2025 Landfill Closure and Post-Closure Care Liability Estimates

Chapman and Croft Waste Disposal Sites
Magnetawan, Ontario

Prepared for:

Municipality of Magnetawan
4304 Highway 520
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TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained by the Municipality of Magnetawan (Municipality) to complete an estimate of liabilities for the closure and post-closure care for two municipal solid waste landfill Sites for the year 2025. The solid waste landfill Sites and their status are as follows:

1. Chapman Waste Disposal Site (active waste disposal site).
2. Croft Waste Disposal Site (active waste disposal site).

Asset Retirement Obligations ("ARO") is a legal obligation associated with the retirement of a tangible long-lived asset that an entity is required to settle as a result of an existing or enacted law, statute, ordinance or written or oral contract by legal construction or a contract under the doctrine of promissory estoppel. The estimated Asset Retirement Cost is the amount that is capitalized and increases the carrying amount of a long-lived asset when a liability for an ARO is recognized. As a result of these ARO requirements as they relate to Municipality's Waste Disposal Sites, Pinchin has assessed the annual liabilities for each Site in accordance with accounting standards set out by the Public Sector Accounting Board (PSAB) Section PS 3280 Solid Waste Landfill Closure and Post-Closure Liability.

The reporting period is up to December 31, 2024, and the base year is 2025 (i.e., time zero for present value calculation is January 1, 2025).

1.1 Scope of Work

The updated liability estimates include the following activities:

- Obtain updated and/or additional information required to estimate the closure and post-closure care liability;
- Estimate the closure, post-closure care and contingency expenditures using the reporting format and assumptions from previous year; and
- Provide additional information required by the Municipality for its financial statements.

2.0 BACKGROUND

A general description of the solid waste landfill Sites is provided in the following paragraphs, and a summary of the main features is provided in the attached Table 1 (all tables are provided in Appendix I).

2.1 Chapman Waste Disposal Site

The Chapman Waste Disposal Site is located on Lot 108, Concession A within the Municipality of Magnetawan, District of Parry Sound, Ontario and is located approximately 5.5 kilometres (km) northeast of the Township of Magnetawan, Ontario. The Site operates in accordance with the Site Certificate of

Approval (CofA, now referred to as Environmental Compliance Approval (ECA)) Number **A521202** for the disposal of municipal solid waste generated within the Municipality. The Site consists of 1.2 hectares (ha) of approved landfilling area within 41 ha of Municipality property. A road with a locked gate is located northwest of the Site which provides access to the Site from the southeast side of Rocky Road, approximately 200 m east of the intersection of Rocky Road and Nipissing Road North. Landfilling began at the Site prior to 1980 and the active landfilling area is currently located within the central portion of the Site.

A waste capacity assessment was completed for the Site in 2017 by D.M. Wills based on a topographic survey completed on November 15, 2016. A subsequent waste capacity assessment was completed by Pinchin in 2019, following the completion of another topographic survey on June 12, 2019. Based on a comparison of the November 2016 and June 2019 surveys, it was estimated that a volume of approximately 6,500 cubic meters (m^3) of waste was deposited at the Site, resulting in an estimated annual waste deposition rate of approximately 2,500 m^3 per year. Additionally, based on Pinchin's report entitled "*Waste Capacity Study, Chapman Waste Disposal Site, Magnetawan, Ontario*", dated September 24, 2019, it was Pinchin's opinion that the current remaining volume of the Site was 38,268 m^3 as of June 2019.

An additional topographic survey was completed for the Site on June 3, 2020, utilizing an Unmanned Aerial Vehicle (UAV). Based on a comparison of the 2019 and 2020 topographic surfaces, it was determined that a volume of approximately 4,750 m^3 was deposited at the Site during that one-year time period, resulting an annual waste deposition rate of approximately 4,750 m^3 per year. Additionally, this additional waste deposition volume resulted in an estimated remaining Site capacity of 33,518 m^3 as of June 2020.

