King's Bay Environmental Centre

Works # 110003665

Annual Wastewater Performance Report

Prepared For: The City of Kawartha Lakes

Reporting Period of January 1st – December 31st, 2023

Issued: March 28, 2024

Revision: 0

Operating Authorities:

Kawartha Lakes

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

2023 Performance Report for King’s Bay Environmental Centre

The King’s Bay Environmental Centre, unless noted within this report, complies with all requirements of the regulating authorities and operates under:

- Environmental Compliance Approval (ECA) No. 7037-A77JLP issued February 16, 2016
- Environmental Compliance Approval (ECA) No. 141-W601 issued June 20, 2023

The Environmental Compliance Approval Number 7037-A77JLP, for the King's Bay Environmental Centre, stipulates that the operating authority for the following conditions shall maintain annual records:

Section 10 - Reporting (6)

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming a part of the Works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance procedures conducted on all monitoring equipment; and

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6.

(g) a tabulation of the volume of sludge generated in the reporting period and an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

(h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

(i) a summary of all by-pass, spill or abnormal discharge events;

(j) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification;

(k) a report summarizing all modifications completed as a result of Schedule B, Section 3; and

(l) any other information the Water Supervisor requires from time to time.

The Environmental Compliance Approval Number 141-W601 for the City of Kawartha Lakes Wastewater Collection System, including the King's Bay Environmental Sewage Collection System, stipulates that the Owner shall prepare an annual performance report for the Authorized System and includes:

Schedule E – Reporting (4.6)

a) a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.
b) a summary of any operating problems encountered and corrective actions taken.
c) a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.
d) a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.
e) a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.
f) a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including:
    i. Dates;
    ii. Volumes and durations;
    iii. If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli;
    iv. Disinfection, if any; and
    v. Any adverse impact(s) and any corrective actions, if applicable.
g) a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable:
    i. A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.
    ii. Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines.
    iii. An assessment of the effectiveness of each action taken.
    iv. An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.
    v. Public reporting approach including proactive efforts

Environmental Compliance Approval (ECA) No. 7037-A77JLP

The following is a report from the records maintained by the Ontario Clean Water Agency for the King's Bay Environmental Centre for the year 2023.

(a) Attached, as **Appendix I**, is a copy of the 2023 **Performance Assessment Report (PAR)** for the King's Bay Environmental Centre showing effluent criteria. The PAR contains: a tabulation of all monthly average raw sewage and final effluent sample results obtained during the reporting period, a tabulation of average daily flows, and monthly volumes for the reporting period, and a tabulation of calculated total loading of BOD, suspended solids, total phosphorus, and ammonia + ammonium as nitrogen concentrations in the final effluent.

Attached as **Appendix II: Groundwater Monitoring**, are the results of the groundwater monitoring as required by the Environmental Compliance Approval – Table 3.

The following table summarizes the average concentration and annual average loading of the effluent parameters $CBOD_5$, Total Suspended Solids, Total Phosphorus, and pH in comparison to the effluent limits and objectives specified by the Environmental Compliance Approval. Attached in **Appendix III**, a summary of the final effluent pH and temperature recorded at the facility. The recording frequency required by the Environmental Compliance Approval is monthly.

Table 1 outlines the effluent criteria limits as set out in Section 7(1) of Environmental Compliance Approval Number 7037-A77JLP as follows:

Table 1: Final Effluent Compliance Limits 2023

Effluent Parameters (Column 1)	Average Effluent Concentration limit (mg/L) (Column 2)	Actual Annual Average Effluent Concentration (mg/L)	Compliant (Y/N)	Average Total Effluent Loading Limit (kg/d) (Column 3)	Actual Annual Average Effluent Loading (kg/d)	Compliant (Y/N)
$CBOD_5$	15.0	7.33	Y	N/A	N/A	N/A
Total Suspended Solids	15.0	12.88	Y	N/A	N/A	N/A
Total Phosphorus	1.0	0.26	Y	0.17	0.01	Y

Effluent Parameters (Column 1)	Average Effluent Concentration limit (mg/L) (Column 2)	Actual Annual Average Effluent Concentration (mg/L)	Compliant (Y/N)	Average Total Effluent Loading Limit (kg/d) (Column 3)	Actual Annual Average Effluent Loading (kg/d)	Compliant (Y/N)
pH	6.0 to 9.0, inclusive, at all times	7.57	Y	N/A	N/A	N/A

Note:
Condition 7(2) states that for the purposes of determining compliance with and enforcing subsection (1):
(a) The Annual Average Concentration of CBOD5 and Total Suspended Solids named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).
(b) The Annual Average Loading of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum waste loading set out in Column 3 of subsection (1).

The maximum raw flow into the facility was 82.59 m^3/d, which occurred in April 2023. This is well below the allowable peak flow rate of approximately 666.0 m^3/d and is also well below the rated capacity of 170.0 m^3/d listed in the Environmental Compliance Approval. The average daily flow for 2023 was 46.39 m^3/d.

ECA Condition 6(2)(b) states: "The Owner shall use best efforts to operate the works within the Rated Capacity of the Works." Rated Capacity is defined as Average Daily Flow for which the Works are approved to handle. Table 2 provides a summary of the average daily influent flows in comparison with the rated capacity of 170.0 m^3/day.

Table 2: Effluent Objectives Influent Flow Data for 2023 (per ECA # 7037-A77JLP, Condition 6(2)(b))

Month	Avg. Daily Flow (m^3)	ECA Rated Capacity (m^3)	Compliant (Y/N)
January	47.09	170.0	Y
February	45.91	170.0	Y
March	47.43	170.0	Y
April	58.36	170.0	Y
May	55.55	170.0	Y
June	49.43	170.0	Y
July	44.31	170.0	Y
August	42.25	170.0	Y
September	41.35	170.0	Y
October	43.24	170.0	Y

Month	Avg. Daily Flow (m^3)	ECA Rated Capacity (m^3)	Compliant (Y/N)
November	39.11	170.0	Y
December	42.73	170.0	Y

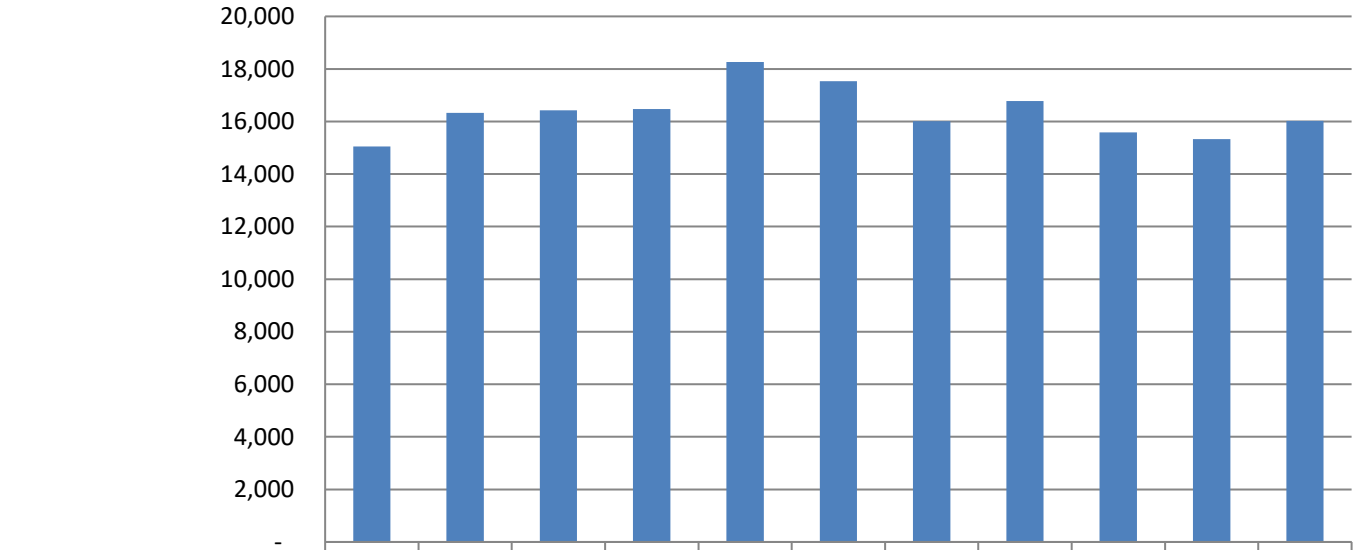
Table 3 provides a summary of the average daily effluent flows in comparison with the rated capacity of 170.0 m^3/day.

