006	0.003
Mercury					<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium					46	46	54	49	56	62	63	65
Sodium					180	180	210	190	210	210	230	230
Sulphate					140	120	110	100	96	89	100	110
Zinc					<0.005	<0.005	<0.005	<0.005	0.016	<0.005	0.0066	<0.005

Table 4.2: Summary of Final Effluent Monitoring – Leachate Related from Ridge Landfill

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Arsenic	0.021	0.037	0.032	0.056	0.063	0.023	0.043	0.036	0.041	0.022	0.051	0.120
Barium	0.45	0.57	0.37	0.68	0.74	0.55	0.66	0.69	0.76	0.63	0.81	1.30
Boron	5.0	19.0	8.7	23	25	9.8	18	14	21	13	2.6	6.9
Cadmium	0.0001	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0009	0.00083	<0.0009	<0.0005	<0.0009	0.0041
Calcium	320	120	200	140	120	190	160	240	190	150	120	1000
Chloride	1200	4600	2600	5600	6100	2900	4900	4300	5200	7100	6400	2700
Chromium	0.032	0.079	0.045	0.11	0.13	0.049	0.1	0.098	0.11	0.063	0.13	0.33
Copper	0.12	0.43	1.9	0.51	1.3	0.0098	2.0	0.15	0.049	0.012	0.081	1.20
Iron	1.6	1.7	36	21	47	3.5	28	41	20	3.4	17	570
Lead	0.0026	0.015	0.025	0.0076	0.019	<0.0025	<0.061	0.024	0.0083	<0.0025	0.0065	0.15
Magnesium	170	140	110	140	160	150	160	180	190	140	170	300
Manganese	0.51	0.20	0.42	0.26	0.20	0.32	0.45	0.86	0.51	0.23	0.33	6.1
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium	260	950	460	1000	1200	740	1000	990	1300	970	1400	640
Sodium	770	2800	1400	3300	3900	1900	3000	2700	3700	2700	4300	1500
Sulphate	150	190	350	260	150	120	28	97	43	73	100	320
Zinc	0.083	0.19	0.84	0.12	0.25	<0.025	0.38	0.26	0.078	<0.025	<0.05	1.2

**Summary of all operating issues encountered and corrective actions taken
Condition 11 4 (c)**

There were no significant operating issues encountered during this reporting period.

**Summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works
Condition 11 4 (d)**

Routine maintenance was performed throughout the reporting period. Chatham-Kent PUC utilises an electronic preventative maintenance program to track preventative maintenance. In addition to the routine maintenance, the following additional maintenance activities and equipment replacement were completed for the reporting period:

- Screen Room Internal Repairs \$ 15,000
- Charing Cross Piping Repairs 10,000

**Summary of any effluent quality assurance or control measures undertaken
Condition 11 4 (e)**

The Chatham-Kent Public Utilities Commission followed a sampling schedule developed in accordance with the Environmental Compliance Approval and applicable regulations for this reporting period.

Composite chemistry samples of the raw flow were collected using an auto sampler. Chemistry samples were submitted weekly to an accredited laboratory for analysis of BOD₅, Total Ammonia as Nitrogen, Total Suspended Solids, Total Kjeldhal Nitrogen, Total Phosphorus, Alkalinity and pH.

Composite chemistry samples of the effluent were collected using an auto sampler. Chemistry samples were submitted weekly during discharge periods to an accredited laboratory for analysis of BOD₅, CBOD₅, Total Suspended Solids, Total Kjeldhal Nitrogen, Total Phosphorus, Free Ammonia as Nitrogen, Alkalinity, pH, Nitrite, Nitrate and Unionized Ammonia.

Bacteriological samples of the effluent were collected weekly during discharge periods according to the Sampling Program. Bacteriological samples were submitted weekly during discharge periods to an accredited laboratory for analysis.

In house samples were analysed by a licensed operator for Dissolved Oxygen, Temperature and pH.

**Summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment
Condition 11 4 (f)**

All required probes and sensors are cleaned, maintained and/or calibrated on a monthly basis or as required by manufacturers' specifications.

Monitoring equipment calibration/verification report(s) included for the following:

- Influent flow meters
- Effluent flow meter
- Spectrophotometer
- pH meter

**Summary of efforts made to achieve the design objectives
Condition 11 4 (g)**

Table 2 outlines monthly average results of parameters tested compared to the objectives outlined in the ECA Schedule B Concentration Objectives

The following criteria was exceeded during this reporting period for the effluent objectives outlined in Condition 6 Effluent Objectives of the Certificate of Approval: None

No criteria were exceeded during this reporting period for the effluent limits as outlined in Schedule C - Final Effluent Compliance Limits of the ECA.

The sand filter beds were maintained throughout the year with the goal of achieving the effluent objectives of Total Suspended Solids in the effluent.

Estimate of the sludge volumes in the lagoon cells

Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period.

Condition 11 4 (h)

Lagoon	Sludge Volume m ³ (Approximate)
A	21,214
B	7,745
C	20,729
D	7,326

No sludge disposal occurred during the reporting period.

Summary of any complaints received and any steps taken to address the complaints

Condition 11 4 (i)

There were no Customer Complaints received during the reporting period.

Summary of all Bypasses, Overflows, Spills within the meaning of Part X of EPA and abnormal discharge events, and other abnormal operating conditions

Condition 11 4 (j)

There were no Bypasses, Overflows or Spills during the reporting period.

Notice of Modifications to Sewage Works submitted to the Water Supervisor under paragraph 1.d. of Condition 10, with a summary report on status of implementation of all modification

Condition 11 4 (k)

There was no Notice of Modifications prepared or submitted to the Water Supervisor under paragraph 1.d. of Condition 10 for the reporting period.

APPENDIX A

Yearly Operational Data Summary for the Reporting Period

APPENDIX B

Calibration Reports for the Reporting Period