2023 Lindsay Ops Landfill Annual Monitoring Report (AMR)

Presentation by:
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Kayla Pantaleo, Regulatory Compliance Officer
Report By: Azimuth Environmental Consulting Inc.

Date: November 20, 2024

Summary

- Introduction
- Site Overview & Background
- Background Information
- Site Operations
- Environmental Monitoring & Recommendations
- Questions

Introduction: Report Compilation

Azimuth Environmental Consulting, Inc:

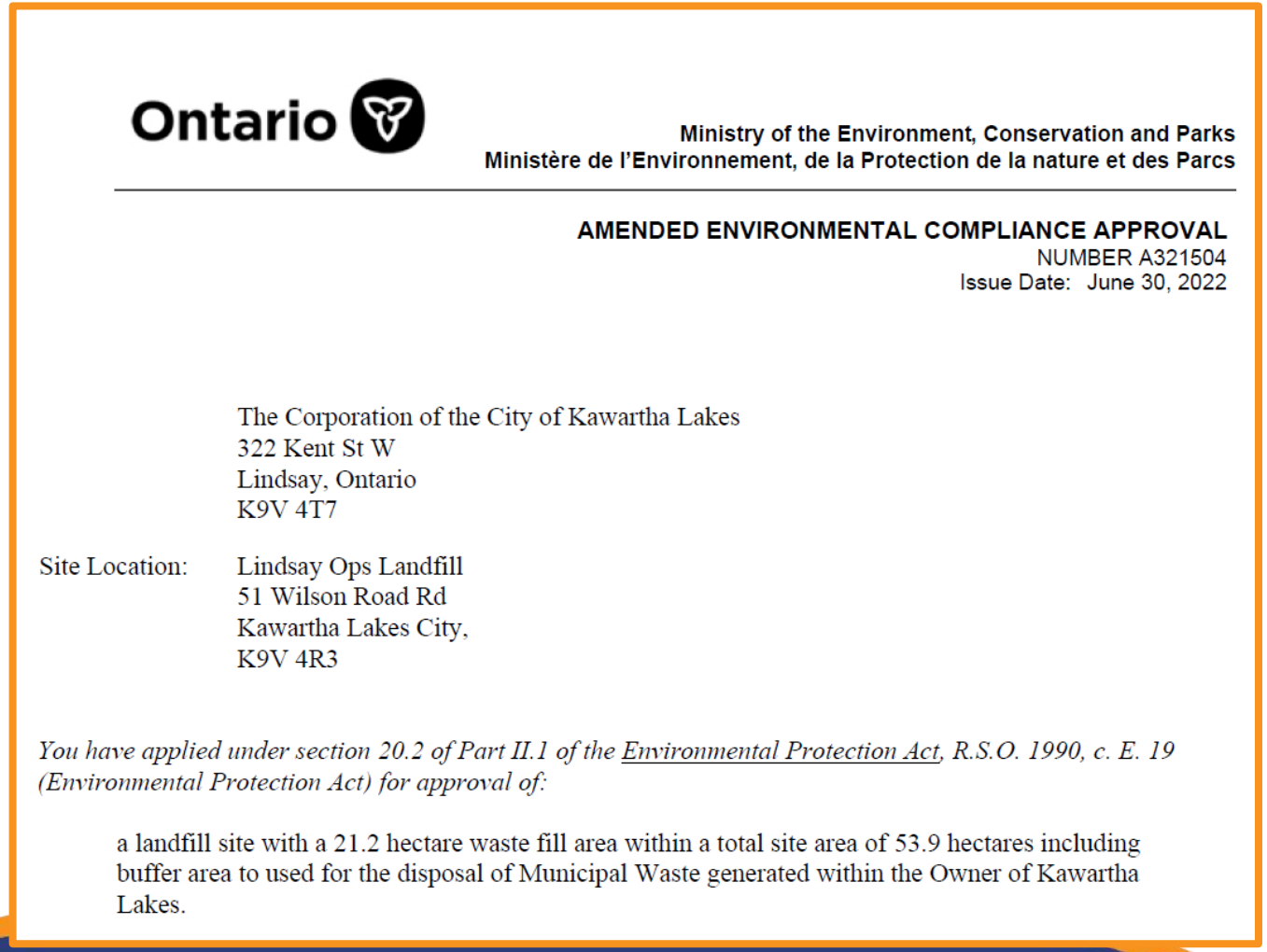
- Completed the Annual Report. Including the following monitoring components; landfill gas, leachate, & ground water sampling.

