# Williamsburg Wastewater System

Waterworks # 120002013

# Annual Report

## Prepared By The Municipality of South Dundas

Reporting Period of January 1st – December 31st 2024

Issued: March 3rd, 2025

Revision: 0

Operating Authority:

The Municipality of
SOUTH DUNDAS

This report has been prepared to meet the requirements set out in:

| Document | Document # | Issue Date | Issue Number |
|---|---|---|---|
| Facility ECA | 3-0456-84-887 | January 28, 1992 | N/A |
| ECA for Municipal Sewage Collection System | 165-W601 | June 2, 2023 | 1.0 |

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# 1 Revision History

| Date | Rev# | Revisions | Revised By |
|---|---|---|---|
| March 03, 2024 | 0 | Annual Report Issued | Chelsea Fletcher, PCT<br>Municipality of South Dundas |

# 2 Operations and Compliance Reliability Indices

| Compliance Event | # of Events |
|---|---|
| Ministry of Environment Inspections | No MECP inspection in 2024. |
| Ministry of Labour Inspections | No MOL inspection in 2024. |
| Non-Compliance | No Non-compliance in 2024 |
| Community Complaints | No community complaints in 2024. |
| Spills | No spills reported in 2024. |
| Overflows | No overflow events reported in 2024. |
| Bypass | No bypass events reported in 2024. |
| Sewer Main Blockages | No sewer main blockages in 2024. |

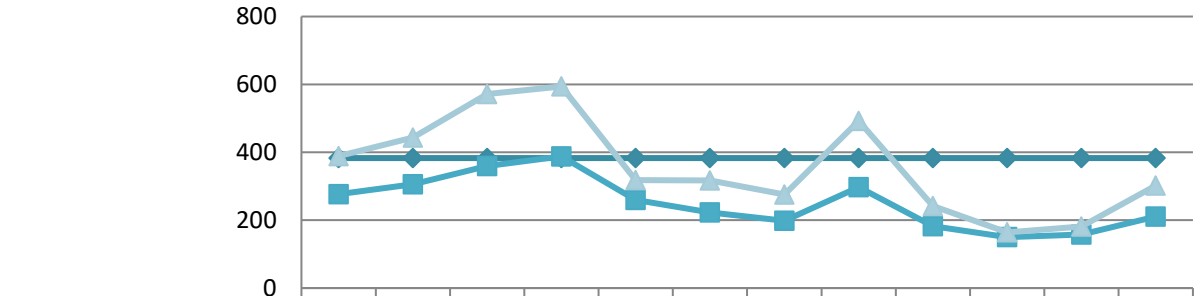
# 3 Process Description

Williamsburg's wastewater system is owned and operated by the Municipality of South Dundas. It consists of a gravity fed collection system, two sewage pumping stations and a wastewater treatment lagoon. The two-cell facultative lagoon system is a Class I wastewater treatment system. Effluent from the lagoon is discharged annually to the McMartin Drain between March 15th and April 21st in accordance with the facility's Certificate of Approval.

# 4 Treatment Flows

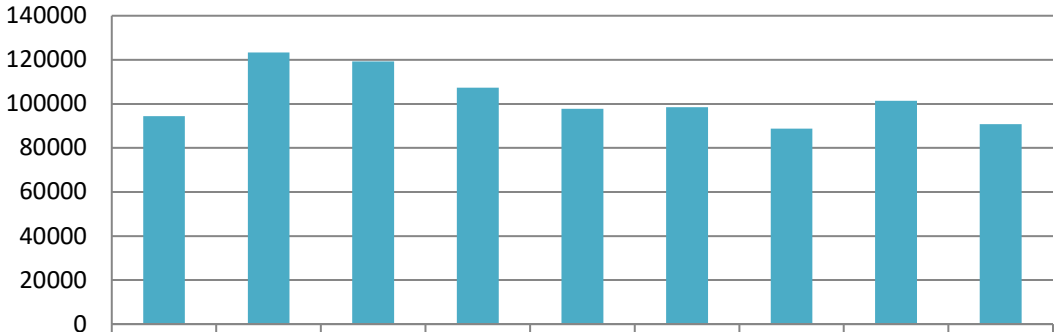
The hydraulic flows reaching the sewage lagoons in 2024 averaged 251 m3/day which represents 65.5% of the 383 m3/day design capacity.

