# Winchester Wastewater System

Sewage Works # 110001202

# Annual Report

Prepared for: Township of North Dundas

Reporting Period of January 1st – December 31st 2025

Issued: March 25, 2026

Revision: 0

Operating Authority:

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

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

| Document | Document # | Issue Date | Issue Number |
|---|---|---|---|
| Facility ECA | A-500-1199362894 | October 13, 2023 | 1.0 |
| ECA for Municipal Sewage Collection System | 180-W601 | October 27, 2022 | 1 |

# Table of Contents

# 1 Revision History

| Date | Rev# | Revisions |
|---|---|---|
| 2026-03-25 | 0 | Annual Report Issued |

# 2 Operations and Compliance Reliability Indices

| Compliance Event | # of Events |
|---|---|
| Environment Canada Inspections | 0 |
| Ministry of Environment Inspections | 0 |
| Ministry of Labour Inspections | 0 |
| Non-Compliance | 1 |
| Community Complaints | 0 |
| Spills/Overflows/Bypasses | 1/0/0 |
| Sewer Main Blockages | 1 |

# 3 System Process Description

Winchester's wastewater system consists of a gravity fed sanitary sewage collection system, four pumping stations and a wastewater treatment lagoon. The main sewage pumping station is located on Ottawa Street and discharges directly to the lagoons. There are also two pumping stations located on Main Street and one on St. Lawrence Street which pump wastewater to the Ottawa St. SPS. Aluminum sulphate is dosed continuously for phosphorus control as wastewater is pumped to the lagoons.

The Township of North Dundas initiated a Class Environmental Assessment of Winchester's wastewater treatment system in 2017 to address various operational challenges, such as hydraulic capacity, discharge constraints and treatment capabilities in order to ensure that increased wastewater flows from future growth can be effectively accommodated. The construction of the SAGR system commenced in 2023. Commissioning of the new treatment system started in the spring of 2025 and will be concluded in early 2026. The SAGR treatment system is expected to reach substantial completion in April 2026.

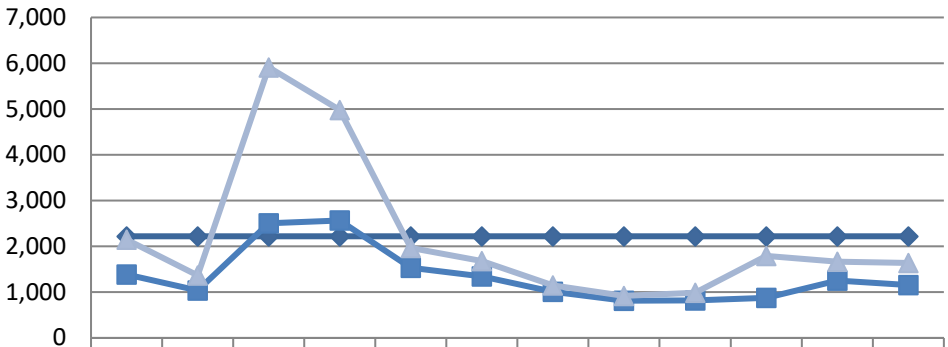
The wastewater treatment system consists of a five cell lagoon system and two Submerged Attached Growth Reactors (SAGRs) with a rated capacity of 2,220 $m^3$/d. The three primary facultative treatment cells are operated in parallel (Cells 1, 2 and 3). Wastewater flows from the primary cells to Cell 4, then to Cell 5 and finally to the SAGRs (Cells 6A and 6B) before being discharged. When the system is not discharging to the river, the SAGR effluent is recirculated to Cell 4 or Cell 2. Seasonal discharge of effluent from the lagoons is permitted at specific times during the spring and fall each year. As of 2026, the effluent from the lagoons will be discharged from November 1 to April 30 each year. During the regulated discharge period, SAGR effluent is conveyed over 7.3 kilometers to an outlet in the South Nation River.

# 4 Wastewater System Flows

The hydraulic flows reaching the sewage lagoons in 2025 averaged 1358.3 $m^3$/day which represents 61.2% of the 2,220 $m^3$/day design capacity.

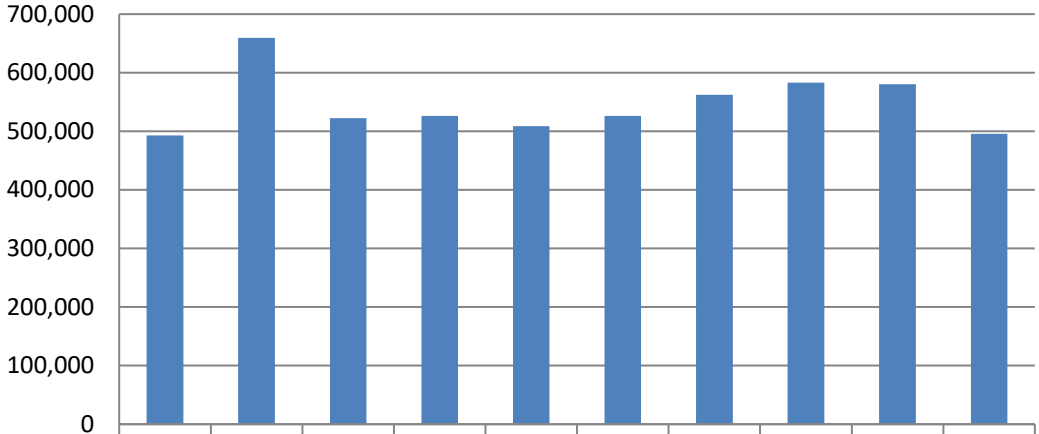
## 4.1 Raw Flows

2025 Raw Flows ($m^3$/d):




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Design Capacity ($m^3$/d) | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 | 2220 |
| Avg Flow ($m^3$/d) | 1389 | 1034 | 2504 | 2565 | 1530 | 1342 | 1011 | 813 | 818 | 874 | 1251 | 1155 |
| Max Flow ($m^3$/d) | 2144 | 1367 | 5912 | 4982 | 1965 | 1681 | 1147 | 918 | 985 | 1794 | 1663 | 1638 |