In support of the annual liability estimate updates, Pinchin had retained the services of Unmanned Aerial Services Inc. (UAS) to conduct a supplemental topographic survey of the Site utilizing a UAV on October 24, 2023. Based on the results of this most recent survey, Pinchin estimated the volume of the existing waste and annual average waste deposition (comparing survey to survey), as well as the resulting estimated remaining capacity and lifespan.

Based on a comparison of the 2020 and 2023 topographic surveys, it was estimated that a volume of approximately 9,680 m^3 of waste has been placed at the Site, resulting in an annual waste deposition rate of approximately 2,904 m^3 per year and a remaining Site capacity of approximately 23,838 m^3 as of October 2023. Utilizing a 7-year average annual waste deposition rate based on the results of the 2016 through 2023 surveys of approximately 3,385 m^3 per year, the remaining lifespan of the Site is estimated to be 7 years as of October 2023, if the Site is developed to the maximum theoretical capacity of approximately 60,000 m^3.

In the absence of an additional topographic survey of the Site in 2024, Pinchin has assumed that waste placement during 2024 continued at a constant average annual waste deposition rate of 3,385 m^3 per year. For the purposes of the 2025 landfill liability estimates, the Chapman Waste Disposal Site is assumed to have a remaining capacity of approximately 20,453 m^3 and a remaining lifespan of approximately 6 years as of October 2024.

2.2 Croft Waste Disposal Site

The Croft Waste Disposal Site is located in Lot 26, Concession 11 within the Municipality of Magnetawan, District of Parry Sound, Ontario and is located approximately 12 km east-northeast of the Township of Magnetawan, Ontario. The Site operates in accordance with the Site CofA (now referred to as an ECA) Number **A7034002** for the disposal of municipal solid waste generated within the Municipality. The Site consists of 2.5 ha of approved landfilling area within 33.7 ha of Municipality property. A road with a locked gate is located east of the Site which provides access to the Site from the west side of 25th and 26th Side Road, approximately 1 km north of the intersection of 25th and 26th Side Road and Highway 520.

The active landfilling area is currently located within the northern portion of the Site. A site capacity survey was completed by D.M. Wills on November 1, 2018, which resulted in an estimated remaining capacity of approximately 23,565 cubic metres (m^3) and an approximate remaining life expectancy of 39 years (assuming a theoretical capacity of 138,850 m^3).

A topographic survey of the Site was completed by Pinchin using a UAV on June 12, 2019, and was utilized for the purpose of calculating the remaining waste capacity and remaining lifespan for the Site. In comparing the 2018 and 2019 topographic surveys, it was estimated that approximately 300 m^3 of waste was deposited at the Site resulting in an estimated annual fill rate of 605 m^3/year.

In contrast to the D.M. Wills waste capacity calculations, Pinchin's review of the 2019 survey data resulted in an estimation that the in-place volume was approximately 32,395 m^3 as of 2019. Additionally, based on the approved waste disposal footprint of 2.5 ha and utilizing the MECP landfill design standards, it is estimated that total maximum capacity of the Site is approximately 141,875 m^3. Therefore, the remaining waste capacity at the Site was approximately 106,454 m^3 as of 2023.

In support of the liability estimate update, Pinchin retained the services of UAS to conduct a supplemental topographic survey of the Croft Landfill Site utilizing a UAV on October 24, 2023. The results of the 2023 topographic survey indicate that a volume of approximately 3,720 m^3 of waste was placed at the Site resulting in a current in-place volume of 36,115 m^3 and an annual waste deposition rate of 858 m^3 per year. This results in a remaining capacity of approximately 105,759 m^3 (i.e., the theoretical capacity of 141,875 m^3 minus the current waste volume 36,115 m^3) as of October 2023.

Utilizing a 5-year average annual waste deposition rate based on the results of the 2018 through 2023 surveys of approximately 731.5 m^3 per year. In the absence of an additional topographic survey of the Site in 2024, Pinchin has assumed that waste placement during 2024 continued at a constant average annual waste deposition rate of 731.5 m^3 per year. Therefore, the estimated remaining capacity of the Croft Waste Disposal Site is approximately 105,027.5 m^3 as of October 2024.

