

Meeting Date: November 20, 2023
Department: Engineering and Public Works
Report No.: EPW-2023-61
Submitted by: Jake Straus, Director of Engineering & Public Works
Approved by: Trisha McKibbin, Chief Administrative Officer
SUBJECT: **Mt. Brydges WWTF Insulation**

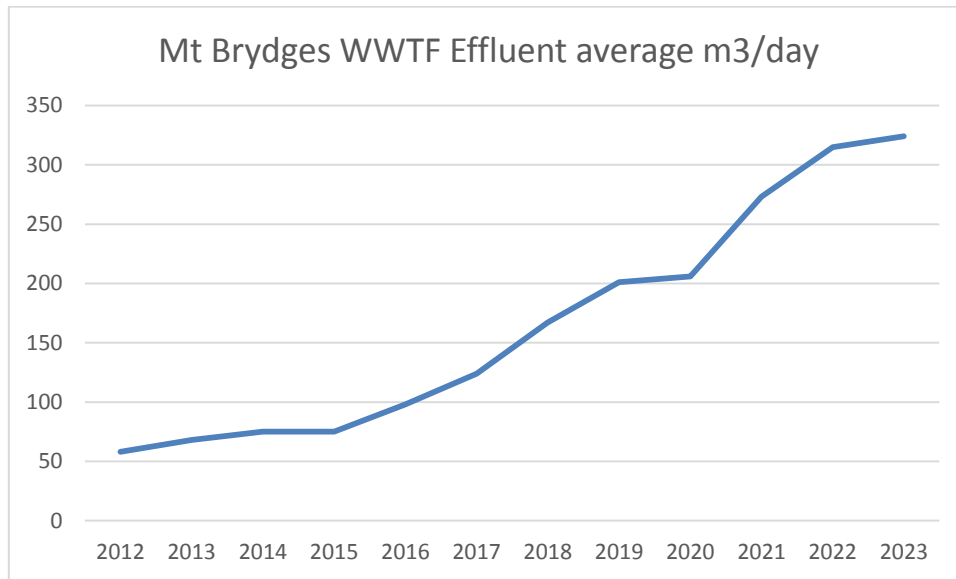
RECOMMENDATION:

THAT: Council receive report EPW-2023-61 Mt. Brydges WWTF Insulation for information.

BACKGROUND:

Construction of a communal Sewage Works for the community of Mt. Brydges began in the spring of 2010 and was completed in the spring of 2012. The Mt. Brydges Sewage Works consists of the sewage collection system, two sewage pumping stations and a sewage treatment facility. Staff reviewed annual reports from 2022 dating back to 2017 and found compliance limits were not met. As a result, staff began to evaluate the process and determine the next steps to move forward with the Facility.

Over the last several 5 years, there has been a significant increase in flows to the facility. The increases in flows to the facility result from development and an increase in the number of connections to our sanitary sewers.



Council Reports

Over several years, Council has been provided information with regards to the performance of the Mt. Brydges WWTF. In order to share this information in an easy to access manner a copy of these reports can be accessed below.

[April 3, 2020, EPW 2020-007](#)

Presentation on the Mt. Brydges WWTF and the upgrades

[June 1, 2020, EPW 2020-13](#)

Report Deferred: Fred Tranquilli, Chief Administrative Officer requests that this report be deferred as there are some deficiencies and will need some time for review. George Elliott, Director of Engineering and Public Works briefly speaks on the details of this report. Councillor Flegel asks if this happened due to a design flaw as the time frame has only been 10 years. He was curious to know if this equipment is not designed for growth. The director indicates that the tank was brought it at the time with the intent of cost savings and the was meant for a smaller community like Mount Brydges. Fred Tranquilli indicates that the technology of this unit was not the best at the time of purchase and requires a little more attention. Through the strategic plan process, this will highlight the mandatory connections.