CKL Waste Management Division:

- Staff are responsible for contract administration, site inspections, certain components of the monitoring program, data entry for the waste quantities, reviewing monitoring results & reports.

Introduction: Reporting Requirements

- Prepared in compliance with the Environmental Compliance Approval (ECA)
- Summary of the 2023 monitoring data with comparison to the historical data
- Assessment of the current state of the landfill site.
- Over 40 years of monitoring results.



Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A321504
Issue Date: June 30, 2022

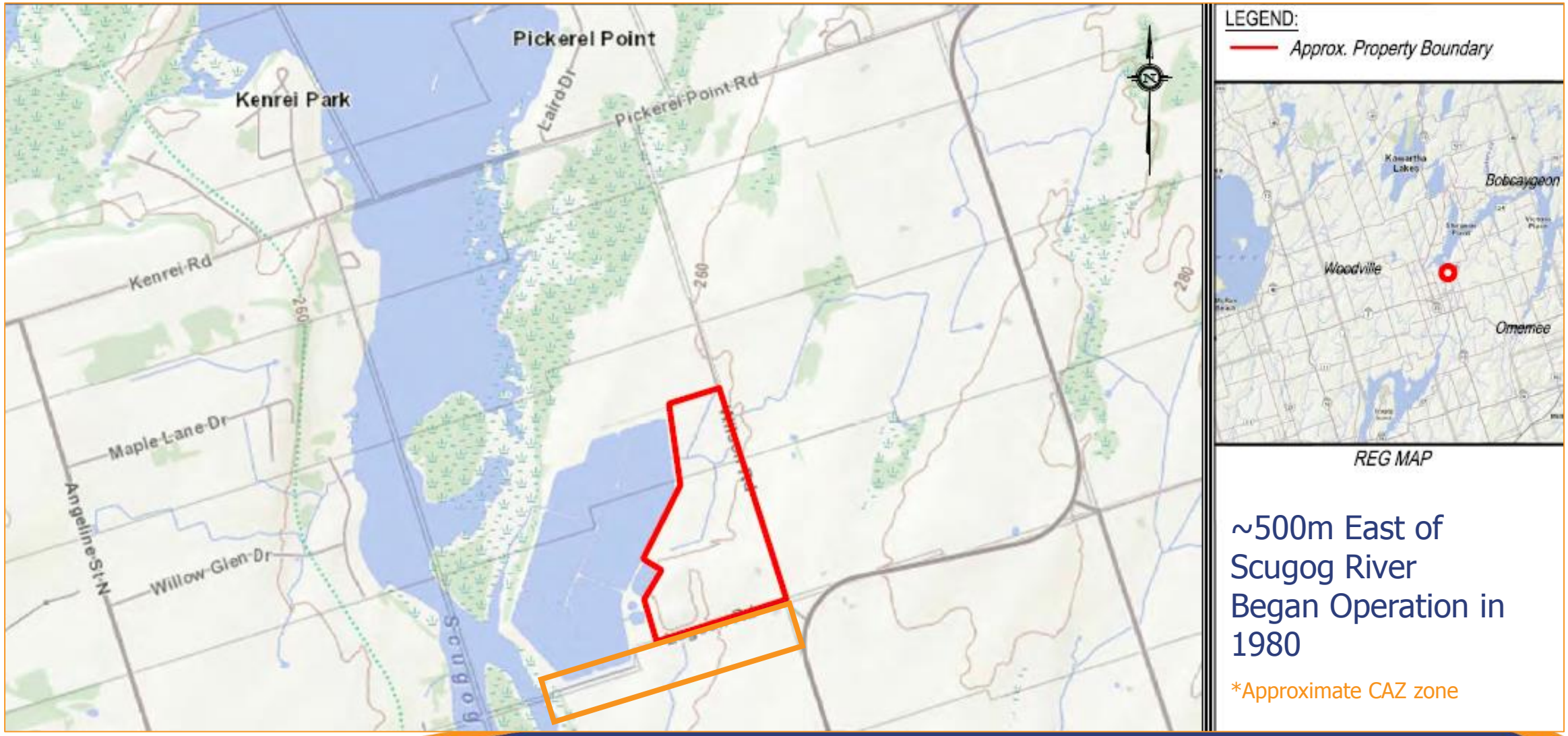
The Corporation of the City of Kawartha Lakes
322 Kent St W
Lindsay, Ontario
K9V 4T7

