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The Regional Municipality of Durham Report

To:	The Committee of the Whole
From:	Commissioner of Works and Commissioner of Finance
Report:	#2017-COW-180
Date:	June 7, 2017

Subject:

Organics Management Strategy

Recommendations:

That the Committee of the Whole recommends to Regional Council:

A) That Regional Council receive the results of Phases One and Two of the preliminary Business Case assessment and technology review conducted by GHD;

B) That Regional Council authorize the Finance Department to initiate a Request for Information (RFI) to identify potential organics management proposals with Works and Finance Department staff to report back to Regional Council with the assessment from the RFI results and an updated business case in 2017;

C) That Regional Council approve a contract with GHD at a cost not to exceed $300,000 in order to assist staff with the development, review, and evaluation of the RFI results, including:

- Explore the various service delivery options;
- Conduct a review of Provincial legislation; and
- Provide the necessary data to update the Business Case.

D) That Regional Council authorize Works and Finance Department staff to provide comments to the Province by the July 30, 2017, deadline regarding the Provincial discussion paper issued May 31, 2017, entitled “Addressing Food and Organic Waste in Ontario”.

Report:

1. Executive Summary

1.1 The existing organics management system (Status Quo) is at capacity and may not meet the requirements of the anticipated Provincial Organics Action Plan (OAP).

1.2 The long-term organics management system may require a significant cost increase no matter what technologies are chosen. Any Regional capital cost would depend upon both facility right-sizing considerations and the contribution of various stakeholders and roles in the evolving provincial organics management market.

1.3 Based on the preliminary Business Case (Section 11), either the aerobic or the anaerobic system could result in capital costs ranging between $170 million to $210 million with the annual costs in the range of $37.3 million to $48 million per year with an estimated property tax increase of up to eight per cent.

1.4 Bio-fuel from organic waste and offsetting fossil fuel use is a significant program in the Regional Municipality of Durham's (Region) Climate Change Action Plan, which must still undergo a Regional Council review of the appropriate business cases.

1.5 A mixed waste pre-sort will be required to extract organics from the garbage bags in order to be compliant with a possible food waste organics ban (landfill and energy-from-waste).

1.6 There are two distinct technologies for the treatment of organic waste:

- Aerobic: produces compost, is energy intensive, and requires very clean feedstock.

- Anaerobic: produces bio-fuel and a digestate (agricultural use), is robust and can handle significant cross-contamination, and requires little energy in the process.

1.7 The anaerobic system may have opportunities to reduce any capital investment through an energy or business partner and climate change grant funding.

1.8 The mixed waste pre-sort and anaerobic treatment has the potential to:

- Produce a bio-fuel which has value as a renewable natural gas or could be used to generate electricity;

- Increase diversion to between 65 per cent and 75 per cent;

- Extend the Durham York Energy Centre's (DYEC) ability to meet the Region's disposal needs;
- Allow compliance with future legislation; and
- Attract partnerships and climate change funding or credits.

1.9 The mixed waste pre-sort and anaerobic treatment is the preferred long-term organics management system.

1.10 It is unlikely that the mixed waste pre-sort and aerobic treatment will be able to produce marketable compost.

1.11 Phase Three of the GHD contract will provide consultant assistance for several stages of the process which will further refine the business case.

1.12 The identification of potential energy or business partners through a transparent and open competitive process (RFI) will further inform Council of an anaerobic digestion (AD) waste management solution.

1.13 Subject to approval to move forward to the RFI phase, staff will proceed with the arrangements to conduct an information session on the basics of organics management, as suggested by members of Council.

2. Purpose

2.1 The purpose of this report is to outline the results of Phases One and Two of the organics management preliminary business case analysis and to seek approval to proceed with an RFI process.

3. Background

3.1 A detailed chronology of the actions taken to-date is included as Attachment #1.

3.2 In 2009, Regional Council approved Works Committee Report #2009-WR-5, "Moving Towards a 70% Diversion Target for Municipal Solid Waste", which outlined recommendations to increase the Region's solid waste diversion rate to 70 per cent including expanding the source separated organics program to the multi-residential sector and to include additional organics such as pet waste. As of 2016, a 55 per cent diversion rate has been achieved. The diversion initiatives that have been investigated or implemented since 2009 have resulted or could have resulted in small incremental increases. Such programs investigated include clear bags, bag limits, by-law enforcement, additional education and promotion, and user fees.

