

FURTHER TO SUSTAINABLE COMMUNITIES BOARD MEETING #2/06
To be held on Friday, June 9, 2006

Pages

FURTHER TO:

7. SECTION I - ITEMS FOR AUTHORITY ACTION

LISTED ON AGENDA AS REPORT TO FOLLOW IN SECTION IV (ITEM 8.5)

**7.2 DURHAM YORK RESIDUAL WASTE ENVIRONMENTAL ASSESSMENT
STUDY**

24-29

TO: Chair and Members of the Sustainable Communities Board
Meeting #2/06, June 9, 2006

FROM: Carolyn Woodland, Director, Planning and Development

**RE: DURHAM YORK RESIDUAL WASTE INDIVIDUAL ENVIRONMENTAL
ASSESSMENT**

KEY ISSUE

Response to information regarding the Durham York Residual Waste Individual Environmental Assessment - Draft Report regarding the "Evaluation of Alternatives to" and identification of the preferred system.

RECOMMENDATION

THE BOARD RECOMMENDS TO THE AUTHORITY THAT York and Durham regions be advised that Toronto and Region Conservation Authority (TRCA) supports their efforts to develop a local solution for municipal solid waste (msw) disposal, including increasing waste diversion targets through recycling and composting, and generating electrical energy for the provincial grid;

THAT the regions of York and Durham be requested to ensure that there will be a benefit to climate change by providing opportunities for a net gain to air quality through techniques including, but not limited to, electricity generation, reduced transportation and natural heritage restoration;

THAT the regions of York and Durham be advised that TRCA supports the recommended preferred alternatives to the undertaking - Systems 2(a) and 2(b) - for consideration as appropriate technologies for residual waste management in the next stage of the Environmental Assessment process - evaluation of the alternative methods/sites;

THAT the regions of York and Durham identify in the Environmental Assessment the support for a policy to be developed to ensure that high-rise residential facilities be developed or retrofitted to include recycling and composting requirements in building design;

THAT the regions of York and Durham identify in the Environmental Assessment the support for a provincial or federal strategy aimed at best management practices for consumers that promotes at-source diversion and conservation;

AND FURTHER THAT staff be directed to report back to the Authority through the Sustainable Communities Board as this project proceeds through the Environmental Assessment process.

BACKGROUND

The regions of Durham and York are participating in a joint Individual Environmental Assessment (EA) study to manage the residual waste (i.e. garbage) that will remain after at-source diversion. The purpose of the undertaking as stated in the Terms of Reference (ToR) for the EA is "to process - physically, biologically and/or thermally- the waste that remains after the application of both regions' at-source diversion programs in order to recover resources, both material and energy, and to minimize the amount of material requiring landfill disposal". The ToR was approved by the Minister of the Environment on March 31, 2006. Following approval of the ToR, the draft report regarding the "Evaluation of *Alternatives to*" and identification of the Preferred Residuals Processing System was released and comprehensive public consultation on the alternatives was completed.

The alternatives to the undertaking are based on Durham and York increasing waste diversion through recycling and composting to 60 per cent by 2011, and to 75 per cent in the future. As such, the study recommends that both municipalities adopt a formal hierarchy for their integrated waste management systems that reflects the purpose of the undertaking for the EA study, as follows:

- At-Source Diversion.
- Thermal Treatment, including energy and materials recovery using conventional combustion or gasification and pyrolysis.
- Landfill Disposal of Residue.

Only those approaches that met or exceeded all regulatory requirements were considered in the "Evaluation of *Alternatives to*" and identification of the Preferred Residuals Processing System. Ontario standards for air emissions are similar to the standards set for Europe and the United States. In Ontario, standards have been updated as required. The technologies in the only thermal treatment facility in Ontario (Peel Region) have been upgraded, as required, to meet those standards.

