

**Meeting Date:** November 18, 2024  
**Department:** Engineering and Public Works  
**Report No.:** EPW-2024-79  
**Submitted by:** Mark Ortiz, Director of Engineering and Public Works  
**Approved by:** Trisha McKibbin, Chief Administrative Officer  
**SUBJECT:** **Mount Brydges Wastewater Treatment Facility Program Update**

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**RECOMMENDATION:**

**THAT: Report EPW-2024-79 Mount Brydges Wastewater Treatment Facility Program Update be received for information.**

**THAT: Council direct Staff to continue exploring Mount Brydges Wastewater Treatment Facility Program opportunities including converting the existing equalization tank construction contract to an equipment-supply contract, completing an operational review and process optimization, and conducting an inflow & infiltration study.**

**BACKGROUND:**

This report provides an update on the current status of the Mount Brydges Wastewater Treatment Facility (WWTF) Program currently being undertaken by the Municipality and follows previous reports on the Program presented to Council including:

- [Mt. Brydges Wastewater Treatment Facility Update \(October 16, 2023\)](#)

Prior reports have explained at length the history of the facility including process details, completed studies, operational challenges, compliance risk, and approvals background. Interim and Medium Term Actions were outlined to improve treatment effectiveness and bring the Mount Brydges Wastewater Treatment Facility (MBWWTF) into compliance. The current report is intended only to provide updates to ongoing initiatives.

For clarity, the Interim Action refers to the conversion of an existing empty tank to an equalization (EQ) tank to stabilize flow entering the facility.

The Medium Term Action refers to the construction of a head works facility and the conversion of all existing tanks, including two (2) Rotating Biological Contactor (RBC) tanks to extended aeration tanks. The head works facility will effectively remove harmful rags, sand, and grit from the treatment

process while the implementation of extended aeration will improve solids and nitrogen removal, enabling the facility to meet compliance limits and effectively treat its current rated capacity of 825 m<sup>3</sup>/day.

The current status of both the Interim and Medium Term plans are included in the comments section of this report along with updated schedules and a current assessment of Compliance Risk. An outline of several opportunities staff have evaluated to streamline program rollout are also included.

## **Approvals and Contract Awards**

The following is a summary of relevant Approvals and Contract Awards provided to date on both the Interim and Medium Term Actions at the MBWTF:

### Interim Action - Equalization Tank

- [Conceptual Design - Approved by Council July 6, 2020](#)
  - \$28,250 for Conceptual Design
  - \$90,000 approved for Pump Station Modifications
- Environmental Compliance Approval (ECA) – Submitted May 2022. Obtained December 2023
- [Construction Tender - Awarded by Council March 18, 2024](#)
  - \$723,079 awarded to Finnbilt General Contracting Ltd.
  - \$66,535 awarded to R.V. Anderson Associates for Contract Administration

### Medium Term Action – Head Works Facility & Extended Aeration

- [Detailed Design - Approved by Council Feb 22, 2022](#)
  - \$384,535 approved for Detailed Design
  - \$70,000 approved for Geotechnical and related works
- Construction Cost Estimate: \$11.5M incl. contingency
- ECA – Submitted January 2023. Obtained August 2024
- ECA for Air and Noise - Submitted June 2024 (currently outstanding)

## **COMMENTS:**

### **Continued Operational Challenges**

The Mount Brydges WWTF continues to face operational challenges, struggling to consistently meet Environmental Compliance Approval (ECA) effluent criteria as regulated by Ministry of Environment, Conservation and Parks (MECP). The plant struggles to meet ammonia limits as well as suspended solids limits, particularly during colder months or after process upsets.

Influent levels of nitrogen (TKN) also continue to exceed that which the plant was originally designed to treat.

Flows at the plant are also continuing to increase annually, putting additional strain on the treatment process. These additional flows are likely a result of on-going development and aging infrastructure that is increasingly susceptible to infiltration, exacerbating the impacts of wet weather flows.

To-date in 2024, Average and Maximum Day Flows per month are 405 m<sup>3</sup> and 484 m<sup>3</sup>, respectively, increases of approximately 25% and 22% over the same period in 2023. This is a rapid rate of increase for a wastewater system which is expected to put further pressure on the treatment facility's continued ability to meet compliance limits.

The trend of increasing flows is expected to continue for the foreseeable future, potentially putting the facility at risk of exceeding its permitted average rated capacity of 825 m<sup>3</sup> per day prior to the Municipality's ability to complete the necessary Environmental Assessment, Design, Approvals and Construction of an infrastructure project to increase wastewater treatment capacity in Mount Brydges.

### Growth/Development Forecasts

There remains a strong pipeline of anticipated development in the Mount Brydges community which will continue to drive increases in demand for wastewater servicing. Although the progress and specific timing of developments is hard to accurately predict as many factors influence the planning and construction of new housing, there is an undeniable trend of increasing wastewater servicing demand which could result in similar or even faster increases in wastewater treatment experienced over the last year.

