Lindsay Wastewater Treatment Plant

Works # 110000383

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:

2023 Performance Report for the Lindsay Wastewater Treatment Plant

During 2023, the Lindsay WWTP was licensed under Environmental Compliance Approval (ECA) 1696-BPLL4R. All Sewage Pumping Stations within the Lindsay Sewage Collection System were licensed under a Consolidated Linear Infrastructure ECA #141-W601. Reporting requirements for all ECAs are contained in this Performance Report.

ECA1696-BPLL4R Section 4, requires the Performance Report to contain the following:

a) a summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;

b) a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;

c) a summary of all operating issues encountered and corrective actions taken;

d) a summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;

e) a summary of any effluent quality assurance or control measures undertaken;

f) a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;

g) a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:

i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;

h) a tabulation of the volume of sludge generated, 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; a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location;

i) a summary of any complaints received and any steps taken to address the complaints;

j) a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;

k) a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Page 20 - NUMBER 1696-BPLL4R Condition 10, including a report on status of implementation of all modification.

l) a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted.

m) any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works.

n) a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year.

The Environmental Compliance Approval Number 141-W601 for the City of Kawartha Lakes Wastewater Collection System, including the Lindsay Sewage Collection System, stipulates that the operating authority for the following conditions shall maintain annual records:

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) 1696-BPLL4R

(a) ECA #1696-BPLL4R requires a summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates.

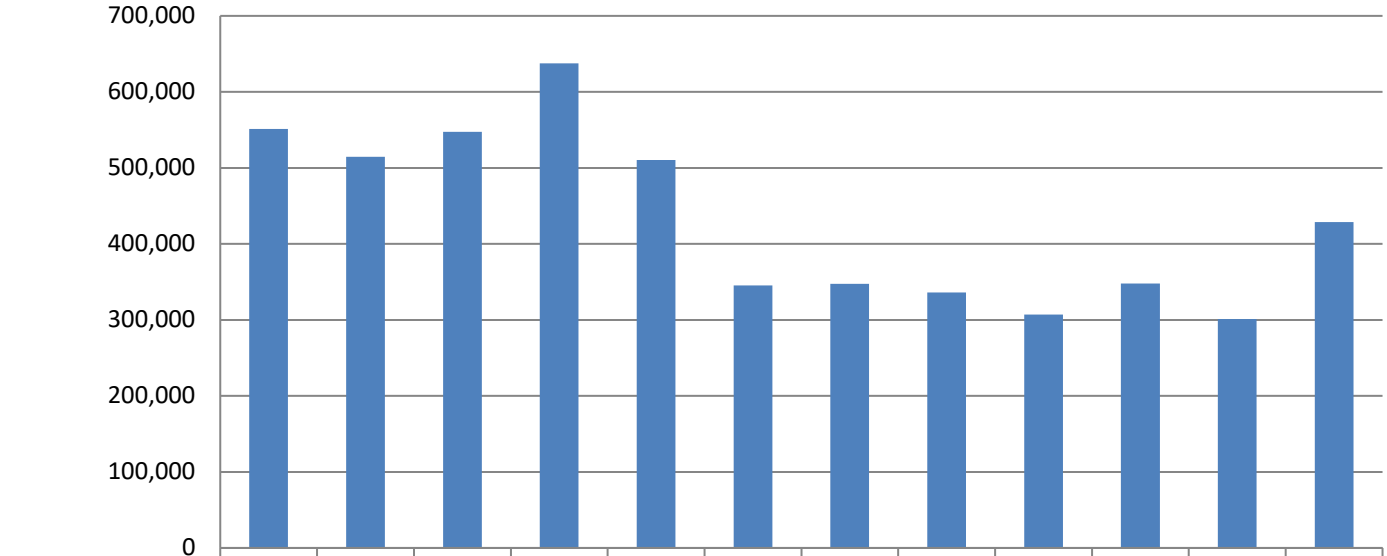
Attached as **Appendix VII** is a copy of the 2023 Performance Assessment Report (PAR) and loading calculations for the Lindsay WWTP raw and final effluent. The PAR contains: a tabulation of all monthly average raw sewage and final effluent sample results obtained during the reporting period, a tabulation of average daily flows, and monthly volumes for the reporting period, and a tabulation of calculated total loading of BOD/CBOD^5, suspended solids, total phosphorus, ammonia + ammonium as N (TAN), Total Kjeldahl Nitrogen (TKN), nitrite and nitrate concentrations in the final effluent.

The Lindsay WWTP Phase 1 Upgrade and Expansion was substantially completed on January 31, 2023. Notice was given to the Ministry of Environment, Conservation and Parks (MECP) in writing on February 7, 2023. With the substantial completion of Phase 1, new limits as outlined in ECA 1696-BPLL4R Design Capacity table, Schedule B, and Schedule C came into effect.

The Lindsay WWTP has a Rated Capacity of 24,500 m^3/day and Actiflo rated capacity of 30,100 m^3/day under ECA 1696-BPLL4R. ECA 1696-BPLL4R requires that everything practicable be undertaken to operate the Sewage Treatment Plant so that the annual average daily influent is within the Rated Capacity. The Rated Capacity of the Lindsay WWTP is 24,500 m^3/day and the 2023 annual average daily influent flow was 14,177.80 m^3/day or 57.9% of the Rated Capacity.

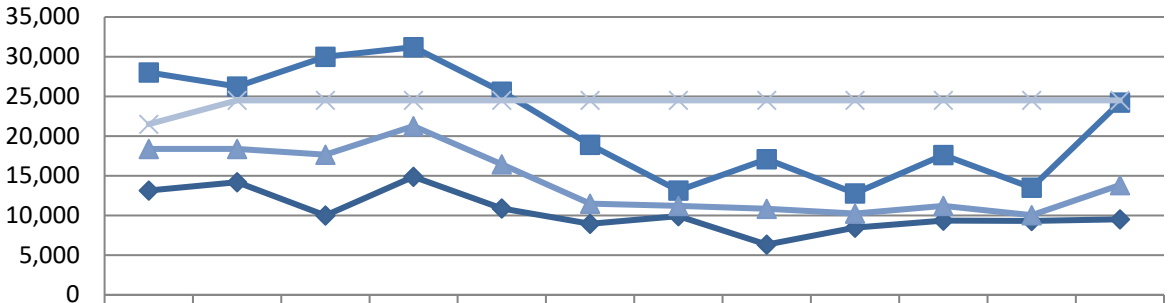
The total Influent flow in 2023 was 5,174,898.00 m^3.

Graph 1: 2023 Influent Flow Monthly Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Influent Flow (m^3)	551,381	514,766	547,287	637,726	510,358	345,257	347,310	336,001	307,212	347,725	301,144	428,731

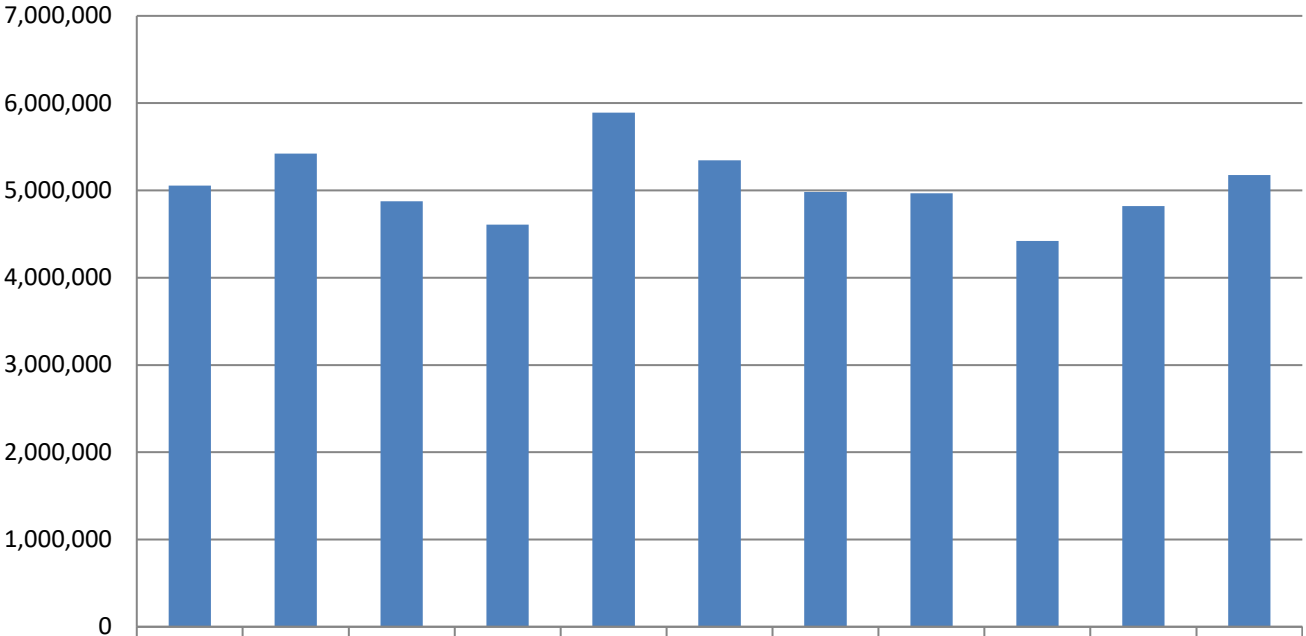
Graph 2: Influent Daily Minimum, Maximum and Average Flows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (m^3/day)	13,125	14,183	10,015	14,877	10,881	8,947	9,924	6,336	8,457	9,373	9,298	9,509
Max (m^3/day)	28,030	26,240	29,997	31,203	25,612	18,897	13,134	17,089	12,801	17,607	13,492	24,233
Avg(m^3/day)	18,399	18,385	17,654	21,258	16,463	11,509	11,204	10,839	10,240	11,217	10,038	13,830
Limit (m^3/day)	21,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500

There may be instances where influent flow exceeded the Rated Capacity on a monthly basis. However, Rated Capacity is calculated as an annual average daily flow rate, which was met in 2023. Influent rated capacity increased from 21,500 m^3/day to 24,500 m^3/day beginning February 2023 after the substantial completion of capital upgrades.

Graph 3: Historical Influent Flows from 2013 to 2023

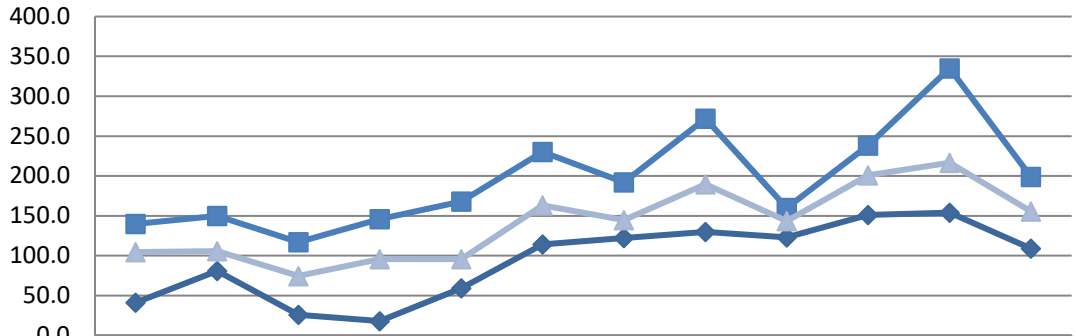


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Influent Flow (m^3)	5,054,164	5,420,324	4,874,886	4,606,899	5,891,445	5,345,291	4,980,995	4,968,971	4,420,109	4,821,709	5,174,898

Biochemical Oxygen Demand (BOD5)

ECA 1696-BPLL4R requires at least one composite sample be collected and analyzed weekly for Biochemical Oxygen Demand (BOD5). The Biochemical Oxygen Demand (BOD5) monthly average results ranged from 18 mg/L to 335 mg/L.

Graph 4: 2023 Monthly BOD5 Influent Concentration Comparisons

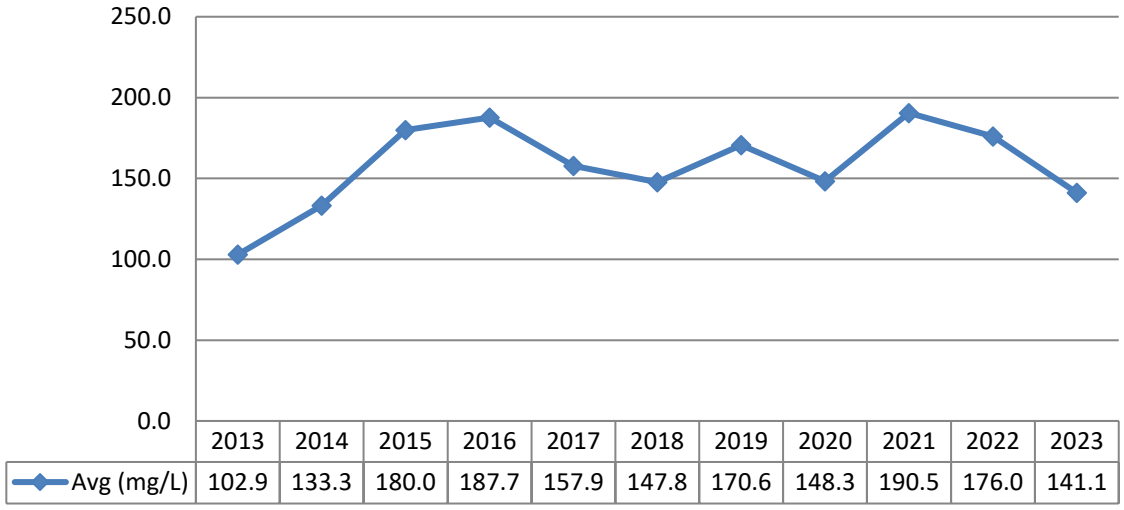


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (mg/L)	41.0	81.0	26.0	18.0	59.0	114.0	122.0	130.0	123.0	151.0	154.0	109.0
Max (mg/L)	140.0	150.0	117.0	146.0	168.0	230.0	192.0	272.0	160.0	238.0	335.0	199.0
Avg (mg/L)	104.5	105.8	74.6	95.5	95.6	163.3	144.8	189.8	143.5	200.8	216.6	155.5

Biochemical Oxygen Demand Historical Trends

The Biochemical Oxygen Demand annual average has been increasing steadily between 2013 and 2023. Although not confirmed, increased raw influent concentrations could be related to increased abattoir and septage receiving.

Graph 5: Historical Influent BOD5 Concentration Comparisons

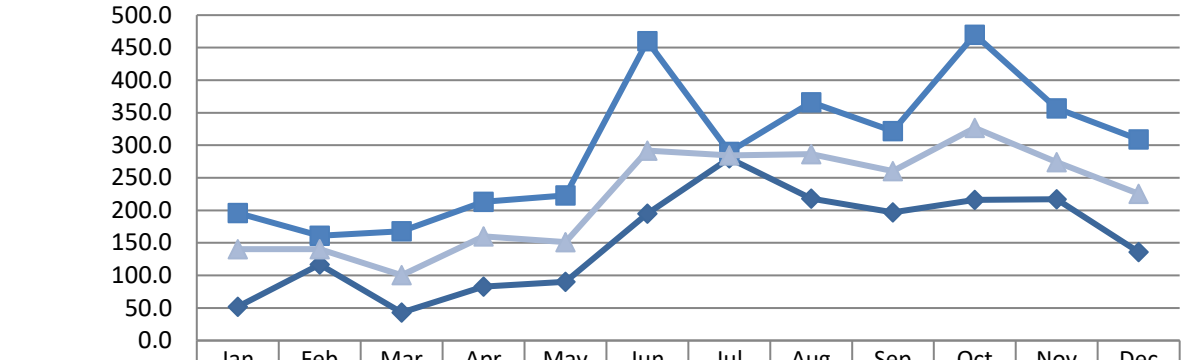


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	102.9	133.3	180.0	187.7	157.9	147.8	170.6	148.3	190.5	176.0	141.1

Total Suspended Solids

ECA 1696-BPLL4R requires at least one composite sample be collected and analyzed weekly for Total Suspended Solids. The monthly average results ranged from 100.4 mg/L to 326.8 mg/L.

Graph 6: 2023 Monthly Total Suspended Solids Influent Concentration Comparisons

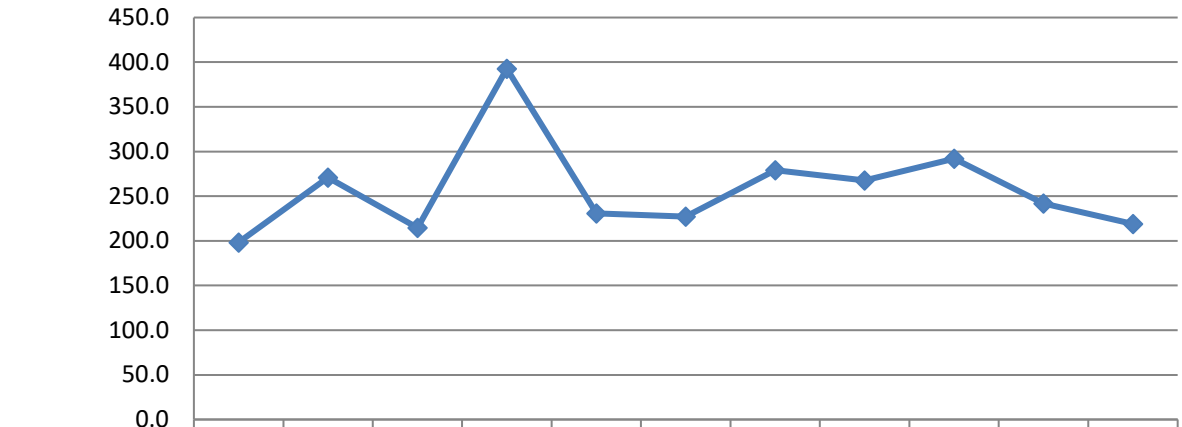


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (mg/L)	52.0	117.0	43.0	83.0	90.0	195.0	280.0	218.0	197.0	216.0	217.0	136.0
Max (mg/L)	196.0	161.0	168.0	213.0	223.0	460.0	290.0	366.0	322.0	470.0	357.0	309.0
Avg (mg/L)	140.5	140.3	100.4	160.0	151.2	292.0	284.5	286.4	260.3	326.8	274.2	225.5

Total Suspended Solids Historical Review

The Total Suspended Solids annual average has remained relatively stable between 2013 and 2023 with the peak annual average in 2016. Although not confirmed, raw influent concentrations could be related to abattoir and septage receiving.

Graph 7: Historical Influent Total Suspended Solids Concentration Comparisons

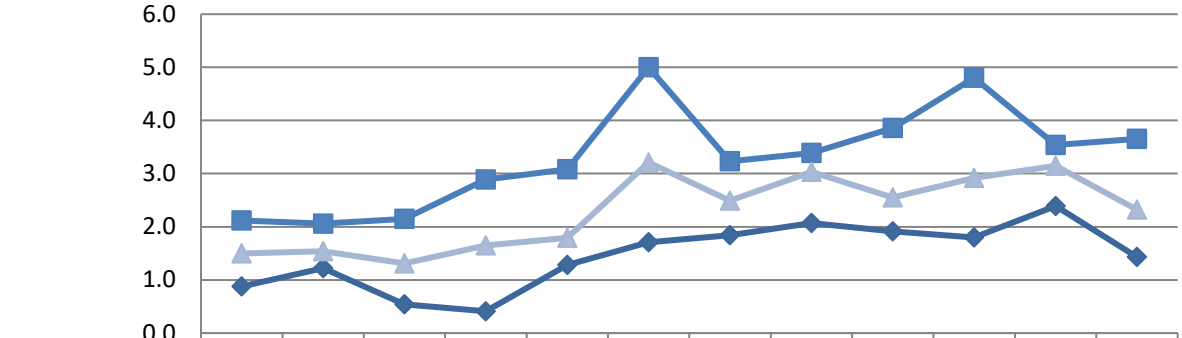


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	198.3	270.8	214.5	392.7	230.7	227.0	279.0	267.6	291.9	241.8	218.9

Total Phosphorus

ECA 1696-BPLL4R requires at least one composite sample be collected and analyzed weekly for Total Phosphorus. The monthly average Total Phosphorus results ranged from 1.3 mg/L to 3.2 mg/L.

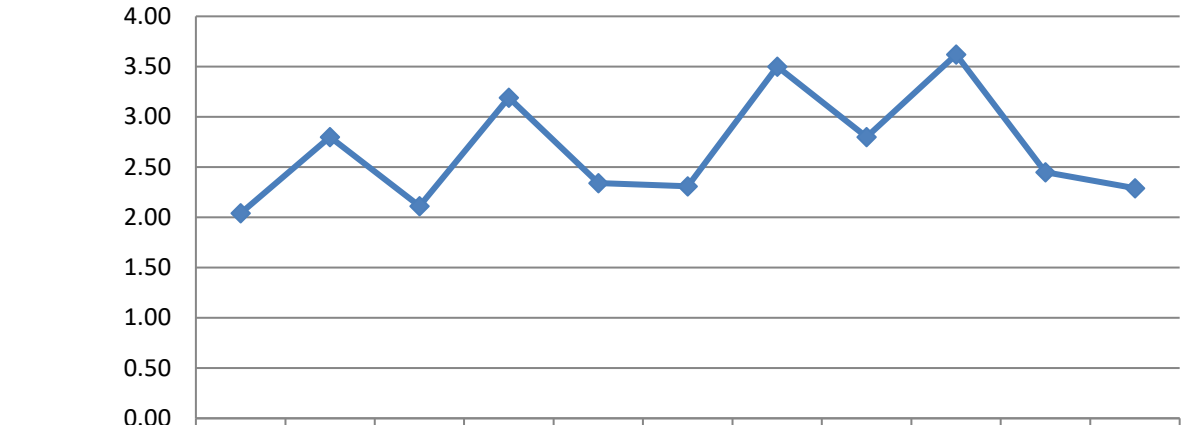
Graph 8: 2023 Monthly Total Phosphorus Influent Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (mg/L)	0.9	1.2	0.54	0.4	1.3	1.7	1.8	2.1	1.9	1.8	2.4	1.4
Max (mg/L)	2.1	2.1	2.2	2.9	3.1	5.0	3.2	3.4	3.9	4.8	3.5	3.7
Avg (mg/L)	1.5	1.5	1.3	1.7	1.8	3.2	2.5	3.0	2.6	2.9	3.2	2.3

Total Phosphorus Historical Trends

Graph 9: Historical Influent Total Phosphorus Concentration Comparisons



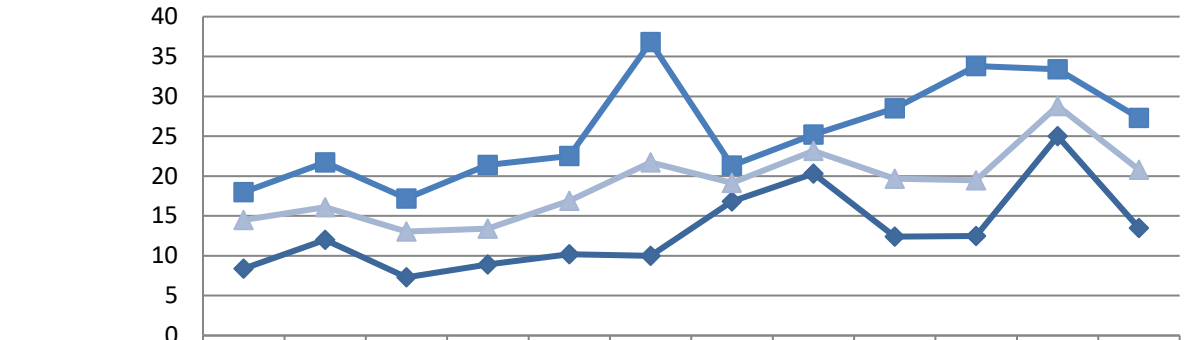
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	2.04	2.80	2.11	3.19	2.34	2.31	3.50	2.80	3.62	2.45	2.29

The Total Phosphorus annual average has increased between 2013 and 2023 with the minimum value being 2.04 mg/L and the maximum value being 3.62 mg/L. Although not confirmed, raw influent concentrations could be related to abattoir and septage receiving.

Total Kjeldahl Nitrogen (TKN)

ECA 1696-BPLL4R requires at least one composite sample be collected and analyzed weekly for Total Kjeldahl Nitrogen. The monthly average Total Kjeldahl Nitrogen results ranged from 13 mg/L to 28.8 mg/L.

Graph 10: 2023 Monthly Total Kjeldahl Nitrogen Influent Concentration Comparisons

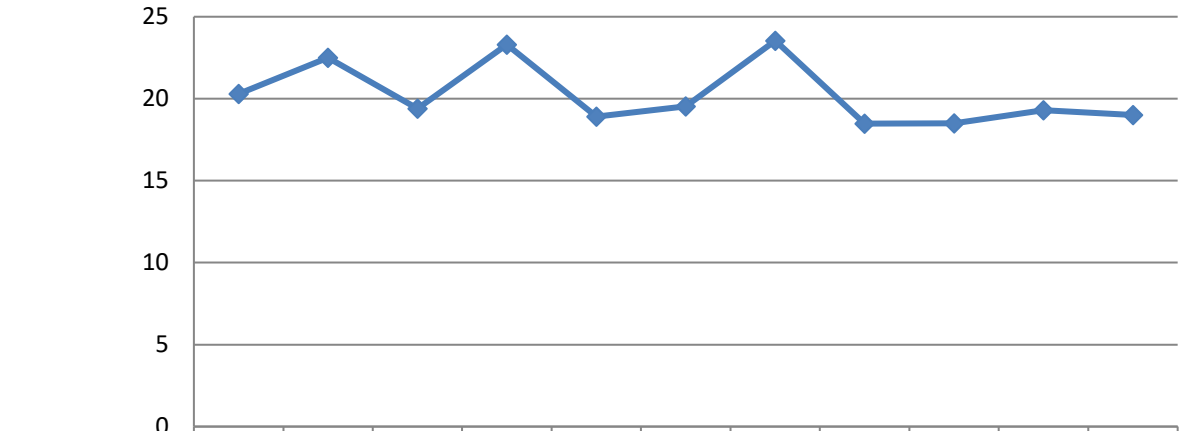


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (mg/L)	8.4	12	7.3	8.9	10.2	10	16.8	20.3	12.4	12.5	25	13.5
Max (mg/L)	18.0	21.7	17.2	21.4	22.5	36.8	21.3	25.2	28.5	33.8	33.4	27.3
Avg (mg/L)	14.5	16.1	13.0	13.4	16.9	21.7	19.2	23.2	19.7	19.5	28.8	20.8

Total Kjeldahl Nitrogen Historical Review

The Total Kjeldahl Nitrogen annual average has remained fairly consistent between 2013 and 2023. The minimum annual average occurred in 2020 and the maximum annual average occurred in 2019.

Graph 11: Historical Influent Total Kjeldahl Nitrogen Concentration Comparisons

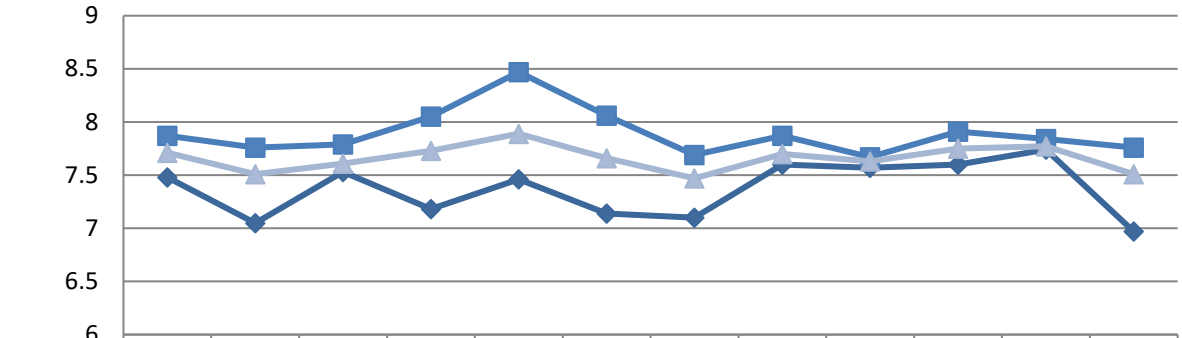


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	20.3	22.5	19.4	23.3	18.9	19.54	23.54	18.48	18.5	19.3	19.0

pH

ECA 1696-BPLL4R does not require a pH sample be collected nor prescribes the sample frequency on the influent. The monthly average pH results were fairly consistent throughout 2023 ranging from 7.47 to 7.89.

Graph 12: 2023 Monthly pH Influent Concentration Comparisons



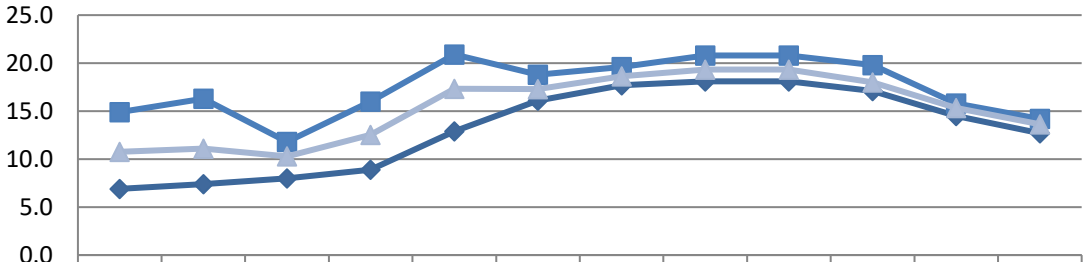
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min	7.48	7.05	7.53	7.18	7.46	7.14	7.1	7.6	7.57	7.6	7.74	6.97
Max	7.87	7.76	7.79	8.05	8.47	8.06	7.69	7.87	7.67	7.91	7.84	7.76
Avg	7.71	7.51	7.61	7.73	7.89	7.66	7.47	7.70	7.63	7.75	7.77	7.51

Historical pH data is only available from 2016 to 2023 and the pH levels in 2023 fluctuated 6.90 and 8.47.

Temperature

ECA 1696-BPLL4R do not require a temperature sample be collected or prescribe sample frequency on the influent. Samples were collected throughout 2023. Variations in results were consistent with seasonal fluctuations. Historically, the influent water temperature drops in the freezing season (i.e. winter) and raises in the non-freezing season (i.e. summer) and this trend continued throughout 2023. Historical data is only available from 2016 to 2023 and the temperature in 2023 ranged from 6.9º to 20.9º.

Graph 13: 2023 Monthly Temperature Influent Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (oC)	6.9	7.4	8.0	8.9	12.9	16.1	17.7	18.1	18.1	17.1	14.5	12.7
Max (oC)	14.9	16.3	11.8	16.0	20.9	18.8	19.6	20.8	20.8	19.8	15.8	14.2
Avg (oC)	10.8	11.1	10.3	12.5	17.3	17.3	18.6	19.3	19.3	18.0	15.3	13.6

Imported Sewage

Imported Sewage is sewage that is hauled to the sewage treatment plant by licensed waste treatment system operators. At the Lindsay WWTP Imported Sewage consists of sewage hauled to the Receiving Station at 38 Lagoon St, Lindsay and abattoir waste hauled to the Lindsay WWTP onsite storage lagoon.

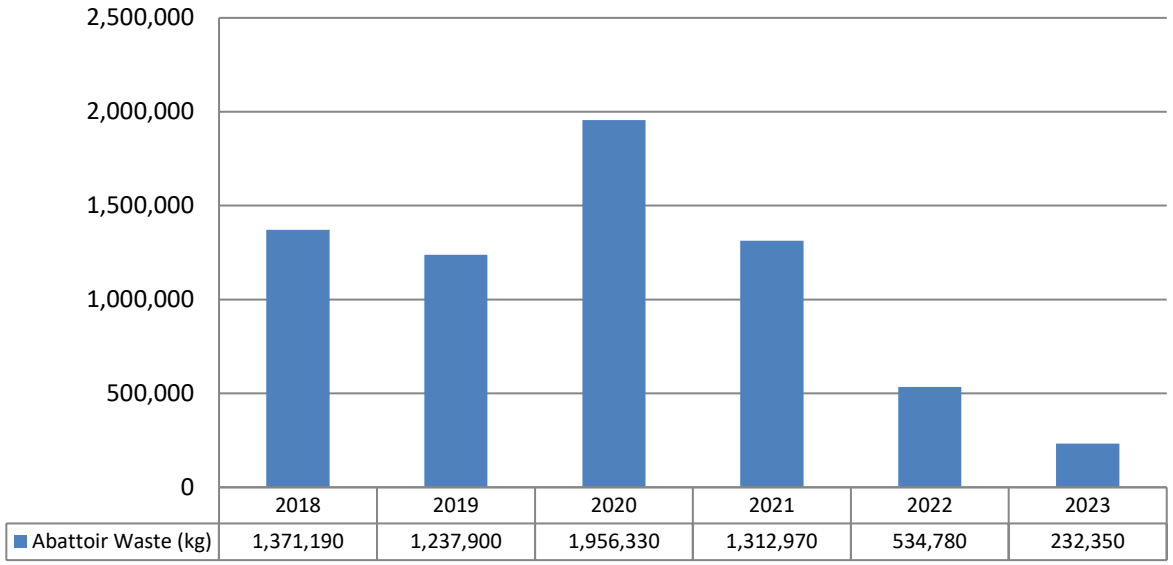
ECA 1696-BPLL4R requires monthly sampling of Imported Sewage.

