MOUNT BRYDGES WASTEWATER TREATMENT FACILITY

2024 ANNUAL REPORT

as per ECA # 5933-C37KWJ Section 12.(4)
Works # 110001441

STRATHROY-CARADOC
URBAN OPPORTUNITY – RURAL HOSPITALITY

1. Influent Monitoring and Compliance Summary (Certificate of Approval 12. 4. (a))

The annual influent laboratory results for carbonaceous biochemical oxygen demand, total suspended solids, total phosphorus and total kjeldahl nitrogen can be found in Appendix A. The incoming sewage characteristics are similar to the previous year.

2. Effluent Monitoring and Compliance Summary (Certificate of Approval 12. 4. (b))

The Mt Brydges WWTF has a design rated capacity of 825 m^3/day, with a peak flow rate of 1,650 m^3/day. During 2024, the annual average daily flow was 405 m^3/day, which is 49% of the design rated capacity for the treatment facility. The maximum daily flow was recorded at 568 m^3/day, which is 34% of the peak flow rate. Flow rates are higher than the previous year.

The summary of the annual effluent laboratory results for carbonaceous biochemical oxygen demand, total suspended solids, total phosphorus, nitrogen, DO and pH is found in Appendix A. The comparison of these results to the compliance criteria can be found in Table 1 below. Parameters that did not meet effluent limits were reported to the MECP.

Table 1

Mt Brydges WWTF – Effluent Quality Summary

Description	Range of Monthly Averages mg/L	Effluent Limits mg/L	# Months Limits Achieved/ # Months
CBOD5 (non-freezing period April-Nov)	2.00 - 4.75	10	8/8
CBOD5 (freeze period Dec - Mar)	2.00 - 4.40	15	4/4
Suspended Solids (non-freezing period April-Nov)	3.75 - 10.5	10	7/8
Suspended Solids (freeze period Dec - Mar)	3.75 - 9.8	15	4/4
Total Phosphorus (non-freezing period April-Nov)	0.05 - 0.33	0.5	8/8
Total Phosphorus (freeze period Dec - Mar)	0.06 - 0.15	1	4/4

Total Ammonia Nitrogen (non-freezing period April-Nov)	1.46 - 14.9	3	2/8
Total Ammonia Nitrogen (freeze period Dec-March)	8.38 - 13.48	5	0/4
E.Coli (counts/100mL)	0.14 - 3.17	200 (geometric mean)	8/8
DO (min)	6.1	>5	12/12
pH	5.86 - 7.3	6.0 - 9.5	11/12

3. Operating Issues and Corrective Actions (Certificate of Approval 12. 4. (c))

During the year, there were several exceedances of the Environmental Compliance Approval final effluent limits. These exceedances were reported to the MECP.

In May 2022, the Municipality submitted an ECA application for an interim solution of adding equalization to the Mt Brydges WWTF in an attempt to improve the final effluent results. The Municipality received a new ECA for the implementation of the interim solution December 20th 2023. The work for the interim solution was tendered for construction and awarded for construction.

In August of 2024, an updated ECA was received for the conversion to an extended aeration process, which includes the addition of a headworks structure and the necessary equipment at the wastewater facility.

In the fall of 2024, the construction of the interim solution was paused. At the end of 2024 it was decided to hire a third party Engineering Consultant to review the process and proposed upgrades. In early 2025 CIMA+ (Engineering Consultant) was awarded the project.

The design for the extended aeration upgrades in nearing completion and is anticipated to be ready for construction tendering in the second quarter of 2025.

4. Maintenance Summary (Certificate of Approval 12. 4. (d))

The operators performed the routine maintenance throughout the year. In addition to the routine maintenance, which includes greasing and oiling, a detailed list is included in Appendix B.

5. Quality Assurance/Quality Control (Certificate of Approval 12. 4. (e))

On a monthly basis, the operator collected and submitted influent samples to SGS Canada Inc for total suspended solids, biochemical oxygen demand, TKN and total phosphorus analysis.

On a weekly basis, the operator collected effluent samples for analysis by SGS Canada Inc for total suspended solids, carbonaceous biochemical oxygen demand, total phosphorus, ammonia and E. Coli analyses. The operator performed analysis for pH, DO and temperature in-house.

In-house laboratory testing also included monitoring of reactive phosphorus, total suspended solids, and ammonia in the effluent.

6. Calibration/Maintenance Summary (Certificate of Approval 12. 4. (f))

Flow meter calibrations were carried out by SCG in February 2024. The laboratory, SGS Canada Inc was used for all the required analytical chemical and biological testing of influent and effluent from the wastewater treatment facility.

7. Effluent Objectives (Certificate of Approval 12. 4. (g))

The Municipality attempted to meet the objectives in the Environmental Compliance Approval (ECA) through regular testing and monitoring of the treatment system.

