



**Baker Road Wastewater
Treatment Plant
Annual Performance Report
Treatment and Collection
Reporting Year: 2023**

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BR-T-1 Wastewater Treatment Process Description

The Baker Road Wastewater Treatment Plant (WWTP) is located at 160 Lake Street in the Town of Grimsby. This facility provides wastewater treatment to the Town of Grimsby, Town of Lincoln and Township of West Lincoln. The Baker Road WWTP is a class III conventional activated sludge treatment facility and has been designed to treat an average daily flow (ADF) of 31,280 cubic meters per day (m³/d). This facility can fully treat all flows up to 62,600 m³/d and provides storm treatment for flows greater than 62,600 m³/d up to a maximum flow rate of 120,000 m³/d.

The Baker Road WWTP operates under the following MECP approvals:

Environmental Compliance Approval (Sewage): 5755-AEFJVC, issued March 30, 2017

Environmental Compliance Approval (Air): 2270-4VGJVB, Issued April 5, 2001

Environmental Compliance Approval (Air): 2186-66ZPWP, Issued December 3, 2004

The Baker Road WWTP uses the following processes to treat wastewater:

- Imported Sewage Receiving
- Raw Influent Pumping
- Screening
- Grit Removal
- Primary Treatment
- Secondary Treatment
- Phosphorus Removal
- Disinfection (Chlorination/Dechlorination)
- Solids Handling – sludge digestion, storage and transportation
- Storm Treatment

Imported Sewage Receiving Station: To provide service to Niagara Region residents outside the wastewater servicing area, the Baker Road WWTP accepts imported sewage from commercial haulers as well as Recreational Vehicle holding tank disposals. Receiving stations are situated to ensure all received sewage receives full treatment.

Raw Influent Pumping: After screening, wastewater from the collection system and imported sewage receiving station enters a wet well, equipped with raw sewage pumps. The wet well provides a low point for the collection system to discharge to while the raw sewage pumps lift the wastewater to allow the remainder of the treatment process to occur by gravity.

Screening: mechanically cleaned screens remove rags and large debris that could harm pumps and process equipment. Screenings are sent for disposal in landfill.

Grit Removal: Grit vortex tanks each equipped with a mixer separate heavy suspended materials such as sand and gravel (grit) from lighter organic particles that are kept in

suspension and pass through the tanks with the wastewater for further treatment. The grit is collected, dewatered and sent for disposal at landfill.

Primary Treatment: Primary clarifiers are large tanks that allow the incoming wastewater to slow down. The slower speed allows heavier solids to fall from the wastewater to the bottom of the tank. Sludge collected at the bottom of the primary clarifiers is removed and sent to the solids handling process.

Phosphorus Removal: A coagulant, ferric chloride, is added to the treatment process to aid in phosphorus and suspended solids removal.

Secondary Treatment:

Aeration Tank: Large tanks are equipped with air diffusers to add fine bubbles into the wastewater. This oxygen-enriched environment encourages microorganisms (or “bugs”) to remove dissolved and suspended organics and nutrients. Activated sludge is returned to the aeration process to ensure enough bugs are present to provide adequate wastewater treatment.

Secondary Clarifiers: Secondary clarifiers receive effluent from the aeration tanks which separates the microorganism population and remaining solids. Solids settle as activated sludge on the bottom of the clarifier while a clean effluent flows from the clarifiers to be disinfected and discharged to the environment. A portion of the activated sludge collected on the bottom of the clarifier is pumped back to the front of the aeration tanks to ensure a healthy microbial population. Excess activated sludge is ‘wasted’ or removed from the process and sent to the primary clarifiers for thickening.

Disinfection (chlorination/dechlorination): Chlorine in the form of liquid sodium hypochlorite is added into the effluent stream for pathogen control from April 1 to October 31 each year. Adequate contact time is provided by the chlorine contact chambers. As chlorine can be toxic to aquatic species, disinfected effluent is dechlorinated with a sodium bisulphite solution before being discharged to the Lake Ontario.

Solids Handling

Anaerobic Digestion: Sludge from the primary clarifiers is pumped to a primary anaerobic digester, which overflow into a secondary digester for thickening. Anaerobic digestion allows a further breakdown of pollutants and pathogens in the collected sludge. The digested sludge is transported from site for further treatment or beneficial reuse such as land application or dewatering at the Garner Road Biosolids Facility.

Storm Treatment: During times of wet weather, inflow and infiltration (I&I) can occur in the collection system resulting in high flows of sewage and storm water to the treatment plant. To protect the plant processes from high flows, flows greater than the design peak flow of 62,600 m³/d are diverted to a storm treatment system. Flows diverted to the storm treatment system

receive screening, grit removal and settling (solids removal) before recombining with the final effluent to receive chlorination and dechlorination (from April 1 to October 31) prior to discharge to Lake Ontario. The two storm tanks can hold approximately 2,000 m³. If the storm volume exceeds the tank capacity, the flows continue for disinfection and discharge to the environment. After a storm, the storm tanks are drained and flushed back to the head of the plant to receive full treatment.

BR-T-2 Review of Plant Flows, Influent and Imported Sewage Sampling and Monitoring

Review of 2023 Plant Flows

Table BR-T-1 below outlines the volume of sewage treated at the Baker Road WWTP during the reporting year. It also outlines how much imported sewage was received at site for treatment.

Table BR-T-1: Table of Baker Road WWTP 2023 Treated and Imported Sewage Flows

Flow Statistic	Value
Design Average Daily Flow (ML/d)	31.280
Design Peak Flow Rate - Dry Weather (ML/d)	61.200
Design Peak Flow Rate - Wet Weather (ML/d)	120.000
Total Volume Processed (ML)	8,650.336
Annual Average Daily Flow (MLD)	23.700
% Annual Average Daily Flow Utilization	76%
% Increase/Decrease over prior year	14%
Volume Imported Sewage Received (ML)	7.609
% Increase/Decrease Imported Sewage over prior year	1%
Imported Sewage as % of Flow	0.09%

Reviewing the treated flows in 2023, it was observed that, on average, the plant is utilizing 76% of its design Average Daily Flow capacity. This indicates that the facility has the hydraulic capacity to meet the needs of the collection system with room for additional flows that may be added from development. If the average becomes greater than 80%, plant expansion should be considered. A capital project has been initiated to investigate increasing the capacity of the Baker Road WWTP.

Daily flows to the plant were reviewed. In 2023, there were 43 instances where the flow to the plant was greater than the design Average Daily Flow, amounting to approximately 12% of the

year. These instances occurred during times of wet weather or heavy snow melt suggesting increased flows are occurring due to Inflow and Infiltration.

A review of the monthly average daily flow rate for the prior 10-year period was completed. This can be observed below in Figure BR-T-1 below. An increasing trend is noted starting in 2021. Spikes during typical wet weather seasons further support increased flows are occurring due to Inflow and Infiltration. Trends will be continued to be monitored.

