

Administration

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September 12, 2014

CL 12-2014, September 11, 2014

PDC 7-2014, September 3, 2014

Report PDS 33-2014

LOCAL AREA MUNICIPALITIES

SENT ELECTRONICALLY

2013 Reserve Water and Wastewater Treatment
Capacities & Servicing Strategy Update for
Niagara-on-the-Lake Wastewater Treatment Plant
PDS 33-2014

Regional Council, at its meeting of September 11, 2014, approved the following recommendations of its Planning and Development Committee:

That Report PDS 33-2014, September 3, 2014, respecting 2013 Reserve Water and Wastewater Treatment Capacities & Servicing Strategy Update for Niagara-on-the-Lake Wastewater Treatment Plant, **BE RECEIVED** and **CIRCULATED** to the Ministry of the Environment and Niagara area municipalities for their information and future reference.

A copy of Report PDS 33-2014 is enclosed for your information.

Yours truly,



Ralph Walton
Regional Clerk
:amn

cc: R. Vickers, District Manager, Ministry of the Environment and Climate Change
P. Lambert, Manager, Strategic Infrastructure and Development
M. L. Tanner, Acting Commissioner, Planning & Development Services
C. Benson, Acting Director; Community and Long Range Planning
N. Smagata, Administrative Assistant to the Commissioner, Planning & Development Services
S. McPetrie, Administrative Assistant, Planning & Development Services



REPORT TO: Planning and Development Committee

SUBJECT: 2013 Reserve Water and Wastewater Treatment Capacities
& Servicing Strategy Update for Niagara-on-the-Lake
Wastewater Treatment Plant

RECOMMENDATION

1. That this report **BE RECEIVED** and **CIRCULATED** to the Ministry of the Environment and Niagara area municipalities for their information and future reference.

PURPOSE

Respond to legislation or mandated reporting requirements.

This report informs Council of the reserve treatment capacities at Niagara's Water and Wastewater Treatment facilities. It provides for the required reporting requirement to the regulator, the Ministry of Environment. This data assists in commenting on new development proposals and related servicing as well as planning for future treatment capacity needs. This report also provides an update on the development monitoring program within the Niagara-on-the-Lake (NOTL) Wastewater Treatment Plant (WWTP) servicing area due to the limited remaining servicing capacity available.

BUSINESS IMPLICATIONS

This report provides Council with historical and projected treatment capacity and flow data. There are no direct financial implications in receiving this report. The data presented in this report is incorporated into the Water and Wastewater Master Servicing Plan and will therefore impact future capital needs and timing. The reserve treatment capacities at the water and wastewater 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.

REPORT

The Infrastructure Planning and Engineering section of Planning and Development Services Department annually reports on an assessment of the average daily water and wastewater flows based on the previous five years, as recorded at our various facilities compared to the Ministry of the Environment (MOE) 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 water and wastewater capital programs so that development may continue unencumbered. This is a 'desktop' exercise, which compares five-year (annual) average flows to the respective MOE Certificate of Approval(s) for each facility, then incorporates 10-year growth forecasts into the calculation. Ongoing phasing and staging strategy work 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 wastewater treatment, weather is the key factor that results in peak wet weather flows, which impacts the collection and trunk sewers in local systems through Inflow and Infiltration (I&I). In wet weather years, the annual average daily flow to the wastewater treatment plants are higher due to the additional flows entering the local municipal sanitary sewage collection systems.

Wet weather flows can have substantial impact on available wastewater treatment plant capacities which has a direct impact on the limitations of available servicing capacity for future growth. For example, five-year average daily flows for the NOTL WWTP indicates that 83% of the plant capacity is utilized; however, in a wet weather year, the utilized plant capacity increased to 93% solely based on 2011 average daily flows, and not the five year average. 2014 is trending to be a slightly higher wet weather year than 2011 for the NOTL WWTP.

Appendix II provides the annual average daily flows and five-year average from 2009 to 2013 for the water and wastewater plants, respectively. Appendices IV and V provide a summary of Niagara's six water treatment facilities and eleven wastewater treatment facilities showing their respective reserve capacities.

