Township of North Glengarry
Alexandria Wastewater System
2024 Annual Report

Contents

A. System Overview

Summary of all system components and designations.

The Alexandria wastewater system is owned and operated by the Corporation of the Township of North Glengarry. The sewage system is comprised of a class 2 wastewater collection system and a class 2 continuous discharge treatment facility. It was originally constructed in the late 1960's with various upgrades throughout the years to improve capacity and treatment as the system expanded to meet the population growth.

The wastewater systems now operate under 2 Environmental Compliance Approvals (ECA). ECA 181-W601, issued in October 2023 for all municipal sewage collection systems located within the North Glengarry Township boundaries and ECA 9873-BQ6LTR, issued in 2021 for the Alexandria Sewage Works.

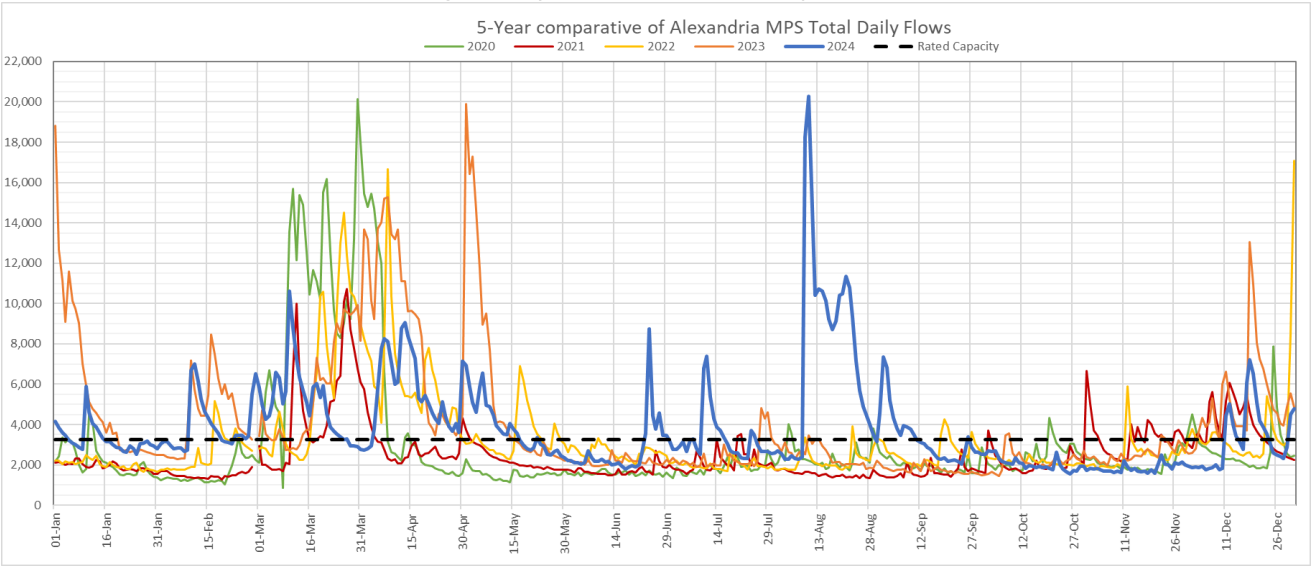
The collection system is comprised of approximately 25.0kms of sanitary sewage collection piping and force mains of various sizes, with approximately 1585 service connections, three sanitary lift stations and one main pumping station. The treatment system is a conventional facultative lagoon system comprised of an aeration cell, coagulant addition for phosphorous removal, three treatment cells, that run-in series, and a disinfection and de-chlorination chamber. The wastewater is aerated before entering the first treatment cell, where it is treated through natural biological means. When the wastewater leaves the third treatment cell it is disinfected with sodium hypochlorite then dechlorinated with sodium bisulfate prior to discharge into the unnamed drain, which flows north-east prior to entering the Delisle River.

B. Performance Assessment

Summary and interpretation of all influent and imported sewage, monitoring data, and a comparison to the effluent limits outlined in condition 7, including an overview of success and adequacy of works.

During the 2024 calendar year 1,391,607 m^3 of raw untreated sewage was directed towards the Alexandria Lagoon Treatment Facility, based on the metered effluent flows from the main pumping station. This raw sewage is mainly comprised of residential and commercial waste from the town of Alexandria, as well as septage from the seasonal RV dumping station, and 779m^3 of leachate from the Alexandria Waste Disposal Site. There were no noted incidents of surface water from the Garry River system entering the wet well of the main station during this reporting period. Flow trending throughout 2024 was observed to be 8% lower than the previous year's total flow, but the overall daily average flow did exceed the rated capacity for the site, see Figure 1 below.

Figure 1: 5-yr Main Station Flow Comparison



The RV dumping station is located upstream from a sewage lift station on the northwest side of Alexandria. It is only in service between May 15 and October 15 annually and is comprised of a concrete dump area as well as access to wash water, if required. The landfill leachate was deposited upstream from the Main Pumping Station between April 11-April 25. Quality monitoring of the leachate started in 2021, and sampling is completed on raw leachate during hauling, as per the frequencies set out in the ECA. Results from 2021 through 2023 indicated little change to the leachate strength during the spring program, see Table 1 below for all results.

Table 1: 5-year Imported Leachate Result Comparison (Schedule D):

Parameter	Imported Sewage Annual Average Concentration				
	2020	2021	2022	2023	2024
BOD_5	No Sampling	3 mg/L	3 mg/L	No Hauling	4 mg/L
TSS	No Sampling	3 mg/L	5 mg/L	No Hauling	4 mg/L
TP	No Sampling	0.08 mg/L	0.02 mg/L	No Hauling	0.03 mg/L
TKN	No Sampling	11.6 mg/L	16.6 mg/L	No Hauling	21.2 mg/L
Boron	No Sampling	0.825 mg/L	0.837 mg/L	No Hauling	0.383 mg/L
Cobalt	No Sampling	0.005 mg/L	0.0006 mg/L	No Hauling	0.0007 mg/L
Magnesium	No Sampling	16.8 mg/L	17.2 mg/L	No Hauling	13.3 mg/L
Manganese	No Sampling	0.058 mg/L	0.069 mg/L	No Hauling	0.115 mg/L
Potassium	No Sampling	20.7 mg/L	18.7 mg/L	No Hauling	12.4 mg/L
Strontium	No Sampling	0.740 mg/L	0.773 mg/L	No Hauling	0.817 mg/L
Bis (2-ethylhexyl) Phthalate	No Sampling	< 5 µg/L	5 µg/L	No Hauling	< 5 µg/L

i. Raw Influent Sewage

The influent sewage was sampled on a monthly basis and when compared to previous years, the influent sewage strength is comparable, which indicates no significant changes or abnormal discharges into the collection system.

Table 2: 5-year Influent Sewage Sampling Result Comparison (Schedule D):

Parameters	Influent Sewage Annual Average Concentration				
	2020	2021	2022	2023	2024
BOD_5	160 mg/L	116 mg/L	108 mg/L	90 mg/L	93.5 mg/L
TSS	300 mg/L	269 mg/L	306 mg/L	209 mg/L	169 mg/L
TP	3.33 mg/L	3.25 mg/L	3.11 mg/L	2.70 mg/L	2.61 mg/L
TKN	20.80 mg/L	20.65 mg/L	20.76 mg/L	16.94 mg/L	18.98 mg/L

ii. Aeration Outfall

The aeration outfall was sampled weekly and monthly, as per the minimum requirements per parameter. When the results were compared to previous years, apart from 2023, which indicates no significant changes or treatment shortfalls.