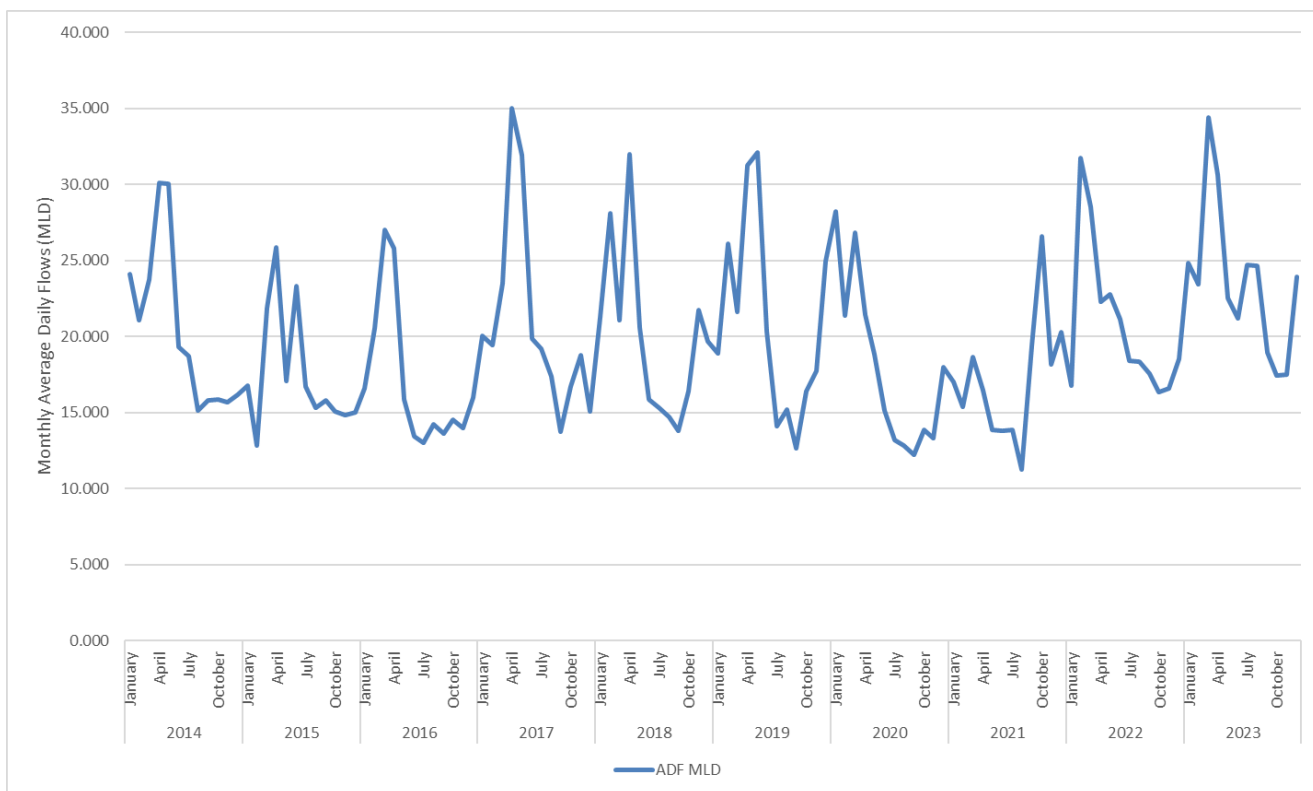


Figure BR-T-1: Graph displaying the Monthly Average Daily Flow Rate in MLD

The volume of imported sewage received at this facility increased by 1% compared to the previous reporting period. There were no operational issues encountered from the receipt of imported sewage in 2023.

Review of Influent Sampling and Monitoring Activities

In 2023, 104 samples of influent were collected and tested. An annual summary of influent sampling can be observed in Table BR-T-5.

Although the volume of sewage is an important consideration for the effective operation of a wastewater treatment plant, another important factor to monitor is plant loading. Plant loading displays if the strength of the sewage received at the plant is getting stronger or weaker. Stronger sewage may impact the amount of sewage the plant can treat effectively.

Plant loading is calculated by measuring the average strength of a pollutant per liter of influent sewage and multiplying it by the average volume of sewage received. This is generally displayed as kilograms of pollutant per day or kg/d. Below in Figure BR-T-2, is a graph depicting four commonly monitored pollutant loading to the plant for the period of 2021-2023.

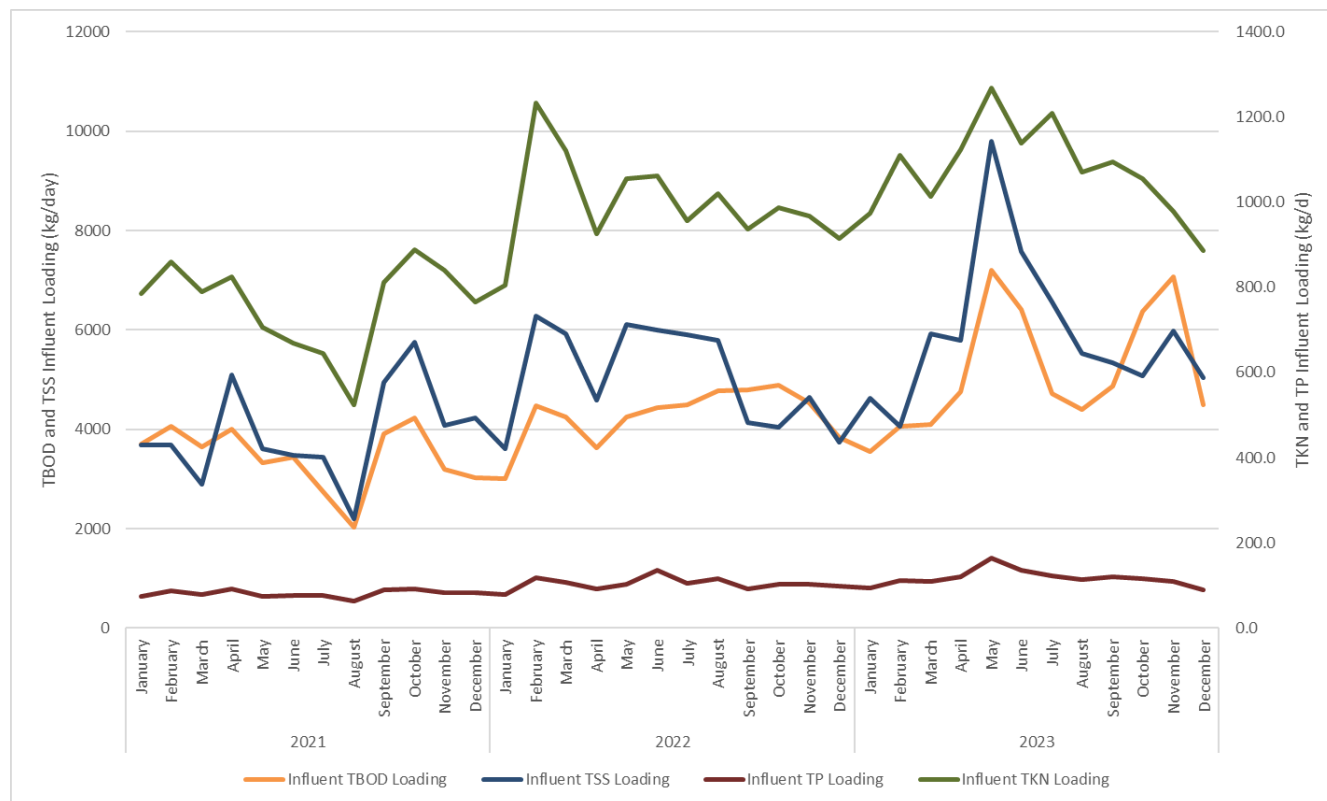


Figure BR-T-2: Figure of monthly plant loadings to the Baker Road WWTP for Total Biochemical Oxygen Demand (TBOD), Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN) and Total Phosphorus (TP), in kg/d, for the period 2021 to 2023.

Reviewing the calculated loadings for TBOD, TSS, TKN and TP for the past three years shows an increasing trend in sewage strength received at the plant. Baker Road WWTP receives flow from industrial sources through the collection system. A review of ten years of loading trends has shown that there was a decrease in loading during the Covid-19 pandemic and loading has returned to typical pre-pandemic levels. Loading will continue to be monitored to ensure proper plant operation.

Review of Imported Sewage Sampling and Monitoring

Imported sewage is sampled bi-weekly to ensure sewage being received will not have an adverse impact to the treatment process or the beneficial re-use of biosolids resulting from the wastewater treatment process. Sampling and testing of imported sewage is not regulated by the ECA but is completed as a best practice. In 2023, 17 samples of imported sewage were collected and submitted for testing by an ISO 17025:2017 accredited laboratory. Results were

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reviewed and compared to the Niagara Region Sewer Use By-law. Where exceedances of the by-law were noted, the source of the imported sewage is investigated. Exceedances of treatable parameters (BOD, TP, TSS, and pH) are allowable under the SUBL.