All of Niagara's water treatment facilities are positioned to accept growth beyond the minimum 10-year period (Appendix IV). However, with respect to the reserve wastewater treatment capacities, ten of the eleven treatment facilities will be able to accommodate growth beyond the critical 10-year horizon (Appendix IV). The exception is the NOTL WWTP, which tentatively has approximately eight years of reserve capacity remaining subject to the factors previously outlined.

An updated servicing plan for the NOTL WWTP is available as Appendix I - Schedule A. Additional details regarding this project are provided on the Niagara Region's website: <http://www.niagararegion.ca/projects/notl-wwtp/default.aspx>.

DEVELOPMENT MONITORING PROGRAM FOR NOTL WWTP

The NOTL WWTP has approximately eight years of reserve capacity remaining with plant capacity at 83% based on the five-year day flow average; however, based on the average daily flows in 2011, the plant capacity reached 93%. This is largely due to wet weather flows caused by heavy precipitation entering the Town's sanitary sewer collection system.

The Town and Regional staff have met many times over the last couple of years and have worked collaboratively towards a development monitoring program for the NOTL WWTP.

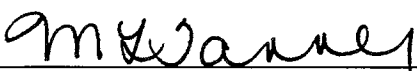
On December 10, 2012, the Town's Interim Policy: *Allocating Waste Water Servicing Capacity* was adopted by Town Council. This policy provides interim direction and guidance for the Town's allocation of wastewater services for all development served by the Wastewater servicing treatment system designed for Virgil and Old Town. The Policy reflects the Town's responsibilities for its sanitary sewage collection system and managing the "envelope" of available servicing capacity as the approval authority for land use changes, subdivision control (condos, consents, subdivisions) and building permits, as well as mitigation of wet weather flows entering the collection system. This policy provides an opportunity for developers to alleviate the demand on sanitary sewer capacity generated by their proposed development through an I&I Study and implementation of the Study recommendations. The policy also provides for conditions on development approvals (draft plans, subdivision agreements, site plans, and development agreements) which identify capacity limitations at the existing plant ensuring that developers and future owners are made aware of this upfront.

Last year a study was completed to review potential interim solutions for greater flow acceptance at the plant. The process improvements identified in the study have been implemented to maintain compliance with the MOE certificate. Unfortunately, due to the amount of wet weather flow experienced at this plant, additional development capacity could not be achieved while maintaining compliance.

The Town commenced an Inflow and Infiltration Study for the Virgil sewer shed in March 2013, which is cost-shared 50/50 through the Region's CSO Funding Program. However, the Old Town requires additional attention as existing development is contributing a substantial amount of wet weather flows into the local sanitary sewer system.

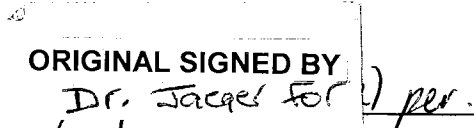
The Town and Region are continuing to work collaboratively to facilitate ongoing development in Niagara-on-the-Lake and provide the requisite servicing and capacity allocation in a responsible way to service the community.

Submitted by:



Mary Lou Tanner, MCIP, RPP
Acting Commissioner
Planning and Development Services

Approved by:



ORIGINAL SIGNED BY
Dr. Jacques Fortin per.
Harry Schlange
Chief Administrative Officer

This report was prepared by Phill Lambert, P. Eng., Development Engineering Manager, and reviewed by Betty Matthews-Malone, P.Eng., Director, Water & Wastewater Services Division, Public Works

APPENDICES (available electronically)

Appendix I	Schedule A – NOTL Wastewater Treatment Plan Upgrade – Servicing Strategy Plan
Appendix II	Annual Average Daily Flow 2009 to 2013 Water Treatment Plants
Appendix III	Annual Average Daily Flow 2009 to 2013 Wastewater Treatment Plants
Appendix IV	Water Reserve Capacity Calculations for 2013
Appendix V	Wastewater Reserve Capacity Calculations for 2013

SCHEDULE 'A'