Abattoir Waste

Waste from local Abattoirs is hauled to the Lindsay WWTP and deposited into Lagoon 5 which acts as a storage lagoon. During high flow events, excess raw water from the collection system is diverted into Lagoon 5 where it is stored until the collection system flows subside enough to feed the water in Lagoon 5 back into the facility Inlet. The abattoir waste mixes with the raw water in Lagoon 5 and is returned to the wastewater treatment plant through the Inlet.

Trucks hauling abattoir waste are weighed at the Lindsay Landfill Inbound Scale and the Outbound Scale and the difference between the two readings is the amount of abattoir waste deposited into Lagoon 5. The amount of abattoir waste deposited in 2023 was 232,350.00 kg. This was a decrease in abattoir waste deposited over 2022, equaling a 56% decrease in volume.

Graph 14: Historical Abattoir Volume Comparisons

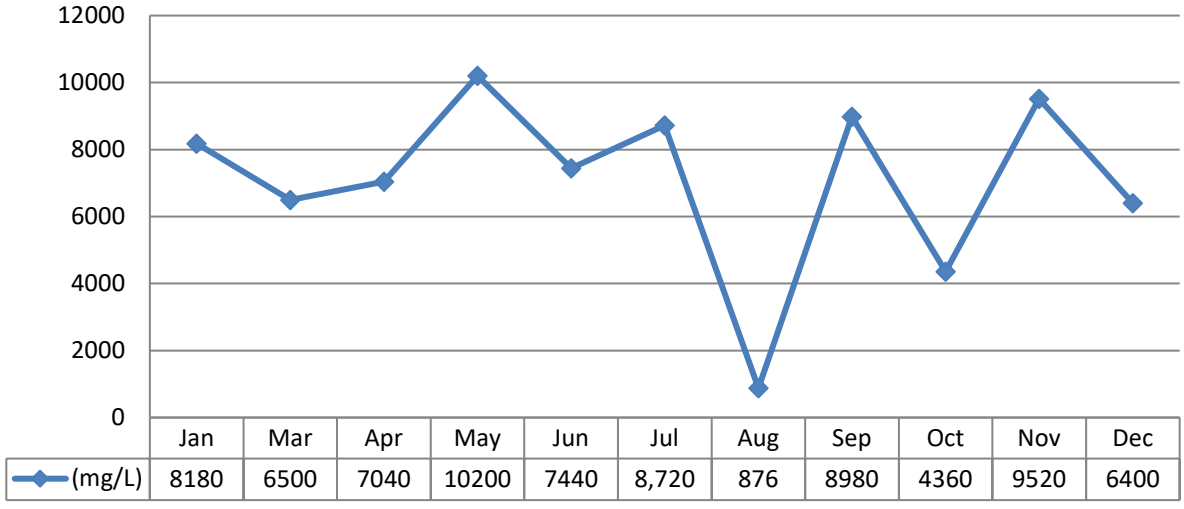


ECA 1696-BPLL4R requires a grab sample be collected monthly and analyzed for BOD5, Total Suspended Solids, Total Phosphorus and Total Kjeldahl Nitrogen for each type of imported sewage. Although not required by the ECA, Total Ammonia Nitrogen was sampled and analyzed monthly in 2023. An Abattoir sample was not collected February 2023. See Section N for further details.

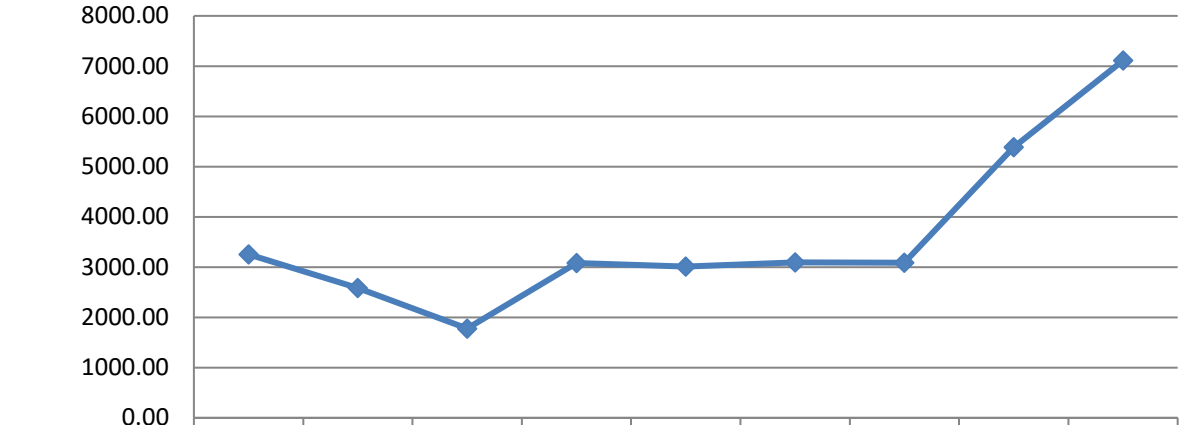
Biochemical Oxygen Demand (BOD5)

ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for BOD5. The BOD5 sample results ranged from 876 mg/L to 10,200 mg/L in 2023.

Graph 15: 2023 Monthly BOD5 Abattoir Waste Concentration Comparisons



Graph 16: Historical BOD5 Abattoir Waste Concentration Comparisons



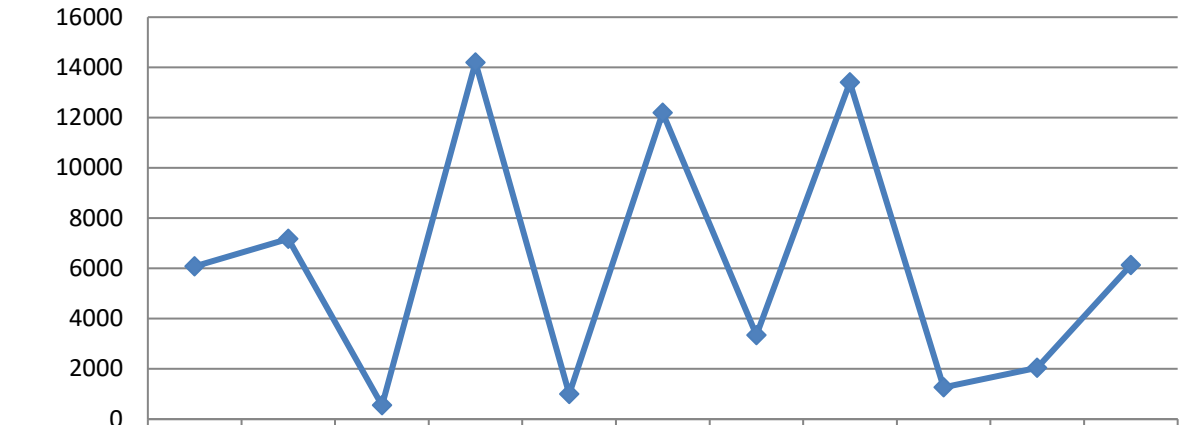
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	3251.23	2584.88	1778.28	3078.07	3009.20	3094.16	3087.75	5386.27	7110.55

The BOD5 annual average has remained fairly consistent between 2015 and 2021. There was a large increase in average BOD in 2022, continuing through 2023. The minimum annual average concentration occurred in 2017 and the maximum annual average concentration occurred in 2023.

Total Suspended Solids

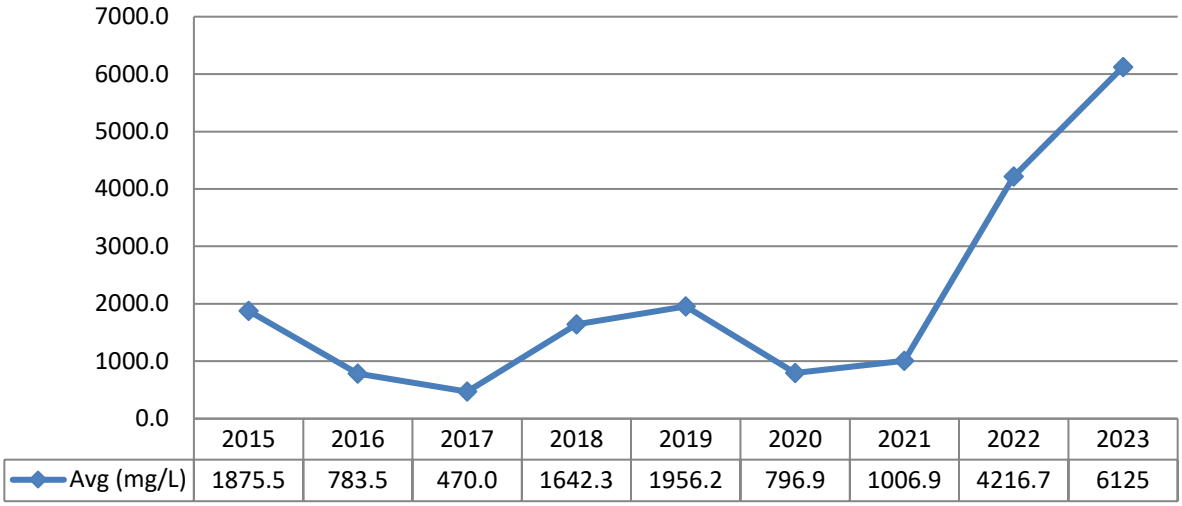
ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for Total Suspended Solids. The Total Suspended Solids sample results ranged from 547 mg/L to 14,200 mg/L in 2023.

Graph 17: 2023 Monthly Total Suspended Solids Abattoir Waste Concentration Comparisons



	Jan	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mg/L)	6080	7170	547	14200	1000	12,200	3340	13400	1270	2040	6130

Graph 18: Historical Total Suspended Solids Abattoir Waste Concentration Comparisons



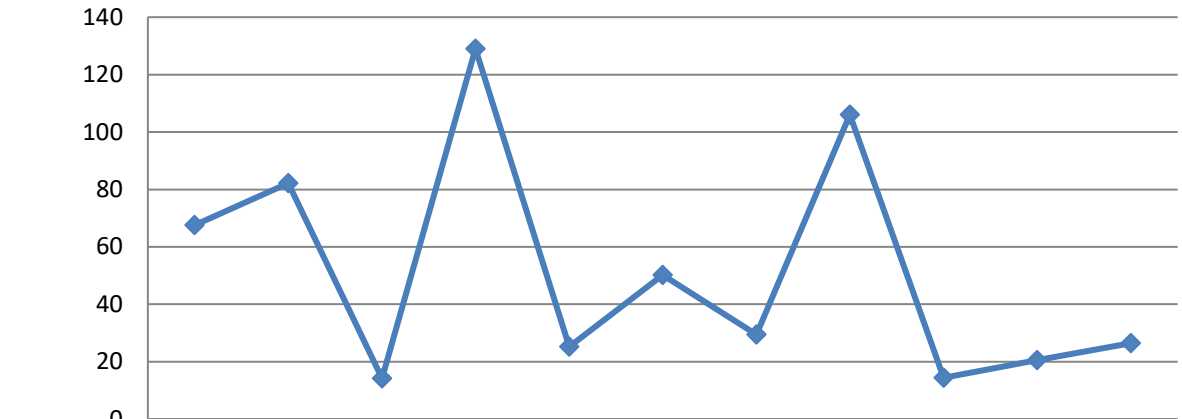
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	1875.5	783.5	470.0	1642.3	1956.2	796.9	1006.9	4216.7	6125

The Total Suspended Solids annual average has remained fairly consistent between 2015 and 2021. There was a significant increase in the annual average in 2022, continuing through 2023. The minimum annual average concentration occurred in 2017 and the maximum annual average concentration occurred in 2023.

Total Phosphorus

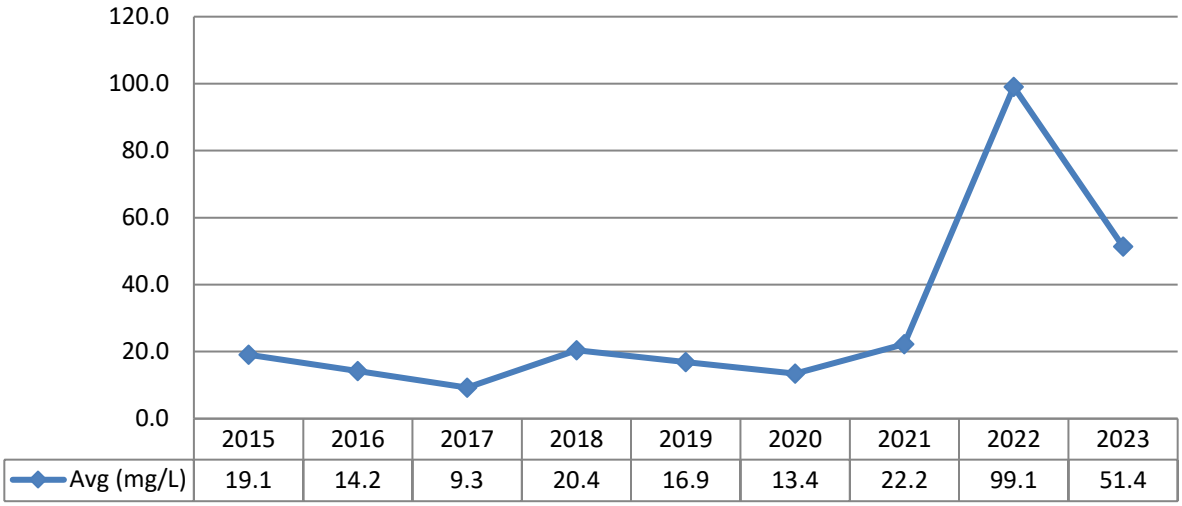
ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for Total Phosphorus. Results ranged from 14.2 mg/L to 129 mg/L in 2023.

Graph 19: 2023 Monthly Total Phosphorus Abattoir Waste Concentration Comparisons



	Jan	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mg/L)	67.6	82.2	14.2	129	25.2	50	29.5	106	14.4	20.6	26.4

Graph 20: Historical Total Phosphorus Abattoir Waste Concentration Comparisons

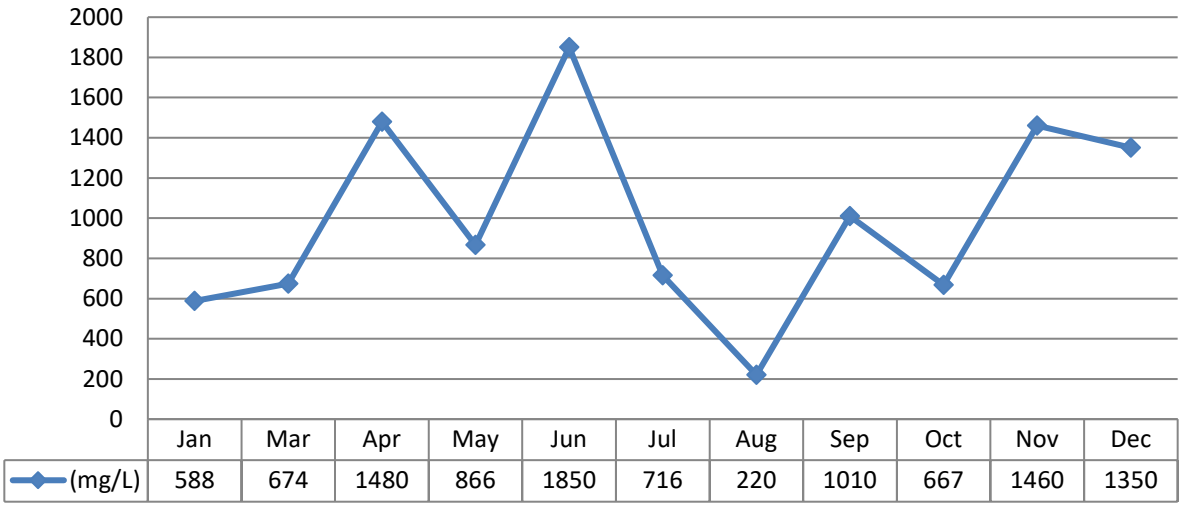


The Total Phosphorus annual average has remained fairly consistent between 2015 and 2021. There was a significant increase in the annual average in 2022, but dropping through 2023. The minimum annual average concentration occurred in 2017 and the maximum annual average concentration occurred in 2022.

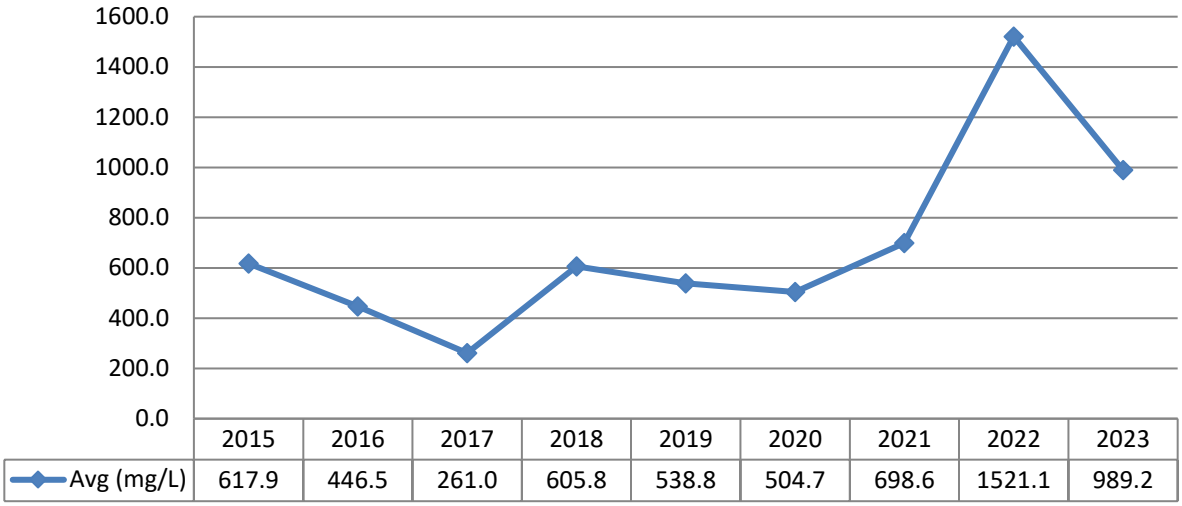
Total Kjeldahl Nitrogen (TKN)

ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for Total Kjeldahl Nitrogen. The Total Kjeldahl Nitrogen results ranged from 220 mg/L to 1,850 mg/L in 2023.

Graph 21: 2023 Monthly TKN Abattoir Waste Concentration Comparisons



Graph 22: Historical Total Kjeldahl Nitrogen Abattoir Waste Concentration Comparisons



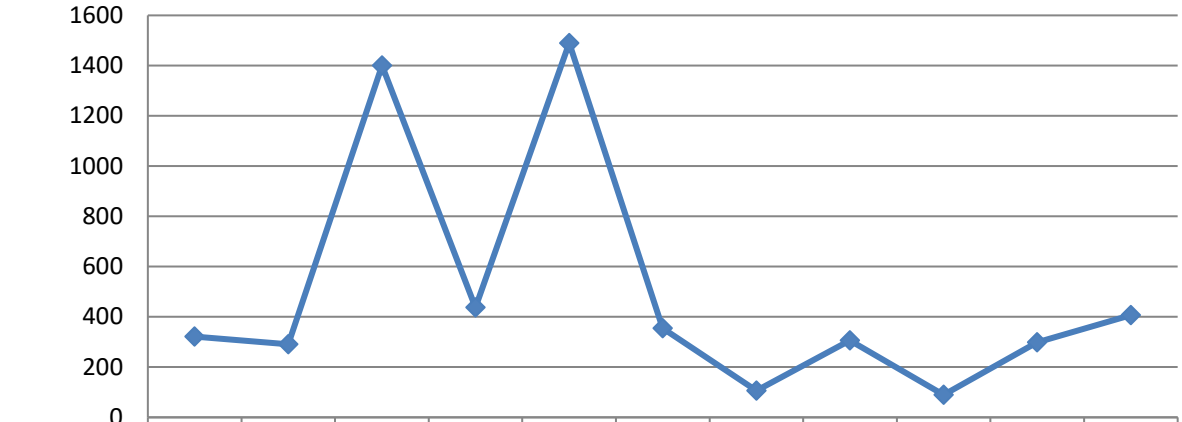
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Avg (mg/L)	617.9	446.5	261.0	605.8	538.8	504.7	698.6	1521.1	989.2

The Total Kjeldahl Nitrogen annual average has ranged between 261.0 mg/L and 1,521.1 mg/L. The minimum annual average concentration occurred in 2017 and the maximum annual average concentration occurred in 2022.

Total Ammonia Nitrogen (TAN)

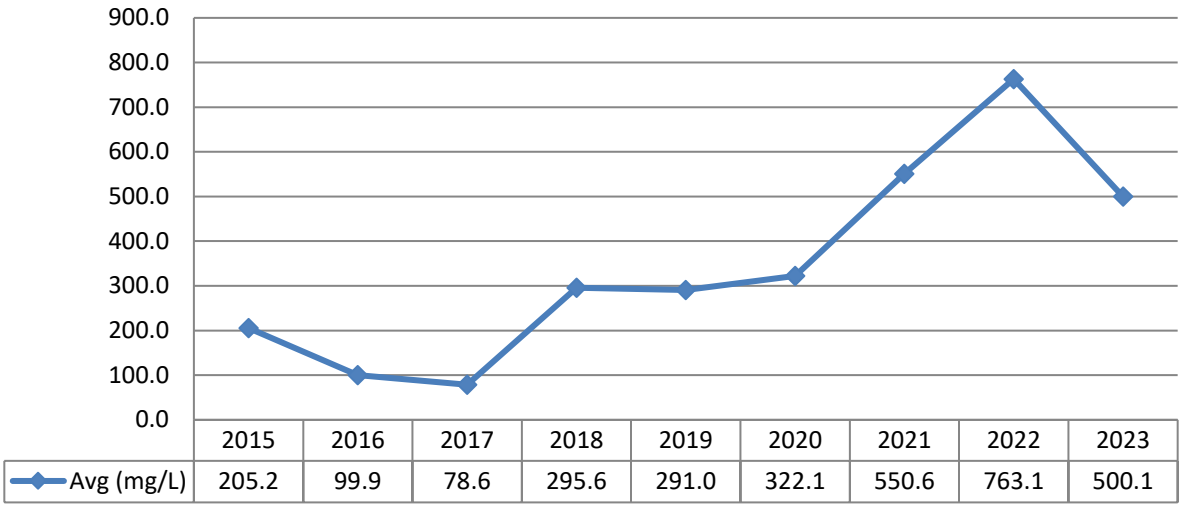
One grab sample was collected of the Abattoir waste each month in 2023 except February and analyzed for Total Ammonia Nitrogen. The results ranged from 90.0 mg/L to 1,490 mg/L.

Graph 23: 2023 Monthly TAN Abattoir Waste Concentration Comparisons



	Jan	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mg/L)	322	291	1400	437	1490	354	106	306	90	299	407

Graph 24: Historical TAN Abattoir Waste Concentration Comparisons



Since 2015 the Total Ammonia Nitrogen annual average has fluctuated between 78.6 mg/L and 763.1 mg/L. The minimum annual average concentration occurred in 2017 and the maximum annual average concentration occurred in 2022.

Receiving Station

ECA 1696-BPLL4R requires monthly sampling of the Receiving Station testing for BOD5, Total Suspended Solids, Total Phosphorus, and Total Kjeldahl Nitrogen. Although not required by the ECA, Total Ammonia Nitrogen was sampled and analyzed monthly in 2023.

As sampling of the Receiving Station began in November 2018 a historical review of the result is limited. The 2018-2023 results are included below. It should be noted that the sewage from the Receiving Station flows to the Inlet Building where the Inlet (Raw) samples are collected so Receiving Station water would form a portion of the Inlet (Raw) sample results.

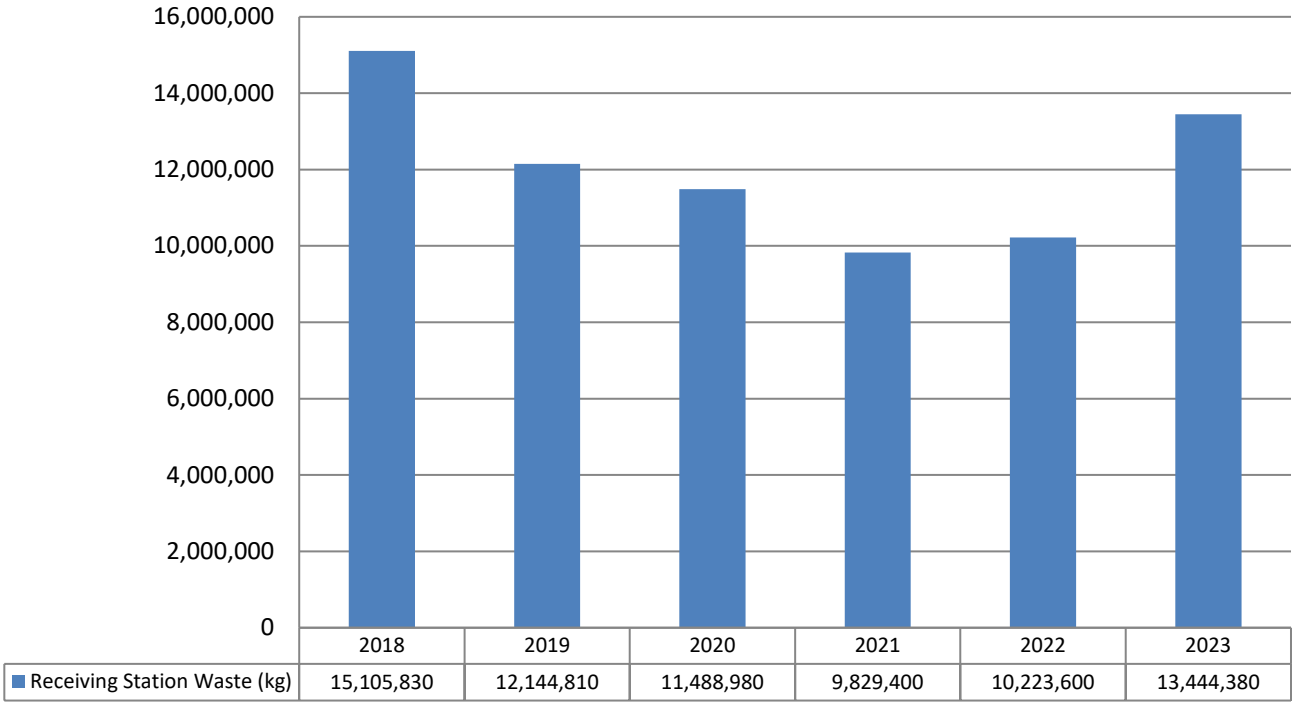
Table 1: Historical Review Receiving Station Sample Results

Parameter	Nov/ Dec 2018	2019 Annual	2020 Annual	2021 Annual	2022 Annual	2023 Annual
BOD5 (mg/L)	3492	3094.2	4549.40	4797.77	5545.17	4408.4
Total Suspended Solids (mg/L)	1810	5397.5	8390.00	7046.85	6165.58	8034.4
Total Phosphorus (mg/L)	18.6	128.75	106.42	132.50	149.72	93.6

Parameter	Nov/ Dec 2018	2019 Annual	2020 Annual	2021 Annual	2022 Annual	2023 Annual
Total Kjeldahl Nitrogen (mg/L)	150	2239.5	1238.40	1148.05	2120.50	1225.7
Total Ammonia Nitrogen (mg/L)	80.25	1417.8	753.74	788.35	1081.24	841.1

Trucks hauling waste are weighed at the Lindsay Landfill Inbound Scale prior to arriving at the Receiving Station and at the Outbound Scale after leaving the Receiving Station. The difference between the two scale readings is the amount of waste deposited into the Lagoon St Receiving Station. The amount of waste deposited into the receiving station in 2023 was 13,444,380 kg. This is a 31.5 % increase in the volume deposited in 2022, and represents an increase after an overall steady trend.

Graph 25: Historical Receiving Station Volume Comparisons



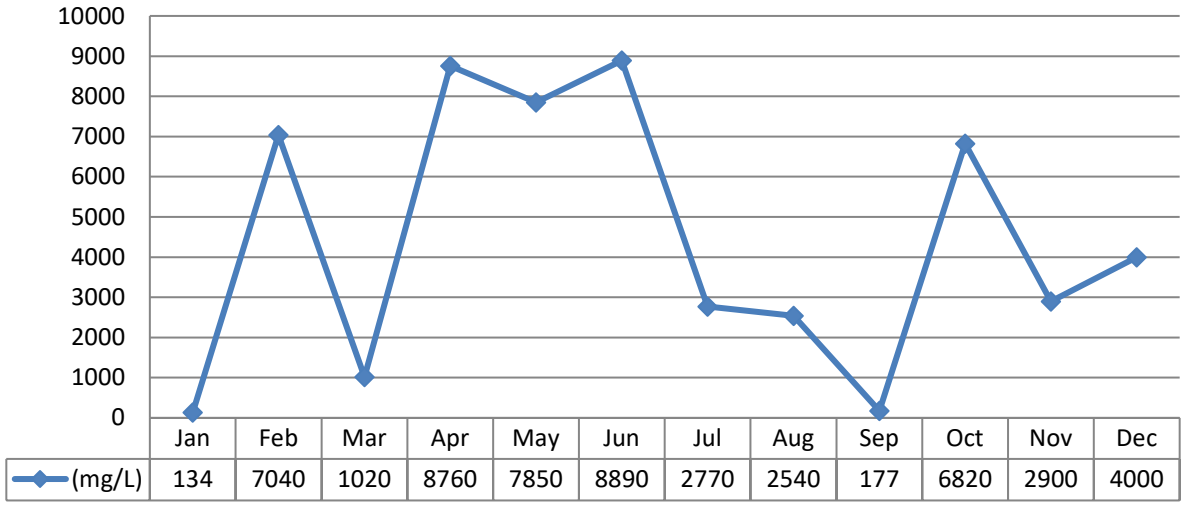
Sample Results

ECA 1696-BPLL4R requires a grab sample be collected monthly and analyzed for BOD5, Total Suspended Solids, Total Phosphorus and Total Kjeldahl Nitrogen. Although not required by the ECA, Total Ammonia Nitrogen was sampled and analyzed monthly in 2023.

Biochemical Oxygen Demand (BOD5)

ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for BOD5. The BOD5 sample results ranged from 134 mg/L to 8890 mg/L.

Graph 26: 2023 Monthly BOD5 Receiving Station Waste Concentration Comparisons

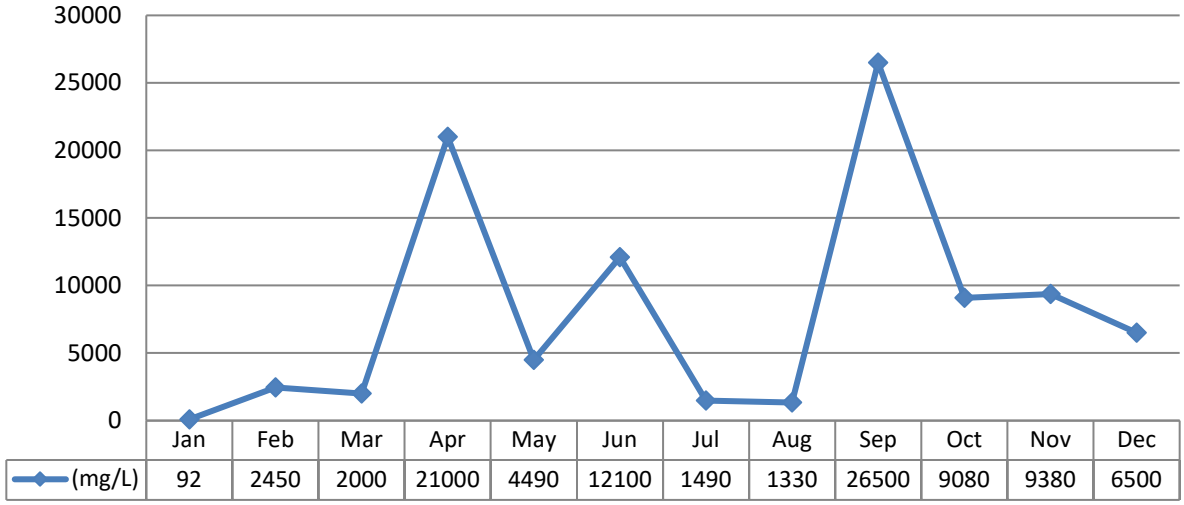


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mg/L)	134	7040	1020	8760	7850	8890	2770	2540	177	6820	2900	4000

Total Suspended Solids

ECA 1696-BPLL4R requires a grab sample be collected monthly and analyzed for Total Suspended Solids. The Total Suspended Solids sample results ranged from 92 mg/L to 26,500 mg/L in 2023.