As mentioned in item #3 the Municipality has submitted two ECA applications and have dedicated capital funding for upgrades. The first ECA is for an interim solution is the conversion of an existing tank to act as an equalization tank with the associated necessary equipment.

The second ECA application is for a medium term solution that involves the changing of the process from an RBC to an extended aeration. The associated ECA application for the medium term solution was received in August of 2024. This upgrade will include the transition to an extended aeration treatment along with other process improvements.

The advantages moving towards extended aeration include:

- More robust system
- Remove materials before they enter the treatment process (headworks facility)
- Superior handling of uneven plant flows
- Recovers much quicker to process upsets
- Staff's confidence in the process
- Proven treatment method

The upgrade to an extended aeration process will involve the following:

- Addition of a headworks/blower building
- Facility updates to meet current building/fire codes
- Reuse of existing tanks by removing the RBCs
- Installation of diffused air system
- Chemical system upgrades
- SCADA upgrades
- Waste activate sludge tank
- Site upgrades to accommodate the changes including lab facilities

In the table below, monitoring data and analytical results are compared to the Effluent Objectives as listed in the ECA.

Table 2

Mt Brydges WWTF – Effluent Objective Summary

Description	Range of Monthly Averages mg/L	Effluent Objectives mg/L	# Months Objectives Achieved/# Months
CBOD5 (non-freezing period April-Nov)	2.00 - 4.75	5	8/8
CBOD5 (freeze period Dec - Mar)	2.00 - 4.40	10	4/4
Suspended Solids (non-freezing period April-Nov)	3.75 - 10.5	5	5/8
Suspended Solids (freeze period Dec - Mar)	3.75 - 9.8	10	4/4
Total Phosphorus (non-freezing period April-Nov)	0.05 - 0.33	0.3	7/8
Total Phosphorus (freeze period Dec - Mar)	0.06 - 0.15	0.8	4/4
Total Ammonia Nitrogen (non-freezing period April-Nov)	1.46 - 14.9	1	0/8
Total Ammonia Nitrogen (freeze period Dec - Mar)	8.38 - 13.48	3	0/4
E.Coli (counts/100mL)	0.14 - 3.17	150 (geometric mean)	8/8
pH	5.86 - 7.3	6.5 - 8.5	9/12

8. Sludge Management (Certificate of Approval 12. 4. (h))

Waste activated sludge is discharged into the tank located beneath the RBC. The sludge was pumped out and hauled to the City of London. The sludge can be taken to the Strathroy sludge lagoon for disposal when the City of London is not accepting sludge. Each load is approximately 12 m^3. The table below summarizes the sludge removed from the plant:

Table 3
Mt Brydges WWTF – Sludge Removal

Month	Sludge Volume (m^3)	Month	Sludge Volume (m^3)
January	9 Loads	July	10 Loads
February	8 Loads	August	8 loads
March	8 Loads	September	8 loads
April	14 Loads	October	10 Loads
May	9 Loads	November	8 Loads
June	8 Loads	December	9 loads

The sludge production and sludge handling methods for 2025 is estimated to be the same as in 2024.

9. Complaints Summary (Certificate of Approval 12. 4. (i))

There were no documented complaints regarding the Mt Brydges WWTF in 2024

10. Summary of By-pass, Spill or Abnormal Events (Certificate of Approval 12. 4. (j))

There were no by-pass, spills or abnormal events to report.

11. Notice, Modifications/Summary of Alterations (Certificate of Approval 12. 4. (k & l))

There were no modifications to the Sewage Works completed under the Limited Operational Flexibility provisions in the ECA.

The following list details alterations, extensions or replacements that were implemented or in process in 2024.

- Mt Brydges WWTF Process Upgrades Design
- Sanitary Masterplan
- Completion of Pollution Control Prevention Plan

For 2025, the following are proposed and provide a benefit to the operation of the Mt Brydges WWTF.

- Mt Brydges WWTF Process Upgrades Construction

12. Changes/Updates in Schedule (Certificate of Approval 12. 4. (m))

The interim solution was paused in the fall of 2024 and a third party Engineering Consultant was hired to review the process. The second ECA is approved for the process changes from RBC to extended aeration, timing for this work is currently anticipated for tendering early in the second quarter of 2025.

13. Summary of Monitoring Schedule (Certificate of Approval 12. 4. (n))

Routine weekly effluent sampling was conducted on Thursdays for 2024. This sampling will be complete on Fridays for 2025.

