

Item No. _____

CITY OF BURLINGTON

CAO 21/85

March 22, 1985

The Chairman and Members of the
Solid Waste Management Committee

Subject: City's Response to Walker Wright Young
Associates Ltd. Phase 2 Stage 2C
Landfill Environmental Assessment Study
Reports for the Region of Halton
File: 60-75-1

RECOMMENDATION:

WHEREAS the principal recommendation of the Draft Environmental Assessment Study Phase 2 Stage 2C Report prepared by Walker Wright Young Associates Ltd., namely, that the Escarpment Site F in Burlington "be selected as the preferred site for landfill in Halton", is based on incomplete information and inadequate analysis;

AND WHEREAS, should the Region's EA submission identify the undertaking as landfill at one preferred site, it would risk having to conduct another Landfill EA Study were the EA Board to not approve the undertaking as submitted;

AND WHEREAS, in the opinion of the City's professional consultants, a close review of the information available to Walker Wright Young Associates Ltd., within a more systematic and more reliable framework for comparatively evaluating the six candidate sites, demonstrates conclusively:

- (1) that none of the six sites, including the Escarpment Site, is clearly preferable to all of the others and
- (2) that Sites A and D, form a very tight grouping as "most preferred" sites, with Site E and Escarpment Site F being close "second most preferred" sites;

THEREFORE BE IT RESOLVED THAT the Region of Halton be urged in its EA submission, to identify the undertaking as the Provision of a Landfill Site by two alternative methods being the establishment of a landfill site at Site A or Site D.

AND FURTHER THAT the Region of Halton be advised that, should it identify the undertaking as the Provision of a Landfill Site at Escarpment Site F only, the City of Burlington, by all means at its disposal, will oppose such an undertaking, and will promote alternatives to the undertaking.

AND FURTHER THAT the Region of Halton be requested to hear a presentation on this matter from the City's consultants Ecoplans Ltd. and Conestoga-Rovers Associates, and from the City's Assistant Director of Public Works -- Transportation, at the Regional Council meeting of April 3, 1985.

AND FURTHER THAT a meeting be held on April 1, 1985 at 7:00 p.m. at Aldershot High school to present the City's position on this matter to members of the public.

REPORT:I. PURPOSE:

The purpose of this report is to respond to the Region's request for comments on the Walker Wright Young Associates Ltd. Landfill EA Study Phase 2 Stage 2C Report (hereafter, the WWY 2C Report), by March 26, 1985.

This report is based in part on reports prepared by its consultants (Ecoplans Ltd. and Conestoga-Rovers, hereafter Ecoplans/CRA), and by the Transportation Division of the City of Burlington's Public Works Department. These reports are attached and are intended to form part of the City's response.

II. INTRODUCTION:

WWY's 2C Report was presented to a special meeting of Regional Council on February 6, 1985. The target date set by the Region for submissions from interested parties is March 26, 1985. This report, together with the Ecoplans/CRA Report and the Public Works Report 65/85 which are attached, constitutes the City's submission.

Since the Landfill Environmental Assessment Study began over two years ago, the City of Burlington has been a close observer of the Study process, and has made half a dozen major submissions in response to requests from the Region. There is no need to review those submissions in detail here. Collectively, our objectives have been to keep the costs of the Study within reasonable limits, and to ensure that WWY's analysis was fair, systematic, and understandable to the broad cross-section of interested observers.

Concern with the treatment of the Escarpment Site F in Burlington (also known variously as the NSP Site, Pit and Quarry Site 1 or P&Q 1, and as Site F to WWY) has figured largely in the City's submissions. However, no City submission has been motivated by a desire to prevent the establishment of a permanent landfill site. On the contrary, during this period the City's stated policy, which arose from the Acres Report, has been to consider a role for the Escarpment Site subject to a number of conditions.

The City's policy with respect to Escarpment Site F has stood in stark contrast to the Town of Milton's unconditional opposition to landfill in its territory on any terms. It is also relevant to note that during this period the City has agreed to a second expansion of the Region's Burlington landfill site, and to the operation at this site of an open air transfer station needed to support the Interim Export Option.