NIAGARA-ON-THE-LAKE WASTEWATER TREATMENT PLANT UPGRADE

SERVICING STRATEGY PLAN*

ITEM	MILESTONE DATE
1. Northeast Area Wastewater Servicing Study - Authorize consultant to proceed with sewer servicing study for St. Catharines, Thorold, Niagara-on-the-Lake and Niagara Falls	2006 (Completed)
2. Complete the Northeast Area Wastewater Servicing Study	2008 (Completed)
3. Authorize consultant to proceed with conceptual design and Schedule 'C' Class Environmental Assessment (EA) to upgrade or replace NOTL WWTP	2008 (Completed)
4. Complete conceptual design and Schedule 'C' Class EA	2012 (Completed)
5. Authorize consultant to proceed with design for new NOTL WWTP	2013 (Ongoing)
6. Complete design of plant upgrade/replacement	2014 (Ongoing)
7. Ministry of the Environmental Approval	2014 (Ongoing)
8. Tender Construction of upgrades	2014
9. Complete construction of upgrades	2016
10. Final Commissioning of upgrades	2017

*Subject to approvals and funding agreement with federal government.

ANNUAL AVERAGE DAILY FLOW 2009 TO 2013 **WATER TREATMENT PLANTS**

Water Treatment Facility Location	Rated Capacity (m³/day)	Average Daily Flow (m³) 2009	Average Daily Flow (m³) 2010	Average Daily Flow (m³) 2011	Average Daily Flow (m³) 2012	Average Daily Flow (m³) 2013	Five Year Average Daily Flow (m³) 2009 to 2013
Decew Falls WTP	227,300	61,444	58,143	53,818	52,603	54,505	56,103
Grimsby WTP	44,000	12,589	13,365	14,120	14,390	14,116	13,716
Niagara Falls WTP	145,475	44,502	48,531	52,217	53,033	46,734	49,003
Port Colborne WTP	36,000	7,756	7,722	8,184	7,926	7,945	7,907
Rosehill WTP	50,026	13,001	13,164	12,769	12,813	11,893	12,728
Welland WTP	102,300	21,969	21,901	22,158	24,346	20,692	22,213

ANNUAL AVERAGE DAILY FLOW 2009 TO 2013 **WASTEWATER TREATMENT PLANTS**

Wastewater Facility Location	Rated Capacity (m ³ /day)	Average Daily Flow (m ³) 2009	Average Daily Flow (m ³) 2010	Average Daily Flow (m ³) 2011	Average Daily Flow (m ³) 2012	Average Daily Flow (m ³) 2013	5 year Average Daily Flow (m ³) 2009 to 2013
Anger Avenue WWTP	24,500	12,875	11,425	14,565	10,998	12,511	12,475
Baker Road WWTP	31,280	24,398	21,947	23,890	18,824	21,271	22,066
Crystal Beach WWTP	9,100	6,354	5,382	6,313	4,663	5,772	5,697
Niagara Falls WWTP	68,300	41,227	38,667	45,447	39,569	43,897	41,761
NOTL Lagoon	5,710	4,865	4,502	5,293	4,265	4,880	4,761
Port Dalhousie WWTP	61,350	37,579	34,329	38,438	31,985	37,706	36,007
Port Weller WWTP	56,180	38,755	35,927	43,303	33,882	37,315	37,836
Queenston WWTP	500	229	230	306	253	284	260
Seaway WWTP	19,600	11,493	10,421	13,607	10,592	12,719	11,766
Stevensville/Douglstown Lagoon	2,289	1,141	1,274	1,535	1,123	1,284	1,271
Welland WWTP	54,550	38,975	36,718	41,701	35,537	40,598	38,706

