Attachment 1

Report on the Health Impact Assessment (HIA) for the Proposed City of Toronto Mixed Waste Processing Facility

At the request of City Council 2007, the Toronto Medical Officer of Health oversaw the development of a Health Impact Assessment (HIA) framework to guide evaluation of alternative methods for managing Toronto's post-diversion residual solid wastes. Toronto Public Health (TPH), in collaboration with Solid Waste Management Services (SWMS), retained Jacques Whitford to prepare a draft "TPH Health Impact Assessment Framework."[1] In late 2008, SWMS retained Golder Associates consulting group to conduct the Mixed Waste Processing Assessment Study to inform their planning for the period 2010 to 2035. This study was initiated to evaluate the various residual waste processing technologies and siting options that the City could use to manage its mixed waste, which is the portion of waste that remains after materials for other city waste diversion programs are removed. The City directed the consultant to undertake an HIA using the draft framework to ensure that all aspects of human health were considered in the assessment.

Developing the Screening HIA

At the advice of the Residual Waste Working Group (RWWG) and with the assistance of TPH, Golder undertook an HIA screening early on in the study to ensure that health was a priority throughout the decision-making process. Work on the HIA and screening of the technologies based on operational criteria took place in parallel. Initially, 7 mixed waste processing technologies and 12 siting options were considered.

In order to assess this long list of options in a short period of time, the consultants developed a Pre-screening Health Determinants Decision Tool to facilitate the HIA. This tool was based on the Analytic Hierarchy Process, a technique which allows for ranking and comparing options in a systematic way. The tool incorporated all determinants of health indicators identified in the draft TPH framework (See Table 1). TPH was consulted during the tool development process, gave input into the choice of health indicators and agreed to the utility and transparency of this new tool and approach. Throughout the process the RWWG was consulted and asked to provide any feedback. They submitted additional health indicators thought to be appropriate.

An HIA working group consisting of a multi-disciplinary team of TPH, Golder and SWMS staff was formed to undertake the initial screening step using the Pre-screening Health Determinants Decision Tool.

[1] The draft TPH HIA framework document can be found at http://www.toronto.ca/health

Table 1: TPH HIA Framework - determinants of health indicators

Environmental Factors		
Air quality	*Groundwater quality*	*Vegetation*
Odour	*Soil quality*	*Noise*
Surface water quality	*Land use*	*Built Environment*
Non-Environmental Factors		
Social and economic factors		
Income / Poverty	*Family cohesion*	*Housing*
Employment	*Community & social cohesion*	*Social exclusion*
Education	*Crime*	
Lifestyle factors		
Diet	*Smoking*	*Drug use*
Physical activity	*Alcohol*	*Sexual behaviour*
Access to services		
Health services	*Social services*	*Leisure*
Education	*Transportation*	
Equality		
Age	*Minorities/disadvantaged group*	
Sex	*Ability*	

HIA is an iterative process and the HIA working group gave input at several decision points. The process identified technologies that were less desirable from a health point of view. For example, because of the potential for impacts on air quality in communities burning refuse-derived fuel (RDF) pellets, Mechanical Biological Treatment (MBT) with biodrying to create RDF pellets which would be marketed for use as an alternative fuel, was eliminated from the list of potential technology options.

As the study evolved and SWMS further refined their qualifying criteria, the list of possible technologies and sites decreased. The HIA was adapted accordingly. In the winter of 2009 SWMS decided on their final qualifying criteria.[2] Once the consultants had applied these criteria, two technologies remained:

- Option 1- Mechanical Biological Treatment (MBT) with aerobic processing with Compost-Like Output (CLO) for land reclamation and

- Option 2- MBT with Anaerobic Digestion (AD) and CLO being diverted for land reclamation.

The only City-owned site large enough to accommodate an MBT facility is the land adjacent to the Green Lane Landfill located in the Township of Southwold.[3] At this point,

[2] The final qualifying criteria included: ability to divert 75, 000 tpy from landfill; ability to conform to the Ministry of the Environment (MOE) Policy Statement; realistic ability to market recovered materials; ability for markets to meet Ontario Environmental Standards; ability to dispose of the material resulting from treatment in the Green Lane Landfill; technology to have a proven operating history; and ability to have a facility under construction by 2010.

[3] Green Lane Landfill will provide for Toronto's waste disposal needs when the City's Michigan landfill disposal contract expires in 2010.

the HIA working group participated in a final HIA screening activity to evaluate the two remaining options and to compare them to the status quo (or Option 3):

- Option 3 – sending the residual waste directly to landfill without treatment or sorting.

