Hanover
Ontario, Canada

Brockton

HANOVER-WALKERTON WASTE MANAGEMENT COMMITTEE MINUTES

Tuesday November 23, 2021| 9:00am
By Zoom

MEMBERS PRESENT: Ron Cooper I Warren Dickert I Gregg Furtney I Bruce Davidson I Tim Elphick

OTHERS PRESENT: Brian Tocheri I Christine Walker

MEMBERS ABSENT: Ed King

1. **DISCLOSURE OF PECUNIARY INTEREST** – None declared.

2. **DELEGATION** – None

3. **ADOPTION OF PREVIOUS MEETING MINUTES**

Moved by TIM ELPHICK / Seconded by WARREN DICKERT
THAT the minutes of November 9, 2021 meeting be approved as printed and circulated.
CARRIED

4. **BUSINESS ARISING** – None

5. **ITEMS FOR DECISION/DISCUSSION**

5.1 Landfill Capacity Planning

The Committee reviewed funding levels based upon current funding as well as increased funding levels to provide for future capital items for cell no. 3, cell no. 4, compactor replacement as well as Environmental Assessment (EA) for future expansion and construction cost.

Attached is a spread sheet showing projected status of reserves with the Post Closure Costs remaining unfunded based upon the following motions.

Moved by WARREN DICKERT / Seconded by TIM ELPHICK
THAT the Hanover/Walkerton Waste Management Committee recommended $180,000 municipal contribution from each municipality being a 6% increase for 2022.
CARRIED

Moved by TIM ELPHICK / Seconded by BRUCE DAVIDSON
THAT the Hanover/Walkerton Waste Management Committee recommend that both Hanover and Brockton Councils consider a minimum of 5% annual increase in municipal contributions for funding of future capital expenditures.
CARRIED

5.2 Leachate Management Review

The Committee reviewed the leachate management system operational plan prepared by Stantec Consulting which confirms that the overflow pond is to be utilized for emergency purposes only.

The final report from Cobide Engineering was provided with no future questions from the Committee. The final report is attached to the minutes which recommends the construction of a leachate pumping station and forcemain to the Hanover Waste Water Treatment Plant.

The Committee discussed the next steps which both Ron Cooper and Gregg Furtney will prepare a Request for Proposal (RFP) for Environmental Assessment (EA) engineering services.

5.3 2021 Landfill Budget

- The Committee reviewed the budget with Ron Cooper responding to questions.
- The following motion was subsequently approved.

Moved by WARREN DICKERT / Seconded by TIM ELPHICK
THAT the Hanover/Walkerton Waste Management Committee recommend the 2022 budget be presented to both Hanover and Brockton Councils for adoption.
CARRIED

6. ITEMS FOR DISCUSSION – None

7. NEW BUSINESS –

7.1 Confirmation of Meeting Minutes
Gregg Furtney requested that the committee members acknowledge if okay with the minutes when circulated prior to him presenting to Brockton Council.

8. NEXT MEETING – Tuesday February 15, 2022 at 9:00am

9. ADJOURNMENT - The meeting was adjourned at 10:39am.

Minutes prepared by Ron Cooper, Director of Public Works

_____
Chair/Secretary, Ron Cooper

2022 - 2042 Forecast -- Using Current Funding with 5% increase/year

		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Closure Costs in Yrly Operations											
Municipal Contributions	360,000	378,000	396,900	416,745	437,582	459,461	482,434	506,556	531,884	558,478	586,402
Closures Costs (included $62,000 / year in Operations up to 2042)											
Amount currently to Reserves	297,400	312,270	327,884	344,278	361,492	379,566	398,544	418,472	439,395	461,365	484,433

USE OF RESERVES	
Cell No. 3 Construction - $2,300,000	- 2,300,000
Cell No 4 Construction - $3,300,000	
Compactor - $1,000,000	
EA for Future Expansion - $2,000,000	
Future Expansion Construction - $2,300,000	

691,300											
RESERVES BALANCE (Opening Reserves = $691,300)	988,700	1,300,970	1,628,854	1,973,131	34,623	414,189	812,733	1,231,205	1,670,600	2,131,965	2,616,399

		2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
UNFUNDED until 2043	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Post Closure Costs - $3,800,000	152,000	155,040	162,792	170,932	179,478	188,452	197,875	207,768	218,157	229,065	240,518

2022 - 2042 Forecast

	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	
	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	**TOTAL**
Closure Costs in Yrly Operations											
Municipal Contributions	615,722	646,508	678,834	712,775	748,414	785,835	825,127	866,383	909,702	955,187	12,858,931
Closures Costs (included $62,000 / year in Operations up to 2042)											
Amount currently to Reserves	508,655	534,088	560,792	588,832	618,273	649,187	681,646	715,729	751,515	789,091	**10,622,905**
USE OF RESERVES											-
Cell No. 3 Construction - $2,300,000											- 2,300,000
Cell No 4 Construction - $3,300,000			- 3,300,000								- 3,300,000
Compactor - $1,000,000			- 1,000,000								- 1,000,000
EA for Future Expansion - $2,000,000	- 250,000	- 250,000	- 250,000	- 250,000	- 250,000	- 250,000	- 250,000	- 250,000			- 2,000,000
Future Expansion Construction - $2,300,000										- 2,300,000	- 2,300,000
											- 10,900,000
691,300											
RESERVES BALANCE (Opening Reserves = $691,300)	2,875,053	3,159,141	- 830,067	- 491,235	- 122,962	276,225	707,871	1,173,600	1,925,115	414,205	

	2%	2%	2%	2%	2%	2%	2%	2%	2%	
UNFUNDED until 2043	2054	2055	2056	2057	2058	2059	2060	2061	2062	**TOTAL**
Post Closure Costs - $3,800,000	252,544	265,171	278,430	292,351	306,969	322,317	338,433	355,355	373,122	**4,886,767**

COBIDE
ENGINEERING INC

December 8, 2021

BY EMAIL

Ron Cooper, Director of Public Works
Town of Hanover,
341 10th Street
Hanover, Ontario N4N 1P5

Tel: 519-364-2780
Email: rcooper@hanover.ca

Subject: **Hanover/Walkerton Waste Disposal Site**
Leachate Management Review
Town of Hanover
O/Ref.: 10029

Dear Mr. Cooper:

COBIDE Engineering Inc. has been retained by the Town of Hanover to prepare a report to evaluate the long-term leachate management alternatives for the Hanover / Walkerton Landfill Site (HWLS).