Table BR-T-2: Table of Imported Sewage monthly average analysis results

Analyte	Units	SUBL Limit	January	February	March	April	May	June	July	August	September	October	November	December
Total Solids	mg/L	-	2,160	1,000		11,500	4,360	3,240	14,800	15,385	79,700	37,065	6,590	134,300
Phosphorus	mg/L	10	6	2		46	53	12	91	56	457	167	38	122
Arsenic	mg/L	1	0.01	0.01		0.05	0.02	0.02	0.05	0.07	0.25	0.35	0.04	0.10
Cadmium	mg/L	0.7	0.00	0.00		0.02	0.01	0.01	0.02	0.03	0.04	0.14	0.01	0.03
Chromium	mg/L	3	0.01	0.01		0.16	0.04	0.05	0.05	0.21	0.85	0.35	0.05	1.20
Cobalt	mg/L	5	0.00	0.00		0.02	0.01	0.01	0.02	0.03	0.39	0.14	0.01	0.05
Copper	mg/L	3	0.18	0.14		1.61	0.90	1.47	3.26	4.16	6.04	3.25	1.59	1.72
Lead	mg/L	1	0.01	0.03		0.22	0.05	0.12	0.29	0.36	1.40	0.35	0.10	0.20
Mercury	ug/L	10	0.42	0.07		0.23	0.23	0.12	5.94	7.57	6.51	0.32	0.24	0.32
Molybdenum	mg/L	5	0.00	0.00		0.04	0.08	0.01	0.05	0.06	0.90	0.08	0.03	0.11
Nickel	mg/L	2	0.01	0.01		0.09	0.04	0.06	0.08	0.15	0.97	0.18	0.08	0.73
Selenium	mg/L	1	0.01	0.01		0.05	0.02	0.02	0.05	0.11	0.10	0.35	0.04	0.10
Zinc	mg/L	3	0.26	0.45		3.90	2.50	2.40	2.80	8.50	28.65	3.00	5.40	2.70
Aluminum	mg/L	-	0.76	0.83		19.30	8.09	7.36	1.90	48.70	614.50	7.25	11.45	21.40
Antimony	mg/L	5	0.02	0.02		0.10	0.04	0.04	0.10	0.12	0.20	0.75	0.07	0.20
Barium	mg/L	-	0.13	0.06		0.51	0.16	0.19	0.21	0.76	7.15	0.35	0.20	0.40
Beryllium	mg/L	-	0.01	0.01		0.05	0.02	0.02	0.05	0.06	0.10	0.35	0.04	0.10
Boron	mg/L	-	0.20	0.20		1.00	0.50	0.40	2.00	1.20	2.00	7.50	0.70	2.00
COD	mg/L	-	2,270	211		19,700	5,440	7,880	166,000	14,140	107,100	94,400	15,200	39,350
Conductivity	us/cm	-	3,000	1,410		2,340	4,240	3,590	2,370	1,945	3,260	2,260	1,890	1,830
Iron	mg/L	-	2.47	2.70		25.20	28.20	13.45	48.60	66.60	611.00	23.30	14.30	83.08
Manganese	mg/L	-	0.06	0.14		0.60	0.69	0.58	1.40	2.66	25.75	1.95	0.56	2.30
pH		6-11	7.90	7.70		5.20	6.70	4.30	3.70	6.60	5.50	3.50	5.55	4.95

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Analyte	Units	SUBL Limit	January	February	March	April	May	June	July	August	September	October	November	December
Silver	mg/L	5	0.01	0.01		0.05	0.24	0.02	0.05	0.06	0.10	0.35	0.04	0.10
Tin	mg/L	5	0.02	0.02		0.10	0.05	0.04	0.20	0.14	0.45	0.75	0.07	0.20
Total Volatile Solids	mg/L	-	1,430	280		8,980	2,080	1,705	11,200	11,385	43,400	28,405	5,350	131,600
Vanadium	mg/L	-	0.01	0.01		0.05	0.02	0.02	0.02	0.07	0.93	0.15	0.03	0.10

Review of Final Effluent Sampling and Monitoring Activities

In 2023, 104 samples of final effluent were collected and tested. Individual as well as monthly average results are reviewed and compared to the objective and compliance limits stated in the facility ECA.

Table BR-T-3 below summarizes the number of monthly objective and compliance limit exceedances at the Baker Road WWTP in the reporting year.

Baker Road did not meet ECA compliance limits for TP in May, August and October of 2023. The ECA objectives for TP were also not met in February, June, July and September. Baker Road WWTP experienced sporadic influent values high in total phosphorus. A more fulsome discussion of the operational issues encountered, and corrective actions taken is included in BR-T-3 below.

A review of individual results against ECA objectives was also complete. Below summarizes the percentage of samples that were over the ECA objective:

- CBOD – 0%
- TSS – 9%
- TP – 38%
- Ammonia – 0%
- E.Coli – 0%

Final effluent sample results did not exceed the ECA objectives greater than 50% of the time.

For most of the year, the Baker Road WWTP provided effective wastewater treatment. Improvements to phosphorus monitoring and treatment are being investigated for 2024. An annual summary of monthly average final effluent sample results are available in

Table BR-T-5 below.

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Table BR-T-3: Evaluation of Final Effluent sample results to ECA objectives and compliance limits

Parameter	ECA Monthly Concentration Objective	ECA Monthly Concentration Limit	Annual Loading Limit	Number of Objective Concentration Exceedances	Number of Monthly Limit Concentration Exceedances	Annual Loading Limit Exceeded? Yes / No
pH	6.5-8.5	6.5-8.5	-	0	0	-
Carbonaceous Biochemical Oxygen Demand (CBOD)	15 mg/L	25 mg/L	782 kg/d	0	0	No
Total Suspended Solids (TSS)	15 mg/L	25 mg/L	782 kg/d	0	0	No
Total Phosphorus (TP)	0.4 mg/L	0.5 mg/L	15.6 kg/d	7	3	No
Total Ammonia Nitrogen: January-April	8 mg/L	10 mg/L	312.8 kg/d	0	0	No
Total Ammonia Nitrogen: May-June	5 mg/L	7 mg/L	219.0 kg/d	0	0	No
Total Ammonia Nitrogen: July-October	3 mg/L	4 mg/L	125.2 kg/d	0	0	No
Total Ammonia Nitrogen: November-December	5 mg/L	7 mg/L	219.0 kg/d	0	0	No
Total Residual Chlorine (TRC)	0.01 mg/L (non-detect)	0.02 mg/L	-	0	0	-
<i>E-Coli (geomean)</i>	100 MPN/100 mL	200 MPN/100 mL	-	0	0	-

Effluent Quality Assurance Measurements and Control Measures

To ensure Baker Road WWTP continues to produce a high-quality effluent the following measures have been implemented:

- Development and implementation of a Wastewater Quality Management System (WWQMS) program
 - This program promotes an environment of continuous improvement for all staff impacting the quality of wastewater
- Compliance samples are analyzed by an ISO 17025:2017 accredited laboratory unless sample results are required to be collected in the field at the time of sampling
- Standard Operating Procedures (SOPs) are in place to support proper sampling and field measurements
- A compliance sampling schedule is created each year to ensure regulatory requirements are being met, as a minimum
- Equipment used in the monitoring and measurement of Final Effluent quality are calibrated annually

Deviations from Scheduled Monitoring Program

Compliance sampling activities at the Baker Road WWTP follow a scheduled monitoring program to ensure all provincial and federal requirements are met. A schedule is prepared for the upcoming year and is submitted to the MECP as part of the annual reporting requirement.

In 2023, nine (9) deviations from the scheduled sampling days occurred. Table BR-T-4 below provides the instances where a deviation occurred and a reason for the deviation.

The 2024 sampling schedule is available upon request.

