

November 2022

Table of Contents

Executive Summary	i
ES1. Introduction.....	i
ES2. Environmental Assessment Process.....	ii
ES3. Alternatives to the Undertaking.....	iii
ES4. Evaluation of the Alternatives to the Undertaking.....	iii
ES5. Preferred Alternative to the Undertaking	vi
ES6. Alternative Methods for Expanding the Landfill	vi
ES7. Evaluation of Alternative Methods for Expanding the Landfill.....	viii
ES8. Preferred Undertaking	x
ES9. Potential Impacts, Mitigation Measures and Net Effects	x
ES10. Consultation	xi
ES11. Commitments and Monitoring.....	xiii
ES11.1. Commitments	xiii
ES11.2. Environmental Effects Monitoring	xiii
ES11.3. Adaptive Management Plan.....	xiii
1.0 Introduction.....	1
1.1 The Proponent.....	5
1.1.1 The Study Team.....	5
1.2 Technical Report Volumes and Appendices.....	5
2.0 Environmental Assessment Framework	7
2.1 Terms of Reference	7
2.2 Environmental Assessment Process.....	7
3.0 Phase 1: Evaluation of Alternatives To the Undertaking	10
3.1 Project Justification and Rationale	10
3.1.1 Town Demographics	10
3.1.2 St. Marys Landfill.....	11
3.1.3 Required Disposal Capacity	15
3.2 Preliminary Problem Statement	28
3.3 Preliminary Description of the Undertaking	28
3.4 Screening of Waste Export Options	28
3.4.1 Screening Methodology.....	28
3.4.2 Screening Findings	30
3.5 Alternatives to the Undertaking	34
3.6 Study Area.....	36
3.7 Description of the Existing Environment.....	36
3.7.1 Existing St. Marys Landfill	39
3.7.2 Twin Creeks Landfill.....	50
3.7.3 Haul Route Between St. Marys and the Twin Creeks Landfill.....	55
3.8 Evaluation of the Net Effects of the Alternatives to the Undertaking.....	57
3.8.1 Evaluation Criteria.....	57
3.8.2 Natural Environment	58

November 2022

3.8.3	Cultural Environment.....	72
3.8.4	Socio-Economic Environment	75
3.8.5	Indigenous Connections to the Land	86
3.8.6	Financial Factors.....	87
3.8.7	Technical Factors.....	92
3.9	Summary of Net Effects.....	93
3.10	Advantages and Disadvantages of the Alternatives to the Undertaking	94
3.11	Input Received during Phase 1, Evaluation of Alternatives to the Undertaking	97
3.12	Preferred Undertaking	101
4.0	Phase 2: Review of the Environmental Assessment Requirements	102
5.0	Phase 3: Redefine the Purpose and Rationale for the Undertaking	103
6.0	Phase 4: Define the Parameters of the Study	104
6.1	Study Area.....	104
6.2	Timeframe of the Study	106
6.3	Methodology for Characterizing the Existing Environment	106
6.4	Description of the Existing Environment.....	107
6.4.1	Natural Environment	107
6.4.2	Cultural Environment.....	148
6.4.3	Transportation.....	151
6.4.4	Land Use.....	152
6.4.5	Socio-Economic Environment	156
6.4.6	Indigenous Communities and Treaty Rights.....	157
7.0	Phase 5: Assess Alternative Methods for Carrying Out the Undertaking..	159
7.1	Alternative Methods to be Assessed.....	159
7.2	Evaluation Indicators	173
7.3	Evaluation Framework	179
7.4	Impacts to the Atmosphere	179
7.4.1	Air Quality	179
7.4.2	Odours	184
7.4.3	Noise.....	189
7.5	Impacts to Hydrogeology	195
7.6	Impacts to Surface Water	203
7.6.1	Surface Water Quality	203
7.6.2	Surface Water Quantity	209
7.7	Impacts to Ecology	212
7.7.1	Terrestrial Ecology	212
7.7.2	Aquatic Ecology	218
7.8	Impacts to Cultural Heritage Resources.....	225
7.8.1	Built Heritage and Cultural Heritage Landscapes	225
7.8.2	Archaeological Resources.....	229
7.9	Impacts to Traffic.....	232
7.10	Impacts to Land Use.....	234