[July 6, 2020, EPW-2020-17](#)

Moved by Councillor Cowan

Seconded by Councillor Baker

THAT: Council receive Report EPW 2020-17 detailing the cost expenditures related to a major failure at the Mount Brydges WWTP and future needs to optimize treatment efficiencies.

THAT: Council approve a project for Interim Flow Equalization for the Mount Brydges WWTP with a capital budget of \$90,000 funded from the Wastewater Capital Reserve Fund.

THAT: Council approve a conceptual design project for an equalization tank in the amount of \$28,250 plus HST funded from the Wastewater Capital Reserve Fund to engage RV Anderson to provide a detailed scope of works and project estimate for the construction of an equalization tank at the Mount Brydges WWTP to be constructed by 2023.

CARRIED

[March 15, 2021, EPW 2021-03](#)

[2020 Summary Report for Strathroy-Caradoc Water Distribution System](#)

Moved by Councillor Brennan

Seconded by Councillor Hipple

THAT: Council receive the report regarding the 2020 Annual Reports for the Strathroy and Mount Brydges Wastewater Treatment Facilities for information.

CARRIED

[February 22, 2022, EPW-2022-03](#)

Moved by Councillor Cowan

Seconded by Councillor Hipple

THAT: Council receive the Report EPW 2022-03 regarding the Mount Brydges WWTF Upgrades Design; and further,

THAT: Council award the design for the Mount Brydges WWTF upgrades to RV Anderson in the amount of \$384,535 (excl. HST); and further,

THAT: Council approve a budget of \$70,000 (excl. HST) for geotechnical and hydrogeological investigations and laser scanning.

CARRIED

[March 21, 2022, EPW 2022-08](#)

[2021 Annual Report - Mount Brydges Wastewater Treatment Facility](#)

Moved by Councillor Baker
Seconded by Councillor Pelkman

THAT: Council receive for information Report EPW 2022-08 regarding the 2021 Annual Reports for the Strathroy and Mount Brydges Wastewater Treatment Facilities.

CARRIED

[December 19, 2022, EPW – 2022-49](#)
[Interim Flow Equalization – Mount Byrdges Wastewater Treatment Plant](#)
[Mount Brydges WWTP Upgrades Conceptual Design Report 2021 12 01](#)

Moved by Mayor Colin Grantham
Seconded by Councillor Kennes

THAT: Council receive Report EPW 2022-49 regarding the Mt Brydges WWTF for information.

CARRIED

[January 12, 2023, Special Meeting of Council](#)
[Mount Brydges WWTP Upgrades Conceptual Design Report 2021 12 01](#)

Moved by Councillor Brennan
Seconded by Councillor Kennes

THAT: the reports be received for information.

CARRIED

[March 20, 2023, EPW 2023-16](#)
[2022 Annual Report - Mount Brydges Wastewater Treatment Facility](#)

Moved by Councillor Kennes
Seconded by Councillor Brennan

THAT: Council receive for information Report EPW 2023-16 regarding the 2022 Annual Reports for the Strathroy and Mount Brydges Wastewater Treatment Facilities.

CARRIED

[April 3, 2023, EPW-2023-20](#)
[Summary Table](#)
[Riverbirch Biodisk Report](#)

Moved by Councillor Brennan
Seconded by Councillor Kennes

THAT: Council receive the Report EPW 2023-20 for information; and further

THAT: Council direct staff to continue with the Mt. Brydges Wastewater Treatment Facility's Upgrade project already underway and for which the ECA approvals have been submitted for.

CARRIED

[May 1, 2023, EPW 2023-28](#)

Moved by Mayor Grantham
Seconded by Councillor Kennes

THAT: Council receive report EPW-2023-28 future expansion of the Mt. Brydges Wastewater Treatment Facility for information.

[July 4, 2023, EPW 2023-40](#)

[2023 Mt Brydges Effluent Summary](#)

Moved by Councillor Brennan
Seconded by Councillor Pelkman

THAT: Council receive report EPW-2023-40 for information.