Table 3: 5-year Aerated Cell Effluent Sampling Result Comparison (Schedule D):

Effluent Parameter	Aerated Cell Annual Average Concentration				
	2020	2021	2022	2023	2024
$CBOD_5$	21 mg/L	16 mg/L	15 mg/L	15 mg/L	12 mg/L
TSS	70 mg/L	83 mg/L	117 mg/L	92 mg/L	81 mg/L
TP	1.36 mg/L	1.64 mg/L	2.41 mg/L	2.13 mg/L	1.84 mg/L
Total Ammonia (N)	9.73 mg/L	8.53 mg/L	8.62 mg/L	4.91 mg/L	7.00 mg/L

Effluent Parameter	Aerated Cell Annual Average Concentration				
	2020	2021	2022	2023	2024
Nitrite	0.26 mg/L	0.65 mg/L	0.98 mg/L	1.11 mg/L	0.50 mg/L
Nitrate	1.97 mg/L	4.02 mg/L	2.49 mg/L	4.19 mg/L	3.03 mg/L
pH	7.59	7.56	7.66	7.57	7.64
Temperature	11.6℃	12.7℃	11.5℃	12.5℃	13.4℃

iii. Discharge Effluent

The final effluent discharge was sampled and tested on a weekly frequency, as per the ECA minimum requirements. Overall, the system operated very well throughout 2024 and all calculated annual averages were found to be well below all Provincial ECA Design Objectives, Effluent Compliance Limits and Federal Wastewater Systems Effluent Limits. As an effort to review the characteristic and historical trending of sewage concentration and treatment efficiency, 5-year sampling comparisons were tabulated below and when compared, treatment efficiencies have slowly improved over time. Please refer to section H and Appendix A for further discussion on 2024 results.

Table 4: 5-year Final Effluent Sampling Sewage Comparison (Schedule D):

Effluent Parameter	Lagoon Effluent Annual Average Concentration				
	2020	2021	2022	2023	2024
$CBOD_5$	7.2 mg/L	3.3 mg/L	3.7 mg/L	3.8 mg/L	3.8 mg/L
TSS	9.9 mg/L	4.7 mg/L	6.5 mg/L	6.0 mg/L	4.2 mg/L
TP	0.22 mg/L	0.15 mg/L	0.19 mg/L	0.14 mg/L	0.13 mg/L
Total Ammonia (N)	6.39 mg/L	4.83 mg/L	4.79 mg/L	2.91 mg/L	3.7 mg/L
TKN	8.84 mg/L	7.15 mg/L	7.34 mg/L	4.73 mg/L	5.01 mg/L
Nitrite	0.13 mg/L	0.12 mg/L	0.15 mg/L	0.06 mg/L	0.09 mg/L
Nitrate	0.67 mg/L	0.45 mg/L	0.29 mg/L	0.43 mg/L	0.54 mg/L
E. Coli *(geometric mean density)*	0 cfu/100mL	1.3 cfu/100mL	2.0 cfu/100mL	2.0 cfu/100mL	1.0 cfu/100mL
Total Chlorine Residual	0.01 mg/L	0.00 mg/L	0.00 mg/L	0.00 mg/L	0.00 mg/L
Dissolved Oxygen	7.95 mg/L	9.16 mg/L	8.15 mg/L	8.58 mg/L	8.15 mg/L
pH	7.49	7.80	7.64	7.62	7.74
Temperature	9.5℃	11.4℃	12.6℃	11.3℃	12.6℃
Un-ionized Ammonia	0.25 mg/L	0.07 mg/L	0.05 mg/L	0.06 mg/L	0.04 mg/L

C. Groundwater Monitoring

Summary and interpretation of all ground water monitoring data

A groundwater monitoring plan was prepared in 2012 by McIntosh Perry and submitted to the MECP. Based on the site elevations and site monitoring it was determined that the groundwater flow is north-east through the site and as such two monitoring wells installed and developed on March 5, 2013, one upgradient (Well 1) and one downgradient (Well 2). Background sampling was completed by Waterworks staff on March 6, 2013 and are currently used to compare current sampling to determine potential impacts.

Operational staff sampled both wells on March 12 and it was found that the results were similar to previous findings, which furthers the belief that there are limited to no major impacts to the downstream areas. There was a noted increase in upstream nitrate and TKN, but no other parameters were elevated. It should be noted the total ammonia was inadvertently left off sampling request, but historically the downstream samples have been gradually increasing since 2017. Please refer to Table 5 below for summary and Appendix D for full summary of results.

Figure 2: Groundwater Wells Locations and Site Layout

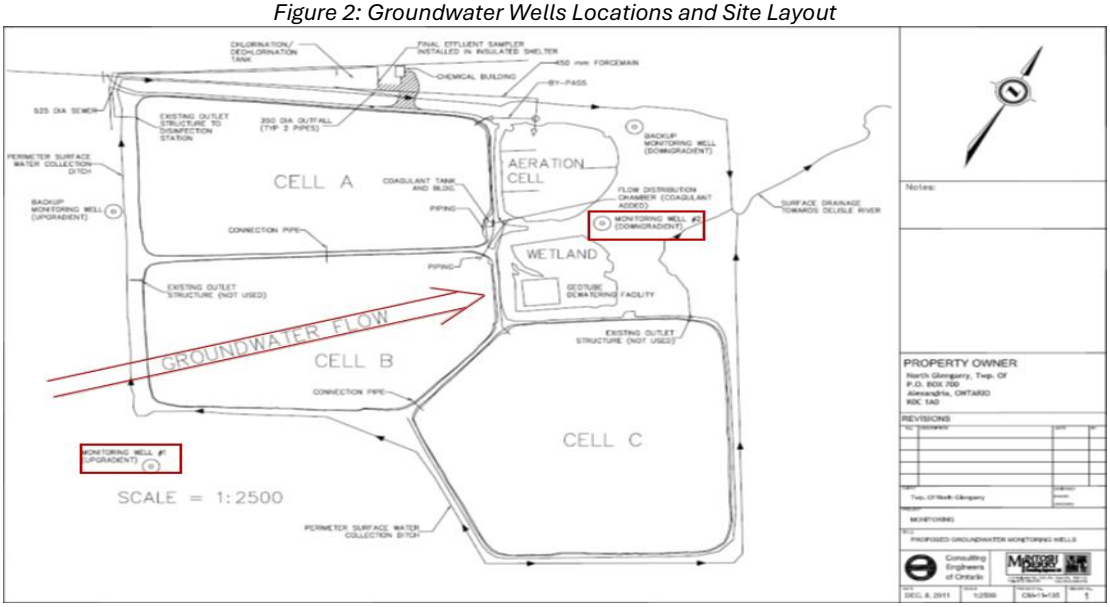


Table 5: Groundwater Monitoring Well Sampling Program:

Parameter	Monitoring Well #1		Monitoring Well #2	
	Background results (March 6, 2013)	2024 Sampling Results (March 12, 2024)	Background results (March 6, 2013)	2024 Sampling Results (March 12, 2024)
TOC	8 mg/L	8.8 mg/L	15.2 mg/L	5.9 mg/L
TP	3.8 mg/L	1.4 mg/L	0.47 mg/L	0.21 mg/L
TKN	0.83 mg/L	2.00 mg/L	1.12 mg/L	0.60 mg/L
Total Ammonia (N)	< 0.01 mg/L	n/a	0.22 mg/L	n/a
Nitrite	< 0.1 mg/L	< 0.05 mg/L	0.5 mg/L	< 0.05 mg/L
Nitrate	< 0.1 mg/L	1.22 mg/L	<0.1 mg/L	0.37 mg/L
E. coli	<2 cfu/100 mL	0 /100 mL	<2 cfu/100 mL	0/100 mL

D. Operational Problems

Description of any operating problems encountered, and corrective actions taken.

Collection System:

- Float issues that cause pump cycle issues.
  - Replace defective float to return to normal operations.
  - Clean or adjust floats as required.
- Pump operation issues or failures.
  - Reset, reverse, or pull pump to remove debris from impeller and restore operations.
  - Replace defective pump with new unit, due to impeller issues.
  - Replace defective pump panel contactors.
  - Hydro One adjusted utility line connections due to on-going electrical issues.
- Alarm panel failure to communicate.
  - Replaced defective fuse to restore power to electrical outlet.

Treatment System:

- Aerator Failure
  - Replaced defective coupler and restore operations.
  - Replace defective motor and repair to wiring short.

- Reversed rotation to remove debris from impellers.
- Unit failed due to defective gearbox.

- Chemical dosage pump issue or loss of dosing.
  - Chemical leak from dosing pump.
    - switch over to back-up pump to maintain operations.
    - pump removed and repaired before reinstallation and placed back into service.
  - Electrical failure due to pump being submerged.
    - Remove defective pump and replace it with spare unit.
- Unplanned utility power failure
  - Hydro One repaired replaced the damaged hydro pole to restore utility power.
    - generator installed to maintain chemical dosing operations until repairs are completed.
  - Transformers were replaced due to imminent upgrades.
    - generator installed to maintain chemical dosing operations until repairs are completed.
- Coagulant building sump pump replacement due to intermittent building flooding.
  - foot valve found to be defective causing groundwater backup
  - adjust float, replace foot valve and fix piping.