November 2022

7.10.1	Sensitive Land Use	234
7.10.2	Aggregate Resources	237
7.11	Impacts to Socio-economic Conditions	240
7.11.1	Financial Factors	240
7.11.2	Social Impacts	244
7.12	Impacts to Indigenous Communities	249
7.12.1	Cultural and Environmental Features	249
7.13	Summary of Net Effects	254
7.14	Input from Stakeholders, Agencies, Indigenous Communities, and the Public	256
7.15	Preferred Undertaking	257
8.0	Description of the Undertaking	258
8.1	Existing Landfill Site	258
8.2	Design Concept	261
8.2.1	Landfill Liner	265
8.2.2	Leachate Collection System	266
8.2.3	Leachate Disposal	268
8.2.4	Waste Footprint Construction	269
8.2.5	Watercourse Realignment	271
8.2.6	Stormwater Management	272
8.2.7	Perimeter Access/Maintenance Road	274
8.2.8	Scale and Public Drop-off Relocation	275
8.2.9	Buffers	275
8.3	Ongoing Consultation and Other Approvals	277
8.4	Complaint Response Framework	279
8.5	Emergency Response and Communications Plan	279
8.6	Construction Activities	280
8.7	Landfill Expansion Development Sequence	281
8.7.1	Interim Operations (Above Phase II/III)	281
8.7.2	Cell 1 (Filling Above Phase II/III)	282
8.7.3	Cell 2 (Filling Above Phase I to Cell 1)	285
8.7.4	Cell 3 (Eastward Horizontal Expansion)	288
8.7.5	Cell 4 (Eastward Horizontal Expansion)	290
8.7.6	High Level Closure and Post-Closure Care	290
9.0	Potential Impacts, Mitigation Measures, and Net Effects	293
9.1	Climate Change Considerations	311
9.1.1	Effect of the Undertaking on Climate Change	311
9.1.2	Effect of Climate Change on the Undertaking	312
9.2	Cumulative Effects	314
9.2.1	Cumulative Effects to Air Quality	317
9.2.2	Cumulative Effects of Odour	320
9.2.3	Cumulative Effects of Noise	320
9.2.4	Cumulative Effects to Groundwater	321

November 2022

9.2.5	Cumulative Effects to Surface Water Quality.....	323
9.2.6	Cumulative Effects to Aquatic Ecology.....	324
9.2.7	Cumulative Effects to Social Conditions.....	326
9.2.8	Cumulative Effects to Environmentally and Culturally Significant Features.....	328
9.2.9	Cumulative Effects Summary.....	329
10.0	Consultation Summary.....	337
10.1	Project Contact List.....	337
10.2	Project Notices.....	338
10.3	Public Consultation.....	338
10.3.1	Public Information Centres.....	338
10.3.2	Project Information Posted to the Town’s Website.....	339
10.3.3	Review of Draft Documents.....	339
10.3.4	Summary of Public Comments.....	340
10.4	Agency Consultation.....	343
10.4.1	Work Plan Review.....	343
10.4.2	Agency Comments to Draft EA Submission.....	349
10.4.3	Draft EA Review.....	349
10.4.4	Meetings.....	349
10.4.5	Final EA Review.....	350
10.5	Indigenous Community Consultation.....	351
10.5.1	Project Notices.....	351
10.5.2	Site Visit.....	352
10.5.3	Meeting with Chippewas of the Thames First Nation.....	352
10.5.4	Meeting with HDI.....	352
10.5.5	Work Plan Review.....	353
10.5.6	Draft EA Review.....	353
10.5.7	Comments Received from Indigenous Communities.....	353
10.6	Submission of Environmental Assessment.....	357
11.0	Commitments and Monitoring.....	358
11.1	Summary of Commitments.....	358
11.2	Monitoring Program.....	367
11.2.1	EA Compliance Monitoring.....	367
11.2.2	Environmental Effects Monitoring.....	367
11.3	Adaptive Management Plan.....	372
11.3.1	Adaptive Management Triggers.....	372
11.3.2	Adaptive Management Responses.....	377
11.3.3	Adaptive Management Summary and Flexibility.....	380
12.0	Compliance with Terms of Reference.....	381
13.0	References.....	385