Regrettably, the City's persistent open-mindedness with respect to landfill in Burlington, its accommodation of the Region's disposal problems, and its constructive efforts in support of the Landfill Environmental Assessment Study, have gone unappreciated. The failure of both the Region and WWY to respond positively to the City's concerns and suggestions led the City to decide to retain its own environmental consultants early in 1984. Neither the submissions prepared by the City alone, nor those prepared with the help of the City's consultants, have altered in any significant way the receptivity of either the Region or of WWY.

What the WWY 2C Report Should Have Been.

The 2C Report is the climax of more than two years of information gathering and analysis. As the account of the step in the analysis that finally recommends the preferred site for the Region's next landfill, the Report should be persuasive in the eyes of the majority of interested parties. Every reader should be able to follow the analysis. Whether a particular reader agrees or disagrees with the conclusion of the analysis, that reader should agree that the conclusion follows from the evidence presented. As the point of departure for the preparation of the Region's Environmental Assessment submission, the Report should be factually correct in virtually every detail. The WWY Report fails to meet these requirements. ||

III. THE WWY 2C REPORT IN SUMMARY

In essence, the WWY 2C Report presents and evaluates information gathered on each of the six candidate sites under five priority categories. Each site is compared with every site and the Escarpment Site F is recommended as the preferred site for landfill in Halton. The 2C Report comprises a "Summary" report and 13 "Technical" reports; the information in the former is derived from the latter.

IV. THE PREPARATION AND NATURE OF THIS RESPONSE

This response is based upon the WWY 2C Report itself, on information presented at public meetings held at the Region, and in Burlington, Milton, and Oakville, during the period between February 6, 1985 and the time of writing, on information obtained from the City's environmental and legal consultants, some of which had been obtained from the Region's consultants and staff, on information received from citizens, and on information contained in various authoritative reports, hearings, and journals.

The general objectives of this report are to demonstrate conclusively:

- (1) that the information and analysis presented by WWY to support the concluding preference for the Escarpment Site F are seriously deficient;
- (2) that no one site can, on the basis of any systematic analysis of the information presented by WWY, be shown logically and consistently to be better than all of the others;
- (3) that Sites A and D, and then Sites E and Escarpment Site F, on the basis of systematic analyses of the information presented by WWY, are consistently better than the other two candidate sites, and that Site A is consistently better than Site D and, that both Sites A and D are consistently better than Sites E and the Escarpment Site F, by margins that are relatively insensitive to changes in factor weightings; and
- (4) that the collection of further information on certain aspects of certain sites would be a rational course of action if one's objective were to establish a clear preference for one site with a view to effectively defending one's preference in subsequent proceedings.

A number of factors make it impossible to address these objectives individually or in any particular order. Among them are that, like the categories defined by WWY, these objectives overlap. Good examples may pertain to several critical points. The methods of presentation and analysis in the WWY 2C Report, also do not lend themselves to orderly review.

V. COMMENTS ON THE 2C REPORT(a) Evidence and Inference

Before commenting on the 2C Report directly we would like to review several fundamental facts and principles about landfill in general, and about landfill in Halton. These facts and principles have been accepted for several years.

Hydrogeology is paramount in the siting of a landfill. Hydrogeologically, tills are superior to fractured shale. From first principles, then, Sites A to E are hydrogeologically superior to the Escarpment Site. At the Interim Expansion Hearings in 1984 the Region's hydrogeology consultant, Mr. R. Leech of Gartner Lee Associates, said that he personally would not recommend the siting of a landfill on shale in the Escarpment Site F area, and that tills are "definitely preferable".

There are short-term and long-term risks to human health and safety and to the environment associated with landfill sites. The engineering and the operation of a site can affect these risks. The Escarpment Site F is known, both from the Region's experience with the current site and its two expansions, and for its extreme terrain, to be the most difficult of the six candidate sites by far to engineer and to operate. Again, from first principles the Escarpment Site F cannot be preferred to the other candidate sites.