The analysis below is the first step in the process that has been undertaken to determine the approximate costs and which preferred solution is the favourable route to treat the leachate generated at the Hanover / Walkerton Landfill Site. Given the probable increased long-term costs based upon current costs, this report provides additional details on several options for the management of the landfill leachate. Construction of a leachate pumping station and forcemain is the preferred solution as it will result in the lowest annual cost over the long-term.

The leachate is currently being collected, loaded, and trucked by a licensed liquid waste hauler to both the Hanover Wastewater Treatment Plant and the Walkerton Wastewater Treatment Plant for final treatment and disposal. This process will continue until the preferred solution has been implemented and is fully operational.

1.0 Location, Site Information and Background

The Town of Hanover and the Municipality of Brockton own and operate a landfill site on Lots 68 to 73, Concession 1 and 2 NDR and Part of Lots 23, 24 of Plan 171 in the former Township of Brant (now the Municipality of Brockton) in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP) Certificate of Approval No. 9704-8YRQA9. The existing Hanover/Walkerton Landfill Site (HWLS) is a waste disposal site with a 11.5 ha waste footprint within a 106.4 ha total site area and services the Town of Hanover as well as the former Town of Walkerton. An aerial map showing the location of the subject property is shown in Figure 1.

The existing landfill was expanded in 2012 and has a total capacity of 411,000 cubic metres. The site has sufficient capacity to service the solid waste disposal needs of the two communities for the next 20 to 25 years. As part of the construction of the landfill expansion area, a leachate collection system was installed with collected leachate being hauled off site to both the Hanover and Walkerton wastewater treatment plants for final treatment. With the recent construction of the second cell, the volume of leachate collected at the site has increased.

Based on the previous pumping records that have been collected at the site from 2012 to 2021, the volume of leachate collected at the site after Cells 3 and 4 are constructed will continue to increase.

Figure 1 – Aerial Photo of the site

Based on the original ***Leachate Management Report*** that was prepared during the design of the expansion area, the total fully developed projected leachate volume for the landfill was estimated to be 8,400 m^3/year or 23 m^3/day. It is anticipated that leachate volumes will fluctuate significantly during the active development of Cells 1 through 4. This is because during the early stages of the cell development, the drainage layer of the leachate collection for each cell will have exposed surfaces with no waste and will be in direct connection to precipitation events. Although the expansion area is projected to be developed in four cells, the design of the leachate collection system must accommodate the entire expansion area (once final closure has occurred) and at various stages of its active development. Since the construction of Cell 2 and the reshaping of the slope at Cell 1, there has been an increase in leachate being collected from the site. In the last twelve months (October 2020 to September 2021), there has been on average 21.5m^3/day of leachate hauled to either Walkerton or Hanover WWTP. This is partially due to the new cell (Cell 2) being connected to the system as well as the slope on Cell 1 being regraded to final grades. This average does not consider varying rainfall events (precipitation), spring melt, etc. which causes the volume of leachate to fluctuate considerably.

For example, in March 2021 when spring melt and significant rainfall was experienced, the total volume of leachate hauled was 1,431 m^3 (106 loads) which equates to a daily average (31 days) of 46.2 m^3/day. In September 2021, a large rainfall event was experienced and a total of 55 loads of leachate over a five-day period was collected and hauled offsite. That equates to approximately 742.5 m^3 total or 148.5 m^3/day which is a substantial increase from the long-term average of 23 m^3/day.

In conclusion, the volume of leachate generated can vary substantially depending on dry or wet climatic conditions. A wet year can result in double the volume of leachate generated than that of an average year. The daily flows become even higher during extreme storm events.

1.1 Analysis of Alternative Solutions

The intent of this report is to address the leachate management at the Hanover / Walkerton Landfill Site by providing four (4) alternatives for the long-term management of leachate:

- Alternative 1 – Hauling Leachate to both the Hanover Wastewater Treatment Plant and Walkerton Wastewater Treatment Plant (current method)
- Alternative 2 – On-site Treatment and Surface Discharge
- Alternative 3 – Proposed Pumping Station and Forcemain to the Hanover Wastewater Treatment Plant
- Alternative 4 – Purchase a truck, operate, and haul the leachate internally (using qualified town/municipal staff)

A summary of the four alternatives is provided below which will provide both the Town of Hanover and the Municipality of Brockton an overview of the alternatives considered, the consultation required and an evaluation of each alternative.

Alternative 1 – Hauling leachate to both the Hanover Wastewater Treatment Plant and Walkerton Wastewater Treatment Plant (current method).

In this alternative, the current method of hauling and treating the leachate will continue and is deemed functional for the short-term. Given that the leachate volumes have been difficult to predict, the hauling and treatment costs can vary from year to year and when new cells are being constructed. Replacing this method with permanent infrastructure will be more cost effective in the long run as continuing to haul leachate has been identified as having a higher life cycle cost.

Other challenges that have been identified in the evaluation process were high greenhouse gas emissions (580 trips in 2020-2021), risk of spills, ongoing health and safety concerns, wear and tear on the transportation system, noise, and disturbance to the adjacent property owners along the trucking route, and potential for spills should an accident occur. There are also limited operators in the area which provides uncertainty for the future of this method.

Alternative 2 – On-site Treatment and Surface Discharge

On-site treatment and surface discharge would be completed by constructing a full-scale leachate treatment facility at the landfill. It would be located in the vicinity of the leachate collection tank. Treatment of the leachate would occur entirely through provision of a mechanically based on site treatment plant. The final effluent discharge would be directly into the Saugeen River.