Table BR-T-4: Table of sampling schedule deviations

Sampling Date Deviation	Sample Type(s)	Reason
2023-03-14	Digested Sludge	Sample submitted on 2023-03-16.
2023-01-25 2023-02-22 2023-03-09 2023-04-05 2023-05-17 2023-07-12 2023-08-23 2023-11-01	Imported Sewage	No samples were submitted by operations staff on the listed dates. Imported Sewage sample analysis is not a compliance requirement. These samples are scheduled as a best practice.

BR-T-3 Description of Operating Problems Encountered and Corrective Actions Taken

ECA Limit and Objective Exceedances – Total Phosphorus

The Baker Road WWTP experienced operational difficulties with intermittent phosphorus loading to the plant during 2023. TP exceeded the ECA compliance limit in May, August and October. The ECA objective was also exceeded in February, June, July and September. Comparing days where the final effluent TP was over the ECA limit to the plant influent, the influent was found to be uncharacteristically high in phosphorus. For example, the annual average influent TP at Baker Road for 2023 was calculated to be 5.2 mg/L. The monthly average influent TP for Baker Road for May was 7.3 mg/L. Of the nine (9) samples collected, six samples were higher than the annual average of 5.2 mg/L, indicating a higher loading of phosphorus to the plant. Due to the sporadic nature of the TP loading, it is difficult to properly dose chemical to combat these spikes resulting in final effluent with TP values over the ECA limit.

Coagulant dosing at the plant was reviewed. A reduction in overall coagulant use was observed. To ensure we are dosing the needed amount of coagulant at times of high loading, coagulant dosing has been increased.

This plant has several industries in its sewer shed, five of which have active over strength agreements with Niagara Region. Environmental Enforcements Officers (EEO) increased monitoring and sampling in the area to evaluate any discharges that may be over the Sewer Use By-law or terms and conditions over strength agreements.

Operations started to increase phosphorus monitoring in fall of 2023. In 2024, operations will be investigating additional monitoring of phosphorus loading to the plant to aid in proper dosing of coagulant.

Table BR-T-5: Annual Summary of Plant and Imported Sewage Flows, Influent and Effluent Sampling and Monitoring Results

Measured Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Total / Average	Samples Collected
Influent - Monthly Average TSS (mg/L)	186	173	172	189	435	358	266	224	282	291	341	211	261	
Number of Influent TSS Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Influent - Monthly Average TBOD (mg/L)	143	173	119	155	320	303	191	178	257	365	404	188	233	
Number of Influent TBOD Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Influent - Monthly Average TP (mg/L)	3.8	4.8	3.2	3.9	7.3	6.4	5.0	4.6	6.4	6.6	6.3	3.8	5.2	
Number of Influent TP Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Influent - Monthly Average TKN (mg/L)	39.26	47.35	29.49	36.68	56.39	53.80	48.93	43.43	57.75	60.46	55.89	37.06	47.21	
Number of Influent TKN Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Total Plant Flows (ML)	769.804	655.995	1,065.899	919.338	697.551	635.196	765.674	764.478	568.831	541.070	525.478	741.022	8650.336	
Daily Average (MLD)	24.832	23.428	34.384	30.645	22.502	21.173	24.699	24.661	18.961	17.454	17.516	23.904	23.700	
Maximum Flow (ML)	48.595	45.734	60.372	58.664	32.099	34.608	39.307	43.476	27.102	29.002	27.970	42.274	MAX	60.372
Minimum Flow (ML)	19.613	17.855	24.949	19.815	17.015	16.898	19.323	20.281	16.547	15.142	9.110	17.633	MIN	9.110
Volume Imported Sewage Received (ML)	0.361	0.243	0.418	0.575	0.493	0.630	0.478	0.598	0.676	1.350	1.321	0.466	7.609	
Final Effluent - Monthly Average TSS (mg/L)	7.3	6.0	9.3	4.4	9.1	10.0	7.2	5.7	6.5	9.5	6.6	14.3	8.0	
Final Effluent - Average Daily TSS Loading (kg/d)	181	141	320	135	205	212	178	141	123	166	116	342	189	
Number of Final Effluent TSS Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average CBOD (mg/L)	4.1	5.0	5.1	4.0	4.0	4.5	4.2	4.0	4.0	5.1	4.8	5.0	4.5	
Final Effluent - Average Daily CBOD Loading (kg/d)	102	117	175	123	90	95	104	99	76	89	84	120	106	
Number of Final Effluent CBOD Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average TP (mg/L)	0.29	0.45	0.26	0.20	0.61	0.49	0.46	0.56	0.45	0.73	0.25	0.40	0.43	
Final Effluent - Average Daily TP Loading (kg/d)	7.20	10.54	8.94	6.13	13.73	10.37	11.36	13.81	8.53	12.74	4.38	9.56	10.17	
Number of Final Effluent TP Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average TKN (mg/L)	2.09	5.55	5.21	2.02	3.41	2.76	2.26	2.33	2.60	3.69	3.26	2.45	3.14	
Number of Final Effluent TKN Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average NH3 (mg/L)	0.11	2.34	2.64	0.45	0.96	0.15	0.15	0.28	0.24	0.67	0.89	0.10	0.75	
Final Effluent - Average Daily NH3 Loading (kg/d)	2.73	54.82	90.77	13.79	21.60	3.18	3.70	6.90	4.55	11.69	15.59	2.39	17.74	
Number of Final Effluent NH3 Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average NO3 (mg/L)	18.42	13.75	8.39	13.33	16.49	15.23	14.82	15.27	18.44	12.96	8.96	11.74	13.98	
Number of Final Effluent NO3 Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average NO2 (mg/L)	0.61	2.24	0.20	0.16	0.50	0.40	0.40	0.40	0.40	0.40	0.51	0.46	0.56	
Number of Final Effluent NO2 Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Geomean E.Coli (MPN/100mL)				3	4	6	11	35	23	18			10	
Number of Final Effluent E.Coli Samples				8	10	8	9	9	8	9				61

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Measured Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Total / Average	Samples Collected
Final Effluent - Monthly Average TRC (mg/L)				0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	
Number of Final Effluent TRC Samples				30	31	30	31	31	30	31				214
Final Effluent - Monthly Average Temperature (°C)	10.94	10.10	10.24	12.29	15.16	18.44	20.66	20.92	20.83	19.37	17.01	14.06	15.84	
Number of Final Effluent Temperature Samples	9	8	9	9	9	8	9	9	8	10	8	8		104
Final Effluent - Monthly Average pH	7.31	7.31	7.30	7.39	7.50	7.08	7.21	7.33	7.25	7.45	7.24	7.05	7.29	
Number of Final Effluent pH Samples	9	8	9	9	9	8	9	9	8	10	8	8		104

BR-T-4 Summary of Major Maintenance Activities and Capital Works

Summary of Maintenance Carried out on Major Equipment

Niagara Region works to keep wastewater infrastructure in a state of good repair. Maintenance activities completed include regular preventative maintenance (PM) activities and normal and emergency equipment repair or replacement. Where a substantial amount of upgrade is required, this work is carried out under the capital works program.

Below is a summary of normal and emergency repairs carried out on major equipment at the Baker Road WWTP:

- Rebuild of sludge haul loading pump
- Secondary Clarifier #1 improvements – major structural rebuild of sludge collection mechanism, media blasted and painting of collector structure

This list does not include PM activities. PMs are completed and tracked in a computerized maintenance management system. PMs completed during the reporting year are available upon request.

Planned Capital Upgrades

The following is a list of capital upgrades forecasted for the Baker Road WWTP:

- Biobed (odour control) upgrades – in design
- Baker Road WWTP Capacity Upgrade – Environmental Assessment and Pre-design stage

Summary and Update of Notice of Modifications Completed

Through the facility ECA, MECP has given System Owners the ability to complete low risk changes to a treatment plant without requiring approval from the MECP. These modifications are documented on a Notice of Modification form and are signed off by the Owner or delegate of the system. Any pre-authorized modifications must be reported on annually to the MECP.