Table 3: Effluent Objectives Effluent Flow Data for 2023 (per ECA # 7037-A77JLP, Condition 6(2)(b))

Month	Avg. Daily Flow (m^3)	ECA Rated Capacity (m^3)	Compliant (Y/N)
January	45.80	170.0	Y
February	43.74	170.0	Y
March	44.82	170.0	Y
April	54.71	170.0	Y
May	53.96	170.0	Y
June	45.77	170.0	Y
July	41.87	170.0	Y
August	40.95	170.0	Y
September	37.41	170.0	Y
October	41.32	170.0	Y
November	37.75	170.0	Y
December	38.84	170.0	Y

Graph 1 provides a summary of the annual total effluent flows from 2013 to the 2023 reporting period.

Graph 1: Annual Total Effluent Flow Comparison



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Annual Effluent Flow (m^3)	15,048	16,331	16,429	16,477	18,267	17,540	16,011	16,776	15,581	15,329	16,028

The final effluent quality for total phosphorus was well below the limits set in the Environmental Compliance Approval. The annual average concentration for total phosphorus was 0.26 mg/L (limit of 1.0 mg/L) and the annual average loading for total phosphorus was 0.01 kg/d (limit of 0.17 kg/d based on design average day flow of 170.0 m^3/d).

The pH of the effluent ranged from 7.16 to 7.96, which are within the range of 6.0 – 9.0 required by the Environmental Compliance Approval.

The total suspended solids effluent objective was not met but the limit was met in 2023. The annual effluent average of 12.88 mg/L exceeded the objective of 10.0 mg/L but met the limit of 15.0 mg/L.

The carbonaceous biochemical oxygen demand effluent objective and limit was met in 2023. The annual effluent average of 7.33 mg/L met the objective of 10.0 mg/L and met the limit of 15.0 mg/L.

During the reporting period, work continued to bring and keep the system in compliance. Adjustments to the system include: alum dosage, the timers on the return sludge system to optimize the return rate, and removal of sludge from the system by a licensed waste hauler to lower the solids build-up. The facility operators continued to closely monitor the process and make necessary adjustments as required.

Groundwater Monitoring Wells

The well levels were measured once in Quarter 1, 2, 3 and 4 of 2023. The well levels for the eight groundwater monitoring wells are found in **Appendix IV: Groundwater Monitor Wells - Levels.**

The groundwater quality monitoring in the eight monitoring wells (**Appendix II**) show consistent results with few anomalies for pH, conductivity, CBOD, total phosphorous, total suspended solids, nitrite, nitrate, and nitrate + nitrite.

The Provincial Water Quality Objective for pH is 6.5 – 8.5 and all samples collected from the eight monitoring wells fell within this range. The Provincial Water Quality Objectives does not outline objectives or interim objectives for any of the remaining parameters.

The Amended ECA issued February 16, 2016 has changed the groundwater monitoring to Quarterly water levels and semi-annually samples for: pH, Conductivity, Total Phosphorous, Nitrate Nitrogen, Total Suspended Solids and CBOD5. It also specifies that Total Phosphorous is to be a field filtered grab sample. The trigger value is a concentration of 0.3 mg/L in either GW1 or GW8.

The following table (Table 4) shows the performance related to groundwater.

Table 4: Groundwater Well Monitoring Performance for Total Phosphorous

Well #	March 2023	September 2023
Up gradient	mg/L	mg/L
Well 5	0.012	0.007
Well 4	0.01	<0.003
Down gradient	mg/L	mg/L
East trench		
Well 3 (5m)	0.064	0.015
Well 2 (10m)	0.014	<0.003
Well 1 (15m)	0.008	0.014
West trench		
Well 6 (5m)	0.011	<0.003
Well 7 (10m)	0.009	<0.003
Well 8 (15m)	0.033	<0.003

Shading indicates a result > 0.3mg/L

(b) The facility has experienced a number of challenges over the past few years, primarily with breakdowns of the rotating biological contactors (RBC). This has historically affected the effluent quality. During the reporting period, both RBC units continued to function as designed. Adjustments to the system include: alum dosage, the timers on the return sludge system to optimize the return rate, and removal of sludge from the system by a licensed waste hauler to lower the solids build-up. The operators are continuing to closely monitor the process and make necessary adjustments as required.

(c) Ontario Clean Water Agency (OCWA) maintenance activities are based on a computerized Work Management System (WMS) using the Maximo application. In its developmental stages, each piece of equipment at the operating facility was tagged with a unique bar code number, and this information was entered into the electronic WMS database. In addition, data regarding the description of the equipment, model number, serial number, the equipment type, location at the facility as related to process, serviceable status, manufacturer's suggested maintenance activities, all risk factor information and average monthly usage was also recorded.

Once the equipment inventory was established, preventive maintenance procedures and schedules were developed for each piece of equipment. Each work order generated by the Preventive Maintenance schedule includes materials and parts required, any special tool requirements, work protection, job safety planning, running checks, a preventive maintenance job procedure, and upon completion of the task, the work order is closed out.

Corrective or breakdown maintenance is required when equipment is determined to be non-serviceable, or the potential for non-serviceability exists. All preventive and corrective/breakdown maintenance in OCWA and more specifically the King’s Bay Environmental Centre is executed and accounted for under a Maximo work order.

Attached is **Appendix V: Maintenance Summary**, a Work Order Summary report, showing all preventive and corrective maintenance activities performed at the King’s Bay Environmental Centre during 2023.

(d) Effluent control measures include in-house sampling and testing for operational parameters such as suspended solids, pH, phosphorus, and temperature. In-house testing provides real time results, which are then evaluated to determine if process changes are necessary to enhance operational performance. All in-house sampling and analysis are performed by certified operations staff utilizing approved methods and protocols for sampling, analysis and recording as specified in the Ministry’s Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works”, the Ministry’s publication, “Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater” and the publication, “Standard Methods for the Examination of Water and Wastewater”.

All final effluent samples collected during the reporting period to meet ECA sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis, with the exception of pH and temperature. SGS Lakefield Research has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Ontario Clean Water Agency is ensuring appropriate control measures are undertaken during sample analysis. The pH and temperature parameters were analyzed in the field at the time of sample collection by certified operators, to ensure accuracy and precision of the results obtained.

(e) Flow meter calibrations were conducted on June 28, 2023. The reports are attached as **Appendix VI: Calibration Reports.**

(f) OCWA uses a number of **Efforts to achieve the Effluent Objectives**. Effluent quality assurance and control measures include in-house sampling and testing for operational parameters such as pH, temperature, TSS and phosphorous. In-house testing provides real time results, which are then used to enhance process and operational performance. OCWA also collects raw sewage and effluent samples as per the ECA and reviews these results on a regular basis to ensure compliance with the ECA objectives and limits.

Table 5 provides a summary of the ECA effluent objectives, specified in Condition 6(1), in comparison to the actual effluent results obtained during the reporting period.

Table 5: Effluent Objectives and Results – 2023

Effluent Parameters	ECA - Effluent Objective Concentration	Actual Annual Average Concentration in Effluent	Compliant (Y/N)
$CBOD_5$	10.0 mg/L	7.33	Y
Total Suspended Solids	10.0 mg/L	12.88	N
Total Phosphorus	0.8 mg/L	0.26	Y
pH	6.5 - 9.0	7.57	Y

The effluent objectives for $CBOD_5$, Total Suspended Solids, Total Phosphorus and pH in the effluent are recommended not to exceed: 10.0 mg/L, 10.0 mg/L, 0.8 mg/L and range of pH between 6.5 – 9.0 respectively. The annual average effluent objective concentrations for $CBOD_5$, Total Phosphorus and pH were met during the 2023 reporting period. The annual average effluent objective concentration for Total Suspended Solids was not met during the 2023 reporting period. The Annual Average for TSS was 12.88 mg/L which exceeded the objective of 10.0 mg/L but met the limit of 15.0 mg/L. The objectives were met for all other parameters.