## 4.1 Raw Flow (m3/d)




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Design Capacity | 383 | 383 | 383 | 383 | 383 | 383 | 383 | 383 | 383 | 383 | 383 | 383 |
| Average Daily Flow | 277 | 306 | 360 | 388 | 260 | 223 | 198 | 297 | 182 | 150 | 158 | 211 |
| Maximum Daily Flow | 389 | 443 | 572 | 594 | 318 | 317 | 276 | 492 | 242 | 164 | 181 | 302 |

### *4.1.1 Annual Comparison (m3)*

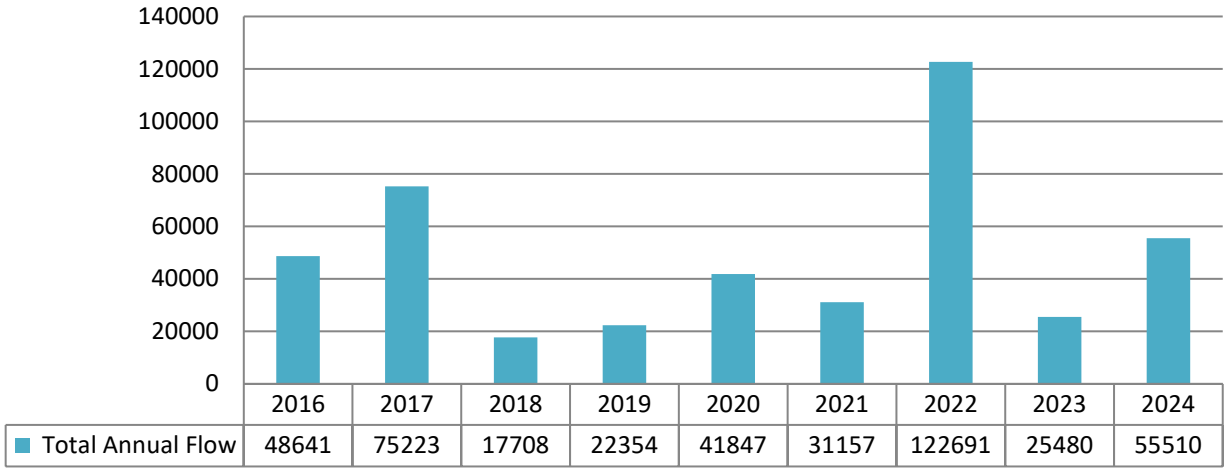



| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| Total Annual Flow | 94371 | 123285 | 119305 | 107288 | 97682 | 98409 | 88766 | 101367 | 90833 |

## 4.2 Discharge Flow

| Discharge Period | Start Date | End Date | Volume Discharged (m3) |
|---|---|---|---|
| Annual Discharge | April 2nd, 2024 | April 9th, 2024 | 55,510 |

### 4.3 Annual Comparison (m3)




| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| Total Annual Flow | 48641 | 75223 | 17708 | 22354 | 41847 | 31157 | 122691 | 25480 | 55510 |

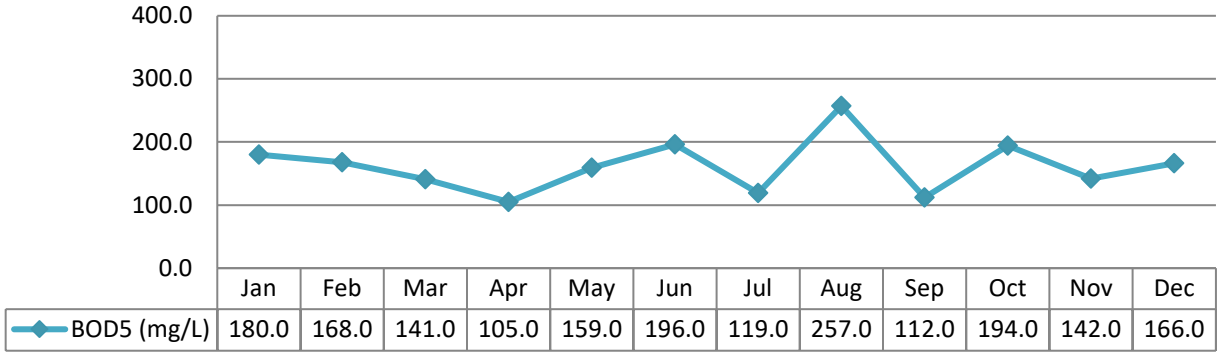
### 4.4 *Imported Waste/Sewage*

There was no imported waste or sewage accepted at this facility in 2024.