E. Maintenance

Summary of all maintenance carried out on any structure, equipment, apparatus, mechanism, or thing forming part of the works.

Collection System:

- Preventative Maintenance Program.
  - schedule and forms at all stations, as required.
  - tasks completed as scheduled.
- Monthly pest control at various sites.
- Bi-annual calibration of all gas monitoring equipment.
- Hydro meter replaced by Hydro One
- Annual level monitoring and flow measurement calibrations.

Treatment System:

- Preventative Maintenance program
  - schedule and forms at all stations, as required.
  - tasks completed as scheduled.
- Monthly pest control.
- Annual analyzers, level monitoring and flow measurement calibrations.

F. Effluent Quality Control and Assurance

Summary of any effluent quality assurance or control measures undertaken in the reporting period.

All parameter sampling was performed within provincial and federal guidelines by licensed operational staff, as per internal SOP. Staff are internally trained to ensure techniques and procedures are followed and testing is performed.

Effluent quality control and assurance measures were undertaken by the accredited certified laboratories, Caduceon Environmental and AGAT, who are contracted to complete all sample analysis for the Township of North Glengarry.

G. Flow Measurement and Equipment Calibration

Summary of the calibration and maintenance carried out on all effluent monitoring equipment.

Annual calibrations on the detection units (pumping station level indicators and chemical tank level indicators), and flow sensing devices (magmeter, miltronics, etc.) were completed by St- Laurent Instrumentation between November 2024. All handheld and benchtop analyzers were calibrated by ClearTech in July 2024. No issues were noted in regard to the operation of the equipment.

H. Effluent Objectives

Description of effort made, and results achieved in meeting the effluent objectives of condition 6.

The wastewater sewage works ECA is conditional on proposed system upgrades and contains descriptions and provisions for existing and post-construction works. At this time, no construction has been started or completed, so the effluent design objectives and limits have not transitioned from the "prior to completion of construction" values found in schedule B and Schedule C.

Monthly discharge effluent monitoring showed that the effluent design objectives and limits were met and greatly exceeded during this reporting period. Table 6 shows a monthly summary of these parameters. Please refer to Appendix A for a full summary of flows, sampling quality analysis for the Alexandria Sewage Treatment Works. All municipal utility monitoring program reports were sent to the environmental monitoring and reporting branch of the Ministry of the Environment electronically for each month.

Table 6: Monthly Average Final Effluent Sampling Summary

	$CBOD_5$ (mg/L)	TSS (mg/L)	TP (mg/L)	Total Chlorine Residual (mg/L)	pH		E. Coli *(geometric mean density)* (organisms/100 mL)
					Min	*Max*	
Concentration Limits	*30*	*40*	*0.5 mg/L*	*0.02 mg/L*	*6.0*	*9.5*	*< 200*
Concentration Objective	*25*	*25*	*0.4 mg/L*	*non-detect*	*6.5*	*8.5*	*< 150*
January	4.3	5.0	0.1	0.00	7.2	8.1	1.0
February	8.0	8.3	0.2	0.00	7.3	8.2	1.0
March	6.0	6.5	0.2	0.00	8.0	8.2	7.0
April	3.0	3.8	0.2	0.00	6.9	8.3	1.0
May	3.0	3.5	0.2	0.00	7.4	7.9	1.0
June	3.0	3.3	0.1	0.00	7.4	9.1	1.4
July	3.0	4.0	0.1	0.00	7.5	8.1	1.7
August	3.0	3.5	0.1	0.00	7.5	7.7	1.2
September	3.0	3.2	0.1	0.00	6.2	8.9	1.0
October	3.0	3.0	0.1	0.00	7.4	8.5	1.0
November	3.0	3.3	0.1	0.00	7.4	7.8	1.0
December	3.6	4.0	0.1	0.00	7.2	8.0	1.0

Quarterly monitoring included acute lethality for rainbow trout and daphnia, as per Federal WSER and Provincial ECA requirements. All samples were found to not be acutely lethal, and no additional sampling was required during this reporting period.

Table 7: Acute Lethality Testing Summary

Date	Rainbow Trout Lethality Result (%)	Comment	Daphnia Lethality Result (%)	Comment
17-Jan-2024	10	Pass	0	Pass
29-Apr-2024	0	Pass	0	Pass
23-Jul-2024	0	Pass	20	Pass
23-Oct-2024	0	Pass	0	Pass

Additional quarterly monitoring has been undertaken by the Water Works Department since 2019, due to previous adverse results consistently noted under ice cover. In response to this event, a technical memo was prepared by McIntosh Perry in consultations with Wood Environment & Infrastructure Solutions and sent to Environment Canada in June. The recommended actions included continued testing for lethality, metals, inorganic and VOC sampling quarterly until upgrades are completed and commissioned.

The summary in Table 8 below lists all results that exceeded the Provincial Water Quality Objectives. As per the technical memo, the parameters listed do not appear to cause lethality, as most results were lower than 2019 values and lethality was not observed during the testing periods. It is believed that treatment short-circuiting occurred through the aeration chamber and intermittent aerator failures attributed to the previous exceedances. Measures have been put into place to prevent the short circuiting until repairs can be completed.

Table 8: Additional Metal, Inorganic and VOC Elevated Results

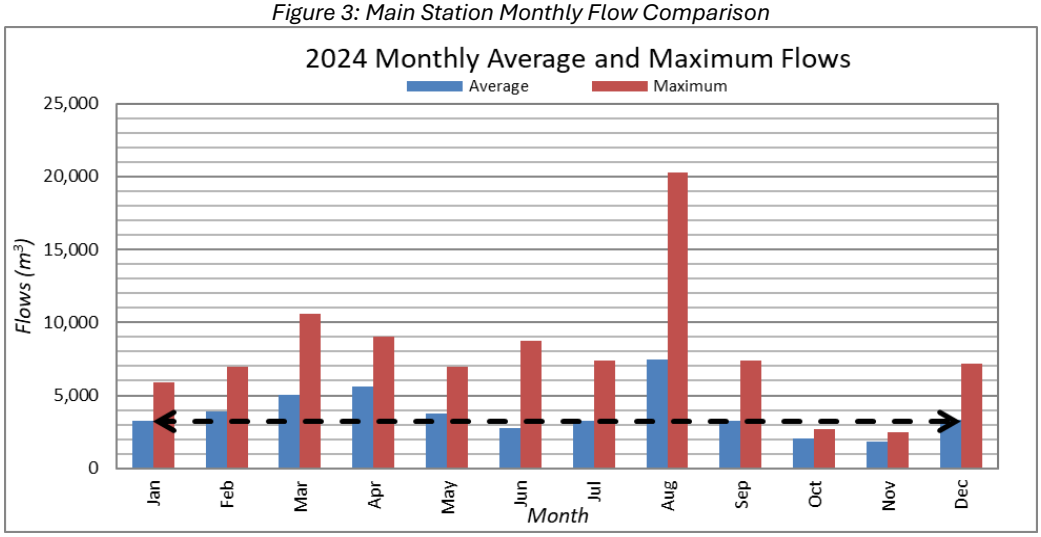
Parameter	Last Adverse		Full Annual Result (mg/L)				
	Date	Result	PWQO Standard	Q1	Q2	Q3	Q4
Un-Ionized Ammonia (mg/L)	23-Oct-2024	**0.0313**	0.02	0.0156	**0.0750**	0.00308	**0.0313**
Total Copper (mg/L)	23-Jul-2024	**0.008**	0.005 mg/L	0.003	0.003	**0.008**	< 0.002
Total Cadmium	29-Apr-2024	**0.0003**	0.0002	< 0.0001	**0.0003**	< 0.0001	< 0.0001
Toluene (µg/L)	28-Oct-2022	**2.01**	0.8	0.30	< 0.20	< 0.20	< 0.20
Total Silver (mg/L)	19-Jan-2022	**0.0002**	0.0001 mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Total Zinc (mg/L)	19-Jan-2022	**0.050**	0.03 mg/L	0.029	< 0.020	< 0.020	< 0.020
Total Cobalt (mg/L)	17-Mar-2021	**0.0014**	0.0009 mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Total Phosphorus (mg/L)	04-Mar-2020	**0.31**	*	0.08	0.14	0.28	0.12
Dissolved Aluminum (mg/L)	22-Apr-2020	**0.078**	0.075 mg/L	0.038	0.025	0.07	0.101

*Interim standard at this time, evidence is insufficient to develop a firm objective general guideline established

There were no reports made in regard to floating or settleable solids or that the wastewater contained oil or any other substance that created a visible film, sheen, foam, or discolouration to the receiving waters.

