

REGION OF OTTAWA-CARLETON  
 RÉGION D'OTTAWA-CARLETON

REPORT  
 RAPPORT

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DATE                        28 June 1999

TO/DEST.                 Coordinator  
                               Planning and Environment Committee

FROM/EXP.                Director, Solid Waste Division  
                               Environment and Transportation Department

SUBJECT/OBJET           **TRAIL ROAD LANDFILL ASSET MANAGEMENT AND  
 LANDFILL OPTIMIZATION STUDY -  
 INCINERATION OPTION**

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### DEPARTMENTAL RECOMMENDATIONS

**That the Planning and Environment Committee and Council:**

- 1. Receive for information, the preliminary analysis on the cost of incineration in comparison to optimization and;**
- 2. Confirm the original direction to pursue the options as outlined in the *Trail Road Landfill Asset Management and Landfill Optimization Study*.**

### BACKGROUND

*The Trail Road Landfill Asset Management and Landfill Optimization Study* (the Optimization Study) was recommended as one of the follow-up studies in the Region's *Waste Management Master Plan - Interim Review* as approved by Council in April 1990. The Optimization Study has now been completed and concludes that it is technically feasible for the Trail Road landfill to continue operation for a number of years, with the adoption of any of the design options set out in the report. In April 1999, preliminary public consultation concluded that there is broad public support for optimizing the Trail Road Landfill.

On 09 June 1999, Regional Council considered a report which recommended that staff be directed to pursue the options outlined in the *Trail Road Landfill Asset Management and Landfill Optimization Study*. Further, Regional Council approved the following motion, on that date, as an amendment to the report (Planning and Environment Committee Report 33, Item 1):

*Staff be directed to include the concept of incineration as: a) a possible enhancement to the existing landfill; b) as a cost comparator to optimization at the Trail Road Landfill.*

## DISCUSSION

### 1. Approvals Process

The approval of waste management facilities in Ontario has proven to be a costly and difficult process. Previously, a proponent, under the *Environmental Protection Act*, was obligated to conduct a study (Waste Management Master Plan) which not only investigated a particular undertaking, but also had to conduct analysis to all alternatives to the undertaking. In the past, some municipalities have expended significant resources only to have a particular undertaking not stand up to this scrutiny or the procedural requirements, and accordingly the undertaking has not proceeded. Generally speaking, municipalities have not been free to reduce the alternatives for an undertaking such as waste disposal. For instance, municipalities are not free to select a greenfield site (expropriation powers allows/obliges that they look broader); nor can municipalities simply select a specific technology (incineration).

In 1996, the Environmental Assessment (EA) process was modified to allow for the possible scoping of an undertaking through a Terms of Reference (T of R). The scoping provision under the *Environmental Assessment Act* allows proponents to more accurately define the components of the EA for their undertaking early in the process and to have it approved by the Ministry of the Environment (MOE). Development of the T of R requires, among other things, public consultation and the T of R is ultimately subject to MOE approval. The EA is then limited to what has been set out in the T of R.

The Optimization Study was completed as a feasibility study in compliance with the EA (such a preliminary study is permitted under the *Act*). The approach recommended by staff in the reports, received by Council on 12 November 1998 and 09 June 1999, is to use the Study as a basis for scoping the T of R for an EA.

### 2. Landfill Optimization

The Optimization Study is a technical study of the Trail Road Landfill which investigates the feasibility of extending the life of the landfill. Three basic options are identified: i) increase the height of the landfill, ii) increase the size (footprint) of the landfill and iii) landfill reclamation (mining). The Study presents different options and combinations of options with estimated capital costs and site-life extensions. The Optimization Study concludes that there are feasible and cost-effective options available to extend the life of the Trail Road Landfill. Preliminary public consultation, conducted in April of 1999, indicated that there was broad public support to optimize the Trail Road Landfill.

The Optimization Study was the result of careful planning and technical analysis over the course of many years, resulting in a comprehensive study which is a critical part of the

Region's Interim Waste Management Strategy. This specific approach has been taken in careful consideration of the waste disposal approvals process. The next step is to review the study with the MOE in the hope of proceeding to a T of R which will set out the proposed EA for landfill optimization.

### 3. Incineration

Incineration as a waste management disposal option was banned by the Province of Ontario in September of 1992. This ban was lifted in 1995 and incineration can now be considered for municipal solid waste (MSW).

Incineration is not a waste disposal solution, rather it is a waste reduction technique. The volume reduction is usually 75 percent to 90 percent, weight reduction is of the order of 70 percent. Most of the waste is what is referred to as "bottom ash" and can generally be landfilled. The remainder is "fly ash" which is usually considered a hazardous waste requiring special disposal.

A key element in the operation of an incinerator is the recovery of the heat produced and conversion of that energy to a revenue-generating product: electricity, heating or industrial process steam, or other use.

Incineration of MSW is more prevalent in areas where approved landfill space is scarce and energy prices are high. Based on 1997 United States' Environmental Protection Agency data, Japan incinerates 60 percent of its MSW, Switzerland is greater than 70 percent and Sweden over 80 percent. The United States incinerates about 13 percent of its MSW, and Canada less than 8 percent.

