

# **TORONTO** STAFF REPORT

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December 15, 2000

To: Works Committee

From: Commissioner of Works and Emergency Services

Subject: Solid Waste Diversion  
Responses to Requests from Works Committee and City Council

Purpose:

The purpose of this report is to provide a consolidated response to a number of information requests in connection with the City's new solid waste diversion targets.

Financial Implications and Impact Statement:

There are no direct financial implications arising from this report.

Recommendations:

It is recommended that this report be received for information.

Background:

Numerous requests for information and responses were adopted at the September 13, 2000 meeting of the Works Committee and at the City Council meeting held on October 3, 4, 5, 2000, and its Special Meetings held on October 6, 2000, October 10, 11, 2000, and October 12, 2000, in connection with planning for new diversion and disposal capacity.

This report provides responses to a number of the requests for information and responses adopted at the above cited meetings.

Comments:

Item 1. Works Committee Request for Additional Information from Consultant

The Works Committee, at its meeting of September 13, 2000, requested the Commissioner of Works and Emergency Services to “provide to Members of Council the details of the consultant’s analysis for achieving 75 percent diversion referred to in the aforementioned report.”

Response:

A report dated September 1, 2000, titled “A 3Rs Implementation Plan for the City of Toronto”, was submitted by the Commissioner of Works and Emergency Services (listed on the Committee agenda as Item No. 9). Attachment No. 2 to the report provided a table entitled “Cost Estimates for Waste Management Systems Achieving 50% Diversion”, prepared by MacViro Consultants Inc. The table identified an \$8.4 to \$28.5 million projected annual cost premium to achieve a 50 percent diversion target, based on a range of processing cost assumptions for three different waste diversion system alternatives.

Attachment A of this report provides the requested consultant’s analysis for achieving a 75 percent diversion target (actually presented as “74” percent by the consultant). The annual cost premiums over the current system cost (adjusted to reflect full contracting out of disposal) range from \$21.2 million to \$53.7 million, based on the same waste diversion system alternatives and processing cost assumptions used for the 50 percent diversion analysis. The cost estimates include all direct operating costs and amortized capital costs associated with each system alternative.

Item 2. Works Committee Request for Strategy to Remove and Process Organics

The Works Committee, at its meeting of September 13, 2000, requested the Commissioner of Works and Emergency Services to “report further thereon to the Works Committee for its first meeting in 2001 on the strategy to remove and process organics, subject to the Province of Ontario providing some financial assistance.”

Response:

The City currently has a number of projects and programs in place to manage organics. Over two hundred multi-bin compost units have been distributed to apartment buildings, condominiums, schools, etc. The estimated diversion from the use of multi-bin compost units is 1.35 to 2.7 tonnes per unit per year. Over 172,000 backyard composters have been distributed to residents. This diversion activity accounts for an estimated 17,200 tonnes of composted organics per year. Our curbside leaf and yard waste program accounts for 60,000 tonnes of diversion on an annual basis. Other programs include a “grasscycling” public education campaign with an estimated diversion of 12,500 tonnes per year, and support of vermi-composting. In addition,

we conduct a comprehensive composting education program that includes ten demonstration sites, presentations to schools and community groups, and promotional literature.

At the current time we are proceeding with proposal negotiations (as per City Council direction) with top-qualified Respondents in Category 1 (Proven Diversion Capacity) of the Toronto Integrated Solid Waste Resource Management Process: Comporec of Tracy, Quebec, and Miller Waste Systems of Markham, Ontario. These two firms have submitted proposals to the City that utilize aerobic composting technology.

We are also proceeding with the construction of an anaerobic digestion facility at the Dufferin Transfer Station. Both a mixed waste stream and source separated organics stream will be tested at the plant in order to gain information about the technologies ability to process organics.

In co-operation with Enwave, we are researching the feasibility of a second anaerobic digestion facility to divert municipal waste and provide an alternative source of power for Enwave's district heating system.