Annual Raw Flow Comparison ($m^3$):




| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Annual Flow ($m^3$) | 493,104 | 659,787 | 522,507 | 526,483 | 508,868 | 526,193 | 562,461 | 582,970 | 580,436 | 495,796 |

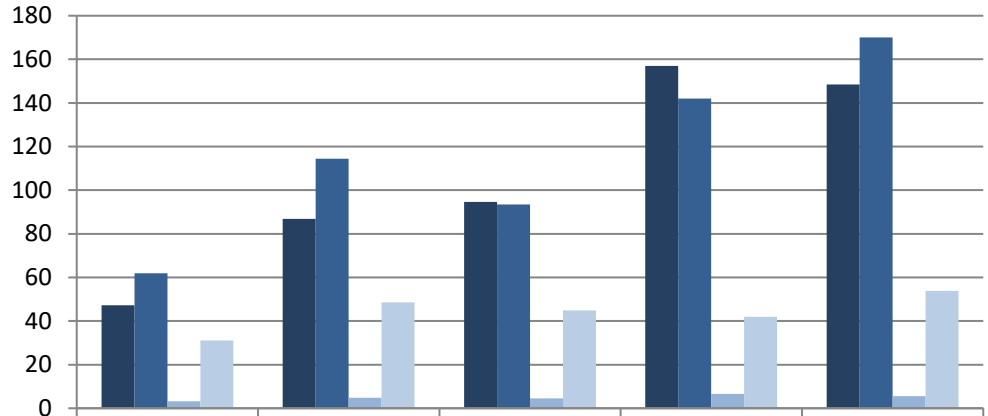
## 4.2 Effluent Flow

| Discharge Period | Start Date | End Date | Volume Discharged ($m^3$) |
|---|---|---|---|
| Spring Discharge | April 8, 2025 | April 30, 2025 | 138,903 |
| Fall Discharge | November 3, 2025 | December 15, 2025 | 151,442 |
| | | **Total Flow Discharged** | 290,345 |

# 5 Raw Sewage Quality

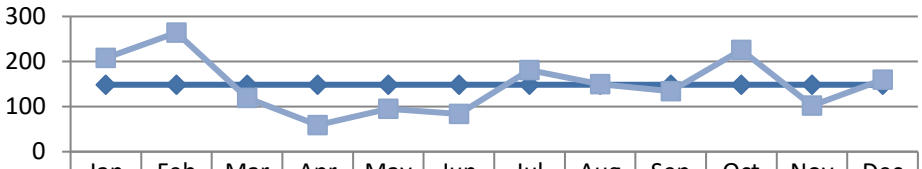
2025 monthly results are available in Appendix A – Performance Assessment Reports.

Annual Comparison (mg/L):



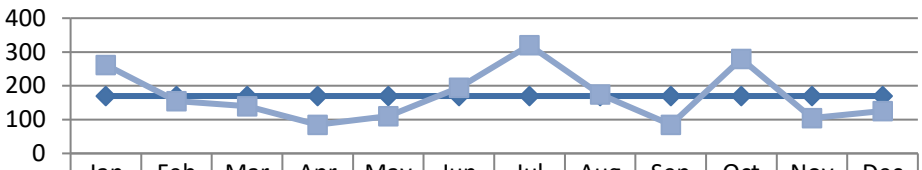

| | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| BOD5 Annual Average | 47 | 87 | 95 | 157 | 149 |
| TSS Annual Average | 62 | 114 | 94 | 142 | 170 |
| TP Annual Average | 3.23 | 4.86 | 4.52 | 6.60 | 5.55 |
| TKN Annual Average | 31.1 | 48.6 | 44.9 | 42.0 | 53.8 |

## 5.1 Biochemical Oxygen Demand (5-Day)



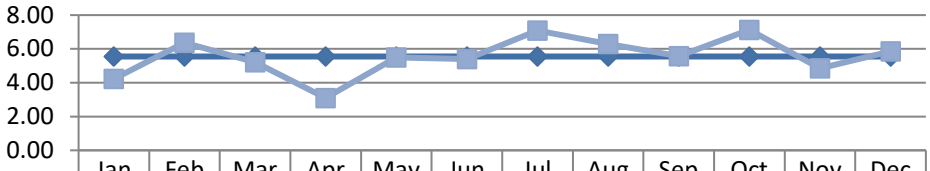

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Average (mg/L) | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 |
| Monthly Results (mg/L) | 208 | 264 | 119 | 59 | 95 | 84 | 181 | 150 | 134 | 226 | 102 | 160 |

## 5.2 Total Suspended Solids



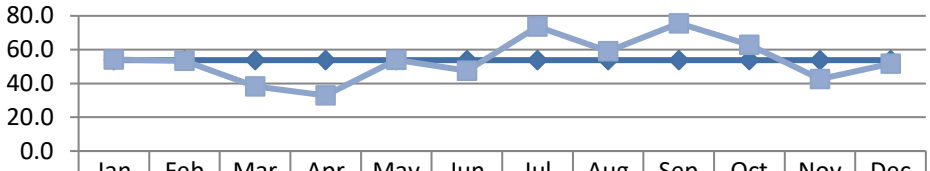

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Average (mg/L) | 170 | 170 | 170 | 170 | 170 | 170 | 170 | 170 | 170 | 170 | 170 | 170 |
| Monthly Results (mg/L) | 262 | 155 | 140 | 85 | 110 | 195 | 320 | 175 | 85 | 280 | 105 | 125 |

### 5.3 Total Phosphorus




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Average (mg/L) | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 | 5.55 |
| Monthly Results (mg/L) | 4.22 | 6.36 | 5.22 | 3.10 | 5.50 | 5.41 | 7.09 | 6.29 | 5.58 | 7.13 | 4.86 | 5.85 |

### 5.4 Total Kjeldahl Nitrogen




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Average (mg/L) | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 |
| Monthly Results (mg/L) | 54.2 | 53.4 | 38.2 | 32.9 | 53.9 | 47.5 | 73.6 | 59.1 | 75.6 | 62.8 | 42.6 | 51.6 |

# 6 Effluent Quality

The results from the spring and fall discharge periods are tabulated below. Please refer to the Performance Reports in Appendix A and the 'Operational Issues' section of this report for further information.