OCWA has developed comprehensive manuals detailing operations, maintenance, instrumentation and emergency procedures. To ensure facilities are operated in compliance with applicable legal requirements, facility staff have access to a network of operational compliance and support experts at the Hub, Region and Corporate level.

Appendix VII contains a summary of the coagulant used in 2023.

(g) Attached as **Appendix VIII: Biosolids Summary** that contains the volume of sludge generated for the reporting period which was 309.98 m^3. The anticipated volume for the next reporting period is not expected to be appreciably different from this reporting period. Sludge is hauled to the Lindsay Water Pollution Control Plant. No change is expected from the current sludge handling methods.

(h) There were zero (0) **Community Complaints** received regarding the King's Bay Environmental Centre during the reporting period.

(i) **Bypass, spill and abnormal discharge event summary**: None to report.

(j) **Notices of Modifications**: None to report.

(k) **Report Summarizing all Modifications**: A summary of all modifications completed as a result of Schedule B, Section 3 are included in **Appendix V: Maintenance Summary.**

(l) **Additional information the Water Supervisor requires**: None to report.

Environmental Compliance Approval (ECA) No. 141-W601

4.6 (a) a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.

The King's Bay Environmental Sewage Collection System consists of works for the collection and transmission of sewage, comprising approximately 1.5 km of sanitary sewer piping that discharges to the King's Bay Environmental Centre.

There are no required monitoring data requirements for the King's Bay Environmental Sewage Collection System.

4.6 (b) a summary of any operating problems encountered and corrective actions taken.

There were no operating problems encountered in 2023 for the King's Bay Environmental Sewage Collection System.

4.6 (c) a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.

A regular scheduled calibration and maintenance program has been kept up to date as scheduled on a daily, weekly, semi-annual and annual basis. All equipment calibration & maintenance scheduling and standard procedures are provided by Maximo Computerized Maintenance System.

Attached is **Appendix V: Maintenance Summary**, a Work Order Summary report, showing all preventive and corrective maintenance activities performed at the King's Bay Environmental Centre, including the sewage collection system, during 2023.

There was no additional repairs or maintenance carried out on any of the linear infrastructure in 2023.

4.6 (d) a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.

Complaints related to the King's Bay Environmental Sewage Collection System and steps taken to address the complaints are included in Section (h) for 2023.

4.6 (e) a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.

There were no Alterations made to the King's Bay Environmental Sewage Collection System in 2023.

4.6 (f) a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including:

i) Dates;
ii) Volumes and durations;
iii) If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli;
iv) Disinfection, if any; and
v) Any adverse impact(s) and any corrective actions, if applicable.

The King's Bay Environmental Sewage Collection system did not experience any collection system Overflows or Spills in 2023.

4.6 (g) a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable:

i) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.

The City of Kawartha Lakes continues to work on a Master Servicing Study and Capacity Assessment for all facilities analyzing existing capacity and future growth requirements. Sanitary sewer flushing is conducted on an annual basis (3 years of dead ends/trouble areas and 4th year is full system flush). During this program, any manholes with infiltration issues are identified and are included in operational maintenance contracts for grouting, frame and cover replacements, etc.

In addition, where manholes are located in lower lying areas and are at risk of being submerged and contributing to inflow, rain bladders are installed to prevent excess water from entering the system, further reducing the risk of overflow.

The King’s Bay wastewater collection system infrastructure is relatively new and does experience excessive infiltration and inflow which could contribute to potential overflows. No deficiencies were identified in 2023.

ii) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP’s timelines.

The King’s Bay Environmental Sewage Collection system does not contain combined sewers and therefore is not required to complete a Pollution Prevention and Control Plan (PPCP).

iii) An assessment of the effectiveness of each action taken.
None to report.

iv) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.

N/A

v) Public reporting approach including proactive efforts

SOP WWC02 Waterwater Bypass/Overflow Notification Procedure has been developed and has been in practice since 2021, which clearly outlines all reporting protocols to both regulatory agencies and the public in various situations. This procedure was developed in consultation with Ontario Clean Water Agency, Ministry of Environment, Conservation and Parks and Ministry of Health.

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Appendix I:

Performance Assessment Report

Ontario Clean Water Agency
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Performance Assessment Report

From 1/1/2023 to 12/31/2023 11:59:59 PM

5318 KING'S BAY WASTEWATER TREATMENT FACILITY 110003665

	1 / 2023	2/ 2023	3/ 2023	4/ 2023	5/ 2023	6/ 2023	7/ 2023	8/ 2023	9/ 2023	10/ 2023	11/ 2023	12/ 2023	Total	Avg	Max	Criteria
Flows																
Raw Flow: Total - Raw m³/d	1,459.66	1,285.60	1,470.40	1,750.83	1,722.05	1,482.79	1,373.70	1,309.60	1,240.42	1,340.39	1,173.27	1,324.48	16,933.21			0.00
Raw Flow: Avg - Raw m³/d	47.09	45.91	47.43	58.36	55.55	49.43	44.31	42.25	41.35	43.24	39.11	42.73		46.39		170.00
Raw Flow: Max - Raw m³/d	59.58	59.25	71.03	82.59	72.89	67.75	49.94	50.62	48.83	54.75	45.49	53.68			82.59	0.00
Raw Flow: Count - Raw m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Eff. Flow: Total - Final Eff m³/d	1,419.76	1,224.85	1,389.40	1,641.43	1,672.70	1,373.06	1,297.92	1,269.56	1,122.24	1,281.06	1,132.38	1,204.07	16,028.43			0.00
Eff. Flow: Avg - Final Eff m³/d	45.80	43.74	44.82	54.71	53.96	45.77	41.87	40.95	37.41	41.32	37.75	38.84		43.91		170.00
Eff. Flow: Max - Final Eff m³/d	57.49	57.54	69.59	78.70	71.01	60.20	49.39	49.87	45.62	52.23	43.71	50.81			78.70	0.00
Eff Flow: Count - Final Eff m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Carbonaceous Biochemical Oxygen Demand: CBOD																
Eff: Avg cBOD5 - Final Eff mg/L	5.60	< 3.50	< 3.25	3.75	< 3.80	6.00	11.40	13.00	14.25	< 8.20	< 5.75	< 7.25		7.33	14.25	15.00
Eff: # of samples of cBOD5 - Final Eff	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	51.00			0.00
Biochemical Oxygen Demand: BOD5																
Raw: Avg BOD5 - Raw mg/L	1,640.00	126.00	306.00	1,330.00	114.00	461.00	123.00	129.00	3,690.00	386.00	540.00	298.00		761.92	3,690.00	0.00
Raw: # of samples of BOD5 - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg BOD5 - Final Eff mg/L	5.60	8.25	< 6.67	7.50	3.80	7.33	14.80	23.00	31.00	13.60	10.75	13.00		12.10	31.00	
Total Suspended Solids: TSS																
Raw: Avg TSS - Raw mg/L	2,180.00	102.00	302.00	1,380.00	97.00	605.00	144.00	145.00	5,460.00	1,630.00	211.00	260.00		1,043.00	5,460.00	0.00
Raw: # of samples of TSS - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TSS - Final Eff mg/L	6.60	6.00	6.00	5.75	6.00	8.25	16.00	20.75	25.50	18.20	12.50	23.00		12.88	25.50	15.00
Eff: # of samples of TSS - Final Eff	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Total Phosphorus: TP																
Raw: Avg TP - Raw mg/L	37.40	63.80	6.49	30.90	11.90	19.80	44.10	213.00	29.80	39.40	22.50	8.88		44.00	213.00	0.00
Raw: # of samples of TP - Raw	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TP - Final Eff mg/L	0.16	0.16	0.15	0.22	0.18	0.21	0.31	0.31	0.54	0.32	0.32	0.30		0.26	0.54	1.00
Eff: # of samples of TP - Final Eff	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TP - Final Eff kg/d	0.007	0.007	0.007	0.012	0.010	0.011	0.013	0.013	0.020	0.013	0.012	0.012		0.01	0.02	
Nitrogen Series																
Raw: Avg TKN - Raw mg/L	318.00	45.30	47.70	119.00	46.00	83.50	70.50	41.80	540.00	67.80	64.90	44.80		124.11	540.00	0.00