Site Location: Lindsay Ops Landfill
51 Wilson Road Rd
Kawartha Lakes City,
K9V 4R3

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

a landfill site with a 21.2 hectare waste fill area within a total site area of 53.9 hectares including buffer area to used for the disposal of Municipal Waste generated within the Owner of Kawartha Lakes.

Background: Site Location



~500m East of Scugog River
Began Operation in 1980

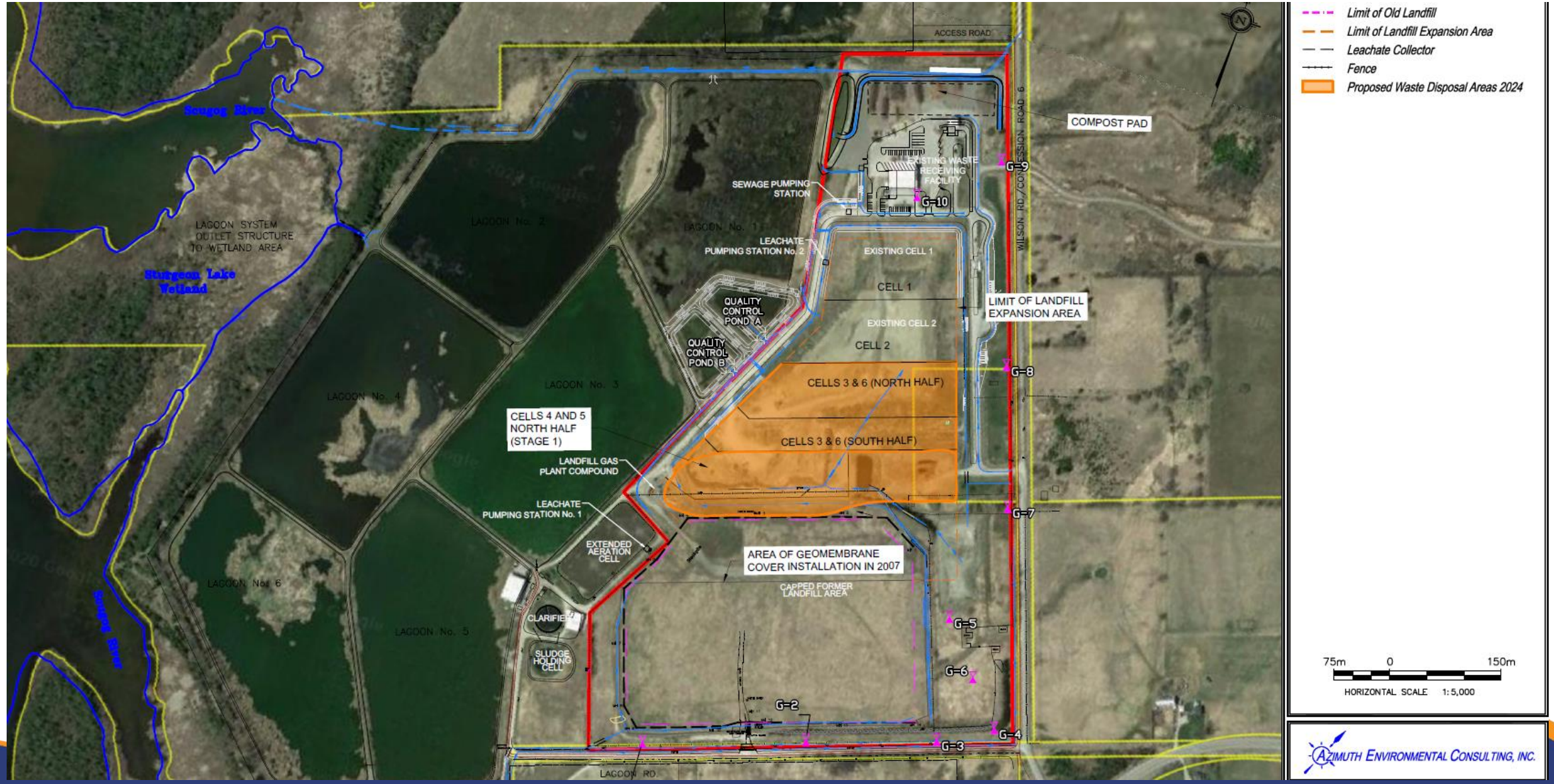
*Approximate CAZ zone

Introduction: Operations & Waste Types

- The Site is licensed to accept solid non-hazardous municipal waste (as defined in O.Reg. 347/90):
  - Wastes generated within CKL by residential & industrial, commercial & institutional;
  - Contaminated soils; and
  - Biosolids
- Waste Facilities:
  - Recycling Depot;
  - Leaf and Yard Waste Composting Facility;
  - Septage Station; &
  - Household Hazardous Waste Depot (HHW)

Site Operations: Disposal Area 2023

Kawartha Lakes
Jump In



Site Operations: 2023 Overview

- Gull control continued including pyrotechnics (flare gun);
- An increase in leachate due to construction (cell 4&5);
- 6 PRC meetings were held in 2023;
- Ongoing staff training with 2 events in spring & fall;
- Wetland Assessment (completed every 5 yrs);
- Methane detection system calibration.

Site Operations: Waste Limits

- ECA annual limit is 58,200 tonnes
  - limit not exceeded - 35,997 tonnes received;
  - Similar to historical amounts
- Daily limit is 240 tonnes
  - Exceeded daily limit 6x waste tonnage went over the limit;
  - Due to road clean-up (sweepings) and/or excess soil;
  - Did not occur over 2 consecutive days.