### 6.1 Effluent Quality Assurance or Control Measures

This system is part of the Ontario Clean Water Agency's Nation Valley Cluster. The cluster is supported by the Eastern Regional Hub and corporate resources. Operational Services are provided by OCWA employees who work in the community. The system is 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. These documents are also part of OCWA's Quality & Environmental Management System.

Effluent control measures include pre-discharge sampling and testing of lagoon cell contents prior to seasonal discharges. The samples are collected by OCWA's competent and licensed staff using approved methods and protocols for sampling including those 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 effluent samples collected during the reporting period to meet legislated sampling requirements were submitted to Caduceon Environmental Laboratories in Ottawa for analysis, with the exception of pH,

temperature, dissolved oxygen and unionized ammonia. Caduceon is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accredited labs must meet strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, OCWA is ensuring appropriate control measures are undertaken during laboratory testing. The pH, temperature and dissolved oxygen samples are analyzed in the field at the time of sample collection by certified operators to ensure accuracy and precision of the results obtained. Un-ionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility's ECA.

OCWA uses several computer systems which include:

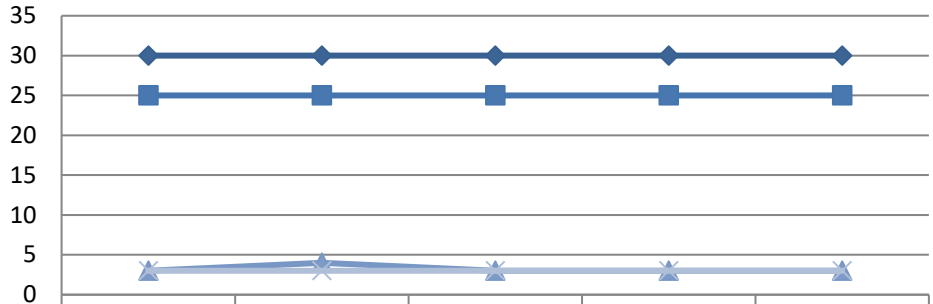
- Process Data Management (PDM)
  - This database consolidates all operational data from a variety of sources including field data, online instrumentation, and electronically uploaded lab test results for reporting, tracking and analysis.
- Maximo – OCWA's Work Management System (WMS)
  - This program is used to track and schedule maintenance activities for all equipment in the system. It is also used to assign specific operational tasks to staff.
- Wonderware (OUTPOST5)/SCADA
  - OCWA's SCADA system allows for process automation, process adjustments, data logging, trending review and remote alarming.

The operations team also has access to a network of compliance and process specialists to assist with process issues.

## 6.2 Carbonaceous Biochemical Oxygen Demand (5-Day)

| Discharge Period | Seasonal Average (mg/L) | Objective (mg/L) | Objective Exceedance (Y/N) | Limit (mg/L) | Limit Exceedance (Y/N) |
|---|---|---|---|---|---|
| Spring | 3.2 | 25.0 | N | 30.0 | N |
| Fall | 3.0 | 25.0 | N | 30.0 | N |

Effluent $CBOD_5$ Results:

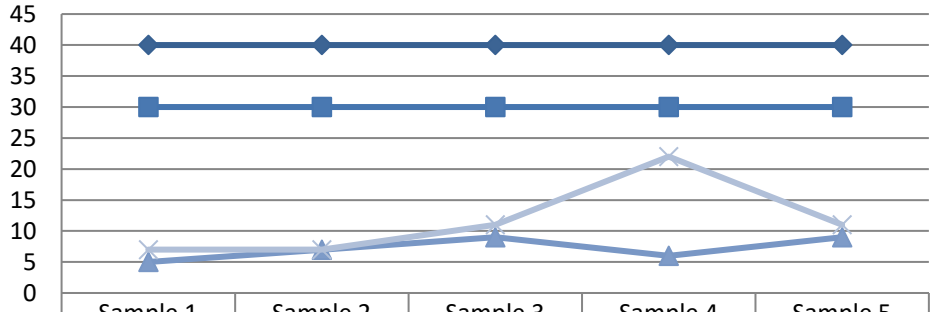



| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Limit (mg/L) | 30 | 30 | 30 | 30 | 30 |
| Objective (mg/L) | 25 | 25 | 25 | 25 | 25 |
| Result - Spring (mg/L) | < 3 | 4 | < 3 | < 3 | < 3 |
| Result- Fall (mg/L) | < 3 | < 3 | < 3 | < 3 | 3 |

## 6.3 Total Suspended Solids

| Discharge Period | Seasonal Average (mg/L) | Objective (mg/L) | Objective Exceedance (Y/N) | Limit (mg/L) | Limit Exceedance (Y/N) |
|---|---|---|---|---|---|
| Spring | 7.2 | 30.0 | N | 40.0 | N |
| Fall | 11.6 | 30.0 | N | 40.0 | N |

Effluent TSS Results:

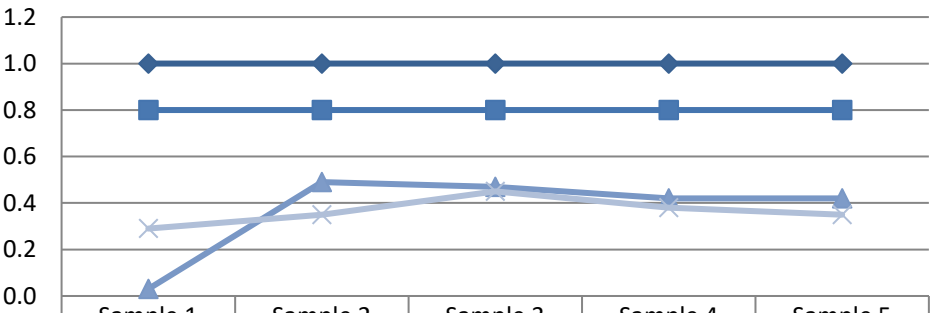



| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Limit (mg/L) | 40 | 40 | 40 | 40 | 40 |
| Objective (mg/L) | 30 | 30 | 30 | 30 | 30 |
| Result - Spring (mg/L) | 5 | 7 | 9 | 6 | 9 |
| Result - Fall (mg/L) | 7 | 7 | 11 | 22 | 11 |

## 6.4 Total Phosphorus

| Discharge Period | Seasonal Average (mg/L) | Objective (mg/L) | Objective Exceedance (Y/N) | Limit (mg/L) | Limit Exceedance (Y/N) |
|---|---|---|---|---|---|
| Spring | 0.37 | 0.8 | N | 1.0 | N |
| Fall | 0.36 | 0.8 | N | 1.0 | N |

Effluent TP Results:



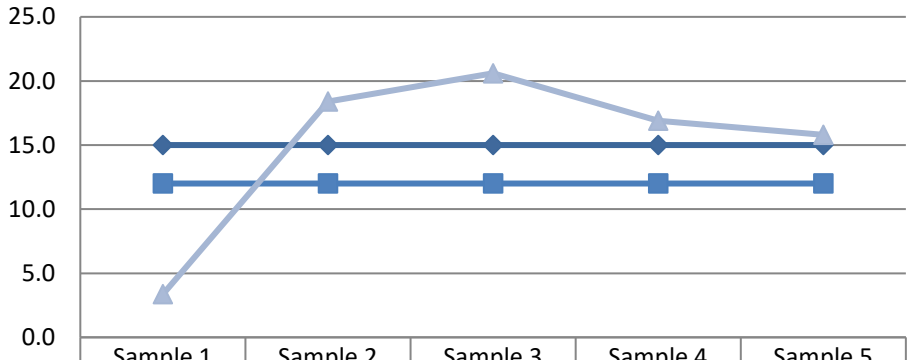

| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Limit (mg/L) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Objective (mg/L) | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| Result - Spring (mg/L) | 0.03 | 0.49 | 0.47 | 0.42 | 0.42 |
| Result - Fall (mg/L) | 0.29 | 0.35 | 0.45 | 0.38 | 0.35 |

## 6.5 Total Ammonia Nitrogen

| Discharge Period | Seasonal Average (mg/L) | Objective (mg/L) | Objective Exceedance (Y/N) | Limit (mg/L) | Limit Exceedance (Y/N) |
|---|---|---|---|---|---|
| Spring | 15.01 | 12.0 | Y* | 15.0 | Y* |
| Fall | 1.83 | 4.0 | N | 7.0 | N |

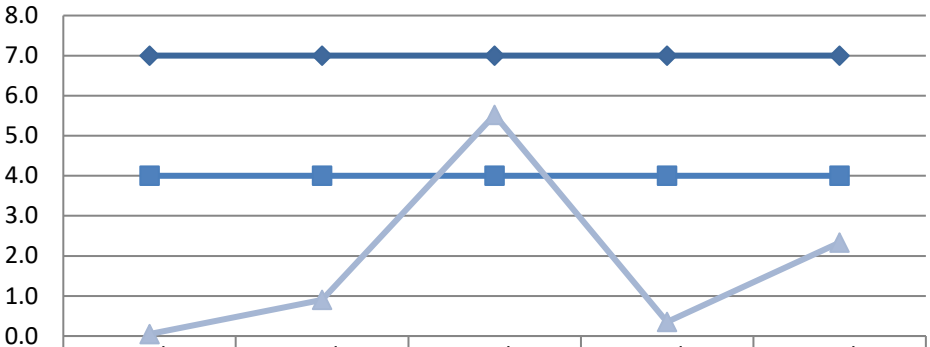
**Please refer to the 'Operating Issues' section of this report for details.*

Effluent TAN Results for Spring Discharge Period:




| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Limit - Spring (mg/L) | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Objective - Spring (mg/L) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| Result - Spring (mg/L) | 3.4 | 18.4 | 20.6 | 16.9 | 15.8 |

Effluent TAN Results for Fall Discharge Period:




| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Limit - Fall (mg/L) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Objective - Fall (mg/L) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Result - Fall (mg/L) | 0.1 | 0.9 | 5.5 | 0.4 | 2.3 |

## 6.6 Undissociated Hydrogen Sulphide

| Discharge Period | Seasonal Average (mg/L) | Objective (mg/L) | Objective Exceedance (Y/N) | Limit (mg/L) | Limit Exceedance (Y/N) |
|---|---|---|---|---|---|
| Spring | Non-Detectable | Non-Detectable | N | 0.02 | N |
| Fall | Non-Detectable | Non-Detectable | N | - | N/A |

Effluent Undissociated $H_2S$ Results for Spring Discharge Period:

| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Average |
|---|---|---|---|---|---|---|
| $S^{2-}$ (mg/L) | < 0.01 | < 0.16 | < 0.08 | < 0.01 | < 0.08 | ND |
| pH | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 | N/A |
| Temp | 6.0 | 8.6 | 9.9 | 11.7 | 13.1 | N/A |
| % Undissociated $H_2S$ (from table) | 18.8 | 20.5 | 19.7 | 22.4 | 18.2 | N/A |
| Undissociated $H_2S$ (mg/L) | ND | ND | ND | ND | ND | ND |

Effluent Undissociated $H_2S$ Results for Fall Discharge Period:

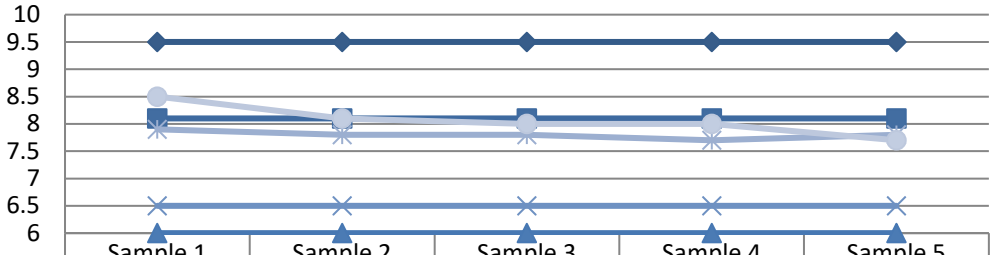
| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Average |
|---|---|---|---|---|---|---|
| $S^{2-}$ (mg/L) | < 0.01 | < 0.08 | < 0.08 | < 0.80 | < 0.08 | ND |
| pH | 8.5 | 8.1 | 8.0 | 8 | 7.7 | N/A |
| Temp | 9.4 | 9.3 | 6.6 | 6.6 | 9.5 | N/A |
| % Undissociated $H_2S$ (from table) | 4.8 | 11.3 | 14.9 | 14.9 | 23.9 | N/A |
| Undissociated $H_2S$ (mg/L) | ND | ND | ND | ND | ND | ND |

## 6.7 pH

| Discharge Period | Seasonal Average | Objective | Objective Exceedance (Y/N) | Limit | Limit Exceedance (Y/N) |
|---|---|---|---|---|---|
| Spring | 7.8 | 6.5 – 8.1 | N | 6.0 – 9.5 | N |
| Fall | 8.1 | 6.5 – 8.1 | Y* | 6.0 – 9.5 | N |

**Please refer to the 'Operating Issues' section of this report for details.*

Effluent pH Results:

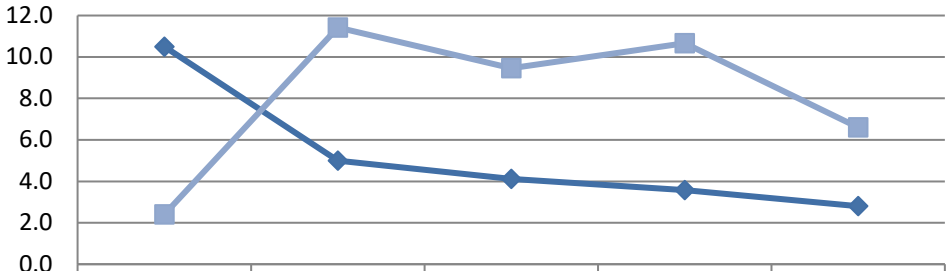



| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Upper Limit | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 |
| Upper Objective | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 |
| Lower Limit | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lower Objective | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Result - Spring | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 |
| Result - Fall | 8.5 | 8.1 | 8.0 | 8.0 | 7.7 |

### 6.8 Dissolved Oxygen

There are no dissolved oxygen objectives or limits specified in the facility's ECA.

Effluent D.O. Results:




| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| Result (mg/L) - Spring | 10.5 | 5.0 | 4.1 | 3.6 | 2.8 |
| Result (mg/L) - Fall | 2.4 | 11.4 | 9.5 | 10.7 | 6.6 |

## 7 Operating Issues

The pH remained within the limits in all effluent samples collected in 2025 but exceeded the upper objective in the first sample collected for the fall discharge.

### 7.1 Effluent Quality Non-Compliance Summary

| Date | Exceedance of | Limit | Value | Corrective Action |
|---|---|---|---|---|
| Spring Discharge | TAN Limit | 15 mg/L | 15.01 mg/L | Five effluent samples were collected over the course of the spring discharge. While a low concentration of TAN was detected in the first effluent sample, the concentration was above the limit for the remainder of the samples collected. It should be noted that effluent was discharged from the lagoon at a relatively low flow rate (~74 l/s) for the duration of the discharge.<br><br>Winchester's lagoon system has been under construction for the installation of a new SAGR treatment system, which provides nitrification and thereby reduces TAN concentrations in the final effluent. |

### 7.2 Summary of Abnormal Sewage Discharge Events

Abnormal discharge events include bypasses, overflows, and spills of sewage. No bypasses, no overflows and one spills of sewage occurred during the reporting period. 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 |
|---|---|---|---|---|---|
| None to report. | | | | | |

# 8 Maintenance

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports.

OCWA uses a Workplace Management System (WMS). WMS is a maintenance tracking system that can generate work orders as well as provide summaries of completed and scheduled work. During the year, the operating authority generates scheduled work orders on a planned frequency. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is added to the system and completed as required.

Routine planned maintenance activities scheduled in WMS include:

- Inspecting, adjusting and calibrating process control equipment to ensure proper operation of sewage collection systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Carrying out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.

Planned maintenance activities are communicated to the individuals responsible for completing the task through the issuance of WMS work orders. Work orders are generated automatically on a schedule based on the manufacturer's recommendations and/or site specific operational and maintenance needs, and are assigned directly to the appropriate operations personnel. Work orders are electronically completed in WMS by the person responsible for completing the task. Unplanned maintenance is carried out as needed.

Suggested capital projects and major maintenance recommendations are provided to the Township of North Dundas annually by OCWA. This list is developed the operations team and provides recommendations for facility components requiring upgrading or improvement.