Results of the initial screen

As part of the overall study Golder undertook a Life Cycle Assessment (LCA)[4] that provided estimates of the overall emissions from the three options. The LCA evaluated the environmental impacts associated with each technology through a defined methodology and quantified the inputs and outputs for each option from "cradle to grave". The HIA working group used the estimates of releases from the LCA and its expert knowledge to screen and rank the environmental factors. For example, the LCA indicated that hydrogen sulphide emissions for the landfill were larger than those of either MBT and MBT/AD. Therefore, both of these options were predicted to contribute less to odour impacts than a landfill would. However, it is worth noting that mitigation measures, such as biofiltration of the exhaust air, were not taken into account.

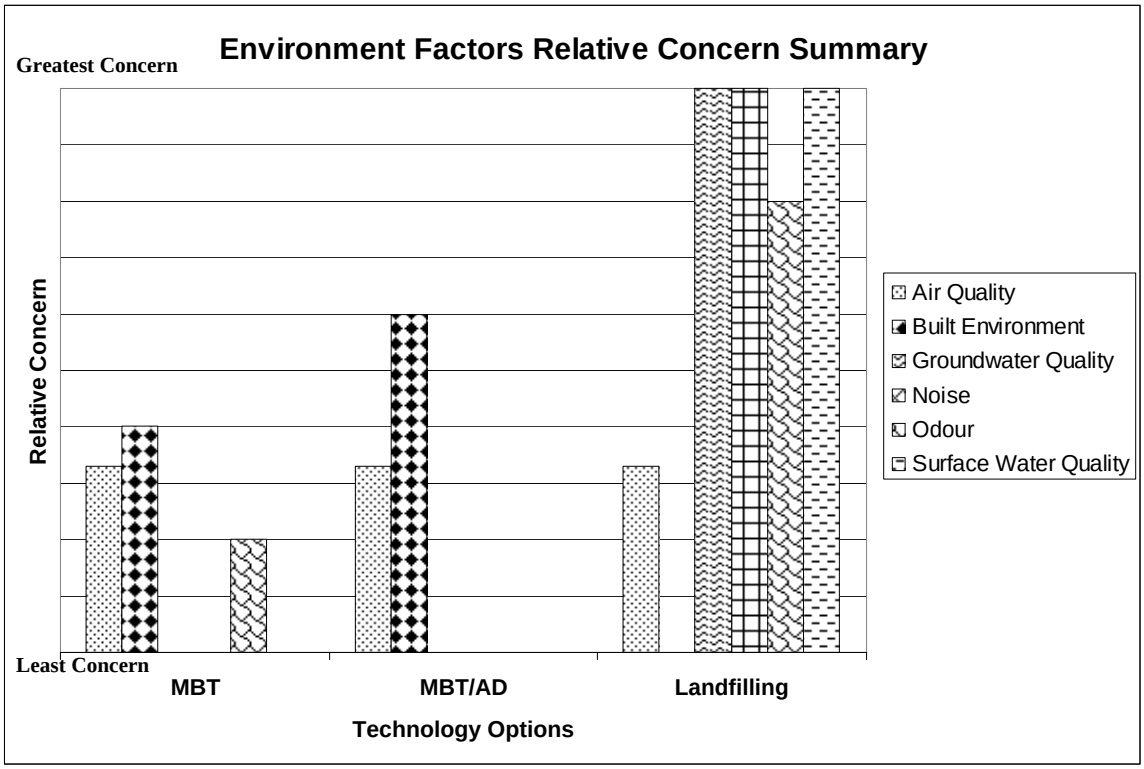
The initial screen identified the following six environmental factors as best distinguishing among the three options: odour, noise, built environment, groundwater quality, air quality and surface water quality. Air and water quality factors reflect environmental contamination issues which can have a direct impact on health. The remaining factors, (e.g. odour, noise, built environment), often have a more indirect impact on health and quality of life.

While all three options have potential for negative impacts on health, the degree of negative impact varies among technologies (see Figure 1). For example, the factor "built environment" is more of a concern from Options 1 and 2 and not a concern from the landfill since the area (largely rural) already houses an operational landfill. In contrast, either of the two MBT processes would require a building which would have a visual impact on the surrounding landscape.

The HIA screening for non-environmental factors (see Table 1) found that these factors were not very useful in distinguishing between the two MBT options as each is likely to have similar impacts on these determinants of health. The working group agreed however, that representatives of the neighbours of the site would be better able to assess these factors.

[4] A description of the LCA process and results can be found in Golder Associates Workpackage 3 Report: Planning Study for Assessment of Mixed Solid Waste Processing Technology and Siting Options, City of Toronto provides more detail on the initial HIA screening.available at http://www.toronto.ca/garbage/mwp/pdf/work_package-3.pdf

Figure 1: Relative Concern for Main Environmental Factors by Technology Option



The HIA screening results indicated that Option 2 (MBT with AD and CLO) had the lowest potential negative impact overall, largely due to the effect of the energy offset from biogas capture. Biogas is created during the process of anaerobic digestion. This biogas (or biofuel) can be utilized for energy production, which can replace energy from other sources and therefore reduce air pollution from these other sources (such as a polluting coal-fired power plant). While both technologies may have an impact on several aspects of health through impacts on the environment, landfilling residual waste with no pre-treatment is the option with the most potential negative impacts. Engineering technologies and design of the facility and site can mitigate some of the potential adverse impacts of the preferred option.