3.3 In 2011, Regional Council directed staff to complete a preliminary investigation of AD. The resulting report, dated November 29, 2013, concluded that AD is a

proven technology that could be implemented, provided the Region generates sufficient organic waste to support developing its own facility.

3.4 Request for Information (RFI) #677-2014 for organics technologies, issued by staff, received 10 responses (reported in the 2015 Annual Solid Waste Management Servicing and Financing Study, Report #2015-J-8) for waste pre-sorting and AD solutions, and confirmed that the Region does generate sufficient organic waste to support developing its own AD solution. Responses included only AD solutions and were provided by a range of companies with several delivery model options. Several of these companies had already progressed through the various stages of energy and environmental approvals. However, staff would like the opportunity to more actively engage the market with an updated scope, to ensure a broad and competitive pool of private sector candidates and projects.

3.5 In 2016, HDR Inc. was engaged to produce a comprehensive organics management option assessment which concluded the following:

- Mixed waste processing or pre-sorting offers the best solution for capturing and diverting organics from the multi-residential sector and has the highest potential to significantly increase organics recovery from the single-family sector.

- Technology options for both sorting of mixed waste to separate organics from the waste stream and AD processing of organics have reached a maturity level in the industry that would provide the Region with reliable options for the potential development of such a processing system.

- There is a range of AD processing technologies which could be adopted for the Region’s organic waste stream.

- The Region generates sufficient organic waste to support a mixed waste pre-sorting and AD facility.

3.6 Following Regional Council’s direction with the approval of Report #2016-J-7, “The 2016 Solid Waste Management Servicing and Financing Study and Forecast 2017 to 2025”, staff secured technical experts GHD/EY to undertake Phases One and Two of the assignment which included a technical organics management Review, a preliminary organics management Business Case, and an organics management Service Delivery Model. The GHD/EY contract was awarded over the summer period of 2016.

3.7 The GHD proposal included a Phase Three section to provide assistance in refining and updating the business case, developing the procurement documents and obtaining the appropriate environmental approvals.

3.8 The Business Case model, specific to the Region, allows for a full consideration of the alternatives for organics management and comparison to the Status Quo or the "Do nothing" option. At this time, the preliminary nature of this business case analysis is due to the following unknowns:

i) The determination of the legislative compliance obligations;

ii) The determination of an energy or business partner and the associated contribution to capital and/or operation costs;

iii) The funding available through Federal or Provincial sources for this project which could reduce greenhouse gases;

iv) The determination of the facility size, location, and capacity utilization; and

v) The future DYEC expansion trigger.

4. Legislation and Regulations

4.1 In 2016, the Provincial government passed new legislation to support a circular economy through the *Resource Recovery and Circular Economy Act*. Included in the *Resource Recovery and Circular Economy Act* is a strategy to address organics management through the OAP. In January 2017, the Ministry of Environment and Climate Change (MOECC) commenced stakeholder engagement on the Food and Organic Waste Framework for Ontario. Regional staff is actively participating in this intensive year-long process. The stakeholders have been meeting monthly with the goal to have a Provincial Policy Statement developed by the end of 2017 and implemented in 2018. The OAP proposes a possible food waste organics ban by 2022.

4.2 On May 31, 2017, the Province issued a discussion paper entitled "Addressing Food and Organic Waste in Ontario" that states the Province is committed to action to develop and implement a Food and Organic Waste Action Plan with a possible food waste organics ban.

4.3 MOECC has identified the development of its OAP as a key component of *Resource Recovery and Circular Economy Act*. The Province is actively looking for opportunities to reduce the generation of organic waste and to divert more into processes which generate renewable natural gas for use in the existing pipeline infrastructure. The following are the Guiding Principles for the OAP:

- Reduce the amount of food that becomes waste;
- Remove food and appropriate organic materials from the disposal stream;

- Reduce greenhouse gas emissions from food and organic waste processing;
- Support and stimulate end markets to recover the value of food and organic waste;
- Increase accountability of responsible parties;
- Improve data on food and organic materials;
- Enhance promotion and public education to reduce food and organic waste.