The remaining lifespan of the Site would be estimated in excess of 100 years. However, it is anticipated that the annual waste deposition rate at the Croft Landfill Site will increase after 6 years following closure of the Chapman Landfill Site to a rate of approximately 4,116.5 m^3 per year (i.e., 731.5 m^3/year plus 3,385 m^3/year). This increase would result in a remaining lifespan for the Croft Landfill Site of approximately 30 years as of October 2024.

3.0 COLLECTION AND REVIEW OF CURRENT INFORMATION

The following information was used to calculate the liability estimates:

1. The remaining landfill capacity for the Chapman and Croft Waste Disposal Sites (active) were updated by using the most recent data available from 2023 topographic surveys.
2. Monitoring/reporting costs are estimated using the unit prices provided in the proposed Pinchin contract entitled *"Proposal for Waste Management Environmental Consulting Services, 2023-2025 Annual Monitoring and Reporting – Chapman and Croft Landfills, Municipality of Magnetawan, Ontario, Pinchin File: 225335.007"* issued March 6, 2023.
3. The contingency amount was estimated using the following equation:

$$F = \$0.50 \times W \times I_2/I_1$$

Where:

F = the amount of financial assurance

W = the number of tonnes of waste that have been deposited in the landfilling site at the time the amount of financial assurance is calculated.

I_1 = the 2017 Annual Average Non-residential Building Construction Price Index for Ontario (based on Toronto and Ottawa-Gatineau (Ontario part) data) as published by Statistics Canada under the authority of the Statistics Act (Canada).

I_2 = the most recent Annual Average Non-residential Building Construction Price Index for Ontario (based on Toronto and Ottawa-Gatineau (Ontario part) data) available at the time the amount of financial assurance is calculated as published by Statistics Canada under the authority of the Statistics Act (Canada).

This is identical to the method of calculation Financial Assurance for contingency plans described in the MECP Landfill Standards Guideline with the exception of using average Ontario Non-residential Building Construction Price indices instead of Toronto only indices.

The Non-residential Building Construction Price Index data for Ontario (based on the average of Toronto and Ottawa-Gatineau (Ontario part)) is summarized as follows:

2024 Quarter	Average Non-residential Building Construction Price Index (NRBCPI) for Toronto, Ontario	Average Non-residential Building Construction Price Index (NRBCPI) for Ottawa-Gatineau, Ontario Part
First	157.6	160.1
Second	159.6	160.8
Third	Not Available	
Fourth	Not Available	
Annual Average	158.6	160.5
2017 Base Value	100	100
Ontario Average	**159.5**	

Notes: the base year for the 2024 NRBCPI values published by Statistics Canada was 2017 (i.e., 2017 = 100).

4.0 INFLATION AND DISCOUNT RATES

4.1 Inflation Rate

The unit costs were updated to 2025 costs by applying an average inflation rate of 5.35% (ten-year average of the Core Consumer Price Index – 2014 to 2023). These rates were published by the MECP for financial assurance funds (found at https://www.ontario.ca/page/financial-assurance-ministry-environment-and-climate-change).

4.2 Discount Rate

A discount rate of – 3.10% was used to complete the cost estimate calculations for Sites expected to close within 30 years. A discount rate of 3.00% was used to complete the cost estimate calculations for Sites expected to close after 30 years. These rates were published by the MECP for financial assurance funds.

5.0 CHANGE IN LIABILITY AND ANNUAL EXPENDITURES

The change in liability was calculated using the equation presented below:

$$G = (A \times E) - F$$

Where:

G = Change in Liability

A = Estimated Total Expenditure

E = Capacity Factor

F = Expenditures Previously Recognized

For each landfill, the change in liability associated with the Estimated Total Expenditure was determined by applying a capacity factor for the estimated fraction of the total landfill capacity used to date (i.e., for closed sites the factor is 1.0). Assumptions used to estimate the capacity factors are noted in the Tables 2 through 5 provided in Appendix I.