This alternative has the highest estimated life cycle cost due to the initial capital required to construct the treatment facility. Currently, it can be assumed that the leachate being collected is mostly comprised of rainwater/snow melt and is highly diluted, but it will no doubt strengthen over time due to the cells being closed and capped. If this alternative is preferred, the on-site treatment system would need to be constructed right away to treat the leachate prior to discharge. The costs for approvals for this alternative could be quite onerous and agency and public perception of surface water disposal may also not be favourable even for a treated leachate.

Alternative 3 – Proposed Pumping Station and Forcemain to the Hanover Wastewater Treatment Plant

The concept of pumping the leachate to Hanover Wastewater Treatment Plant was developed as a solution to dispose of the leachate and eliminate the need for hauling. Presently, there is a leachate collection tank located at landfill. Leachate collected within the lined portions of the landfill cells flows by gravity to the collection tank where it is currently collected and pumped into a truck from manhole for hauling and disposal to either Hanover or Walkerton WWTP. It is thought that the existing manhole could be converted to a pumping station for pumping of the leachate through a dedicated forcemain to the existing Hanover WWTP. The length of forcemain required would be approximately 900 m to connect the Hanover Landfill to the Hanover Wastewater Treatment Plant. The intent would be to directional drill the forcemain directly east of the landfill site, underneath the Saugeen River where it would connect into the existing Hanover Wastewater Treatment Plant.

This alternative has the lowest life cycle cost of all the alternatives considered and does not present any significant operational, technical, or regulatory challenges. It is recognized that there may be potential impacts when leachate is added to a municipal wastewater treatment plant, but it is thought that any challenges encountered could be addressed during final design. Some temporary impacts during construction were identified which could be mitigated with standard practices.

Alternative 4 – Purchase a truck, operate, and haul the leachate internally (using qualified town/municipal staff)

This alternative would see the Town of Hanover and the Municipality of Brockton purchase a suitable truck to haul the leachate to either of their respective wastewater treatment plants. This would also include the Town/Municipality hiring full-time staff to operate and manage the trucking of the leachate. This option has the same challenges as Alternative 1 and a slightly higher life cycle cost but may be more reliable and sustainable in the long term.

The methodology for evaluation included the following:

a) Current Conditions and Factors

b) Cost Evaluation

c) Regulatory Approvals

d) Comparison of Alternatives Based on Environmental Impacts, Technical Reliability, Logistics and Economic Impacts (collectively called the *Evaluation Criteria*)

1.2 Current Conditions and Factors

Leachate is defined as any liquid produced when water percolates through any permeable waste material. It contains elevated levels of general chemistry parameters, metal, and some volatile organic compounds. The volume of leachate generated depends on the amount of precipitation, the active area of disposal, the characteristics cover soil, and the landfill development. At the Hanover/Walkerton Landfill Site the average collection volume rate is 23 m^3/day which is the projected full development leachate volume.

Leachate quality, generation, required treatment capacity, and storage capacity in the current landfill for all four (4) alternatives are the same except for the treatment objective. The treatment objective and its potential impacts are described below.

Alternative 1 and 4 includes ultimate treatment of the leachate at both the Hanover and Walkerton WWTP. The effluent criteria established for both the WWTP's are stipulated in the Certificate of Approval for the operation of the Hanover WWTP and Walkerton WWTP with discharge to the Saugeen River.

Alternative 2 includes a full-scale leachate treatment facility at the HWLS and therefore must meet Provincial Water Quality Objective (PWQO) criteria for the eventual discharge into the Saugeen River.

Alternative 3 includes the construction of a pumping station and forcemain with ultimate treatment of the leachate at the Hanover WWTP. The capacity of the Hanover WWTP must be considered when discharging the leachate to the Hanover WWTP.

1.3 Cost Evaluation (2020)

The cost assessment alternatives have been prepared based on the net present value for both a 25-year and 50-year timeframe as the treatment plant would be approaching the lifespan on the mechanical components within that time. To understand the experience of other municipalities with leachate treatment systems, documents from several municipalities with active disposal sites using on-site treatment have been reviewed. Information was gathered from the Municipality of Kincardine, the Township of McDougall, and the City of Toronto all of which manage landfill leachate via on-site treatment although each solution is unique both the site and situation. The major factors, aside from the plant cost, that influenced the selection to on-site leachate treatment were:

1. Distance to an existing wastewater treatment plant
2. Ease of connection or construction
3. Availability of existing plant capacity
4. A willing host if in a different municipality
5. Scale of operation – volume of leachate production
6. Availability of adequate receiving water body

Kincardine and McDougall have built on-site plants as they were faced with the challenge of the treatment plants being 13 and 11 kilometres away, respectively. The Township of McDougall also had bedrock and an unwilling host to consider. The Municipality of Kincardine constructed a $2.8M leachate treatment plant three years ago and is considered the best comparison for Hanover and Walkerton. Their construction and operating costs have been used to estimate the cost of an on-site treatment plant at the HWLS.

The Kincardine Plant has found that there is a wide variability in leachate strength, characteristics, and inflow which makes operating an extended aeration plant challenging to stay within legislative requirements. Special efforts such as maintaining a separate feed stock is required to avoid killing off or adversely changing the biological process. Other treatment technologies are available that do not rely as heavily on bacteria, but they have a higher capital cost and would require further review.

Hauling the leachate to the Hanover/Walkerton wastewater treatment plants and treating it currently has an annual operating cost of $180,000 based off data provided by the Town of Hanover from October 2020 to September 2021. It should be noted that when new cells are being constructed, the annual operating cost could fluctuate due to the additional leachate piping being installed and connected into the system while the existing open landfill cell(s) are still operational and producing leachate. Precipitation also plays heavily into the fluctuating volumes.

On-site treatment at the Hanover/Walkerton Landfill with disposal to the Saugeen River has a total estimated capital cost of $2,800,000 (based on Kincardine's costs of a similar project) plus an annual operating cost of $242,000. The annual operating cost is based on the current cost to treat the leachate.