A potential Request for Proposals ("RFP") for new and emerging technologies could identify additional firms and technologies that could process organics. The report from the Commissioner of Works and Emergency Services titled "Proposed 'Workable Alternative Waste Management Strategy to the Adams Mine Disposal Option'", also listed on the Committee's agenda, provides additional information about the approach to a second RFP for diversion technologies.

At this time the Ontario Waste Diversion Organization ("WDO") has provided \$220,000 in funding to the City of Toronto for the following organics diversion initiatives:

- contribution to the Enwave anaerobic digestion feasibility studies (\$70,000);
- compost market analysis (\$25,000);
- testing of new anaerobic digestion technologies (\$50,000);
- partial funding of organics co-collection pilot (\$45,000); and
- a study on overcoming commercial barriers related to the development of large-scale organics composting plants (\$30,000).

The WDO has also recommended in its report to the Minister of the Environment that "the cost of increasing organic waste diversion should be shared primarily between municipalities and the province." The Minister has not yet responded to the recommendations contained in the WDO report.

### Item 3. Works Committee Request for Development of Detailed Plan for a City-wide Wet/Dry System

The Works Committee, at its meeting of September 13, 2000, requested the Commissioner of Works and Emergency Services to "report to the Works Committee as part of the 2001 Operating

Budget process on the development of a detailed plan for a City-wide wet/dry system, including the cost and required phase-in cash flow to support such system.”

Response:

A report dated April 14, 2000 was submitted to the Works Committee by the Commissioner of Works and Emergency Services titled “Analysis of the CUPE Waste Management Plan (Wet-dry System)”. The purpose of the report was to respond to the CUPE recommendation for the implementation of a two stream wet-dry system for all municipally collected waste, as well as waste from the City’s agencies, boards, commissions and departments. All waste would be separated at source into “wet” material (e.g. food waste, diapers, soiled paper) and dry waste (recyclable material and other dry garbage), with the wet waste composted in an aerobic channel composting system and the dry waste processed through a material recovery facility (MRF).

The evaluation of the CUPE Plan by Enviro RIS, a sub-consultant to MacViro Consultants Inc., identifies seven major concerns with the wet-dry system as proposed. These concerns were summarized as follows in the body of the report:

- “(1) Since a wet-dry system has never been fully implemented for commercial and multi-family household waste, the material recovery projections in the CUPE Plan are speculative. The City of Guelph has the only fully operational wet-dry system in North America and it services single family homes only. The Guelph wet-dry system achieves 25% diversion of incoming residential dry material and 67% diversion of incoming wet material.”
- “(2) The capital and operating cost assumptions used in the CUPE Plan are based on a theoretical “Guelph II” dry MRF facility design which has not yet been implemented and which was not designed to meet Toronto’s specific requirements. Therefore, the costs provided must be considered as preliminary estimates only.
- “(3) The quantity of compost that can be produced is significantly overstated compared to the Guelph experience. The CUPE Plan projects that 60% of the wet stream will be converted to compost whereas Guelph achieves 25% conversion to compost. Incorporating this change increases the net cost of the wet processing operation from \$38 to \$59 per tonne (a 35% increase in cost).
- “(4) Aggressive assumptions for material capture rates and revenues, particularly for aluminum, result in optimistic revenue projections. The CUPE Plan projects that 10,050 tonnes of aluminum beverage cans will be recovered annually and sold at the current market value of \$2,055.00 per tonne, for total aluminum revenue of \$20.6 million (37% of total dry material revenue). This recovery level is seven times higher than the amount presently captured in the Blue Box Program and the current market value for aluminum is at an historic high. By comparison, the average price the City has received for aluminum over the last five years is \$1,737.00 per tonne. For planning purposes it is preferable to use conservative revenue projections based on historical market prices and the recovery levels achieved in other similar programs.