Annual flow summaries indicate a calculated average daily flow of 3,798m^3/day, which represents 117% of the total rated capacity for this facility, which is out of compliance. The flows have decreased 8% from the previous year, which is the first decreasing in the last 4 years, despite continued efforts to reduce infiltration and inflow. The observed maximum daily flow for the year was reported to be 20,271m^3/day, which was reported in August following a major rain event. Other impacting factors to flows were Spring Peak Melt (April), and seven significant rain events that exceeded a daily total of 25mm in May, Jun (x3), Jul (x2), and Aug. Please refer to figure 2 below and to Appendix A for a full summary of flows for the Alexandria Sewage Treatment Works.

Figure 3: Main Station Monthly Flow Comparison



I. Lagoon Cell Sludge Accumulation

Tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and summary of the locations to where the sludge was disposed.

A sludge management plan was created by McIntosh Perry and put into place in 2008. As part of monitoring methods, it is recommended sludge levels are to be collected annually by staff. The levels in all 3 cells were measured on October 11, 2024. Based on recorded values, the sludge levels have decreased 5.6% in cell A and 4.1% in cell C, but increased 0.1% in Cell B. The warning triggers for total sludge volume have been exceeded in Cell B and C, which is consistent with previous years observations.

Efforts to reduce sludge levels in Cell B were restarted in 2021 by Bishop Water, who were contracted for a multi-year Geotube® project, during this reporting period Bishop Water technicians were on-site from May 1 through May 17. Due to insufficient capacity in the original Geotube® units, three additional Geotube® units were installed to ensure needs were met during this phase of the project. Desludging Cell B was completed over six days and the total amount of solids removed was calculated to be 2,247.60m^3. Minimal amounts of dewatering were observed from the Geotube® units after the desludging period between May and October, nonetheless the water collected from the trench was recycled back into lagoon at Cell B via a small sump pump. The dewatering effluent quality was not analyzed nor was the pumped volume tracked.

Figure 4: Site Layout from Bishop Water Final Report
(Figure does not show second layer of Geotube® units as it would cover the same footprint as the base layer)

Table 9: Desludging Operation Summary

Week	BDT	Volume Pumped	Total Polymer Usage	Average Polymer Dosage
		m^3	L	kg/BDT
2024 Total	**109.36**	**2,719.62**	**1,312.79**	**2.27**
2022 Total	88.48	3,763.69	495.78	5.06

J. Complaints

Summary of any complaints received during the reporting period and any steps taken to address the complaints.

There were only about a dozen received complaints from homeowners, the majority of these complaints were in regard to sewer lateral back-up. In half the complaints, the issues were on the homeowner's side resulting in private contracted services for repair. The other half of the issues noted within municipal boundaries were caused by sewer main or lateral blockage and all issues were repaired by Water Works Staff in a timely manner and servicing was restored.

K. Bypass, Overflow, Spill, Abnormal Discharge Events

Summary of all bypasses, spills, or abnormal discharge events.

There were three primary overflow events reported during 2024. All events were observed on August 9 in the wastewater collection system at an identified overflow point or from a manhole just upstream from the trunk sewer main. The overflows coincided with a significant rain event and equipment failures. The overflows were reported to the EOHU and SAC, and samples were collected as per requirements and reports were submitted as required. The total annual volume for overflows was estimated to be 6,027.5m^3, with 4,821.5m^3 being metered and 1,206m^3 estimated. A summary of the report submission can be found on table below, please refer to Appendix C for an overflow breakdown and report.

Table 10: Collection System Overflow Report Submission Summary

# Event	Date	Reported to	Reference Number	Location
1	09-August-2024	☒ Ministry of Health ☒ Spills Action Center	1-9Q450P	Alexandria Main Pumping Station
2	09-August-2024	☒ Ministry of Health ☒ Spills Action Center	1-9QLSPY	MH-150 / MH-160 / MH-170
3	09-August-2024	☒ Ministry of Health ☒ Spills Action Center	1-9QMMN3	MH-120

Quarterly reports for bypasses and overflows are now required to be submitted to Ministry of the Environment inspector as per the ECA for the Wastewater Treatment Facility. No observances of bypass or overflow were observed during this period.

Table 11: Quarterly Bypass and Overflow Report from Alexandria Sewage Works

Quarter	Month	Year	By-Pass Occur	Overflow Occur	Submitted to MECP	Report Name
1	January-March	2024	N	N	15-Apr-2024	2024-ALX WWS-Bypass and Overflow_ Q1
2	April-June	2024	N	N	23-Jul-2024	2024-ALX WWS-Bypass and Overflow_ Q2
3	July- September	2024	N	N	12-Feb-2025	2024-ALX WWS-Bypass and Overflow_ Q3
4	October- December	2024	N	N	12-Feb-2025	2024-ALX WWS-Bypass and Overflow_ Q4

L. Other Items

Any other information the District Manager requires from time to time.

i. Additional Equipment Summary: EOS 2000

The date of installation and removal of the EOS-2000 unit within each unit

The EOS unit was not installed into the lagoon cells during this reporting period. No additional monitoring in regard to operations was completed.

ii. Authorized System Alterations Summary

A summary of all alterations within the reporting period as authorized by the ECA, including all alterations that pose a significant drinking water threat.

As per ECA 181-W601 schedule D, section 6.2.7 the proactive replacement of 3 manholes and associated inlet/outlet piping on Dominion St South and Derby St East were completed in June 2024. This work was completed in conjunction with the watermain replacement project, and each manhole was brought up to internal standards.

Work completed as repair/maintenance included multiple replacement of pump panel components due to electrical issues at the Leroux lift station, replacement of various floats used for station control at the Leroux lift station, and the replacement of a sewage pump at the Main Pumping Station due to damage impeller.

i. Collection System Inspection, Repair and Remediation to Reduce System Overflows

A summary of all works completed within the reporting period as authorized by the ECA, including all projects undertaken, PPCP updates and an assessment of the effectiveness of these actions.

Work to reduce infiltration and inflow was continued throughout this period. All of the Alexandria collection system was inspected through CCTV to identify system conditions and areas of inflow and infiltration. Through this inspection various areas of concern were identified such as damaged piping and defective lateral connections in areas of high groundwater. These issues were repaired through lining or replacement of main sections and grouting around laterals to prevent further inflow. It was also identified that the sanitary sewer overflow point MH-0170 sluice gate allowed surface water inflow when levels were above the sluice gate, which prompted repairs.

ii. Proposed Construction of Works Status Update

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

Proposed works were anticipated to be constructed and commissioned within 5 years of the issuance of the current ECA, dated February 2021. To date no construction or tenders for work have begun, but the Housing-Enabled Water Systems Fund grant was obtained by the Township to aid in the eligible costs for the expansion of the Alexandria Lagoons.

As per the ECA conditions, notification to the District Manager must be completed on project start-up, commissioning and final completion. If the proposed work is delayed beyond the ECA expiry, notice must be provided no later than 6 months before expiry to the District Manager for approval amendment, with rational for delay and any proposed design changes.

iii. Sampling Scheduling Summary and Deviations

A summary of any deviation from the monitoring schedule and reasons for the current reporting year and proposed future scheduling.

An internal weekly sampling schedule with sign-off is used to communicate all operational staff sampling requirements and timelines. All sampling requirements are reviewed annually to ensure scheduling is up to date and in-line with provincial and federal requirements.

As per the ECA requirement, the sampling date was rotated from Tuesday to Monday during the 2024 reporting period. Sampling dates were shifted 8 times due to statutory holidays and in each instance the

samples were taken on the next day, typically on a Tuesday and once on a Wednesday. The 2025 sampling period, the sampling date was shifted from Monday to Wednesday. This date was selected in coordination with lab sample submission timelines and sample date rotation from previous year sampling date as per ECA requirements.