Construction of a leachate forcemain to the sanitary sewer with disposal at the Hanover WWTP has a total estimated capital cost of $1,500,000 and an estimated annual cost to treat the leachate of $75,000. The estimated cost of the forcemain is based off a construction estimate completed by Cobide Engineering Inc. using today's construction and material rates including the cost of the Class EA study. The estimated annual treatment cost of $75,000 is based off 7,830 m^3 of leachate at a treatment cost of $7.95/$m^3$ as provided by the Town of Hanover from October 2020 to September 2021.

1.4 Regulatory Approvals

Alternative 1 – Permanently Haul Leachate

This is the current method of managing the leachate from the Hanover/Walkerton Landfill. All approvals are already in place to continue to operate in this manner.

Alternative 2 – On-site Treatment and Surface Discharge

This alternative will require approval under Section 53 of the Ontario Water Resources Act, the Conservation Authority Regulation 169/06 as well as a Municipal Class Environmental Assessment (Class EA). Historically, the MECP has approved numerous on-site leachate treatment facilities. Although this approval is feasible to obtain, it would be at a higher cost than Alternative 3 due to the technical complexity. Approval agencies include the Saugeen Valley Conservation Authority (SVCA), Saugeen Ojibway Nation (SON) and the MECP.

Alternative 3 – Pumping Station and Forcemain to the Hanover WWTP)

This alternative will also require a Municipal Class Environmental Assessment (Class EA) involving comparison of the forcemain to other alternatives and would require public consultation. An amendment to both the EPA and OWRA Certificates of Approval for the Hanover/Walkerton Landfill will also be required. The approval of Alternative 3 will be efficient based on past projects of a similar nature that were reviewed in preparation of this report. Commenting and approval agencies include the Ministry of Transportation (MTO), the Saugeen Valley Conservation Authority (SVCA), Saugeen Ojibway Nation (SON), and the MECP.

Alternative 4 – Purchase a truck, operate, and haul the leachate internally (using qualified town/municipal staff)

This alternative is similar to the current method of managing leachate at the Hanover/Walkerton Landfill site. All approvals are already in place to continue to operate in this manner. Minimal changes would be required such as registering the Town of Hanover as the new leachate carrier, obtaining the appropriate licensing for the municipal staff, etc.

1.5 Evaluation Criteria

Alternative 1: Hauling of Leachate to Hanover and Walkerton WWTP	
Pro	**Con**
Regulatory Approvals in place	High energy consumption
Logistics are already in place	WWTP ECA requirements if new receiving station is constructed at either plant
Low implementation time	Environmental liability due to accidents and spills
Low Capital cost, receiving area at both WWTPs already in place	Moderate 50-year life cycle cost
	Dependent on hauling company and/or supply chain
	Cost/unit higher than other alternatives because of precipitation and/or weather events

Alternative 2: On-Site Treatment and Surface Discharge	
Pro	**Con**
No additional load on the Hanover or Walkerton WWTP	Will require additional operating resources (min 0.6 to 1 full-time employee)
Not sending leachate to wastewater treatment plant will maintain allocation for 5 residential units	Leachate Treatment Plant will not have the buffering effects of municipal wastewater which may lead to more upsets with longer recovery processes
No risk of additional odours concerns at the Hanover WWTP due to leachate	Treatment process is susceptible to temperature swings of leachate
Process design will be purpose built to treat leachate and address all leachate variability	Higher capital and operating costs than pumping station and forcemain
Corrosive nature of leachate will not affect municipal wastewater plants	Significant additions of chemicals required to balance biology of leachate plant
Upsets due to leachate will be contained at the landfill treatment plant and have no impact on the Town's ability to treat municipal wastewater	

Alternative 2: On-Site Treatment and Surface Discharge (cont..)	
Pro	**Con**
Forcemain maintenance and potential blockages avoided	Enhanced electrical power supply requiring standby power and robust systems to ensure routine power glitches do not result in operator being on-site to reset the plant
Leak potential from forcemain breaks causing spill to natural environment avoided	Biosolids will likely not meet the requirements to apply on land and will be sent back to landfill with potential of concentrate loading
	Leachate treatment plants have additional on-going reporting and testing requirements
	Leachate treatment plant may require additional on-site effluent storage facilities during periods of low or no flow of the receiving watercourse

Alternative 3: Pumping Station and Forcemain to Hanover WWTP	
Pro	**Con**
Corrosive nature of leachate will be buffered by municipal wastewater	Leachate pumping station will require sufficient communications and programming to enable leachate flow pacing to the inflow of the Hanover WWTP
Power fluctuations will not be as critical at pumping station. Standby power will not be necessary given inherent on-site storage. Restart will be automatic when power supply resumes	
Receiving outlet for effluent from treatment plant is already approved	
Biosolids will be mixed with municipal wastewater biosolids and can be land applied	
Influent leachate will mix with municipal wastewater, making leachate easier to treat	May require WWTP process adjustment upon varying strength of leachate
Economies of scale by operating and maintaining one plant instead of two to treat the same wastewater	
Leachate inflow is below 2% domestic inflow rule of thumb guideline where no additional treatment considerations are considered necessary to add leachate to a domestic wastewater plant	Leachate pumping station and forcemain will require more maintenance than wastewater pumping station and forcemain due to nature of leachate
Temperature of leachate will be moderated by municipal sewer, reducing the temperature swings of the leachate, allowing for more consistent treatment efficiencies	Requires the construction of a forcemain with potential risk of spills to the natural environment

Alternative 3: Pumping Station and Forcemain to Hanover WWTP (cont.)	
Pro	**Con**
No requirement for additional chemicals or nutrient loading to allow the biological process to operate.	

