
Subject: 2022 Reserve Water and Wastewater Treatment Capacities

Report to: Planning and Economic Development Committee

Report date: Wednesday, May 10, 2023

Recommendations

1. That Report PDS 13-2023 **BE RECEIVED** for information; and
2. That Report PDS 13-2023 **BE CIRCULATED** to the Ministry of the Environment, Conservation and Parks and Local Area Municipalities

Key Facts

- The purpose of this report is to inform Council of the reserve treatment capacities at Niagara's Water and Wastewater Treatment facilities. This reporting is required by the Ministry of Environment, Conservation and Parks (MECP).
- The data contained in this report assists in commenting on new development proposals and related servicing as well as planning for future treatment capacity.
- All of Niagara Water Treatment Plants (WTPs) and Wastewater Treatment Plants (WWTPs) are positioned to accept growth beyond the minimum ten year horizon.

Financial Considerations

This report provides Council with historical and projected treatment capacity and flow data. There are no direct financial implications in receiving this report.

The reserve treatment capacities at the water and wastewater (W&WW) facilities are considered in commenting on new development proposals and related servicing and, as a result, could result in a financial impact related to specific future applications.

Analysis

The Infrastructure Planning and Development Engineering Division annually reports on an assessment of the average daily W&WW flows based on the previous five years, as recorded at our various facilities compared to MECP rated capacities for the facilities. A key objective of this report is to highlight potential capacity constraints and allow

sufficient lead-time to plan for future capacity increases through the W&WW capital programs so that development may continue unencumbered. This assessment is completed as a desktop exercise, which compares five-year (annual) average flows to the respective MECP Environmental Compliance Approval(s), formerly known as Certificate of Approval(s) for each facility, and then incorporates ten year growth forecasts into the calculation. Ongoing phasing and staging strategy works with our local municipal partners will further refine this assessment for understanding development capacity.

This assessment does not reflect specific compliance, quality, sustainability, risk, or operational deficiencies at the treatment plants or trunk conveyance/transmission systems, which may affect the Region's ability to approve new development or permit servicing extensions.