Locations	Flow (m <sup>3</sup> /day)
2023 ADF (existing connected lots)	419
<b>Proposed Developments</b>	
22182 Adelaide Road	23
Falconbridge	154
Falconbridge West	202
Edgewood	100
Forest View	122
22226 Adelaide Road	20
22696 Adelaide Road	163
2585 Queen Street	60
8535 Glendon Drive	33
22268 Adelaide Road	22
<b>Total Flow Generated from Developments</b>	<b>899</b>
<b>Total Flow to the WWTF</b>	<b>1,318</b>
<b>Plant Capacity</b>	<b>825</b>
<b>Remaining Capacity</b>	<b>-493</b>

Table 1: Proposed Developments and Expected Flow Rates on Wastewater System

In addition to planned growth and development forecasts, the connection of existing un-serviced residences in Mount Brydges will add to overall wastewater treatment demand. In total, existing un-serviced residences are expected to add over 600 m<sup>3</sup>/d to the wastewater system.

## **Status of Interim Action - Installation of Equalization Tank**

The Equalization Tank will utilize and re-purpose an existing, empty tank intended for future expansion for the purpose of flow equalization. Flow equalization equipment including pipework, pumps and mixers will be installed in the empty RBC Tank which will then feed the two (2) existing RBC tanks.

Most of the flow equalization equipment to be installed as part of the EQ Tank will be removed and reused in the construction of Extended Aeration.

The Equalization Tank was originally approved for Conceptual Design in July 2020. Since then it has been fully designed and a tender was awarded for Construction in March 2024.

The General Contractor has ordered most materials and is ready to mobilize and complete the installation of the Equalization Tank as of October 2024.

In mid-October, upon review of project scope and timing, staff requested the General Contractor to momentarily defer mobilizing to site in order to provide an opportunity to review project scope in greater detail in relation to the extended aeration project and to initiate further consultation with MECP regarding the overall Mount Brydges WWTF program.

## **Status of Medium Term Action - Extended Aeration**

The Extended Aeration project will convert the three (3) existing tanks (2x RBC and 1x empty) into extended aeration tanks with the installation of aeration equipment including pipework, diffusers, mechanical, blowers and electrical. The project will also include construction of a head works facility, including screening for the removal of rags and grit removal.

Extended Aeration was approved for Detailed Design by Council in February 2022. Detailed Design has been on-going since, with 90% Detailed Design expected Q1 2025. Several permits are still outstanding and are also expected to be received Q1 2025. The ECA for Extended Aeration was approved by the MECP and received in August 2024.

The Municipality is currently on track to tender the Construction Contract in Q2 2025. Construction and commissioning is expected to take approximately two (2) years from the date of award.

Outstanding approvals and permits still required for construction include:

- ECA Air + Noise – Submitted June 4/24
- Permit To Take Water – Field work completed last month; application pending.
- Conservation Authority Approval
- Site Plan Approval
- Building Permit

## **Green Municipal Fund Grant**

The Municipality was recently successful in its application for funding through the Green Municipal Fund (GMF), administered by the Federation of Canadian Municipalities in partnership with the Government of Canada.

The Municipality was approved for a grant in the amount of up to \$998,030, in addition to a loan in the amount up to \$6,653,570.

After fees, the grant will total nearly \$900,000, to be applied to the implementation of extended aeration at the Mount Brydges WWTF. This is a significant funding opportunity that will reduce overall project cost and impact to wastewater rates in Mount Brydges.

## **Compliance Risk**

The inability of the Mount Brydges WWTF to consistently meet effluent criteria remains a significant risk to the Municipality. Perceived inaction on behalf of the Municipality could result in actions being taken by the MECP including orders, fines, and limits on growth.

Staff continue to foster a strong working relationship with the MECP through open communication, setting clear goals and timelines, and executing plans to ultimately bring the Mount Brydges WWTF into compliance.

## **Mount Brydges WWTF Program Opportunities**

### **1. Converting Equalization Tank Construction Contract to Equipment-Supply Only**

Several factors have changed the overall project outlook and timelines since the original Conceptual Design was approved by Council:

**EQ Tank Timing -** When the Conceptual Design was approved in July 2020, it was planned that construction would be completed as early as 2022. Actual award of the construction contract was achieved much later in March 2024. This is in part due to a lengthy ECA approval process, with the original ECA application submitted in 2022 and only receiving approval December 2023.

**Extended Aeration Timing –** Detailed Design for Extended Aeration was originally approved by Council in February 2022. Detailed Design is on-going and currently on track to be tender-ready by Q2 2025.

**ECA Approval Timing –** The ECA for the Extended Aeration project was submitted January 2023 and received approval in August 2024, prior to mobilization of the EQ Tank General Contractor.

**Flow Equalization –** As part of the approval for the Conceptual Design of the EQ Tank, Council approved the implementation of Flow Equalization at the Mill Rd. Pump Station. This enabled the Municipality to reduce the flow rate entering the WWTF.

The net effect of these changes is that the Extended Aeration tender now follows the planned installation of the EQ Tank by only several months. Further, benefits of the stabilized flows associated with the EQ Tank may not be as significant when compared to the current flow patterns resulting from Flow Equalization efforts.