Summary of LOPS Annual Waste Tonnages

Year	Tonnes Landfilled	# of Days Exceeding Daily Limit
2014	25,998	3
2015	29,152	13
2016	27,654	7
2017	27,122	11
2018	27, 463	8
2019	27,919	9
2020	27,604	5
2021	32,531	29
2022	30,660	6
2023	**35,997**	**6**

Note:
ECA Annual Limit = 58,200 tonnes

Materials Diverted

Material Type	Tonnes
Curbside Recyclables (containers & fibers)	5,530
Leaf and Yard Waste	2,305
Construction and Demolition	1,701
Scrap Metal	293
Mattresses	158
Electronics	143
HHW	143
Bulky Plastics	61
Textiles	9
Total Tonnes diverted in 2023:	~10,343

Site Life & Capacity

- Total Air Space: 58,110 m3
- Waste Density: 700 kg/m3
- Remaining Capacity: 511,387m3
- About 11 years remaining at December 31, 2023

2023 Monitoring Program Summary

	Site Inspections (monthly)	Groundwater Monitoring/ Sampling (Quarterly)	Surface Water Monitoring/ Sampling (Quarterly)	Gas well Monitoring (monthly during frozen ground conditions & quarterly thereafter)	Leachate Sampling (monthly)
Azimuth Environmental	✓	✓	✓	✓	✓
CKL Staff	✓			✓	✓
Notes:				Occurred on eight occasions	

Leachate Overview

- Old landfill area (south area) has a synthetic membrane cap with a perimeter leachate collection system (LCS).
- North expansion area has a compacted clay composite base with a geomembrane liner system & an overlying LCS.
- Once collected leachate goes to the wastewater treatment plant.
- Pumping levels are recorded to track quantities.
- Annual flushing is completed to ensure flow/ operations
- Vibrating Wire piezometer tested to ensure flow through waste
- Monthly visual inspection for seepage and/or springs.