Graph 27: 2023 Monthly Total Suspended Solids Receiving Station Waste Concentration Comparisons

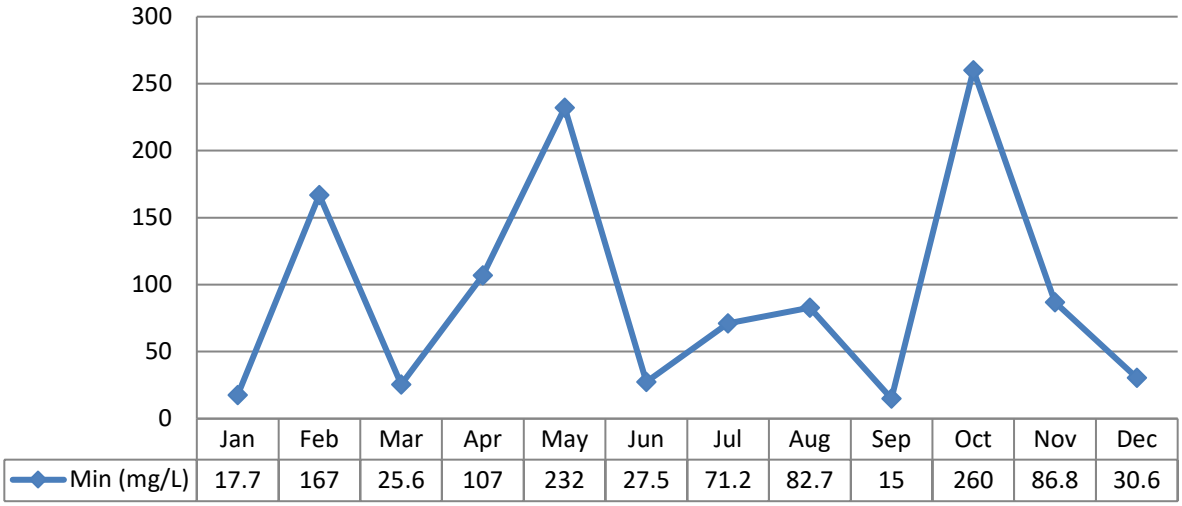


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mg/L)	92	2450	2000	21000	4490	12100	1490	1330	26500	9080	9380	6500

Total Phosphorus

ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for Total Phosphorus. Results ranged from 15.0 mg/L to 260 mg/L.

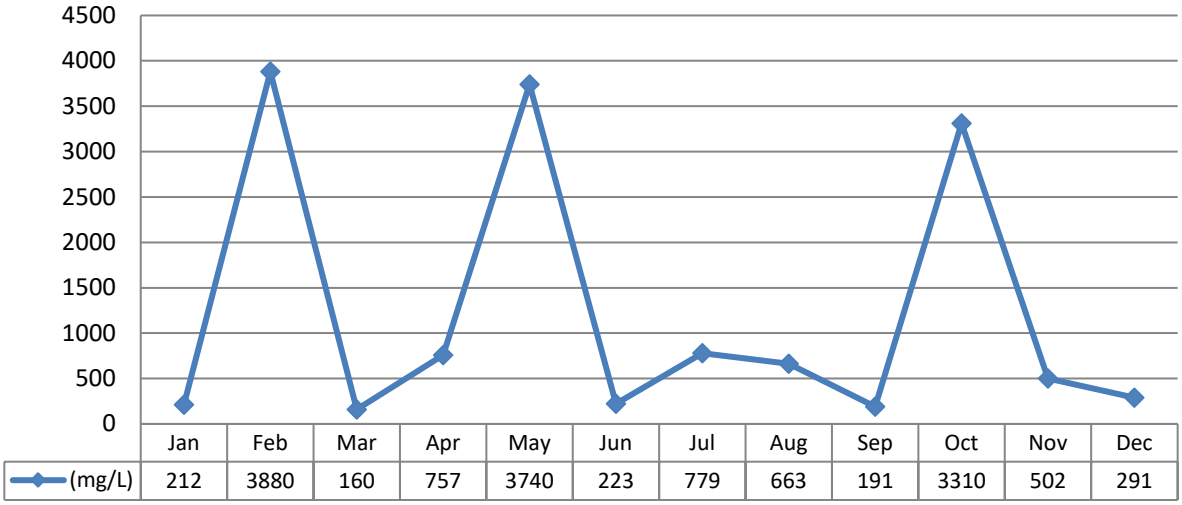
Graph 28: 2023 Monthly Total Phosphorus Receiving Station Waste Concentration Comparisons



Total Kjeldahl Nitrogen (TKN)

ECA 1696-BPLL4R requires one grab sample be collected monthly and analyzed for Total Kjeldahl Nitrogen. Monthly Total Kjeldahl Nitrogen results ranged from 191 mg/L to 3880 mg/L.

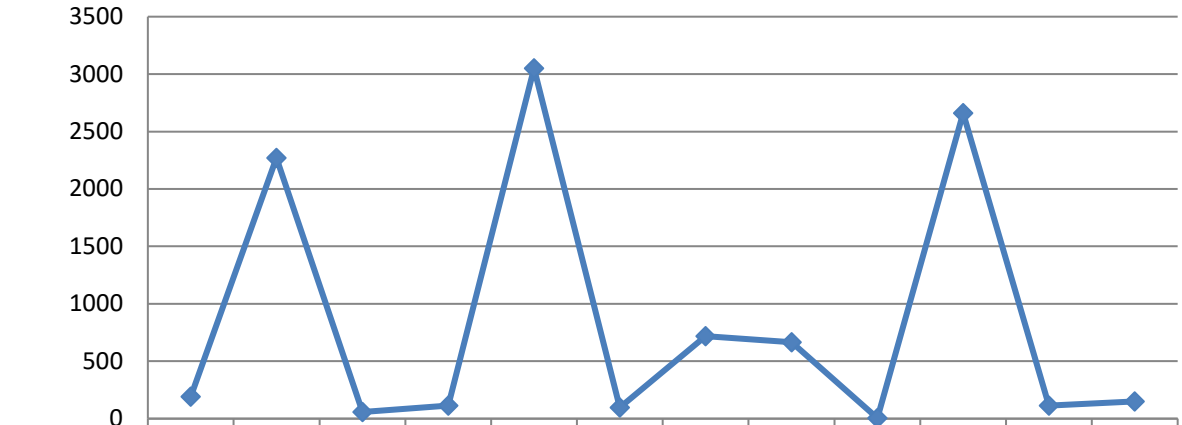
Graph 29: 2023 Monthly TKN Receiving Station Waste Concentration Comparisons



Total Ammonia Nitrogen (TAN)

One grab sample was collected from the Receiving Station waste each month in 2022 and analyzed for Total Ammonia Nitrogen. The monthly average concentration results ranged from 4.5 mg/L to 3,050 mg/L.

Graph 30: 2023 Monthly TAN Receiving Station Waste Concentration Comparisons



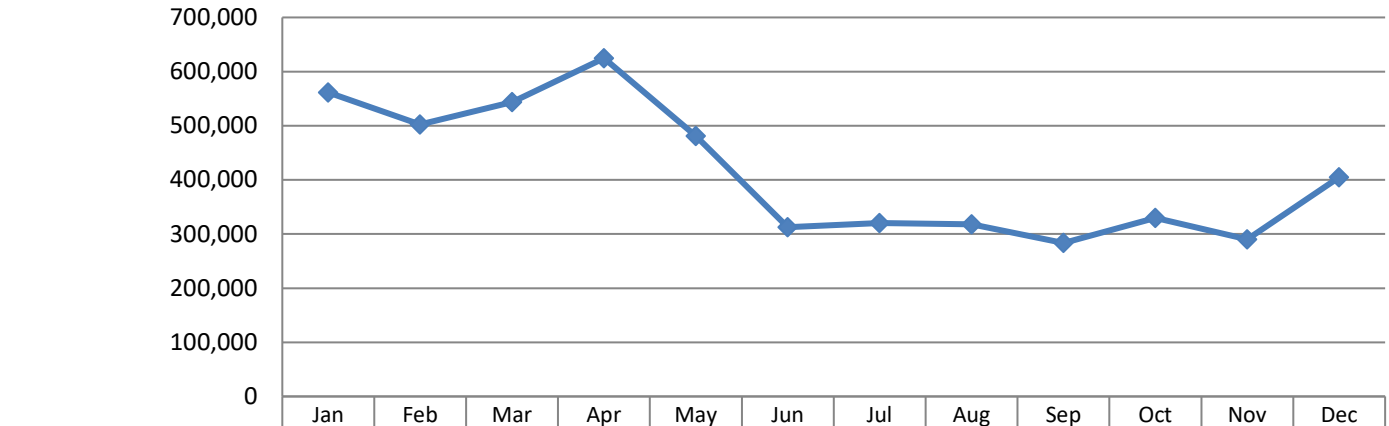
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mg/L)	192	2270	57.9	115	3050	97.3	717	665	4.5	2660	114	150

(b) Environmental Compliance Approval (ECA) #1696-BPLL4R requires a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits, including an overview of the success and adequacy of the works be included in the report.

The 2023 Lindsay WWTP annual average daily effluent flow was 13,619.80 m^3/day and the total Effluent flow in 2023 was 4,971,226.00 m^3.

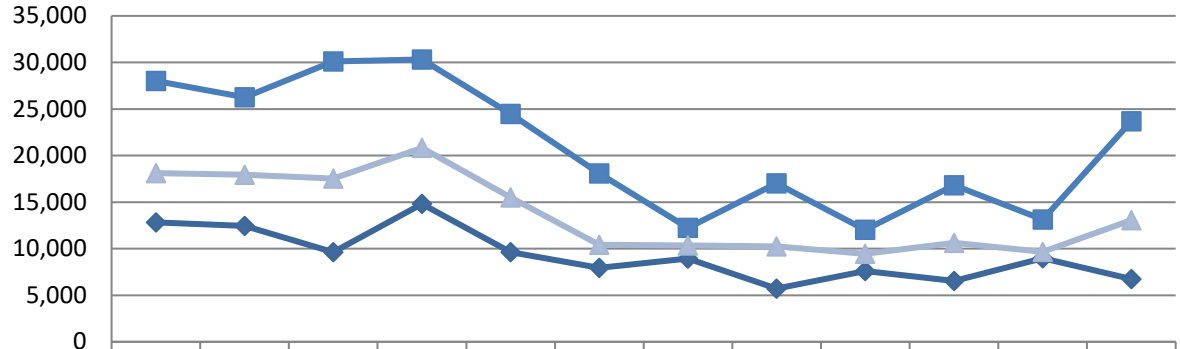
Effluent Flow Monthly Totals

Graph 31: 2023 Final Effluent Monthly Flows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly Total (m^3/d)	561,668	502,307	543,556	624,657	480,803	312,401	320,394	318,037	283,388	329,579	289,904	404,532

Graph 32: 2023 Final Effluent Daily Minimum, Maximum and Average Flows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (m^3/day)	12,815	12,449	9,625	14,802	9,622	7,959	8,933	5,712	7,600	6,540	8,968	6,730
Max (m^3/day)	28,015	26,258	30,107	30,319	24,488	18,081	12,240	17,024	12,027	16,800	13,141	23,692
Avg (m^3/day)	18,118	17,940	17,534	20,822	15,510	10,413	10,335	10,259	9,446	10,632	9,663	13,049

Note: See **Table 8: 2023 Lindsay WWTP Operational Challenges** for information when final effluent totalized daily flow exceeded the limit set out in ECA 1696-BPLL4R

Final Effluent Lab Results

With the substantial completion of Phase 1 Upgrade and Expansion, new limits as outlined in ECA 1696-BPLL4R Schedule B and C came into effect. This resulted in changes to Final Effluent parameters design objectives listed in Schedule B, and compliance limits for the Final Effluent parameters listed in the table(s) included in Schedule C. These changes came into effect February 1, 2023.

Carbonaceous Biochemical Oxygen Demand (CBOD5)

The table below outlines the changes to CBOD5 design objectives and compliance limits set in the ECA 1696-BPLL4R before and after substantial completion of Phase 1 Upgrade and Expansion

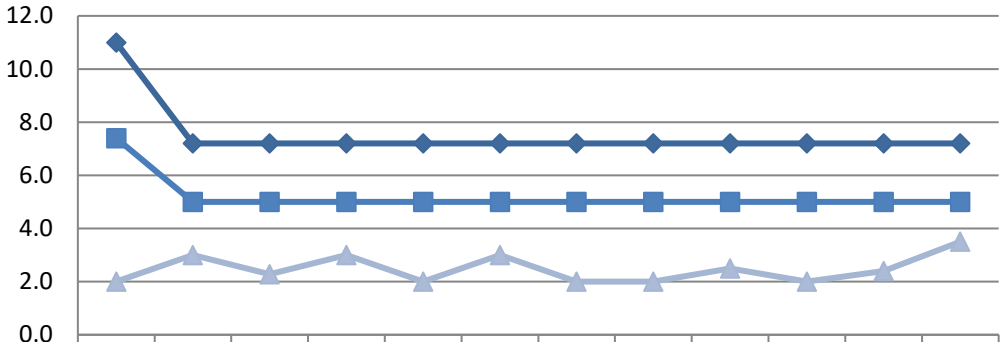
Table 2: CBOD5 Objective and Limit Changes

Previous	Objective (mg/l)	7.4 Monthly
	Limit (mg/L)	11.0 Annual
	Loadings Limit (kg/d)	238.0 Annual
Current	Objective (mg/L)	5.0 Monthly
	Limit (mg/L)	7.2 Monthly
	Loadings Limit (kg/d)	176.4 Monthly

The monthly average concentration results ranged from 2.0 mg/L to 3.5 mg/L in 2023.

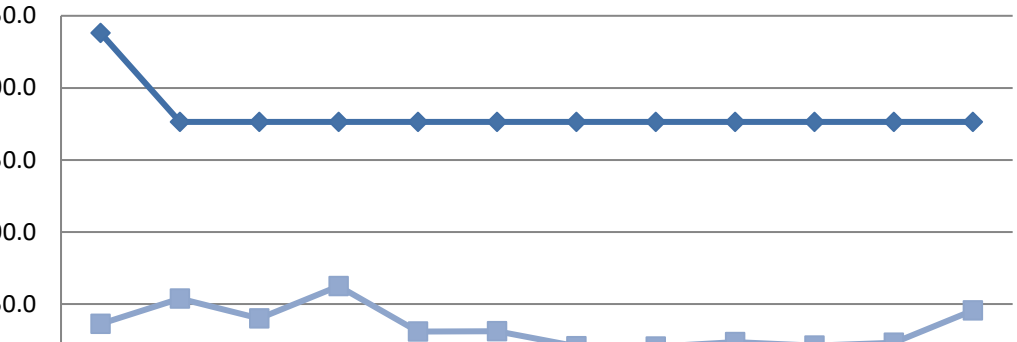
The monthly CBOD average concentration results and monthly average waste loading results throughout 2023 were in compliance with the limits outlined in the ECA.

Graph 33: 2023 Monthly Final Effluent CBOD5 Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	11.0	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Objective (mg/L)	7.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Avg (mg/L)	2.0	3.0	2.3	3.0	2.0	3.0	2.0	2.0	2.5	2.0	2.4	3.5

Graph 34: 2023 Monthly Final Effluent CBOD5 Average Waste Loading Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (kg/day)	238.0	176.4	176.4	176.4	176.4	176.4	176.4	176.4	176.4	176.4	176.4	176.4
Avg (kg/day)	36.2	53.8	40.1	62.47	31.0	31.2	20.7	20.5	23.6	21.3	23.2	45.7

Total Suspended Solids (TSS)

The table below outlines the changes to TSS design objectives and compliance limits set in the ECA 1696-BPLL4R before and after substantial completion of Phase 1 Upgrade and Expansion

Table 3: TSS Objective and Limit Changes

Previous	Objective (mg/l)	7.4 Monthly
	Limit (mg/L)	11.0 Annual
	Loadings Limit (kg/d)	238.0 Annual
Current	Objective (mg/L)	7.4 Monthly
	Limit (mg/L)	11.0 Monthly
	Loadings Limit (kg/d)	238.0 Monthly

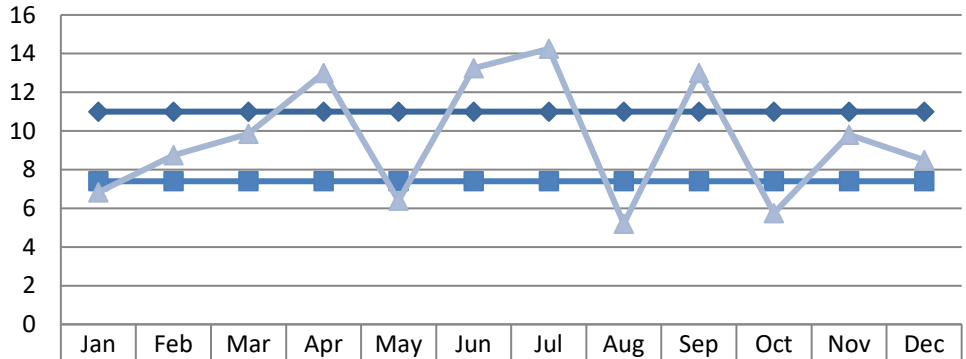
After substantial completion, the only change to TSS in ECA 1696-BPLL4R was the TSS average concentration limit frequency from an annual average to monthly average, the limit concentrations did not change.

The monthly average concentration results ranged from 5.2 mg/L to 14.3 mg/L in 2023

The monthly average waste loading concentration results range from 20.5 kg/day to 62.47 kg/day.

There were several months in 2023 when the limit and objective for TSS were not met as shown in Graph 35. Throughout 2023, the Total Suspended Solids monthly removal rates ranged from 90.2% to 98.2%. Continuous efforts made to meet the Effluent Objectives are discussed in Section H. All exceedances of ECA limits were reported appropriately in accordance with ECA 1696-BPLL4R Section 11. See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.

Graph 35: 2023 Monthly Final Effluent TSS Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	11	11	11	11	11	11	11	11	11	11	11	11
Objective (mg/L)	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Avg (mg/L)	6.8	8.8	9.9	13.0	6.4	13.3	14.3	5.2	13.0	5.8	9.8	8.5

Total (Ammonia+Ammonium) Nitrogen (TAN)

The table below outlines the changes to TAN design objectives and compliance limits set in the ECA 1696-BPLL4R before and after substantial completion of Phase 1 Upgrade and Expansion

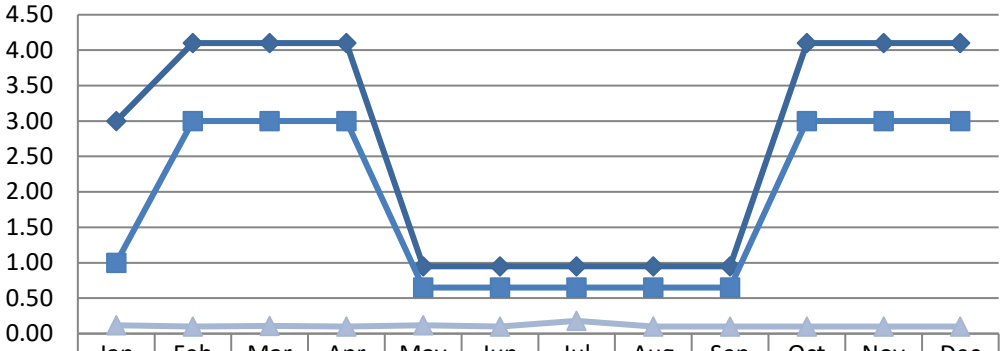
Table 4: TAN Objective and Limit Changes

Previous	May 1 – Sept 30	Objective (mg/l)	<1.0 Monthly
	Oct 1 – April 30	Objective (mg/l)	<2.0 Monthly
	May 1 – Sept 30	Limit (mg/L)	1.5 Monthly
	Oct 1 – April 30	Limit (mg/L)	3.0 Monthly
	May 1 – Sept 30	Loadings Limit (kg/d)	32.3 Monthly
	Oct 1 – April 30	Loadings Limit (kg/d)	64.5 Monthly
Current	May 1 – Sept 30	Objective (mg/L)	0.65 Monthly
	Oct 1 – April 30	Objective (mg/L)	3.0 Monthly
	May 1 – Sept 30	Limit (mg/L)	0.95 Monthly
	Oct 1 – April 30	Limit (mg/L)	4.1 Monthly
	May 1 – Sept 30	Loadings Limit (kg/d)	23.4 Monthly
	Oct 1 – April 30	Loadings Limit (kg/d)	99.5 Monthly

Since the installation of diffused aeration, the Lindsay WWTP has seen dramatically improved effluent TAN results, very often receiving individual results less than the laboratory method detection limit of 0.1 mg/L.

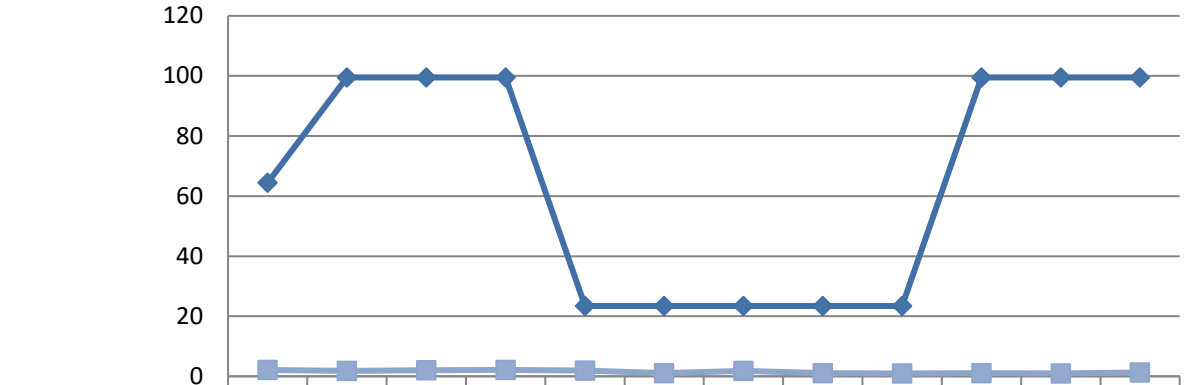
The monthly Total (Ammonia + Ammonium) Nitrogen average concentration results and monthly average waste loading results throughout 2023 were in compliance with the limits outlined in the ECA.

Graph 36: 2023 Monthly Final Effluent TAN Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	3.00	4.10	4.10	4.10	0.95	0.95	0.95	0.95	0.95	4.10	4.10	4.10
Objective (mg/L)	1.00	3.00	3.00	3.00	0.65	0.65	0.65	0.65	0.65	3.00	3.00	3.00
Avg (mg/L)	0.12	0.10	0.11	0.10	0.12	0.10	0.18	0.10	0.10	0.10	0.10	0.10

Graph 37: 2023 Monthly Final Effluent TAN Average Waste Loading Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (kg/day)	64.5	99.5	99.5	99.5	23.4	23.4	23.4	23.4	23.4	99.5	99.5	99.5
Avg (kg/day)	2.1	1.8	2.0	2.1	1.9	1.0	1.8	1.0	0.9	1.1	1.0	1.3

Total Phosphorus (TP)

The table below outlines the changes to TP design objectives and compliance limits set in ECA 1696-BPLL4R before and after substantial completion of Phase 1 Upgrade and Expansion

Table 5: TP Objective and Limit Changes

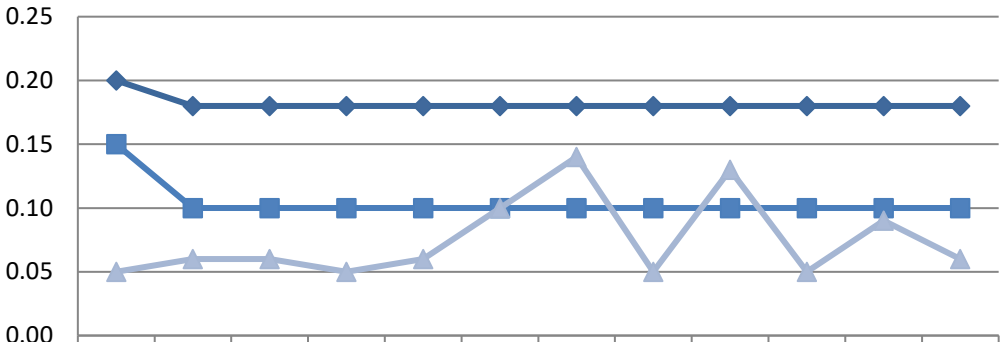
Previous	Objective (mg/l)	0.15 Monthly
	Limit (mg/L)	0.2 Monthly
	Loadings Limit (kg/d)	4.3 Monthly
Current	Objective (mg/L)	<0.1 Monthly
	Limit (mg/L)	0.18 Monthly
	Loadings Limit (kg/d)	4.3 Monthly

There were no changes to the TP loading limit.

The monthly Total Phosphorus average concentration results throughout 2023 were less than the concentration objectives, with the exception of July and September. Continuous efforts made to meet the Effluent Objectives are discussed in Section H.

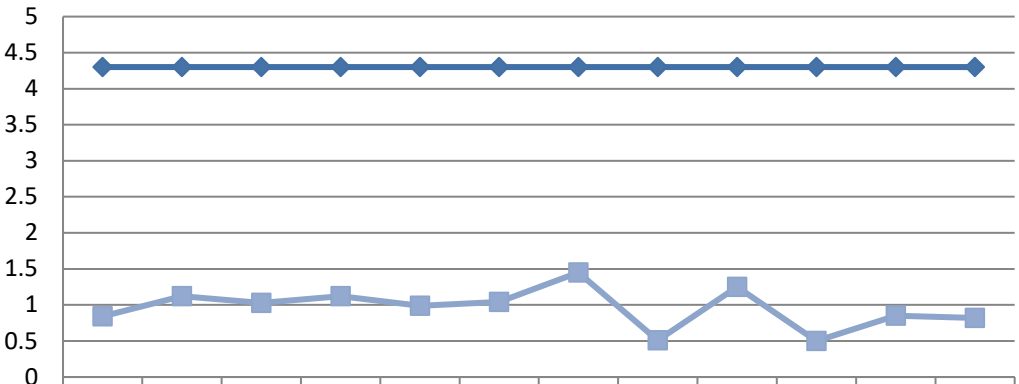
The monthly Total Phosphorus average concentration limits and monthly average waste loading limits throughout 2023 were in compliance with the limits outlined in the ECA.

Graph 38: 2023 Monthly Final Effluent Total Phosphorus Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	0.20	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Objective (mg/L)	0.15	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Avg (mg/L)	0.05	0.06	0.06	0.05	0.06	0.10	0.14	0.05	0.13	0.05	0.09	0.06

Graph 39: 2023 Monthly Final Effluent Total Phosphorus Average Waste Loading Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (kg/day)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Avg (kg/day)	0.84	1.12	1.03	1.12	0.99	1.04	1.45	0.51	1.25	0.50	0.85	0.82

E.coli

The table below outlines the changes to E.coli design objectives and compliance limits set in ECA 1696-BPLL4R before and after substantial completion of Phase 1 Upgrade and Expansion

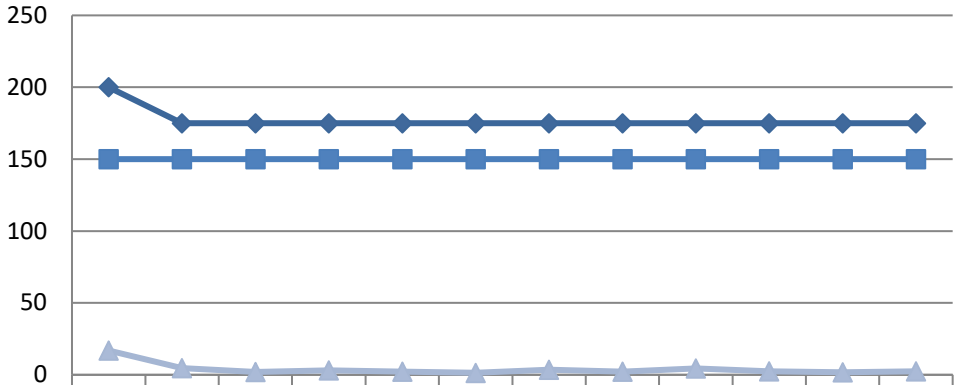
Table 6: E.coli Objective and Limit Changes

Previous	Objective (CFU/100ml)	150 Monthly GMD*
	Limit (CFU/100ml)	200 Monthly GMD*
Current	Objective (CFU/100ml)	150 Monthly GMD*
	Limit (CFU/100ml)	175 Monthly GMD*

*Geometric Mean Density

The final effluent results were less than the E. coli monthly geometric mean density limit and objective throughout 2023.

Graph 40: 2023 Monthly Final Effluent E. coli Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (CFU/100mL)	200	175	175	175	175	175	175	175	175	175	175	175
Objective (CFU/100mL)	150	150	150	150	150	150	150	150	150	150	150	150
Geomean (CFU/100mL)	16.9	4.6	2.0	3.1	2.3	1.4	3.6	2.2	4.4	2.4	1.7	2.4

Acute Lethality to Rainbow Trout and Daphnia Magna

Quarterly effluent samples were collected on January 4, April 4, July 5, and October 4, 2023 for analysis for acute lethality to rainbow trout and daphnia magna.

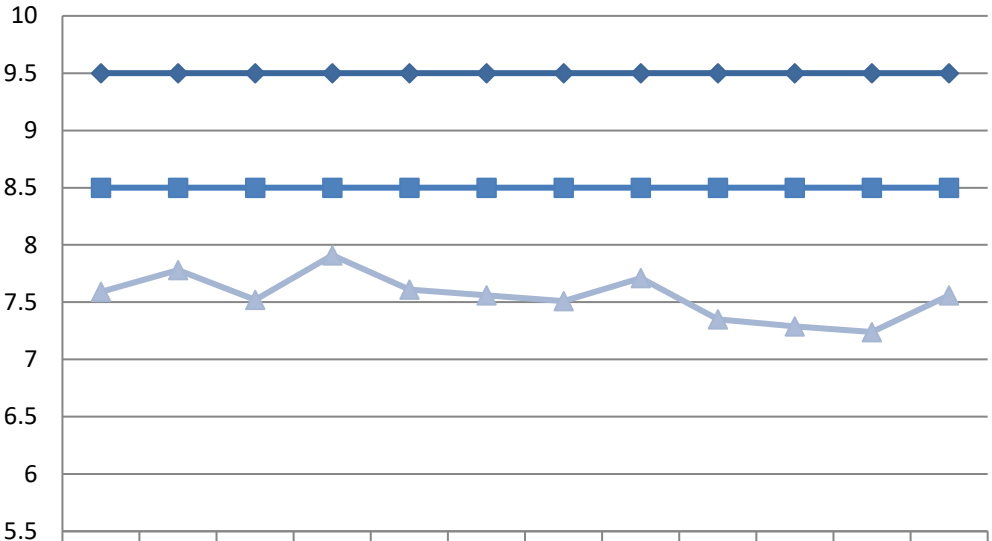
All of the 2023 samples resulted in a 0% mortality rate for Rainbow Trout. The July 5 sample resulted in a 56.7 % mortality to Daphnia Magna only. A resample was collected and retested on July 12, returning a result of 0% mortality. A summary of the results are provided in **Appendix I: Acute Lethality Analysis Results**.

pH

ECA 1696-BPLL4R set a pH compliance limit within the range of 6.0 to 9.5, inclusive, at all times on the effluent. Every pH reading in 2023 was within the compliance limits set by the ECA.

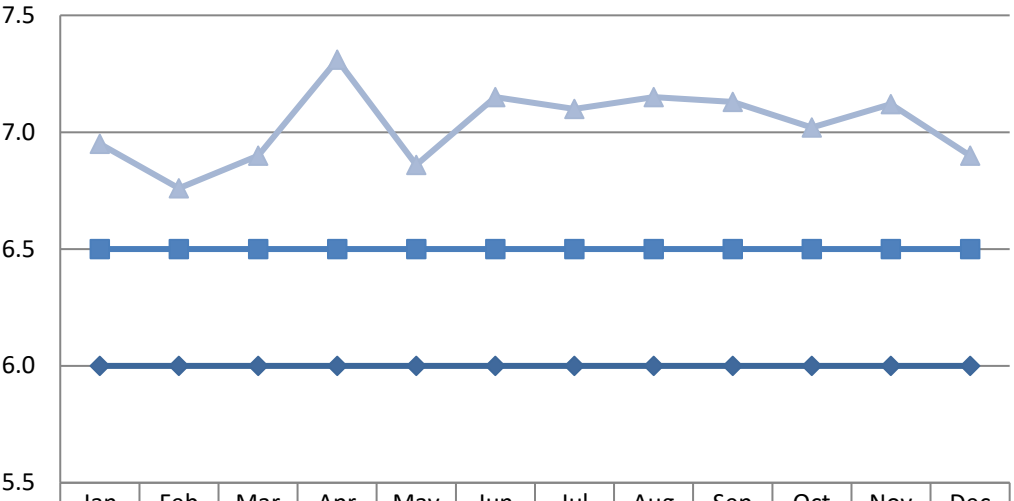
ECA 1696-BPLL4R set the pH objective of each single sample result between 6.5 and 8.5, inclusive, at all times on the effluent. Every pH reading in 2023 was within the compliance objectives set by the ECA.