## 5 Raw Sewage Quality

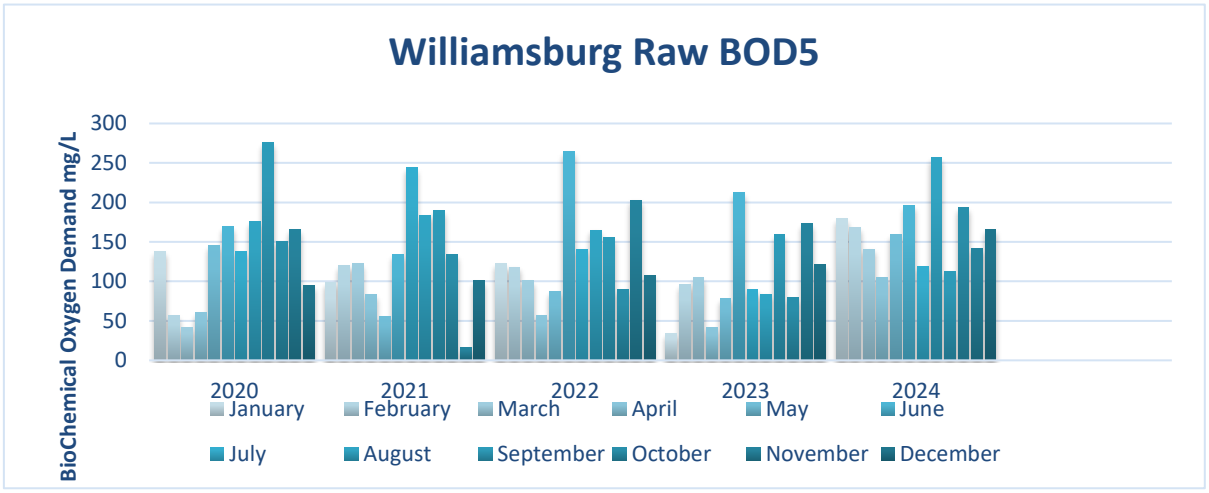
Current year minimum, maximum and averages are available in Appendix A – Performance Assessment Report.

#### *5.1.1 BOD5 (mg/L)*

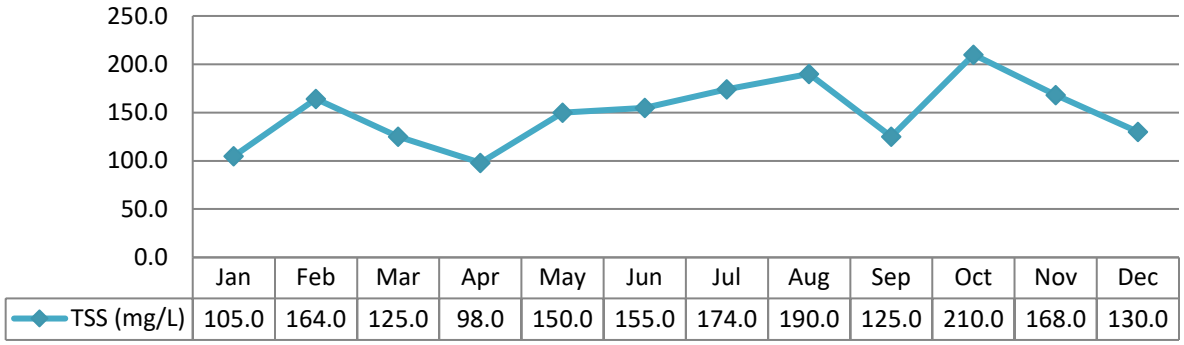



| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOD5 (mg/L) | 180.0 | 168.0 | 141.0 | 105.0 | 159.0 | 196.0 | 119.0 | 257.0 | 112.0 | 194.0 | 142.0 | 166.0 |