Regional Water Treatment Facilities Reserve Capacity Calculation for 2013

Treatment Facility	Permit To Take Water (1) (ML/D)	Rated Treatment Capacity (ML/D)	Peaking Factor (2)	Theoretical Average Day Capacity (ML/D)	90% of Average Day Capacity (ML/D)	5-Year Average Day Flow (ML/D)	% of Total Capacity Used	Reserve Treatment Capacity (90%) (ML/D)	Average Consumption Rate (300 l/c/d)	Reserve Serviceable Population (Equivalents)	10-Year Forecast For Population (Residential & Employment)	Surplus Population Over 10-Year Projection
DeCew Falls WTP	227.000	227.300	1.937	117.346	105.6	56.1	48%	49.512	300	165,039	15,704	149,335
Grimsby WTP	44.000	44.000	1.913	23.001	20.7	13.7	60%	7.000	300	23,335	9,414	13,921
Niagara Falls WTP	145.475	145.584	1.572	92.611	83.3	49.0	53%	34.350	300	114,499	14,404	100,095
Port Colborne WTP	45.460	36.000	1.503	23.952	21.6	7.9	33%	13.657	300	45,523	3,065	42,458
Rosehill WTP	78.000	50.026	1.662	30.100	27.1	12.7	42%	14.390	300	47,966	5,876	42,090
Welland WTP	110.000	102.300	1.581	64.706	58.2	22.2	34%	36.035	300	120,118	13,134	106,984

Region's W&WW MSP (AECOM, 2011) requires planning process for expansion when plant capacity exceeds 80%, and expansion should be completed when capacity exceeds 90%

(1) MOE approved quantity of raw water permitted (Permit To Take Water).

(2) The peaking factors used this year are based on an average of actual flow rates of maximum day versus average day flows over the past three years at each facility.

Regional Wastewater Treatment Facilities Reserve Capacity Calculation for 2012

Treatment Facility	MOE Plant Rated Capacity (m3/day)	90 % Plant Capacity - Improvement Project Req'd to be Finished	5-Year Average Daily Flow (m3/day)	% of Total Capacity Used	Reserve Treatment Capacity (of 90% Plant Capacity) (m3/day)	Average Flow Rate (340 L/c/d)	Reserve Serviceable Population (Equivalent)	10-Year Forecast For Population (Res & Employ)	Surplus Over 10-Year Projection (Population)
Anger Avenue (Fort Erie) WWTP	24,500	22,050	12,475	51%	9,575	340	28,162	3,500	24,662
Baker Road (Grimsby) WWTP	31,280	28,152	22,066	71%	6,086	340	17,900	10,700	7,200
Crystal Beach (Fort Erie) WWTP	9,100	8,190	5,697	63%	2,493	340	7,332	991	6,341
Niagara Falls WWTP (1)	68,300	61,470	41,761	61%	19,709	340	57,968	13,724	44,244
NOTL Lagoon (2)	5,710	5,139	4,761	83%	378	340	1,112	1,373	-261
Port Dalhousie (St. Catharines) WWTP	61,350	55,215	36,007	59%	19,208	340	56,494	4,661	51,833
Port Weller (St. Catharines) WWTP	56,180	50,562	37,836	67%	12,726	340	37,429	9,065	28,364
Queenston (NOTL) WWTP(3)	500	450	260	52%	190	340	559	9	550
Seaway (Port Colborne) WWTP	19,600	17,640	11,766	60%	5,874	340	17,276	2,876	14,400
Stevensville/Douglastown Lagoon	2,289	2,060	1,271	56%	789	340	2,321	1,385	936
Welland WWTP	54,550	49,095	38,706	71%	10,389	340	30,556	13,134	17,422

Region's W&WW MSP (AECOM, 2011) requires planning process for expansion when plant capacity exceeds 80%, and expansion should be completed when capacity exceeds 90%

(1) The Niagara Falls WWTP assessment includes the sewage flows from the St. David's area of Niagara-on-the-Lake.

(2) The Niagara-on-the-Lake Lagoon does not currently have sufficient reserve capacity for the next ten years. Planning for expansion is ongoing.

(3) The Queenston WWTP in Niagara-on-the-Lake has a unique capacity commitment of 226m3/day for the following properties: Niagara Parks Commission (75m3/d), Niagara Falls Bridge Commission (63m3/d), Shalamar Campground (38m3/d) and Ontario Power Generation (50m3/d). Due to these commitments and limited UAB, very little residential growth is expected within the next 10 year period within the tributary area.