Graph 41: 2023 Monthly Final Effluent Maximum pH Concentration Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Limit	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Max Objective	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Max	7.59	7.78	7.52	7.91	7.61	7.56	7.51	7.71	7.35	7.29	7.24	7.56

Graph 42: 2023 Monthly Final Effluent Minimum pH Concentration Comparisons



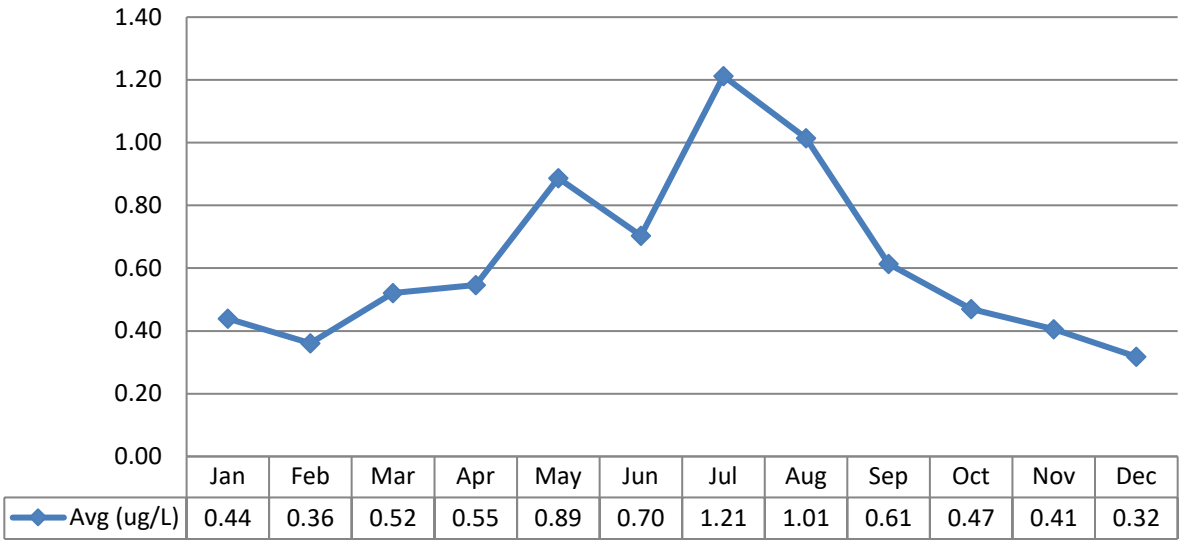
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min Limit	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Min Objective	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Min	6.95	6.76	6.90	7.31	6.86	7.15	7.10	7.15	7.13	7.02	7.12	6.90

Unionized Ammonia

Unionized Ammonia is calculated monthly based on the final effluent total ammonia nitrogen results and the field pH and temperature collected at the same time as the TAN

sample. The average monthly results ranged between 0.32 ug/L and 1.21 ug/L. ECA 1696-BPLL4R does not set a Unionized Ammonia limit or objective.

Graph 43: 2023 Monthly Final Effluent Unionized Average Concentration



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg (ug/L)	0.44	0.36	0.52	0.55	0.89	0.70	1.21	1.01	0.61	0.47	0.41	0.32

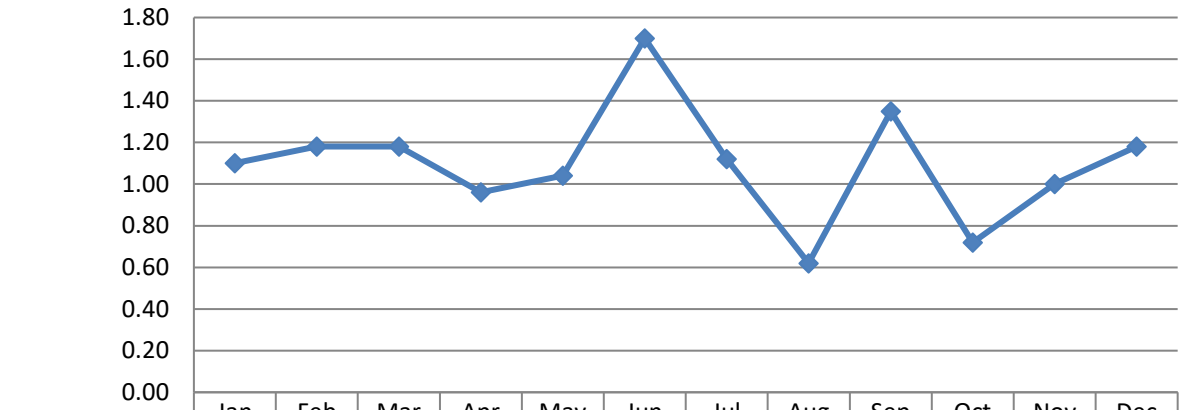
Additional Parameters

The following parameters are requirements of ECA 1696-BPLL4R, but are not designated average concentration limits or average waste loading limits.

TKN

Total Kjeldahl Nitrogen is sampled weekly and the average monthly results ranged between 0.62 mg/L and 1.70 mg/L.

Graph 44: 2023 Monthly Final Effluent TKN Average Concentration

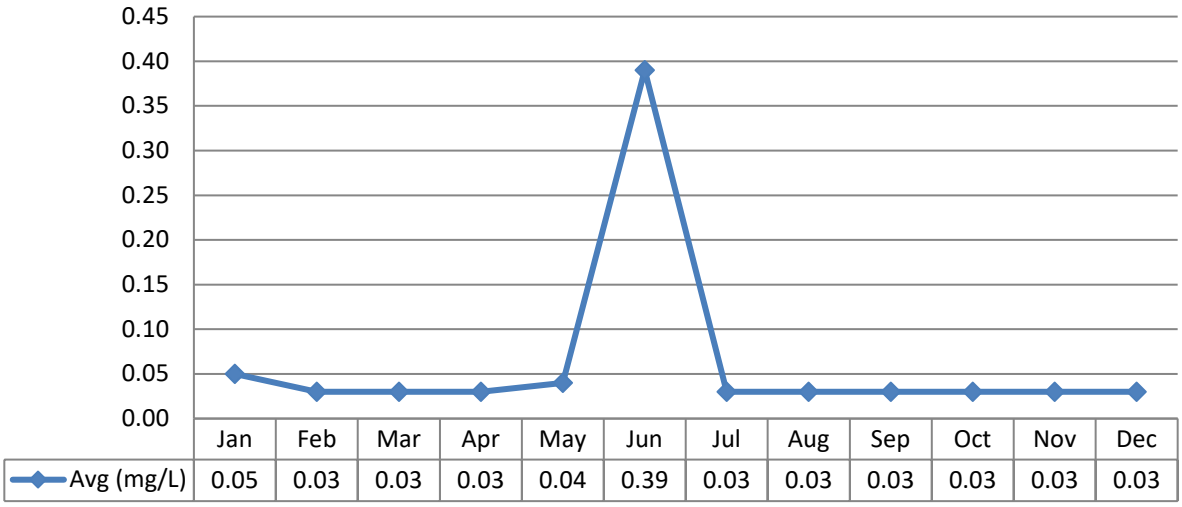


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg (mg/L)	1.10	1.18	1.18	0.96	1.04	1.70	1.12	0.62	1.35	0.72	1.00	1.18

Nitrite as Nitrogen

Nitrite is sampled weekly and the average monthly results ranged between the laboratory method detection limit of <0.03 mg/L and 0.39 mg/L.

Graph 45: 2023 Monthly Final Effluent Nitrite Average Concentration

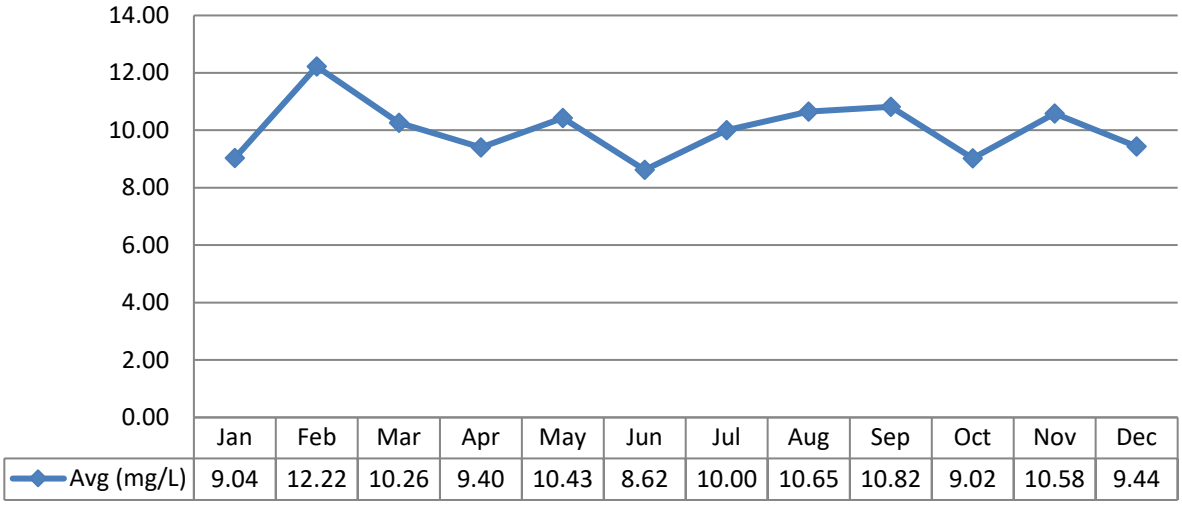


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg (mg/L)	0.05	0.03	0.03	0.03	0.04	0.39	0.03	0.03	0.03	0.03	0.03	0.03

Nitrate as Nitrogen

Nitrate is sampled weekly and the average monthly results ranged between 8.62 mg/L and 12.22 mg/L.

Graph 46: 2023 Monthly Final Effluent Nitrate Average Concentration

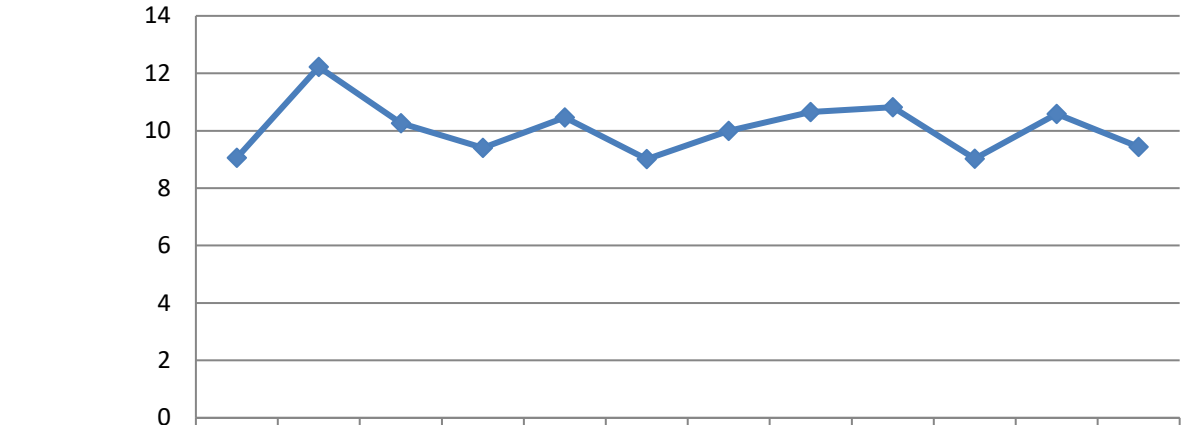


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg (mg/L)	9.04	12.22	10.26	9.40	10.43	8.62	10.00	10.65	10.82	9.02	10.58	9.44

Nitrite + Nitrate as Nitrogen

Nitrite + Nitrate is sampled weekly and the average monthly results ranged between 0.43 mg/L and 20.94 mg/L.

Graph 47: 2023 Monthly Final Effluent Nitrite + Nitrate Average Concentration



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg (mg/L)	9.06	12.22	10.26	9.4	10.46	9.01	10	10.65	10.82	9.02	10.58	9.44

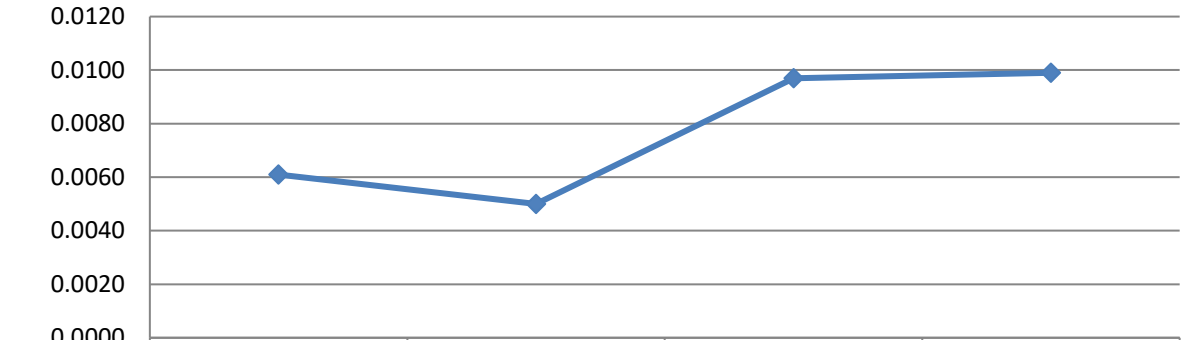
Final Effluent Samples Used For Leachate Related Monitoring

Samples are collected of the Final Effluent quarterly for the purpose of Leachate related monitoring for the Lindsay Landfill as a requirements of ECA 1696-BPLL4R.

Copper

Copper was sampled quarterly in 2023 and the results ranged between 0.005 mg/L and 0.0099 mg/L.

Graph 48: 2023 Final Effluent Copper Concentration

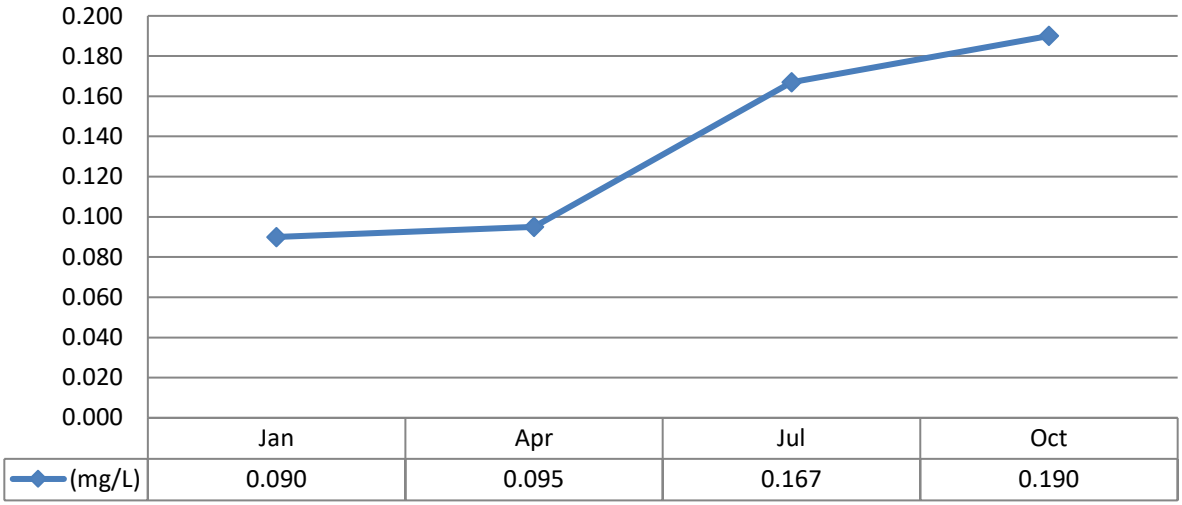


	Jan	Apr	Jul	Oct
(mg/L)	0.0061	0.0050	0.0097	0.0099

Boron

Boron was sampled quarterly in 2023 and the results ranged between 0.09 mg/L and 0.19 mg/L.

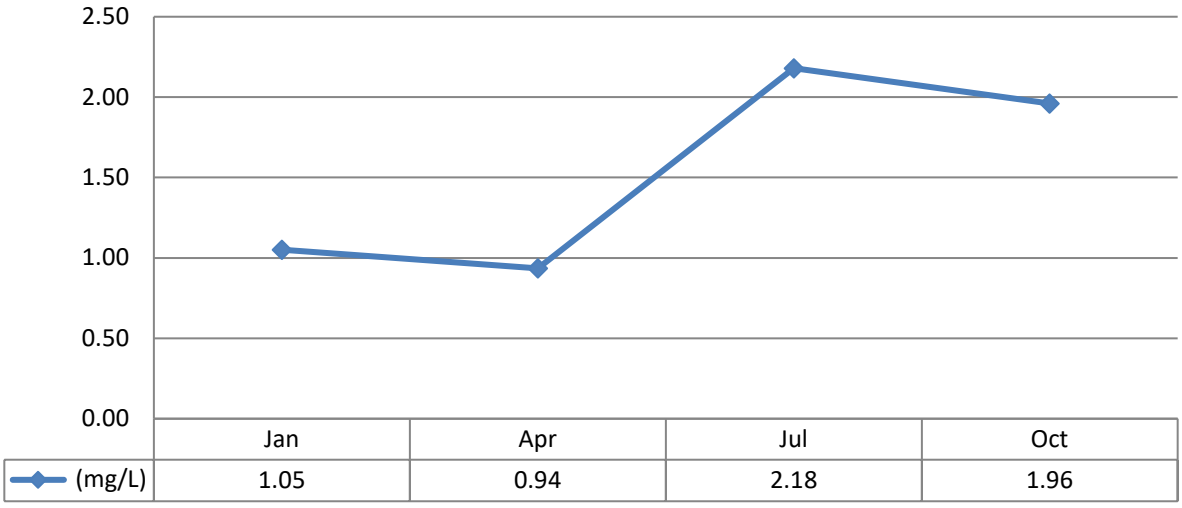
Graph 49: 2023 Final Effluent Boron Concentration



Aluminum (Total)

Aluminum was sampled quarterly in 2023 and the results ranged between 0.94 mg/L and 2.18 mg/L.

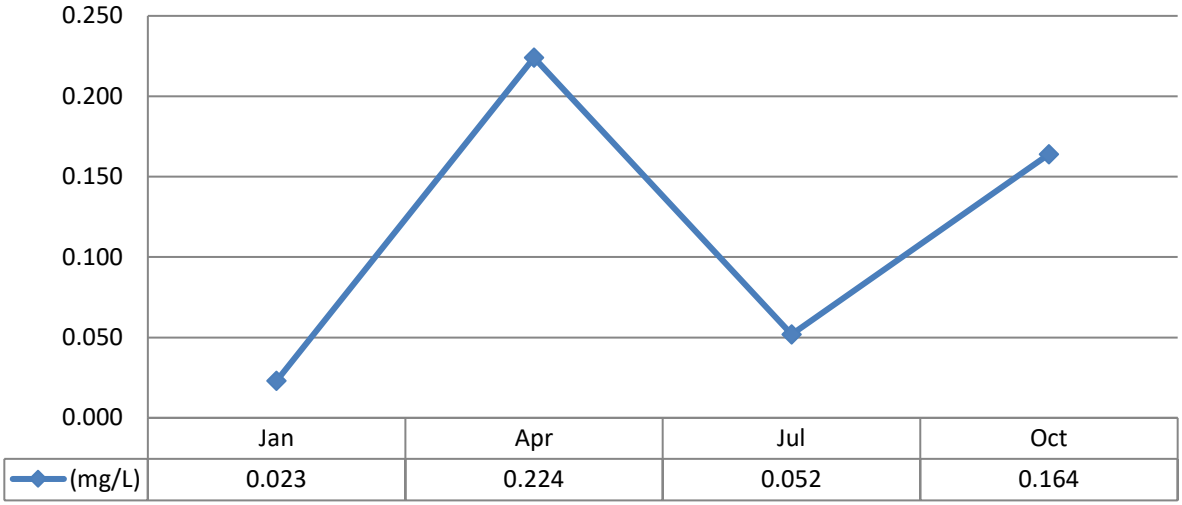
Graph 50: 2023 Final Effluent Aluminum Concentration



Iron (total)

Iron was quarterly in 2023 and the results ranged between 0.02 mg/L and 0.224 mg/L.

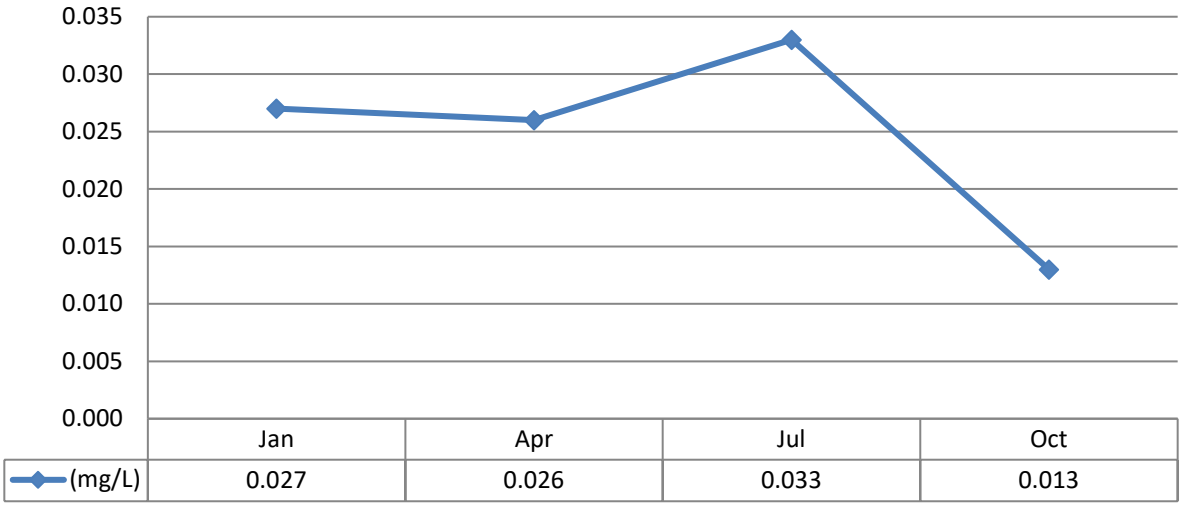
Graph 51: 2023 Final Effluent Iron Concentration



Zinc (total)

Zinc was sampled quarterly in 2023 and the results ranged between 0.013 mg/L and 0.033 mg/L.

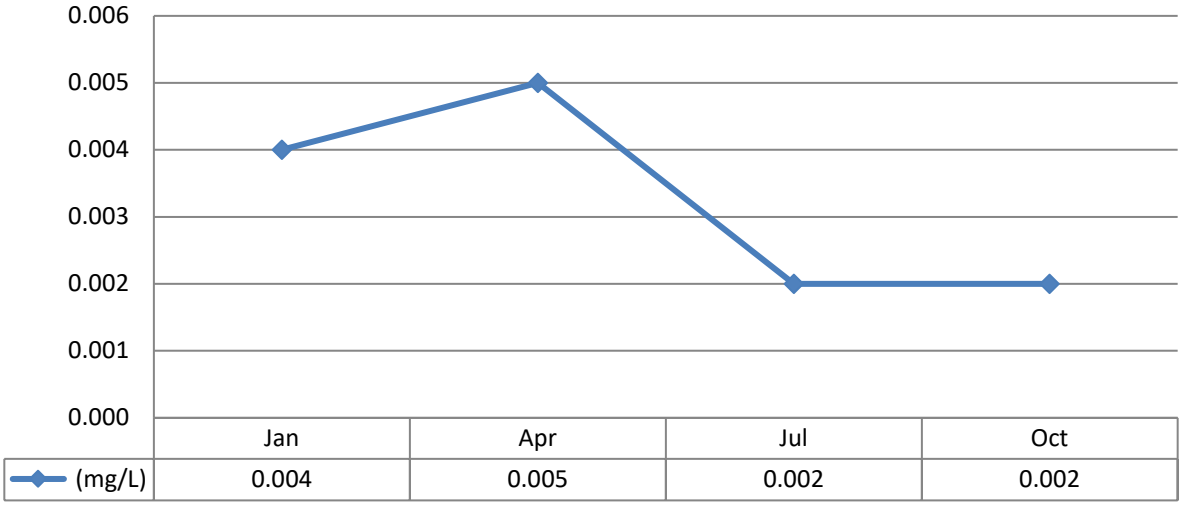
Graph 52: 2023 Final Effluent Zinc Concentration



4AAP-Phenolics

4AAP-Phenolics was sampled quarterly in 2023 and the results ranged between 0.002 mg/L and 0.005 mg/L.

Graph 53: 2023 Final Effluent 4AAP-Phenolics Concentration



Benzene

Benzene was sampled quarterly in 2023 and the results were consistent each quarter at <0.5 ug/L, except for the fourth quarter result of <20 ug/L. Information from the accredited laboratory, explained that due to the fourth quarter sample matrix the samples required diluting, which is why the reporting limit is elevated.

Toluene

Toluene was sampled quarterly in 2023 and the results were consistent each quarter at <0.5 ug/L, except for the fourth quarter result of <20 ug/L.

Ethylbenzene

Ethylbenzene was sampled quarterly in 2023 and the results were consistent each quarter at <0.5 ug/L, except for the fourth quarter result of <20 ug/L.

Xylene

Xylene was sampled quarterly in 2023 and the results were consistent each quarter at <0.5 ug/L, except for the fourth quarter result of <20 ug/L

Quarterly Samples

ECA 1696-BPLL4R requires a grab sample be collected at least quarterly and analyzed for Bis (2-ethylhexyl) Phthalate, Cobalt, Magnesium, Manganese, Potassium and Strontium. Limits are not defined in the ECA.

Table 7: 2023 Final Effluent Results for Samples Required by ECA 1696-BPLL4R.

Parameter	January 4, 2022	April 7, 2022	July 4, 2022	October 4, 2022
Bis (2-ethylhexyl) Phthalate (ug/L)	<2	<2	<2	<2
Cobalt (mg/L)	0.00017	0.00018	0.000148	0.000168
Magnesium (mg/L)	14.6	14.5	11.5	13.8
Manganese (mg/L)	0.00422	0.00482	0.014	0.00621
Potassium (mg/L)	16.1	9.65	8.21	13.0
Strontium (mg/L)	0.309	0.475	0.395	0.377

(c) The following details describe all operating problems encountered during the reporting period and the corrective actions taken.

Table 8: 2023 Lindsay WWTP Operational Challenges

Month	Challenges	Corrective Actions
January	Capital Construction	Capital construction continued through 2023, with substantial completion January 31, 2023.
	Tertiary Treatment PLC Panel	Replacement of tertiary treatment PLC panel including programming and drawing updates.
	Outside Normal Operating Conditions	Rated flow capacity exceeded on Actiflo Unit 2 (16,778 m^3/day) January 1, 2023. See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.
February	Ridout St Sewage Pumping Station	Replace failed soft starter on Pump 2.
	Wellington St Sewage Pumping Station Pump Replacement	Pump 2 failed at end of life cycle. Pump replacement and piping reconfiguration.
March	Outside Normal Operating Conditions	Rated flow capacity exceeded on Actiflo Unit 1 (15,271 m^3/day) on March 25 and Total Effluent Flow (30,107 m^3/day) and Actiflo Unit 1 (15,573 m^3/day) on March 26, 2023. See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.
	Actiflo Train 2 Recirculation Pump Replacement	Replace Actiflo Train 2 recirculation pump.
April	April 2023 Monthly TSS and Loading Limit Exceedance	Environmental Compliance Approval #1696-BPLL4R sets the monthly TSS average concentration effluent limit at 11.0 mg/L and the monthly average waste loading limit at 238 kg/day. The April 2023 TSS average concentration was 13.0 mg/L and loading

Month	Challenges	Corrective Actions
		limit 271.7 kg/day. See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.
	Outside Normal Operating Conditions	Rated flow capacity exceeded on Total Effluent Flow (30,319 m^3/day) and Actiflo Unit 2 (16,337 m^3/day) on April 6, 2023 See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.
May	Actiflo Train 1. Injection Mixer Gearbox Failure	Initially thought to be a failure of the motor coupler. During repair attempt, found ring gear stripped inside mixer. Replacement mixer gear part ordered and installed.
	Rivera Park Sewage Pumping Station Odour Control Carbon	End of life replacement of carbon media in odour control units.
June	June 2023 Monthly TSS Limit Exceedance	Environmental Compliance Approval #1696-BPLL4R sets the monthly TSS average concentration effluent limit at 11.0 mg/L. The June 2023 TSS average concentration was 13.25 mg/L The loading limit was met in June 2023.See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.
	Ridout St Sewage Pumping Station	Soft starter installed on Pump 2 in February failed again, soft starter replaced on Pump 2.
July	July 2023 Monthly TSS Limit Exceedance	Environmental Compliance Approval #1696-BPLL4R sets the monthly TSS average concentration effluent limit at 11.0 mg/L. The July 2023 TSS average concentration was 14.25 mg/L The loading limit was met in July 2023.See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.
September	September 2023 Monthly TSS Limit Exceedance	Environmental Compliance Approval #1696-BPLL4R sets the monthly TSS average concentration effluent limit at 11.0 mg/L. The September 2023 TSS average concentration was 13.0 mg/L The loading limit was met in July 2023.See **Appendix VI - Bypasses, Overflows, Spills, Abnormal Events** for details.

Month	Challenges	Corrective Actions
	Logie St Sewage Pumping Station Pump 2	Pull and replace wear rings and impellers on both pumps. Install new hook and chain on Pump 1.
October	Rivera Park Sewage Pumping Station Pumps Investigation.	Investigate Pump 3 vibration warning, repair Pump 3 guide rails, contractor serviced Pumps 1 and 3.
December	Wellington St Sewage Pumping Station	Emergency repair of discharge piping.

Operating issues which impacted the Lindsay WWTP meeting the Final Effluent concentration limits, loading limits or concentration objectives are addressed above in Section B.

(d) OCWA uses a Work Maintenance System (WMS) to schedule normal maintenance activities and track repairs. WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out and assets are maintained to manufacturer's and/or industry standards. Emergency and capital repair maintenance is completed and added to the system.

Refer to **Appendix III: WMS Work Order Summary**.

(e) Effluent quality assurance is maintained in several ways. Laboratory samples are sent to an accredited laboratory (SGS Canada Inc. or AquaTox Testing & Consulting Inc.) for analysis of all effluent parameters. Sampling calendars are issued to the operators denoting frequency of sampling and these calendars are submitted to the Process Compliance Technician at the end of each month. Raw and effluent samples are collected as per the Environmental Compliance Approval and the results are reviewed on a regular basis to ensure compliance with the site's objectives and limits.

Work orders illustrating all scheduled and preventative maintenance to be completed are issued to the operator and/or mechanic. Upon completion staff enter results of the work order into OCWA's WMS system. OCWA conducts internal audits of the facility and develops Action Plans to ensure deficiencies are identified.

(f) Calibrations on effluent monitoring equipment were performed by Franklin Empire in December 2023 for equipment located at the Lindsay Wastewater Treatment Plant and Pumping Stations. Masstec Weighing Systems completed calibrations on the Inbound and Outbound scales at the Lindsay Landfill on June 14, 2023 and December 7, 2023.

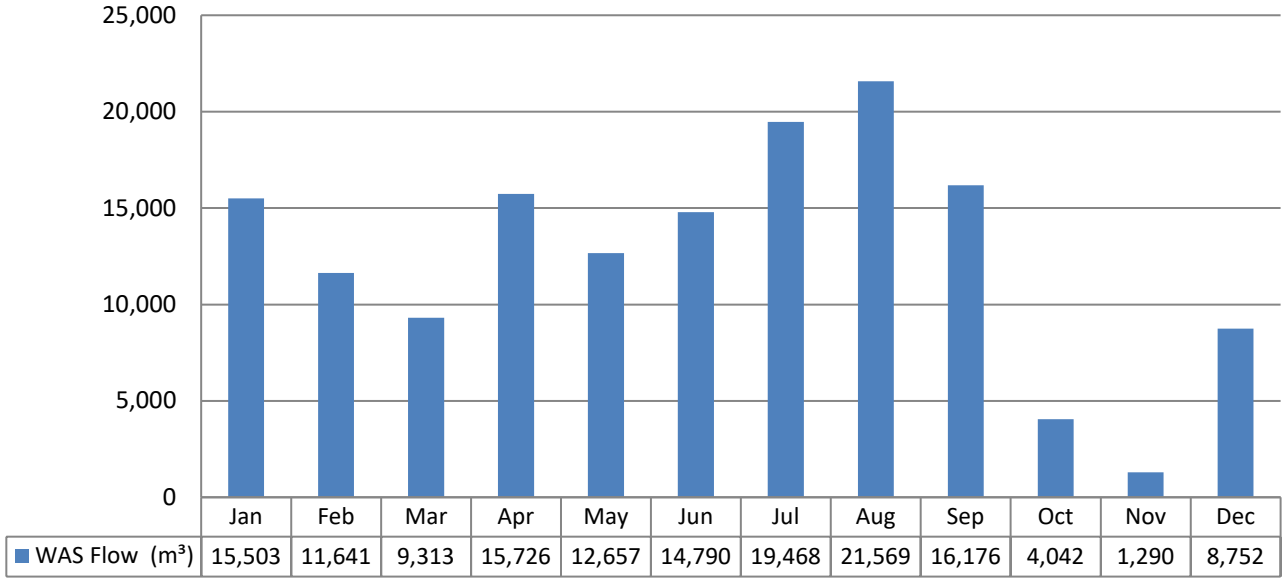
Refer to **Appendix IV: Calibration Reports**.

(g) Continuous efforts were made to meet the Effluent Objectives in 2023:

1. Development of the sampling plan which meets or exceeds the minimum sample requirements as required in the ECA;
2. Visual Inspection of the entire process while performing rounds;
3. Influent monitoring;
4. Ensuring that chemicals are being dosed and adjusting as required;
5. Continually optimizing the Actiflo process;
6. Calibration of lab equipment;
7. Annual calibration of flow meters;
8. Performing preventative maintenance activities in accordance with work order schedules;
9. Performing in-house lab tests on days that data is collected;
10. Monitoring treatment processes by performing regular laboratory analysis and reviewing of lab results;
11. Sludge monitoring of primary clarifiers & adjustments to pumping volume based on tank levels to reduce solids carryover to the secondary clarifiers;
12. Visual review of microbiological activity of activated sludge to ensure appropriate F/M ratio;
13. Aeration blower maintenance
14. Pumping lagoon wastewater back to headworks was managed to reduce influent loadings when DO was low.