Groundwater (GW) Locations

Kawartha Lakes

LEGEND:

- Approx. Property Boundary
- Limit of Old Landfill
- Limit of Landfill Expansion Area
- Leachate Collector
- Fence
- Overburden Well Locations
- Refuse Well Locations
- Bedrock Well Locations
- Gas Probe Location
- Vibrating Wire Piezometer Installed on Surface of Geomembrane Liner
- Manhole

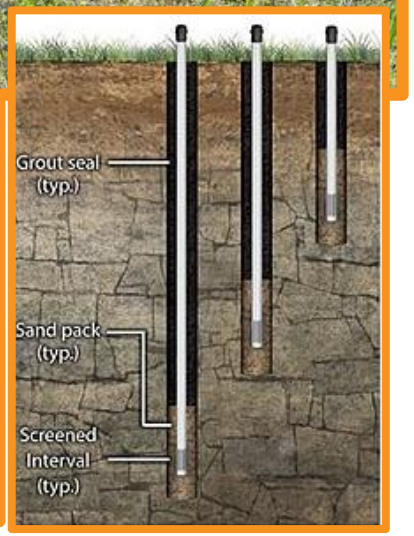
75m 0 150m

HORIZONTAL SCALE 1:5,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Ground Water Monitoring Network

Lindsay OPS Landfill, Lindsay, ON



Groundwater (GW) Conclusions

- No offsite impacts observed;
- Analysis meets MECP criteria;
- Monitoring was in accordance with the requirements of the ECA;
- Water levels confirm that the regional flow is towards the Scugug River;

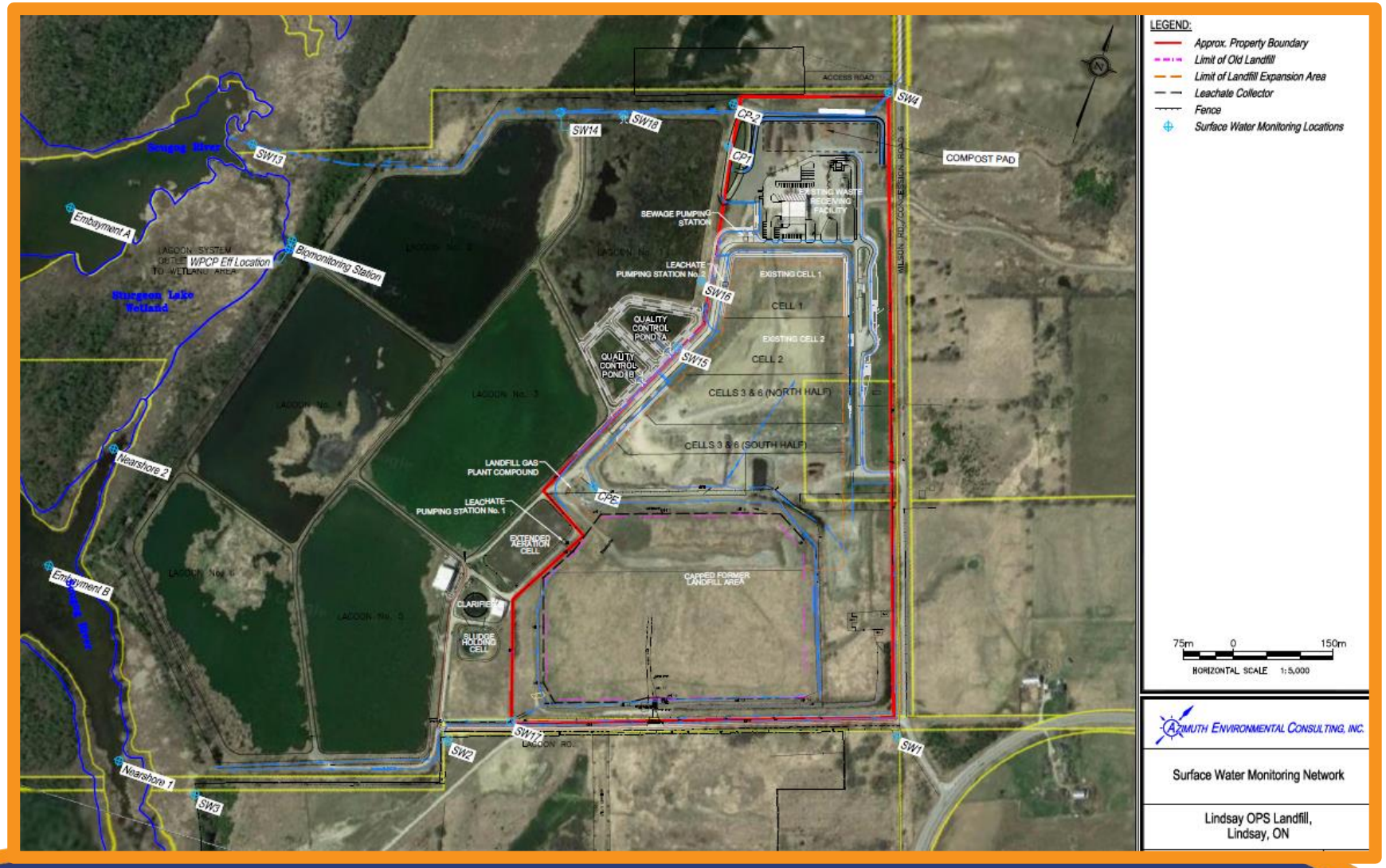
- In May 2023 an exceedance for ammonia was observed at MW61-10-I. In July & October sampling results were significantly lower so considered not valid.