NORTH GLENGARRY WATER WORKS

WASTEWATER TREATMENT WORKS PERFORMANCE RESULTS

Municipality: *North Glengarry* **Year:** *2024*

Project: *Alexandria STP* **Receiving Stream:** *Delisle River*

Description: *1 Pumping Station, 1 Aerated Cell, 3 Facultative Cells* **Design Capacity:** *3,237 m^3/day*

Continuous Discharge with Phosphorous Removal

MONTH	Flows			Biochemical O_2 Demand			Suspended Solids			Phosphorus		
	Total Flows (m^3)	Average Daily Flow (m^3)	Maximum Daily Flow (m^3)	Average Raw $CBOD_5$ (mg/L)	Average Effluent $CBOD_5$ (mg/L)	Percent Removal (%)	Average Raw SS (mg/L)	Average Effluent SS (mg/L)	Percent Removal (%)	Average Raw TP (mg/L)	Average Effluent TP (mg/L)	Percent Removal (%)
Jan	101,902	3,287	5,909	83.0	4.3	94.8	132.0	5.0	96.2	4.65	0.11	97.7
Feb	113,273	3,906	6,995	31.0	8.0	74.2	106.0	8.3	92.2	1.12	0.20	82.4
Mar	156,619	5,052	10,623	89.0	6.0	93.3	226.0	6.5	97.1	1.99	0.17	91.3
Apr	168,382	5,613	9,050	71.0	3.0	95.8	154.0	3.8	97.5	1.73	0.19	89.0
May	116,503	3,758	6,937	48.0	3.0	93.8	39.0	3.5	91.0	1.04	0.16	84.4
Jun	82,073	2,736	8,748	140.0	3.0	97.9	310.0	3.3	99.0	3.66	0.09	97.5
Jul	102,103	3,294	7,402	37.0	3.0	91.9	34.0	4.0	88.2	1.15	0.10	91.1
Aug	231,317	7,462	20,271	22.0	3.0	86.4	17.0	3.5	79.4	0.47	0.11	76.1
Sep	98,022	3,267	7,362	159.0	3.0	98.1	370.0	3.2	99.1	3.62	0.10	97.2
Oct	63,243	2,040	2,689	223.5	3.0	98.7	347.5	3.0	99.1	5.92	0.09	98.5
Nov	55,370	1,846	2,488	38.0	3.0	92.1	57.0	3.3	94.3	1.44	0.10	93.1
Dec	102,801	3,316	7,201	51.0	3.6	92.9	56.0	4.0	92.9	1.21	0.15	87.8
Total	**1,391,607**											
Average		**3,798**		**82.7**	**3.8**	**92**	**154.0**	**4.3**	**94**	**2.33**	**0.13**	**90**
Minimum												
Maximum			**20,271**									
Criteria		***3,237***			***30***			***40***			***0.50***	

NORTH GLENGARRY WATER WORKS

WASTEWATER TREATMENT PERFORMANCE RESULTS

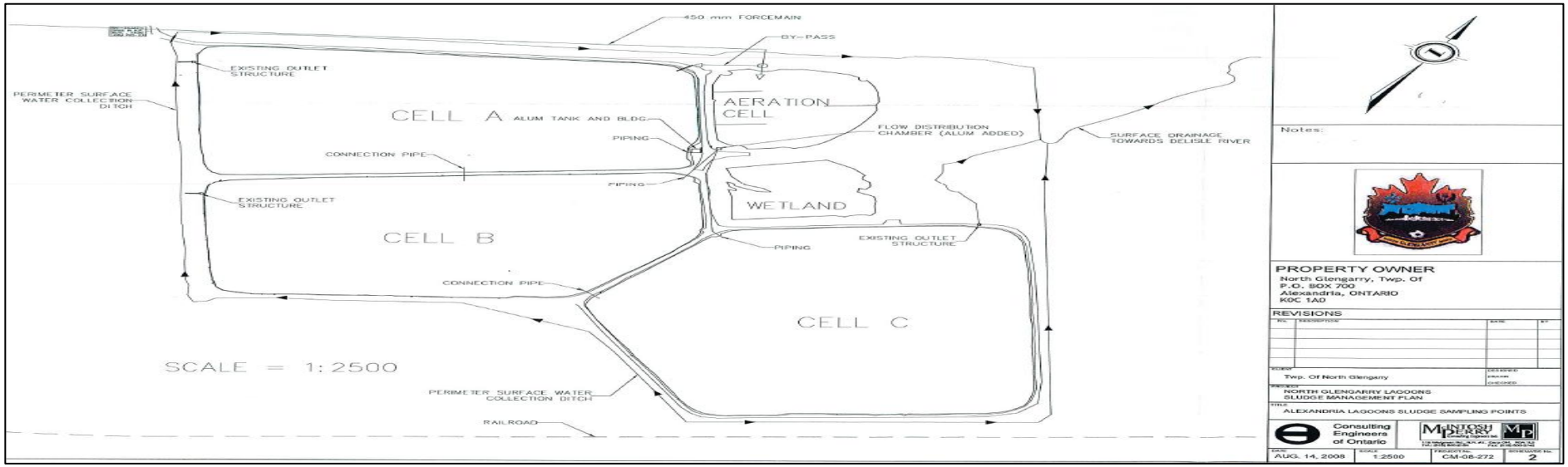
2024

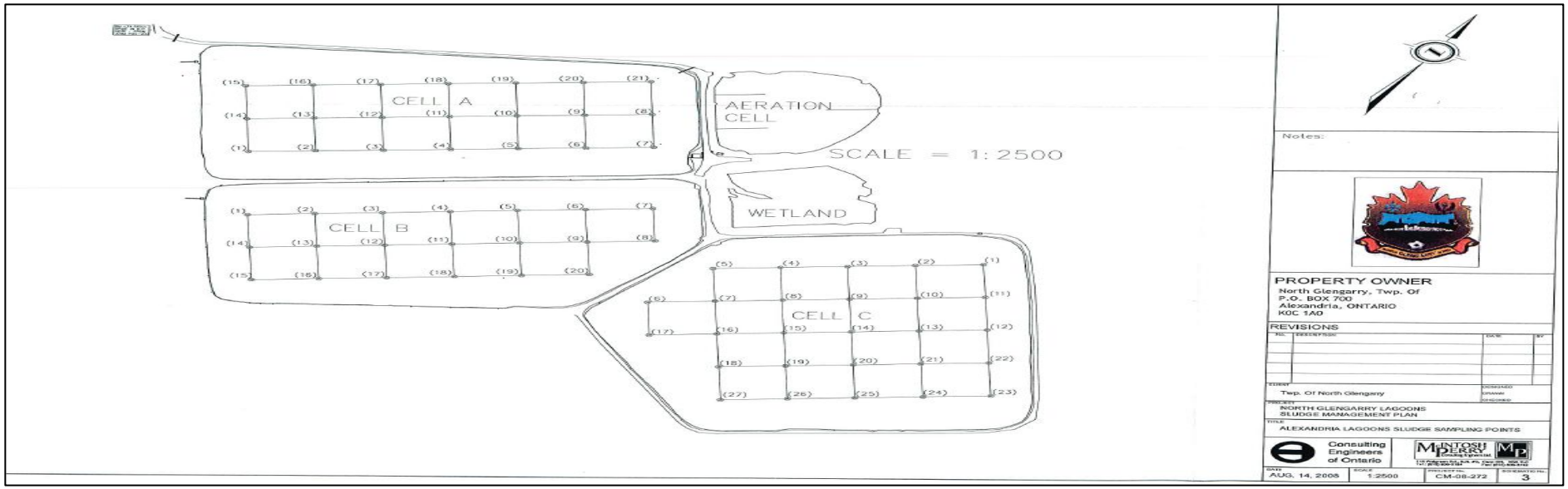
MONTH	Ammonia			TKN			Nitrite			Nitrate		
	Average Raw Ammonia (mg/L)	Average Effluent Ammonia (mg/L)	Percent Removal (%)	Average Raw TKN (mg/L)	Average Effluent TKN (mg/L)	Percent Removal (%)	Average Raw Nitrite (mg/L)	Average Effluent Nitrite (mg/L)	Percent Removal (%)	Average Raw Nitrate (mg/L)	Average Effluent Nitrate (mg/L)	Percent Removal (%)
Jan	n/a	5.75		33.00	7.50	77.3	n/a	0.05		n/a	1.1	n/a
Feb	n/a	7.64		8.00	10.70	-33.8	n/a	0.08		n/a	0.6	n/a
Mar	n/a	5.78		9.90	8.43	14.9	n/a	0.06		n/a	0.7	n/a
Apr	n/a	6.38		9.80	7.68	21.6	n/a	0.05		n/a	0.4	n/a
May	n/a	5.57		11.60	5.18	55.4	n/a	0.21		n/a	0.5	n/a
Jun	n/a	0.28		23.20	1.23	94.7	n/a	0.13		n/a	0.4	n/a
Jul	n/a	0.52		12.60	2.10	83.3	n/a	0.19		n/a	0.5	n/a
Aug	n/a	0.67		4.90	1.98	59.7	n/a	0.06		n/a	0.2	n/a
Sep	n/a	0.62		17.80	1.34	92.5	n/a	0.07		n/a	0.3	n/a
Oct	n/a	0.66		38.10	1.45	96.2	n/a	0.05		n/a	0.4	n/a
Nov	n/a	2.34		20.80	3.13	85.0	n/a	0.10		n/a	0.6	n/a
Dec	n/a	7.15		19.00	8.30	56.3	n/a	0.05		n/a	0.8	n/a
Total												
Average		3.61		17.39	4.92	59		0.09			0.52	
Minimum												
Maximum												
Criteria												