The majority of those participating in the consultation process supported the thermal treatment of residual waste and the minimization of landfill disposal of the residue. The majority of those participating in the consultative process for the York Durham study also supported the waste diversion goals of the study, although a minority expressed concerns about the ability of the two regions to achieve these goals.

The EA study included a detailed evaluation of four alternatives to the undertaking. All four alternatives met or exceeded the regulatory requirements for emissions.

- System 1 - Mechanical and Biological Treatment with Biogas Recovery.
- System 2a - Thermal Treatment of Mixed Waste with Recovery of Materials from the Ash or Char.
- System 2b - Thermal Treatment of Solid Recovered Fuel.
- System 2c - Thermal Treatment of Solid Recovered Fuel with Biogas Recovery.

The study indicated that System 2a is the preferred system, however, System 2b also has the potential to offer additional benefits. The study concluded that both systems should be carried forward into the next steps of the EA process.

PREFERRED ALTERNATIVES TO THE UNDERTAKING

Four alternative systems to dispose of the residual waste were formulated and evaluated under a seven step methodology which involved: additional consultation on the evaluation criteria and methodology; assembling the component alternatives into four systems, data collection, application of the comparative criteria, identification of potential effects and net effects; and, consideration of the relative advantages and disadvantages of the systems. As a result of the evaluation process it was concluded that System 2a is the preferred system, but System 2b has the potential to offer additional benefits. Both systems should be carried forward into the next steps of the EA process.

System 2a involves the combustion of residual (post-diversion) waste and recovery of materials (metals) from the remaining ash/char. While System 2a has the potential to generate the highest impacts on the air environment of the four alternatives studied, air pollution control technology has evolved in order for all applicable air emissions standards to be met or exceeded. The thermal treatment of mixed waste with recovery of materials from the ash/char has proven reliable in Canada, the United States and Europe. In fact, Peel Region has been operating this type of system for over 10 years. This system does not include mechanical separation of recyclables in the residual waste at the front-end. Because the recycling and composting targets are high (60 percent and up to 75 percent), the EA study determined there would be little added benefit from mechanical separation. Rather, the majority of residual materials will be burned and recyclable metals (ferrous and aluminium) will be removed from the ash and char.

System 2b incorporates mechanical separation of recyclables from the residual waste, an optional bio-drying of the residual stream that contains organics and a thermal treatment of a solid fuel recovered from the residual waste. As this solid recovered fuel is more homogenous than mixed waste, it is suitable for thermal treatment via gasification and pyrolysis. It has less potential impacts to the air environment than System 2a, but many of the technologies that could be used to thermally treat the solid recovered fuel (e.g. gasification) are regarded as "new technologies". There is active research and development in these technologies, but they are less proven than those applied to the technologies that are currently available to combust residual waste in System 2a.

Regional staff has recommended that during the competitive process used during the next phase of the EA, "Evaluation of Alternative Methods" (Sites), submission of proposals to implement both System 2a and System 2b be encouraged. The final recommendation on the technologies to be used to implement the preferred residuals processing system will be based on the results of this competitive process.

In Systems 2a and 2b, only 9 to 12 per cent of the residual waste generated in both regions would require landfilling. Negotiations with other municipalities that have existing landfill capacity are underway. An additional landfill within York or Durham regions will not be required. There is potential to significantly decrease the amount of materials to be landfilled if the provincial government adopted policies that supported the use of bottom ash/char in aggregate applications. In some European nations such as Belgium and the Netherlands, where landfill is considered the last option, most of the char/ash is recycled into Granular "B" materials and is used to manufacture concrete blocks or used as granular materials for roads. If approved in Ontario, the European practice of curing and recycling bottom ash into aggregate materials could then increase the diversion from landfill disposal to 95 per cent.

SYSTEM DETAILS FOR THE ALTERNATIVES TO THE UNDERTAKING

The following chart summarizes the advantages and disadvantages of each of the four alternatives to the undertaking that were studied.