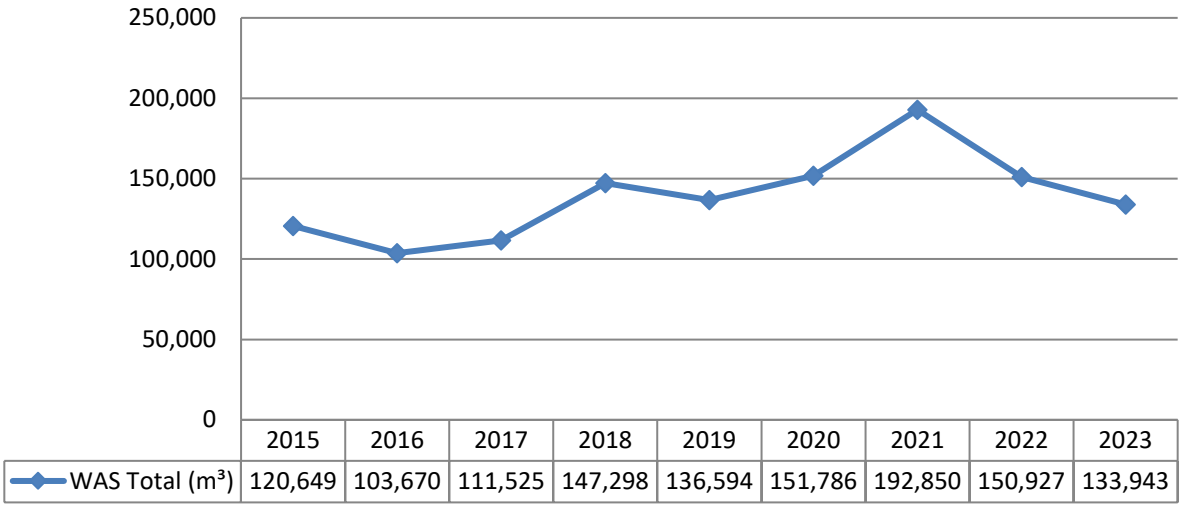
(h) The total volume of sludge generated in 2023 was 133,943 m^3 which was an 11.3 percent decrease over the volume generated in 2022. Sludge is stored in onsite storage lagoons at the Lindsay WWTP and the volume is not expected to be appreciably different in the next reporting period.

Graph 54: 2023 Monthly Sludge Generation Volumes



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WAS Flow (m^3)	15,503	11,641	9,313	15,726	12,657	14,790	19,468	21,569	16,176	4,042	1,290	8,752

Graph 55: Historical Sludge Volume Comparisons



	2015	2016	2017	2018	2019	2020	2021	2022	2023
WAS Total (m^3)	120,649	103,670	111,525	147,298	136,594	151,786	192,850	150,927	133,943

Sludge Removal

There was no sludge removed from the Lindsay WWTP in 2023.

(i) A summary of complaints received by the owner and operating authority is provided in the following table.

Table 9: Summary of Community Complaints

Date	Issue	Actions Taken
June 19	Odour	Odour coming from vent on forcemain along Angeline St. N in Lindsay. The odour coincided with pump station cleanouts the same day. When staff attended the site, odour was no longer present.
August 16	Odour	Same resident called regarding odour again from vent along Angeline St. N. Staff investigated.
October 8	Odour	Vent for sewer forcemain on Angeline St. N at Connelly has odour. Staff investigated.

(j) Summary of By-passes, Overflows, situations outside Normal Operation Conditions, spills within the meaning of Part X of EPA and abnormal discharge events during 2023.

Bypasses

There were not any bypasses at the Lindsay WWTP in 2023

Overflows

There were not any overflows at the Lindsay WWTP or pumping stations in 2023.

Refer to **Appendix VI: Bypasses, Overflows, Spills or Abnormal Events** for copies of the quarterly Bypass and Overflow reports submitted to the Ministry of the Environment, Conservation and Parks.

Situations outside Normal Operation Conditions

"Normal Operating Condition" means the condition when all unit process(es), excluding Preliminary Treatment System, in a treatment train is operating within its design capacity. In the instances of Situations outside Normal Operation Conditions, ECA 1696-BPLL4R directs to collect daily sample(s) of the Final Effluent, on any day when there is any situation outside Normal Operating Conditions and sample for CBOD, TSS, Total phosphorus, TKN. As a best practice, samples were also tested for TAN, Nitrite, Nitrate and Nitrite + Nitrate.

There were instances of Situations outside Normal Operating Conditions in 2023.

On December 31, 2022 the final flow through the Actiflo units exceeded the rated design capacity of 30,100 m³/day. This was caused due to an unseasonal thaw with rain. The composite sampler was set on December 31, 2022 and samples were collected January 1, 2023. High flow continued and on January 2, 2023 the final flow through the Actiflo Unit 2 exceeded the rated design capacity of 15,050 m³/day. The composite sampler was set on January 1, 2023 and sample collected January 2, 2023.

On March 25, 2023 the final flow through the Actiflo Unit 1 exceeded the rated design capacity of 15,050 m³/day. This was caused by heavy rain. The composite sampler was set on March 25, 2023 and samples were collected March 26, 2023.The following day, March 26, 2023 the final flow through both Actiflo units exceeded the rated design capacity of 30,100 m³/day and Actiflo Unit 1 exceeded the rated design capacity of 15,050 m³/day. The composite sampler was set on March 26, 2023 and samples were collected March 27, 2023.

On April 6, 2023 the final flow through both Actiflo units exceeded the rated design capacity of 30,100 m³/day and Actiflo Unit 2 exceeded the rated design capacity of 15,050 m³/day. The composite sampler was set on April 6, 2023 and samples were collected April 9, 2023.

Refer to **Appendix VI: Bypasses, Overflows, Spills or Abnormal Events** for the Certificate of Analysis.

Spills
There were not any spills at the Lindsay WWTP in 2023.

Abnormal Discharge Events

There were not any abnormal discharge events at the Lindsay WWTP in 2023.

(k) There were not any Notices of Modifications to Sewage Works initiated, worked on or completed in 2023.

A summary of all modifications completed which did not require a Notices of Modifications to Sewage Works are included in **Appendix III: WMS Work Order Summary.**

(l) During the 2023 reporting period there were no incidents of a bypass or overflow within the sanity sewer system or the WWTP. Therefore no proposed projects to eliminate bypasses or overflows are forecasted for the 2024 reporting period.

(m) ECA 1696-BPLL4R states that the annual report must contain “any change or updates to the schedule for the completion of construction and commissioning operations of major process(es)/equipment groups in the Proposed Works”.

There is work remaining to complete the replacement of the North clarifier column/ scraper, and the South clarifier weir covers. This is estimated to be completed summer 2024.

(n) ECA 1696-BPLL4R states that the annual report must contain “a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year”

The 2023 sample plan states that weekly samples would be collected on Wednesdays and monthly samples would be collected on the first Wednesday of each month. Annual samples were scheduled to be sampled on July 5, 2023. Weekly sampling occurring on Wednesdays did not need to be considerate of holidays and there was no need to pre-plan alternate sample dates to accommodate holidays and accredited lab holiday hours in 2023.

As noted in an email from Sargol Okhovatian, Ministry of the Environment, Conservation and Parks – Review Engineer Assistant, dated October 12, 2018, since neither the City of Kawartha Lakes nor the Ontario Clean Water Agency has control of the delivery schedule of Imported Sewage the monthly Imported Sewage samples are not required to be sampled on specific dates. As long as there is a minimum of one sample from each Imported Sewage stream (Abattoir Waste and Receiving Station) each month then there will be no deviation from the Sample Plan.

There were deviations from the Sample Plan in 2023:

Table 10: Deviations from Sample Plan in 2023

Date	Deviation	Reason
February 2023	Monthly – Abattoir sample not collected	Operations staff were not notified by hauler of abattoir waste being delivered. Amount of abattoir waste has decreased significantly (see Graph 14)
April 5, 2023	Quarterly – Final effluent phenols required resampling due to incorrect bottle.	Final effluent phenols sample was collected as scheduled on April 5, 2023. On April 6, 2023, a representative of the accredited laboratory informed OCWA that the bottles provided to us by the laboratory were incorrect and the sample could not be processed. The correct bottles were provided and resample collected on April 27, 2023.
May 17, 2023	Weekly – Samples scheduled for May 17, 2023, sampled on May 19, 2023	Operator error resulted in the composite sampler not being set for May 17, 2023. The sample was unable to be collected on May 18, 2023 due to the composite sampler clogging. The sample was collected on May 19, 2023.
August 2, 2023	Weekly – Samples scheduled for August 2, 2023, sampled on August 3, 2023	Unable to sample due to composite sampler pickup line being plugged.
August 23, 2023	Weekly – Samples scheduled for August 23, 2023, sampled on August 22, 2023	Weekly samples collected one day early due to accommodate PLC replacement scheduled for August 22, 2023.
October 4, 2023	Quarterly - Acute Lethality sampling scheduled for October 4, sample collected October 17, 2023	Staff error resulted in the sample not being collected on the scheduled day. Despite this the sample was still within the sample collection time frame.
December 27, 2023	Weekly – Samples scheduled for December 27, 2023, sampled on December 28, 2023	Unable to sample due to composite sampler pickup line being plugged.

For the Lindsay WWTP 2024 Sample Plan refer to **Appendix II: 2024 Sample Plan**.

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.

There are no required monitoring data requirements for the Lindsay Sewage Collection System.

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

A summary of any operating problems encountered at any sewage pumping stations within the Lindsay Sewage Collection System are included in **Table 8: 2023 Lindsay WWTP Operational Challenges** above.

Below is a summary of any operating problems encountered in the rest of the collection system.

Table 11: Summary of Operating Problems in Collection System and Corrective Actions (not including pumping stations)

Date	Operational Issue	Corrective Action Taken
May 24, 2023	Resident at 61 Lindsay St. N reported sewer backup – sewer main on Lindsay St. N also backed up	Hired contractor to flush sewer main and remove debris, lateral launch service. Homeowner repaired private service.

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.

Calibrations on effluent monitoring equipment were performed by Franklin Empire in December 2023 for equipment located at the Lindsay Wastewater Treatment Plant and associated Pumping Stations. Refer to **Appendix IV: Calibration Reports**.

Attached is **Appendix III: WMS Work Order Summary**, a Work Order Summary report, showing all preventive and corrective maintenance activities performed at the Lindsay WWTP, including the sewage pumping stations within the collection system, during 2023.

All other collection system repairs are summarized in the table below:

Table 12: Summary of Major Structure & Equipment Calibration, Maintenance and Repair

Major Structure	Work Performed
Manhole General Repair	MH1619 Kirkconnell Rd – Raised manhole frame to finish asphalt grade
Manhole Moduloc, Frame and Cover Repair	MH128 Adelaide St. @ Sanderling Cres. – Replace 8” moduloc, frame and cover MH996 41 Victoria Ave N – Replace 11” moduloc, frame and cover MH1316 Bond St @ William St. – Replace 12” moduloc, frame and cover MH1477 40 Dormer – Replace 6” moduloc, reset frame and cover MH236 121 Angeline St. N – replace frame and cover
Manhole Rain Bladder Installation	MH322 Dominion Dr. MH1140 Hazel St. MH449 Kent St. E MH1495 Thurshwood Trail
Sanitary Lateral Cleaning – Municipal Portion	100 Pottinger St. – cleared tree roots on City side 97 Pottinger St. – cleared tree roots 31 Adelaide St. N – cleared tree roots
Sanitary Sewer Main/Lateral Repair	MH1371 – MH1297 Peel St. – install 1m x 200 mm CIPP covering displaced/open joint 9 Redwing St. – install liner for spot repair City portion of lateral. 25 Adelaide St. N – install liner on City portion of lateral
Manhole Grouting	MH1391 27 Water Street MH936 92 Short Ave MH583 St. Peter @ Bertie St. MH219 82 Short Ave MH1436 386 Wallace Dr

Major Structure	Work Performed
	MH159 Mary St. W @ Wilson Ave MH1453 8 O'Connell Court MH206 5 Jefferson Blvd MH440 Green Arbour Way @ Adelaide St. MH1497 1 Selena St MH428 Auk Trail @ Arena MH543 50/52 Maryknoll Ave MH653 Moose Rd MH636 109 Adelaide St. N

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.

A summary of complaints is above in **Table 9: Summary of Community Complaints.**

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.

The table below provides a summary of the projects that saw alterations to the collection system in 2023.

Table 13: Summary of Alterations to Authorized System

Alteration to the Authorized System Project Name	Project Details	Does This Project Pose a Significant Drinking Water Threat (SDWT)?
Hillside Drive Reconstruction – sanitary sewer replacement	Replacement of 461 m of 200 mm diameter sanitary sewer and 14.5 m of 450 mm diameter sanitary sewer along Hillside Drive, as well as all sanitary sewer services.	N

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 Lindsay 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.

Annually manhole inspections are completed by City operations staff within the collection systems to identify any deficiencies that may result in excess flows increasing the risk of potential overflows. In an effort to reduce all excess flows, the City has an annual manhole rehabilitation program which includes but is not limited to grouting, moduloc replacement and frame and cover replacements.

Operationally, 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.

During the 2023 reporting period there were no incidents of a bypass or overflow within the sanity sewer system or the WWTP. However, a summary of operational activities that were performed to help reduce overflow potential are summarized in **Table 12: Summary of Major Structure & Equipment Calibration, Maintenance and Repair** above.

There are no proposed projects to specifically eliminate bypasses or overflows forecasted for the 2024 reporting period, however there is an operational budget of $50,000 available for any necessary operational repairs.

ii) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines.
The Lindsay 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.
N/A

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.

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix I:
Acute Lethality Analysis Results

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 250524
Sample Number : 76027

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sample Date :	2023-01-04
Location :	Lindsay ON	Time Collected :	10:50
Substance :	Final Effluent	Date Received :	2023-01-05
Sampling Method :	Grab	Time Received :	12:45
Sampled By :	Preeti	Temperature at Receipt :	11 °C
Sample Description :	Clear, light yellow	Date Tested :	2023-01-06

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	9.2 days
Organism Batch :	Dm22-26	Average Brood Size :	30.4
Culture Mortality :	0.4% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-01-03	LC50 :	6.3 g/L
Organism Batch :	Dm22-26	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	PG, NM	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.9 - 7.1 g/L

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 250524
Sample Number : 76027

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.5	9.1	1769	20	108	370 mg/L

0 HOURS

Date & Time : 2023-01-06 10:30
Analyst(s) : NM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.7	8.8	1778	20	105	370
100	B	0	0	7.7	8.8	1778	20	105	370
100	C	0	0	7.7	8.8	1778	20	105	370
Control	A	0	0	8.2	8.7	520	20	100	140
Control	B	0	0	8.2	8.7	520	20	100	140
Control	C	0	0	8.2	8.7	520	20	100	140

Notes:

24 HOURS

Date & Time : 2023-01-07 10:30
Analyst(s) : SJC

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	21
100	B	–	0	–	–	–	21
100	C	–	0	–	–	–	21
Control	A	–	0	–	–	–	21
Control	B	–	0	–	–	–	21
Control	C	–	0	–	–	–	21

Notes:

48 HOURS

Date & Time : 2023-01-08 10:30
Analyst(s) : SJC

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.2	8.4	1729	21
100	B	0	0	8.2	8.3	1711	21
100	C	0	0	8.1	8.2	1710	21
Control	A	0	0	8.4	8.5	518	21
Control	B	0	0	8.4	8.4	519	21
Control	C	0	0	8.3	8.4	517	21

Notes:

Number immobile does not include number dead.

"–" = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ
Date : 2023-01-10

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 250524
Sample Number : 76027

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sample Date :	2023-01-04
Location :	Lindsay ON	Time Collected :	10:50
Substance :	Final Effluent	Date Received :	2023-01-05
Sampling Method :	Grab	Time Received :	12:45
Sampled By :	Preeti	Temperature at Receipt :	11 °C
Sample Description :	Clear, light yellow	Date Tested :	2023-01-06

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout. Environment Canada, EPS 1/RM/50 (March 2008), with deviation(s) as noted.

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	40.7 mm (±5.7)
Organism Batch :	T22-30	Range of Fork Lengths :	37 - 44 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.5 g (±0.3)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.3 - 0.7 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.4 g/L

TEST CONDITIONS

Sample Treatment :	pH Stabilization	Number of Replicates :	1
pH Adjustment :	Yes (as per EPS 1/RM/50)	Organisms Per Replicate :	10
pH Stabilization Technique :	pH Controller	Organisms Per Test Level :	10
Gas Mixture Used :	100% CO_2	Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L
Test Aeration :	Yes	Total Pre-Aeration Time :	30 minutes
Volume Tested (L) :	14	Test Method Deviation(s) :	Yes (see 'COMMENTS')

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T22-30	LC50 :	3534 mg/L
Date Tested :	2023-01-03	95% Confidence Limits :	3197 - 3925 mg/L
Analyst(s) :	AJS, PG, NM	Historical Mean LC50 :	3741 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	3020 - 4635 mg/L

COMMENTS

• All test validity criteria as specified in the test method were satisfied.

• Noted Deviation: pH controllers are calibrated at the start of the test, and not daily as described in the test method. Extensive internal method validation of this approach has confirmed the accuracy and stability of the pH controllers over the course of the 96-h test. Additionally, pH of the test and control solutions is measured daily throughout the test.

Approved By : _____

Project Manager

Work Order : 250524
Sample Number : 76027

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	TAN (mg/L)[1]	NH3 (mg/L)[2]
Initial Water Chemistry (100%) :	7.3	9.6	1789	16	101	0.07	0.000
After 30 min pre-aeration :	7.5	9.5	1786	16	100	–	–

0 HOURS

Date & Time 2023-01-06 13:45
Analyst(s) : PG (SV)/SV

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness (mg/L as $CaCO_3$)	Total Chlorine (mg/L)
100%	0	0	7.5	9.5	1786	16	100	370	–
Control	0	0	7.9	9.5	802	16	100	–	–

Notes:

24 HOURS

Date & Time 2023-01-07 13:45
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.4	–	–	15	–	–
Control	0	0	8.1	–	–	15	–	–

Notes:

48 HOURS

Date & Time 2023-01-08 13:45
Analyst(s) : SV

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.5	–	–	15	–	–
Control	0	0	7.8	–	–	15	–	–

Notes:

72 HOURS

Date & Time 2023-01-09 13:45
Analyst(s) : JCS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.5	–	–	15	–	–
Control	0	0	8.0	–	–	15	–	–

Notes:

96 HOURS

Date & Time 2023-01-10 13:45
Analyst(s) : AJS (NM)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]	Average pH (0 - 96 h)
100%	0	0	7.3	9.1	1790	15	–	–	7.4
Control	0	0	8.1	9.3	767	15	–	–	8.0

Notes:

[1] TAN = Total ammonia (as N); analysis conducted by Bureau Veritas S.A., Mississauga ON; MDL = 0.05 mg/L.

[2] NH3 = Un-ionized ammonia (calculated from TAN, pH, and temperature according to the test method).

"–" = not measured/not required

Number impaired does not include number dead.

* adjusted for temperature and barometric pressure

Test Data Reviewed By : FS

Date : 2023-01-13

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 2 SO 524

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 1313 (Kawartha - Lindsay WWTP)
Field Sampler Name (print): Preeti
Signature: Preeti
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by:
Date/Time Shipped:

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon Street
Lindsay, ON
K9V4R3
Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested											Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
04-1-23	1050	Final Effluent	76027	11	X		✓		✓							✓		1 x 23L

For Lab Use Only
Received By: SN / PG / CFM
Date: 2023-01-05
Time: 12:45
Storage Location:
Storage Temp.(°C):

Please list any special requests or instructions:

* Trout pH stabilization testing as per client email. CN 2023-01-05

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 251250
Sample Number : 77199

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sample Date :	2023-04-05
Location :	Lindsay ON	Time Collected :	10:45
Substance :	Final Effluent	Date Received :	2023-04-06
Sampling Method :	Grab	Time Received :	12:50
Sampled By :	P. Preeti	Temperature at Receipt :	13 °C
Sample Description :	Clear, pale yellow.	Date Tested :	2023-04-06

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	10.6 days
Organism Batch :	Dm23-05	Average Brood Size :	33.5
Culture Mortality :	0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-03-28	LC50 :	6.3 g/L
Organism Batch :	Dm23-05	95% Confidence Limits :	5.9 - 6.6 g/L
Analyst(s) :	PC	Historical Mean LC50 :	6.6 g/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	5.9 - 7.4 g/L

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 251250
Sample Number : 77199

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.4	9.4	1273	20	108	380 mg/L

0 HOURS

Date & Time : 2023-04-06 14:10
Analyst(s) : NP/CFM (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.5	9.0	1275	20	104	380
100	B	0	0	7.5	9.0	1275	20	104	380
100	C	0	0	7.5	9.0	1275	20	104	380
Control	A	0	0	8.4	8.9	396	19	100	150
Control	B	0	0	8.4	8.9	396	19	100	150
Control	C	0	0	8.4	8.9	396	19	100	150

Notes:

24 HOURS

Date & Time : 2023-04-07 14:10
Analyst(s) : KR (CGR)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2023-04-08 14:10
Analyst(s) : CGR

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.2	8.7	1243	20
100	B	0	0	8.2	8.7	1250	20
100	C	0	0	8.2	8.7	1256	20
Control	A	0	0	8.4	8.4	404	20
Control	B	0	0	8.4	8.6	405	20
Control	C	0	0	8.4	8.6	403	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : JCS
Date : 2023-04-10

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 251250
Sample Number : 77199

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sample Date :	2023-04-05
Location :	Lindsay ON	Time Collected :	10:45
Substance :	Final Effluent	Date Received :	2023-04-06
Sampling Method :	Grab	Time Received :	12:50
Sampled By :	P. Preeti	Temperature at Receipt :	13 °C
Sample Description :	Clear, pale yellow.	Date Tested :	2023-04-06

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout. Environment Canada, EPS 1/RM/50 (March 2008), with deviation(s) as noted.

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	39.0 mm (±7.4)
Organism Batch :	T23-04	Range of Fork Lengths :	33 - 44 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.5 g (±0.3)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.3 - 0.8 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.4 g/L

TEST CONDITIONS

Sample Treatment :	pH Stabilization	Number of Replicates :	1
pH Adjustment :	Yes (as per EPS 1/RM/50)	Organisms Per Replicate :	10
pH Stabilization Technique :	pH Controller	Organisms Per Test Level :	10
Gas Mixture Used :	100% CO_2	Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L
Test Aeration :	Yes	Total Pre-Aeration Time :	30 minutes
Volume Tested (L) :	14	Test Method Deviation(s) :	Yes (see 'COMMENTS')

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-04	LC50 :	4086 mg/L
Date Tested :	2023-04-02	95% Confidence Limits :	3752 - 4449 mg/L
Analyst(s) :	PG, KR, NM, AJS	Historical Mean LC50 :	3994 mg/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	3194 - 4993 mg/L

COMMENTS

• All test validity criteria as specified in the test method were satisfied.

• Noted Deviation: pH controllers are calibrated at the start of the test, and not daily as described in the test method. Extensive internal method validation of this approach has confirmed the accuracy and stability of the pH controllers over the course of the 96-h test. Additionally, pH of the test and control solutions is measured daily throughout the test.

Approved By : _____

Project Manager

AQUATOX

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 251250
Sample Number : 77199

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]	TAN (mg/L)[1]	NH3 (mg/L)[2]
Initial Water Chemistry (100%) :	7.0	9.8	1742	14	100	<0.050	0.000
After 30 min pre-aeration :	7.0	9.5	1738	14	98	–	–

0 HOURS

Date & Time 2023-04-06 14:40
Analyst(s) : SV

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]	Hardness (mg/L as $CaCO_3$)	Total Chlorine (mg/L)
100%	0	0	7.0	9.5	1738	14	98	380	–
Control	0	0	8.1	9.7	777	14	100	–	–

Notes:

24 HOURS

Date & Time 2023-04-07 14:40
Analyst(s) : CN

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	6.9	–	–	15	–	–
Control	0	0	8.1	–	–	15	–	–

Notes:

48 HOURS

Date & Time 2023-04-08 14:40
Analyst(s) : KR (JW)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.0	–	–	15	–	–
Control	0	0	8.3	–	–	15	–	–

Notes:

72 HOURS

Date & Time 2023-04-09 14:40
Analyst(s) : KR (JW)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.2	–	–	16	–	–
Control	0	0	8.3	–	–	16	–	–

Notes:

96 HOURS

Date & Time 2023-04-10 14:40
Analyst(s) : KR (JCS)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]	Average pH (0 - 96 h)
100%	0	0	7.2	8.9	1745	15	–	–	7.1
Control	0	0	8.2	8.9	758	15	–	–	8.2

Notes:

[1] TAN = Total ammonia (as N); analysis conducted by Bureau Veritas S.A., Mississauga ON; MDL = 0.05 mg/L.

[2] NH3 = Un-ionized ammonia (calculated from TAN, pH, and temperature according to the test method).

[3] adjusted for temperature and barometric pressure

"–" = not measured/not required

Number impaired does not include number dead.

Test Data Reviewed By : JJ

Date : 2023-04-17

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 251250

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 1313 (Kawartha - Lindsay WWTP)
Field Sampler Name (print): PREETI PREETI
Signature: Preeti
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by:
Date/Time Shipped: 2023-04-05

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon Street
Lindsay, ON
K9V4R3

Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested											Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-04-05	10:45	Final Effluent	77199	13°C	X		✓ *		✓							✓		1 x 23L
							*											

For Lab Use Only
Received By: MP/JW
Date: 2023-04-06
Time: 12:50
Storage Location:
Storage Temp.(°C)

Please list any special requests or instructions:
* ~10L in pail 2023-04-06 JW
* pH stabilized testing required as per client email. CW 2023-04-06

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 252072
Sample Number : 78504

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sampling Date :	2023-07-06
Location :	Lindsay ON	Sampling Time :	07:40
Substance :	Final Effluent	Date Received :	2023-07-07
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	P. Lucas	Temperature at Receipt :	24 °C
Sample Description :	Clear, light yellow/brown.	Date Tested :	2023-07-07

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	56.7 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	8.2 days
Organism Batch :	Dm23-12	Average Brood Size :	36.4
Culture Mortality :	0.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-07-04	LC50 :	6.3 g/L
Organism Batch :	Dm23-12	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	SSF	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.7 - 7.4 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 252072
Sample Number : 78504

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.4	8.0	1333	22	96	410 mg/L

0 HOURS

Date & Time : 2023-07-07 15:10
Analyst(s) : AJS/NP (NM)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.4	8.0	1333	22	96	410
100	B	0	0	7.4	8.0	1333	22	96	410
100	C	0	0	7.4	8.0	1333	22	96	410
Control	A	0	0	8.3	8.6	455	20	100	140
Control	B	0	0	8.3	8.6	455	20	100	140
Control	C	0	0	8.3	8.6	455	20	100	140

Notes:

24 HOURS

Date & Time : 2023-07-08 15:10
Analyst(s) : AJS

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	21
100	B	–	0	–	–	–	21
100	C	–	0	–	–	–	21
Control	A	–	0	–	–	–	21
Control	B	–	0	–	–	–	21
Control	C	–	0	–	–	–	21

Notes:

48 HOURS

Date & Time : 2023-07-09 15:10
Analyst(s) : AJS

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	5	0	8.4	8.3	1323	20
100	B	7	0	8.4	8.2	1327	20
100	C	5	0	8.4	8.3	1342	20
Control	A	0	0	8.4	8.4	467	20
Control	B	0	0	8.4	8.5	462	20
Control	C	0	0	8.4	8.5	464	20

Notes: Settled solids stuck to the bodies of test organisms in 100% test concentration.

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-07-11

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT
Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 252072
Sample Number : 78504

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sampling Date :	2023-07-06
Location :	Lindsay ON	Sampling Time :	07:40
Substance :	Final Effluent	Date Received :	2023-07-07
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	P. Lucas	Temperature at Receipt :	24 °C
Sample Description :	Clear, light yellow/brown.	Date Tested :	2023-07-08

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout. Environment Canada, EPS 1/RM/50 (March 2008), with deviation(s) as noted.

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	36.4 mm (±5.2)
Organism Batch :	T23-14	Range of Fork Lengths :	33 - 39 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.4 g (±0.2)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.3 - 0.5 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.2 g/L

TEST CONDITIONS

Sample Treatment :	pH Stabilization	Number of Replicates :	1
pH Adjustment :	Yes (as per EPS 1/RM/50)	Organisms Per Replicate :	10
pH Stabilization Technique :	pH Controller	Organisms Per Test Level :	10
Gas Mixture Used :	100% CO_2	Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L
Test Aeration :	Yes	Total Pre-Aeration Time :	30 minutes
Volume Tested (L) :	18	Test Method Deviation(s) :	Yes (see 'COMMENTS')

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-14	LC50 :	3690 mg/L
Date Tested :	2023-07-04	95% Confidence Limits :	3171 - 4132 mg/L
Analyst(s) :	JGR, KR, LL	Historical Mean LC50 :	3870 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2948 - 5080 mg/L

COMMENTS

• All test validity criteria as specified in the test method were satisfied.

• Noted Deviation: pH controllers are calibrated at the start of the test, and not daily as described in the test method. Extensive internal method validation of this approach has confirmed the accuracy and stability of the pH controllers over the course of the 96-h test. Additionally, pH of the test and control solutions is measured daily throughout the test.

Approved By : _____

Project Manager

NAUTILUS ENVIRONMENTAL

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 252072
Sample Number : 78504

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]	TAN (mg/L)[1]	NH3 (mg/L)[2]
Initial Water Chemistry (100%) :	7.4	7.7	1426	15	81	0.182	0.001
After 30 min pre-aeration :	7.4	7.9	1400	15	84	–	–

0 HOURS

Date & Time 2023-07-08 10:15
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]	Hardness (mg/L as $CaCO_3$)	Total Chlorine (mg/L)
100%	0	0	7.4	7.9	1400	15	84	410	–
Control	0	0	8.2	9.4	628	15	100	–	–

Notes:

24 HOURS

Date & Time 2023-07-09 10:15
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.4	–	–	15	–	–
Control	0	0	8.4	–	–	15	–	–

Notes:

48 HOURS

Date & Time 2023-07-10 10:15
Analyst(s) : KR (PC)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.6	–	–	15	–	–
Control	0	0	8.4	–	–	15	–	–

Notes:

72 HOURS

Date & Time 2023-07-11 10:15
Analyst(s) : LL

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.5	–	–	16	–	–
Control	0	0	8.2	–	–	16	–	–

Notes:

96 HOURS

Date & Time 2023-07-12 10:15
Analyst(s) : KR (JGR)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]	Average pH (0 - 96 h)
100%	0	0	7.4	9.2	1563	16	–	–	7.5
Control	0	0	8.4	8.9	642	16	–	–	8.3

Notes:

[1] TAN = Total ammonia (as N); analysis conducted by Bureau Veritas S.A., Mississauga ON; MDL = 0.05 mg/L.

[2] NH3 = Un-ionized ammonia (calculated from TAN, pH, and temperature according to the test method).

[3] adjusted for temperature and barometric pressure

"–" = not measured/not required

Number impaired does not include number dead.