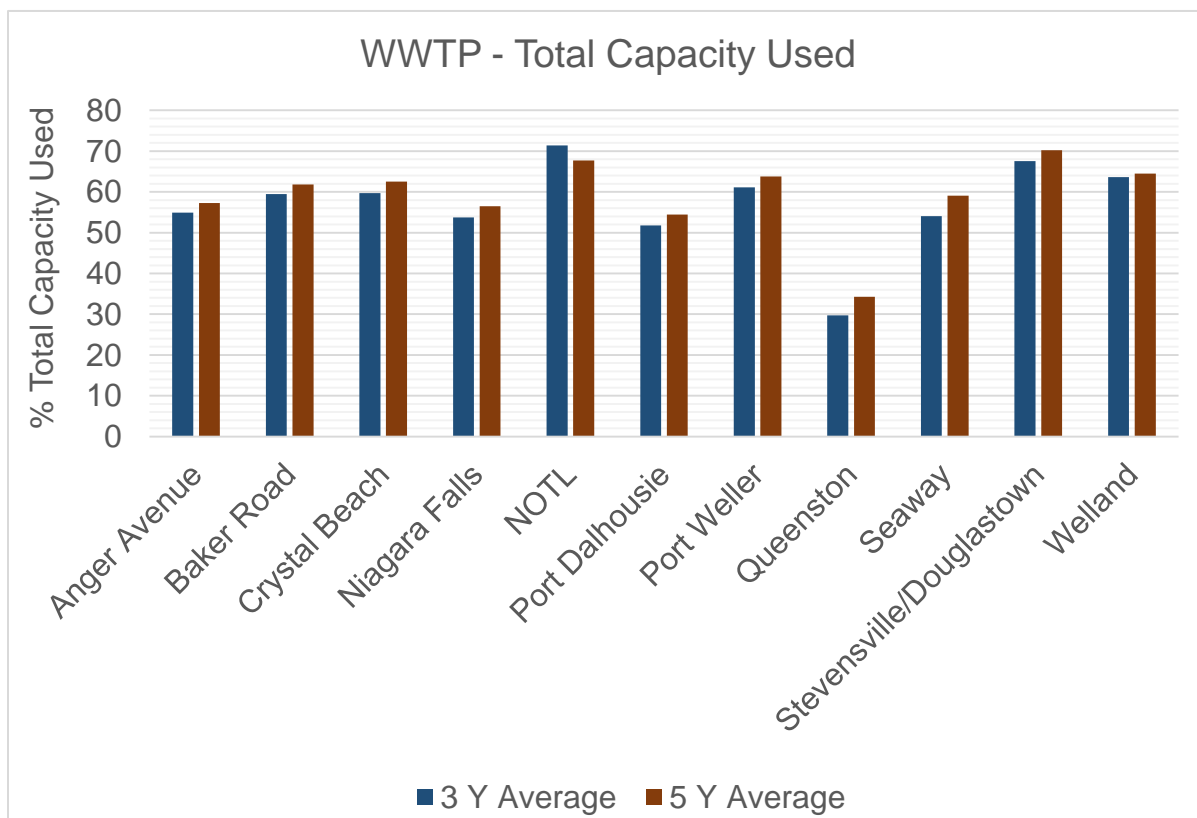
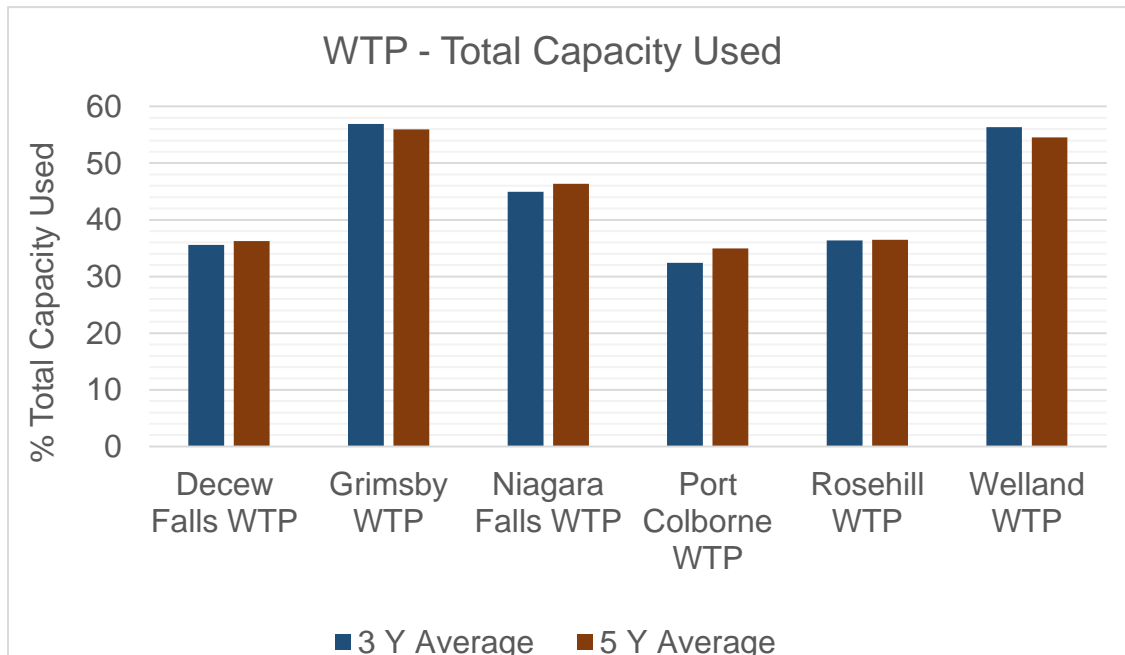
For municipal wastewater treatment, weather is the key factor that results in peak wet weather flow, which impacts the collection and trunk sewers in both local and regional systems through "Rainfall Derived Inflow and Infiltration" (RDI&I). Wet weather flows can have substantial impact on available WWTP capacities and a direct impact on the limitations of available servicing capacity for future growth.