During the reporting year 2023, no Notices of Modification were completed.

No Notice of Modification forms were completed in previous reporting years. No status update is required.

Proposed Works – Status Update

There were no Proposed Works to be reported on for the 2023 reporting period.

BR-T-5 Summary Calibration Activities

Flow Meter Calibration – Influent, Effluent and Imported Sewage

Flow meters measuring discharges to the environment are calibrated at minimum, once per calendar year. Below in Table BR-T-6 provides a summary of flow meter calibration

Table BR-T-6: Summary of Flow Meter Calibration

Meter Name	Date Calibrated	Comments
Baker Road WWTP Influent Meter	2023-06-08	Passed
Baker Road WWTP Plant Overflow Meter	2023-06-08	Passed
Baker Road Final Effluent Meter	2023-04-24	Passed
Baker Road Secondary Bypass Meter	2023-04-14	Passed
Baker Road Final Effluent Meter	2023-11-23	Passed
Baker Road Secondary Bypass Meter	2023-11-23	Passed

Calibration certificates are available upon request.

The volume of Imported Sewage received at site is reported by the sewage hauler on submitted paper manifests. No calibration required.

Effluent Monitoring Equipment Calibration/Verification

It is a requirement to calibrate, or, where unable to calibrate, verify equipment that is used to measure effluent quality.

Some effluent monitoring equipment calibration or verification is completed daily or as used by operations staff such as pH meter calibration or verification of the Total Residual Chlorine colorimeter.

Once annually, a contractor performs calibration or verification on all effluent monitoring equipment. A summary of calibration/verification activities are available in

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Table BR-T-7 below.

Table BR-T-7: Summary of Calibration/Verification of Effluent Monitoring Equipment

Equipment Description	Date Calibrated	Comments
DR1900 Spectrophotometer	2023-08-10	Passed
DR1900 Spectrophotometer	2023-08-10	Passed - top cover replaced
COD Reactor (HACH DRB200)	2023-08-10	Passed
HQ40D with Dissolved Oxygen and pH probe	2023-08-10	Passed – LDO calibration cap replaced
Bench pH Meter (Thermo)	2023-08-10	Passed
Chlorine Portable Pocket Colorimeter	2023-08-10	Passed
Balance – ML3001E/03	2023-09-13	Passed
Balance – ML204/03	2023-09-13	Passed

Calibration certificates are available upon request.

BR-T-6 Solids Handling

Processed Organics Received

No processed organics were received at the Baker Road WWTP during the reporting period. Baker Road WWTP does not typically receive processed organics.

13.6 ML of water treatment plant residuals were received at Baker Road WWTP for further processing.

Volumes of Sludge Generated and Removed From Site

Solids removed from the treatment process are thickened, digested and transported from site for further processing and beneficial re-use. All sludge removed from the Baker Road WWTP is taken to Niagara Region’s Garner Road Biosolids Facility where it is stored, further thickened and either sent for land application or for dewatering and conversion to a pelletized fertilizer.

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Table BR-T-8 provides a summary of 2022 and 2023 sludge volumes removed from site.

Table BR-T-8: Summary of Sludge Removed from Site 2023

Month	2023 Volume Sludge Hauled (ML)	Prior Year Volume Sludge Hauled (ML)
January	3.425	2.732
February	3.816	2.298
March	5.333	3.122
April	4.726	4.336
May	5.203	2.645
June	4.423	3.989
July	4.423	3.122
August	4.163	3.469
September	3.209	3.295
October	4.076	4.163
November	6.808	3.512
December	6.027	4.032
TOTAL	55.631	40.715

There was a 37% increase in sludge removed from site in 2023 versus reporting year 2022. Flows to the facility increased in 2023. An increase in water treatment plant residual received to site was also higher than in 2023. Reviewing historical data, the volume of sludge removed from site is comparative to volumes prior to the pandemic.

No changes are anticipated for sludge handling in 2024 at the Baker Road WWTP.

Sludge Quality Monitoring

Sludge is sampled and analyzed bi-weekly to meet regulatory requirements of the Garner Road Biosolids Facility ECA and maintain our ability to beneficially re-use biosolids. Results are trended and compared to Nutrient Management Act (NMA) limits. Where a trend is detected, investigations are initiated to identify potential sources of the pollutant and correct any issue identified. Average monthly results for 2023 sludge analysis from the Baker Road WWTP is included in Table BR-T-9.

Table BR-T-9: Summary of Monthly Average Sludge Results

Analyte	Units	NMA Limits	January	February	March	April	May	June	July	August	September	October	November	December
Total Solids	%	-	3.03	2.85	1.85	2.00	2.40	2.45	2.05	2.60	2.70	1.85	2.30	2.25
Ammonia as N	mg/Kg	-	1007	995	830	895	935	810	930	860	945	760	805	855
Nitrate+Nitrite	mg/Kg	-	1.00	1.00	0.99	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00
Phosphorus	mg/Kg	-	14,627	28,100	26,700	28,450	21,150	27,800	26,800	28,700	27,700	25,500	22,550	26,550
Arsenic	mg/Kg	170	6.46	6.68	7.98	7.03	6.55	4.95	5.60	5.11	6.09	5.48	4.31	4.52
Cadmium	mg/Kg	34	0.37	0.70	0.95	1.15	0.70	0.50	0.50	0.50	0.85	0.50	0.50	0.50
Chromium	mg/Kg	2,800	32.63	71.30	68.70	72.90	65.85	69.35	69.40	95.47	89.30	86.35	59.55	64.60
Cobalt	mg/Kg	340	1.35	4.25	2.30	3.45	2.25	3.00	4.10	3.80	3.55	4.55	1.55	3.45
Copper	mg/Kg	1,700	277.61	401.00	372.50	391.50	367.50	365.50	364.50	395.67	402.50	424.00	374.50	329.00
Lead	mg/Kg	1,100	14.73	20.00	18.50	27.00	17.50	14.50	12.50	18.67	82.50	220.50	128.00	119.00
Mercury	mg/Kg	11	0.17	0.14	0.17	0.37	0.22	0.17	0.21	0.16	0.11	0.13	0.11	0.18
Molybdenum	mg/Kg	94	6.72	14.50	8.50	9.00	9.50	13.50	14.50	17.33	16.00	19.50	19.50	20.00
Nickel	mg/Kg	420	47.98	91.80	58.40	46.90	27.15	56.95	43.80	49.60	45.00	47.95	105.25	25.95
Potassium	mg/Kg	-	2,527	4,315	7,290	7,185	3,165	4,420	5,115	3,733	3,725	5,065	5,300	5,135
Selenium	mg/Kg	34	2.97	2.85	2.75	3.29	3.30	3.90	2.55	4.03	3.62	3.01	2.48	1.37
Zinc	mg/Kg	4,200	411	1,001	1,045	1,095	779	916	925	1,026	1,038	943	743	673

BR-T-7 Complaints

Two (2) odour complaints were received in 2023 regarding the operation of the Baker Road WWTP. When a complaint is received, operations staff attend the site to verify the complaint. Corrective actions are taken if required based on the site verification. All complaints and corrective actions are logged in a complaint tracking system.

BR-T-8 Bypasses, Overflows, other situations outside Normal Operating, Spills and Abnormal Discharge Events

Bypasses and Overflows

There were five (5) secondary bypass events at the Baker Road WWTP in 2023. Secondary bypasses from this facility receive partial treatment prior to discharge including screening, grit removal, settling (solids removal), chlorination and dechlorination (from April 1 to October 31). Table BR-T-10 provides a monthly breakdown of secondary bypass events occurring at the Baker Road WWTP during the reporting period.

Table BR-T-10: Annual Summary of Secondary Bypass Events by Month

Month Name	Number of Overflow Events	Total Volume (ML)
January	1	4.226
February	0	0.000
March	2	5.425
April	2	11.790
May	0	0.000
June	0	0.000
July	0	0.000
August	0	0.000
September	0	0.000
October	0	0.000
November	0	0.000
December	0	0.000
Total	5	21.441

Secondary bypasses are sampled and submitted for analysis. Results are shown in Table BR-T-11 below.