Alternatives to the Undertaking	Advantages	Disadvantages	Selected as Preferred Alternative
System 1 - Mechanical and Biological Treatment with Biogas Recovery	<ul style="list-style-type: none"> ● Lowest potential impacts on the air environment. ● More flexible to changes in waste quantities and composition. ● Potentially lower overall system costs provided low cost landfill capacity can be obtained from a third party. ● Potential to increase diversion through the recovery of additional recyclables - advantage shared with Systems 2(b) and 2(c). 	<ul style="list-style-type: none"> ● Greatest potential impacts to water and land. ● Greatest potential to disrupt sensitive habitat. ● Lowest energy generation - both renewable and total. ● Greatest potential social impact on the landfill host community. ● Least reliable due to dependence on export landfill contracts. 	No
System 2a - Thermal Treatment of Mixed Waste with Recovery of Materials from the Ash or Char	<ul style="list-style-type: none"> ● Lowest potential impact to water and land. ● Least potential to disrupt sensitive habitats. ● Greatest energy generation - both renewable and total. ● Lowest potential social impact on landfill host community due to a minimizing of the quantities requiring landfill. ● Higher reliability due to minimum dependence on export landfill. ● Costs, although high, are comparable in the case of System 2a with System 1 (System 2(a) does not recover as much recyclables as 2(b) which may also offer potential benefits in regards to air emissions, energy conversion efficiency). 	<ul style="list-style-type: none"> ● Highest potential impacts on the air environment, although current technology has the proven ability to exceed all applicable air emissions standards. ● Less flexibility to changes in waste quantities and composition. ● Need to manage hazardous residues from the pollution control system. 	Yes

Alternatives to the Undertaking	Advantages	Disadvantages	Selected as Preferred Alternative
System 2b - Thermal Treatment of Solid Recovered Fuel	<ul style="list-style-type: none"> ● Lowest potential impact to water and land. ● Least potential to disrupt sensitive habitats. ● Greatest energy generation - both renewable and total. ● Lowest potential social impact on landfill host community due to a minimizing of the quantities requiring landfill. ● Higher reliability due to minimum dependence on export landfill (System 2(b) has higher costs and is less reliable than System 2 (a)). 	<ul style="list-style-type: none"> ● Highest potential impacts on the air environment, although current technology has the proven ability to exceed all applicable air emissions standards. ● Less flexibility to changes in waste quantities and composition. ● Need to manage hazardous residues from the pollution control system. 	Yes
System 2c - Thermal Treatment of Solid Recovered Fuel with Biogas Recovery	<ul style="list-style-type: none"> ● Ability to recover additional recyclable materials and also make beneficial use of post diversion waste stream. 	<ul style="list-style-type: none"> ● Highest cost and lowest technical reliability due to amount and complexity of the required processing equipment. 	No

NEXT STEPS

- June 2006 - Durham and York Committees and Councils to consider recommendation from the Joint Waste Management Group on Residuals Processing System.
- Summer 2006 - "Alternative Methods/Sites" including alternative ways or methods of implementing the preferred "Alternative To" will be initiated. This typically involves an evaluation of the alternative "sites" and may evaluate alternative facility design and operational aspects. A detailed Health and Ecological Risk Assessment will be prepared as part of this process. Proximity of natural and residential areas to proposed sites will be considered in the evaluation. At this time it is anticipated that the facility will be located in an industrial area. TRCA has been asked to provide the regions with environmental background data, and to provide input on the exclusionary siting criteria and separation distances, and to continue to review and comment on the study as it proceeds. TRCA staff will investigate programs for natural heritage regeneration within the vicinity of the airshed to be impacted by the emissions. The intent is to provide an overall net gain to the local environment. TRCA staff will also review the proposed facility locations with respect to the existing watershed characteristics and the impacts that the anticipated contaminant loadings could potentially have on water quality.

- 2008 - Complete the EA.
- 2009 - Minister approval of the EA.
- 2011 - Facility ready to operate.

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Date: June 7, 2006