NORTH GLENGARRY WATER WORKS
WASTEWATER TREATMENT PERFORMANCE RESULTS
2024

MONTH	Hydrogen Sulphide			E. coli			pH			Temp	Cl_2
	Average Raw H_2S (mg/L)	Average Effluent H_2S (mg/L)	Percent Removal (%)	Average Raw E. coli (cts/100ml)	Average Effluent E. coli (cts/100ml)	Percent Removal (%)	Minimum Effluent pH	Average Effluent pH	Maximum Effluent pH	Average Effluent Temp (°C)	Average Effluent Cl_2 (mg/L)
Jan	n/a	n/a		n/a	1.00		7.18	7.50	8.07	3.53	0.00
Feb	n/a	n/a		n/a	1.00		7.29	7.60	8.22	6.48	0.00
Mar	n/a	n/a		n/a	7.01		7.99	8.09	8.20	5.45	0.00
Apr	n/a	n/a		n/a	1.00		6.93	7.89	8.32	10.43	0.00
May	n/a	n/a		n/a	1.00		7.41	7.63	7.88	19.53	0.00
Jun	n/a	n/a		n/a	1.41		7.38	8.54	9.06	20.95	0.00
Jul	n/a	n/a		n/a	1.70		7.49	7.75	8.07	21.17	0.00
Aug	n/a	n/a		n/a	1.19		7.46	7.55	7.66	22.63	0.00
Sep	n/a	n/a		n/a	1.00		6.23	7.44	8.87	20.00	0.00
Oct	n/a	n/a		n/a	1.00		7.10	7.70	8.54	12.22	0.00
Nov	n/a	n/a		n/a	1.00		7.44	7.58	7.75	7.65	0.00
Dec	n/a	n/a		n/a	1.00		7.19	7.60	8.00	3.56	0.00
Total											
Average					1.3			7.62		13.06	0.00
Minimum							6.23				
Maximum					7.0				8.68	26.80	0.00
Criteria					***200***		***6.0***	***6.5 - 8.5***	***9.5***		***0.02***

Sludge Monitoring Points Identification





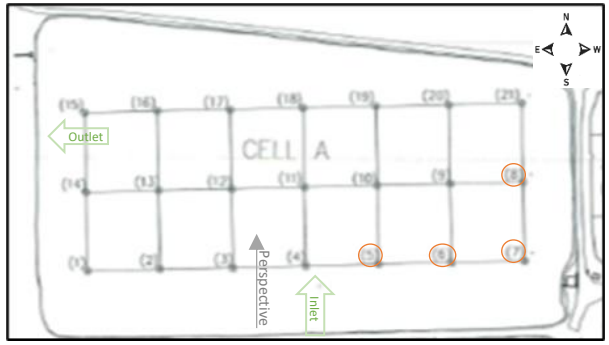
Sludge Sampling Point Volume Index

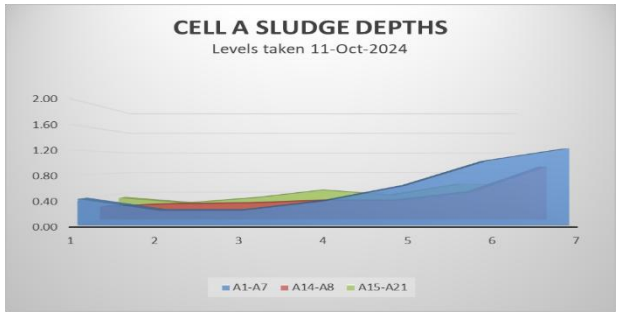
Date	Cell A- Sample Point Sludge Volume m^3																											Total Sludge Volume (m^3)	Warning Trigger	Sludge Volume %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21									
05-Jun-20	1236	927	876	1520	1132	2309	3013	3404	709	972	668	466	770	837	1599	1173	1238	1049	1021	1240	1189								27347		52.2
28-Oct-20	670	1271	743	1127	1395	1784	3794	631	466	628	466	304	405	972	1487	864	634	655	902	1667	793								21660		41.3
11-Nov-22	787	742	1142	865	1264	2047	3710	2548	770	466	871	162	446	724	1190	1173	922	1520	1258	1560	1941								26104		49.8
13-Oct-23	933	583	1009	1520	2317	2047	3850	2322	1175	972	567	770	243	837	1562	988	1094	1389	285	1560	1523								27544		52.5
15-Apr-24	1399	609	1009	1127	1553	1915	1311	969	1073	668	466	567	567	520	1004	556	662	603	546	1026	459								18611		35.5
11-Oct-24	1224	609	611	996	1658	2703	3431	2097	972	668	668	567	547	497	1190	679	922	1232	878	1240	1189								24579		46.9
Date	Cell B- Sample Point Sludge Volume m^3																											Total Sludge Volume (m^3)	Warning Trigger	Sludge Volume %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20										
04-Jun-20	2048	1792	2109	2892	4296	3271	4244	2987	1883	2491	2045	1053	749	1627	1348	1007	1691	2162	2370	2220									44286	Total Sludge Volume High	86.9
28-Oct-20	1897	2076	2419	2274	3959	4047	4244	2717	2288	1316	1114	1175	810	1236	1152	1367	2549	2303	2963	4718									46625	Total Sludge Volume High	91.5
04-Nov-22	2349	512	928	2892	4296	4518	4563	1078	1377	1377	1175	1073	567	1236	2010	1727	1509	2050	1467	1789									38493	Total Sludge Volume High	75.5
13-Oct-23	2319	1422	2897	2892	4072	4103	4084	2313	2693	2592	1377	1762	1154	1453	1642	1247	1353	1460	1044	1419									43298	Total Sludge Volume High	85.0
15-Apr-24	663	1792	2194	2331	1011	2717	1149	943	2410	2410	770	1377	1073	1019	1912	1871	1639	2050	1495	2220									33044	Total Sludge Volume High	64.9
11-Oct-24	2470	1934	2025	2611	3594	3410	4084	2425	2592	2390	1256	1458	1154	1453	1520	1487	1483	1320	2031	2683									43380	Total Sludge Volume High	85.1
Date	Cell C- Sample Point Sludge Volume m^3																											Total Sludge Volume (m^3)	Warning Trigger	Sludge Volume %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27			
04-Jun-20	3578	3097	4276	5424	4920	2558	1883	1235	1377	1114	1867	3910	1073	1013	1175	2592	2174	2902	972	1073	972	1767	2836	1523	1624	1751	2911	61595	Total Sludge Volume High	93.1
28-Oct-20	3361	3041	3046	3819	4248	2105	2187	1377	1276	871	1603	713	1377	466	830	1681	1181	1573	1215	972	871	702	1128	1318	1367	1176	1349	44854	Total Sludge Volume High	67.8
11-Nov-22	3516	3990	3940	4373	4248	2784	2086	1580	1883	1478	2262	1577	851	851	1377	2086	3142	2727	1175	972	972	2086	2073	1816	1054	2681	2024	59602	Total Sludge Volume High	90.1
13-Oct-23	3516	3013	3018	4373	4785	2988	1478	1073	1276	1580	1691	1793	1154	851	1154	1559	2528	2517	1175	648	1175	2512	2683	1816	1624	1833	3657	57469	Total Sludge Volume High	86.9
11-Oct-24	2240	3711	4136	4788	4382	3237	2693	1681	1580	1478	1713	2009	851	1276	1580	1357	2552	1993	648	0	1478	1980	2683	1084	-456	1696	2379	54746	Total Sludge Volume High	82.8

Note: if a Sample Point Volume or the Total Sludge Volume is underlined, this signifies that the volume of sludge in that section is high and action might be required to obtain a uniform distribution.