Test Data Reviewed By : JL

Date : 2023-07-18

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 252072

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 1313 (Kawartha - Lindsay WWTP)
Field Sampler Name (print): PAT LUCAS
Signature: Pat Lucas
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by:
Date/Time Shipped: JULY 06 2023

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon Street
Lindsay, ON
K9V4R3

Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested											Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-07-06	7:40	Final Effluent	78504	24°C			✓		✓							✓		1 x 23L

For Lab Use Only
Received By: CL
Date: 2023-07-07
Time: 1300
Storage Location:
Storage Temp.(°C)

Please list any special requests or instructions:

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 252126
Sample Number : 78572

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sampling Date :	2023-07-12
Location :	Lindsay ON	Sampling Time :	07:15
Substance :	Final Effluent	Date Received :	2023-07-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	P. Lucas	Temperature at Receipt :	23 °C
Sample Description :	Clear, yellow.	Date Tested :	2023-07-14

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	8.2 days
Organism Batch :	Dm23-12	Average Brood Size :	35.4
Culture Mortality :	2.0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-07-04	LC50 :	6.3 g/L
Organism Batch :	Dm23-12	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	SSF	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.7 - 7.4 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 252126
Sample Number : 78572

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.4	8.0	1379	20	94	190 mg/L

0 HOURS

Date & Time : 2023-07-14 9:10
Analyst(s) : SV/JGR

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.4	8.0	1379	20	94	190
100	B	0	0	7.4	8.0	1379	20	94	190
100	C	0	0	7.4	8.0	1379	20	94	190
Control	A	0	0	8.3	8.7	469	20	100	150
Control	B	0	0	8.3	8.7	469	20	100	150
Control	C	0	0	8.3	8.7	469	20	100	150

Notes:

24 HOURS

Date & Time : 2023-07-15 9:10
Analyst(s) : KP

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	21
100	B	–	0	–	–	–	21
100	C	–	0	–	–	–	21
Control	A	–	0	–	–	–	21
Control	B	–	0	–	–	–	21
Control	C	–	0	–	–	–	21

Notes:

48 HOURS

Date & Time : 2023-07-16 9:10
Analyst(s) : KR (KP)/KP

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.4	8.2	1382	20
100	B	0	0	8.4	8.2	1387	20
100	C	0	0	8.4	8.2	1377	20
Control	A	0	0	8.3	8.2	476	20
Control	B	0	0	8.3	8.1	474	20
Control	C	0	0	8.3	8.0	475	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-07-20

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 252126

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 1313 (Kawartha - Lindsay WWTP)
Field Sampler Name (print): PAT LUCAS
Signature: Pat Lucas
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by:
Date/Time Shipped: JULY 12/23

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon Street
Lindsay, ON
K9V4R3

Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-07-12	7:15	Final Effluent	78572	23					✓							✓		1 x 23L

For Lab Use Only
Received By: SV/AJS
Date: 2023-07-13
Time: 13:00
Storage Location:
Storage Temp.(°C)

Please list any special requests or instructions:

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 253010
Sample Number : 79863

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sampling Date :	2023-10-17
Location :	Lindsay ON	Sampling Time :	08:55
Substance :	Final Effluent (Grab)	Date Received :	2023-10-18
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	T. Smith	Temperature at Receipt :	19 °C
Sample Description :	Clear, pale yellow	Date Tested :	2023-10-20

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	3.3 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	10.2 days
Organism Batch :	Dm23-19	Average Brood Size :	31.8
Culture Mortality :	0.7% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	3.3%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-10-10	LC50 :	6.7 g/L
Organism Batch :	Dm23-19	95% Confidence Limits :	6.4 - 7.0 g/L
Analyst(s) :	SSF, MEP	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.6 - 7.4 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 253010
Sample Number : 79863

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.5	9.4	1328	21	112	280 mg/L

0 HOURS

Date & Time : 2023-10-20 12:05
Analyst(s) : FM/SSF/SV (PG)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.8	8.7	1324	21	105	280
100	B	0	0	7.8	8.7	1324	21	105	280
100	C	0	0	7.8	8.7	1324	21	105	280
Control	A	0	0	8.3	8.4	479	21	100	150
Control	B	0	0	8.3	8.4	479	21	100	150
Control	C	0	0	8.3	8.4	479	21	100	150

Notes:

24 HOURS

Date & Time : 2023-10-21 12:05
Analyst(s) : JW

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	21
100	B	–	0	–	–	–	21
100	C	–	0	–	–	–	21
Control	A	–	1	–	–	–	21
Control	B	–	0	–	–	–	21
Control	C	–	0	–	–	–	21

Notes:

48 HOURS

Date & Time : 2023-10-22 12:05
Analyst(s) : SSF (JW)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.5	8.2	1339	22
100	B	0	0	8.5	8.2	1355	22
100	C	0	0	8.5	8.3	1327	22
Control	A	1	0	8.4	8.3	497	22
Control	B	0	0	8.4	8.3	497	22
Control	C	0	0	8.4	8.3	496	22

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JCS

Date : 2023-10-25

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT
Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 253010
Sample Number : 79863

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Lindsay WPCP	Sampling Date :	2023-10-17
Location :	Lindsay ON	Sampling Time :	08:55
Substance :	Final Effluent (Grab)	Date Received :	2023-10-18
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	T. Smith	Temperature at Receipt :	19 °C
Sample Description :	Clear, pale yellow	Date Tested :	2023-10-19

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout. Environment Canada, EPS 1/RM/50 (March 2008), with deviation(s) as noted.

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	38.8 mm (±3.7)
Organism Batch :	T23-22	Range of Fork Lengths :	37 - 43 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.4 g (±0.2)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.3 - 0.7 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	pH Stabilization	Number of Replicates :	1
pH Adjustment :	Yes (as per EPS 1/RM/50)	Organisms Per Replicate :	10
pH Stabilization Technique :	pH Controller	Organisms Per Test Level :	10
Gas Mixture Used :	100% CO_2	Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L
Test Aeration :	Yes	Total Pre-Aeration Time :	30 minutes
Volume Tested (L) :	16	Test Method Deviation(s) :	Yes (see 'COMMENTS')

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-22	LC50 :	3277 mg/L
Date Tested :	2023-10-18	95% Confidence Limits :	2932 - 3675 mg/L
Analyst(s) :	DT, JGR	Historical Mean LC50 :	3551 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2852 - 4421 mg/L

COMMENTS

• All test validity criteria as specified in the test method were satisfied.

• Noted Deviation: pH controllers are calibrated at the start of the test, and not daily as described in the test method. Extensive internal method validation of this approach has confirmed the accuracy and stability of the pH controllers over the course of the 96-h test. Additionally, pH of the test and control solutions is measured daily throughout the test.

Approved By : _____

Project Manager

NAUTILUS ENVIRONMENTAL

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13
EPS 1/RM/50

Work Order : 253010
Sample Number : 79863

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]	TAN (mg/L)[1]	NH3 (mg/L)[2]
Initial Water Chemistry (100%) :	7.4	9.3	1127	15	98	<0.050	0.000
After 30 min pre-aeration :	7.4	9.2	1120	15	97	–	–

0 HOURS

Date & Time 2023-10-19 14:00
Analyst(s) : AJS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]	Hardness (mg/L as $CaCO_3$)	Total Chlorine (mg/L)
100%	0	0	7.4	9.2	1120	15	97	280	–
Control	0	0	8.3	9.6	631	15	99	–	–

Notes:

24 HOURS

Date & Time 2023-10-20 14:00
Analyst(s) : DT (PG)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.5	–	–	14	–	–
Control	0	0	8.5	–	–	14	–	–

Notes:

48 HOURS

Date & Time 2023-10-21 14:00
Analyst(s) : DT (JGR)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.4	–	–	14	–	–
Control	0	0	8.2	–	–	14	–	–

Notes:

72 HOURS

Date & Time 2023-10-22 14:00
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]
100%	0	0	7.6	–	–	15	–	–
Control	0	0	8.4	–	–	15	–	–

Notes:

96 HOURS

Date & Time 2023-10-23 14:00
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	TAN (mg/L)[1]	NH3 (mg/L)[2]	Average pH (0 - 96 h)
100%	0	0	7.4	9.5	1125	15	–	–	7.5
Control	0	0	8.2	9.5	630	15	–	–	8.3

Notes:

[1] TAN = Total ammonia (as N); analysis conducted by Bureau Veritas S.A., Mississauga ON; MDL = 0.05 mg/L.

[2] NH3 = Un-ionized ammonia (calculated from TAN, pH, and temperature according to the test method).

[3] adjusted for temperature and barometric pressure

"–" = not measured/not required

Number impaired does not include number dead.

Test Data Reviewed By : JJ

Date : 2023-10-31

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 253010

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 1313

Field Sampler Name (print): Ty Smith

Signature: Ty Smith

Affiliation: Ontario Clean Water Agency

Sample Storage (prior to shipping): N/A

Custody Relinquished by:

Date/Time Shipped:

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon Street
Lindsay ON
K9V 4R3

Phone: (705) 741-6905

Fax: (705) 324-9374

Contact: Julie Mulligan

Sample Identification					Analyses Requested									Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Pseudokirchneriella subcapitata* Growth	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023/10/17	08:55	Final Effluent (Grab)	79863	19	✓ (*)		✓							X		1 x 23L

For Lab Use Only

Received By: EK/SSF PG

Date: 2023-10-18 2023-10-19

Time: 13:00

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:

(*) Daphnia single concentration testing + rainbow trout pH stabilized (EPS 1/RM/50) single concentration testing required as per client email 2023-10-19. CN

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix II:
2024 Sample Plan

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab **Lagoon 4**	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

January 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
	1 **Stat Holiday New Year's Day**	**2**	**3**	**4** ☐ Weekly ☐ Monthly ☐ Quarterly	**5**	**6**
7	**8**	**9**	**10**	**11** ☐ Weekly	**12**	**13**
14	**15**	**16**	**17**	**18** ☐ Weekly	**19**	**20**
21	**22**	**23**	**24**	**25** ☐ Weekly	**26**	**27**
28	**29**	**30**	**31**		Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

February 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
				1 ☐ **Weekly** ☐ **Monthly**	**2**	**3**
4	**5**	**6**	**7**	**8** ☐ **Weekly**	**9**	**10**
11	**12**	**13**	**14**	**15** ☐ **Weekly**	**16**	**17**
18	**19** **Stat Holiday Family Day**	**20**	**21**	**22** ☐ **Weekly**	**23**	**24**
25	**26**	**27**	**28**	**29** ☐ **Weekly**	Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

March 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample				**1**	**2**
3	**4**	**5**	**6**	**7** ☐ **Weekly** ☐ **Monthly**	**8**	**9**
10	**11**	**12**	**13**	**14** ☐ **Weekly**	**15**	**16**
17	**18**	**19**	**20**	**21** ☐ **Weekly**	**22**	**23**
24	**25**	**26**	**27**	**28** ☐ **Weekly**	**29** **Stat Holiday Good Friday**	**30**
31						

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

April 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
	1 **Stat Holiday Easter Monday**	**2**	**3**	**4** ☐ Weekly ☐ Monthly ☐ Quarterly	**5**	**6**
7	**8**	**9**	**10**	**11** ☐ Weekly	**12**	**13**
14	**15**	**16**	**17**	**18** ☐ Weekly	**19**	**20**
21	**22**	**23**	**24**	**25** ☐ Weekly	**26**	**27**
28	**29**	**30**			Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

May 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample		**1**	**2** ☐ **Weekly** ☐ **Monthly**	**3**	**4**
5	**6**	**7**	**8**	**9** ☐ **Weekly**	**10**	**11**
12	**13**	**14**	**15**	**16** ☐ **Weekly**	**17**	**18**
19	**20** **Stat Holiday Victoria Day**	**21**	**22**	**23** ☐ **Weekly**	**24**	**25**
26	**27**	**28**	**29**	**30** ☐ **Weekly**	**31**	

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

June 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample	Quarterly >60 days since previous sample				**1**
2	**3**	**4**	**5**	**6** ☐ **Weekly** ☐ **Monthly**	**7**	**8**
9	**10**	**11**	**12**	**13** ☐ **Weekly**	**14**	**15**
16	**17**	**18**	**19**	**20** ☐ **Weekly**	**21**	**22**
23	**24**	**25**	**26**	**27** ☐ **Weekly**	**28**	**29**
30						

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

July 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
	1 **Stat Holiday Canada Day**	**2**	**3**	**4** ☐ Weekly ☐ Monthly ☐ Quarterly ☐ Annual Biosolids	**5**	**6**
7	**8**	**9**	**10**	**11** ☐ Weekly	**12**	**13**
14	**15**	**16**	**17**	**18** ☐ Weekly	**19**	**20**
21	**22**	**23**	**24**	**25** ☐ Weekly	**26**	**27**
28	**29**	**30**	**31**		Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

August 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample			**1**	**2**	**3**
4	**5** **Stat Holiday Civic Day**	**6**	**7**	**8** ☐ **Weekly** ☐ **Monthly**	**9**	**10**
11	**12**	**13**	**14**	**15** ☐ **Weekly**	**16**	**17**
18	**19**	**20**	**21**	**22** ☐ **Weekly**	**23**	**24**
25	**26**	**27**	**28**	**29** ☐ **Weekly**	**30**	**31**

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

September 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
1	**2** **Stat Holiday Labour Day**	**3**	**4**	**5** ☐ Weekly ☐ Monthly	**6**	**7**
8	**9**	**10**	**11**	**12** ☐ Weekly	**13**	**14**
15	**16**	**17**	**18**	**19** ☐ Weekly	**20**	**21**
22	**23**	**24**	**25**	**26** ☐ Weekly	**27**	**28**
29	**30** **Stat Holiday T&R**				Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

October 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
		1	2	3 ☐ Weekly ☐ Monthly ☐ Quarterly	4	5
6	7	8	9	10 ☐ Weekly	11	12
13	14 **Stat Holiday Thanksgiving Day**	15	16	17 ☐ Weekly	18	19
20	21	22	23	24 ☐ Weekly	25	26
27	28	29	30	31 ☐ Weekly	Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

November 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample				**1**	**2**
3	**4**	**5**	**6**	**7** ☐ **Weekly** ☐ **Monthly**	**8**	**9**
10	**11** **Stat Holiday Remembrance Day**	**12**	**13**	**14** ☐ **Weekly**	**15**	**16**
17	**18**	**19**	**20**	**21** ☐ **Weekly**	**22**	**23**
24	**25**	**26**	**27**	**28** ☐ **Weekly**	**29**	**30**

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar
Lindsay WWTP (1313) Works # 110000383

Imported sewage samples can be taken at any point in the month but all other samples must be collected on date indicated.

Weekly	
Raw – Grab	- pH, Temperature
Raw - Comp	-BOD, TSS, TP, TKN, TAN
Final – Comp	- CBOD5, TSS, TP, Total (Ammonia+Ammonium) Nitrogen, TKN, Nitrite, Nitrate, Nitrate+Nitrite
Final – Grab	-E.Coli, pH, Temperature
Final - Calculated	- Unionized Ammonia

Monthly	
Lagoon Cell 5-	- TSS, CBOD, BOD, TSS, TKN, TAN, TP
Imported Sewage - Abattoir (IndW)	-BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN
Imported Sewage - Septage Receiving Station (InW2)	- BOD, TSS, TP, Total (Ammonia+ Ammonium) /nitrogen, TKN

Quarterly	
Final – Grab	- Iron, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate, Benzene, Xylene, Phenols
Final – Comp	- Aluminum, Cobalt, Zinc, Copper, Boron, Lead, Toluene, ethyle-Benzene
Acute Lethality	Final - Grab Rainbow Trout & Magna daphnia – Aquatox Testing & Consulting Ltd.

Annual	
Biosolids - Grab Lagoon 4	- Total Solids, Total Phosphorus, Total Ammonia Nitrogen, Nitrate as Nitrogen, Metal Scan (Arsenic, Cadmium, Cobalt, Chromium, Copper, Lead, Mercury, Zinc, Molybdenum, Nickel, Potassium, Selenium

Operator Name: _____ Operator Signature: _____ *Date:* _____
(all collection and submission complete as per ECA, WSER, etc. plus any special requirements).
Sampler to initial on the date samples are taken and check off the appropriate sample box

December 2024

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
1	**2**	**3**	**4**	**5** ☐ **Weekly** ☐ **Monthly**	**6**	**7**
8	**9**	**10**	**11**	**12** ☐ **Weekly**	**13** *Please review SGS's Holiday schedule prior to sampling	**14**
15	**16**	**17**	**18** ☐ **Weekly**	**19**	**20**	**21**
22	**23** ☐ **Weekly**	**24**	**25** **Stat Holiday Christmas Day**	**26** **Stat Holiday Boxing Day**	**27**	**28**
29	**30** ☐ **Weekly**	**31**			Sample Collection Time Frames (Days) WSER Sampling Windows (CBOD, TSS, Acute Lethality)	Weekly >5 days since previous sample Monthly >10 days since previous sample Quarterly >60 days since previous sample

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix III:
WMS Work Order Summary

Work Order	Description
1465033	DEFERRED 1313, North Leachate SPS, Pump and Gate Valve Replacement
3108754	DEFERRED,1313, Lindsay WWT, ESA Inspection Defects Flexible Cords, Repair/Removal
3245148	1313, Wellington SPS, Pump Replacement
3288623	1313, Lindsay WWT, Actiflo Pump Train 2, Replacement
3383410	1313, Lindsay St. North Leachate SPS, Pump 2, Pump Fault, Overload
3385543	1313, Rivera Park SPS, Meter Flow FIT 101, No Output to HMI, Repair
3385936	1313, Lindsay WWTP, Injection Mixer Gearbox, Actiflo Train 1, Repair
3386809	1313, Lindsay WWTP, Clarifier Alum Pump Issue, Troubleshooting
3431502	1313, Lindsay WWT, Actiflo Room and Inlet Building Emergency Light Repair
3431551	1313, Ridout SPS, Fixed Gas Monitor, Installation
3431552	1313, Lindsay St. North SPS, Fixed Gas Monitors
3483616	1313, Lindsay WWT, SPS Hardware
3522702	1313, Mary SPS, Pump 1, Check Valve, Replace
3525479	1313, Lindsay WWT, Polymer System, Water Leak
3622369	1313, Lindsay WWT, ESA Inspection Defects, Repairs
3571724	1313, Lindsay WWT, Landscaping Cleanup
3573049	1313, Logie SPS, Impeller, Replacement
3575889	1313, Lindsay St North Leachate SPS, Pump Submersible 1, Rebuild for Spare
3620932	1313, Lindsay WWT, Blower For Confined Space Ventilation, Purchase
3624710	1313, Rivera Park SPS, Pump 3, Guide Rail, Repair
3661429	1313, Lindsay WWT, Polymer Pump Poer Failure, Investigate/repair
3661498	1313, Lindsay WWT, Facility, Comcor Main Disconnect Tripped, Reset
3661912	1313, Lindsay WWT, Polymer System, Feed Water, PRV, Replace
3664530	1313, Lindsay WWT, Lagoon Berm Grass, Cutting
3664562	1313, Lindsay WWT, Spider Pest Control,
3664578	1313, Riverview SPS, Road Improvement
3664689	1313, Lindsay WWT, Clarifier 1 (North), Cleaning by Contractor
3664972	1313, Lindsay WWT, Site Pole Lights, Repair
3665499	1313, Ridout SPS, Pump 1, Fault, Repair/Trouble Shoot
3704070	1313, Lindsay WWT, Composite Sampler, Final Effluent, Replace Tubing on Peristaltic Pump
3705234	1313, Rivera Park SPS, Submersible Pump 3 RSP-103, Vibration Fault, Repair
3705351	1313, Rivera Park SPS, Pump 3 Failure, Investigate/Repair
3705780	1313, Lindsay WWT, Aeration Tank 1 & 2, Anoxic Zone, Surface Cleaning
3706153	1313, Lindsay WWT, Valve Backflow Preventer DCVA, Repair
3706155	1313, Lindsay WWT, Valve Backflow Preventer DCVA Tertiary Actiflow , Repair
3706156	1313, Lindsay WWT, Valve Backflow Preventer DCVA Tertiary Actiflow , Repair
3706162	1313, Lindsay WWT, Valve, Backflow, Tertiary, Basement Supply, Repair
3706167	1313, Lindsay WWT, Valve, Backflow, Lab Water Supply, Repair
3706172	1313, Lindsay WWT, Valve, Backflow, Replace
3706504	1313, Lindsay WWT, HACH SD900 Sample Tubing, Replacement
3707349	1313, Lindsay WWT, Inspect FEP101 VFD Display, Investigate

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix IV:
Calibration Reports

Franklin Empire
550 Braidwood Ave. Unit 4
Peterborough ON K9J 1W1, CANADA

Tel: (705) 745-1626
Fax: (705) 745-3493

OCWA Kawartha Lindsay WWTP

2023 Flow Calibrations

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-501

Date: Dec. 13, 2023

SITE:	Lindsay WWTP	**SERVICE DATE:**	Dec. 13, 2023
PROCESS AREA:	Actiflo 1	**TECHNICIAN:**	M Manley
INSTR. TAG:	FIT-501	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC 090		
SERIAL No.:	A98 18896		
INSTR. RANGE:	0000423853		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**	
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s	m3/day
Min:	0.00		**Min:**	4.00	0.00	
Max:	2.15		**Max:**	20.00	373.30	32250.00
DN (mm):	450	18				
GK=1 GKL=2	1			coil	118.3 ohms	
GK:	3.589			open to ground		
Constant:	4177.44					

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (mA)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	4.00	0.00%	4.00	0.00%
0.50	A	7.73	7.76	0.39%	7.76	0.39%
1.00	B	11.46	11.44	-0.17%	11.44	-0.17%
2.00	C	18.91	18.90	-0.05%	18.90	-0.05%

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments:

Total 40.554 E6m3

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-502

Date: Dec. 13, 2023

SITE:	Lindsay WWTP	**SERVICE DATE:**	Dec. 13, 2023
PROCESS AREA:	Actiflo 2	**TECHNICIAN:**	M Manley
INSTR. TAG:	FIT-502	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC 090		
SERIAL No.:	A98 18895		
INSTR. RANGE:	0000423852		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**	
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s	m3/day
Min:	0.00		**Min:**	4.00	0.00	
Max:	2.17		**Max:**	20.00	373.30	32250.00
DN (mm):	450	18				
GK=1 GKL=2	1			coil	118.0	ohms
GK:	3.548			open to ground		
Constant:	4177.44					

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (mA)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	4.00	0.00%	4.00	0.00%
0.50	A	7.69	7.69	0.00%	7.69	0.00%
1.00	B	11.37	11.33	-0.35%	11.33	-0.35%
2.00	C	18.74	18.68	-0.32%	18.68	-0.32%

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments:

41.871 E6 m3

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-101

Date: Dec. 13, 2023

SITE:	Lindsay WWTP	**SERVICE DATE:**	Dec. 13, 2023
PROCESS AREA:	Middle Leachate	**TECHNICIAN:**	M Manley
	FIT-101	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC 090		
SERIAL No.:	A03 29326		
INSTR. RANGE:	0000423619		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s
Min:	0.00		**Min:**	4.00	0.00
Max:	6.67		**Max:**	20.00	25.00
DN (mm):	80	3 inch			
GK=1 GKL=2	1			coil	62.0 ohms
GK:	2.445			open to ground	
Constant:	4177.44				

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (mA)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	4.00	0.00%	4.00	0.00%
0.50	A	5.20	5.20	0.00%	5.20	0.00%
1.00	B	6.40	6.39	-0.16%	6.39	-0.16%
2.00	C	8.79	8.77	-0.23%	8.77	-0.23%
5.00	D	15.99	15.96	-0.19%	15.96	-0.19%

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments: In Panel outside, fuse marked on instrument. (CB#8 3rd from right) (mA input 2 on RCI 800)

226680m3

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-201

Date: Dec. 13, 2023

SITE:	Lindsay WWTP
PROCESS AREA:	South Leachate
	FIT-201
MANUFACTURER:	Krohne
MODEL:	IFC100
SERIAL No.:	S15302427
INSTR. RANGE:	0000423730

SERVICE DATE:	Dec. 13, 2023
TECHNICIAN:	M Manley
JOB REFERENCE:	LINDSWW 23

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s
Min:	0.00		**Min:**	4.00	0.00
Max:	2.74		**Max:**	20.00	10.00
DN (mm):	80	3 inch			
GK=1 GKL=2	2			coil	61.8 ohms
GK:	4.757			open to ground	open
Constant:	4177.44				

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (mA)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	4.00	0.00%	4.00	-0.25%
0.50	A	6.92	6.91	-0.14%	6.91	-0.14%
1.00	B	9.83	9.84	0.10%	9.84	0.10%
2.00	C	15.66	15.68	0.13%	15.68	0.13%
5.00	D	33.15				
10.00	E	62.31				

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments: Total AF 130559 m3
S78 123S
SWB SRWS

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.:	LINDSWW 23 FIT-203
Date:	Dec. 13, 2023

SITE:	Lindsay WWTP	**SERVICE DATE:**	Dec. 13, 2023
PROCESS AREA:	North / Middle Leachate		
INSTR. TAG:	FIT-203	**TECHNICIAN:**	M Manley
MANUFACTURER:	Krohne		
MODEL:	IFC 090	**JOB REFERENCE:**	LINDSWW 23
SERIAL No.:	A03 21903		
INSTR. RANGE:	0000422119		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s
Min:	0.00		**Min:**	4.00	0.00
Max:	15.22		**Max:**	20.00	90.00
DN (mm):	100	4			
GK=1 GKL=2	1			coil	103 ohms
GK:	2.470			open to ground	
Constant:	4177.44				

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (mA)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	4.00	0.00%	4.00	0.00%
0.50	A	4.53	4.49	-0.88%	4.49	-0.88%
1.00	B	5.05	5.01	-0.79%	5.01	-0.79%
2.00	C	6.10	6.08	-0.33%	6.08	-0.33%
5.00	D	9.26	9.20	-0.65%	9.20	-0.65%
10.00	E	14.51	14.44	-0.48%	14.44	-0.48%

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments: Total AF 351035 m3
Display cycles 2Xper second and pushbuttons not working.
Noisy signal, somewhat erratic, Consider replacement.

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-202

Date: Dec. 13, 2023

SITE:	Lindsay WW	**SERVICE DATE:**	Dec. 13, 2023
PROCESS AREA:	Reject		
INSTR. TAG:	FIT-202	**TECHNICIAN:**	M Manley
MANUFACTURER:	Greyline Transit Time		
MODEL:	TTFM 1.0	**JOB REFERENCE:**	LINDSWW 23
SERIAL No.:	53787		
Type:	0000423880		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**	
Type:	Simulation		**Type or EGU:**	mA	m3/day	m3/hr
Min:	0		**Min:**	4.00	0	0
Max:	25920		**Max:**	20.00	25920.000	1080
Pipe OD:	12.75					
Sensor Spacing:	4.5 inch	1 Pass				
Material:	Stainless Steel					

			Before Calibration		**After Calibration**	
Input	**Input %**	**Calc. m3/day**	**Output**	**%Error**	**Output**	**%Error**
0			0		0	
1400		1400	1350	-3.57%	1350	-3.57%
Simulation	**Input %**	**Calc. mA**	**Output**	**%Error**	**Output**	**%Error**

Calibration Equipment			
Type:	DMM	Clamp-on Transit time Flowmeter	
Manufacturer:	Fluke	Siemens	
2018 Flow Calibrat	Model 87	FUP1010	
Serial No.:	13440128	Service	
Last Cal. Date:	Feb. 17, 2023		

Comments: Unit was not functional upon arrival, added couplant unit started working.

Unsteady flow but seemed to compare with our clamp flowmeter, flow surged from 200 - 1400 m3/d

Adjusted correction factor 1.00

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-101

Date: Dec. 8, 2023

SITE:	Lindsay WWTP	**SERVICE DATE:**	Dec. 8, 2023
PROCESS AREA:	Ridout SPS	**TECHNICIAN:**	M Manley
INSTR. TAG:	FIT-101	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC 020D		
SERIAL No.:	A0246587		
INSTR. RANGE:	0000422553		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**	
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s	m3/day
Min:	0.00		**Min:**	4.00	0.00	
Max:	7.31		**Max:**	20.00	450.00	
DN (mm):	300	12				
GK=1 GKL=2	1			coil	102.5 ohms	
GK:	2.856			open to ground		
Constant:	4177.44					

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (mA)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	3.99	-0.25%	3.99	0.00%
0.50	A	5.09	5.04	-0.98%	5.04	-0.98%
1.00	B	6.19	6.12	-1.13%	6.12	-1.13%
2.00	C	8.38	8.29	-1.07%	8.29	-1.07%
5.00	D	14.94	14.80	-0.94%	14.80	-0.94%
10.00	E	25.88				

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments: Total 449617.3

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-W SPS

Date: Dec. 8, 2023

SITE:	Lindsay WW Wellington SPS
PROCESS AREA:	Wellington SPS
INSTR. TAG:	FIT-W SPS
MANUFACTURER:	Greyline Doppler
MODEL:	DFM-IV
SERIAL No.:	20450
Type:	0000422219

SERVICE DATE:	Dec. 8, 2023
TECHNICIAN:	M Manley
JOB REFERENCE:	LINDSWW 23

Input	**(Test)**
Type:	Simulation
Min:	0.00
Max:	0.024
Pipe ID:	3.96
Material:	Cast Iron

Output	**(Signal)**	**(Process)**	
Type or EGU:	mA	m3/s	m3/day
Min:	4.00	0	0
Max:	20.00	0.024	2074

			Before Calibration		**After Calibration**	
Input	**Input %**	**Calc. m3/day**	**Output**	**%Error**	**Output**	**%Error**
Simulation	**Input %**	**Calc. mA**	**Output**	**%Error**	**Output**	**%Error**
0.000	0.00%	4.00	4.00		4.00	
0.006	25.00%	8.00	8.00		8.00	
0.120	50.00%	12.00	12.00		12.00	
0.018	75.00%	16.00	15.99		15.99	
0.024	100.00%	20.00	20.00		20.00	

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
2018 Flow Calibrat	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments:

2019 Tested pump 2, ran at 0.009 m3/sec
2020 Tested Pump 2, ran at 0.01 m3/sec
2021 Tested Pump 1, ran at 0.010 m3/s
2022 Tested Pump 1, ran at 0.009 m3/s
2023 P1 (new pump), ran at 0.012m3/s

Functional test and mA output check only. This meter was not compared to any reference.

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 232 FIT 101

Date: Dec. 13, 2023

SITE:	Lindsay WWTP	**SERVICE DATE:**	Dec. 13, 2023
PROCESS AREA:	Logie St	**TECHNICIAN:**	M Manley
TAG:	232 FIT 101	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC 300		
SERIAL No.:	S0825543 CG30011100		
INSTR. RANGE:	0000421415		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s
Min:	0.00		**Min:**	4.00	0.00
Max:	3.22		**Max:**	20.00	200.00
DN (mm):	250	10 inch			
GK=1 GKL=2	2			coil	
GK:	8.304			open to ground	
Constant:	4177.44				

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (l/s)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	4.00	0.00%	4.00	0.00%
0.50	A	6.48	6.47	-0.15%	6.47	-0.15%
1.00	B	8.97	8.92	-0.56%	8.92	-0.56%
2.00	C	13.94	13.86	-0.57%	13.86	-0.57%

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments:

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT-Fair

Date: Dec. 8, 2023

SITE:	Lindsay WW Fairgrounds	**SERVICE DATE:**	Dec. 8, 2023
PROCESS AREA:	Fairgrouds SPS	**TECHNICIAN:**	M Manley
INSTR. TAG:	FIT-Fair	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Greyline Doppler		
MODEL:	DFM-IV		
SERIAL No.:	19456		
Type:	0000421388		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**	
Type:	Simulation		**Type or EGU:**	mA	m3/s	m3/day
Min:	0.00		**Min:**	4.00	0	0
Max:			**Max:**	20.00	0.056	4838
		programmed				
Pipe ID:	6	5.1				
Material:	plastic					

			Before Calibration		**After Calibration**	
Input	**Input %**	**Calc. m3/s**	**Output**	**%Error**	**Output**	**%Error**
0	0.00%	0	0	0.00%	0	0.00%
22.7	l/s	0.023	0.023	1.32%	0.023	1.32%

Calibration Equipment			
Type:	DMM	Clamp-on Transit time Flowmeter	
Manufacturer:	Fluke	Siemens	
2018 Flow Calibrat	Model 87	FUP1010	
Serial No.:	13440128	Service	
Last Cal. Date:	Feb. 17, 2023		

Comments: Verified with clamp on flowmeter, ALC 81, 1490 fps

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.:	FIT-101
Date:	0-Jan-00

SITE:	Lindsay WW Riverview SPS	**SERVICE DATE:**	
PROCESS AREA:	Riverview SPS		
INSTR. TAG:	FIT-101	**TECHNICIAN:**	
MANUFACTURER:	Greyline Doppler		
MODEL:	DFM V5.1	**JOB REFERENCE:**	
SERIAL No.:	63248		
Type:	0000421427		

Input	**(Test)**	**Output**	**(Signal)**	**(Process)**
Type:	Comparison	**Type or EGU:**	mA	m3/day
Min:	0.00	**Min:**	4.00	0
Max:	actual flow	**Max:**	20.00	3295
Pipe ID:	4.26			
Cal:	1.06000			

			Before Calibration		**After Calibration**	
Input	**Input %**	**Calc. O/P**	**Output**	**%Error**	**Output**	**%Error**

Calibration Equipment			
Type:	DMM	Clamp-on Transit time Flowmeter	
Manufacturer:	Fluke	Siemens	
2018 Flow Calibrat	Model 87	FUP1010	
Serial No.:	13440128	Service	
Last Cal. Date:			

Comments: Not Functional, transducers not accessable.

AS FOUND: **AS LEFT:**

CERTIFIED BY:

CALIBRATION REPORT

Report No.:	FIT-102
Date:	0-Jan-00

SITE:	Lindsay WW Riverview SPS	**SERVICE DATE:**	
PROCESS AREA:	Riverview SPS		
INSTR. TAG:	FIT-102	**TECHNICIAN:**	
MANUFACTURER:	Greyline Doppler		
MODEL:	DFM V5.1	**JOB REFERENCE:**	
SERIAL No.:	62244		
Type:	0000421428		

Input	**(Test)**	**Output**	**(Signal)**	**(Process)**
Type:	Comparison	**Type or EGU:**	mA	m3/day
Min:	0.00	**Min:**	4.00	0
Max:	actual flow	**Max:**	20.00	2905
Pipe ID:	4.26			
Cal:	0.838			

			Before Calibration		**After Calibration**	
Input	**Input %**	**Calc. O/P**	**Output**	**%Error**	**Output**	**%Error**

Calibration Equipment			
Type:	DMM	Clamp-on Transit time Flowmeter	
Manufacturer:	Fluke	Siemens	
2018 Flow Calibrat	Model 87	FUP1010	
Serial No.:	13440128	Service	
Last Cal. Date:			

Comments: Not Functional, transducers not accessable.

AS FOUND: **AS LEFT:**

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT 1

Date: Dec. 8, 2023

SITE:	Mary St SPS	**SERVICE DATE:**	Dec. 8, 2023
PROCESS AREA:	Pump 1	**TECHNICIAN:**	M Manley
INSTR. TAG	FIT 1	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC100		
SERIAL No.:	S17315264		
OCWA Code.	0000423609		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s
Min:	0.00		**Min:**	4.00	0.00
Max:	3.69		**Max:**	20.00	25.00
DN (mm):	100	4 inch			
GK=1 GKL=2	2			coil	104.6 ohms
GK:	5.657			to ground	34M ohms
Constant:	4177.44				

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (l/s)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	3.99	-0.25%	3.99	0.00%
0.50	A	6.17	6.11	-0.97%	6.11	-0.97%
1.00	B	8.33	8.26	-0.84%	8.26	-0.84%
2.00	C	12.67	12.59	-0.63%	12.59	-0.63%
5.00	D	25.67				
10.00	E	47.33				

Calibration Equipment			
Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments: SRB SRWS

34M ohms to ground. These meters have had moisture in the junction boxes. Recommend dry them out in the summer and fill them with potting compound.