- “(5) Only one of Toronto’s seven transfer station properties is large enough to accommodate the integrated wet-dry facilities as proposed by CUPE. Therefore, additional land adjacent to the transfer stations or other properties would have to be acquired to site the facilities, which would have a significant impact on the total system cost.
- “(6) The unspecified cost savings associated with co-collection of wet and dry waste may not be realized if co-collection vehicles cannot operate effectively in the downtown core, if wet and dry facilities cannot be located at the same location, or if the one man co-collection vehicles such as used in Guelph are unacceptable to the union.
- “(7) A more accurate cost comparison of the proposed CUPE wet-dry processing system with the existing waste management system (excluding collection and adjusted to reflect export of all waste disposal tonnage) shows that the wet-dry system as proposed would in fact cost Toronto an estimated \$41 million more over a 20-year period, rather than save \$400 million indicated in the CUPE Plan. Factoring in land acquisition costs for siting the proposed facilities would further increase the wet-dry system cost.

The Enviro RIS report concludes that the assumptions and calculations used in the CUPE Plan would have to be substantially revised to accurately compare a wet-dry system to the TIRM diversion systems. The complete Enviro RIS report was attached to the report for reference.

The report noted, however, that additional consulting work proceed and a Phase 2 comparative analysis of the modified wet-dry system for the following reasons:

- “(1) Although we have concerns with the wet-dry system option proposed by CUPE, the system does warrant further analysis with respect to single family households. The wet process is working effectively in Guelph and the dry process is working effectively in Northumberland County.”
- “(2) Analysis of a wet-dry system in comparison to diversion systems that evolve from the TIRM process will allow a wider range of potential diversion systems to be considered (e.g. Three-stream system with source separated organics, Blue/Grey Box recycling plus mixed waste processing, two-stream wet-dry system).
- “(3) It is possible that one or more of the TIRM diversion proposals could be considered as part of the wet processing requirements of a wet-dry system.
- “(4) Modelling the collection component of the wet-dry system will also allow us to model other two-stream options in the future. One example of an alternative two-stream system is in Edmonton where all recyclable materials are collected commingled in a blue bag, and the remaining waste will be composted in a mixed waste composting plant (currently being commissioned).”

The report carried with it a recommendation to engage MacViro to develop system costs and associated premiums for a Wet/Dry system for single family households. The results of that

analysis are included in Attachment A of this report under Alternative 2 – Single Family Wet/Dry and Multi Residential Recycling.

We are also planning to undertake a Wet/Dry collection pilot project in 2001, subject to operating budget approval.

#### Item 4. City Council Request for Budget and Timeframe for Meeting Diversion Targets

At its meeting held on October 3, 4, 5, 2000, and its Special Meetings held on October 6, 2000, October 10, 11, 2000, and October 12, 2000, City Council adopted Amendment No. 3 c) to Clause No. 1 of Report No. 17 of the Works Committee, headed “3Rs Implementation for the City of Toronto”, which states:

“Rail Cycle North be advised that the City of Toronto is committed to the development of programs which will recycle and compost 80 percent of its municipally collected waste by the year 2009, with the reduction scheduled to coincide with the next three terms of Council, as follows:

- (1) 2001-2003 – recycle and compost 30 percent;
- (2) 2004-2006 – recycle and compost 60 percent;
- (3) 2007-2009 – recycle and compost 80 percent,

and the Commissioner of Works and Emergency Services be requested to submit a report to the first regular meeting of the Works Committee, and Council, in 2001 on a budget and timeframe to give effect to the recycling and composting targets adopted by Council.”

#### Response:

Attachment B of this report provides a summary of the proposed capital works budget for the years 2001-2005 required to achieve 60 percent diversion, assuming all the facilities are publicly owned and financed. The total estimated capital budget is \$226,150,000. In order to reach 80 percent diversion by 2009 an additional estimated capital expenditure of \$93,773,000 will be required (over the course of 2006-2008) to construct an additional mixed waste plant designed to process 150,000 tonnes per year, which will be factored into future capital cost projections. The total estimated capital budget is therefore \$325,834,000 to provide the processing facilities linked to achieving an 80 percent diversion rate. The cost figures presented include consulting fees, construction, and required environmental protection measures.