Sludge Volume Profile

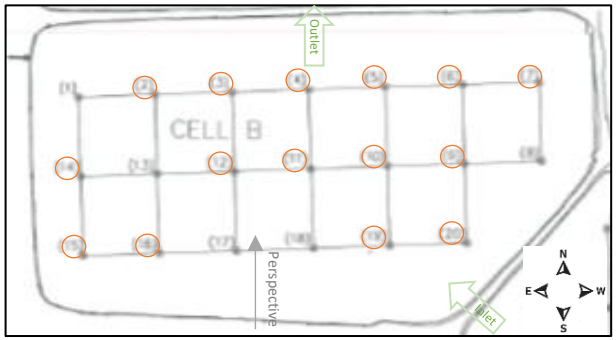
CELL A

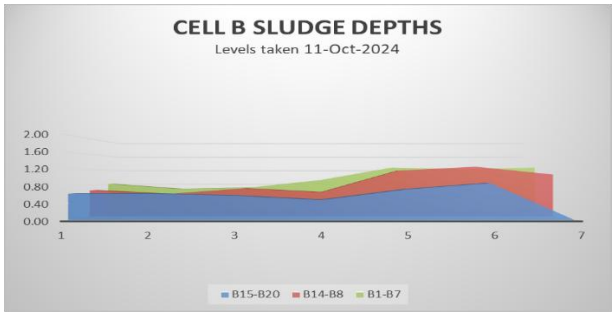




- Last depth reading: October 11, 2024.
- Cell volume is calculated to be 46.9%.
- Sludge volume decreased 5.6% from Fall 2023 value.
- 4 locations exceeded trigger levels:
  - 5,6,7,8
- Highest volume noted in south-west corner of cell.

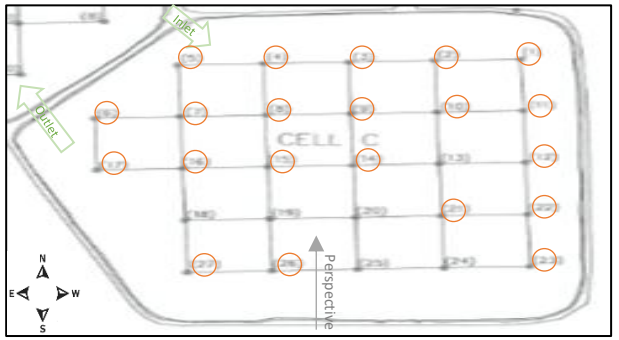
CELL B

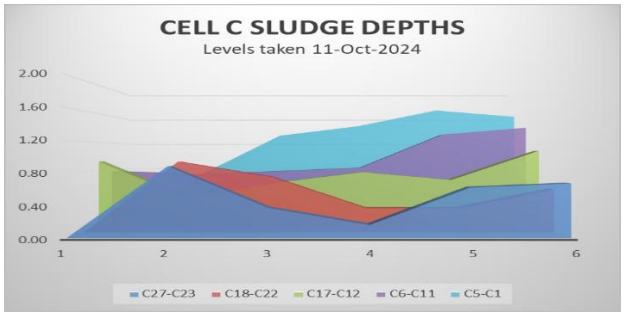




- Last depth reading: October 11, 2024.
- Cell volume calculated to be 85.1%.
- Sludge volume increased 0.1% from Fall 2023 value.
- 16 locations exceeded trigger levels:
  - 2,3,4,5,6,7,8,9,10,11,12,14,15,16,19,20
- Highest volume located in north-east area of cell.

CELL C





- Last depth reading: October 11, 2024.
- Cell volume calculated to be 82.7%.
- Sludge volume reduced 4.1% from Fall 2023 values.
- 21 locations exceeded trigger levels:
  - 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14,15, 16, 17, 21, 22, 23, 26, 27
- Highest volume located in north-west corner of cell.

1.0- Provide the following information for each bypass that occurred at each sewage pumping station or treatment plant bypass location for the reporting year. Start with a new line for each event.

Facility Name: Alexandria WWTP
Report Year: 2024

Date	Location	Type [1]	Start Time	Duration	Volume	Disinfect [2]	Reason Code [3]	Sample Results			
dd-mmm-yyyy				Hrs	m^3			BOD_5 (mg/L)	SS (mg/L)	TP (mg/L)	E. Coli (mg/L)
09-Aug-24	Alexandria MPS (SSOP)	P	5:50	17.92	4821.5	N	1	20.0	138.0	0.8	1100000
09-Aug-24	MH150 (SSOP)	P	8:28	5.58	402.0	N	1	8	84	0.59	2700000
09-Aug-24	MH160 (SSOP)	P	8:28	5.58	402.0	N	1	33	142	1.41	870000
09-Aug-24	MH170 (SSOP)	P	8:28	5.58	402.0	N	1	8	58	0.35	800000
09-Aug-24	MH120	P	8:25	5.58	1206.0	N	1	6.0	37.0	0.7	25000

Comments Area for Pumping Stations and Plant Bypasses:

Type [1]		Disinfect [2]	Reason Code [3]
P: Primary	*the discharge of raw sewage subject to no treatment*	*Y: Yes*	*1: Heavy Precipitation*
S: Secondary	*excludes grit removal and/or chlorination*	*N: No*	*2: Snow Melt*
	the discharge of sewage that has undergone solids removal at the primary clarifiers but bypassed the secondary treatment process	*U: Unknown*	*3: Equipment Failure*
			4: Equipment Maintenance
			5: Sewer Problems
			6: Power Failure
			7: Exceed Design
			8: Other

2.0- Pumping Station and Plant Bypass Monthly Summary

Facility Name: Alexandria WWTP

Month	Primary Bypass			Secondary Bypass		
	No. of Days (days)	Duration (hours)	Volume (m^3)	No. of Days (days)	Duration (hours)	Volume ($1000m^3$)
January	0			0		
February	0			0		
March	0			0		
April	0			0		
May	0			0		
June	0			0		
July	0			0		
August	1	17.92	6027.5	0		
September	0			0		
October	0			0		
November	0			0		
December	0			0		
Total	1	17.92	6027.5	0	0	0

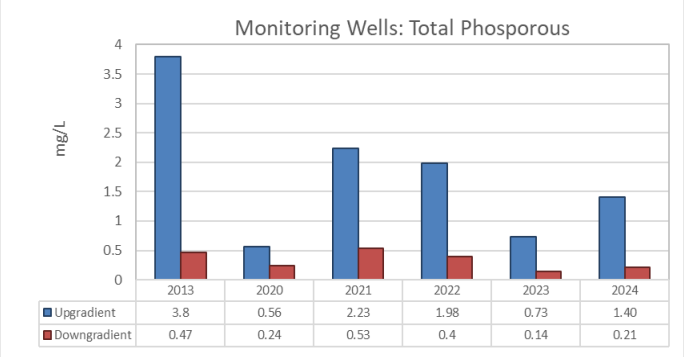
AADF: Annual Average Daily Flow | *% of AADF= ((Volume of Bypass/ADDF)/365)*100*

**AADF(m^3/d) = 3798*

Volume of Bypass as % of AADF* / Daily Flow = 0.43%

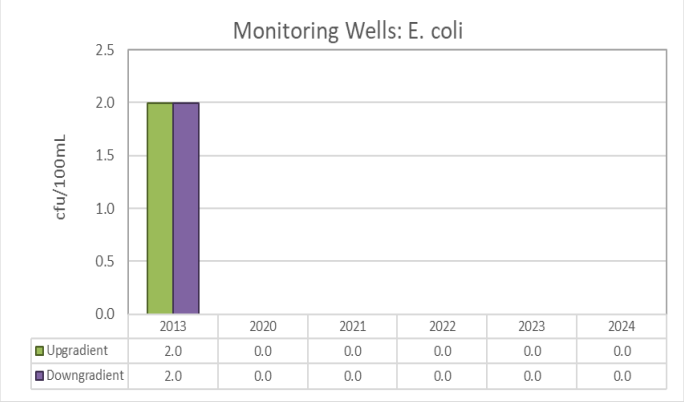
5-Year Groundwater Sampling Results Analysis

Prior to sampling both wells are purged of standing water through one of 3 methods, well hydraulic performance purge, field parameter monitoring or calculated well casing volume purge. Each well is equipped with an inertia pump/foot valve and poly tubing which extends from the top of the well to the bottom of the well casing. During Sampling operational staff are to ensure all required PPE is in place, all samples are to be collected in laboratory prepared sampling containers, and all samples are to be stored in coolers and delivered to laboratory for analysis. Charts below display the last 5 years and the original background sample, but all evaluations include results from 2013 through 2024.