November 2022

Tables

Table 1-1: Reports Prepared Through the EA Process	6
Table 2-1: EA Process.....	7
Table 3-1: Census Data and Growth Rates for St. Marys	11
Table 3-2: Summary of Waste Diversion from St. Marys Landfill	13
Table 3-3: ECA No. A150203 Amendments and Approved Capacity	14
Table 3-4: St. Marys Landfill Historic Waste Disposal Rates.....	15
Table 3-5: Resulting Population Projections	17
Table 3-6: St. Marys Proposed Potential Diversion Programs	22
Table 3-7: Responses to Private Landfill/Thermal Treatment Fee and Capacity Questions.....	32
Table 3-8: Net Effects to the Atmosphere	61
Table 3-9: Net Effects to Geology and Hydrogeology	66
Table 3-10: Net Effects to Surface Water	69
Table 3-11: Net Effects to Biology	71
Table 3-12: Net Effects to Transportation Routes	76
Table 3-13: Net Effects to Land Use	78
Table 3-14: Net Effects on Employment	80
Table 3-15: Net Effects on Economic Conditions	82
Table 3-16: Net Effects on Local Aesthetics and Enjoyment of Life	85
Table 3-17: Cost Summary for Alternative 1	89
Table 3-18: Cost Comparison of Alternatives.....	91
Table 3-19: Summary of Net Effects	93
Table 3-20: Summary of Advantages and Disadvantages	95
Table 3-21: Comments Received During Phase 1 of the EA (Alternatives to the Undertaking)	99
Table 6-1 Existing Levels of Air Contaminants.....	109
Table 6-2 Existing Odour Conditions	111
Table 6-3 Points of Reception	114
Table 6-4 Existing Noise Conditions	116
Table 6-5: Leachate Concentrations 1991 to 2015	122
Table 6-6: 2015 VOC Concentrations	123
Table 6-7: Groundwater – Table 2 Potable Water Exceedances.....	125
Table 6-8 Groundwater Quality in Wells Associated with the CKD Pile.....	126
Table 6-9 Groundwater Chemistry in Wells Associated with the CKD Pile.....	127
Table 6-10: Groundwater Concentrations – Private Wells.....	129
Table 6-11: Methodology of Natural Heritage Field Investigations	135
Table 6-12: Vegetation Communities in the On-Site Study Area and Study Area Vicinity	140
Table 6-13: Cultural Heritage Resources in the Study Area Vicinity.....	149
Table 6-14: Complaint Summary (2013 to 2022)	155
Table 7-1: Key Characteristics of Each Alternative	168
Table 7-2: Standard Mitigation and Operating Practices Common to All Alternatives .	169

November 2022

Table 7-3: Evaluation Indicators	174
Table 7-4: Potential Effects to Air Quality	183
Table 7-5: Predicted Odour Impacts	185
Table 7-6: Potential Effects due to Odour	187
Table 7-7: Potential Effects to Noise.....	193
Table 7-8: Groundwater Effects Assessment.....	201
Table 7-9: Potential Effects to Surface Water Quality	207
Table 7-10 Potential Effects to Surface Water Quantity	211
Table 7-11: Potential Effects to Terrestrial Ecology	216
Table 7-12: Potential Effects to Aquatic Ecology	222
Table 7-13: Potential Effects to the Built Heritage Resources and Cultural Heritage Landscapes	228
Table 7-14: Potential Effects to Archaeological Resources.....	231
Table 7-15: Potential Effects to Local Transportation.....	233
Table 7-16: Sensitive Land Uses	236
Table 7-17: Potential Effects to Aggregate Extraction and Processing.....	239
Table 7-18 Summary of Financial Factors	243
Table 7-19: Potential Effects to Social Conditions	247
Table 7-20: Cultural and Environmental Features.....	252
Table 7-21: Summary of Net Effects	255
Table 7-22: Comments Received from the Public Regarding the Alternative Methods	256
Table 8-1: Public Operating Hours.....	258
Table 8-2: Soil Balance	270
Table 8-3: Stormwater Basin Design Summary	274
Table 8-4: Required Approvals and Rationale	278
Table 8-5: Interim Fill Quantities	282
Table 8-6: Cell 1 Fill Quantities.....	282
Table 8-7: Cell 2 Fill Quantities.....	285
Table 8-8: Cell 3 Fill Quantities.....	288
Table 8-9: Cell 4 Fill Quantities.....	290
Table 9-1: Effects, Mitigation Measures and Net Effects.....	295
Table 9-2: Estimated Cumulative Air Quality Effects.....	319
Table 9-3: Cumulative Effects Assessment	330
Table 10-1: Public Information Centres.....	339
Table 10-2: Summary of Public Comments	341
Table 10-3: Agency Review and Comment on Work Plans.....	344
Table 10-4: Summary of Comments From Indigenous Communities	355
Table 11-1: Summary of EA Commitments.....	359
Table 11-2: Ground & Surface Water Monitoring Program Summary	370
Table 11-3: Groundwater Monitoring Program Summary.....	371
Table 11-4: Water Quality Parameters.....	371
Table 11-5: Points of Compliance and Indicator Parameters	373
Table 12-1: Concordance with Approved Terms of Reference.....	382