5. Project Drivers

5.1 There are several drivers that require a timely solution for the Region's organics management and overall integrated waste management system, as below.

- Legislation: Meeting the Provincial objectives in the new *Waste Free Ontario Act* and the *Climate Change/Low-Carbon Economy Act* provides challenges and significant opportunities to the Region;
- Diversion: The Region's diversion rate is currently at 55 per cent. The small incremental diversion increases outlined in "Moving Towards a 70% Diversion Target for Municipal Solid Waste" are challenging and expensive to implement and will not achieve the Region's 70 per cent diversion goal;
- DYEC Capacity: A significant increase in waste diversion must be achieved to ensure the DYEC's continued ability to meet the Region's long term disposal requirements without the need for a facility expansion in the near future. The removal of organics and recyclables will also increase the DYEC energy generation potential;
- Growth: The Region will continue to experience significant growth. The multi-residential sector presents an opportunity and a necessity for a new waste diversion process.

6. Status Quo Organics Management

6.1 Currently, the Region's organics management is completed through the Ebara wide-bed aerobic processing technology (Miller Waste Systems owned facility) located in the City of Pickering. Essentially, the high-rate processing of organic material is completed at this facility and from this site, material is hauled to an outdoor facility in the Municipality of Clarington for maturation for low-rate composting and curing. This system is operating at capacity.

6.2 Moving forward with the Region's current organics management system or the "Do nothing" option contemplates the landfilling of all wastes beyond the existing integrated waste management system capacity and therefore, is not sustainable for the following reasons:

i) Does not allow any increase to the Region's diversion rate;

ii) Does not have the capacity or ability to accept an expanded suite of organic waste materials or organics of any kind from multi-residential buildings;

iii) Does not allow for additional processing of organics in light of the rapid population growth within the Region because it is at capacity;

iv) Does nothing to extend the existing capacity of the DYEC; and

v) Does not meet the expected provincial legislation requirements or position the Region to take advantage of the opportunities available in the Climate Change/Low-Carbon Economy Act.

7. Organics Management Processes

7.1 There are two distinct technologies for the treatment of organic waste.

- Aerobic (treatment using Oxygen): produces compost, is energy intensive and requires a very clean feedstock.

- Anaerobic (treatment without Oxygen): produces bio-fuel and a digestate (agricultural use), is robust and can handle significant cross-contamination, and requires little energy in the process.

7.2 Anaerobic Digestion (AD) involves a series of biological processes in which microorganisms break down organic material in the absence of oxygen. One of the end products is a methane bio-fuel, which can be combusted to generate electricity and heat, or can be processed into renewable natural gas and transportation fuels.

7.3 An organics management solution that effectively increases the capture of organic material in the garbage streams from single family homes as well as from apartment and condominium buildings would first have to be processed at a mixed-waste pre-sorting facility. A mixed-waste pre-sorting facility would accept a mixed solid waste stream (black garbage bags) and then separate out designated recyclable materials and organics through mechanical sorting for further processing and marketing. AD is a technology which has been used in wastewater treatment plants over many decades and is considered a proven technology. AD for organic management facilities utilizes the same principals and adapts to waste characteristics.

8. In-Vessel Organics Management

8.1 In-vessel organics management is a variation of aerobic composting which builds on the Status Quo system by adding mixed waste pre-sorting and increases the capacity of the current aerobic system to process additional organics wastes. In order to produce a marketable product, this option requires increased sorting for both the pre and post-process. The residuals from this option are significant, will need to be disposed of at the DYEC, and will not contribute to the diversion rate.

8.2 This aerobic system will increase Regional diversion somewhat, but is unlikely to achieve a 70 per cent diversion rate due to the significant additional sorting and the increased quantities of residuals, which will need to be processed at the DYEC. This option will have limited effect on extending the DYEC capacity. The aerobic system will meet the expected provincial legislation for organics management. However, the Region may possibly have more limited ability to take advantage of the opportunities available in the *Climate Change/Low-Carbon Economy Act*.

8.3 It is also highly unlikely that the in-vessel organics management option will produce compost that meets the Provincial standards necessary to be useful for agricultural purposes.