#### *5.1.2 5-year BOD5 (mg/L)*

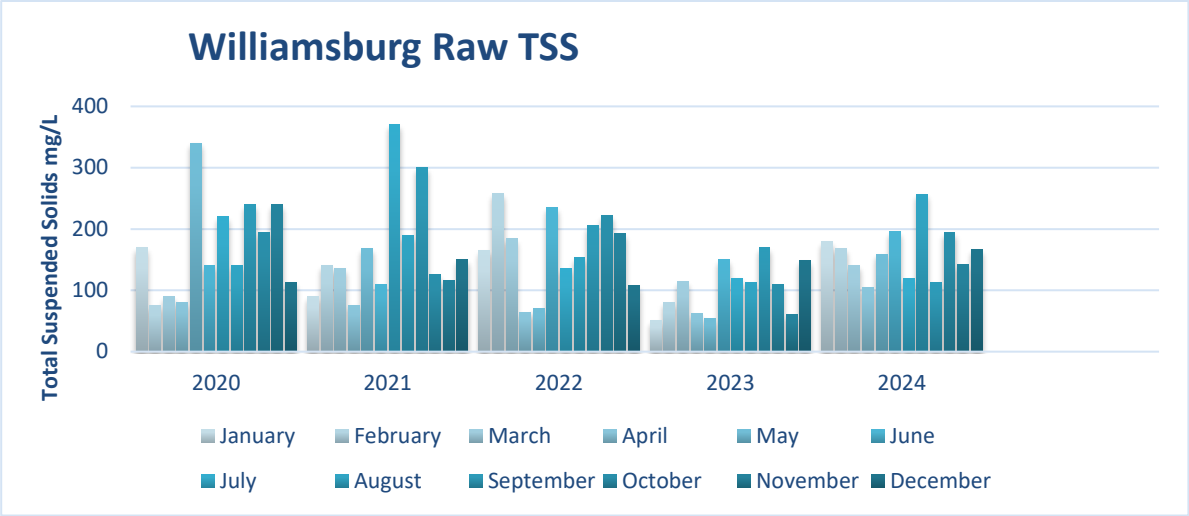


### 5.1.3 *Total Suspended Solids (mg/L)*

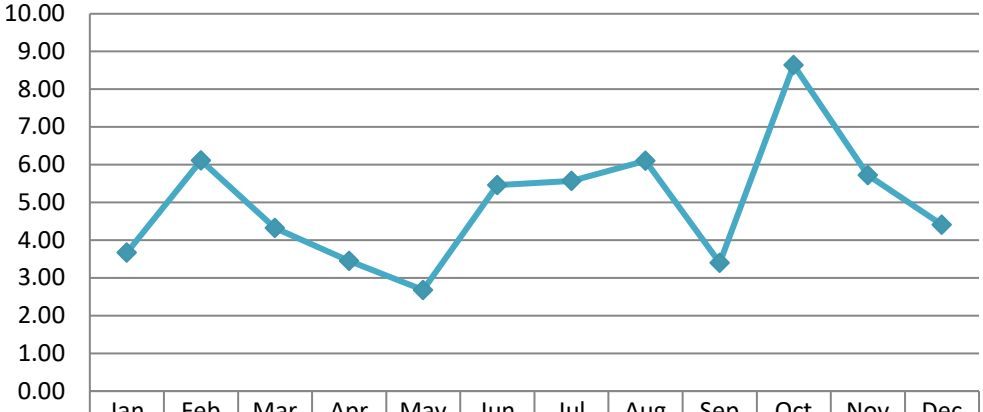



| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSS (mg/L) | 105.0 | 164.0 | 125.0 | 98.0 | 150.0 | 155.0 | 174.0 | 190.0 | 125.0 | 210.0 | 168.0 | 130.0 |