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT 2

Date: Dec. 8, 2023

SITE:	Mary St SPS	**SERVICE DATE:**	Dec. 8, 2023
PROCESS AREA:	Pump 2	**TECHNICIAN:**	M Manley
INSTR. TAG	FIT 2	**JOB REFERENCE:**	LINDSWW 23
MANUFACTURER:	Krohne		
MODEL:	IFC100		
SERIAL No.:	S17315262		
OCWA Code.	0000423611		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	GS 8 (X val)		**Type or EGU:**	mA	l/s
Min:	0.00		**Min:**	4.00	0.00
Max:	3.73		**Max:**	20.00	25.00
DN (mm):	100	4 inch			
GK=1 GKL=2	2			coil	102.9 ohms
GK:	5.595			to ground	13M ohms
Constant:	4177.44				

			Before Calibration		**After Calibration**	
Input (Y pos)	**Knob Setting**	**Calc. O/P (l/s)**	**Output (mA)**	**%Error**	**Output (mA)**	**%Error**
0.00	0	4.00	3.99	-0.25%	3.99	0.00%
0.50	A	6.14	6.12	-0.33%	6.12	-0.33%
1.00	B	8.29	8.26	-0.36%	8.26	-0.36%
2.00	C	12.57	12.55	-0.16%	12.55	-0.16%
5.00	D	25.43				
10.00	E	46.86				

Calibration Equipment

Type:	DMM	Simulator	
Manufacturer:	Fluke	Krohne	
2018 Flow Calibrat	Model 87	GS 8B	
Serial No.:	13440128	U1127700020705	
Last Cal. Date:	Feb. 17, 2023	Mar. 27, 2023	

Comments: SRB SRWS

13 M ohms to ground. These meters have had moisture in the junction boxes. Recommend dry them out in the summer and fill them with potting compound.

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.:	LINDSWW 23 FIT 101
Date:	Dec. 8, 2023

SITE:	Rivera SPS	**SERVICE DATE:**	Dec. 8, 2023
PROCESS AREA:	FIT 101		
INSTR. TAG	FIT 101	**TECHNICIAN:**	M Manley
MANUFACTURER:	Siemens		
MODEL:	Model 6000 Industry	**JOB REFERENCE:**	LINDSWW 23
SERIAL No.:	333901H188		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	Simulation		**Type or EGU:**	SCADA	l/s
Min:	0%		**Min:**	0.00	0.00
Max:	100%		**Max:**	400.00	400.00
DN (mm):	450	18 inch			
LF Cutoff	1.50%			coil	
Empty Pipe	ON			open to ground	
Cal Factor:	169.7953				

			Before Calibration		**After Calibration**	
Simulation	**mA**	**O/P (l/s)**	**Scada (l/s)**	**%Error**	**Scada (l/s)**	**%Error**
0.00	4.00	0.0	0.0	0.00%	0.0	0.00%
100.00	8.00	100.0				
200.00	12.00	200.0	200.1	0.05%	200.1	0.05%
300.00	16.00	300.0				
400.00	20.00	400.0	399.9	-0.02%	399.9	-0.02%

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
2018 Flow Calibrat	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments: Checked Signal suitability +9

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: LINDSWW 23 FIT 201

Date: Dec. 8, 2023

SITE:	Rivera SPS	**SERVICE DATE:**	Dec. 8, 2023
PROCESS AREA:	FIT 201		
INSTR. TAG	FIT 201	**TECHNICIAN:**	M Manley
MANUFACTURER:	Siemens		
MODEL:	Model 6000 Industry	**JOB REFERENCE:**	LINDSWW 23
SERIAL No.:	333801H188		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	Simulation		**Type or EGU:**	SCADA	l/s
Min:	0%		**Min:**	0.00	0.00
Max:	100%		**Max:**	400.00	400.00
DN (mm):	450	18 inch			
LF Cutoff	1.50%				
Empty Pipe	ON				
Cal Factor:	171.2212				

			Before Calibration		**After Calibration**	
Simulation	**mA**	**O/P (l/s)**	**Scada (l/s)**	**%Error**	**Scada (l/s)**	**%Error**
0.00	4.00	0.0	0.0	0.00%	0.0	0.00%
100.00	8.00	100.0				
200.00	12.00	200.0	200.4	0.20%	200.4	0.20%
300.00	16.00	300.0				
400.00	20.00	400.0	399.9	-0.02%	399.9	-0.02%

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
2018 Flow Calibrat	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments: Checked Signal suitability +9

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

Verification report Promag 400

Endress+Hauser
People for Process Automation

Plant operator: OCWA

Device information

Location	Lindsay WWTP
Device tag	FIT421
Module name	K323-00
Nominal diameter	DN150 / 6"
Device name	Promag 400
Order code	5W4C1F-1H9E4/0
Serial number	SA25B919000
Firmware version	02.01.01

Calibration

Calibration factor	1.1313
Zero point	1.0

Verification information

Operating time (counter)	414d19h48m50s
Date/time (manually recorded)	13.12.23 09:52
Verification ID	9
Verification mode	Standard verification

Overall verification result*

☑ Passed	Details see next page

*Result of the complete device functionality test via Heartbeat Technology

Confirmation

Heartbeat Verification verifies the function of the flowmeter within the specified measuring tolerance, over the useful lifetime of the device, with a total test coverage > 94 %, and complies with the requirements for traceable verification according to DIN EN ISO 9001:2008 – Section 7.6 a. (attested by TÜV-SÜD Industrieservices GmbH)

Notes

Date | Operator's signature | Inspector's signature

Verification report Promag 400

Endress+Hauser
People for Process Automation

Plant operator: OCWA

Device identification and verification identification

Serial number	SA25B919000
Device tag	FIT421
Verification ID	9

Heartbeat Technology

Sensor	☑ **Passed**
Shot time symmetry	☑ Passed
Hold voltage symmetry	☑ Passed
Coil current loss	☑ Passed
Coil current stability	☑ Passed
Coil resistance	☑ Passed
E1 electrode cable	☑ Passed
E2 electrode cable	☑ Passed
EPD electrode cable	☑ Passed
Sensor electronic module (ISEM)	☑ **Passed**
Supply voltage	☑ Passed
Internal voltages	☑ Passed
Linearity and reference voltage	☑ Passed
Offset of electrode measuring circuit	☑ Passed
Hold voltage feedback	☑ Passed
Shot voltage feedback	☑ Passed
Electronic current loss	☑ Passed
Coil circuit measurement	☑ Passed
Shot control circuit	☑ Passed
Electrode signal integrity	☑ Passed
System status	☑ **Passed**
I/O module	☑ **Passed**
Input/output 1	☑ Passed
Input/output 2	? Not done
Input/output 3	? Not done

Plant operator: OCWA

Device identification and verification identification

Serial number	SA25B919000
Device tag	FIT421
Verification ID	9

Heartbeat Technology

Test item with value	Unit	Actual	Min.	Max.	Visualization
Sensor					
Shot time symmetry deviation		1.0007	0.9000	1.1000	
Hold voltage symmetry deviation		1.0000	0.9000	1.1000	
Coil current loss deviation	%	0.0000	-10.0000	10.0000	
Coil current offset	%	-0.008123	-0.1000	0.1000	
Coil current deviation	%	-0.008123	-0.1000	0.1000	
Coil resistance value	Ohm	67.9	50.0	240.0	
E1 electrode impedance	Ohm	434.29			
E2 electrode impedance	Ohm	430.86			
EPD electrode impedance	Ohm	431.78			
E1/E2 electrode impedance on E1	Ohm	439.23			
E1/E2 electrode impedance on E2	Ohm	435.99			
Sensor electronic module (ISEM)					
Supply voltage 30.0V	V	31.19	27.000	35.000	
Linearity and reference voltage 1		0.9995	0.9900	1.0100	
Linearity and reference voltage 2		0.9995	0.9900	1.0100	
Measuring point offset		2.3826	-100.0000	100.0000	
Hold voltage feedback value	%	2.09	-10.0	10.0	
Shot voltage feedback value	%	-0.45	-20.0	20.0	
Electronic current loss deviation	%	-0.34	-10.0000	10.0000	
Coil circuit value	%	0.00	-1.0	1.0	
Shot control circuit value	%	-0.18	-10.0	10.0	
Electrode signal integrity deviation	%	1.54	-40.0	40.0	

Test item with value	Unit	Actual	Min.	Max.	Visualization
I/O module					
Output 1 value 1	mA	4.0374	3.8600	4.1400	
Output 1 value 2		0.0000	0.0000	0.0000	
Output 2 value 1		0.0000	0.0000	0.0000	
Output 3 value 1		0.0000	0.0000	0.0000	

Plant operator: OCWA

Device identification and verification identification

Serial number	SA25B919000
Device tag	FIT421
Verification ID	9

Heartbeat Technology

Test item with value	Unit	Actual
Process conditions		
Volume flow value verification	m^3/d	0.0000
Conductivity value verification	µS/cm	-nan
Electronic temperature	°C	31.4
Current difference potential	V	0.08061
Current potential electrode 1	V	0.001390
Current potential electrode 2	V	-0.07719
Current potential electrode Pipe GND	V	0.003487

Verification report Promag 400

Endress+Hauser
People for Process Automation

Plant operator: OCWA

Device information

Location	Lindsay WW
Device tag	FIT401
Module name	K323-00
Nominal diameter	DN450 / 18"
Device name	Promag 400
Order code	5W4C4F-7MD6/0
Serial number	SC22A719000
Firmware version	02.01.01

Heartbeat Technology

Calibration

Calibration factor	1.1386
Zero point	-13.0

Verification information

Operating time (counter)	414d19h40m57s
Date/time (manually recorded)	13.12.23 09:37
Verification ID	26
Verification mode	Standard verification

Overall verification result*

☑ Passed	Details see next page

*Result of the complete device functionality test via Heartbeat Technology

Confirmation

Heartbeat Verification verifies the function of the flowmeter within the specified measuring tolerance, over the useful lifetime of the device, with a total test coverage > 94 %, and complies with the requirements for traceable verification according to DIN EN ISO 9001:2008 – Section 7.6 a. (attested by TÜV-SÜD Industrieservices GmbH)

Notes

Date | Operator's signature | Inspector's signature

Verification report Promag 400

Endress+Hauser
People for Process Automation

Plant operator: OCWA

Device identification and verification identification

Serial number	SC22A719000
Device tag	FIT401
Verification ID	26

Heartbeat Technology

Sensor	☑ **Passed**
Shot time symmetry	☑ Passed
Hold voltage symmetry	☑ Passed
Coil current loss	☑ Passed
Coil current stability	☑ Passed
Coil resistance	☑ Passed
E1 electrode cable	☑ Passed
E2 electrode cable	☑ Passed
EPD electrode cable	☑ Passed
Sensor electronic module (ISEM)	☑ **Passed**
Supply voltage	☑ Passed
Internal voltages	☑ Passed
Linearity and reference voltage	☑ Passed
Offset of electrode measuring circuit	☑ Passed
Hold voltage feedback	☑ Passed
Shot voltage feedback	☑ Passed
Electronic current loss	☑ Passed
Coil circuit measurement	☑ Passed
Shot control circuit	☑ Passed
Electrode signal integrity	☑ Passed
System status	☑ **Passed**
I/O module	☑ **Passed**
Input/output 1	☑ Passed
Input/output 2	? Not done
Input/output 3	? Not done

Plant operator: OCWA

Device identification and verification identification

Serial number	SC22A719000
Device tag	FIT401
Verification ID	26

Heartbeat Technology

Test item with value	Unit	Actual	Min.	Max.	Visualization
Sensor					
Shot time symmetry deviation		1.0003	0.9000	1.1000	
Hold voltage symmetry deviation		1.0000	0.9000	1.1000	
Coil current loss deviation	%	0.06979	-10.0000	10.0000	
Coil current offset	%	0.0000	-0.1000	0.1000	
Coil current deviation	%	-0.008123	-0.1000	0.1000	
Coil resistance value	Ohm	134.9	50.0	240.0	
E1 electrode impedance	Ohm	529.61			
E2 electrode impedance	Ohm	461.82			
EPD electrode impedance	Ohm	427.44			
E1/E2 electrode impedance on E1	Ohm	514.91			
E1/E2 electrode impedance on E2	Ohm	450.60			
Sensor electronic module (ISEM)					
Supply voltage 30.0V	V	31.15	27.000	35.000	
Linearity and reference voltage 1		0.9994	0.9900	1.0100	
Linearity and reference voltage 2		0.9995	0.9900	1.0100	
Measuring point offset		3.4844	-100.0000	100.0000	
Hold voltage feedback value	%	0.75	-10.0	10.0	
Shot voltage feedback value	%	-0.70	-20.0	20.0	
Electronic current loss deviation	%	0.23	-10.0000	10.0000	
Coil circuit value	%	0.00	-1.0	1.0	
Shot control circuit value	%	-0.093	-10.0	10.0	
Electrode signal integrity deviation	%	-0.089	-40.0	40.0	

Test item with value	Unit	Actual	Min.	Max.	Visualization
I/O module					
Output 1 value 1	mA	7.0657	6.9358	7.2779	
Output 1 value 2		0.0000	0.0000	0.0000	
Output 2 value 1		0.0000	0.0000	0.0000	
Output 3 value 1		0.0000	0.0000	0.0000	

Plant operator: OCWA

Device identification and verification identification

Serial number	SC22A719000
Device tag	FIT401
Verification ID	26

Heartbeat Technology

Test item with value	Unit	Actual
Process conditions		
Volume flow value verification	m^3/d	3105.053
Conductivity value verification	µS/cm	-nan
Electronic temperature	°C	31.1
Current difference potential	V	-0.07874
Current potential electrode 1	V	0.1086
Current potential electrode 2	V	0.1863
Current potential electrode Pipe GND	V	0.001118

Verification report Promag 400

Endress+Hauser
People for Process Automation

Plant operator: OCWA

Device information

Location	LINDSAY WWTP
Device tag	Promag
Module name	K323-00
Nominal diameter	DN450 / 18"
Device name	Promag 400
Order code	5W4C4F-7MD6/0
Serial number	SC22A819000
Firmware version	02.01.01

Calibration

Calibration factor	1.1444
Zero point	3.0

Verification information

Operating time (counter)	414d15h05m04s
Date/time (manually recorded)	13.01.23 09:43
Verification ID	3
Verification mode	Standard verification

Overall verification result*

☑ Passed	Details see next page

*Result of the complete device functionality test via Heartbeat Technology

Confirmation

Heartbeat Verification verifies the function of the flowmeter within the specified measuring tolerance, over the useful lifetime of the device, with a total test coverage > 94 %, and complies with the requirements for traceable verification according to DIN EN ISO 9001:2008 – Section 7.6 a. (attested by TÜV-SÜD Industrieservices GmbH)

Notes

Date | Operator's signature | Inspector's signature

Verification report Promag 400

Endress+Hauser
People for Process Automation

Plant operator: OCWA

Device identification and verification identification

Serial number	SC22A819000
Device tag	Promag
Verification ID	3

Heartbeat Technology

Sensor	☑ **Passed**
Shot time symmetry	☑ Passed
Hold voltage symmetry	☑ Passed
Coil current loss	☑ Passed
Coil current stability	☑ Passed
Coil resistance	☑ Passed
E1 electrode cable	☑ Passed
E2 electrode cable	☑ Passed
EPD electrode cable	☑ Passed
Sensor electronic module (ISEM)	☑ **Passed**
Supply voltage	☑ Passed
Internal voltages	☑ Passed
Linearity and reference voltage	☑ Passed
Offset of electrode measuring circuit	☑ Passed
Hold voltage feedback	☑ Passed
Shot voltage feedback	☑ Passed
Electronic current loss	☑ Passed
Coil circuit measurement	☑ Passed
Shot control circuit	☑ Passed
Electrode signal integrity	☑ Passed
System status	☑ **Passed**
I/O module	☑ **Passed**
Input/output 1	☑ Passed
Input/output 2	? Not done
Input/output 3	? Not done

Plant operator: OCWA

Device identification and verification identification

Serial number	SC22A819000
Device tag	Promag
Verification ID	3

Heartbeat Technology

Test item with value	Unit	Actual	Min.	Max.	Visualization
Sensor					
Shot time symmetry deviation		0.9992	0.9000	1.1000	
Hold voltage symmetry deviation		0.9984	0.9000	1.1000	
Coil current loss deviation	%	0.1586	-10.0000	10.0000	
Coil current offset	%	-0.008123	-0.1000	0.1000	
Coil current deviation	%	0.0000	-0.1000	0.1000	
Coil resistance value	Ohm	135.3	50.0	240.0	
E1 electrode impedance	Ohm	416.25			
E2 electrode impedance	Ohm	399.35			
EPD electrode impedance	Ohm	438.01			
E1/E2 electrode impedance on E1	Ohm	406.57			
E1/E2 electrode impedance on E2	Ohm	390.54			
Sensor electronic module (ISEM)					
Supply voltage 30.0V	V	31.17	27.000	35.000	
Linearity and reference voltage 1		0.9997	0.9900	1.0100	
Linearity and reference voltage 2		0.9997	0.9900	1.0100	
Measuring point offset		3.1881	-100.0000	100.0000	
Hold voltage feedback value	%	0.54	-10.0	10.0	
Shot voltage feedback value	%	-0.78	-20.0	20.0	
Electronic current loss deviation	%	0.36	-10.0000	10.0000	
Coil circuit value	%	0.055	-1.0	1.0	
Shot control circuit value	%	-0.079	-10.0	10.0	
Electrode signal integrity deviation	%	-0.78	-40.0	40.0	

Test item with value	Unit	Actual	Min.	Max.	Visualization
I/O module					
Output 1 value 1	mA	7.1062	6.9216	7.2635	
Output 1 value 2		0.0000	0.0000	0.0000	
Output 2 value 1		0.0000	0.0000	0.0000	
Output 3 value 1		0.0000	0.0000	0.0000	

Plant operator: OCWA

Device identification and verification identification

Serial number	SC22A819000
Device tag	Promag
Verification ID	3

Heartbeat Technology

Test item with value	Unit	Actual
Process conditions		
Volume flow value verification	m³/d	3091.134
Conductivity value verification	µS/cm	-nan
Electronic temperature	°F	86.5
Current difference potential	V	-0.01197
Current potential electrode 1	V	0.04741
Current potential electrode 2	V	0.06216
Current potential electrode Pipe GND	V	-0.00004353

Verification report Promag 500

Endress+Hauser
People for Process Automation

Plant operator: OCWA.

Device information

Location	Lindsay WWTP
Device tag	Promag
Module name	C300-01
Nominal diameter	DN750 / 30"
Device name	Promag 500
Order code	5W5B7F-1K11/0
Serial number	T10D6919000
Firmware version	01.01.06

Heartbeat Technology

Calibration

Calibration factor	1.0939
Zero point	-10

Verification information

Operating time (counter)	491d01h20m45s
Date/time (manually recorded)	13.12.23 11:01
Verification ID	4
Verification mode	Internal verification

Overall verification result*

☑ Passed	Details see next page

*Result of the complete device functionality test via Heartbeat Technology

Confirmation

Heartbeat Verification verifies the function of the flowmeter within the specified measuring tolerance, over the useful lifetime of the device, with a total test coverage > 94 %, and complies with the requirements for traceable verification according to DIN EN ISO 9001:2008 – Section 7.6 a. (attested by TÜV-SÜD Industrieservices GmbH)

Notes

Date | Operator's signature | Inspector's signature

Plant operator: OCWA.

Device identification and verification identification

Serial number	T10D6919000
Device tag	Promag
Verification ID	4

Heartbeat Technology

Sensor		**Passed**
Shot time symmetry		Passed
Hold voltage symmetry		Passed
Coil current loss		Passed
Coil current stability		Passed
Coil resistance		Passed
Electrode circuit 1		Passed
Electrode circuit 2		Passed
Electrode circuit EPD		Passed
Sensor electronic module (ISEM)		**Passed**
Supply voltage		Passed
External reference voltage		Passed
Linearity and reference voltage		Passed
Offset of electrode measuring circuit		Passed
Hold voltage feedback		Passed
Shot voltage feedback		Passed
Electronic current loss		Passed
Coil circuit measurement		Passed
Shot control circuit		Passed
Electrode signal integrity		Passed
System status		**Passed**
I/O module		**Passed**
Input/output 1	26-27 (I/O 1)	Passed
Input/output 2	24-25 (I/O 2)	Passed
Input/output 3	22-23 (I/O 3)	Not plugged
Input/output 4	20-21 (I/O 4)	Not plugged

Plant operator: OCWA.

Device identification and verification identification

Serial number	T10D6919000
Device tag	Promag
Verification ID	4

Heartbeat Technology

Test item with value	Unit	Actual	Min.	Max.	Visualization
Sensor					
Shot time symmetry deviation		0.9973	0.9000	1.1000	
Hold voltage symmetry deviation		1.0018	0.9000	1.1000	
Coil current loss deviation	%	0.01678	-10.0000	10.0000	
Coil current offset	%	-0.0081	-0.1	0.1	
Coil current deviation	%	-0.0081	-0.1	0.1	
Coil resistance value	Ohm	116.7	50.0	240.0	
Electrode impedance 1	Ohm	343.50			
Electrode impedance 2	Ohm	325.92			
Electrode EPD impedance	Ohm	389.28			
Electrode impedance E1/E2 on E1	Ohm	334.38			
Electrode impedance E1/E2 on E2	Ohm	317.91			
Sensor electronic module (ISEM)					
External reference voltage 1	V	-nan			
Linearity and reference voltage 1		0.9996			
Linearity and reference voltage 2		0.9997			
Measuring point offset		-2.0470	-100.0000	100.0000	
Hold voltage feedback value	%	1.00	-10.0	10.0	
Shot voltage feedback value	%	-0.38	-20.0	20.0	
Electronic current loss deviation	%	0.073	-10.0000	10.0000	
Coil circuit value	%	0.055	-1.0	1.0	
Shot control circuit value	%	-0.013	-10.0	10.0	
Electrode signal integrity deviation	%	8.19	-40.0	40.0	
System status					

Test item with value		Unit	Actual	Min.	Max.	Visualization
I/O module						
I/O module 1 terminal numbers	26-27 (I/O 1)					
Output 1 value 1		mA	0.01157	-0.2040	0.2040	
Output 1 value 2			0.0000	0.0000	0.0000	
I/O module 2 terminal numbers	24-25 (I/O 2)					
Output 2 value 1			1.0000	0.9995	1.0005	
Output 2 value 2			0.0000	0.0000	0.0000	

Plant operator: OCWA.

Device identification and verification identification	
Serial number	T10D6919000
Device tag	Promag
Verification ID	4

Heartbeat Technology

Test item with value	Unit	Actual
Process conditions		
Volume flow value verification	m^3/d	14923.54
Conductivity value verification	µS/cm	-nan
Electronic temperature	°C	24.4605

Flowmeter Verification Certificate Transmitter

OCWA K	Lindsay WW
Customer	Plant
Jennings	--------
Order code	Tag Name
PROMAG 10 W DN350	1.0729 - 1.0729
Device type	K-Factor
F809B216000	0
Serial number	Zero point
V1.03.00	
Software Version Transmitter	Software Version I/O-Module
12/05/2023	14:33
Verification date	Verification time

Verification result Transmitter: Failed

Test item	Result	Applied Limits
Amplifier	Passed	Basis: 0.65 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Not tested	0 P
Test Sensor	Failed	

FieldCheck Details	**Simubox Details**
550149	
Production number	Production number
1.07.10	1.00.01
Software Version	Software Version
04/2023	04/2023
Last Calibration Date	Last Calibration Date

Date

Operator's Sign

Inspector's Sign

FieldCheck - Result Tab Transmitter

Customer	**OCWA K**	Plant	**Lindsay WW**
Order code	**Jennings**	Tag Name	**--------**
Device type	**PROMAG 10 W DN350**	K-Factor	**1.0729 - 1.0729**
Serial number	**F809B216000**	Zero point	**0**
Software Version Transmitter	**V1.03.00**	Software Version I/O-Module	
Verification date	**12/05/2023**	Verification time	**14:33**

Verification Flow end value (100 %): 384.845 l/s
Flow speed 4.00 m/s

Passed / Failed	Test item	Simul. Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	19.242 l/s (5%)	1.60 %	0.26 %
✓		38.485 l/s (10.0%)	1.10 %	0.88 %
✓		192.424 l/s (50.0%)	0.70 %	0.04 %
✓		384.846 l/s (100%)	0.65 %	-0.03 %
✓	Current Output 1	4.000 mA (0%)	0.05 mA	0.011 mA
✓		4.800 mA (5%)	0.05 mA	0.004 mA
✓		5.600 mA (10.0%)	0.05 mA	0.007 mA
✓		12.000 mA (50.0%)	0.05 mA	0.018 mA
✓		20.000 mA (100%)	0.05 mA	0.046 mA
–	Pulse Output 1	---	---	---
		Start value	**Limits range**	**Measured value**
	Test Sensor			
✓	Coil Curr. Rise	100.001 ms	23.340..100.001 ms	59.479 ms
✗	Coil Curr. Stability		---	**---**

Legend of symbols

✓	✗	–	?	!
Passed	Failed	not tested	not testable	Attention

FieldCheck: Parameters Transmitter

Customer	**OCWA K**	Plant	**Lindsay WW**
Order code	**Jennings**	Tag Name	**--------**
Device type	**PROMAG 10 W DN350**	K-Factor	**1.0729 - 1.0729**
Serial number	**F809B216000**	Zero point	**0**
Software Version Transmitter	**V1.03.00**	Software Version I/O-Module	
Verification date	**12/05/2023**	Verification time	**14:33**

Curent Output	**Assign**	**Current Range**	**Value 0_4mA**	**Value 20 mA**		
Terminal 26/27	VOLUME FLOW	4-20 mA active	0.0 l/s	300.01 l/s		
Pulse Output	**Assign**	**Pulse Value**	**Output signal**	**Pulse width**		
Terminal 24/25	VOLUME FLOW	0.114 m3/P	Passive/Positive	100.01 ms		

Actual System Ident. 111.0

VeriMaster - Flow Meter Verification Report

Customer Information	
Customer	OCWA
Verification Download	Wed, Dec 13, 2023

Meter Information	
Meter Owner	Lindsay St North
Meter Type	WaterMaster
Sensor Size	DN300
Pipe Status	Fluid Present
Sensor Type	Fullbore
Sensor Serial No	3K620000175045
Transmitter Serial No	3K620000175045
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	8663100.36 m3
Reverse	145051.72 m3
Net	8518048.64 m3

Sensor Information	
Q3	694.44 l/s
Calibration Accuracy	OIML Class 2
Sensor Calibration Factors	150.5%; 0.00 mm/s; 11
Date of Manufacture	2014 Sept 17
Run Hours	3184days 14hrs 20mins

Sensor Data	
Coil Current	179.9 mA
Coil Inductance	279.6 mH
Coil Inductance Shift	0.0%
Coil / Loop Resistance	36.3 ohm

Transmitter Information	
Application Version	V01.05.00 12/07/12
MSP Version	00.00.04
Date of Manufacture	2014 Sept 17
Run Hours	4207days 13hrs 34mins

Transmitter Data	
Tx Gain - Adjustment	0.1%

VeriMaster Information	
Version	01.00.03
Limit Version	01.00.01

Current Output	
4mA Value	Pass : 4.000 mA ; 0.00%
12mA Value	Pass : 11.992 mA ; 0.07%
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:

FIT 102 North

Configuration Settings	
Mains Frequency	60 Hz
Qmax	400.00 l/s
Pulses/Unit	10.000000
Pulses Limit Frequency	1200.0 Hz
Sensor User Span/Zero	100.0%; 0.00 mm/s
User Flow Cutoff/Hysterisis	1.00%; 20%
Meter Mode	Normal operation

Date Wed, Dec 13, 2023 Operator Signature Print

ABB Instrumentation World Flow Technology

ABB Limited
Oldends Lane, Stonehouse
Gloucestershire, GL10 3TA UK
Tel: +44(0) 1453 826661
Fax: +44(0) 1453 821121
instrumentation@gb.abb.com

ABB Automation Inc.
125 East County Line Road
Warminster, PA 18974 USA
Tel: +1 215 674 6000
Fax: +1 215 674 6394
instrumentation@gb.abb.com

ABB Australia Pty Ltd.
Bapaune Rd
Moorebank, NSW 2170
Tel: +61-2-982 1-0111
Fax: +61-2-9821-0950

ABB Automation GmbH
Dransfelder Str.2
37079 Gottingen, GERMANY
Tel: +49 (0) 551 905212
Fax: +1 (215) 674 6394

SIEMENS MAGFLO® Verification Certificate

Customer:

Name	OCWA Kawartha
Address	Lindsay St N
Phone	
Email	

MAGFLO® Identification:

TAG No./Name	0
Sensor Code No.	7ME631
Sensor Serial No.	671540H193
Converter Code No.	7ME691
Converter Serial No.	N1E2208822
Location	Lindsay St N Leachate

Results:

Verification file name or No.		Lindsay St N Lea
Converter		Passed
Sensor	Insulation	Passed
	Magnetic Circuit	Passed

Velocity	**Current Output**			**Frequency Output**		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.803mA	0.39%	0.500kHz	0.499kHz	-0.16%
1.0m/s	5.600mA	5.607mA	0.41%	1.000kHz	1.002kHz	0.16%
3.0m/s	8.800mA	8.803mA	0.06%	3.000kHz	3.000kHz	0.01%

Current Output 4-20mA Frequency Output 0-10kHz

Converter Settings:

Basic

Qmax.	6.2 l/s
Flow Direction	Positive
Low flow Cut-off	1.50%
Empty Pipe	OFF

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	79486.75 m³
Totalizer 1 value after test	79486.78125 m³
Totalizer 2 value before test	7951.90478516 m³
Totalizer 2 value after test	7951.90478516 m³

Sensor Details:

Size	DN 100 4 IN
Cal. Factor	7.6739769
Correction Factor	1.0
Excitation Freq.	7.5Hz

Verificator Details (083F5060)

Serial No.	000711N218
Device No.	90994
Software Version	1.40
PC-Software Version	4.02
Cal. date	2023.11.03
ReCal. date	2024.11.03

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

2023.12.13 M Manley

MASSTEC WEIGHING SYSTEMS QF-11.3

887 HWY 7 , Peterborough, ON K9J 6X7 (705) 745-2488 1-800 363-9007
www.masstec.ca

VEHICLE SCALE TEST REPORT

Customer: City of Kawartha Lakes	**Address: 51 Wilson Rd**
Lindsay Landfill-Inbound Scale	**City: Lindsay Prov: Ont Postal Code: K9V 4R3**

Make of Scale:	Model No:	Serial No:	Scale Capacity:	Graduation Size:
Active	CMD-1080-1-100-FD2	033024	70,000kg	10kg
Make of Indicator:	**Model No:**	**Serial No :**	**Pounds:**	**Kilograms:**
Rice Lake	820	006095		x

SECTION TESTING (Test 1)

A shift test in which the test load is applied over individual sections of the scale.

1st LOAD	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5
AS FOUND	20120	20040	20110	20090	20150
2ND LOAD	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5
AS LEFT	20050	20050	20050	20050	20050

Scale house/Indicator (Reference to Platform)

LOAD TESTING (Test 2)

Normal basic performances in which observations are made as increments of test load are successively added to the load receiving elements of the scale.

	TEST LOAD	AS FOUND SCALE INDICATION	AS LEFT SCALE INDICATION
0 Load	0	0	0
	2000	2000	2000
	4000	3990	4000
	6000	5990	6000
	8000	7980	8000
MAX	10000	9980	10000
	8000	7980	8000
	6000	5990	6000
	4000	3990	4000
	2000	2000	2000
0 Load	0	0	0

STRAIN-LOAD (Test 3)

Indicated weight of empty vehicle	Known standards	Total weight indicated
10050 kg	10,000kg	20050 kg

DESCRIPTION OF REPAIR AND ADJUSTMENTS

Adjusted sections at 20050 kg. Calibrated zero and span at 10,000 kg known standards.

WEIGHT IDENTIFICATION NUMBERS: 1418981	
CALIBRATION DATE: June 14, 2023	**NEXT CALIBRATION DATE: December 14, 2023**

PERFORMED BY: Dana Smith/Lee Alton

MASSTEC WEIGHING SYSTEMS QF-11.3

887 HWY 7, Peterborough, ON K9J 6X7 (705) 745-2488 1-800 363-9007
www.masstec.ca

VEHICLE SCALE TEST REPORT

Customer: City of Kawartha Lakes	**Address: 51 Wilson Rd**
Lindsay Landfill-Outbound Scale	**City: Lindsay Prov: Ont Postal Code:**

Make of Scale:	Model No:	Serial No:	Scale Capacity:	Graduation Size:
Active	CMD-1080-1-100-FD2	033025	70,000kg	10kg
Make of Indicator:	**Model No:**	**Serial No :**	**Pounds:**	**Kilograms:**
Rice Lake	680 Synergy Plus	1963200145		x

SECTION TESTING (Test 1)

A shift test in which the test load is applied over individual sections of the scale.