8.4 The aerobic system does not produce a bio-fuel which could off-set the use of fossil fuels and be of interest to an energy or business partner.

8.5 Finally, the Business Case analysis shows that in-vessel aerobic composting will have similar long term gross costs as AD but without the potential additional benefits of AD in the form of receiving funding from an energy or business partner, energy revenues (fossil fuel offsets), or improved cap and trade/carbon trading benefits.

9. AD Organics Management

9.1 An organics management system involving waste pre-sorting and AD provides a robust system which will be able to sort and process cross-contaminated materials from the single and multi-family residence waste stream. The AD component will produce a bio-fuel which has high market demand and carbon trading and climate change benefits as well as a solid by-product, called digestate, which has several beneficial uses which will be qualified and quantified in Phase Three of the Business Case analysis.

9.2 AD will facilitate compliance and meet the intention of the *Waste Free Ontario Act* to a possible food waste organics ban in order to create a circular economy. With the AD production of bio-fuel, there is also the opportunity to participate in the Cap and Trade Program initiated by the *Climate Change/Low-Carbon Economy Act*.

9.3 The AD process, with mixed waste pre-sorting, has the potential to exceed the diversion goal of 70 per cent (65 per cent to 75 per cent) and would, thereby, divert enough waste from disposal to extend the current DYEC capacity, into the near future, as well as meeting pending legislative requirements.

9.4 The AD process, with mixed waste sorting, could provide the robustness necessary to maximize diversion of multi-residential waste and will be sized to accommodate projected future population growth.

9.5 The AD organics management can be achieved through a full range of service delivery models ranging from a fully or partially Regionally owned and operated facility through to a service contract for full merchant capacity, where the service provider owns and operates the facility and the Region simply pays a tipping fee in exchange for material sorting and processing.

10. Option Analysis

10.1 The GHD option analysis evaluated the ability of in-vessel (aerobic) and AD (anaerobic) with mixed waste pre-sorting and the Status Quo options to meet the Region's needs related to the drivers and objectives stated above. The following table demonstrates that the AD with mixed waste pre-sorting will achieve all the requirements of the organics management drivers and objectives.

Drivers/Options	Status Quo	Pre-Sort In-Vessel	Pre-Sort Merchant Capacity	Pre-Sort AD
Waste Free Ontario Act	No	Yes	Yes	Yes
Climate Change/Low-Carbon Economy Act.	No	Possibly*	Possibly	Yes
70 per cent diversion target	No	No	Yes	Yes
DYEC capacity management	No	Yes	Yes	Yes
Growth management	No	Yes	Possibly	Yes

* May qualify for cap and trade credits if the process results in a net greenhouse gas benefit.

11. Financial and Risk Implications

11.1 In 2018, the province will:

- Begin implementation of a Food and Organic Waste Action Plan, which

according to the discussion paper released May 31, 2017, has the ultimate goal of removing food waste across the entire waste system. There is no timeframe identified to achieve this goal. Works and Finance Department staff will be reviewing the discussion paper and preparing a response by the Provincial deadline of July 30, 2017;

- Issue its first policy statement; and,

- Develop and consult with stakeholders on possible waste bans, including materials under existing waste diversion programs (2021) and a possible food waste organics ban in 2022.

11.2 The province notes that of all food waste:

- 47 per cent is produced by households, and

- 53 per cent is produced by the food supply chain (e.g. food processers, wholesalers, grocery stores, and restaurants, etc.).

11.3 The Region's Status Quo Green Bin organics processing system, without expansion of organics diversion, is unlikely to be compliant with the anticipated provincial regulatory framework under the *Waste Free Ontario Act*.

11.4 The technical and financial analysis conducted by GHD considered preliminary costing and potential Regional waste system impacts compared to Status Quo, including:

- Implementation of mixed waste processing and green bin processing through construction of a two-stream processing facility using either:

  - Wet or dry anaerobic digestion; or,

  - In-vessel Ebara facility composting (e.g. the current Green Bin organics processing technology).

- Implementation of a service contract (merchant capacity) for the treatment of mixed organics and green bin waste.

11.5 All long-term organics processing options analysed by GHD include implementation of a Regional pre-sort and transfer capital project.