Performance Assessment Report

From 1/1/2023 to 12/31/2023 11:59:59 PM

Raw: # of samples of TKN - Raw	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	12.00			0.00
Eff: Avg TAN - Final Eff mg/L	0.12		0.10	<	0.13	<	0.15	<	0.14		0.13		0.18		2.15		12.20		0.26	<	0.13	<	0.20		1.28	12.20	8.00
Eff: # of samples of TAN - Final Eff	5.00		4.00		3.00		4.00		5.00		4.00		5.00		4.00		4.00		5.00		4.00		4.00	51.00			0.00
Disinfection																											
Eff: GMD E. Coli - Final Eff cfu/100mL	29,000.00		21,000.00		24,000.00		42,000.00		55,000.00		31,000.00		4,200.00		34,000.00		45,497.25		34,000.00		46,000.00		12,000.00				
Eff: # of samples of E. Coli - Final Eff	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		2.00		1.00		1.00		1.00	13.00			0.00

Ontario Clean Water Agency
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Appendix II:

Groundwater Monitoring

Ontario Clean Water Agency
Time Series Info Report

From: 01/01/2023 to 31/12/2023

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 1 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						< 4	
Monitoring Well 1 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			884						1160						1160	
Mean Lab			884						1160					1022		
Min Lab			884						1160							884
Monitoring Well 1 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			3.98						5.18						5.18	
Mean Lab			3.98						5.18					4.58		
Min Lab			3.98						5.18							3.98
Monitoring Well 1 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			3.98						5.18						5.18	
Mean Lab			3.98						5.18					4.58		
Min Lab			3.98						5.18							3.98
Monitoring Well 1 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						< 0.03	
Monitoring Well 1 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.008						0.014						0.014	
Mean Lab			0.008						0.014					0.011		
Min Lab			0.008						0.014							0.008
Monitoring Well 1 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			370						339						370	
Mean Lab			370						339					354.5		
Min Lab			370						339							339
Monitoring Well 1 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.05						7.5						8.05	
Mean Lab			8.05						7.5					7.775		
Min Lab			8.05						7.5							7.5

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 2 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						< 4	
Monitoring Well 2 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			1880						1960						1960	
Mean Lab			1880						1960					1920		
Min Lab			1880						1960							1880
Monitoring Well 2 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			15.1						14.9						15.1	
Mean Lab			15.1						14.9					15		
Min Lab			15.1						14.9							14.9
Monitoring Well 2 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			15.1						14.9						15.1	
Mean Lab			15.1						14.9					15		
Min Lab			15.1						14.9							14.9
Monitoring Well 2 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						< 0.03	
Monitoring Well 2 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.014						< 0.003						< 0.014	
Mean Lab			0.014						< 0.003					< 0.009		
Min Lab			0.014						< 0.003						< 0.003	
Monitoring Well 2 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			334						138						334	
Mean Lab			334						138					236		
Min Lab			334						138							138
Monitoring Well 2 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.05						7.49						8.05	
Mean Lab			8.05						7.49					7.77		
Min Lab			8.05						7.49							7.49

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 3 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						< 4	
Monitoring Well 3 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			2290						2340						2340	
Mean Lab			2290						2340					2315		
Min Lab			2290						2340							2290
Monitoring Well 3 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			14.6						16.9						16.9	
Mean Lab			14.6						16.9					15.75		
Min Lab			14.6						16.9							14.6
Monitoring Well 3 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			14.6						16.9						16.9	
Mean Lab			14.6						16.9					15.75		
Min Lab			14.6						16.9							14.6
Monitoring Well 3 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						< 0.03	
Monitoring Well 3 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.064						0.015						0.064	
Mean Lab			0.064						0.015					0.04		
Min Lab			0.064						0.015							0.015
Monitoring Well 3 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			1500						865						1500	
Mean Lab			1500						865					1182.5		
Min Lab			1500						865							865
Monitoring Well 3 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.08						7.63						8.08	
Mean Lab			8.08						7.63					7.855		
Min Lab			8.08						7.63							7.63

Ontario Clean Water Agency
Time Series Info Report

From: 01/01/2023 to 31/12/2023

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 4 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4							< 4
Monitoring Well 4 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			630						686						686	
Mean Lab			630						686					658		
Min Lab			630						686							630
Monitoring Well 4 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			3.18						5.02						5.02	
Mean Lab			3.18						5.02					4.1		
Min Lab			3.18						5.02							3.18
Monitoring Well 4 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			3.18						5.02						5.02	
Mean Lab			3.18						5.02					4.1		
Min Lab			3.18						5.02							3.18
Monitoring Well 4 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03							< 0.03
Monitoring Well 4 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.01						< 0.003						< 0.01	
Mean Lab			0.01						< 0.003					< 0.007		
Min Lab			0.01						< 0.003							< 0.003
Monitoring Well 4 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			94						77						94	
Mean Lab			94						77					85.5		
Min Lab			94						77							77
Monitoring Well 4 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.09						7.73						8.09	
Mean Lab			8.09						7.73					7.91		
Min Lab			8.09						7.73							7.73

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 5 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						< 4	
Monitoring Well 5 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			1480						850						1480	
Mean Lab			1480						850					1165		
Min Lab			1480						850							850
Monitoring Well 5 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			6.42						5.76						6.42	
Mean Lab			6.42						5.76					6.09		
Min Lab			6.42						5.76							5.76
Monitoring Well 5 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			6.42						5.76						6.42	
Mean Lab			6.42						5.76					6.09		
Min Lab			6.42						5.76							5.76
Monitoring Well 5 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						< 0.03	
Monitoring Well 5 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.012						0.007						0.012	
Mean Lab			0.012						0.007					0.01		
Min Lab			0.012						0.007							0.007
Monitoring Well 5 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			162						198						198	
Mean Lab			162						198					180		
Min Lab			162						198							162
Monitoring Well 5 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.02						7.78						8.02	
Mean Lab			8.02						7.78					7.9		
Min Lab			8.02						7.78							7.78

Ontario Clean Water Agency
Time Series Info Report

From: 01/01/2023 to 31/12/2023

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 6 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						< 4	
Monitoring Well 6 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			2260						1810						2260	
Mean Lab			2260						1810					2035		
Min Lab			2260						1810							1810
Monitoring Well 6 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			14.4						16.8						16.8	
Mean Lab			14.4						16.8					15.6		
Min Lab			14.4						16.8							14.4
Monitoring Well 6 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			14.4						16.8						16.8	
Mean Lab			14.4						16.8					15.6		
Min Lab			14.4						16.8							14.4
Monitoring Well 6 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						< 0.03	
Monitoring Well 6 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.011						< 0.003						< 0.011	
Mean Lab			0.011						< 0.003					< 0.007		
Min Lab			0.011						< 0.003						< 0.003	
Monitoring Well 6 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			852						591						852	
Mean Lab			852						591					721.5		
Min Lab			852						591							591
Monitoring Well 6 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.07						7.72						8.07	
Mean Lab			8.07						7.72					7.895		
Min Lab			8.07						7.72							7.72

Ontario Clean Water Agency
Time Series Info Report

From: 01/01/2023 to 31/12/2023

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 7 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						<	4
Monitoring Well 7 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			2000						2000						2000	
Mean Lab			2000						2000					2000		
Min Lab			2000						2000							2000
Monitoring Well 7 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			12.6						18.5						18.5	
Mean Lab			12.6						18.5					15.55		
Min Lab			12.6						18.5							12.6
Monitoring Well 7 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			12.6						18.5						18.5	
Mean Lab			12.6						18.5					15.55		
Min Lab			12.6						18.5							12.6
Monitoring Well 7 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						<	0.03
Monitoring Well 7 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.009						< 0.003						< 0.009	
Mean Lab			0.009						< 0.003					< 0.006		
Min Lab			0.009						< 0.003						<	0.003
Monitoring Well 7 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			1410						524						1410	
Mean Lab			1410						524					967		
Min Lab			1410						524							524
Monitoring Well 7 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			8.03						7.96						8.03	
Mean Lab			8.03						7.96					7.995		
Min Lab			8.03						7.96							7.96