APPENDIX A

Mt Brydges WWTF

Year: 2024

		January	February	March	April	May	June	July	August	September	October	November	December	Average	Total
Flows, Average Daily Flow 825 m3/day															
Effluent Total	m^3	13,143	12,308	12,519	12,660	13,261	12,716	11,899	11,230	11,154	11,845	12,265	13,141	12,345	148,141
Effluent Average	m^3/day	424	424	404	422	428	424	384	362	372	382	409	424	405	
Effluent Max	m^3/day	568	536	456	505	473	499	468	403	445	464	502	459	482	
cBOD, Monthly Average Concentration Limits Freezing 15mg/L, Non-Freezing 10mg/L,															
Raw Average BOD	mg/L	114	156	117	137	135	122	226	283	216	232	139	99	165	
Eff cBOD Avg (BOD5)	mg/L	2.00	4.40	4.00	4.75	3.80	2.00	2.00	2.00	3.00	2.00	2.75	3.50	3.02	
Suspended Solids, Monthly Average Concentration Limits Freezing 15mg/L, Non Freezing Limit 10mg/L															
Raw Average	mg/L	92.0	51.0	66.0	79.0	45.0	86.0	240.0	203.0	187.0	183.2	114.5	54.0	116.7	
Eff Avg SS	mg/L	3.75	9.80	8.75	10.50	6.00	3.75	3.75	4.00	9.25	4.60	4.00	5.75	6.16	
Total Phosphorus, Monthly Average Concentration Limits Freezing 1mg/L, Non Freezing 0.5mg/L															
Raw Average	mg/L	2.8	3.2	3.8	4.1	3.8	4.0	4.8	4.0	4.6	5.3	15.5	4.9	5.1	
Effluent Average TP	mg/L	0.06	0.15	0.13	0.17	0.07	0.05	0.06	0.13	0.33	0.21	0.16	0.15	0.14	
Nitrogen, Monthly Average Concentration Limits Freezing 5mg/L, Non Freezing 3mg/L															
Raw Average TKN	mg/L	39.50	35.40	43.70	50.30	41.10	42.40	43.10	39.60	36.70	48.26	40.28	51.40	42.64	
Effluent Avgerage Total N	mg/L	8.55	8.38	13.15	14.90	10.22	5.38	2.50	1.46	4.25	6.50	10.30	13.48	8.26	
Nitrogen Loading	kg/D	3.62	3.56	5.31	6.29	4.37	2.28	0.96	0.53	1.58	2.48	4.21	5.71		
Effluent TKN	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.60	6.96	11.25	13.80		
Nitrate as Nitrogen	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.27	5.93	8.72	7.91		
Nitrite as Nitrogen	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.09	0.09	0.08		
Unionized Ammonia Avg	mg/L	0.01	0.02	0.03	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.04		
Unionized Ammonia Min	mg/L	0.00	0.0080	0.0150	0.0110	0.0090	0.0030	0.0030	0.0010	0.0060	0.0100	0.0220	0.0250		
Unionized Ammonia Max	mg/L	0.03	0.0360	0.0320	0.1160	0.0200	0.0120	0.0140	0.0180	0.0120	0.0220	0.0300	0.0850		
E. Coli, Monthly Geometric Average Limit Non Freezing 200 Counts/mL															
E.Coli Geo Mean	CFU/ 100mL	2.4	0.8	0.1	0.5	2.0	0.1	2.0	2.0	0.6	3.2	3	1	1	
pH 6.0 -9.5, DO > 5.0															
pH Min	SU	5.86	6.80	6.70	6.60	6.60	6.30	6.60	6.70	6.40	6.70	6.70	6.80	6.56	
pH Max	SU	7.30	7.30	7.30	6.90	6.90	7.00	7.30	7.10	7.20	7.20	7.10	7.30	7.16	
pH Average	SU	6.92	6.98	7.05	6.74	6.71	6.68	6.97	6.91	6.84	6.92	6.92	7.06		
Temperature MIN	^oC	11.20	10.70	10.40	11.40	13.40	15.10	16.40	18.00	18.10	16.70	14.50	12.50	14.0	
Temperature MAX	^oC	13.40	12.10	12.20	13.50	15.40	18.30	78.00	19.70	19.50	19.30	17.70	14.70	21.2	
DO Min	mg/L	7.5	7.8	7.9	7.4	7.0	6.3	6.1	6.3	6.5	6.2	6.9	6.8	6.9	
Non-Freezing (N) Freezing (F)		F	F	F	N	N	N	N	N	N	N	F	F		

APPENDIX B

2024 Annual Maintenance Summary for:
MOUNT BRYDGES WWTF

January
- Replaced burnt out UV bulbs
- Run generators

February
- Annual Flow meter calibration
- Run generators

March
- Run generators

April
- Cleaning of headworks
- reject water pit cleanout
- Run generators

May
- Replaced burnt out UV bulbs
- Modifications to filter return water
- Run generators

June
- Replaced burnt out UV bulbs
- Clean out of reject water pit and headworks
- Run generators

July
- Run generators

August
- Replaced sludge pump guide rails
- Run generators

September
- Replaced 2 burnt out UV bulbs
- Run generators

October
- Replaced gear box RBC 1
- Oil change in gear boxes
- Filter plastic liner replacement in center of filter 1 and 2
- Run generators

November
- Run generators

December
- Modifications to chemical dosing pumps
- Wiring for filter wash water control valve
- Run generators