Capital Costs

11.6 GHD's estimated preliminary capital cost ranges from $169.6 million to $208.2 million, per the table below, indicating a requirement for a very significant initial capital investment.

Expanded Organics Solutions: GHD Preliminary Estimated Capital Costs

($ millions forecast at implementation 2019/2010)

	AD	In-Vessel
Consulting:		
Part 3 GHD Study (2017/2018)	0.8	0.8
Land:		
Pre-sort Facility	1.0	1.0
Organics Processing Facility	1.3	1.0
	2.3	2.0
Capital:		
Pre-sort/Transfer Facility	44.4	44.4
Processing Facility	118.8	161.0
Biogas Upgrade System	3.3	0.0
	166.5	205.4
Total Estimated Capital Cost	**169.6**	**208.2**

11.7 This level of capital investment was not included within the 10-year capital planning or projections (2017 capital forecast projection was $79.8 million).

11.8 Significant debentures would be required if the Region is to finance these capital costs (approximately $22 million to $27 million in annual debenture payments).

Operating Costs

11.9 The annual operational costs could also be significant, as a result of the following:

- Implementation of mixed waste pre-sort and a new organics processing facility to process existing Green Bin and newly captured mixed waste organics;
- Capital debt servicing payments;
- Potential collection and garbage and organics haulage costs; and,
- Implications related to City of Oshawa and Town of Whitby collections,

which will need to be further analyzed once potential site locations have been determined.

11.10 Excluding haulage impacts, the following table demonstrates GHD's estimated annual operational costs related to implementation of mixed waste pre-sort and AD and in-vessel compost processing technologies compared to Status Quo, which does not include expanded organics diversion tonnages.

Status Quo compared to Expanded Organics Processing
Start of Operations - 2021 annual costs

	Status Quo (26,796 tonnes) $millions	**AD** (61,409 tonnes) $millions	**In-Vessel** (61,409 tonnes) $millions
Pre-sort costs:			
Annual pre-sort cost	0.0	9.0	9.0
Less: recycling and EPR revenues[1]	(0.7)	(1.8)	(1.8)
Total Pre-sort Operations	**(0.7)**	**7.2**	**7.2**
Processing costs:			
Annual Processing cost	6.1	13.3	11.5
Other costs (compost/biogas)	0.0	4.8	2.7
Total Processing Operations	**6.1**	**18.1**	**14.2**
Debt Service Payment	**0.0**	**22.0**	**27.0**
Less Revenues:			
Renewable Natural Gas	0.0	(1.0)	0.0
Net Operating Cost	**5.4**	**46.3**	**48.4**
Excess Capacity Potential Recovery:			
Processing	0.0	(9.0)	(9.0)
Landfill Disposal Cost[2]	1.1	0.0	0.0
Net after excess capacity recovery	**6.5**	**37.3**	**39.4**

Notes: 1. For Status Quo, includes existing ferrous and non-ferrous metal recycling revenues.
2. Landfill costs result under Status Quo from waste delivered beyond DYEC capacity.

11.11 The net increase in organic processing costs related to expanded organics diversion would be between $30.8 million and $32.9 million per year, resulting in a combined property tax increase of over five per cent.

11.12 In addition, GHD's analysis depends on significant revenues, estimated at $9 million in 2021 being generated from excess organics processing capacity in both scenarios. However, if this revenue is not achieved, the 2021 annual cost of AD would increase to $46.3 million and $48.4 million for in-vessel processing or a property tax increase of over eight per cent. In fact, GHD's analysis projects declining revenue from sale of excess-capacity over time, falling from $9 million in 2021 to $5.6 million by 2030 and $0.3 million by 2040.

11.13 In addition to the costs estimated above, it is important to note that reducing organics' delivery to DYEC through enhanced diversion will also create unused Durham capacity at the DYEC. This could result in stranded capital capacity for a period of time until waste disposal increases to the annual waste delivery commitment. This potential cost has not been factored into the preliminary analysis.

11.14 In terms of AD energy revenue potential, the energy sub-project assumptions suggest that such a venture will not be financially self-sustaining based on a biogas upgrade option.