### 8.1 Maintenance and Repair Summary

| Description |
|---|
| - Performed routine sewer flushing & wet well cleanings<br>- Completed annual generator maintenance<br>- Replaced water pump on generator at Ottawa St. SPS<br>- Completed annual flow meter calibration<br>- Completed annual backflow preventer inspection<br>- Installed new flow hour meter for pump #3 at Ottawa St. SPS<br>- Installed new UPS units in all outpost panels<br>- Replaced wet well ladders at Main St. SPS and St-Lawrence St. SPS |

| Description |
|---|
| - Installed new check valves on pump 1 and 2 at Ottawa St SPS<br>- Replaced exterior doors (1 x single door and 2 x double door) at Ottawa St SPS<br>- Replaced double exterior door for pump room at lagoon<br>- Replaced heater in discharge pump room at lagoon<br>- Installed two new sewer connections / clean out on Alexandre St.<br>- Cleaned sewer blockage in between last manhole and Main St SPS with vacuum truck<br>- Repaired sewer main break on Main St. SPS force main |

### 8.2 Flow Meter Calibration and Maintenance

| Location | Date of Calibration | Additional Maintenance |
|---|---|---|
| Lagoon Effluent Flow Meter | April 15, 2025 | n/a |

### 8.3 Authorized Alterations in Collection System

| Work Order | Details | Significant Drinking Water Threat (Y/N) |
|---|---|---|
| None to Report | | |

### 8.4 Notice of Modifications

| Date | Process | Modification | Status |
|---|---|---|---|
| Substantial completion expected in April 2026 | Wastewater Treatment | Construction of SAGR treatment system Commissioning began in 2025 | Ongoing |

## 9 Sludge Generation

Sludge depth is monitored periodically, and plans for sludge removal are made as required for optimal operation of the lagoon system. Sludge levels in all ponds were measured in 2025. The measurements were as follows:

| Lagoon Cell | Sludge Depth |
|---|---|
| Cell 1 | 4” – 6” |
| Cell 2 | 3” – 6” |
| Cell 3 | 3” – 6” |
| Cell 4 | 4” – 8” |
| Cell 5 | 0 “ |

### 9.1 Sludge Disposal Summary

Sludge from Cell 2 & Cell 3 was removed in the early 2000s. Sludge was removed from Cell 5 in 2023, stored onsite in geotubes to dry, and then hauled with the geotubes to the municipal landfill (Boyne Road) in 2025.

## 10 Summary of Complaints

There were no complaints received in 2025.

# Appendix A – Performance Assessment Reports

## WINCHESTER WASTEWATER PERFORMANCE ASSESSMENT REPORT

| MONTH | FLOWS | | | | | | CBOD5 | | | TOTAL SUSPENDED SOLIDS | | | PHOSPHORUS | | | TKN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL FLOW m³ | AVG DAY FLOW m³ | MAX DAY FLOW m³ | EFFLUENT FLOW m³ | DISCHARGE DURATION (days) | Avg. Alum Dosage (mg/L) | AVG RAW BOD5 (mg/L) | AVG EFF CBOD5 (mg/L) | PERCENT REMOVAL (%) | AVG RAW TSS (mg/L) | AVG EFF TSS (mg/L) | PERCENT REMOVAL (%) | AVG RAW PHOS. (mg/L) | AVG EFF PHOS. (mg/L) | PERCENT REMOVAL (%) | AVG RAW TKN (mg/L) |
| **JAN** | 43,055 | 1,389 | 2,144 | | | 106.7 | 208 | | | 262 | | | 4.22 | | | 54.2 |
| **FEB** | 28,955 | 1,034 | 1,367 | | | 107.0 | 264 | | | 155 | | | 6.36 | | | 53.4 |
| **MAR** | 77,629 | 2,504 | 5,912 | | | 106.1 | 119 | | | 140 | | | 5.22 | | | 38.2 |
| **APR** | 76,953 | 2,565 | 4,982 | 138,903 | 23 | 108.8 | 59 | 3.2 | | 85 | 7.2 | | 3.10 | 0.37 | | 32.9 |
| **MAY** | 47,436 | 1,530 | 1,965 | | | 106.6 | 95 | | | 110 | | | 5.50 | | | 53.9 |
| **JUN** | 40,271 | 1,342 | 1,681 | | | 106.4 | 84 | | | 195 | | | 5.41 | | | 47.5 |
| **JUL** | 31,353 | 1,011 | 1,147 | | | 109.1 | 181 | | | 320 | | | 7.09 | | | 73.6 |
| **AUG** | 25,214 | 813 | 918 | | | 110.1 | 150 | | | 175 | | | 6.29 | | | 59.1 |
| **SEP** | 24,531 | 818 | 985 | | | 110.9 | 134 | | | 85 | | | 5.58 | | | 75.6 |
| **OCT** | 27,084 | 874 | 1,794 | | | 108.7 | 226 | | | 280 | | | 7.13 | | | 62.8 |
| **NOV** | 37,518 | 1,251 | 1,663 | 95,400 | 28 | 109.4 | 102 | 3.0 | | 105 | 8.3 | | 4.86 | 0.36 | | 42.6 |
| **DEC** | 35,798 | 1,155 | 1,638 | 56,042 | 15 | 110.1 | 160 | 3.0 | | 125 | 16.5 | | 5.85 | 0.36 | | 51.6 |
| **TOTAL** | 495,796 | | SPRING | 138,903 | 23 | | | | | | | | | | | |
| **TOTAL** | | | FALL | 151,442 | 43 | | | | | | | | | | | |
| **AVG** | | 1,358 | | | | 108.3 | 148.5 | 3.1 | 97.9 | 170 | 9.4 | 94.5 | 5.55 | 0.36 | 93.5 | 53.8 |
| **MAX** | | | 5,912 | | | | 264 | | | 320 | | | 7.13 | | | 75.6 |
| **CRITERIA** | | **2,220** | | SPRING | **21** | | | **30** | | | **40** | | | **1** | | |
| **CRITERIA** | | | | FALL | **21** | | | **30** | | | **40** | | | **1** | | |

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

## EFFLUENT LOADING

| TOTAL LOADING | SPRING | FALL | TOTAL | ECA LIMIT |
|---|---|---|---|---|
| CBOD (kg) | 444 | 454 | **899** | **24,309** |
| SS (kg) | 1,000 | 1,757 | **2,757** | **32,412** |
| TP (kg) | 51 | 55 | **106** | **810.3** |
| $NH_3$ (kg) | 2,085 | 277 | **2,362** | **-** |