Alternative 4: Hauling of Leachate to Hanover and Walkerton WWTP with Municipal Staff/Equipment	
Pro	**Con**
Regulatory Approvals in place	High energy consumption
Logistics are already in place	WWTP ECA requirements if new receiving station is constructed at either plant
Low implementation time	Environmental liability due to accidents and spills
Minimal Capital cost, receiving area at both WWTPs already in place	Moderate life-cycle cost
Not dependent on a hauling company and/or supply chain	

2.0 COSTS

A potential 2.8-million-dollar project for the Town and Municipality is a substantial undertaking and warrants appropriate consideration. The economic environment is an important consideration of any EA study. Alternative 3 was estimated to be approximately 40% lower in total life-cycle costs than Alternative 2.

Costs compared to similar projects in the area have been reviewed and considered while preparing this report. The Kincardine Leachate Treatment Plant was recently commissioned with a cost quoted at $1.7M, however it is understood that the actual costs were closer to $2.8M.

The cost of treating leachate at both the Hanover and Walkerton WWTP in 2021 was $7.95 per m^3 and $14.81/m^3$ to haul the leachate to either treatment plant.

The following table represents the lifecycle costs of each alternative at 25 and 50 years. All costs are calculated using present volumes and present costs.

Table 1 – Leachate Management Cost Summary

Table 1 - Leachate Management Cost Summary

Opt.	Description	Initial Capital	Annual Ops. [6]	Lifecycle[4]	
				25-years	50-years
1	Permanently Haul Leachate (status quo)[1]	$0	$180,000	$3,240,000	$7,740,000
2	On-Site Treatment and Surface Discharge[2]	$2,800,000	$242,000	$7,156,000	$13,206,000
3	Pumping Station and Forcemain[1][3]	$1,500,000	$75,000	$2,850,000	$4,725,000
4	Purchase truck and use own forces to Haul Leachate [1][5]	$630,000 $945,000	$168,000	$3,654,000	$8,169,000

Notes:

1. Based on $7.95/m^3$ treatment cost at WWTP for leachate and $14.81/m^3$ for hauling leachate to the WWTPs
2. Based on capital and operating costs for Kincardine Leachate Plant
3. Based on $7.95/m^3$ treatment cost at WWTP
4. Based on Net Present Value (no inflation or discounting were applied)
5. Based on present cost to purchase a truck $315,000 with a life expectancy of 15 years
    - For 25-year analysis $630,000 was used for initial capital cost
    - For 50-year analysis $945,000 was used for initial capital cost
6. See Appendix B for cost breakdown and details

In comparing Alternative 1 to Alternative 3, the number of years that the initial capital required for Alternative 3 to reach a break even point with Alternative 1 would be 13 years. After that time, the accumulative cost to continue trucking would be greater than the 1.5M initial capital cost for Alternative 3. From years 13 to 25 a total savings of 1.4M would be achieved. From years 20 to 50 a total savings of 4.3M would be achieved.

3.0 INITIATE CLASS EA

The Town would be required to initiate the Municipal Class EA process if they chose to deviate from the current process of hauling leachate. A Terms of Reference (i.e., the problem and opportunity) would be prepared, and a consultant retained to undertake the EA review and additional study work as necessary to complete a Class EA. See Appendix A for the MEA Municipal Class EA Flow Chart.

Alternative 2 would fall under a Schedule C Class EA. This process would include Phases 1 through 5 of the EA process.

Alternative 3 is anticipated to fall under a Schedule B Class EA. This alternative would generally end at the completion of Phase 2 of the EA process where the preferred alternative would be defined. To complete the Schedule B process, a Notice of Completion shall be submitted to review agencies and the public and a period of at least 30 calendar days shall be allowed for comment and input. If no Part II order is received within the review period (30 calendar days), then the project may be developed, designed, tendered, and constructed based on the preferred alternative.

Below is an outline of Phase 1 through Phase 5 of a Class EA including the mandatory public consultation process for each phase.

Phase 1:

Phase 1 of a Class EA explores the problem or opportunity. The first step is to identify and describe the problem or opportunity. This phase should lead to the development of a clear statement of the problem or opportunity being addressed and from this point, the project will be developed. During Phase 1, a public consultation plan should be developed to structure how public consultation will be handled during the entire Class EA process. Public consultation should be initiated during Phase 1 to notify the public, affected stakeholders, and regulatory agencies of the project commencement.

Phase 2:

Phase 2 of the Class EA process involves the evaluation of the defined alternatives, in this case, Alternatives 1 through 4. The technical, economic, and environmental aspects will be examined during this time before any alternative is suggested or implemented as the favourable alternative. Any mitigation measures that could reduce the environmental impacts will also be defined during this phase. When a preferred alternative is selected, several activities are incorporated into the assessment process such as land use analysis, site inspection, review of expert technical opinion and consultation with affected stakeholders and regulatory agencies (SON, SVCA, MECP, etc.). The outcome in Phase 2 is the evaluation of alternative solutions to the defined problems and the selection of the preferred alternative based on the assessment results as mentioned above and a review of the technical components associated with the project.

During Phase 2, more in depth Public Consultation should be introduced as outlined below. It should be noted that public consultation is an integral component of a Class EA.

- Notice of first Public Contact – Optional Alternatives – to notify the basic project concept through newspaper advertisements, town/municipal website, mailing to stakeholder list to announce first opportunity for public contact.

- Implement first Public Contact – to convey the project information and receive public response/feedback to the problem/opportunity statement, optional conceptual solutions, evaluation criteria, and the results of the preliminary evaluations by way of a public information centre, public presentation meeting and public response with questionnaires, comments, Q & A, etc.

- Notice of Completion – Concept Solution Alternatives – to notify the results of Phase 2 evaluation and public response to selection of preferred option with explanation of opportunity for Part II Order Request.