At this time we have assumed that the plants will be designed to manage a “mixed waste” feedstock. However, based on results of current demonstration programs, some portion of the feedstock may be adjusted to a “source separated organics” feedstock. This would require residents to separate their kitchen leftovers that would be directed to a plant designed to compost or digest source separated organics as opposed to mixed waste. The introduction of one or more

plants that are designed to manage a source separated organics feedstock will have associated impacts on the capital and operating budgets for collection, which will be factored into future budget projections if this option is pursued.

In addition to the capital costs, the net operating costs of the diversion plants (operating cost less disposal savings) have been factored into the budget impact. By 2006, the net annual operating budget impact of achieving 60 percent diversion is estimated at \$10,965,000 (see Attachment B). By 2009, the net annual operating budget impact of achieving 80 percent diversion is estimated at \$16,241,000.

Additional input into the design of the capital works budget and implementation of diversion programs and facilities will be assisted through:

- the outcome of the proposal negotiations with the qualified “formal” respondents in Category 1 (proven diversion capacity) of the Toronto Integrated Solid Waste Resource Management “TIRM” Process;
- feedback from the anaerobic digestion demonstration facility at the Dufferin Transfer Station and engineering studies with Enwave concerning anaerobic digestion to provide a supplemental heat source for the downtown core; and
- the analysis of focus groups results and a broad-based public attitude survey concerning collection system options and feedback from pilot projects.

#### Item 5. City Council Invitation to City of Edmonton Staff to Present Slide Presentation

Amendment No. 3 to Clause No. 2 of Report No. 17 of the Works Committee, headed “Toronto Integrated Solid Waste Resource Management (“TIRM”) Process – Category 2, Proven Disposal Capacity”, as adopted by City Council at its regular meeting held on October 3, 4 and 5, 2000, and its Special Meetings held on October 6, 2000, October 10 and 11, 2000, and October 12, 2000, recommended that:

“A group of engineers from the City of Edmonton be invited to visit the City of Toronto and provide, for the information of City of Toronto Councillors, a slide presentation on the waste disposal process used by the City of Edmonton, such visit to take place prior to December 5, 2000.”

#### Response.

We have contacted the City of Edmonton regarding Council’s request for a slide presentation on their waste disposal process. Edmonton staff has agreed to provide the requested presentation, but were unable to do so prior to December 5, 2000. We are currently reviewing potential dates in 2001. We will work with the Chair of the Works Committee to arrive at a suitable date for the presentation. When a date has been arrived at all City Councillors will be invited.

Conclusions:

This report provides responses to a number of information requests from the Works Committee held on September 13, 2000, and the City Council meeting held during the first two weeks of October 2000.

Follow-up activities identified in this report will assist in the process of reaching the solid waste diversion targets that have been set by City Council.

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Attachment B.

Proposed Capital Works Budget 2002-2005 to Achieve 60% Diversion by 2006 (\$000's)

<b>Project Description</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Total 2001-2005</b>
Commissioners MRF	257	0	0	0	0	257
Mixed Waste Processing Facility # 1  (Demonstration and Full Scale)	8,267	6,076	12,152	5,571	0	32,066
Mixed Waste Processing Facility # 2	4,835	28,466	11,100	0	0	44,401
Mixed Waste Processing Facility # 3	493	30,587	30,587	0	0	61,668
Additional Mixed Waste Capacity	0	0	1,037	32,395	32,395	68,826
Replacement Compost Facility	158	13,345	264	0	0	13,767
Material Recovery Facility # 3	0	1,062	6,345	759	0	8,165
<b>Total</b>	<b>14,010</b>	<b>79,536</b>	<b>61,485</b>	<b>38,724</b>	<b>32,395</b>	<b>226,150</b>
<b>Diversion %</b>	<b>26.3%</b>	<b>26.5%</b>	<b>34.1%</b>	<b>50.0%</b>	<b>50.2%</b>	<b>2006 Target of 60.3%</b>

Annual Operating Budget Impact (\$000's)

<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
86	350	1,548	7,740	7,740	10,965