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Monitoring Well 8 / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 4						< 4						< 4	
Mean Lab			< 4						< 4					< 4		
Min Lab			< 4						< 4						< 4	
Monitoring Well 8 / Conductivity - µS/cm																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			925						902						925	
Mean Lab			925						902					913.5		
Min Lab			925						902							902
Monitoring Well 8 / Nitrate + Nitrite as N: NO3-N + NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			4.55						4.18						4.55	
Mean Lab			4.55						4.18					4.365		
Min Lab			4.55						4.18							4.18
Monitoring Well 8 / Nitrate as N: NO3-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			4.55						4.18						4.55	
Mean Lab			4.55						4.18					4.365		
Min Lab			4.55						4.18							4.18
Monitoring Well 8 / Nitrite as N: NO2-N - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			< 0.03						< 0.03						< 0.03	
Mean Lab			< 0.03						< 0.03					< 0.03		
Min Lab			< 0.03						< 0.03						< 0.03	
Monitoring Well 8 / Total Phosphorus: TP - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			0.033						< 0.003						< 0.033	
Mean Lab			0.033						< 0.003					< 0.018		
Min Lab			0.033						< 0.003						< 0.003	
Monitoring Well 8 / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			2230						998						2230	
Mean Lab			2230						998					1614		
Min Lab			2230						998							998
Monitoring Well 8 / pH - ---																
Count Lab	0	0	1	0	0	0	0	0	1	0	0	0	2			
Max Lab			7.89						7.28						7.89	
Mean Lab			7.89						7.28					7.585		
Min Lab			7.89						7.28							7.28

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Appendix III:

pH & Temperature Summary

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Final Eff / Temperature - °C																
Count IH	13	12	14	12	14	13	13	13	14	14	13	16	161			
Max IH	14.6	14.4	13.8	16.1	18.3	19.6	189.8	24	21.6	22	19.8	19.3			189.8	
Mean IH	12.792	12.258	12.707	14.792	15.564	18.431	33.085	20.615	19.757	18.936	16.569	16.25		17.649		
Min IH	10.5	10.4	10.9	13.1	13.5	17	19	19.5	18.1	16.5	14.3	13.8				10.4
Final Eff / pH - ---																
Count IH	13	12	14	12	14	13	13	13	14	14	13	16	161			
Max IH	7.79	7.76	7.96	7.8	7.8	7.83	7.54	7.58	7.96	7.77	7.85	7.66			7.96	
Mean IH	7.623	7.663	7.581	7.644	7.695	7.548	7.452	7.449	7.566	7.541	7.578	7.528		7.571		
Min IH	7.35	7.5	7.38	7.46	7.58	7.38	7.32	7.3	7.16	7.36	7.3	7.27				7.16

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Appendix IV:

Groundwater Monitoring Wells - Levels

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total
Monitoring Well 1 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			5.31			5.14			7.3			5.85	
Monitoring Well 2 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			6.38			6.29			6.7			7	
Monitoring Well 3 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			6.82			6.75			5.64			7.61	
Monitoring Well 4 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			7.38			7.14			7.59			7.96	
Monitoring Well 5 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			7.69			7.54			8.03			8.39	
Monitoring Well 6 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			4.78			4.95			5.66			5.65	
Monitoring Well 7 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			4.37			4.56			5.27			5.25	
Monitoring Well 8 / Well Level - m													
Count IH	0	0	1	0	0	1	0	0	1	0	0	1	4
Total IH			4.05			3.31			5			4.95	

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Appendix V:

Maintenance Summary

Workorder Summary Report

Report Start Date: Jan 1, 2023 12:00 AM

Report End Date: Dec 31, 2023 11:59 PM

Location: 5318*

Work Order Type: CALL,EMER

Work Order Class:

			WorkOrder		Workorder Details			
WO #	Asset Description	Location Description	Type	Class	Work Order Description	Status	Actual Start	Actual Finsh
3339334		5318, Kings Bay Effluent PS, Process	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay Effluent PS, Effluent Pump Fail, Alarm	CLOSE	4/5/23 06:30 AM	4/5/23 07:00 AM
3340298		5318, Kings Bay WWT, Facility	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, RBC 2, Fault	CLOSE	4/17/23 02:52 AM	4/17/23 02:25 PM
3524930	MOTOR GEAR DRIVE AC 02 RBC	5318, Kings Bay WWT, Process	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, RBC 2 Fail, Alarm	CLOSE	8/12/23 03:40 PM	8/12/23 05:00 PM
3527356	GEAR DRIVE 01 RBC	5318, Kings Bay WWT, Process	CALL	Inspection	5318 Kingsbay WWT, RBC 1 Fault, Alarm	CLOSE	8/26/23 09:15 PM	8/27/23 12:15 AM
3706638		5318, Kings Bay Effluent PS, Facility, Power Distribution	CALL	Inspection	5318, Kings Bay Effluent PS, Panel Fault, Alarm	CLOSE	12/18/23 10:30 PM	12/19/23 02:30 AM
3759396		5318, Kings Bay Effluent PS	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay Effluent PS, Effluent Hi/LO, Alarm	COMP	12/29/23 11:09 PM	12/30/23 01:15 AM
3759397		5318, Kings Bay Effluent PS	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay Effluent PS, Effluent Tank Hi/lo, Alarm	COMP	12/30/23 12:34 PM	12/30/23 04:30 PM
3759399		5318, Kings Bay Effluent PS	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay Effluent PS, Effluent HI/LO, Alarm	COMP	12/30/23 10:17 PM	12/31/23 12:40 AM

3759404	5318, Kings Bay Effluent PS	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay Effluent PS, Effluent HI/LO, Alarm	COMP	12/30/23 10:17 PM	12/30/23 11:40 PM
3759403	5318, Kings Bay Effluent PS	CALL	Refurbish/ Replace/ Repair	5318, Kings Bay Effluent PS, Effluent HI/LO, Alarm	COMP	12/31/23 11:36 AM	12/31/23 03:00 PM

Workorder Summary Report

Report Start Date: Jan 1, 2023 12:00 AM

Report End Date: Dec 31, 2023 11:59 PM

Location: 5318*

Work Order Type: CAP,CORR

Work Order Class:

			WorkOrder		Workorder Details			
WO #	Asset Description	Location Description	Type	Class	Work Order Description	Status	Actual Start	Actual Finsh
2868350		5318, Kings Bay Influent PS	CAP	Refurbish/ Replace/ Repair	5318, Kings Bay Influent PS, Influent and Effluent Pump Replacement	COMP	8/5/22 02:14 PM	1/4/24 08:06 AM
3244848		5318, Kings Bay WWT, Process	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, RBC 2, Hauling	CLOSE	2/7/23 06:50 AM	2/7/23 07:50 AM
3340338		5318, Kings Bay WWT, Facility	CORR	Refurbish/ Replace/ Repair	5318, King's Bay, RBC 2 Fault, Repairs	CLOSE	4/17/23 02:38 PM	4/17/23 02:38 PM
3386972	PUMP SUBMERSIBLE 01 EFFLUENT KINGS BAY [6 HP]	5318, Kings Bay WWT, Process	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, Effluent Pump 1 Pressure Gauge Replacement	CLOSE	5/26/23 10:00 AM	8/3/23 10:13 AM
3524521	MOTOR GEAR DRIVE AC 02 RBC	5318, Kings Bay WWT, Process	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, Motor Gear Drive RBC 2, Motor Tripping, Repair	CLOSE	8/9/23 02:10 PM	9/18/23 02:12 PM
3526374	PANEL CONTROL EFFLUENT	5318, Kings Bay WWT, Facility, Power Distribution	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, Effluent Pump Control Panel, Failure, Repair	CLOSE	8/22/23 07:45 AM	9/1/23 08:30 AM
3571193	GEAR DRIVE 01 RBC	5318, Kings Bay WWT, Process	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, RBC Chain, Repair Follow Up	CLOSE	9/7/23 02:02 PM	9/7/23 02:02 PM
3703870		5318, Kings Bay WWT, Process	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWT, RBC 1 Clarifier Inflow Pipe Fallen Off Weir, Follow up	CLOSE	12/5/23 12:34 PM	12/8/23 02:43 PM

3705497	UPS BATTERY BANK	5318, Kings Bay WWT, Facility, Power Generation, Backup Power	CORR	Refurbish/ Replace/ Repair	5318, Kings Bay WWTP, UPS Battery Bank Fail, Replace	CLOSE	12/13/23 07:56 AM	12/14/23 01:24 PM