November 2022

Figures

Figure 1-1: Site Location Plan	3
Figure 1-2: Town Limits and St. Marys Landfill Site	4
Figure 3-1: Study Area	38
Figure 3-2: St. Marys Landfill Existing Environment.....	40
Figure 3-3: Schedule D of the Town of St. Marys Official Plan.....	48
Figure 3-4: Twin Creeks Landfill Existing Environment	52
Figure 6-1: Study Areas.....	105
Figure 6-2: Location of Odour Receptors.....	113
Figure 6-3: Groundwater Conditions	120
Figure 6-4: Vegetation Communities	143
Figure 6-5: Significant Wildlife Habitat	147
Figure 6-6: Cultural Heritage Resources.....	150
Figure 7-1: Alternative 1 Vertical Expansion	162
Figure 7-2: Alternative 2 Horizontal Expansion	163
Figure 7-3: Alternative 3, Vertical and Horizontal Expansion with Watercourse Relocation.....	164
Figure 7-4: Alternative 3 Vertical and Horizontal Expansion with Watercourse Realignment.....	165
Figure 7-5: Alternative 4 New Waste Footprint	166
Figure 7-6: Alternative 5 Vertical Expansion with New Waste Footprint.....	167
Figure 8-1: Existing Conditions Site Plan.....	259
Figure 8-2: Alternative Method 3A Proposed Final Refuse Contours	260
Figure 8-3: Alternative Method 3A, Section A-A'	263
Figure 8-4: Alternative Method 3A, Sections B-B' and C-C'	264
Figure 8-5: Proposed Grading and Site Plan	267
Figure 8-6: Alternative Method 3A, Cell 1 Development	284
Figure 8-7: Alternative Method 3A, Cell 2 Development	287
Figure 8-8: Alternative Method 3A, Cell 3 Development	289
Figure 8-9: Alternative Method 3A, Cell 4 Development	291
Figure 11-1: Location of Monitoring Wells	369

Appendices

Appendix A Waste Reduction and Diversion Assessment	
Appendix B Survey of Landfill Operators	
Appendix C CKD Stockpile Report	
Appendix D Supplementary Information in Support of Alternative 3A	
Appendix E Approved Terms of Reference	
Appendix F Comments with Respect to the August 2021 EA Submission	

November 2022

List of Volumes and Appendices

Volume I – Environmental Assessment Report

- Appendix A – Waste Reduction and Diversion Assessment
- Appendix B – Survey of Landfill Operators
- Appendix C – CKD Stockpile Report
- Appendix D – Supplementary Information in Support of Alternative 3A
- Appendix E – Approved Terms of Reference
- Appendix F – Comments with Respect to the August 2021 EA Submission

Volume II – Work Plans

- Appendix A – Air Quality, Noise and Vibration
- Appendix B – Hydrogeological
- Appendix C – Ecological
- Appendix D – Archaeological and Cultural Heritage
- Appendix E – Socio-Ecological

(Note: Work Plans were provided as draft reports only. Comments provided by agencies, Indigenous communities and the public were directly incorporated into the implementation as described in Volume I, Section 10.0, Consultation Summary)

Volume III – Technical Reports

- Appendix A – ESDM Report
- Appendix B – Noise Impact Assessment
- Appendix C – Hydrogeology Study
- Appendix D – Natural Heritage Assessment
- Appendix E – Cultural Heritage Resource Assessment
- Appendix F – Stage 1 Archaeological Assessment
- Appendix G – Socio-Economic Impact Assessment
- Appendix H – Traffic Impact Study
- Appendix I – Leachate Treatment and Disposal Report

Volume IV – Record of Consultation

- Appendix A – Notice of Approval of the TOR and Commencement of the EA
- Appendix B – Public Information Centre #1
- Appendix C – Public Information Centre #2
- Appendix D – Consultation with Federal Agencies
- Appendix E – Consultation with Provincial Agencies
- Appendix F – Consultation with Municipal Authorities
- Appendix G – Consultation with the Conservation Authority
- Appendix H – Consultation with Indigenous Communities
- Appendix I – Consultation with Utilities/Services
- Appendix J – Consultation with Landowners/Interested Stakeholders
- Appendix K – Consultation Summary Table