Unsustainable Revenue Potential (in five-year increments)
($ millions nominal capital and operating costs)

	2019/20	2021	2025	2030	2036	2040
Capital Cost	3.3					
Annual Costs						
Operations		2.4	2.5	2.7	3.0	3.2
Revenue		(1.0)	(1.0)	(1.1)	(1.2)	(1.3)
Net Operating Loss		1.4	1.5	1.6	1.8	1.9
Debt Servicing Cost		0.4	0.4	0.4	0.0	0.0
Total Annual Costs	**3.3**	**1.8**	**1.9**	**2.0**	**1.8**	**1.9**

11.15 The preliminary analysis excludes potential financial implications related to the pending carbon offset credit market. The draft provincial protocols are expected to be released fall 2017. It could impact the Region in several ways based on the following:

- A reduction in organics within the feedstock at the DYEC could increase

facility greenhouse gas emissions with a direct financial burden on the Region;

- The Region may seek carbon offset credits to offset its own emissions at the DYEC and possibly the larger WPCP facilities in the future; and
- The market for carbon offset credits and carbon accounting, monitoring, reporting, and third party verification requirements are not yet known.

11.16 Based on the GHD capital and operating cost estimates over a 24-year base case analysis, the following provides the NPV of the anaerobic digestion, in-vessel composting, and merchant capacity options on an incremental basis.

Net Present Value 2017 dollars*			
NPV ($2017 millions)	Anaerobic Digestion	In-Vessel	Merchant Capacity
Total	**(303.3)**	**(296.6)**	**(271.5) to (385.5)**

- Excludes transfer and haul costs which remain dependent on facility siting.
- Excludes leaf and yard waste to be processed separately.
- GHD's per tonne pricing for merchant capacity (i.e. private sector service delivery) was approximately 127 per cent to 163 per cent higher than processing pricing assumed under a Regionally-owned or P3 service delivery option. If Status Quo merchant pricing is assumed under the merchant capacity option, the net present value ($2017) cost of merchant capacity would fall by approximately $114 million.

11.17 Pre-sort facility and AD organics treatment facility oversizing (to meet the Region's 20-year projected mixed waste processing requirements) are also a factor in higher capital cost. GHD assumed projected Regional mixed waste and organics tonnages as demonstrated below for both pre-sort and AD scenarios.

Proposed Capacity and Tonnage Forecast: Pre-sort

	2016	**2021**	**2025**	**2030**	**2035**	**2040**
Proposed Pre-sort Capacity	-	160,000	160,000	160,000	160,000	160,000
SF Mixed organics	77,602	87,342	97,164	111,008	123,403	136,782
MR Mixed organics	13,492	15,244	18,179	21,134	23,493	26,040
Total Mixed Waste	91,094	102,586	115,343	132,142	146,897	162,823
Pre-sort Excess Capacity	-	57,414	44,657	27,858	13,103	(2,823)

Proposed Capacity and Tonnage Forecast: Anaerobic Digestion

	2016	2021	2025	2030	2035	2040
AD Capacity	-	110,000	110,000	110,000	110,000	110,000
Mixed Waste Organics	34,613	38,981	43,839	50,227	55,835	61,888
Green Bin	26,796	30,159	33,551	38,331	42,611	47231
Total organics	61,409	69,140	77,390	88,558	98,446	109,119
AD Excess Capacity	-	40,860	32,610	21,442	11,554	881

Outstanding Analysis

11.18 The GHD and EY preliminary technical and financial analysis has raised additional questions which should be addressed in subsequent analysis.

- Reducing organics delivery to the DYEC through enhanced organics diversion will reduce the Region's waste below its delivery guarantee.
- Further refinements are required to understand cost implications and risks related to expansion of organic waste services into the multi-residential sector.
- Clarification on merchant pricing assumptions applied in the analysis is required.
- Regional population growth forecasts should be revisited based on recent trends, with additional consideration given to reduced waste tonnages in recent years, despite population growth, particularly in light of the province's continuing goal of enhanced producer responsibility and reduced organics volumes in waste disposal.
- Include a revenue estimate for the merchant capacity scenario, as was done for the Regionally owned scenario (estimated at $200 per tonne or approximately $9 million in 2021).
- If the Regional Municipality of York was to fully use any excess DYEC capacity created through the Region's increase in organics diversion from disposal, there are additional risks, such as:
    - No discussions to date have occurred with the Regional Municipality of York regarding their own disposal and organics plans, or at what fee the use of the excess DYEC capacity would be sold to the Regional Municipality of York.
    - The Co-owners' Agreement allows for capacity sharing at the net

operations fee, however, the capital component of the Region's capacity is a sunk cost which may not be recoverable.