Workorder Summary Report

Report Start Date: Jan 1, 2023 12:00 AM

Report End Date: Dec 31, 2023 11:59 PM

Location: 5318*

Work Order Type: OPER,PM

Work Order Class:

			WorkOrder		Workorder Details			
WO #	Asset Description	Location Description	Type	Class	Work Order Description	Status	Actual Start	Actual Finsh
3153232		5318, Kings Bay WWT	PM	Inspection	Daily Operational Activities (1y) - 5318 - KTS	COMP	1/1/23 12:00 AM	1/2/24 08:49 AM
3155695	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	1/10/23 10:30 AM	1/10/23 10:45 AM
3156401		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #2 Insp/Service (3m) - 5318 - KTS	CLOSE	1/10/23 10:00 AM	1/11/23 12:00 AM
3178210		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	1/10/23 10:30 AM	1/10/23 10:45 AM
3182462		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	1/4/23 12:30 PM	1/4/23 01:30 PM
3184034		5318, Kings Bay WWT	OPER	Health and Safety	Corporate Facility Workplace H & S Inspection (3m) - 5318 - KTS	CLOSE	1/4/23 09:30 AM	1/4/23 09:45 AM
3210998	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	2/10/23 07:00 AM	2/10/23 07:20 AM
3226954		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	2/10/23 07:00 AM	2/10/23 07:20 AM
3229503		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	2/3/23 08:34 AM	2/3/23 09:19 AM
3251791		5318, Kings Bay WWT	PM	Inspection	Tank Wetwell Level Equipment Inspection (6m) - 5318- KTS	CLOSE	3/7/23 09:10 AM	3/7/23 09:40 AM

3251793		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #1 Insp/Service (3m) - 5318 - KTS	CLOSE	3/14/23 07:00 AM	3/20/23 01:40 PM
3252080	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	3/7/23 09:40 AM	3/7/23 10:10 AM
3252083	TANK PROCESS WETWELL EFFLUENT	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Wetwell Cleaning/Inspection (6m) - 5318 Effulent- KTS	CLOSE	5/26/23 06:50 AM	5/26/23 11:30 AM
3269886		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	3/7/23 10:26 AM	3/7/23 10:26 AM
3272433		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	3/2/23 07:00 AM	3/7/23 10:22 AM
3296731	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	4/18/23 11:35 AM	4/18/23 12:05 PM
3297544		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #2 Insp/Service (3m) - 5318 - KTS	CLOSE	4/17/23 10:00 AM	4/20/23 07:15 AM
3316186		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	4/18/23 11:35 AM	4/18/23 12:05 PM
3318393		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Gear Drive RBC #1 Inspection/Service (1y) - 5318 - KTS	CLOSE	4/17/23 09:00 AM	4/17/23 10:00 AM
3318399		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Gear Drive RBC #2 Inspection/Service (1y) - 5318 - KTS	CLOSE	4/17/23 09:00 AM	4/17/23 10:00 AM
3319513		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	4/3/23 08:50 AM	4/3/23 11:30 AM
3321439		5318, Kings Bay WWT	OPER	Health and Safety	Corporate Facility Workplace H & S Inspection (3m) - 5318 - KTS	CLOSE	4/14/23 08:35 AM	4/14/23 08:35 AM
3346173		5318, Kings Bay WWT	PM	Inspection	Lifting Devices & Fall Arrest Inspection by Contractor (1y) - 5318 - KTS	CLOSE	6/15/23 11:28 AM	6/15/23 01:00 PM
3346255	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	5/9/23 12:45 PM	5/9/23 01:00 PM

3364276		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	5/9/23 12:45 PM	5/9/23 01:00 PM
3366910		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	5/2/23 09:00 AM	5/2/23 11:45 AM
3383730	TANK PROCESS WETWELL INFLUENT	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Wetwell Cleaning/Inspection (6m) - 5318 Influent- KTS	CLOSE	5/26/23 06:50 AM	5/26/23 11:30 AM
3391789		5318, Kings Bay WWT	PM	Calibration	Online Process Equipment Calibration Service by Contractor (1y) - 5318 - KTS	CLOSE	6/28/23 09:40 AM	6/28/23 03:30 PM
3391794		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #1 Insp/Service (3m) - 5318 - KTS	CLOSE	6/15/23 07:00 AM	6/29/23 11:35 AM
3392027	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	6/15/23 09:41 AM	6/15/23 09:56 AM
3411199		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	6/15/23 09:56 AM	6/15/23 10:10 AM
3414199		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	6/2/23 01:35 PM	6/2/23 03:16 PM
3415715		5318, Kings Bay Effluent PS	OPER	Health and Safety	Corporate Facility Workplace H & S Inspection (1y) - 5318 - KTS	CLOSE	10/12/23 11:17 AM	10/12/23 11:30 AM
3441062	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	7/13/23 08:30 AM	7/13/23 08:45 AM
3441499		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #2 Insp/Service (3m) - 5318 - KTS	CLOSE	7/13/23 06:50 AM	7/14/23 02:02 PM
3458770		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	7/13/23 08:30 AM	7/13/23 08:45 AM
3461898		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	6/30/23 02:33 PM	7/12/23 02:34 PM
3463391		5318, Kings Bay WWT	OPER	Health and Safety	Corporate Facility Workplace H & S Inspection (3m) - 5318 - KTS	CLOSE	7/13/23 08:45 AM	7/13/23 09:00 AM
3488339	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	8/9/23 01:40 PM	8/9/23 02:10 PM

3504834		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	8/9/23 01:40 PM	8/9/23 02:10 PM
3507217		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	8/1/23 01:00 PM	8/1/23 01:30 PM
3531578		5318, Kings Bay WWT	PM	Inspection	Tank Wetwell Level Equipment Inspection (6m) - 5318- KTS	CLOSE	9/12/23 11:20 AM	9/12/23 11:40 AM
3531580		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #1 Insp/Service (3m) - 5318 - KTS	CLOSE	9/27/23 10:00 AM	9/28/23 08:00 AM
3532100	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	9/13/23 11:50 AM	9/13/23 12:00 PM
3532103	TANK PROCESS WETWELL EFFLUENT	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Wetwell Cleaning/Inspection (6m) - 5318 Effulent- KTS	CLOSE	9/20/23 11:59 AM	9/20/23 11:59 AM
3550311		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	9/12/23 11:40 AM	9/12/23 12:15 PM
3553161		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	9/1/23 12:00 PM	9/1/23 12:30 PM
3580714	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	10/24/23 10:30 AM	10/24/23 10:45 AM
3581311		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #2 Insp/Service (3m) - 5318 - KTS	CLOSE	10/24/23 10:30 AM	10/24/23 10:58 AM
3597469		5318, Kings Bay WWT	PM	Inspection	UPS Insp/Service (1y) - 5318 - KTS	CLOSE	12/19/23 12:49 PM	12/19/23 12:49 PM
3598787		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	10/24/23 10:30 AM	10/24/23 10:45 AM
3602529		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	10/5/23 12:30 PM	10/5/23 03:30 PM
3603966		5318, Kings Bay WWT	OPER	Health and Safety	Corporate Facility Workplace H & S Inspection (3m) - 5318 - KTS	CLOSE	10/12/23 11:17 AM	10/12/23 11:30 AM
3629458	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	11/15/23 10:30 AM	11/15/23 11:00 AM

3629461	TANK PROCESS WETWELL INFLUENT	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Wetwell Cleaning/Inspection (6m) - 5318 Influent- KTS	CLOSE	11/16/23 09:15 AM	11/16/23 11:10 AM
3644483		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	11/15/23 10:30 AM	11/15/23 11:00 AM
3647319		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	11/9/23 07:00 AM	11/9/23 03:30 PM
3670548		5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank RBC #1 Insp/Service (3m) - 5318 - KTS	CLOSE	12/1/23 12:47 PM	12/19/23 12:47 PM
3670685	TANK STORAGE ALUM BULK	5318, Kings Bay WWT, Process	PM	Refurbish/ Replace/ Repair	Tank Alum Inspection (1m) - 5318 - KTS	CLOSE	12/18/23 12:00 PM	12/18/23 12:15 PM
3686415		5318, Kings Bay WWT	PM	Inspection	Chemical Feed System Insp (1m) - 5318 - KTS	CLOSE	12/18/23 12:00 PM	12/18/23 12:15 PM
3688769		5318, Kings Bay WWT	OPER	Compliance	Operator PDM Entry & Review (1m) - 5318 - KTS	CLOSE	12/6/23 11:30 AM	12/7/23 12:00 PM