The estimated liability amounts for 2025 are provided in the following Table:

Site	2024 Liability Estimate (F) ($)	2025 Liability Estimate (A X E) ($)	Change in Liability (G) ($)
Chapman Waste Disposal Site	$505,670.20	$641,835.49	$136,165.29
Croft Waste Disposal Site	$208,817.21	$229,691.16	$20,873.95
Total	**$714,487.41**	**$871,526.65**	**$157,039.24**

6.0 ADDITIONAL INFORMATION

The notes to the financial statements require the information included in the following Table:

Information Required	Comment
1. The nature and source of landfill closure and post-closure care requirements.	The information sources and assumptions are noted in the attached Tables in Appendix I.

Information Required	Comment
2. The basis of recognition and measurement of the liability for closure and post-closure care.	The method used to determine the liability is presented in the attached Tables in Appendix I.
3. The remaining capacity of the landfill and the estimated remaining landfill life in years.	The remaining landfill capacity and the estimated remaining landfill life, including the basis for this estimation, are noted in the attached Tables in Appendix I.
4. How any requirements for closure and post-closure care financial assurance are being met.	See item 5.
5. The amount of any assets designated for settling closure and post-closure care liabilities.	The following assets were identified by the Municipality for closure and post-closure care liabilities: • The Municipality has a landfill rehabilitation reserve of $588,710; and • The Municipality has a landfill closure reserve of $294,520.
6. The estimated length of time needed for post-closure care.	The minimum period for post-closure monitoring required by the MECP is 25 years. A 25 year period was assumed for post-closure care activities.

APPENDIX I
Tables

TABLE 1
Summary of Site Features
2025 Closure and Post-Closure Care Cost Estimate

Site (status)	Surface Area	Type of Cover	Leachate Management System Components	No. of Groundwater Monitoring Wells	Surface Water Controls	In-place Volume (m^3)	Permitted Volume (m^3)
Chapman Waste Disposal Site	1.2 ha	Soil	Monitored Natural Attenuation	13	Three surface water monitoring locations	39,547	60,000
Croft Waste Disposal Site	2.5 ha	Soil	Monitored Natural Attenuation	11	Three surface water monitoring locations	36,847	141,874

TABLE 2
Chapman Waste Disposal Site
2025 Closure Cost Estimate

Item	Unit	Quantity	Unit Cost 2024 $	Unit Cost 2025 $	Cost 2025 $	Expected Closure Year	Present Value Factor	Present Value Cost	Comment (source)
Closure Costs									
Final Cover and Vegetation									
Grading of Waste Cells	m²	12,000	$ 8.87	$ 9.35	$112,193	2031	1.21	$ 135,525.73	1.2 ha landfill footprint
Levelling Layer	m²	12,000	$ 8.12	$ 8.56	$102,678	2031	1.21	$ 124,032.38	150 mm thick sand layer
Landfill Cap and Vegetation	m²	12,000	$ 38.94	$ 41.02	$492,247	2031	1.21	$ 594,621.15	600 mm thick low permeability cap, plus a 150 mm vegetative layer
Leachate Monitoring Facilities Completion									
Monitoring Wells	each	0	See comment					$ -	Monitoring well network established.
Water Quality Monitoring Facilities Completion									
Monitoring Wells	each	0	See comment					$ -	Monitoring well network established.
Other									
Roads	m	0	See comment					$ -	Construction/maintenance costs associated with ongoing landfill operation.
Fencing/Gate	m	0	See comment					$ -	Existing gate, assume no new fencing.
Subtotal Closure Costs					$ 707,117.67			$ 854,179.27	
15% Contingency					$ 106,067.65			$ 128,126.89	
Total Closure Costs					**$ 813,185.32**			**$ 982,306.16**	