Other Potential Risks and Due Diligence Considerations

Potential Risk	Required Due Diligence
1. Market Risks	
Revenues uncertainty presents a significant risk with the suspension of the Large Renewable Procurement Program by the province and currently depressed natural gas prices, potential electricity connection issues and potential inability to meet energy quality and quantity required in energy sales contracts due to changes in waste composition.	Discussions with energy providers to determine potential pricing for energy by-products, availability of access to grid.
	Update waste composition studies to determine available organics content and capture (last studies 2011-2013).
	Further analysis of oversizing benefits versus costs.
There is a possibility that excess capacity sales will not materialize, given an estimated fee of $200 per tonne and potential availability of other options in the new waste management framework.	Discussions with York regarding payment for temporary DYEC excess capacity.
	Assess the likelihood that market participants will be willing to pay $200 per tonne for organics processing versus implementation of other public or private sector facilities at competitive rates.
There is risk that opportunities for enhanced private sector solutions may result in lower than forecast pricing for private sector organics processing. Current analysis assumes that private sector processers will be significantly more expensive than the Region implementing the same project and that the benefit of facility revenues will not be passed through to a contract fee structure.	Conduct additional due diligence including a private sector market scan.

2. Regulatory Risks

Significant changes to the waste management framework are pending in Ontario, with a key consideration being enhanced producer responsibility.

With the largest portion of disposed organics within the ICI sector, it is likely that additional investment and action will be required by key producers. It may not be reasonable to assume that municipalities will be required to bear the most significant investments in new capital.

The net benefits and costs of entering the carbon offset market are currently not known and should be analyzed with consideration to the more significant capital and operating costs being proposed.

Await provincial regulations later this year, which could result in greater producer responsibility in processing organics resulting in opportunities for lower cost municipal options (e.g. private sector/food industry AD) or altered timing for the possible food waste organics ban.

Await the provincial organics policy statement anticipated in late 2017 as well as the provincial organics carbon offset protocols to determine challenges and market opportunities.

3. Technological Risks

According to GHD, likely complaints for existing AD facilities relate to odour and truck traffic issues.

Odour and trucking issues can be mitigated by implementing odour and noise control measures or siting away from residents and ensuring sufficient land to keep fence line odour levels at or below regulatory limits. However distance from residents also could mean higher costs for haulage, related to collection, haulage to organics curing facilities, or haulage to disposal. Further consideration of these issues is required, along with potential haulage impacts, during the siting analysis.

4. Cost Risks

GHD notes that cost escalation is a likely risk.

Part Three should include additional risk analysis and recommendations for risk mitigation strategies and risk transfer cost assessments where risks are proposed to be shifted to the private sector.

This is only a preliminary concept based estimate.

5. Delay Risk

Regardless of what solution the Region chooses for organics management, an extension to the existing in-vessel composting contract will be necessary to ensure continuous service for the processing of Green Bin organics.	Negotiate contract extension with Miller to ensure continuous service.

Procurement Consideration

11.19 In order to ensure that discussions with potential partners are part of an open, accountable, and transparent process, it is recommended that a Request for Information process be undertaken. This process does not bind Council to move forward with the AD project. However, staff would have additional information required in order to update the business case analysis and be in a position to proceed to the next stages.

11.20 The information gathered from the RFI will be considered in order to determine the best option for the Region based on the following fundamental principles:

- The project will include the mixed waste pre-sort, AD, and energy utilization/distribution.
- The Region will commit to a quantity and quality of organic waste for treatment.
- Synergies with other Regional activities will be considered.
- Energy subcomponents will be financially self- sustaining.
- Financial viability.

11.21 Concurrently, it is anticipated that additional information will be provided by the Province regarding both the treatment of waste and pending protocols for cap and trade offset credits.

11.22 Based on the results of the RFI, the Business Case will be updated and evaluated to provide recommendations regarding appropriate next steps to Council for consideration.