Workpackage 3 Report: Planning Study for Assessment of Mixed Solid Waste Processing Technology and Siting Options, City of Toronto provides more detail on the initial HIA screening.[5]

The results of the Mixed Waste Processing Study including the HIA were presented to the local community in a public consultation process which included:

1) a presentation and open house for the local council, representatives from the local Public Liaison Committee, the First Nations Liaison committee, Middlesex-London and Elgin-St. Thomas health units and site neighbours on September 29, 2010;

[5] Workpackage 3 Report can be found at http://www.toronto.ca/garbage/mwp/pdf/work_package-3.pdf.

2) an evening open house for the local community on September 30, 2010; and

3) written and verbal comments collected from the attendees.

This consultation indicated that members of the community were interested in being involved in the HIA process.

HIA Stakeholder Workshop

It was decided that the best approach to involve the local receiving community in the HIA was to hold a stakeholder workshop, which occurred at the Green Lane Landfill administrative offices on March 8, 2010. The workshop was facilitated by TPH with support of the Public Consultation Unit, SWMS and Golder. Invitations were sent to:

- Munsee-Delaware First Nation
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames
- Elgin-St. Thomas Public Health Unit
- Middlesex-London Health Unit
- Green Lane Landfill Public Liaison Committee, and
- Township of Southwold Council.

Seventeen stakeholder representatives participated including (among others): Mayor McIntyre, three Councillors, the Township's Chief Administrative Officer, and Dr. Frank Warsh, the Medical Officer of Health for Elgin-St. Thomas Public Health. There was no representative from the Munsee-Delaware First Nation.

In the time intervening between the first phase of the HIA and the workshop, SWMS had further refined their operational criteria. Once applied, these identified Option 2 – MBT with AD as the preferred technology. This is the same option that the initial HIA screen assessed as having the lowest health impact. The HIA workshop therefore focussed on getting input into this preferred option.

The main objective of the HIA workshop was to gain a better understanding of any potential health concerns of the community relating to the proposed technology and to identify the areas where further mitigation efforts could be needed to address these concerns.

The screening tool found in the draft TPH HIA framework was used to gather input from the participants who were divided into stakeholder groups.[6] Each group discussed the potential impacts of the facility on health and identified their ranking of factors in terms of level of importance for positive or negative impacts. The stakeholders presented their small group findings to the whole group, and

[6] The four stakeholder groups completing the HIA tool were: 1) First Nations, 2) Township of Southwold Council, 3) public health and 4) Green Lane Landfill Public Liaison Committee.

discussed them. This discussion highlighted their concerns (see Table 2). Ways in which these concerns might be addressed were also suggested.

The local community stakeholders identified similar potential impacts on health as those identified in the first phase of the HIA. The potential negative impacts of most importance to the participants included odour, air quality and truck traffic. The group discussion also brought forward a number of specific mitigation requests from the participants, including comments from the Township of Southwold Council representatives on the need to enclose the CLO during the curing process and a request by the local health units for a cumulative impact assessment. In addition, matters that had not been previously recognized, such as the potential for educational opportunities and impacts of catastrophic failure of the facility, were brought forward. The group identified an education centre, research and development opportunities, trust fund benefits and joint recycling between the City of Toronto and the local community as ways the new facility could benefit the community.

Table 2: Participants' Ranking of Potential Impacts from the Proposed Mixed Waste Processing Facility

Negative Impacts			**Positive Impacts**		
Most Important	**Important**	**Least Important**	**Most Important**	**Important**	**Least Important**
Odour	*Physical activity*	*Aesthetic and tourism*	*Local jobs*	*Greenhouse gas reduction*	
Air Quality	*Local food supply*	*Relationship/ resentment of Toronto*	*Education*	*Waste diversion*	
Transportation	*Litter/nuisance*	*Crime*	*Local compost use*	*Recycling with Toronto*	
Water	*Noise and dust*		*Revenue*	*Research and development*	
Soil Quality	*Transportation concerns*		*Social cohesion*	*Experimental farm to test benefit/impacts of CLO*	
Health Services	*Increase in coyote and vermin*		*Increased benefit to trust fun*		
Vector born illness	*Hunting and fishing*				
Vermin issues	*Traditional medicine*				
Catastrophic failures					
Community and social cohesion					
Family cohesion					
Noise					
Property Values					

More detail on the HIA stakeholder workshop can be found in the document titled, *Summary of the Health Impact Assessment (HIA) Consultation, City of Toronto Mixed Waste Processing Facility* found at http://www.toronto.ca/garbage/mwp/pdf/work_package-3.pdf.