### 5.1.4 *5-year Total Suspended Solids (mg/L)*

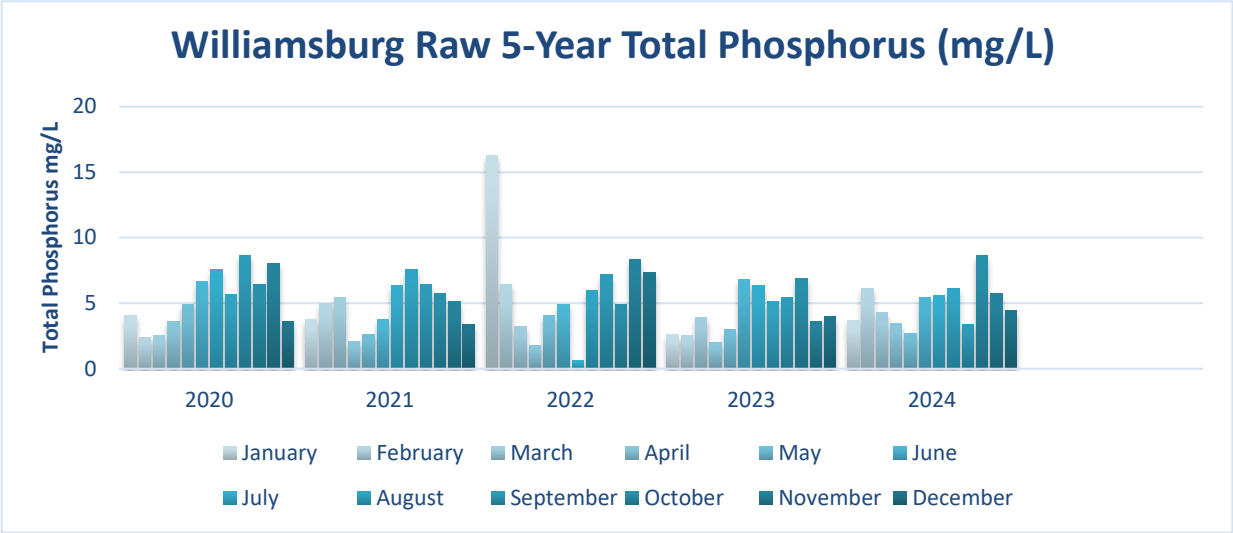



### 5.1.5 *Total Phosphorus (mg/L)*

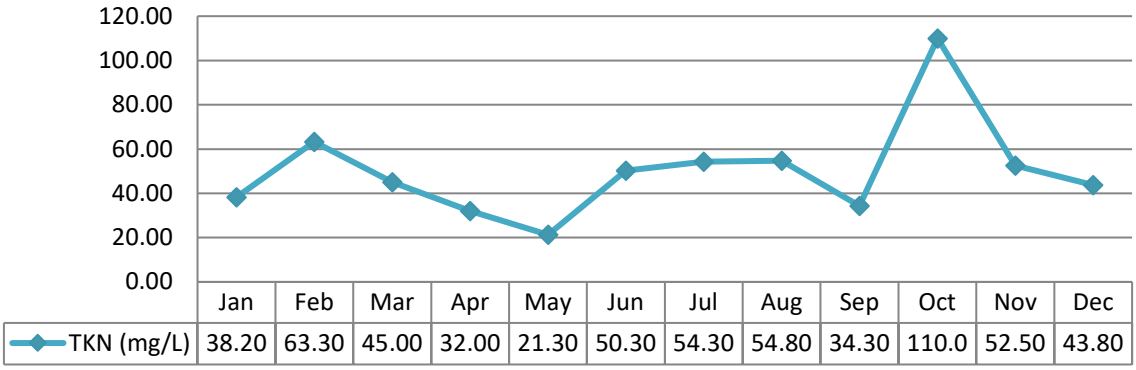



| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Phosphorus (mg/L) | 3.67 | 6.11 | 4.32 | 3.45 | 2.68 | 5.46 | 5.57 | 6.10 | 3.40 | 8.64 | 5.72 | 4.41 |