CARRIED

[October 16, 2023, EPW 2023-52](#)

Mt Brydges Wastewater Treatment Facility Update

Moved: Deputy Mayor McGuire
Seconded: Councillor Hipple

THAT: Council receive report EPW-2023-52 Mt. Brydges Wastewater Treatment Facility Update for information.

Moved by Councillor Derbyshire
Seconded by Councillor Willsie

THAT: The recommendation that Council receive Report EPW-2023-52 "Mt. Brydges Wastewater Treatment Facility Update" for information be amended to reflect a further request that staff prepare a report regarding the feasibility of insulating or heating the tanks and the Wastewater Treatment building.

CARRIED

**Moved by Deputy Mayor McGuire
Seconded by Councillor Hipple**

THAT: Council receive Report EPW-2023-52 Mt. Brydges Wastewater Treatment Facility Update for information; and further,

THAT: Council direct staff to prepare a report regarding the feasibility of insulating or heating the tanks and the Wastewater Treatment building.

CARRIED

COMMENTS:

Insulating RBC

Staff reached out to the existing equipment manufacturer (Napier Reid) for pricing on insulating the RBCs. Napier Reid has completed this type of work before. Napier Reid provided the following summary and pricing to complete the insulating of 1 RBC. It should be noted that temperatures should be greater than 10°F for this installation.

- Preparation, 2 staff 1 day at site.
- 2-3" of polyurethane foam insulation spray with equipment and material, 3 staff 2 days at site.
- Painting with white epoxy for weather protection, 2 staff 2 days at site.
- Clean-up, 2 staff 1 day at site.

The total price to complete the work for one RBC is \$26,103.80

*This type of insulation still permits access to the dome for ongoing maintenance.

Process

Staff reached out to the Consulting Engineer who is currently working on the design of the upgrades with regards to the effectiveness of insulating the RBC's. They provided the following feedback. The current operating temperature in the RBCs ranges between 16-18°C, which is much higher than the temperature range of 7-10°C at which the nitrification efficiency gets impacted. As such the ammonia non-compliance at the WWTP under current conditions indicates this to be a "non-temperature" operational issue. Further, even at the low winter temperatures indicated above, the reduction in nitrification efficiency is typically compensated by the high biomass inventory in an attached growth systems like RBC, while also being protected by higher ammonia limits in colder months.

In addition, the fact that the Mt Brydges system is operating at only 40% of its design loads further confirms the current poor nitrification is a non-temperature issue. The current nitrification issues are due to lack of equalization which causes the sewage to be fed in intermittent loading spike as opposed to a steady feed to the system through the day. The RBC systems are typically equipped with an equalization facility, which the existing system lacks. Provision of a temporary equalization facility therefore would address this issue.

As such the key to improving nitrification in winter months is flow/loading equalization which is currently underway as a part of the interim upgrade (until the proposed eventual conversion of RBC system to extended aeration system). While improving the RBC temperature conditions to a more favorable range

in winter months could further enhance nitrification following equalization, it is unlikely to be able to resolve the nitrification issue by itself. This temperature improvement can be achieved via insulation comprised of a polyurethane foam with a protective coating on top, on the outside of the RBC enclosures, and can be implemented as a process enhancement measure along with or following equalization.

CONSULTATION:

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

- Director of Finance/Treasurer
- Chief Administrative Officer
- Manager of Environmental Services
- RV Anderson Associates Ltd
- Napier Reid

FINANCIAL IMPLICATIONS:

1 RBC is \$26,103.80

Total Costs for insulation of both RBCs is \$52,207.60

STRATEGIC PLAN ALIGNMENT:

This matter is in accord with the following strategic priorities:

- Local Infrastructure - Households and businesses in Strathroy-Caradoc are supported by reliable, financially responsible and well-maintained infrastructure networks.

ATTACHMENTS:

None