Appendix 1 and 2 provide the annual average daily flows, five year average flows from 2018 to 2022 for the water and wastewater treatment plants, respectively. Appendices 3 and 4 provide a summary of Niagara's six water treatment facilities and eleven wastewater treatment facilities presenting their respective reserve capacities.

It is worth noting that growth rates in recent years have increased, which consequently can affect the way this desktop exercise conducts the reserve capacity calculations. For the WTP's, the averaging daily flows over a five year period versus a three year period in the Reserve Capacity calculations for 2022 does not show a compelling difference or significant trend. For the WWTP's, there is a general trend of a slightly reduced annual average daily flow when comparing the three year to the five year average flow except for NOTL WWTP. This can partially be due to a number of infill and infiltration (I&I) reduction and capacity restoration projects within the recent years.

Figure 1 shows a comparison of the total capacities used for WTPs and WWTPs when daily flows are averaged over the last three and five years.

Figure 1: Total Capacity Used – Annual Flows Averaged over 3-Year and 5-Year Period



At present, all of Niagara's WTPs and WWTPs are positioned to accept growth beyond the minimum ten year period (Appendix 3 and Appendix 4).

Niagara Official Plan and Water/Wastewater Master Servicing Plan

The new Niagara Official Plan was approved by the Regional Council and subsequently approved and adopted by the Province on November 4, 2022. As part of the Plan, the Region completed extensive background review, consultation, and supporting studies in 2022, which resulted in policies and mapping to managing growth and the economy while protecting the natural environment, resources and agricultural land, and providing infrastructure to support developments of the whole region. The approval of the Niagara Official Plan helps the Region prepare for the anticipated population of 694,000 people and 272,000 jobs by 2051.

The anticipated growth out to 2051 from the Niagara Official Plan process was utilized in the 2021 Master Servicing Plan Update (MSPU) to determine the required water and wastewater growth related capital projects for the future while maintaining the existing infrastructure.

The 2021 MSPU is a critical component in the Region's planning for growth and provides the framework and vision for the water and wastewater servicing needs for the lake based service areas of the Region to 2051. The 2021 MSPU evaluates the ability of the existing and planned water and wastewater infrastructure to continue to efficiently and effectively service the Region's existing users, service anticipated growth, and to evaluate and develop recommended strategies. This work considered the alignment of Regional water and wastewater infrastructure with the urban expansion and intensification areas identified through the Niagara Official Plan review. Additionally, the potential impacts of estimated growth beyond 2051 were considered due to the longer useful life of water and wastewater infrastructure assets.

Wet Weather Management

The Niagara wastewater systems are a mix of separated and combined sewer systems. Each system is experiencing varying levels of impact during wet weather conditions. Climate change continues to create changing weather conditions and the wastewater systems are experiencing, in most cases, high peak flows under rainfall events. In order to accommodate the anticipated growth from Niagara 2051 and to maintain an existing servicing level for the wastewater infrastructure, system capacity upgrades (upgrades to trunk sewers, pumping stations, etc.) and the upstream management (storage, peak

shaving, diversion) together with peak flow management (I&I reduction projects) for every wastewater system were investigated. Based on this review, there are wet weather projects listed with identified areas for targeted I&I removal to offset the requirement to upgrade and expand more expensive infrastructure all the way to the WWTPs. It is crucial to achieve I&I reductions in order to offset the capacity needs from growth, to protect the environment, and mitigate potential basement flooding.

The wet weather management program currently identifies overall preliminary priority, staging of location and target amount of I&I reduction across all systems. This program provides for a proactive and targeted approach to addressing wet weather impacts.

The Region has been aiding Local Municipalities by funding the Combined Sewer Overflow (CSO) Control Program as a part of the overall Wet Weather Management Strategy to support various I&I related projects and programs on the municipal side. This program has been reducing the impacts of I&I and has been a benefit to both, the Region and the Local Municipalities. Therefore, it is important to continue working collaboratively to facilitate ongoing development throughout the region and provide the requisite servicing and capacity allocation in a responsible way to service the communities.

The available funding for the 2023 CSO Control Program has been fully utilized and subscribed with applications from the Municipal partners. A separate report on the 2023 CSO Control Program is anticipated to be presented to the Planning and Economic Development Committee as well.