Traditional concerns about incineration include higher operating costs, air quality emissions, residue disposal requirement and the perceived negative effect incineration may have on the 3Rs (i.e., incineration and recycling compete for highly combustible items like paper and plastic). Benefits include energy generation, large reduction in waste volume, less land requirement (as compared to a landfill), and there is no capacity constraint (i.e., it does not have a specific "closure" date) although technical upgrades are often required over time.

### 4. Incineration as a Cost Comparator

In order to make a preliminary assessment of incineration at the Trail Road Landfill site, J. L. Richards and Associates Limited were retained to do some preliminary background and costing work for comparison with optimization options. Copies of the consultant's draft report were not final at the time this report was written, but will be available through the Solid Waste Division upon request. Several of the consultant's preliminary comments are included in Section 3 and 4 of this report.

Based on analysis of a number of Canadian experiences, J. L. Richards' preliminary estimate for an incinerator to handle the waste stream going to Trail Road costs approximately \$70M. If this facility could be approved, designed, built and operational by the Year 2003, based on

project waste volume reductions, the site life at Trail Road could be extended by an estimated 35 years. In comparison to the capital costs and site life extension presented in the Optimization Study, this option fits in comparably with those proposed. When operating costs of an incinerator plus landfill are compared, however, to the operating cost of a landfill, a significant discrepancy is evident. Canadian experiences suggest incineration operating costs appear to be about three (3) times the costs of current landfill operations. In addition, waste from the incinerators requires either landfilling or hazardous waste treatment.

Based on preliminary numbers of J. L. Richards' analysis, this would suggest an increase in operating costs of \$4M - \$5M per year. Over the life of the landfill extension, this would result in an operating premium in excess of \$100M.

In summary, when compared on the basis of capital cost, incineration is generally in the same range as the optimization option; however, a preliminary review of operating costs suggest a significant annual premium would be incurred by operating an incinerator/landfill as opposed to a landfill alone.

## 5. Waste Management Planning Process

The Optimization Study did not consider incineration. Should Committee and Council choose to pursue incineration for waste disposal, there are three basic options as follows:

### i) Consider Incineration As Part of Existing Operations:

In order to add the concept of an incinerator used in conjunction with the landfill would require a new study, although much of the preliminary work used for the Optimization Study may be applicable to an incineration study. Further, at the end of the incineration study period, there would be a high degree of uncertainty as to whether a T of R focussed on incineration would be approved. Should the T of R be successful, then the full process (approvals, design, tendering, and start up) could, conservatively, take three to five years to complete. Although Trail Road would have diminished disposal capacity at this point, the reduction of waste by incineration would allow Trail Road to be operational for a number of years, as discussed in Section 4 above.

It is important to note that since the Province lifted the ban on incineration in 1995, no proponent has made an application under the EA for an MSW incinerator. There is no current incineration approval experience in Ontario, therefore, for the Region to draw upon.

### ii) Full Waste Management EA:

If it is Council's wish to consider incineration, in consideration of the current waste disposal approvals process, it might be best accomplished by reviewing this process as part of a broad waste management EA. For a full EA study, all disposal alternatives would be considered, including waste export, siting a new landfill, incineration, increased diversion and other new technologies. This would take the Region down a significantly different

planning path than the current approach of trying to optimize an existing asset while minimizing financial costs and improving environmental protection. Additional resources, funds and a longer timeline would be required in this case. Should the MOE reject the suggestion of scoping a T of R, the Region may eventually have to take this approach.

iii) Proceed With Optimization:

As mentioned above, the next step in the optimization process is to prepare a T of R for Ministry approval. The majority of scoped EA applications, to date, have been for existing facilities, similar to the Region's approach with the Optimization Study. If the T of R is approved, the Region can proceed with the EA. This will involve, among other things, more detailed technical studies, additional consultation and pilot work, which will hopefully lead to Ministry approval to proceed. This process may take two to three years.

### CONSULTATION

There has been no specific consultation on incineration to date. Incineration was included with other options (new landfill site, export, other technology) in one question in the telephone survey as part of the public consultation on Trail Road Optimization.

### FINANCIAL IMPLICATIONS

Approval for waste management disposal options has been a costly and uncertain process. The Optimization Study was one of three cornerstone studies that the Region undertook after abandoning a previous landfill search. A great deal of care and caution has been taken to complete this study and position the Region to approach the MOE as the next step in the process. If Council chooses, at this time, to expand the optimization scope of options to further consider incineration, it is estimated that the in-depth study, consultation on the findings, and updating of the base study could cost \$250K, to bring the concept of the technical feasibility of incineration to the same level as we are now with the existing study. A full updating of the Waste Management Plan, in the absence of a resolution to the waste disposal question, would start the Corporation on a workplan that could cost between \$5M and \$10M simply to establish the best disposal solution. The Optimization Study suggests addressing waste disposal requirements by using the existing site.

### CONCLUSION

In the report, dated 07 May 1999, considered by Council on 09 June 1999, staff recommend that the next step be to determine the likelihood of the acceptability of the concepts outlined in the Optimization Study as basis for a T of R in the scoped EA process. Having conducted a preliminary review of incineration, concerns exist with respect to the higher costs of operation related to this type of facility, as well as the increased uncertainties of the approval process if

pursuing this option at this time. Staff recommends that the Region continue to pursue the options outlined in the original Study. If the MOE is not acceptable to this approach, it is likely that a broader waste management EA will be required, at which time incineration will be one of the disposal options considered.

*Approved by  
P. McNally, P.Eng.*

PM/KHW/md