Table BR-T-11: Baker Road WWTP Secondary Bypass Sampling Results

Date	CBOD (mg/L)	TSS (mg/L)	TP (mg/L)	TKN (mg/L)	Ammonia as N (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	E.Coli ¹ (MPN/100mL)
2023-01-04	61	113	2.19	17.1	7.15	1.3	0.4	
2023-03-04	37	50	1.5	12.1	8.3	0.7	0.6	
2023-03-05	80	83	2	22.6	14.6	0.2	0.1	
2023-04-01	24	27	0.7	5.8	2.2	4.6	0.2	80,000
2023-04-05	24	35	0.9	8.3	4.8	3.8	0.1	50,000
2023-04-06	24	9	0.3	1.8	0.9	4.1	0.1	3

Situations Outside of Normal Operating Conditions

The MECP defines “Normal Operating Conditions” as when all unit process(es), excluding Preliminary Treatment System, in a treatment train is operating within its design capacity.

The plant did not operate outside of Normal Operating Conditions during the reporting year.

Spills

Niagara Region strives to maintain and operate wastewater infrastructure so spills to the environment do not occur. However, circumstances may arise and a spill occurs due to equipment malfunction, failure or other reasons. Occasionally, a planned spill may be required to safely complete required maintenance to critical equipment. If this is necessary, approval from the MECP is obtained in advance.

All spills are reported to the MECP Spills Action Centre upon discovery. Spills are investigated and written reports are submitted to the MECP and Environment and Climate Change Canada as required by legislation. Below in Table BR-T-12 summarizes spills that occurred at the Baker Road WWTP in 2023.

Table BR-T-12: Summary of spills occurring at the Baker Road WWTP during the reporting year

Spill Date	MECP Incident Number	Description of Spill
No Spills in 2023		

¹ Sampling and Testing of E.Coli is completed April 01 to October 31 annually

Abnormal Discharges

An abnormal discharge is a discharge to the environment that is abnormal in quality or quantity. There were no abnormal discharges from the Baker Road WWTP during this reporting year.

BR-T-9 Summary of Efforts to Achieve Conformance with F-5-1 and/or F-5-5

Summary of Efforts – Procedure F-5-1 – Secondary Treatment Equivalent

Procedure F-5-1 states wastewater treatment facilities are to provide treatment of wastewater to a minimum of secondary treatment equivalence. This means the WWTP should be designed to meet objectives of 15 mg/L for CBOD and TSS and 1 mg/L for TP.

As demonstrated above in section BR-T-2, Baker Road WWTP provides effective secondary treatment. The Final Effluent annual average quality achieved in 2023 were below the secondary treatment equivalent MECP design objectives.

Summary of Efforts – Procedure F-5-1 – Sewage Bypass/Overflow from Nominally Separated System

Procedure F-5-1 states that bypasses and overflows from nominally separated systems are not allowed except in emergency situations. Emergency situations include protection from basement flooding, preventing damage to WWTP equipment or pumping stations or to prevent treatment process washout.

The Baker Road WWTP experiences high flow conditions due to inflow and infiltration in the collection system that require overflows to occur to prevent emergency situations. Being a two-tier system, Niagara Region works closely with the Town of Grimsby, Town of Lincoln and Township of West Lincoln to reduce overflows at the wastewater treatment plant. Niagara Region participates in a cost sharing strategy with lower tier municipalities to fund overflow reduction projects. In 2023, Niagara Region had an approved budget totaling \$4.0M for the overflow reduction cost sharing program. Two (2) projects in the Town of Grimsby, two (2) projects in the Town of Lincoln and one (1) project for the Township of West Lincoln were approved for cost sharing with Niagara Region contributing \$330,500 to support a sewer inflow and infiltration reduction, sanitary sewer replacement and flow monitoring activities.

Excess Primary Treatment Capacity

F-5-1 allows for excess primary treatment where it is impractical or uneconomical to provide secondary treatment to wet weather flow. Baker Road is equipped with two storm tanks that

provide excess primary treatment to wet weather flow. Flows greater than the plant design peak flow of 62,600 m³/d are diverted to the storm system. Storm flows diverted to the storm treatment system receive screening, grit removal and settling (solids removal) before recombining with the final effluent to receive chlorination and dechlorination (from April 1 to October 31) prior to discharge to Lake Ontario via the plant effluent outfall.

The two storm tanks can store approximately 2,000 m³ in the settling tanks prior to a secondary bypass occurring. This volume is returned to the plant for full treatment when wet weather events are over.

Industrial Waste

Industrial waste can contain material that can have negative impacts on collection system infrastructure as well as the wastewater treatment process itself. Upsets to the treatment process can cause a plant to become non-compliant with ECA objectives and limits. To protect our infrastructure, the Niagara Region has a Sewer Use By-law in place. Environmental Enforcement Officers conduct industry inspections as well as sampling and monitoring of industrial discharges on a routine basis to ensure that they meet the Sewer Use By-law limits.

Summary of Efforts – Procedure F-5-5

The MECP Procedure F-5-5 applies to combined sewage systems. The Baker Road wastewater collection system is considered nominally separated. This procedure does not apply.

BR-C-1 Overview of the Baker Road WWTP Collection System

The Baker Road WWTP collection system is a class II system that collects wastewater from domestic, commercial and some industrial sources from the municipalities of Grimsby, Lincoln and West Lincoln. The collection system consists of the following:

- Local sanitary sewers
- 19.7 kilometres of regional gravity mains
- 41.7 kilometres of regional force mains
- 15 pumping stations:
 - Bal Harbour Sewage Pumping Station
 - Biggar Lagoon Sewage Pumping Station and Sewage Detention Tank
 - Bridgeport Sewage Pumping Station
 - Campden Avenue Sewage Pumping Station
 - Jordan Valley Sewage Pumping Station
 - Lake Street Sewage Pumping Station
 - Lakewood Gardens Sewage Pumping Station
 - Laurie Avenue Sewage Pumping Station
 - Old Orchard Sewage Pumping Station
 - Ontario Street Sewage Pumping Station
 - Roberts Road Avenue Sewage Pumping Station
 - Smithville Sewage Pumping Station and Sewage Detention Tank
 - Streamside Sewage Pumping Station
 - Victoria Avenue Sewage Pumping Station
 - Woodsview Sewage Pumping Station
- Grimsby Works Yard Sewage Detention Facility
- Three odour control facilities (OCF):
 - Park Road OCF
 - Sann Road OCF
 - Thirty Road OCF
- A total of nine Sanitary Sewage Outfalls (SSO) outfalls, including overflow structures at eight of the 15 pumping stations

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Figure BR-C-1: Map of Baker Road WWTP Collection System

The collection system is operated under a two-tier system, where the Town of Grimsby, Town of Lincoln and Township of West Lincoln own and operate local gravity sanitary sewers and Niagara Region owns and operates sewage pumping stations, forcemains and larger gravity sanitary sewers or trunk sewers. It is classified as a nominally separated system meaning that storm water is collected separately from sanitary sewage but the system may still be impacted by inflow and infiltration from sources such as roof leaders, foundation drains, leaky pipes and joints and maintenance holes.

The collection system operates under the following Consolidated Linear Infrastructure ECA:

- Baker Road Wastewater Catchment System, 007-W608, issue number 1

Annual reporting has been prepared to meet the requirements of this approval.

The Niagara Region also has an ECA for the Smithville Lagoon site.

- Smithville Lagoon, ECA 3-1192-79-006

This site is no longer in operation but details of the monitoring and status of this site have been included to satisfy site annual reporting requirements.