12. Current Status and Next Steps

12.1 There are several factors that require a timely implementation of the mixed-waste sorting and AD initiative, as listed below.

i) The existing organics management contracts will end in 2019 and significant additional funding will be required to continue with Status Quo;

ii) The Province's possible food waste organics ban may be implemented by 2022; and

iii) The DYEC is at capacity.

12.2 GHD has completed their technology evaluation and the Preliminary Business Case. An updated analysis including Business Case will be prepared once the assumptions have been further defined.

12.3 This report seeks Council approval to move forward with the Phase Three, Part 1, of the GHD Agreement along with authorization to undertake a RFI. Results of the RFI will be reported back in Regional Council in 2017.

12.4 The approved 2017 Waste Management Budget and Business Plan include $800,000 to fund Phase Three of the organics management business plan development which includes the following:

Phase Three, Part 1

- Explore the various service delivery options;
- Conduct a review of Provincial legislation; and
- Provide the necessary data to update the Business Case.

13. Conclusion

13.1 Staff recommends that Regional Council approve the issue of a RFI and the retention of GHD to assist with the RFI preparation, review, and analysis.

14. Attachment

Attachment #1: Detailed Chronology of the Actions Taken To-date

Respectfully submitted,

Original signed by:

S. Siopis, P.Eng.
Commissioner of Works

Original signed by:

R.J. Clapp, CPA, CA
Commissioner of Finance and Treasurer

Recommended for Presentation to Committee

Original signed by:

G.H. Cubitt, MSW
Chief Administrative Officer

Anaerobic Digestion Chronology

2009

- 2009-WR-5, Golder Associates Report " Moving Towards a 70% Diversion Target for Municipal Solid Waste"

2011

- 2011-J-22 Servicing & Financing Report Council approval of $50,000 for a consultant to do a preliminary investigation of anaerobic digestion processing

2012

- March 12, 2012, Kelleher Environmental signs Consulting Services Agreement RC00000031 for $50,000
- April 11, 2012, Agreement RC00000031 signed by the Commissioner of Finance and Treasurer
- July 20, 2012, Initial Draft of the Kelleher Environmental Report received

2013

- November 29, 2013, Final Kelleher Environmental Report received

2014

- Council approves S&F Report #2013-J-38 which outlines the Kelleher Report conclusions and informs that staff will continue to investigate the potential of AD and report back to Council on its investigations
- Staff issues RFI-677-2014 to solicit interest from organics processors, to gather information from companies throughout North America and Europe about processing technologies that can process highly contaminated organics from a MSW stream and what materials could be recovered, and to gather information on up to six reference facilities that could be included in a due diligence review. 11 mostly European companies responded.

2015

- Council approves S&F Report #2015-J-8 which describes detailed investigations of new waste processing technologies and reports on the outcome of RFI-677-2014
- Council approves $500,000 in Waste Management Budget for AD project.
- Staff recruits HDR (Agreement RC00000835) as technical expert and review the information gathered in RFI-677-2014 and to organize a first due diligence delegation to AD facilities in Europe (Netherlands, France, Germany) 7 facilities were visited in Europe as well as the BHS pre-sorting facility in Montgomery, Alabama.
- HDR submits report titled, "Anaerobic Digestion Implementation/Organics Plan Development which provides a review of the technologies seen in Europe, an AD analysis and recommendations for next steps

2016

- Council approves S&F Report #2016-J-7 directing staff to secure financial and technical experts to complete a technical AD review, a AD business case and service delivery model and, pending Council approval, to assist the Region in securing an energy partner and preparing a procurement process for Durham's pre-sort/AD solution

- Council approves $400,000 in the Waste Management Budget for staff to develop and report back on a detailed investigation of both pre-sort and AD options through a technical and financial consulting engagements (item 5.8 in #2016-J-7)
- Second AD technology due diligence review delegation with Works Committee members and senior staff to see two facilities in France and two in Spain
- GHD and Ernst & Young contracted (RFP 602-2016, Agreement RC00001376) complete a technical AD review, an AD business case and service delivery model and, pending Council approval, to assist the Region in securing an energy partner and preparing a procurement process for Durham's pre-sort/AD solution