1st LOAD	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5
AS FOUND	20110	20160	20170	20220	20130
2ND LOAD	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5
AS LEFT	20050	20050	20050	20050	20050

Scale house/Indicator (Reference to Platform)

LOAD TESTING (Test 2)

Normal basic performances in which observations are made as increments of test load are successively added to the load receiving elements of the scale.

	TEST LOAD	AS FOUND SCALE INDICATION	AS LEFT SCALE INDICATION
0 Load	0	0	0
	2000	2000	2000
	4000	4010	4000
	6000	6010	6000
	8000	8010	8000
MAX	10000	10020	10000
	8000	8010	8000
	6000	6010	6000
	4000	4010	4000
	2000	2000	2000
0 Load	0	0	0

STRAIN-LOAD (Test 3)

Indicated weight of empty vehicle	Known standards	Total weight indicated
10050 kg	10,000kg	20050 kg

DESCRIPTION OF REPAIR AND ADJUSTMENTS

Adjusted sections at 20050 kg. Calibrated zero and span at 10,000 kg known standards.

WEIGHT IDENTIFICATION NUMBERS: M1-20 500kg cert# 1418981	
CALIBRATION DATE: June 14, 2023	**NEXT CALIBRATION DATE: December 14, 2023**

PERFORMED BY: Dana Smith/Lee Alton

MASSTEC WEIGHING SYSTEMS

887 Highway #7 Peterborough, ON K9J 6X7 | phone: (705) 745-2488 | toll-free: 1-800-363-9007
www.masstec.ca

Thursday, December 7, 2023

VEHICLE SCALE TEST REPORT (QF-11.3)

Customer:
18- City of Kawartha Lakes
Lindsay Inbound Site

Address: **51 Wilson Road**
City: **Lindsay**
Postal Code: **K9V 4R3**

Province: **Ontario**
Phone: **705-324-9411**

Make of Scale:	Model No:	Serial No:	Scale Capacity:	Graduation Size:
Active	**CMD-1080-1-100-FD2**	**033024**	**70,000kg**	**10 kg**

Make of Indicator:	Model No:	Serial No:	Pounds	Kilograms
Rice Lake Weighing Systems Inc.	**820**	**006095**		**X**

SECTION TESTING (Test 1)

A shift test in which the test load is applied over individual sections of the scale.

1st LOAD	**SECTION 1**	**SECTION 2**	**SECTION 3**	**SECTION 4**	**SECTION 5**
AS FOUND	20070	20060	20070	20070	20060
2ND LOAD	**SECTION 1**	**SECTION 2**	**SECTION 3**	**SECTION 4**	**SECTION 5**
AS LEFT	20070	20060	20070	20070	20060

Scale house/Indicator (Reference to Platform)

LOAD TESTING (Test 2)

Normal basic performances in which observations are made as increments of test load are successively added to the load receiving elements of the scale.

TEST LOAD (KG)		AS FOUND SCALE INDICATION	AS LEFT SCALE INDICATION
0 Load	0	0	0
	2000	1990	2000
	4000	3990	4000
	6000	5990	6000
	8000	7980	8000
MAX	10000	9980	10000
	8000	7980	8000
	6000	5990	6000
	4000	3990	4000
	2000	1990	2000
0 Load	0	0	0

MASSTEC WEIGHING SYSTEMS

887 Highway #7 Peterborough, ON K9J 6X7 | phone: (705) 745-2488 | toll-free: 1-800-363-9007

www.masstec.ca

STRAIN-LOAD (Test 3)

Indicated weight of empty vehicle	Known standards	Total weight indicated
10,070 kg	Plus 10,000 kg	20,070 kg

DESCRIPTION OF REPAIR AND ADJUSTMENTS

Calibrated zero and span at 10,000 kg known standards

WEIGHT IDENTIFICATION NUMBERS:	M1-20
Measurement Canada Certificate #:	1418981

Calibration Date:	December 6, 2023
Next Calibration Date:	**June 6, 2024**

INSPECTION AND TESTS PERFORMED BY: Brent Cole & Dana Smith

Scale is accurate and approved for use by:

MASSTEC
WEIGHING SYSTEMS

MASSTEC WEIGHING SYSTEMS

887 Highway #7 Peterborough, ON K9J 6X7 | phone: (705) 745-2488 | toll-free: 1-800-363-9007
www.masstec.ca

Thursday, December 7, 2023

VEHICLE SCALE TEST REPORT (QF-11.3)

Customer:
18- City of Kawartha Lakes
Lindsay Outbound Site

Address: **51 Wilson Road**
City: **Lindsay**
Postal Code: **K9V 4R3**

Province: **Ontario**
Phone: **705-324-9411**

Make of Scale:	Model No:	Serial No:	Scale Capacity:	Graduation Size:
Active	**CMD-1080-1-100-FD2**	**033025**	**70,000kg**	**10 kg**

Make of Indicator:	Model No:	Serial No:	Pounds	Kilograms
Rice Lake Weighing Systems Inc.	**680 Synergy Plus**	**1963200145**		**X**

SECTION TESTING (Test 1)

A shift test in which the test load is applied over individual sections of the scale.

1st LOAD	**SECTION 1**	**SECTION 2**	**SECTION 3**	**SECTION 4**	**SECTION 5**
AS FOUND	20070	20070	20060	20060	20050
2ND LOAD	**SECTION 1**	**SECTION 2**	**SECTION 3**	**SECTION 4**	**SECTION 5**
AS LEFT	20070	20070	20060	20060	20050

Scale house/Indicator (Reference to Platform)

LOAD TESTING (Test 2)

Normal basic performances in which observations are made as increments of test load are successively added to the load receiving elements of the scale.

TEST LOAD (KG)		AS FOUND SCALE INDICATION	AS LEFT SCALE INDICATION
0 Load	0	0	0
	2000	1990	2000
	4000	3990	4000
	6000	5980	6000
	8000	7980	8000
MAX	10000	9970	10000
	8000	7980	8000
	6000	5980	6000
	4000	3990	4000
	2000	1990	2000
0 Load	0	0	0

MASSTEC WEIGHING SYSTEMS

887 Highway #7 Peterborough, ON K9J 6X7 | phone: (705) 745-2488 | toll-free: 1-800-363-9007

www.masstec.ca

STRAIN-LOAD (Test 3)

Indicated weight of empty vehicle	Known standards	Total weight indicated
10,070 kg	Plus 10,000 kg	20,070 kg

DESCRIPTION OF REPAIR AND ADJUSTMENTS

Calibrated zero and span at 10,000 kg known standards

WEIGHT IDENTIFICATION NUMBERS:	M1-20 [500kg]
Measurement Canada Certificate #:	1418981

Calibration Date:	December 6, 2023
Next Calibration Date:	**June 6, 2024**

INSPECTION AND TESTS PERFORMED BY: Brent Cole & Dana Smith

Scale is accurate and approved for use by:

MASSTEC
WEIGHING SYSTEMS

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix VI:
Bypass, Overflows, Spill, Abnormal Events

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

David Bradley
District Manager
Peterborough District Office
Ministry of Environment, Conservation and Parks
300 Water Street South, 2nd Floor, South Tower
Peterborough ON K9J 3C7

May 8, 2023

Mr. Bradley:

Re: Lindsay WWTP April 2023 Total Suspended Solids (TSS) Exceedance

Further to my voice mail on May 4, 2023, I am submitting written notification of exceedance of the monthly Total Suspended Solids (TSS) mg/L limit and loading limit as required by Environmental Compliance Approval (ECA) #1696-BPLL4R for the Lindsay WWTP.

With the recent substantial completion of the Proposed Works in Amended ECA 1696-BPLL4R, the TSS monthly average concentration effluent limit is 11.0 mg/L and the monthly average waste loading limit is 238 kg/day. The April 2023 TSS average concentration was 13.0 mg/L. The loading limit result was 271.7 kg/day.

There were a number of factors that impacted the effluent quality.

Firstly, the system experienced high flows from spring weather, with one rated capacity exceedance on April 6, and many days that came close to the rate capacity flow limit. Operations staff made efforts to keep the optimal sand and polymer dosage in the Actiflo units but with the high flows, there was a lot of washout.

Secondly, the automatic bar screen was out of service until April 20. There has been ongoing remediation work on the automatic bar screen as part of the capital upgrades. When the automatic bar screen is down it diverts a lot of water to the lagoon. This caused the lagoon level to be high, limiting how much flow we could divert. Since the bar screen has been online, staff have been dropping the lagoon level.

Lastly, with flows being high, and the lagoon being high, staff had to hold off on some Actiflo PMs that require taking the unit offline. Actiflo units were cleaned out on the 24th and 27th, respectively.

The Ontario Clean Water Agency is hopeful that with the continued operation of the automatic bar screen, the lagoon level will be managed as such to buffer future high flow days.

Please contact me if you have any questions.
Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha-Trent Regional Hub

(705) 731-9125

CC: B. Martin, Sr. Operations Manager, OCWA Kawartha-Trent
W. Henneberry, SPC Manager, OCWA Kawartha-Trent
G. Redden, General Manager, OCWA Kawartha-Trent
K. Lorente, Regional Manager, OCWA Kawartha-Trent
P. Lucas, ORO, OCWA Kawartha-Trent
A. Hayter, Manager Water and Wastewater, Kawartha Lakes
M. Flaherty, Contract Coordinator, Kawartha Lakes
J. Fuller, Water Compliance Supervisor, Peterborough MECP (On Leave)
B. Jackson, Water Compliance Supervisor, Peterborough MECP (Acting)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

David Bradley
District Manager
Peterborough District Office
Ministry of Environment, Conservation and Parks
300 Water Street South, 2nd Floor, South Tower
Peterborough ON K9J 3C7

July 13, 2023

Mr. Bradley:

Re: Lindsay WWTP June 2023 Total Suspended Solids (TSS) Exceedance

Further to my voice mail and our discussion on July 11, 2023, I am submitting written notification of exceedance of the monthly Total Suspended Solids (TSS) mg/L limit as required by Environmental Compliance Approval (ECA) #1696-BPLL4R for the Lindsay WWTP.

With the recent substantial completion of the Proposed Works in Amended ECA 1696-BPLL4R, the TSS monthly average concentration effluent limit is 11.0 mg/L and the June 2023 TSS average concentration was 13.25 mg/L.

The monthly average waste loading limit is 238 kg/day and the monthly average waste loading in June 2023 was 138 kg/day.

There were a number of factors that impacted the effluent quality.

Firstly, the hot weather experienced throughout June led to increased algae accumulation in the clarifiers. Operations staff made efforts to reduce the amount of algae in the clarifiers throughout the month but the weather conditions led to the continual increased algae growth. Launder covers have been installed in the North clarifier and are helping reduce the algae growth. Launder covers for the South clarifier are planned to be installed in 2024.

Secondly, the Actiflo units at the Lindsay WWTP require maintenance. The required replacement parts were ordered in April 2023 and the expected delivery date is November 2023.

Thirdly, the Lindsay WPCP experiences large swings in flows. Daily flow totals ranged from below 8000m^3 to over 18000m^3 in June. This affected the process and requires continual adjustments.

Please contact me if you have any questions.

Best regards,

Julie Mulligan
Safety, Process and Compliance Manager (A)
Ontario Clean Water Agency
Kawartha-Trent Regional Hub
(705) 741-6905

CC: B. Martin, Sr. Operations Manager, OCWA Kawartha-Trent
W. Henneberry, Regional Manager (A), OCWA Kawartha-Trent
G. Redden, General Manager, OCWA Kawartha-Trent
R. Junkin, VP Operations, OCWA
J. Mather, PCT, OCWA Kawartha-Trent
P. Lucas, ORO, OCWA Kawartha-Trent
A. Hayter, Manager Water and Wastewater, Kawartha Lakes
M. Flaherty, Contract Coordinator, Kawartha Lakes
J. Fuller, Water Compliance Supervisor, Peterborough MECP (On Leave)
B. Jackson, Water Compliance Supervisor, Peterborough MECP (Acting)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

David Bradley

August 10, 2023

District Manager
Peterborough District Office
Ministry of Environment, Conservation and Parks
300 Water Street South, 2nd Floor, South Tower
Peterborough ON K9J 3C7

Mr. Bradley:

Re: Lindsay WWTP July 2023 Total Suspended Solids (TSS) Exceedance

Further to the verbal reporting to Brad Jackson in your absence on August 9, I am submitting written notification of exceedance of the monthly Total Suspended Solids (TSS) mg/L limit as required by Environmental Compliance Approval (ECA) #1696-BPLL4R for the Lindsay WWTP.

With the recent substantial completion of the Proposed Works in Amended ECA 1696-BPLL4R, the TSS monthly average concentration effluent limit is 11.0 mg/L and the July 2023 TSS average concentration was 14.25 mg/L. The monthly average waste loading limit is 238 kg/day and the monthly average waste loading in July 2023 was within the limit at 147 kg/day.

The hot weather throughout June continued through July along with the increased algae accumulation in the clarifiers. Operations staff made efforts to reduce the amount of algae in the clarifiers but the weather conditions led to the continual increased algae growth.

Secondly, the Actiflo units at the Lindsay WWTP require maintenance. The required replacement parts were ordered in April 2023 and the expected delivery date is November 2023.

The return flow from Lagoon 5 was closed on July 11th to reduce the loading in the process. Additionally, the South clarifier was taken offline on July 26th in favour of the North clarifier, which is equipped with Launder covers. The north clarifier does not experience as much algae growth and produces a better effluent.

A single sample TSS result of 5 mg/L on August 3 indicates the above changes are having a positive effect on the effluent TSS.

Please contact me if you have any questions.

Best regards,

Julie Mather
Process and Compliance Technician
Ontario Clean Water Agency
Kawartha-Trent Regional Hub
(705) 731-9125

CC: B. Martin, Sr. Operations Manager, OCWA Kawartha-Trent
W. Henneberry, Regional Manager (A), OCWA Kawartha-Trent
G. Redden, General Manager, OCWA Kawartha-Trent
R. Junkin, VP Operations, OCWA
J. Mulligan, Safety, Process and Compliance Manager (A), OCWA Kawartha Trent
P. Lucas, ORO, OCWA Kawartha-Trent
A. Hayter, Manager Water and Wastewater, Kawartha Lakes
M. Flaherty, Contract Coordinator, Kawartha Lakes
J. Fuller, Water Compliance Supervisor, Peterborough MECP (On Leave)
B. Jackson, Water Compliance Supervisor, Peterborough MECP (A)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

David Bradley
District Manager
Peterborough District Office
Ministry of Environment, Conservation and Parks
300 Water Street South, 2nd Floor, South Tower
Peterborough ON K9J 3C7

October 6, 2023

Mr. Bradley:

Re: Lindsay WWTP September 2023 Total Suspended Solids (TSS) Exceedance

Further to my voicemail on October 6, 2023, I am submitting written notification of exceedance of the monthly Total Suspended Solids (TSS) mg/L limit as required by Environmental Compliance Approval (ECA) #1696-BPLL4R for the Lindsay WWTP.

With the recent substantial completion of the Proposed Works in Amended ECA 1696-BPLL4R, the TSS monthly average concentration effluent limit is 11.0 mg/L and the October 2023 TSS average concentration was 13.00 mg/L. The monthly average waste loading limit is 238 kg/day and the monthly average waste loading in October 2023 was within the limit at 147 kg/day.

The Actiflo units at the Lindsay WWTP require maintenance. The required replacement parts were ordered in April 2023 and the expected delivery date is November 2023. One maintenance need, the repair of Actiflo #1 injection mixer was completed on October 5, 2023.

After high (16 mg/L and 19 mg/L) TSS single sample results in mid-September, sample collection methods were examined and assessed that a dirty sample collection bottle could be contributing to higher TSS results. The sample collection composite bottle is now being cleaned prior to sample collection.

Please contact me if you have any questions.

Best regards,

Julie Mather
Process and Compliance Technician
Ontario Clean Water Agency
Kawartha-Trent Regional Hub
(705) 731-9125

CC: B. Martin, Sr. Operations Manager, OCWA Kawartha-Trent
W. Henneberry, Regional Manager (A), OCWA Kawartha-Trent
G. Redden, General Manager, OCWA Kawartha-Trent
R. Junkin, VP Operations, OCWA
J. Mulligan, Safety, Process and Compliance Manager (A), OCWA Kawartha Trent
P. Lucas, ORO, OCWA Kawartha-Trent
A. Hayter, Manager Water and Wastewater, Kawartha Lakes

M. Flaherty, Contract Coordinator, Kawartha Lakes
B. Jackson, Water Compliance Supervisor, Peterborough MECP (A)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

David Bradley
District Manager
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

May 1, 2023

Dear Mr. Bradley:

Re: Lindsay WWTP 2023 Q1 Bypass Event and Overflow Event Summary Report

Amended Environmental Compliance Approval #1696-BPLL4R sections 4(6) and 5(6) issued June 29, 2020 for the Lindsay WWTP requires a Bypass Event and Overflow Event summary report be submitted to the District Manager on a quarterly basis, no later than February 15, May 15, August 15, and November 15 each calendar year.

Amended Environmental Compliance Approval #1328-AN5PBL section 5(3) issued July 4, 2017 for the Rivera PS requires an Overflow Event summary report be submitted to the Water Supervisor on a quarterly basis, no later than February 14, May 15, August 14, and November 15 each calendar year.

There were no incidents of Bypass or Overflow Events at the Lindsay WWTP or Pumping Station during the first quarter of 2023 (January, February, and March).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Wesley Henneberry, OCWA - SPC Manager
Geoff Redden, OCWA – General Manager
Amber Hayter, Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator
Jacqueline Fuller, MECP – Water Supervisor (On Leave)
Brad Jackson, MECP – Water Supervisor (A)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

David Bradley
District Manager
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

August 1, 2023

Dear Mr. Bradley:

Re: Lindsay WWTP 2023 Q2 Bypass Event and Overflow Event Summary Report

Amended Environmental Compliance Approval #1696-BPLL4R sections 4(6) and 5(6) issued June 29, 2020 for the Lindsay WWTP requires a Bypass Event and Overflow Event summary report be submitted to the District Manager on a quarterly basis, no later than February 15, May 15, August 15, and November 15 each calendar year.

Amended Environmental Compliance Approval #1328-AN5PBL section 5(3) issued July 4, 2017 for the Rivera PS requires an Overflow Event summary report be submitted to the Water Supervisor on a quarterly basis, no later than February 14, May 15, August 14, and November 15 each calendar year.

There were no incidents of Bypass or Overflow Events at the Lindsay WWTP or Pumping Station during the second quarter of 2023 (April, May and June).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Julie Mulligan, OCWA - SPC Manager (A)
Geoff Redden, OCWA – General Manager
Amber Hayter, Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator
Jacqueline Fuller, MECP – Water Supervisor (On Leave)
Brad Jackson, MECP – Water Supervisor (A)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

David Bradley
District Manager
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

November 7, 2023

Dear Mr. Bradley:

Re: Lindsay WWTP 2023 Q3 Bypass Event and Overflow Event Summary Report

Amended Environmental Compliance Approval #1696-BPLL4R sections 4(6) and 5(6) issued June 29, 2020 for the Lindsay WWTP requires a Bypass Event and Overflow Event summary report be submitted to the District Manager on a quarterly basis, no later than February 15, May 15, August 15, and November 15 each calendar year.

Amended Environmental Compliance Approval #1328-AN5PBL section 5(3) issued July 4, 2017 for the Rivera PS requires an Overflow Event summary report be submitted to the Water Supervisor on a quarterly basis, no later than February 14, May 15, August 14, and November 15 each calendar year.

There were no incidents of Bypass or Overflow Events at the Lindsay WWTP or Pumping Station during the third quarter of 2023 (July, August and September).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Julie Mulligan, OCWA - SPC Manager (A)
Geoff Redden, OCWA – General Manager
Amber Hayter, Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator
Brittney Wielgos, MECP – Water Supervisor

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

David Bradley
District Manager
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

February 1, 2024

Dear Mr. Bradley:

Re: Lindsay WWTP 2023 Q4 Bypass Event and Overflow Event Summary Report

Amended Environmental Compliance Approval #1696-BPLL4R sections 4(6) and 5(6) issued June 29, 2020 for the Lindsay WWTP requires a Bypass Event and Overflow Event summary report be submitted to the District Manager on a quarterly basis, no later than February 15, May 15, August 15, and November 15 each calendar year.

Amended Environmental Compliance Approval #1328-AN5PBL section 5(3) issued July 4, 2017 for the Rivera PS requires an Overflow Event summary report be submitted to the Water Supervisor on a quarterly basis, no later than February 14, May 15, August 14, and November 15 each calendar year.

There were no incidents of Bypass or Overflow Events at the Lindsay WWTP or Pumping Station during the fourth quarter of 2023 (October, November, and December).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Julie Mulligan, OCWA - SPC Manager (A)
Geoff Redden, OCWA – General Manager
Amber Hayter, Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator
Brittney Wielgos, MECP – Water Supervisor

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 110000383
Project : PO#017018

10-January-2023

OCWA-Kawartha (Lindsay WWTF)
Attn : Julie Mulligan

PO Box 279, Boyd St. E
Bobcaygeon, ON
K0M 1A0, Canada

Phone: 705-887-3596
Fax:

Date Rec. : 04 January 2023
LR Report: **CA13052-JAN23**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					01-Jan-23 06:50
Temperature Upon Receipt [°C]	---	---	---	---	4.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	04-Jan-23	17:09	09-Jan-23	13:22	< 2
Total Suspended Solids [mg/L]	05-Jan-23	10:55	06-Jan-23	13:04	9
Phosphorus (total) [mg/L]	05-Jan-23	21:47	06-Jan-23	16:14	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	04-Jan-23	18:40	05-Jan-23	15:43	1.0
Ammonia+Ammonium (N) [as N mg/L]	05-Jan-23	16:01	06-Jan-23	10:19	< 0.1
Nitrite (as N) [mg/L]	04-Jan-23	20:09	09-Jan-23	17:20	< 0.03
Nitrate (as N) [mg/L]	04-Jan-23	20:09	09-Jan-23	17:20	8.23
Nitrate + Nitrite (as N) [mg/L]	04-Jan-23	20:09	09-Jan-23	17:20	8.23

Carrie Greenlaw
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003186281

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 110000383
Project : PO#017018

09-January-2023

OCWA-Kawartha (Lindsay WWTF)
Attn : Julie Mulligan

PO Box 279, Boyd St. E
Bobcaygeon, ON
K0M 1A0, Canada

Phone: 705-887-3596
Fax:

Date Rec. : 03 January 2023
LR Report: **CA12010-JAN23**

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					02-Jan-23
Temperature Upon Receipt [°C]	---	---	---	---	5.5
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	04-Jan-23	17:09	09-Jan-23	13:03	< 2
Total Suspended Solids [mg/L]	04-Jan-23	07:46	04-Jan-23	16:26	6
Phosphorus (total) [mg/L]	05-Jan-23	21:47	06-Jan-23	16:10	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	06-Jan-23	16:14	09-Jan-23	12:47	1.3
Ammonia+Ammonium (N) [as N mg/L]	04-Jan-23	22:18	06-Jan-23	10:11	< 0.1
Nitrite (as N) [mg/L]	04-Jan-23	12:25	06-Jan-23	12:10	< 0.03
Nitrate (as N) [mg/L]	04-Jan-23	12:25	06-Jan-23	12:10	8.90
Nitrate + Nitrite (as N) [mg/L]	04-Jan-23	12:25	06-Jan-23	12:10	8.90

Carrie Greenlaw
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003185705

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 110000383
Project : PO#017018

03-April-2023

OCWA-Kawartha (Lindsay WWTF)
Attn : Julie Mulligan

PO Box 279, Boyd St. E
Bobcaygeon, ON
K0M 1A0, Canada

Phone: 705-887-3596
Fax:

Date Rec. : 27 March 2023
LR Report: **CA12707-MAR23**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent (Comp)
Sample Date & Time					26-Mar-23
Temperature Upon Receipt [°C]	---	---	---	---	13.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	28-Mar-23	15:18	03-Apr-23	11:15	< 2
Total Suspended Solids [mg/L]	28-Mar-23	07:55	28-Mar-23	16:12	11
Phosphorus (total) [mg/L]	28-Mar-23	18:51	29-Mar-23	09:49	0.04
Total Kjeldahl Nitrogen [as N mg/L]	28-Mar-23	19:14	29-Mar-23	13:09	< 0.5
Ammonia+Ammonium (N) [as N mg/L]	28-Mar-23	17:05	29-Mar-23	11:35	< 0.1
Nitrite (as N) [mg/L]	28-Mar-23	15:00	29-Mar-23	11:00	< 0.03
Nitrate (as N) [mg/L]	28-Mar-23	15:00	29-Mar-23	11:00	9.27
Nitrate + Nitrite (as N) [mg/L]	28-Mar-23	15:00	29-Mar-23	11:00	9.27

Hawley Anderson, Hon.B.Sc
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003287153

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 110000383
Project : PO#017018

05-April-2023

OCWA-Kawartha (Lindsay WWTF)
Attn : Julie Mulligan

PO Box 279, Boyd St. E
Bobcaygeon, ON
K0M 1A0, Canada

Phone: 705-887-3596
Fax:

Date Rec. : 29 March 2023
LR Report: **CA15575-MAR23**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent (Comp)
Sample Date & Time					27-Mar-23 14:00
Temperature Upon Receipt [°C]	---	---	---	---	6.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	30-Mar-23	16:53	04-Apr-23	17:21	< 2
Total Suspended Solids [mg/L]	30-Mar-23	13:25	31-Mar-23	13:08	10
Phosphorus (total) [mg/L]	30-Mar-23	17:07	31-Mar-23	13:31	0.10
Total Kjeldahl Nitrogen [as N mg/L]	30-Mar-23	17:06	31-Mar-23	12:29	1.5
Ammonia+Ammonium (N) [as N mg/L]	30-Mar-23	16:05	31-Mar-23	10:42	< 0.1
Nitrite (as N) [mg/L]	30-Mar-23	14:52	05-Apr-23	13:03	< 0.03
Nitrate (as N) [mg/L]	30-Mar-23	14:52	05-Apr-23	13:03	8.83
Nitrate + Nitrite (as N) [mg/L]	30-Mar-23	14:52	05-Apr-23	13:03	8.83

*Sampling dates used as indicated on sample containers.

Carrie Greenlaw
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003290027

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 110000383
Project : PO#017018

18-April-2023

OCWA-Kawartha (Lindsay WWTF)
Attn : Julie Mulligan

PO Box 279, Boyd St. E
Bobcaygeon, ON
K0M 1A0, Canada

Phone: 705-887-3596
Fax:

Date Rec. : 11 April 2023
LR Report: **CA12470-APR23**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					09-Apr-23 18:00
Temperature Upon Receipt [°C]	---	---	---	---	17.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	12-Apr-23	17:20	17-Apr-23	16:00	3
Total Suspended Solids [mg/L]	13-Apr-23	07:53	14-Apr-23	09:57	8
Phosphorus (total) [mg/L]	13-Apr-23	14:40	14-Apr-23	11:47	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	14-Apr-23	15:01	17-Apr-23	11:05	< 0.5
Ammonia+Ammonium (N) [as N mg/L]	13-Apr-23	15:47	14-Apr-23	11:00	0.1
Nitrite (as N) [mg/L]	13-Apr-23	08:22	16-Apr-23	08:49	< 0.03
Nitrate (as N) [mg/L]	13-Apr-23	08:22	16-Apr-23	08:49	9.23
Nitrate + Nitrite (as N) [mg/L]	13-Apr-23	08:22	16-Apr-23	08:49	9.23

Hawley Anderson, Hon.B.Sc
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003302491

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix VII:
Performance Assessment Report

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Performance Assessment Report

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

1313 LINDSAY WASTEWATER TREATMENT FACILITY 110000383

	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	551,381.00	514,766.00	547,287.00	637,726.00	510,358.00	345,257.00	347,310.00	336,001.00	307,212.00	347,725.00	301,144.00	428,731.00	5,174,898.00			0.00
Raw Flow: Avg - Raw m³/d	17,786.48	18,384.50	17,654.42	21,257.53	16,463.16	11,508.57	11,203.55	10,838.74	10,240.40	11,216.94	10,038.13	13,830.03		14,177.80		
Raw Flow: Max - Raw m³/d	28,030.00	26,240.00	29,997.00	31,203.00	25,612.00	18,897.00	13,134.00	17,089.00	12,801.00	17,607.00	13,492.00	24,233.00			31,203.00	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 - Eff m³/d	561,668.00	502,307.00	543,556.00	624,657.00	480,803.00	312,401.00	320,394.00	318,037.00	283,388.00	329,579.00	289,904.00	404,532.00	4,971,226.00			0.00
Eff. Flow: Avg - Eff m³/d	18,118.32	17,939.54	17,534.06	20,821.90	15,509.77	10,413.37	10,335.29	10,259.26	9,446.27	10,631.58	9,663.47	13,049.42		13,619.80		
Eff. Flow: Max - Eff m³/d	28,015.00	26,258.00	30,107.00	30,319.00	24,488.00	18,081.00	12,240.00	17,024.00	12,027.00	16,800.00	13,141.00	23,692.00			30,319.00	0.00
Eff Flow: Count - 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 - Eff mg/L	< 2.00	< 3.00	< 2.29	< 3.00	< 2.00	< 3.00	< 2.00	< 2.00	< 2.50	< 2.00	< 2.40	< 3.50		< 2.44	< 3.50	7.20
Eff: # of samples of cBOD5 - Eff	6.00	4.00	7.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	57.00			0.00
Loading: cBOD5 - Eff kg/d	< 36.237	< 53.819	< 40.078	< 62.466	< 31.020	< 31.240	< 20.671	< 20.519	< 23.616	< 21.263	< 23.192	< 45.673		< 33.21	< 62.47	
Biochemical Oxygen Demand: BOD5																
Raw: Avg BOD5 - Raw mg/L	104.50	105.75	74.60	95.50	95.60	163.25	144.75	189.80	143.50	200.75	216.60	155.50		140.84	216.60	0.00
Raw: # of samples of BOD5 - Raw	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	52.00			0.00
Total Suspended Solids: TSS																
Raw: Avg TSS - Raw mg/L	140.50	140.25	100.40	160.00	151.20	292.00	284.50	286.40	260.25	326.75	274.20	225.50		220.16	326.75	0.00
Raw: # of samples of TSS - Raw	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	52.00			0.00
Eff: Avg TSS - Eff mg/L	6.83	8.75	9.86	13.00	6.40	13.25	14.25	5.20	13.00	5.75	9.80	8.50		9.40	14.25	11.00
Eff: # of samples of TSS - Eff	6.00	4.00	7.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	57.00			0.00
Loading: TSS - Eff kg/d	123.809	156.971	172.836	270.685	99.263	137.977	147.278	53.348	122.801	61.132	94.702	110.920		128.07	270.68	
Percent Removal: TSS - Raw %	95.14	93.76	90.18	91.88	95.77	95.46	94.99	98.18	95.00	98.24	96.43	96.23		95.11	98.24	0.00
Total Phosphorus: TP																
Raw: Avg TP - Raw mg/L	1.50	1.54	1.31	1.65	1.79	3.21	2.49	3.03	2.55	2.93	3.15	2.32		2.29	3.21	0.00
Raw: # of samples of TP - Raw	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	52.00			0.00
Eff: Avg TP - Eff mg/L	< 0.05	0.06	0.06	< 0.05	< 0.06	0.10	0.14	< 0.05	0.13	< 0.05	0.09	< 0.06		< 0.07	< 0.14	0.18
Eff: # of samples of TP - Eff	6.00	4.00	7.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	57.00			0.00
Loading: TP - Eff kg/d	< 0.846	1.121	1.027	< 1.124	< 0.993	1.041	1.447	< 0.513	1.252	< 0.505	0.850	< 0.816		< 0.99	< 1.45	
Percent Removal: TP - Raw %	96.88	95.95	95.53	96.72	96.43	96.88	94.38	98.35	94.81	98.38	97.21	97.31		96.57	98.38	0.00
Nitrogen Series																

Raw: Avg TKN - Raw mg/L	14.50	16.08	13.04	13.43	16.90	21.70	19.15	23.18	19.68	19.48	28.80	20.80		18.89	28.80	0.00
Raw: # of samples of TKN - Raw	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	52.00			0.00
Eff: Avg TAN - Eff mg/L	< 0.12	< 0.10	< 0.11	< 0.10	< 0.12	< 0.10	< 0.18	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.11	< 0.18	4.10
Eff: # of samples of TAN - Eff	6.00	4.00	7.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	57.00			0.00
Loading: TAN - Eff kg/d	< 2.114	< 1.794	< 2.004	< 2.082	< 1.861	< 1.041	< 1.809	< 1.026	< 0.945	< 1.063	< 0.966	< 1.305		< 1.51	< 2.11	
Eff: Avg NO3-N - Eff mg/L	9.04	12.23	10.26	9.40	10.43	8.62	10.01	10.65	10.83	9.03	10.58	9.44		10.04	12.23	0.00
Eff: # of samples of NO3-N - Eff	6.00	4.00	7.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	57.00			0.00
Eff: Avg NO2-N - Eff mg/L	< 0.05	< 0.03	< 0.03	< 0.03	< 0.04	< 0.39	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03		< 0.06	< 0.39	0.00
Eff: # of samples of NO2-N - Eff	6.00	4.00	7.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	57.00			0.00
Disinfection																
Eff: GMD E. Coli - Eff cfu/100mL	16.88	4.56	2.00	3.13	2.30	1.41	3.56	2.17	4.36	2.38	1.74	2.38				175.00
Eff: # of samples of E. Coli - Eff	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	52.00			0.00