BR-C-2 Summary and Interpretation of Collection System Monitoring Data

Monitoring of Pump Station Operations

Pump stations operate through automatic control and are monitored continuously using Supervisory Control and Data Acquisition (SCADA). Stations alarms are programmed to alert the operations staff at the Baker Road WWTP 24 hours a day of potential issues including but not limited to high wet well levels, pump faults, communication failures and standby generator status. Operators will respond to station alarms as required to ensure proper station operation.

Station operation is trended in SCADA. SCADA trends are reviewed daily by operations staff to evaluate station performance. Operators will look at pump cycle times, station discharge flow and pump duty rotation to identify potential issues. Where potential issues are identified, work orders are generated for follow up by maintenance staff.

In addition to SCADA monitoring, monthly station inspections are completed by operations staff. This includes inspection of the station and testing of standby generator equipment.

Sanitary Sewer Closed-Circuit Television Inspection Program

Niagara Region owns and maintains 145 kilometers of trunk sanitary gravity sewers, 161 kilometers of sanitary forcemains, and 2,093 sanitary access chambers across 11 municipalities. Approximately 85% of its conventional trunk sanitary gravity system is inspected using closed-circuit television (CCTV) once every three years. The remaining 15% is large diameter trunk sewers, which are inspected once every 10 to 15 years due to the necessity for specialized equipment to access and inspect sewers that have continuous high flow levels.

Table BR-C-1 details the total length of sewers inspected over the past four years.

Table BR-C-1- CCTV Program Summary

Measurement in Kilometers (km)	2020	2021 ²	2022	2023
Inspection Length (km)	37.9	18.5	59.3	33.0

Observations from the inspections are recorded for structural and operational deficiencies of the pipes. Operational deficiencies (blockage from grease, roots, debris) are addressed through the cleaning/flushing program. Structural deficiencies (broken, fractured, surface

² 2021 marked the end of one inspection contract and the start of a new contract. Delays in the procurement process due to competing priorities resulted in a gap in inspection contracts. As a result, the length of sewers inspected in 2021 was less than in prior years.

damage, holes) as well as Inflow and Infiltration are forwarded for consideration in the asset management plan and capital upgrade program.

Flow Monitoring

Niagara Region monitors sewer flows at 158 locations. Flow monitoring information is used for municipal Pollution Prevention and Control Plans (PPCPs), Master Servicing Plans (MSPs) including the 2021 Water and Wastewater MSP, Inflow and Infiltration studies, billing, development planning, and capital project design.

BR-C-3 Summary of Operating Issues Encountered and Corrective Actions Taken

Pump Stations and Forcemains

No operational issues were encountered with pump stations or forcemains in 2023.

Gravity Trunk Sewers

No operational issues were encountered with Niagara Region gravity trunk sewers in 2023.

BR-C-4 Summary of Major Maintenance, Capital Projects and Pre-Authorized Alterations

Summary of Maintenance Carried out on Major Equipment

Niagara Region works to keep wastewater infrastructure in a state of good repair. Maintenance activities completed include regular preventative maintenance (PM) activities and normal and emergency equipment repair or replacement. Where a substantial amount of upgrade is required, this work is carried out under the capital works program.

Below is a summary of normal and emergency repairs carried out on major equipment in the Baker Road Collection System:

- Woodsvew SPS – repair of pump #1
- Jordan Valley SPS – rebuild of pump #2
- Ontario Street SPS – rebuild of pump #2
- Bridgeport SPS capital upgrades were completed in 2023

This list does not include PM activities. PMs are completed and tracked in a computerized maintenance management system. PM completed during the reporting year are available upon request.

Planned Capital Upgrades

The following is a list of capital upgrades forecasted for the Baker Road Collection System:

- Jordan Valley SPS station and forcemain upgrades – 60% design
- Lakewood Gardens SPS station upgrades – 90% design
- Bal Harbour SPS Upgrades – 90% design
- Lake Street SPS station upgrades – 90% design
- Laurie Avenue SPS station upgrades – construction anticipated for 2024
- Victoria Avenue SPS forcemain upgrades – 40% design
- Biggar Lagoon SPS – 90% design
- Woodsvie SPS station capacity and sustainability upgrades – Class environmental assessment and conceptual design underway

The Smithville Lagoon site operates under ECA 3-1192-79-006 and is under the care and control of Baker Road WWTP Operations staff. This site has not received sewage since 2006. No discharge from the site occurred in 2023. A capital project is underway to decommission the facility. A risk assessment was initiated and completed in 2022. Decommissioning of the site will occur as funding permits.

Summary of Pre-Authorized Alterations Undertaken

Through collection system ECAs, MECP has given System Owners the ability to complete low risk changes to a sewage pumping station, forcemain or gravity main without requiring further approval from the MECP. These modifications are documented on an applicable MECP form and signed off by the Owner or delegate of the system. Any pre-authorized modifications must be reported on annually to the MECP.

During the reporting year 2023, no pre-authorized modifications were completed.

No pre-authorized works were completed and therefore, there were no alterations that would pose a significant threat to drinking water.

BR-C-5 Summary of Calibration Activities

The following calibration activities were completed in the Baker Road collection system in 2023:

Table BR-C-2: Annual Summary of Collection System Calibration Activities Completed

Equipment Description	Date Calibrated	Comments
Smithville SPS Station Discharge Meter	2023-04-14	Passed
Smithville SPS Station Discharge Meter	2023-11-22	Passed
Ontario Street SPS Station Discharge Meter	2023-04-14	Passed

Equipment Description	Date Calibrated	Comments
Ontario Street SPS Station Discharge Meter	2023-11-23	Passed
Lake Street SPS Overflow Meter	2023-06-09	Passed
Grimsby Works Yard Overflow Meter	2023-06-07	Passed

Calibration certificates are available upon request.

BR-C-6 Summary of Complaints

One (1) odour complaint was received in 2023 regarding the operation of the Baker Road collection system. When a complaint is received, operations staff attend the site to verify the complaint. Corrective actions are taken if required based on the site verification. All complaints and corrective actions are logged in a complaint tracking system.

BR-C-7 Summary of Collection System Overflows and Spills

Collection System Overflows

Although the Baker Road wastewater collection system is nominally separated, collection system overflows occur during wet weather events due to inflow and infiltration into the sewage collection system. Overflows are necessary to prevent basement flooding and to protect downstream infrastructure and wastewater treatment processes.

Overflow Location	Overflow Date	Overflow Volume (ML)	Overflow Duration (hh:mm)	BOD Loading (kg)	TSS Loading (kg)	TP Loading (kg)	TKN Loading (kg)
Grimsby Works Yard CSO	2023-01-04	0.981	2:12	NS	NS	NS	NS
Grimsby Works Yard CSO	2023-02-09	4.668	9:25	NS	NS	NS	NS
Grimsby Works Yard CSO	2023-03-04	2.328	24:00	NS	NS	NS	NS
Grimsby Works Yard CSO	2023-04-01	1.470	14:45	62	182	2.9	23.4
Grimsby Works Yard CSO	2023-04-04	0.017	0:10	NS	NS	NS	NS
Grimsby Works Yard CSO	2023-04-05	4.415	14:40	340	243	5.3	66.2
Grimsby Works Yard CSO	2023-07-29	0.713	4:10	NS	NS	NS	NS
Grimsby Works Yard CSO	2023-08-15	1.490	5:00	NS	NS	NS	NS
Jordan Valley SPS	2023-03-04	0.098	1:00	NS	NS	NS	NS
Jordan Valley SPS	2023-04-05	0.189	1:55	8	7	0.2	1.8
Old Orchard SPS	2023-01-04	1.517	5:05	NS	NS	NS	NS