Ontario Clean Water Agency
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Appendix VI:

Calibration Report

Franklin Empire Inc,
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OCWA Kawartha

2023 Calibrations Kings Bay WTP & WWTP

SIEMENS MAGFLO® Verification Certificate

Customer:

Name	OCWA Kawartha
Address	
Phone	
Email	

MAGFLO® Identification:

TAG No./Name	0
Sensor Code No.	7ME658
Sensor Serial No.	041101U493
Transmitter Code No.	7ME691
Transmitter Serial No.	229730U463
Location	RBC 1

Results:

Verification file name or No.		RBC 1 Flow
Transmitter		Passed
Sensor	Insulation	Passed
	Magnetic Circuit	Passed

Velocity	Current Output			Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.796mA	-0.52%	0.500kHz	0.497kHz	-0.56%
1.0m/s	5.600mA	5.599mA	-0.08%	1.000kHz	1.000kHz	-0.05%
3.0m/s	8.800mA	8.800mA	-0.01%	3.000kHz	3.002kHz	0.06%
	Current Output 4-20mA			Frequency Output 0-10kHz		

Transmitter Settings:

Basic	Qmax.	10.0000 l/s
	Flow Direction	Positive
	Low flow Cut-off	1.50%
	Empty Pipe	ON
Output	Current Output	ON (4-20mA)
	Time Constant	5.0 Sec.
	Relay Output	Error Level
	Digital Output	Pulse
	Frequency Range	N/A
	Time Constant	N/A
	Volume/pulse	0.99999953 US G/p
	Pulse width	0.066 sec.
	Pulse polarity	Positiv
Totalizer 1 value before test		87724.8359375 m³
Totalizer 1 value after test		87724.8515625 m³
Totalizer 2 value before test		956.33630371 m³
Totalizer 2 value after test		956.33630371 m³
Operating time in days		3470

Sensor Details:

Size	DN 80 3 IN
Cal. Factor	5.12170267
Correction Factor	1.0
Excitation Freq.	7.5Hz

Verificator Details (083F5061)

Serial No.	000811N218
Device No.	91739
Software Version	1.40
PC-Software Version	5.01
Cal. date	2022.12.29
ReCal. date	2023.12.29

Comments

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters.

Verification is traceable to National and International Standards.

Date and signature

2023.06.28 M Manley

SIEMENS MAGFLO® Verification Certificate

Customer:

Name	OCWA Kawartha
Address	Kings Bay WW
Phone	
Email	

MAGFLO® Identification:

TAG No./Name	0
Sensor Code No.	7ME658
Sensor Serial No.	041001U493
Transmitter Code No.	7ME691
Transmitter Serial No.	231030U463
Location	Kings Bay RBC2

Results:

Verification file name or No.		RBC 2
Transmitter		Passed
Sensor	Insulation	Passed
	Magnetic Circuit	Passed

Velocity	Current Output			Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.806mA	0.80%	0.500kHz	0.501kHz	0.13%
1.0m/s	5.600mA	5.604mA	0.25%	1.000kHz	0.999kHz	-0.10%
3.0m/s	8.800mA	8.807mA	0.15%	3.000kHz	3.001kHz	0.04%
	Current Output 4-20mA			Frequency Output 0-10kHz		

Transmitter Settings:

Basic	Qmax.	10.0000 l/s
	Flow Direction	Positive
	Low flow Cut-off	1.50%
	Empty Pipe	ON
Output	Current Output	ON (4-20mA)
	Time Constant	5.0 Sec.
	Relay Output	Error Level
	Digital Output	Pulse
	Frequency Range	N/A
	Time Constant	N/A
	Volume/pulse	0.99999953 US G/p
	Pulse width	0.066 sec.
	Pulse polarity	Positiv
Totalizer 1 value before test		87475.984375 m³
Totalizer 1 value after test		87476.0 m³
Totalizer 2 value before test		2355.4230957 m³
Totalizer 2 value after test		2355.42504883 m³
Operating time in days		3470

Sensor Details:

Size	DN 80 3 IN
Cal. Factor	4.97646475
Correction Factor	1.0
Excitation Freq.	7.5Hz

Verificator Details (083F5061)

Serial No.	000811N218
Device No.	91739
Software Version	1.40
PC-Software Version	5.01
Cal. date	2022.12.29
ReCal. date	2023.12.29

Comments

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters.

Verification is traceable to National and International Standards.

Date and signature

2023.06.28 M Manley

VeriMaster - Flow Meter Verification Report

Customer Information	
Customer	OCWA
Verification Download	Wed, Jun 28, 2023

Meter Information	
Meter Owner	King Bay WW
Meter Type	WaterMaster
Sensor Size	DN100
Pipe Status	Fluid Present
Sensor Type	Fullbore
Sensor Serial No	3K620000164062
Transmitter Serial No	3K620000168464
Tag	ABB Warminster
Location	?

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/ -1% of its original factory calibration

Summary of Results	
Coil Group	Passed
Electrode Group	Passed
Sensor Group	Passed
Transmitter Signal	Passed
Transmitter Driver	Passed
Output Group	Passed
Configuration	Passed

Verification History	
OIML Accuracy Alarms	0

Totaliser Information	
Forward	31686.54 m3
Reverse	1316.62 m3
Net	30369.92 m3

Sensor Information	
Q3	69.44 l/s
Calibration Accuracy	OIML Class 2
Sensor Calibration Factors	88.1%; 0.00 mm/s; 11
Date of Manufacture	20 May 2014
Run Hours	3108days 22hrs 20mins

Sensor Data	
Coil Current	179.9 mA
Coil Inductance	205.0 mH
Coil Inductance Shift	-0.1%
Coil / Loop Resistance	39.1 ohm

Transmitter Information	
Application Version	V01.05.00 12/07/12
MSP Version	00.00.04
Date of Manufacture	20 May 2014
Run Hours	4036days 9hrs 47mins

Transmitter Data	
Tx Gain - Adjustment	0.2%

VeriMaster Information	
Version	01.00.03
Limit Version	01.00.01

Current Output	
4mA Value	Pass : 4.000 mA ; 0.00%
12mA Value	Pass : 11.980 mA ; 0.17%
20mA Value	Pass : 20.000 mA ; 0.00%

Pulse Output	
Output 1: 1200.0Hz	Not tested
Output 1: 600.0Hz	Not tested
Output 2: 1200.0Hz	Not tested
Output 2: 600.0Hz	Not tested

Installation Comments / Equipment used:

Pump 1

Configuration Settings	
Mains Frequency	60 Hz
Qmax	10.00 l/s
Pulses/Unit	120.000000
Pulses Limit Frequency	1200.0 Hz
Sensor User Span/Zero	100.0%; 0.00 mm/s
User Flow Cutoff/Hysterisis	3.00%; 20%
Meter Mode	Normal operation

Date Wed, Jun 28, 2023 Operator Signature Print

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VeriMaster - Flow Meter Verification Report

Customer Information	
Customer	OCWA
Verification Download	Wed, Jun 28, 2023

Meter Information	
Meter Owner	Kings Bay WW
Meter Type	WaterMaster
Sensor Size	DN100
Pipe Status	Fluid Present
Sensor Type	Fullbore
Sensor Serial No	3K620000168465
Transmitter Serial No	3K620000168466
Tag	?
Location	?