GW & Leachate Recommendations

- Reduce frequency of leachate collection system inspection & flushing to every 3yrs, or as required;
- Perform maintenance test at all monitoring wells;
- Reduce quarterly to semi-annual monitoring
- Remove; Phenols monitoring, PCBs. VOC's, BTEX & phosphorus monitoring.

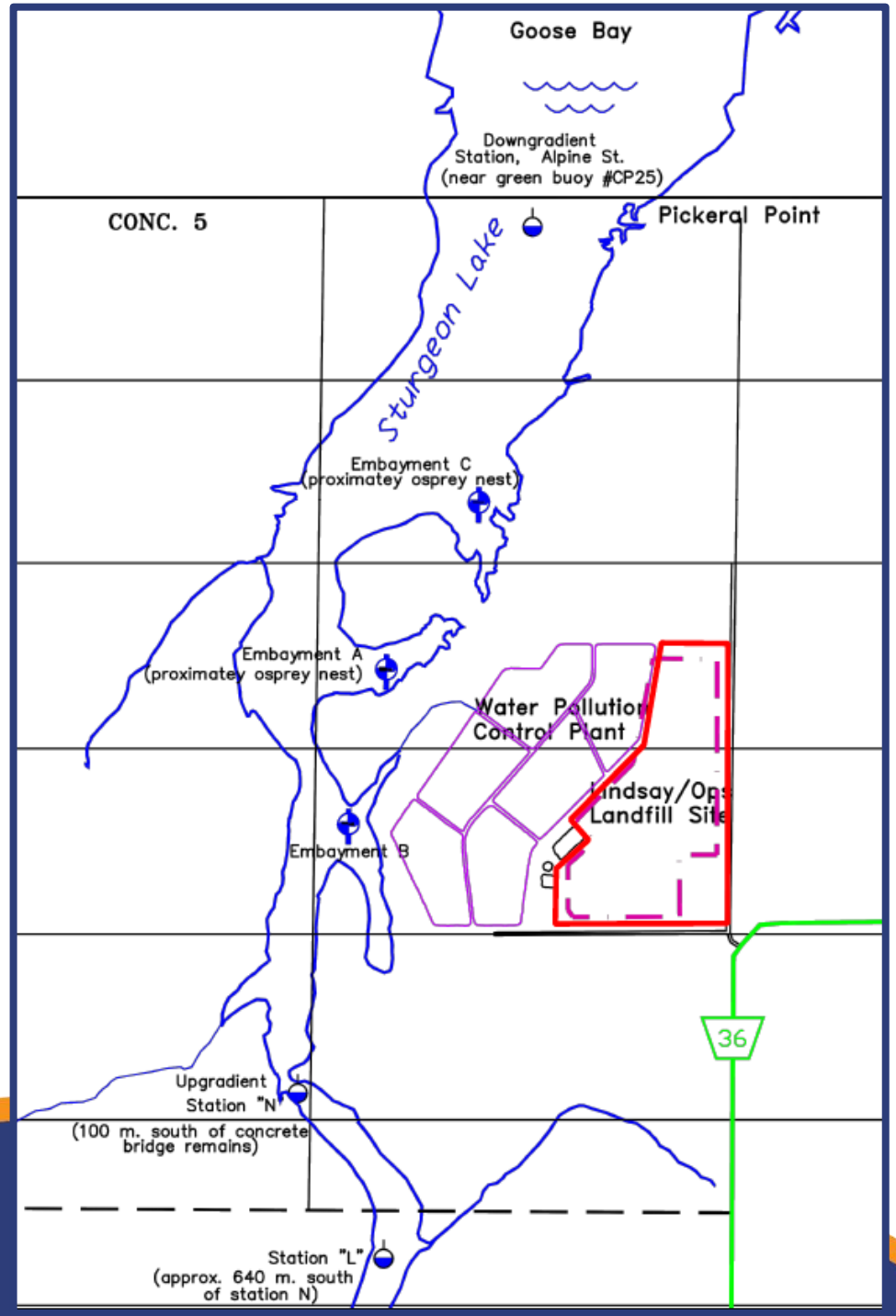
Surface Water Locations

- Upstream locations:
  - SW1 & SW4
- Downstream locations:
  - SW2, SW3, SW13, SW14, & SW18
- On-Site locations:
  - SW15 & SW16



Surface Water Locations

- Scugog River locations:
  - SW sampling locations
  - Embayment locations



Surface Water Conclusions

- Scogog River:
  - Parameter concentrations between the upstream & downstream are similar - no environmental impacts
- Onsite drainage
  - Low flows + the concentrations provide no influence the Scugog River.
  - Many locations are dry in the summer and therefore can not influence the river.
  - VOC and PCB are not a cause for concern from the site.

Surface Water Recommendations

- Low flow surface water sample conditions should be filtered in lab or field to improve water quality results.
- No significant contaminant detection threat of organic priority pollutants in decades;
- No significant PCB results in decades, not necessary to sample;
- No significant VOC results
  - Concentrations of BTEX are barely traceable or even non-detectable levels, due to it degrading over time. Further evaluation is seen as unwarranted