## EFFLUENT SAMPLE RESULTS – SPRING

| | SAMPLE RESULTS | SPRING | | | | | | 138,903 $m^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | DATE | 08-Apr | 16-Apr | 22-Apr | 27-Apr | 30-Apr | Average | **C of A Objective** | **C of A Limit** |
| SAMPLE 5X/DISCHARGE | CBOD (mg/L) | <3 | 4 | <3 | <3 | <3 | 3.2 | **25** | **30** |
| | TSS (mg/L) | 5 | 7 | 9 | 6 | 9 | 7.2 | **30** | **40** |
| | TP (mg/L) | 0.03 | 0.49 | 0.47 | 0.42 | 0.42 | 0.37 | **0.8** | **1** |
| | DO (mg/L) | 10.5 | 5.0 | 4.1 | 3.6 | 2.8 | 5.2 | **-** | **-** |
| | N-$NH_3$ (mg/L) | 3.36 | 18.4 | 20.6 | 16.9 | 15.8 | 15.01 | **12** | **15** |
| | Un-ionized $NH_3$ (mg/L)* | 0.04 | 0.19 | 0.24 | 0.18 | 0.23 | | | |
| START, 25%, 50%, 75%, END | $NO_2$ (mg/L) | <0.4 | <0.4 | <0.40 | <0.40 | <0.05 | | | |
| | $NO_3$ (mg/L) | <0.4 | <0.4 | <0.40 | <0.40 | <0.05 | | | |
| | *E.coli* (cfu/100 mL) | <2 | <10 | <10 | <10 | 10 | | | |

* Un-ionized $NH_3$ based on in-house calculation

| | 08-Apr | 16-Apr | 22-Apr | 28-Apr | 30-Apr | **Average** | **Objective** | **Limit** |
|---|---|---|---|---|---|---|---|---|
| S2- (mg/L) | <0.01 | <0.16 | <0.08 | <0.01 | <0.08 | ND | N/A | N/A |
| pH | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 | 7.80 | **6.5 - 8.1** | **6.0 - 9.5** |
| Temp | 6.0 | 8.6 | 9.9 | 11.7 | 13.1 | N/A | N/A | N/A |
| % Undissociated H2S | 18.80 | 20.5 | 19.7 | 22.40 | 18.2 | N/A | N/A | N/A |
| Undissociated $H_2S$* | ND | ND | ND | ND | ND | ND | **ND** | **0.02** |

*Lab analysis could not detect hydrogen sulphide above the reporting limit in any effluent samples, and no odour was present during spring discharge

## PRE-DISCHARGE RESULTS – SPRING

| | **Cell 1*** | **Cell 2*** | **Cell 3** | **Cell 4** | **Cell 5** | **Comments** |
|---|---|---|---|---|---|---|
| CBOD (mg/L) | - | - | 10 | 16 | 7 | *Cell 1 & Cell 2 not discharged in spring |
| TSS (mg/L) | - | - | 16 | 39 | 22 | |
| TP (mg/L) | - | - | 0.39 | 1.17 | 0.63 | |
| $NH_3$ (mg/L) | - | - | 12.6 | 21.4 | 14.6 | |
| TKN (mg/L) | - | - | 18.8 | 30.6 | 18.0 | |
| H2S (mg/L) | - | - | <0.08 | <0.16 | <0.08 | |
| *E.coli* (cfu/100 mL) | - | - | 10600 | 30 | 500 | |

## EFFLUENT SAMPLE RESULTS – FALL

| | SAMPLE RESULTS | FALL | | | | | | 151,442 $m^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | DATE | 03-Nov | 10-Nov | 24-Nov | 08-Dec | 15-Dec | Average | **C of A Objective** | **C of A Limit** |
| SAMPLE 5X/DISCHARGE | CBOD (mg/L) | < 3 | < 3 | < 3 | < 3 | 3 | 3.0 | **25** | **30** |
| | TSS (mg/L) | 7 | 7 | 11 | 22 | 11 | 11.6 | **30** | **40** |
| | TP (mg/L) | 0.29 | 0.35 | 0.45 | 0.38 | 0.35 | 0.36 | **0.8** | **1** |
| | DO (mg/L) | 2.4 | 11.42 | 9.46 | 10.66 | 6.6 | 8.1 | **-** | **-** |
| | $N\text{-}NH_3$ (mg/L) | 0.05 | 0.9 | 5.52 | 0.35 | 2.33 | 1.83 | **4** | **7** |
| | Un-ionized $NH_3$ (mg/L)* | 0.003 | 0.0195 | 0.0771 | 0.005 | 0.021 | 0.03 | | |
| START, 25%, 50%, 75%, END | $NO_2$ (mg/L) | < 0.40 | 0.91 | < 0.40 | 1.08 | < 0.40 | | | |
| | $NO_3$ (mg/L) | 5.98 | 5.41 | 7.32 | 8.75 | 12.4 | | | |
| | *E.coli* (cfu/100 mL) | 20 | 40 | < 10 | 60 | 20 | | | |

* Un-ionized $NH_3$ based on in-house calculation

| | 08-Apr | 16-Apr | 22-Apr | 28-Apr | 30-Apr | **Average** | **Objective** | **Limit** |
|---|---|---|---|---|---|---|---|---|
| S2- (mg/L) | <0.01 | <0.16 | <0.08 | <0.01 | <0.08 | ND | N/A | N/A |
| pH | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 | 7.80 | **6.5 - 8.1** | **6.0 - 9.5** |
| Temp | 6.0 | 8.6 | 9.9 | 11.7 | 13.1 | N/A | N/A | N/A |
| % Undissociated H2S | 18.80 | 20.5 | 19.7 | 22.40 | 18.2 | N/A | N/A | N/A |
| Undissociated $H_2S$* | ND | ND | ND | ND | ND | ND | **ND** | **0.02** |

*Lab analysis could not detect hydrogen sulphide above the reporting limit in any effluent samples, and no odour was present during fall discharge