### 5.1.6 *5-year Total Phosphorus (mg/L)*

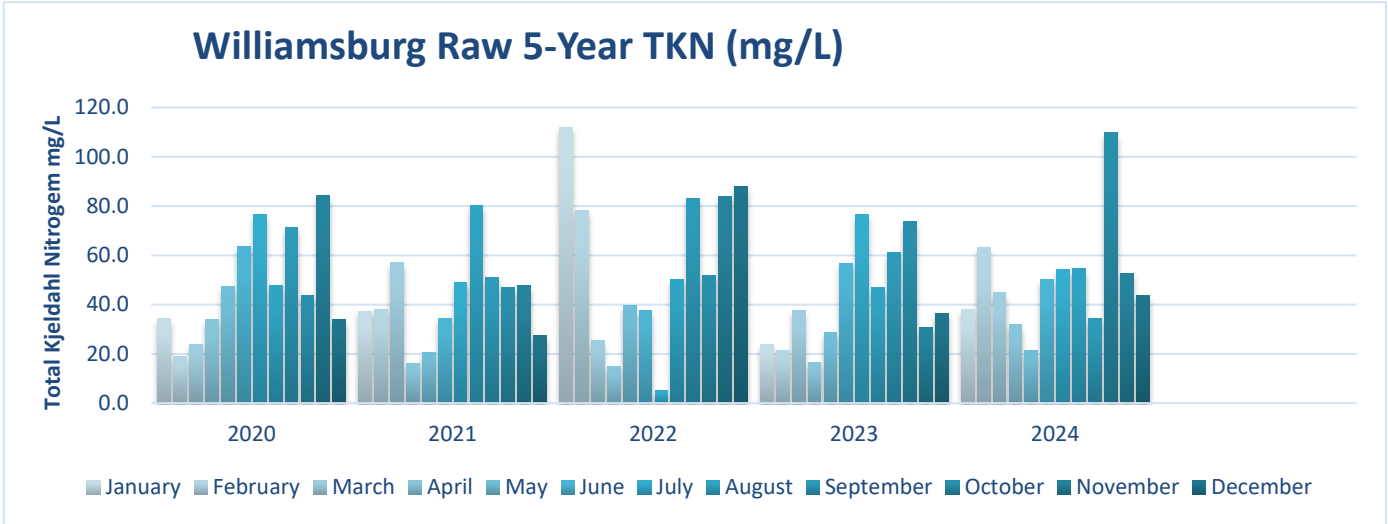



### 5.1.7 *Total Kjeldahl Nitrogen (mg/L)*




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TKN (mg/L) | 38.20 | 63.30 | 45.00 | 32.00 | 21.30 | 50.30 | 54.30 | 54.80 | 34.30 | 110.0 | 52.50 | 43.80 |

### 5.1.8 *5-year Total Kjeldahl Nitrogen (mg/L)*



### 5.2 Imported Waste Quality

There were no imported wastes accepted at this facility in the 2024 reporting period.

# 6 Effluent Quality

For the 2024 discharge period, there were no exceedances of the concentration limits outlined in the facility's Certificate of Approval. The results from the spring discharge can be found tabulated in the Performance Assessment Reports attached in Appendix A.

### 6.1 Effluent Quality Assurance and Control Measures Taken

This system is part of the Municipality of South Dundas. The Municipality's Compliance and Operational Services are delivered by Municipal staff that work to protect the community and public health. The systems are operated to meet compliance with applicable regulations. The system has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents and are updated as required.

The process is reviewed and maintained by certified operators. These operators complete in-house rounds and testing to monitor the process. All Sampling and analysis follow approved methods and protocols for sampling, analysis and recording as specified in the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the publication, "Standard Methods for the Examination of Water and Wastewater".

All final effluent samples collected during the reporting period to meet legislated sampling requirements are submitted to Caduceon Ottawa for analysis, with the exception of pH and temperature. Caduceon Ottawa has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Municipality of South Dundas is ensuring appropriate control measures are undertaken during sample analysis. The pH and temperature parameters are analyzed in the field at the time of sample collection by certified operators, to ensure accuracy and precision of the results obtained.

South Dundas uses a data management system maintained by staff, which includes:

- SharePoint – Municipality of South Dundas Water/Wastewater Site.
  - This online database consolidates all operational data from a variety of sources including field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.

The operations team also has access to in-house Operational Compliance and Process Technicians (PCTs) to assist for emerging process issues. This aids in establishing additional control measures to ensure a quality effluent product.

Detailed sample results for raw sewage and final effluent can be requested from the operating authority.

### 6.2 Effluent Quality Summary

| Parameter | April Result (mg/L) | Limit (mg/L) | Exceedance |
|---|---|---|---|
| BOD | 3.0 | 30 | No |
| Total Suspended Solids | 28.0 | 30 | No |
| Total Phosphorus | 0.37 | N/A | N/A |
| Total Ammonia Nitrogen | 0.12 | N/A | N/A |
| pH | 7.16-8.05 | N/A | N/A |

# 7 Operating Issues/Problems

There were no operating issues in the 2024 reporting period.

### 7.1 Effluent Quality Non-Compliance Summary

| Date | Exceedance of | Limit | Value | Corrective Action |
|---|---|---|---|---|
| No ECA limits were exceeded in 2024 | | | | |

### 7.2 Summary of Abnormal Sewage Discharge Events

Abnormal Discharge Events include Bypass', Overflows, Diversions and Spills of Sewage. Summary Details are included in Appendix B.

### 7.3 Spills (Other than Sewage)

| Date | Location | Details | Volume (m3) | Start Date and Time | End Date and Time |
|---|---|---|---|---|---|
| No spills to report on in 2024. | | | | | |

# 8 Maintenance

Routine planned maintenance activities:

- Inspect, adjust and calibrate process control equipment to ensure proper operation of water distribution systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Carry out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.
- Perform day-to-day maintenance duties to equipment including checking machinery and electrical equipment when required.
- Maintain an equipment inventory
- Maintain accurate records of work conducted, activities, and achievements.