TABLE 3
Chapman Waste Disposal Site
2025 Post-Closure Care Cost Estimate

Item	Unit	Quantity	Unit Cost	Cost (Annual) 2024$	Cost (Annual) 2025 $	Year Starting	Year Ending	PV Factor Equal Payments	PV Factor Single Payment	Present Value Cost	Comment (source)
Post-Closure Costs											
Final Cover and Vegetation Inspection and Maintenance	-	Allowance	-	$ 3,880.91	$ 4,088.53	2031	2056	38.63	1.21	$ 190,764	Annual allowance based on assumed 1% of estimated capital cost for 1.2 ha cap at approximately $300,000/ha
Roads Inspection and Maintenance	-	Allowance	-	$ 404.80	$ 426.46	2031	2056	38.63	1.21	$ 19,898	Annual allowance based on assumed 5% estimated capital cost for 50 m at approximately $150/m
Fencing/Gate Inspection/Maintenance	-	Allowance	-	-	-	-	-	-	-	-	Included in roads inspection/maintenance.
Water Quality Monitoring Facilities Inspection/Maintenance	-	Allowance	-	$ 75.56	$ 79.61	2031	2056	38.63	1.21	$ 3,714	Annual allowance based on assumed 1% of estimated capital cost for replacement of 2 wells at approximately $3,500/well
Monitoring/Reporting Program	-	Allowance	-	$ 15,875.00	$ 15,875.00	2031	2056	38.63	1.21	$ 740,700	Based on costs contractually submitted by Pinchin from 2023 to 2025
Contingency (e.g. future impacts to surface water/groundwater, acquisition of additional buffer lands, etc)	-	Allowance	-	-	-	-	-	-	-	$ 18,706	Calculated using Landfill Standards Guideline for Financial Assurance for Contingency Plans (39,547m^3 x 0.5931t/m^3 x$0.50/t*inflation adjustment of 159.5/100)
Total Post-Closure Costs					**$ 20,469.60**					**$ 973,781.30**	
									ESTIMATED TOTAL EXPENDITURE	**$ 973,781.30**	A - Sum of discounted future closure and post-closure costs
									TOTAL ESTIMATED SITE CAPACITY (M^3)	**60,000**	B - Based on the theoretical capacity of a 1.2 ha footprint
									REMAINING CAPACITY (M^3)	**20,453**	C - Remaining capacity
									CUMULATIVE CAPACITY USED (M^3)	**39,547**	D = B - C
									CAPACITY FACTOR	**0.6591**	E = D / B
									FACTORED EXPENDITURES	**$ 641,835.49**	A X E
									EXPENDITURES PREVIOUSLY REALIZED	**$ 505,670.20**	F
									CHANGE IN LIABILITY	**$ 136,165.29**	G = A X E - F

Notes:

Inflation Rate	5.35%
Discount Rate	-3.10%
Base Year	2025
Closure Year	2031
Remaining Landfill Life (years)	6
Period of Post-Closure Care (years remaining)	25

Other Comments:

2025 Costs include $15,875 monitoring and reporting
Inflation Rate and Discount Rate found at https://www.ontario.ca/page/financial-assurance-ministry-environment-and-climate-change