## PRE-DISCHARGE RESULTS - FALL

| | **Cell 1** | **Cell 2** | **Cell 3** | **Cell 4** | **Cell 5** | **Comments** |
|---|---|---|---|---|---|---|
| CBOD (mg/L) | 20 | 19 | 9 | 6 | 5 | |
| TSS | 80 | 56 | 30 | 30 | 18 | |
| TP (mg/L) | 0.81 | 0.69 | 0.46 | 1.15 | 0.74 | |
| pH | 8.3 | 8.6 | 7.4 | 7.9 | 8.4 | |
| Temperature (°C) | 14.7 | 14.1 | 15.0 | 16.7 | 15.5 | |
| $NH_3$ (mg/L) | 6.17 | 2.70 | 15.30 | 2.78 | 1.30 | |
| Un-ionized ammonia (mg/L) | 0.002 | 0.000 | 15.300 | 0.000 | 0.000 | |
| TKN (mg/L) | 14.9 | 11.2 | 22.7 | 7.2 | 3.7 | |
| $H_2S$ (mg/L) | <0.16 | <0.01 | <0.08 | <0.08 | <0.04 | |
| *E.coli* (cfu/100 mL) | 30000 | 2700 | 800 | 1300 | 240 | |

**Un-Ionized Ammonia Calculation**

| Sample Date | Temperature (°C) | Degrees Kelvin | Dissociation Constant pKa | Sample pH on-site | Fraction of Un-ionized Ammonia | Total Ammonia (mg/L) ($NH_3$ +$NH_4$+as N) | Un-ionized Ammonia (mg/L) |
|---|---|---|---|---|---|---|---|
| 08-Apr | 6.0 | 279.15 | 9.87 | 7.9 | 0.0106 | 3.36 | 0.036 |
| 16-Apr | 8.6 | 281.75 | 9.78 | 7.8 | 0.0104 | 18.4 | 0.191 |
| 22-Apr | 9.9 | 283.05 | 9.73 | 7.8 | 0.0115 | 20.6 | 0.237 |
| 28-Apr | 11.7 | 284.85 | 9.67 | 7.7 | 0.0105 | 16.9 | 0.178 |
| 30-Apr | 13.1 | 286.25 | 9.63 | 7.8 | 0.0147 | 15.8 | 0.232 |
| 03-Nov | 9.4 | 282.55 | 9.75 | 8.5 | 0.0530 | 0.05 | 0.003 |
| 10-Nov | 9.3 | 282.45 | 9.76 | 8.1 | 0.0216 | 0.9 | 0.0195 |
| 24-Nov | 6.6 | 279.75 | 9.85 | 8 | 0.0140 | 5.52 | 0.0771 |
| 08-Dec | 6.6 | 279.75 | 9.85 | 8 | 0.0140 | 0.35 | 0.0049 |
| 15-Dec | 9.5 | 282.65 | 9.75 | 7.7 | 0.0089 | 2.33 | 0.021 |

# 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 |
|---|---|---|---|---|---|---|---|---|
| None to report. | | | | | | | | |

*Facility Overflow*

| Date | Location | Details | Volume (m³) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| None to report. | | | | | | | | |

*Collection Overflow*

| Date | Location | Details | Volume (m³) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| None to report. | | | | | | | | |

*Spills of Sewage*

| Date | Location | Details | Volume (m³) | Start Time | End Time | Duration (h) | Discharge Receiver | Disinfection Provided |
|---|---|---|---|---|---|---|---|---|
| April 16, 2025 | Near 546 Main St. Winchester | Force main break | 2.1 | 8:00 | 16:00 | 8 | N/A | No |

## Collection System Monitoring Data

| Event Date | Event Location | Volume (m³) | Parameter | mg/L | Source Loading (kg) | Any Adverse Impacts & Corrective Actions |
|---|---|---|---|---|---|---|
| April 16, 2025 | Near 546 Main St. Winchester | 2.1 | BOD5 | 77 | 0.16 | No adverse impacts from the spill. Corrective action was to shut off Main St. SPS pumps after force main leak was discovered. Hydrovac truck on site to bypass inflow from Main St. SPS for the duration of the repair. |
| | | | Total Suspended Solids | 380 | 0.80 | |
| | | | Total Phosphorus | 1.55 | 0.003 | |
| | | | Total Kjeldahl Nitrogen (TKN) | 19 | 0.04 | |
| | | | E. coli | 1,200,000 | | |

# Appendix C – ECA Annual Report Requirements

| **Facility ECA #A-500-1199362894**<br>**Section 11(4)** | **Section in Report** |
|---|---|
| 6.a. A summary and interpretation of all Influent, monitoring data, and a review of the historical trend of the sewage characteristics and flow rates; | Wastewater System Flows<br>Raw Sewage Quality<br>Appendix A |
| 6.b. 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; | Wastewater System Flows<br>Effluent Quality<br>Appendix A |
| 4.c. A summary of all operating issues encountered and corrective actions taken; | Operating Issues |
| 4.d. A 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; | Maintenance |
| 4.e. A summary of any effluent quality assurance or control measures undertaken; | Effluent Quality |
| 4.f. A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer; | Maintenance |
| 4.g. A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:<br>a. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;<br>b. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity; | Wastewater System Flows<br>Effluent Quality<br>Operating Issues |
| 4.h. A tabulation of the volume of sludge generated, 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 and a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location; | Sludge Generation |
| 4.i. A summary of any complaints received and any steps taken to address the complaints; | Summary of Complaints |
| 4.j. A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events; | Operating Issues<br>Appendix B |
| 4.k. A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification; | Maintenance |
| 4.l. A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted; | Maintenance<br>Operating Issues |
| 4.m. Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works; | Maintenance<br>Operating Issues |

| **Collection ECA #180-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 |
| 4.6.4 Includes a summary of any operating problems encountered and corrective actions taken. | Operating Issues |

| **Collection ECA #180-W601**<br>**Schedule E** | |
|---|---|
| 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<br>Appendix B |
| 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 |