Unplanned maintenance is conducted as required.

### 8.1 Normal Maintenance and Repairs

| Maintenance/Repair |
|---|
| - Wet wells cleaned every quarter<br>- Annual generator load test<br>- Sluice gate wheel repaired due to weather and age |

### 8.2 Emergency Maintenance and Repairs

| Maintenance/Repair | Details |
|---|---|
| No emergency maintenance in 2024. | |

### 8.3 Flow Meter Calibrations and Maintenance

| Location | Date of Calibration | Additional Maintenance |
|---|---|---|
| FIT-01 Williamsburg SPS Flow | May 28th 2024 | None. |

### 8.4 Authorized Alterations in Collection System

| Alteration | Details | Significant Drinking Water Threat (Y/N) |
|---|---|---|
| No alterations were made in 2024. | | |

### 8.5 Notice of Modifications

| Date | Process | Modification | Status |
|---|---|---|---|
| No modifications made in 2024. | | | |

## 9 Sludge Generation

Sludge depth is monitored periodically across the lagoon, and plans for sludge removal are made as required for optimal operation of the wastewater system.

## 10 Summary of Complaints

| Location | Date | Nature of Complaint | Actions Taken |
|---|---|---|---|
| No complaints in 2024. | | | |

# Appendix A

## Appendix A - Performance Assessment Report

**MUNICIPALITY OF SOUTH DUNDAS**
**PERFORMANCE ASSESSMENT REPORT**

**PROJECT:** WILLIAMSBURG SEWAGE — **YEAR:** 2024
**WORKS NUM.:** 3-0456-84-887 — **WATER COURSE:** MCMARTIN DRAIN
**DESCRIPTION:** A TWO CELL LAGOON HAVING A TOTAL SURFACE AREA OF 7.1 HA — **DESIGN CAPACITY:** 383 $m^3$/day

| MONTH | FLOWS | | | | | BIOCHEMICAL $O_2$ DEMAND | | | SUSPENDED SOLIDS | | | PHOSPHORUS | | | TKN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Flow $m^3$ | Avg Day Flow $m^3$ | Max Day Flow $m^3$ | Effluent Flow $m^3$ | Discharge Duration (days) | Avg Raw BOD (mg/L) | Avg Eff BOD (mg/L) | Percent Removal | Avg Raw SS (mg/L) | Avg Eff SS (mg/L) | Percent Removal | Avg Raw PHOS. (mg/L) | Avg Eff PHOS. (mg/L) | Percent Removal | Avg Raw TKN |
| JAN | 8581 | 277 | 389 | | | 180 | | | 105 | | | 3.67 | | | 38.2 |
| FEB | 8888 | 306 | 443 | | | 168 | | | 164 | | | 6.11 | | | 63.3 |
| MAR | 11167 | 360 | 572 | | | 141 | | | 125 | | | 4.32 | | | 45.0 |
| APR | 11643 | 388 | 594 | 55,510 | 6 | 105 | 3.0 | | 98 | 28.0 | | 3.45 | 0.37 | | 32.0 |
| MAY | 8060 | 260 | 318 | | | 159 | | | 150 | | | 2.68 | | | 21.3 |
| JUN | 6682 | 223 | 317 | | | 196 | | | 155 | | | 5.46 | | | 50.3 |
| JUL | 6150 | 198 | 276 | | | 119 | | | 174 | | | 5.57 | | | 54.3 |
| AUG | 8281 | 267 | 492 | | | 257 | | | 190 | | | 6.10 | | | 54.8 |
| SEPT | 5452 | 182 | 242 | | | 112 | | | 125 | | | 3.40 | | | 34.3 |
| OCT | 4663 | 150 | 164 | | | 194 | | | 210 | | | 8.64 | | | 110.0 |
| NOV | 4737 | 158 | 181 | | | 142 | | | 168 | | | 5.72 | | | 52.5 |
| DEC | 6529 | 211 | 302 | | | 166 | | | 130 | | | 4.41 | | | 43.8 |
| TOTAL | 90,833 | | | 55,510 | 6 | | | | | | | | | | |
| AVG | | 249 | | | | 162 | 3.0 | 98.1 | 150 | 28.0 | 81.3 | 4.96 | 0.37 | 92.5 | 50.0 |
| MAX | | | 594 | | | 257 | | | 210 | | | 8.64 | | | |
| CRITERIA | | **383** | | | | | **30** | | | **30** | | | | | |
| COMPLIANCE | | YES | | | | | YES | | | YES | | | | | |