  - The byproduct of WPCP processing, trihalomethanes, is not in relation to the landfill and does not need to be assessed

Lethality Testing Overview

- Replaced the biomonitoring program with lethality testing of the water at SW13.
- Purpose is to determine toxic nature of the sample when a sensitive species is exposed.
- Sampled 4x a year; April, June, August & October.
- All results indicated a 0% impairment & 0% mortality rate for both Rainbow Trout & *Daphnia magna.*

Daphnia or waterfleas, are key part of the food web and are tiny crustaceans which exist in any healthy freshwater ecosystem

Gas Monitoring Conclusions

- This program is designed to evaluate the migration potential of gas compounds in the environment.
- Concentrations are typical of a landfill site.
- Only exceeding the Lower Explosive Limit (LEL) of 5% at the leachate monitoring wells;
- The remaining landfill gas monitoring locations indicated insignificant methane levels; and
- 2023 results are consistent with the previous years & indicate that methane gas from the landfill is not migrating off Site.

Landfill Gas Recommendations

- No significant migration of gas at the Site.
- Program needs to continue as a safeguard
- Late winter annual measurement should be considered if there has been no detection in past 5 yrs;
- If concentrations increase over 25% or a detection occurs, quarterly sampling should be completed;
- Termination should be considered if for a decade there is no detection

Questions?