TABLE 4
Croft Waste Disposal Site
2025 Closure Cost Estimate

Item	Unit	Quantity	Unit Cost 2024 $	Unit Cost 2025 $	Cost 2025 $	Expected Closure Year	Present Value Factor	Present Value Cost	Comment (source)
Closure Costs									
Final Cover and Vegetation									
Grading of Waste Cells	m²	25,000	$ 8.87	$ 9.35	$233,735	2055	0.41	$ 96,295.60	2.5 ha landfill footprint
Levelling Layer	m²	25,000	$ 8.12	$ 8.56	$213,913	2055	0.41	$ 88,129.19	150 mm thick sand layer
Landfill Cap and Vegetation	m²	25,000	$ 38.94	$ 41.02	$1,025,514	2055	0.41	$ 422,498.37	600 mm thick low permeability cap, plus a 150 mm vegetative layer
Leachate Monitoring Facilities Completion									
Monitoring Wells	each	0	See comment					$ -	Monitoring well network established.
Water Quality Monitoring Facilities Completion									
Monitoring Wells	each	0	See comment					$ -	Monitoring well network established.
Other									
Roads	m	0	See comment					$ -	Construction/maintenance costs associated with ongoing landfill operation.
Fencing/Gate	m	0	See comment					$ -	Existing gate, assume no new fencing.
Subtotal Closure Costs					$ 1,473,161.80			$ 606,923.16	
15% Contingency					$ 220,974.27			$ 91,038.47	
Total Closure Costs					**$ 1,694,136.07**			**$ 697,961.63**	

TABLE 5
Croft Waste Disposal Site
2025 Post-Closure Care Cost Estimate

Item	Unit	Quantity	Unit Cost	Cost (Annual) 2024$	Cost (Annual) 2025 $	Year Starting	Year Ending	PV Factor Equal Payments	PV Factor Single Payment	Present Value Cost	Comment (source)
Post-Closure Costs											
Final Cover and Vegetation Inspection and Maintenance	-	Allowance	-	$ 7,782.52	$ 8,198.88	2055	2080	17.4	0.41	$ 58,819	Annual allowance based on assumed 1% of estimated capital cost for 2.5 ha cap at approximately $300,000/ha
Roads Inspection and Maintenance	-	Allowance	-	$ 1,619.22	$ 1,705.85	2055	2080	17.4	0.41	$ 12,238	Annual allowance based on assumed 5% estimated capital cost for 200 m at approximately $150/m
Fencing/Gate Inspection/Maintenance	-	Allowance	-	-	-	-	-	-	-	-	Included in roads inspection/maintenance
Water Quality Monitoring Facilities Inspection/Maintenance	-	Allowance	-	$ 75.56	$ 79.61	2055	2080	17.4	0.41	$ 571	Annual allowance based on assumed 1% of estimated capital cost for replacement of 2 wells at approximately $3,500/well
Monitoring/Reporting Program	-	Allowance	-	$ 13,575.00	$ 13,575.00	2055	2080	17.4	0.41	$ 97,387	Based on costs contractually submitted by Pinchin from 2023 to 2025
Contingency (e.g. future impacts to surface water/groundwater, acquisition of additional buffer lands, etc)	-	Allowance	-	-	-	-	-	-	-	$ 17,428	Calculated using Landfill Standards Guideline for Financial Assurance for Contingency Plans (36,847 m^3 x 0.5931t/m^3 x$0.50/t*inflation adjustment of 159.5/100)
Total Post-Closure Costs					**$ 23,559.34**					**$ 186,442.69**	
									ESTIMATED TOTAL EXPENDITURE	**$ 884,404.32**	A - Sum of discounted future closure and post-closure costs
									TOTAL ESTIMATED SITE CAPACITY (M^3)	**141,874**	B - Based on the theoretical capacity associated with a 2.5 ha landfill footprint
									REMAINING CAPACITY (M^3)	**105,028**	C - Remaining capacity
									CUMULATIVE CAPACITY USED (M^3)	**36,847**	D = B - C
									CAPACITY FACTOR	**0.2597**	E = D / B
									FACTORED EXPENDITURES	**$ 229,691.16**	A X E
									EXPENDITURES PREVIOUSLY REALIZED	**$ 208,817.21**	F
									CHANGE IN LIABILITY	**$ 20,873.95**	G = A X E - F

Notes:

Inflation Rate	5.35%
Discount Rate	3.00%
Base Year	2025
Closure Year	2055
Remaining Landfill Life (years)	30
Period of Post-Closure Care (years remaining)	25

Other Comments:

2025 Costs include $13,575 monitoring and reporting
Inflation Rate and Discount Rate found at https://www.ontario.ca/page/financial-assurance-ministry-environment-and-climate-change