Staff is working with the Development Industry including Public Works Officials, Building Officials, Developers, Consultants and Contractors to raise awareness of wet weather management issues and potential upcoming changes to address this. The Region is also represented at the Expert Stakeholder Committee (ESC) for the Guideline to Undertaking Flow Monitoring of New Construction and will work with all stakeholders to move forward with a consistent approach for the review the flow monitoring of new subdivisions.

South Niagara Falls Wastewater Treatment Plant

While this report identifies there is short term capacity available at the existing Niagara Falls WWTP, it only considers the treatment capacity at the plant for the next ten years. It does not consider the constraints in the existing sanitary collection system, wet

weather flow issues, consideration for development demands and longer term growth, or the required infrastructure improvements to get the flows to the plant.

The MSPU used updated population and employment growth forecasts based on a 2051 planning horizon. Based on the Niagara 2051 planning review, the implementation and timing of the preferred solution for the new South Niagara Falls (SNF) Wastewater Treatment Plant and Servicing Solution (SNF Servicing Solution) continues to be supported and is necessary to accommodate growth.

In Niagara Falls, there is not enough capacity in the existing sewer system nor at the existing treatment plant to meet the increasing system demands resulting from growth as well as the increased wet weather flows due to aging infrastructure and climate change. The SNF Servicing Solution is essential to unlocking the development potential in the broader South Niagara area. The ability to redirect existing flows to the south, provide additional capacity in the new trunk sewer, provide flexibility for storage in the trunk sewer, and ultimately treat the wastewater flows at the new WWTP all contribute to a significant wet weather management program. In addition, the location of the new WWTP will provide flexibility for the potential for additional wet weather management through potential connections of other service areas such as Chippawa. Through the analysis undertaken as part of the Class EA process, it is estimated that the new South Niagara Wastewater Solutions strategy, will result in a reduction of over 60% of wet weather volume overflow to the environment.

It should be noted that despite the limited capacity within the south Niagara Falls system, the Region and City have committed the necessary sanitary capacity and any required improvements to accommodate the new South Niagara Hospital to Infrastructure Ontario and Niagara Health.

This new WWTP is integral to the overall growth servicing strategy that supports the anticipated residential and employment growth in the Niagara Falls, NOTL, and Thorold South service areas. This total growth is estimated to be over 90,000 people and jobs in the area out to the year 2051. The new WWTP and collection system strategy is also considering potential long term growth beyond 2051. The capital program to support the new WWTP will provide greater flexibility for development servicing in St. Catharines, Niagara Falls, Thorold, and Niagara-on-the-Lake.

The Notice of Study Completion for the SNF WWTP, Class C EA was issued on July 28, 2022 for the public review period ending on September 26, 2022.

Queenston Wastewater Treatment Plant

The South Niagara Falls wastewater strategy presented opportunities for adjacent systems. Based on this, the redirection of the Queenston flows to Niagara Falls and decommissioning of the Queenston WWTP is to be explored further and confirmed through the ongoing Queenston – St. David’s Wastewater Servicing Strategy EA.

Alternatives Reviewed

No alternatives reviewed.

Relationship to Council Strategic Priorities

The report aligns with Council’s Priority of Responsible Growth and Infrastructure Planning by highlighting the reserve capacity available for growth at all Regional Water and Wastewater Treatment Facilities.

The report also provides MECP and local municipal partners operational summary and reserve capacity projections for Region’s Water and Wastewater Treatment facilities.

Other Pertinent Reports

- PW 39-2021, September 9, 2021, South Niagara Falls Wastewater Treatment Plant – Budget and Property
- PDS 20-2022, April 6, 2022, 2021 Reserve Water and Wastewater Treatment Capacities
- PDS 17-2022, June 15, 2022, Official Plan Recommendations Report for Adoption

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Appendices

Appendix 1	Annual Average Daily Flow 2018 to 2022 WTP
Appendix 2	Annual Average Daily Flow 2018 to 2022 WWTP
Appendix 3	Water Reserve Capacity Calculations for 2022
Appendix 4	Wastewater Reserve Capacity Calculations for 2022