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Overflow Location	Overflow Date	Overflow Volume (ML)	Overflow Duration (hhh:mm)	BOD Loading (kg)	TSS Loading (kg)	TP Loading (kg)	TKN Loading (kg)
Old Orchard SPS	2023-03-04	3.216	17:00	NS	NS	NS	NS
Old Orchard SPS	2023-04-01	1.657	7:40	40	30	0.8	2.7
Old Orchard SPS	2023-04-05	0.679	5:30	27	34	0.1	1.0
Old Orchard SPS	2023-07-29	7.330	5:55	NS	NS	NS	NS
Old Orchard SPS	2023-08-15	1.606	4:50	NS	NS	NS	NS
Old Orchard SPS	2023-08-25	0.271	3:03	NS	NS	NS	NS
Ontario Street SPS	2023-01-04	0.568	5:05	NS	NS	NS	NS
Ontario Street SPS	2023-03-04	0.091 ⁴	6:00	NS	NS	NS	NS
Woodsview SPS	2023-01-04	0.300	5:03	NS	NS	NS	NS
Woodsview SPS	2023-03-04	0.097 ⁵	16:30	NS	NS	NS	NS
Woodsview SPS	2023-04-01	0.318 ⁵	6:25	NS	NS	NS	NS
Woodsview SPS	2023-04-05	0.096 ⁵	5:40	4	4	0.0	0.1
Woodsview SPS	2023-07-29	0.060 ⁵	4:50	NS	NS	NS	NS
Woodsview SPS	2023-08-15	0.018 ⁵	5:03	NS	NS	NS	NS
Woodsview SPS	2023-08-24	0.000 ⁵	3:18	NS	NS	NS	NS

Table BR-C-3 provides a summary of collection system overflows that occurred during the reporting year. The table includes volume discharge, overflow durations as well as pollutant loading to the environment.

More [information on sewage overflows and inflow and infiltration](http://www.niagararegion.ca/living/sewage/cso), is available on the Region's website (www.niagararegion.ca/living/sewage/cso).

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Table BR-C-3: Collection System Overflow Event Details. Where NS is indicated, no sample results are available.

Overflow Location	Overflow Date	Overflow Volume (ML)	Overflow Duration (hhh:mm)	BOD Loading (kg)	TSS Loading (kg)	TP Loading (kg)	TKN Loading (kg)	E.Coli ³ (MPN/100 mL)	Was the Overflow Disinfected (Yes/No)	Were Any Adverse Impacts Observed (Yes/No)	Corrective Actions Taken
Grimsby Works Yard CSO	2023-01-04	0.981	2:12	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-02-09	4.668	9:25	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-03-04	2.328	24:00	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-04-01	1.470	14:45	62	182	2.9	23.4	440,000	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-04-04	0.017	0:10	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-04-05	4.415	14:40	340	243	5.3	66.2	1,300,000	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-07-29	0.713	4:10	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Grimsby Works Yard CSO	2023-08-15	1.490	5:00	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Jordan Valley SPS	2023-03-04	0.098	1:00	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Jordan Valley SPS	2023-04-05	0.189	1:55	8	7	0.2	1.8	1,000,000	No	No	Awaited End of Event
Old Orchard SPS	2023-01-04	1.517	5:05	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Old Orchard SPS	2023-03-04	3.216	17:00	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Old Orchard SPS	2023-04-01	1.657	7:40	40	30	0.8	2.7	120,000	No	No	Awaited End of Event
Old Orchard SPS	2023-04-05	0.679	5:30	27	34	0.1	1.0	50,000	No	No	Awaited End of Event
Old Orchard SPS	2023-07-29	7.330	5:55	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Old Orchard SPS	2023-08-15	1.606	4:50	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Old Orchard SPS	2023-08-25	0.271	3:03	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Ontario Street SPS	2023-01-04	0.568 ⁴	5:05	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Ontario Street SPS	2023-03-04	0.091 ⁴	6:00	NS	NS	NS	NS	N/A	No	No	Awaited End of Event

³ E.Coli sampling and analysis is required April 01 to October 31 annually.

⁴ Overflow volume is estimated.

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Overflow Location	Overflow Date	Overflow Volume (ML)	Overflow Duration (hhh:mm)	BOD Loading (kg)	TSS Loading (kg)	TP Loading (kg)	TKN Loading (kg)	E.Coli ³ (MPN/100 mL)	Was the Overflow Disinfected (Yes/No)	Were Any Adverse Impacts Observed (Yes/No)	Corrective Actions Taken
Woodsview SPS	2023-01-04	0.300 ⁵	5:03	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Woodsview SPS	2023-03-04	0.097 ⁵	16:30	NS	NS	NS	NS	N/A	No	No	Awaited End of Event
Woodsview SPS	2023-04-01	0.318 ⁵	6:25	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Woodsview SPS	2023-04-05	0.096 ⁵	5:40	4	4	0.0	0.1	110,000	No	No	Awaited End of Event
Woodsview SPS	2023-07-29	0.060 ⁵	4:50	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Woodsview SPS	2023-08-15	0.018 ⁵	5:03	NS	NS	NS	NS	NS	No	No	Awaited End of Event
Woodsview SPS	2023-08-24	0.000 ⁵	3:18	NS	NS	NS	NS	NS	No	No	Awaited End of Event

⁵ Overflow volume is estimated.

Collection System Spills

Niagara Region strives to maintain and operate wastewater infrastructure so spills to the environment do not occur. However, circumstances arise where a spill occurs due to equipment malfunction, failure or other reasons. Occasionally, a planned spill may be required to safely complete required maintenance to critical equipment. If this is necessary, approval from the MECP is obtained in advance.

All spills are reported to the MECP Spills Action Centre upon discovery. Spills are investigated and written reports are submitted to the MECP and Environment and Climate Change Canada as required by legislation. Below in Table BR-C-4 summarizes spills that occurred in the Baker Road collection system in 2023.

Table BR-C-4: Summary of Spills Occurring in the Baker Road Collection System

Spill Date	MECP Incident Number	Description of Spill
No spills in the collection system in 2023		

BR-C-8 Summary of Efforts to Reduce WWTP Bypasses/Overflows and Collection System Overflows

Projects Undertaken to Reduce Bypasses or Overflows

The Baker Road WWTP experiences high flow conditions that require overflows to occur due to inflow and infiltration in the collection system to prevent emergency situations. Being a two-tier system, Niagara Region works closely with the Town of Grimsby, Town of Lincoln and Township of West Lincoln to reduce overflows at the wastewater treatment plant and from the collection system. Niagara Region participates in a cost sharing strategy with lower tier municipalities to fund overflow reduction projects. In 2023, Niagara Region had an approved budget totaling \$4.0M for the overflow reduction cost sharing program. Two (2) projects in the Town of Grimsby, two (2) projects in the Town of Lincoln and one (1) project for the Township of West Lincoln were approved for cost sharing with Niagara Region contributing \$330,500 to support a sewer inflow and infiltration reduction, sanitary sewer replacement and flow monitoring activities.

The Baker Road collection system had 26 overflows in 2023. A Pollution Prevention and Control Plan (PPCP) update was recently undertaken by Niagara Region with participation and

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support from area municipalities serviced by the Baker Road WWTP. This project was completed in December 2021 and provided recommendations to target areas of high inflow and infiltration.

Many stations are forecasted for upgrades in the Baker Road collection system which include increases to the capacity of the station. Capacity increases have been completed at the Bridgeport SPS and Campden SPS. Capacity upgrades are in design for Lake Street SPS, Laurie Avenue SPS and Victoria Avenue SPS. Capacity increases will help alleviate collection system overflows.

Public Reporting of Bypasses and Overflows

Niagara Region reports all [bypass and overflow events](https://www.niagararegion.ca/living/sewage/CSO/Reporting/CSOLocations.aspx) publicly on the Niagara Region website (<https://www.niagararegion.ca/living/sewage/CSO/Reporting/CSOLocations.aspx>)

Niagara Region updates the data on recent overflows four times a year and displays any overflows that may have occurred in the past 12 months.

A [listing of overflow data back to 2008](https://niagaraopendata.ca/dataset/combined-sewage-overflow) is available through the Niagara Open Data website (<https://niagaraopendata.ca/dataset/combined-sewage-overflow>)

An active project is underway to improve public reporting of bypasses and overflows including making the data available in near real time.