The EQ Tank project utilizes a currently empty RBC tank for equalization. The same empty tank is also being designed to be retrofitted with aeration equipment for the Extended Aeration contract, at which time all mechanical, pumping and mixing equipment contained within it will be removed and replaced with aeration equipment.

The costs to install equipment in the EQ tank for the purpose of flow equalization and then to remove the same equipment in order to accommodate Extended Aeration represents non-recoverable, sunk costs.

As there was no indication that the ECA for Extended Aeration would be approved at the time of award of the EQ Tank construction contract and the Municipality has previously communicated its plan to bring the WWTF into compliance with the MECP, it would have been premature to change approach at that time. However, the Municipality has now received an ECA for Extended Aeration and, considering Extended Aeration will likely be following relatively shortly after the planned EQ Tank Installation, there may be an opportunity to reduce non-recoverable costs associated with installation of EQ Tank Equipment.

It is estimated that by converting the EQ Tank construction contract to an equipment-supply contract only, thereby cancelling any construction activities, the **Municipality may save up to \$200-225k in total costs** associated with the installation and subsequent removal of EQ Tank equipment.

Prior to any changes in approach, the Municipality would need to provide an update to the MECP on the revised plan and project schedules.

## **2. Third-Party Operational Review & Process Optimization**

Staff have recently undertaken an influent characterization program at the Mount Bydges WWTF, conducting daily testing on the wastewater flowing into the plant. Staff are also in the process of retaining a third-party to conduct a review of facility operations and process optimization.

The operational review and process optimization exercise is intended to ensure the facility is currently operating at maximum efficiency by validating process strategies and setpoints and providing staff with the best information available.

Maximizing process efficiency at the Mount Brydges WWTF will increase the chances of meeting effluent criteria at a low cost while the Extended Aeration project is designed and constructed.

### 3. Inflow and Infiltration Study

Inflow and Infiltration (I&I) refer to the undesirable connection of storm water infrastructure (ie. Private downspouts, storm drains etc.) to the sanitary system and the intrusion of ground/surface water into existing sanitary sewers and maintenance holes through cracks and holes typically found in aging infrastructure.

Reductions in I&I ultimately reduce the volume of wastewater to be treated at the wastewater treatment facility, delaying the need for expansions.

With the recent rapid increases in wastewater flows at the Mount Brydges WWTF it would be prudent to undertake an I&I study in order to assess the Municipality's vulnerability to undesirable water finding its way into the wastewater system and to identify any opportunities to reduce I&I.

Staff will be further investigating opportunities to conduct I&I studies in Mount Brydges in 2025.

#### **Water, Wastewater & Stormwater Master Plan Alignment**

The plans included herein for the Mount Brydges WWTF fully align with the recently submitted Water, Wastewater & Stormwater Master Plan.

The upgrades required at the WWTF are process-related upgrades needed to bring the Facility into compliance and enable it to meet its current rated capacity of 825 m<sup>3</sup>/day. The upgrades will not increase the rated capacity at the Facility.

A Class C Environmental Assessment (EA) will be required to address wastewater servicing needs in Mount Brydges for any flows in excess of 825 m<sup>3</sup>/day. Staff are currently preparing a Request For Proposal for Consulting Services for Mount Brydges Wastewater Servicing EA and expect to start Q1 2025.

#### **CONSULTATION:**

The preparation of this report and recommendation was completed in consultation with:

- Manager of Environmental Services
- Senior Development Coordinator
- Director of Finance/Treasurer
- Chief Administrative Officer

**FINANCIAL IMPLICATIONS:**

Converting the Equalization Tank construction contract to an equipment-supply contract only, thereby cancelling any construction activities, the Municipality may save up to \$200-225k in total costs associated with the installation and subsequent removal of EQ Tank equipment.

The costs to undertake an operational review and process optimization at the Mount Brydges WWTF and an inflow and infiltration study of the Mount Brydges Wastewater System are estimated to be \$75k and \$100k, respectively. These additional expenditures would come from the Wastewater Reserve Fund, to be potentially offset by any cost savings from the EQ Tank.

**ALTERNATIVE(S) TO THE RECOMMENDATION:**

1. Council to direct staff to continue with Installation of Interim Equalization Tank.
2. Council to direct staff to formally cancel remaining items on (Interim) Equalization Tank Installation contract and safely store equipment to be used in future (Medium Term) Head Works Facility & Extended Aeration project.
3. Council to provide alternate direction(s).

**STRATEGIC PLAN ALIGNMENT:**

This matter is in accord with the following strategic priorities:

**Local Infrastructure and Capital Investment:** Households and businesses in Strathroy-Caradoc will be supported by reliable, financially responsible and well-maintained infrastructure networks.

**Managing the Challenges of Growth for the Municipal Organization:** Strathroy-Caradoc will be an inclusive community where growth is managed to accommodate a range of needs and optimize municipal resources. We are committed to maintaining operational efficiency and economies of scale through these times of change.

**ATTACHMENTS:**

None