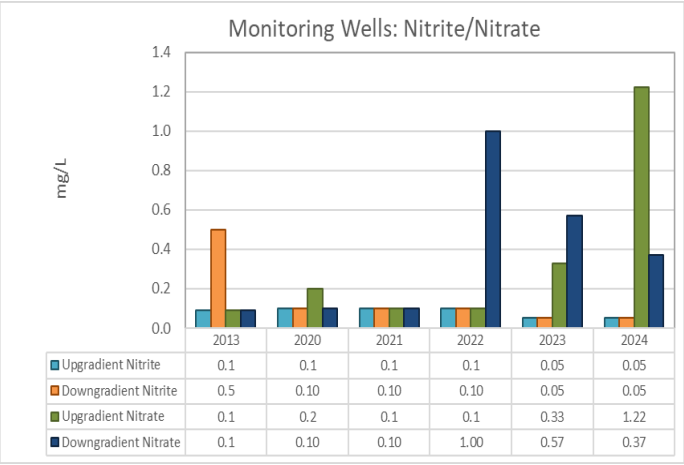
	2013	2020	2021	2022	2023	2024
Upgradient	3.8	0.56	2.23	1.98	0.73	1.40
Downgradient	0.47	0.24	0.53	0.4	0.14	0.21

- There is no standard or guideline for this parameter in the ODWS Table 2 Chemical Standards or Table 4 Objectives and Guidelines.
- Total Phosphorous in the downgradient well was found to be consistently lower than the result from the upgradient well
- Results would appear to indicate little to no impact from the lagoon system for this parameter.



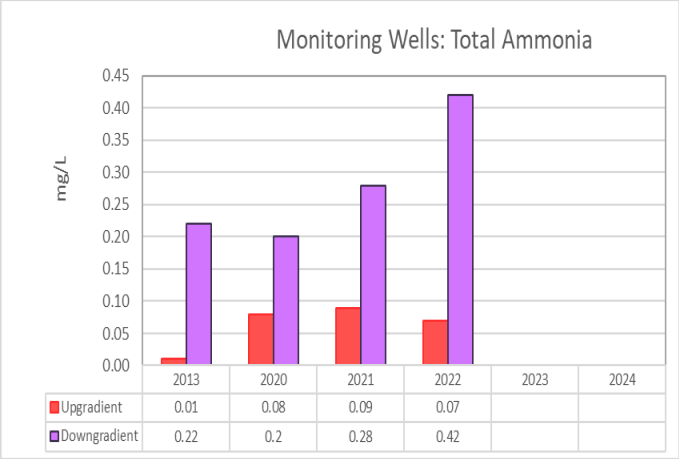
	2013	2020	2021	2022	2023	2024
Upgradient	2.0	0.0	0.0	0.0	0.0	0.0
Downgradient	2.0	0.0	0.0	0.0	0.0	0.0

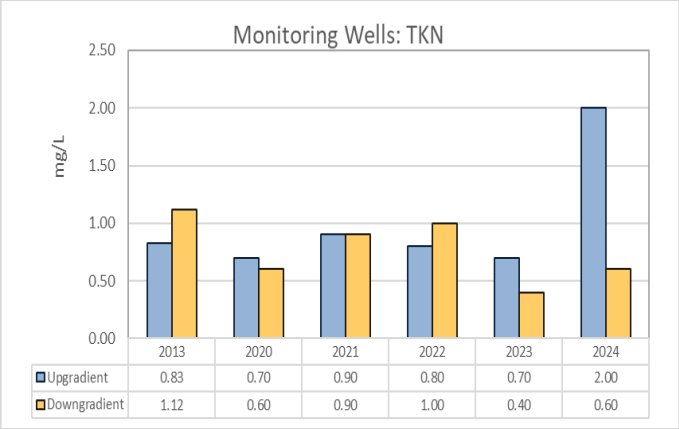
- The ODWS Table 1 Microbiological Standard is non-detectable
- E. coli has not been detected in the downgradient well since 2019. It should be noted the background value from 2013 is < 2 cfu/100mg/L result, represented as a 2 on chart.
- Results would appear to indicate little to no impact from this parameter. The 2019 result would appear to be the only sample where E.coli was found at the same level in both wells, which questions the sample integrity for this parameter.

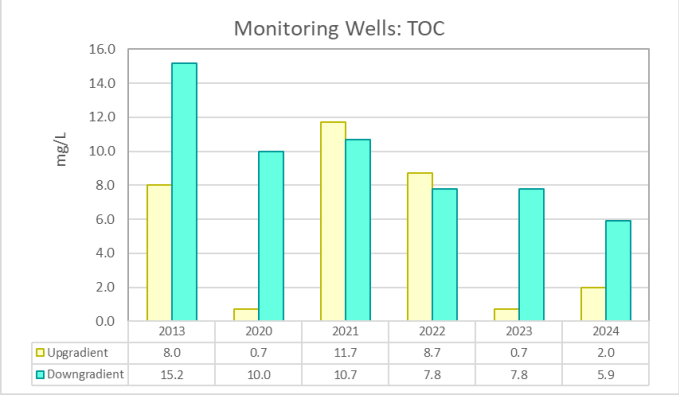


	2013	2020	2021	2022	2023	2024
Upgradient Nitrite	0.1	0.1	0.1	0.1	0.05	0.05
Downgradient Nitrite	0.5	0.10	0.10	0.10	0.05	0.05
Upgradient Nitrate	0.1	0.2	0.1	0.1	0.33	1.22
Downgradient Nitrate	0.1	0.10	0.10	1.00	0.57	0.37

- The ODWS Table 2 Chemical Standards for Nitrite is 1mg/L and Nitrate is 10mg/L. MAC (maximum allowable concentration.
- Nitrite samples in the downgradient well were not detectable apart from 2013 and 2017.
- Nitrate samples in the downgradient well have been detected starting in 2022 but are trending downwards. All results are well below 25% of MAC indicated.
- Results would appear to indicate there is potential for impact on groundwater for Nitrate, however more investigation may be required to confirm impact and rule out other environmental factors.







- There is no standard or guideline for this parameter in the ODWS Table 2 Chemical Standards or Table 4 Objectives and Guidelines.
- No sampling was completed in 2023 or 2024 due to scheduling/COC errors.
- Historical trending results from the downgradient well indicate gradually increasing levels since 2016, but all levels are well below 1mg/L.
- Results would appear to indicate there is potential for impact on groundwater from Ammonia, however more investigation may be required to confirm impact and rule out other environmental factors.
- There is no standard or guideline for this parameter in the ODWS Table 2 Chemical Standards or Table 4 Objectives and Guidelines.
- Historical results from upgradient and downgradient have consistently been close until 2024. The downgradient value is substantially lower, but all levels are less than 2mg/L.
- Results would appear to indicate there is potential for impact on groundwater from TKN, however more investigation may be required to confirm impact and rule out other environmental factors.
- There is no standard or guideline for this parameter in the ODWS Table 2 Chemical Standards or Table 4 Objectives and Guidelines.
- Historical results have shown the TOC results to be increased in the downgradient well but have been slowly decreasing since 2021.
- Results would appear to indicate there is potential for impact on groundwater from TOC, however more investigation may be required to confirm impact and rule out other environmental factors