Phase 3:

Phase 3 is the identification and evaluation of the alternative design concepts in the selection of a preferred design concept that could be utilized to the implement the preferred alternative solution identified in Phase 2 are evaluated in Phase 3. Each reasonable design shall be identified and described. A detailed inventory of the natural, social, and economic environments shall be prepared, and the specific components of the environment must be considered and shall be identified in detail during this phase. The potential impacts and evaluation of the alternative designs shall also be established which would generally lead to the preliminary identification of a recommended design. The effected review agencies and public would be consulted and given the opportunity to comment and have input. It is important at this stage, that the recommended design is not presented as a decision but as a preliminary preference based on rational evaluation and available information. The preferred design would then be confirmed or selected with mitigating measures defined and the preliminary preferred design finalized.

Additional public consultation is required for Phase 3. A Notice of second Public Contact followed by Implementation of second Public Contact is mandatory. This additional Public Contact is only required for Phase 3 Schedule C projects (i.e., Alternative 2).

Phase 4:

This phase represents the culmination of the planning and design procedures set out in the Class EA. A Project File for public and government agency review should be prepared and submitted that details and outlines all activities undertaken to date through Phases 1, 2 and 3, embodying the Environmental Study Report (ESR). This document is intended to be a transparent and easily understood record of the decision-making process. The ESR should be filed with the municipal clerk and be on public record for at least 30 calendar days for review by the public and review agencies. At this point, there is still allowance for a Part II Order. If no order is received by the Minister within the review period, then the project can proceed to Phase 5.

Additional public consultation is required for Phase 4 in the form of a Notice of Completion. The purpose of this third point of contact is to notify the public and review agencies with the results of the EA process as documented in the ESR initiating the 30-day review period for public to comment on the selection of the preferred design alternatives with the explanation of opportunity or Part II Order Request.

Phase 5:

Once this phase is reached and no Part II Order Requests have been received, the Town/Municipality can proceed with the completion of contract drawings, tender documents, and method of construction. The processes as detailed in the ESR must be followed during this phase. The project would proceed to construction and operation and be monitored as per the program outlined in the ESR. During the planning and design phase of the chosen preferred alternative, a full cost analysis will be conducted for the Town/Municipality to prepare budgets and apply for any funding or grants that may be available.

The projected schedule to undertake a review of the Class EA and proceed through each Phase is:

- ➔ 2022 – Conduct Phase 1 to 4 of EA Process
- ➔ 2022/2023 – Preliminary Design
- ➔ 2023/2024 – Final Design and Approvals
- ➔ 2024/2025 – Construction/Commissioning

From the above schedule, the Town and Municipality can expect to operate as it currently does until 2025. This schedule can be used as a timeline for both Alternatives 2 and 3 which as previously mentioned, would require a Class EA.

The cost of the EA review is difficult to estimate until the scope of work is well known. Typically, 3% - 4% of estimated capital cost of the most expensive option is used to establish a project budget. Using a range of $1.9 - $2.8M in capital cost for an on-site treatment plant (Alternative 2) provides an estimated cost of around $100,000. There are, however, cost risks to consider that could increase that estimate substantially such as:

- Additional natural environment studies required by agencies;
- Four seasons monitoring to establish natural environment baseline;
- First Nation capacity allowance;
- Market forces for consulting services;
- Responding to Part II Order Request(s)

In addition, the decision to undertake an EA will cause the Town and Municipality to incur the costs to keep hauling leachate as well as compliance and long-term health and safety risks.

4.0 SUMMARY AND CONCLUSIONS

The preferred solution is Alternative 3; the construction of a leachate pumping station and forcemain to Hanover Waste Water Treatment Plant as it has the lowest 25 and 50 year life cycle cost for the Town and Municipality. The lowest life cycle cost however should not be the sole evaluation criteria since there are also environmental and social/cultural factors to consider. When the non-economic factors are significantly adverse, the proponent may wish to pay a premium to responsibility implement the solution with the highest net benefit to the community. In the absence of other significant factors, the solution with the lowest life cycle cost generally becomes preferred. The leachate pumping station and forcemain alternative however has the lowest cost without posing undue environmental risks or causing social/cultural concerns, and thus continues to be recommended solution in this report as the preferred long-term leachate management solution.

Based on the findings of this report, the following conclusions have been made:

1. Operating one treatment plant instead of two to accomplish the same goal is preferable,
2. The Hanover WWTP is reliable, and the treatment process would have less risk of process upset and non-compliant effluent than the onsite treatment;
3. The proposed forcemain has the lowest life cycle costs of all long-term solutions;
4. The environmental risk due to a forcemain break can be mitigated;
5. The EA Review would likely result in the same preferred solution based on preliminary research;
6. Currently, the Town of Hanover and Municipality of Brockton are paying $116,000 annually in trucking costs (as provided by the Town of Hanover). The estimated capital costs of Alternative 3 are approximately $75,000 amounting to a potential savings of $41,000 annually.
7. In comparing Alternative 1 to Alternative 3, the number of years that the initial capital required for Alternative 3 to reach a break even point with Alternative 1 would be 13 years. After that time, the

accumulative cost to continue trucking would be greater than the 1.5M initial capital cost for Alternative 3.

The above assessment summarizes our review of the potential alternatives for the long-term treatment of the leachate from the Hanover / Walkerton Landfill site.

If you have any questions regarding the above, please contact the undersigned at 519-506-5959, extension 102.

Yours truly,

Stephen J. Cobean, P.Eng., FEC
Director

Encl.