**COMMENTS:** PERCENT REMOVAL BASED ON 12 MONTHS OF RAW COMPOSITE SAMPLES

**MUNICIPALITY OF SOUTH DUNDAS**
**LAGOON PERFORMANCE ASSESSMENT REPORT**

**PROJECT:** WILLIAMSBURG LAGOON — **YEAR:** 2024
**WORKS NUM.:** 3-0456-84-887 — **WATER COURSE:** MCMARTIN DRAIN
**DESCRIPTION:** A TWO CELL LAGOON HAVING A TOTAL SURFACE AREA OF 7.1 HA — **DESIGN CAPACITY:** 383 $m^3$/day

| | SAMPLE RESULTS DATE | SPRING 02-Apr | 04-Apr | 09-Apr-24 | 55,510 Average | $m^3$ C of A Limit* |
|---|---|---|---|---|---|---|
| | BOD (mg/L) | 3 | 3 | 3 | 3.0 | **30** |
| | TSS (mg/L) | 70 | 11 | 3 | 28.0 | **30** |
| **Minimum** | TP (mg/L) | 0.51 | 0.3 | 0.3 | 0.37 | |
| **2x per Week** | $NH_3$ (mg/L) | 0.12 | 0.13 | 0.11 | 0.12 | |
| **Sample Collection** | $NO_2$ (mg/L) | <0.05 | <0.05 | <0.05 | | |
| | $NO_3$ (mg/L) | 0.16 | 0.14 | 0.06 | | |
| | TKN (mg/L) | 2.3 | 1.3 | 1.3 | | |
| | S2- (mg/L) | <0.16 | 0.02 | <0.01 | | |

| EFFLUENT FLOW | |
|---|---|
| DATE | Flow ($m^3$/d) |
| 02-Apr | Start |
| 03-Apr | 21,840 |
| 04-Apr | 7,280 |
| 05-Apr | 2,730 |
| 08-Apr | 3,640 |
| 09-Apr | 20,020 |

*910 m3 per inch

| | | | |
|---|---|---|---|
| pH | 8.05 | 7.16 | 7.62 |
| Temp | 11.9 | 9 | 10.3 |
| S2- (mg/L) | <0.16 | 0.02 | <0.01 |
| % | --- | 55.9 | --- |
| undissociated H2S | ND | 0.0112 | ND |

# Appendix B

## Appendix B - Details of Abnormal Sewage Discharge Events

### Event Details Summary

*Facility Bypass*

| Date | Location | Details | Volume (m3) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| No bypass's of Williamsburg Sewage Lagoon to report in 2024. | | | | | | | | |

*Facility Overflow*

| Date | Location | Details | Volume (m3) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| No facility overflows to report in 2024. | | | | | | | | |

*Collection Overflow*

| Date | Location | Details | Volume (m3) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| No collection overflows to report in 2024. | | | | | | | | |

*Spills of Sewage*

| Date | Location | Details | Volume (m3) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| No spills of sewage to report in 2024. | | | | | | | | |

# Appendix C

## Appendix C - ECA Annual Report Requirements

| Facility ECA # 3-0456-84-887 | Section in Report |
|---|---|
| No section in the CofA references an annual report. | N/A |

| Collection ECA # # 165-W601<br>Schedule E | |
|---|---|
| 4.6.3 If applicable, includes a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations. | Operating Issues and Problems |
| 4.6.4 Includes a summary of any operating problems encountered and corrective actions taken. | Operating Issues and Problems |
| 4.6.5 Includes a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System. | Maintenance |
| 4.6.6 Includes a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints. | Summary of Complaints |
| 4.6.7 Includes a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat. | Maintenance |
| 4.6.8 Includes a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including:<br>a) Dates;<br>b) Volumes and durations;<br>c) If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli;<br>d) Disinfection, if any; and<br>e) Any adverse impact(s) and any corrective actions, if applicable. | Operating Issues and Problems |
| 4.6.9 Includes a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable:<br>a) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.<br>b) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines.<br>c) An assessment of the effectiveness of each action taken.<br>d) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.<br>e) Public reporting approach including proactive efforts. | Maintenance<br>Operating Issues and Problems |