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/ -1% of its original factory calibration

Summary of Results	
Coil Group	Passed
Electrode Group	Passed
Sensor Group	Passed
Transmitter Signal	Passed
Transmitter Driver	Passed
Output Group	Passed
Configuration	Passed

Verification History	
OIML Accuracy Alarms	0

Totaliser Information	
Forward	40482.98 m3
Reverse	1584.49 m3
Net	38898.48 m3

Sensor Information	
Q3	69.44 l/s
Calibration Accuracy	OIML Class 2
Sensor Calibration Factors	87.0%; 0.00 mm/s; 11
Date of Manufacture	17 May 2014
Run Hours	3108days 21hrs 25mins

Sensor Data	
Coil Current	179.9 mA
Coil Inductance	218.2 mH
Coil Inductance Shift	-0.6%
Coil / Loop Resistance	38.2 ohm

Transmitter Information	
Application Version	V01.05.00 12/07/12
MSP Version	00.00.04
Date of Manufacture	17 May 2014
Run Hours	4485days 23hrs 11mins

Transmitter Data	
Tx Gain - Adjustment	0.2%

VeriMaster Information	
Version	01.00.03
Limit Version	01.00.01

Current Output	
4mA Value	Pass : 4.000 mA ; 0.00%
12mA Value	Pass : 11.980 mA ; 0.17%
20mA Value	Pass : 20.020 mA ; -0.10%

Pulse Output	
Output 1: 1200.0Hz	Not tested
Output 1: 600.0Hz	Not tested
Output 2: 1200.0Hz	Not tested
Output 2: 600.0Hz	Not tested

Installation Comments / Equipment used:

P2

Configuration Settings	
Mains Frequency	60 Hz
Qmax	10.00 l/s
Pulses/Unit	120.000000
Pulses Limit Frequency	1200.0 Hz
Sensor User Span/Zero	1200.0Hz; 0.00 mm/s
User Flow Cutoff/Hysterisis	3.00%; 20%
Meter Mode	Normal operation

Date Wed, Jun 28, 2023 Operator Signature Print

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VeriMaster - Flow Meter Verification Report

Customer Information	
Customer	OCWA
Verification Download	Wed, Jun 28, 2023

Meter Information	
Meter Owner	Kings Bay WW
Meter Type	WaterMaster
Sensor Size	DN100
Pipe Status	Fluid Present
Sensor Type	Fullbore
Sensor Serial No	3K620000168466
Transmitter Serial No	3K620000164062
Tag	ABB Warminster
Location	?

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/ -1% of its original factory calibration

Summary of Results	
Coil Group	Passed
Electrode Group	Passed
Sensor Group	Passed
Transmitter Signal	Passed
Transmitter Driver	Passed
Output Group	Passed
Configuration	Passed

Verification History	
OIML Accuracy Alarms	0

Totaliser Information	
Forward	37048.31 m3
Reverse	73.84 m3
Net	36974.47 m3

Sensor Information	
Q3	69.44 l/s
Calibration Accuracy	OIML Class 2
Sensor Calibration Factors	85.4%; 0.00 mm/s; 11
Date of Manufacture	11 Apr 2014
Run Hours	3108days 21hrs 15mins

Sensor Data	
Coil Current	179.9 mA
Coil Inductance	219.6 mH
Coil Inductance Shift	0.9%
Coil / Loop Resistance	38.8 ohm

Transmitter Information	
Application Version	V01.05.00 12/07/12
MSP Version	00.00.04
Date of Manufacture	11 Apr 2014
Run Hours	4046days 20hrs 46mins

Transmitter Data	
Tx Gain - Adjustment	0.2%

VeriMaster Information	
Version	01.00.03
Limit Version	01.00.01

Current Output	
4mA Value	Pass : 4.000 mA ; 0.00%
12mA Value	Pass : 11.980 mA ; 0.17%
20mA Value	Pass : 19.980 mA ; 0.10%

Pulse Output	
Output 1: 1200.0Hz	Not tested
Output 1: 600.0Hz	Not tested
Output 2: 1200.0Hz	Not tested
Output 2: 600.0Hz	Not tested

Installation Comments / Equipment used:

Pump 3

Configuration Settings	
Mains Frequency	60 Hz
Qmax	10.00 l/s
Pulses/Unit	120.000000
Pulses Limit Frequency	1200.0 Hz
Sensor User Span/Zero	100.0%; 0.00 mm/s
User Flow Cutoff/Hysterisis	3.00%; 20%
Meter Mode	Normal operation

Date Wed, Jun 28, 2023 Operator Signature Print

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VeriMaster - Flow Meter Verification Report

Customer Information	
Customer	OCWA
Verification Download	Wed, Jun 28, 2023

Meter Information	
Meter Owner	Kings Bay WWTP
Meter Type	WaterMaster
Sensor Size	DN100
Pipe Status	Fluid Present
Sensor Type	Fullbore
Sensor Serial No	3K620000168464
Transmitter Serial No	3K620000168465
Tag	ABB Warminster
Location	?

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/ -1% of its original factory calibration

Summary of Results	
Coil Group	Passed
Electrode Group	Passed
Sensor Group	Passed
Transmitter Signal	Passed
Transmitter Driver	Passed
Output Group	Passed
Configuration	Passed

Verification History	
OIML Accuracy Alarms	0

Totaliser Information	
Forward	26444.76 m3
Reverse	722.70 m3
Net	25722.06 m3

Sensor Information	
Q3	69.44 l/s
Calibration Accuracy	OIML Class 2
Sensor Calibration Factors	86.0%; -3.00 mm/s; 11
Date of Manufacture	16 May 2014
Run Hours	3108days 19hrs 15mins

Sensor Data	
Coil Current	179.9 mA
Coil Inductance	218.4 mH
Coil Inductance Shift	-0.1%
Coil / Loop Resistance	38.5 ohm

Transmitter Information	
Application Version	V01.05.00 12/07/12
MSP Version	00.00.04
Date of Manufacture	16 May 2014
Run Hours	4264days 13hrs 11mins

Transmitter Data	
Tx Gain - Adjustment	-0.0%

VeriMaster Information	
Version	01.00.03
Limit Version	01.00.01

Current Output	
4mA Value	Pass : 4.000 mA ; 0.00%
12mA Value	Pass : 11.980 mA ; 0.17%
20mA Value	Pass : 19.980 mA ; 0.10%

Pulse Output	
Output 1: 100.0Hz	Not tested
Output 1: 50.0Hz	Not tested
Output 2: 250Hz	Not available for testing
Output 2: 125Hz	Not available for testing

Installation Comments / Equipment used:

Pump 4

Configuration Settings	
Mains Frequency	60 Hz
Qmax	10.00 l/s
Pulses/Unit	120.000000
Pulses Limit Frequency	100.0 Hz
Sensor User Span/Zero	100.0%; 0.00 mm/s
User Flow Cutoff/Hysterisis	1.00%; 20%
Meter Mode	Normal operation

Date Wed, Jun 28, 2023 Operator Signature Print

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Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix VII:

Coagulant Used

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: 5318
Facility Works Number: 110003665
Facility Name: KING'S BAY WASTEWATER TREATMENT FACILITY
Facility Owner: Municipality: City of Kawartha Lakes
Facility Classification: Class 2 Wastewater Treatment
Receiver: Subsurface
Service Population: 200.0
Total Design Capacity: 170.0 m3/day

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total	Avg	Max	Min
Chem / Coagulant Used - kg																
Count IH	31	28	31	30	31	30	31	31	30	31	30	31	365			
Max IH	11.38	9.47	10.48	9.75	9.75	9.75	9.75	11.09	13.88	13.41	13	13			13.88	
Mean IH	8.366	7.138	7.401	7.085	7.443	7.73	7.521	7.15	6.487	9.866	8.648	7.907		7.736		
Min IH	5.85	5.71	5.19	6.16	6.18	6.5	3.25	3.25	3.79	6.43	3.25	3.25				3.25
Total IH	259.36	199.86	229.43	212.56	230.728	231.903	233.165	221.66	194.615	305.84	259.44	245.11	2823.671			

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix VIII:

Biosolids Summary

Ontario Clean Water Agency
Time Series Info Report

From: **01/01/2023 to 31/12/2023**

Facility Org Number: **5318**
Facility Works Number: **110003665**
Facility Name: **KING'S BAY WASTEWATER TREATMENT FACILITY**
Facility Owner: **Municipality: City of Kawartha Lakes**
Facility Classification: **Class 2 Wastewater Treatment**
Receiver: **Subsurface**
Service Population: **200.0**
Total Design Capacity: **170.0 m3/day**

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023	Total
Bslq / Hauled Vol. - m^3													
Count IH	0	1	1	1	0	1	1	1	1	0	0	1	8
Total IH		35.5	34.5	35.96		35.45	36.62	35.21	34.7			62.04	309.98