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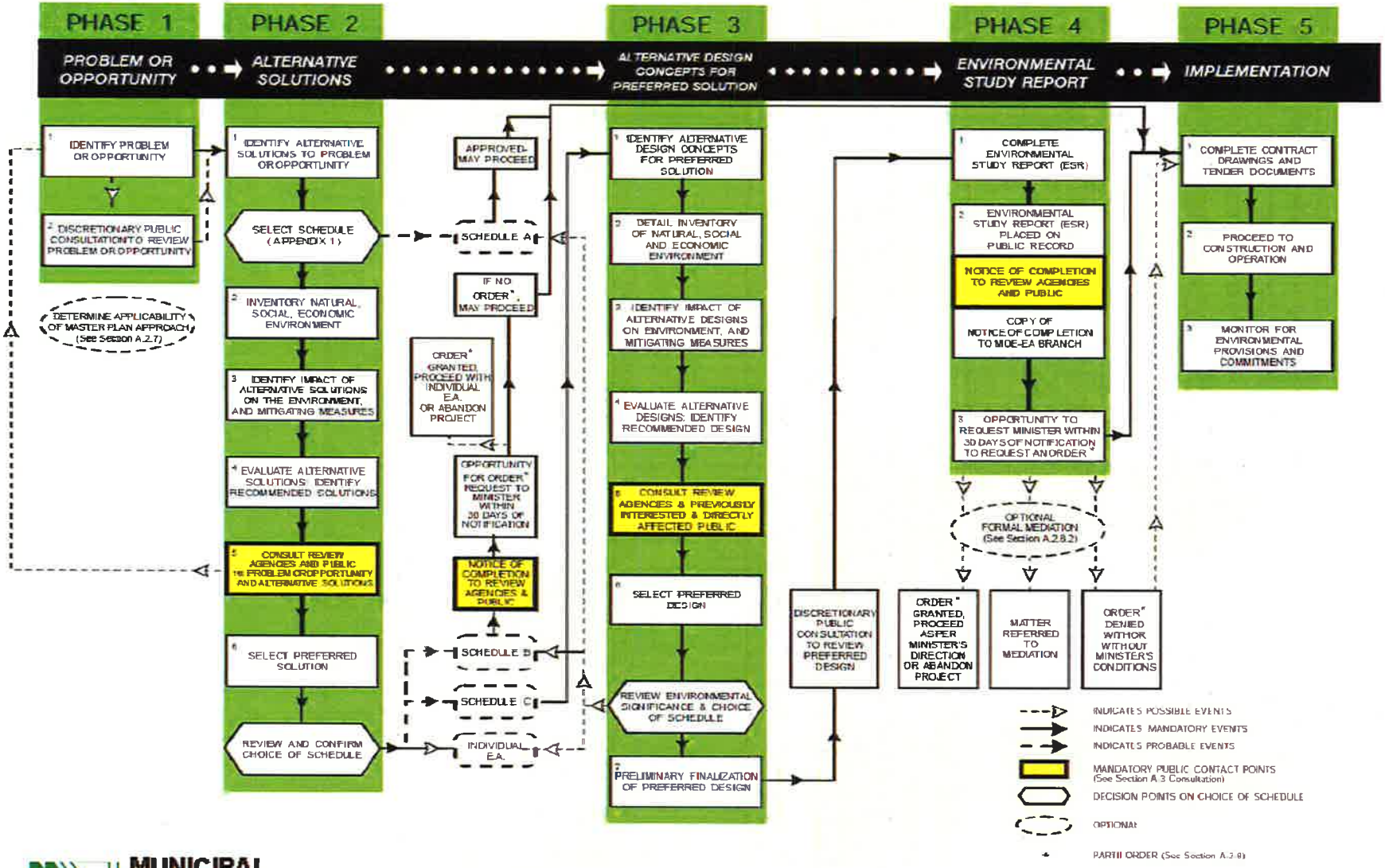
NOTE: *This flow chart is to be read in conjunction with Part A of the Municipal Class EA*



MUNICIPAL ENGINEERS ASSOCIATION

COBIDE ENGINEERING INC

HANOVER/WALKERTON WASTE DISPOSAL SITE
LEACHATE MANAGEMENT REVIEW
CLASS EA PROCESS

DATE: NOVEMBER 4, 2021

PROJECT No. 10029

APPENDIX A

Appendix B - Annual Operating Costs

Alternative 1

Leachate Haulage with Local Hauler (current method)

Haulage		
October 2020 to September 2021		
No. of Loads		580
Cost per load	$	200.00
	$	116,000.00
Treatment		
No. of Loads		580
Volume (13.5 m^3/truck x 580)		7830
Treatment Cost (m^3)	$	7.95
	$	62,248.50
Total Annual Cost	***$***	***178,248.50***

Alternative 2

On-Site Treatment and Surface Discharge

Staff		
Equipment Operator with benefits (full time)		
Includes additional staff vehicle	$	145,677.20
Operation and Maintenance (includes treatment costs)	$	96,002.81
Total Annual Cost	***$***	***241,680.01***

Alternative 3

Pumping Station and forcemain to the Hanover WWTP

Maintenance of Equipment		
	$	12,000.00
	$	12,000.00
Treatment		
No. of Loads		580
Volume (13.5 m^3/truck)		7830
Treatment Cost (m^3)	$	7.95
	$	62,248.50
Total Annual Cost	***$***	***74,248.50***

Alternative 4

Leachate Haulage with Municipal Staff and Equipment

Staff		
Equipment Operator with benefits (full time)	$	71,955.00
Additional time		
(Monday to Friday)		
156 loads @ 1.22/hr = 75 hrs		
(75@26.62/hr x 1.5)=2,994.76	$	2,994.76
Saturday		
190 loads @ 1.33/hr = 120 hrs		
(120x26.62/hr x 1.5)=4791.60	$	4,791.60
Sunday		
49 laods @ 1.33/hr = 65 hrs		
(65x26.62/hr x 2.0) = 3,460.60	$	3,460.60
Subtotal	$	83,201.96
Maintenance (10-15000/yr)	$	12,000.00
Fuel (5-7,000/yr)	$	6,000.00
Insurance	$	2,400.00
Licence	$	1,200.00
Subtotal	$	21,600.00
Total Staff/Equipment	$	104,801.96
Treatment Cost	$	62,248.50
Total Annual Cost	***$***	***167,050.46***

2022 BUDGET vs 2021 BUDGET

LANDFILL	2021 Approved	2021 Actuals	2022 Proposed	BUDGET CHANGE $	BUDGET CHANGE %
4500 Hanover Walkerton Landfill Site					
31-4500-0521 GRANTS & SUBSIDIES	(7,600)	-7,659	-7,300	300	-4
31-4500-0536 FEES-TIRES	(300)	-380		300	-100
31-4500-0560 FEES-APPLIANCES	(700)	-550	-700	-	0
31-4500-0561 FEES-RESIDENTS(CASH CUST.)	(145,000)	-167,425	-185,000	(40,000)	28
31-4500-0562 FEES-COMMERCIAL ACCOUNTS	(400,000)	-398,074	-500,000	(100,000)	25
31-4500-0579 MISC. FEES	(14,000)	-27,008	-21,000	(7,000)	50
31-4500-0747 FARMLAND LEASE-WAECHTER/OSTENDORFF	(5,000)		-6,400	(1,400)	28
31-4500-0921 SHORT TERM DEPOSIT INTEREST	-			-	
31-4500-0922 MONTHLY BANK INTEREST	(3,000)	-4,415	-4,000	(1,000)	33
31-4500-0934 TRANSFER FROM RESERVES	-			-	
31-4500-0945 TRANSFER FROM TOWN OF HANOVER	(170,000)	-170,000	-180,000	(10,000)	6
31-4500-0946 TRANSFER FROM MUN. OF BROCKTON	(170,000)	-170,000	-180,000	(10,000)	6
31-4500-1110 REGULAR SALARIES	88,200	85,221	90,400	2,200	2
31-4500-1111 PART-TIME SALARIES	53,600	45,467	55,800	2,200	4
31-4500-1112 OVERTIME (TIME & HALF)	400	64	400	-	0
31-4500-1113 OVERTIME (DOUBLE)		402			
31-4500-1152 WAGE ACCRUAL(ANN.ADJ./AUDIT)	-	-5,994		-	
31-4500-1510 EMPLOYEE BENEFITS	33,400	31,518	34,400	1,000	3
31-4500-1516 WSIB	4,300	4,215	4,600	300	7
31-4500-1519 EMPLOYEE ASSISTANCE PROGRAM (EAP)	-	60		-	
31-4500-2214 UNIFORMS & CLOTHING	1,000	777	1,000	-	0
31-4500-3110 PROF.DEV./TRAINING/TRAVEL	600	45	600	-	0
31-4500-3210 POSTAGE & FAX	700	574	700	-	0
31-4500-3212 TELEPHONE	1,100	1,010	1,100	-	0
31-4500-3214 OFFICE SUPPLIES & STATIONERY	500	702	500	-	0
31-4500-3215 PRINTING & ADVERTISING	800	153	800	-	0
31-4500-3310 AUDIT SERVICE	5,300	4,955	5,100	(200)	-4
31-4500-3311 LEGAL SERVICE/CONSULTANTS	1,000		60,000	59,000	5,900
31-4500-3325 COMPUTER SERVICES/SUPPLIES	500	508	500	-	0
31-4500-3410 PROPERTY MAINTENANCE/PURCHASES	4,000	627	2,000	(2,000)	-50
31-4500-3415 ROAD MAINTENANCE/REPAIRS	5,200	7,913	6,500	1,300	25
31-4500-3507 WEIGH SCALE MTC CONTRACT	6,200	6,369	6,200	-	0
31-4500-3526 ANN.MONITORING(ENGINEER)	66,700	48,190	69,000	2,300	3
31-4500-3527 LEACHATE HAULING	174,000	93,832	184,000	10,000	6
31-4500-3546 HOUSEHOLD HAZARDOUS WASTE	20,600	13,762	14,500	(6,100)	-30
31-4500-3555 DRYWALL/SHINGLES/TIRES	54,100	28,166	56,300	2,200	4
31-4500-3614 LABORATORY SERVICES	16,300	6,862	17,000	700	4
31-4500-3623 MACHINERY RENTAL-"TOWN EQUIPMENT"	36,000	34,314	36,800	800	2
31-4500-3624 MACHINERY RENTAL-"OUTSIDE"	13,000	9,540	11,000	(2,000)	-15
31-4500-3710 INSURANCE (GENERAL)	6,800	8,082	8,200	1,400	21
31-4500-3716 HYDRO (GENERAL SERVICE) #1	2,500	1,980	2,600	100	4
31-4500-3719 TAXES-BROCKTON-(BRANT)	9,200	8,840	9,400	200	2
31-4500-4121 MERCHANT FEES	400	559	700	300	75
31-4500-4126 ADMINISTRATION FEE (INTERNAL)	70,700	70,700	72,100	1,400	2
31-4500-4410 CASHIER OVER/SHORT	-	123		-	
31-4500-5210 TCA PURCHASES	-	148,336		-	
31-4500-5213 TRANSFER TO RESERVES	206,800		297,400	90,600	44
31-4500-6000 AMORTIZATION EXPENSE - TCA	189,100		188,300	(800)	-0
31-4500-6100 CHANGE IN INVESTMENT IN CAPITAL ASSETS	(189,100)		-188,300	800	-0
Total 4500 Hanover Walkerton Landfill Site	(31,700)	-287,639	-34,800	(3,100)	10
Total 4500 Hanover Walkerton Landfill Site	(31,700)	-287,639	-34,800	(3,100)	10
4550 2015 Cat 816F Compactor					
4550 2015 Cat 816F Compactor					

LANDFILL	2021 Approved	2021 Actuals	2022 Proposed	BUDGET CHANGE $	BUDGET CHANGE %
31-4550-2410 FUEL/OPERATIONS	21,700	22,252	24,500	2,800	13
Total 4550 2015 Cat 816F Compactor	21,700	22,252	24,500	2,800	13
Total 4550 2015 Cat 816F Compactor	21,700	22,252	24,500	2,800	13
4560 Densifier - Styrofoam					
4560 Densifier - Styrofoam					
31-4560-3525 CONTRACTED STAFF	10,000	7,069	10,300	300	3
Total 4560 Densifier - Styrofoam	10,000	7,069	10,300	300	3
Total 4560 Densifier - Styrofoam	10,000	7,069	10,300	300	3
Total Landfill	-	**(258,318)**	-	-	