Another major risk factor associated with landfill sites is transportation. Transportation risk is a function of haul distance and of the probability of conflicts with non-haulage vehicles, with pedestrians, and with private property. The landfill that is known to minimize transportation risk is the site that is located closest to the centroid of waste generation. The Escarpment Site is not the closest candidate site to this centroid.

It is clear then that WWY's selection of the Escarpment Site as the preferred site for Halton violates accepted and fundamental facts and principles.

On our reading the inconsistencies just noted between evidence and inference are compounded and multiplied in the 2C Report. Collectively they create an enormous gap between the evidence collected and presented, and the principal conclusion reached. Given the sensitivity of the 2C task, one should have thought that WWY would have gone to great lengths to have the preferred site emerge as fairly as possible from the analysis.

Among the inconsistencies and anomalies catalogued in the reports attached to this report are the following:

- acknowledging the "unique characteristics" of quarry sites and then evaluating the Escarpment Site F against non-quarry sites as if nothing about quarry sites is "unique"

- defining the social impact boundaries for the Escarpment Site F, effectively minimizing the uniquely social impacts of the only urban candidate site

- using several social impact indicators based on the same resident/residence counts within arbitrarily defined social impact boundaries to inflate the impacts of certain sites through "double counting" of the same people.

- exaggerating the impact of landfill upon community facilities at other sites, while ignoring the same impacts on similar facilities at the Escarpment Site F (e.g. Milton District Hospital versus Joseph Brant Hospital)
- selectively employing mitigating measures having their own high social impacts, to reduce or to nullify otherwise significant impacts (e.g. terminating Bayview Park)
- elaborately defining hydrogeological impacts so as to reflect the highest concern for groundwater resources, and dismissing the groundwater below the Escarpment Site F when its quality compares favourably with the groundwater at other sites
- dismissing C.R.O.W.'s public plea of October 9, 1984, to drop Sites B and C from further competition, and then dismissing them early in the 2C Report upon cursory consideration of essentially the same information and analysis used by C.R.O.W. (Concerned Residents Over Waste is an Oakville citizens' group.)
- dismissing as "rather crude", systematic forms of comparative analysis that would have allowed others to test the sensitivity and reliability of WWY's comparative judgements.

As noted above illustrations of these inconsistencies can be found in the attached Ecoplans/CRA report and in the Public Works report. Those reports also contain point-by-point comments and criticisms of the 2C report.

(b) How to Evaluate Competing Sites

WWY use methods of ranking the sites on factors and sub-factors that are inappropriate and inferior in a number of respects. The factor and sub-factor rank-orderings (i.e. from 1 for the lowest impact to 6 for the highest impact) assume that the assigned ranks are equidistant from one another. Moreover the information that is used to rank the sites on the factors and sub-factors tends to be chosen selectively, rather than systematically. And finally, the combining of the factor rankings through the "pairings technique" does not allow the consistent and reliable application of factor weightings.

The attached report by Ecoplans/CRA provides a detailed critique of these techniques and proposes an alternate methodology that allows for consistent and reliable application of factor weightings. It also allows for the determination of the sensitivity of the results to changes in the underlying data and assumptions.

The Ecoplans/CRA analysis clearly shows that the selection of a preferred site is critically dependent upon the assigning of factor rankings and weightings. By changing these parameters within reasonable limits, the overall rankings of Sites A, D and Escarpment Site F vary. This precise sensitivity testing was not possible within the WWY "pairings" method.

Many sensitivity runs show that, while Sites A and D, and Sites E and Escarpment Site F, consistently emerge as the best and second-best pairs, the rank score of none of the sites is considerably greater than all other sites. This result contradicts WWY's claims that the Escarpment Site F is the best site, and that Site D is the second best site.

VI. OTHER CONSIDERATIONS

(a) Bayview Park

WWY's analysis recommends the transfer of activities from Bayview Park as a mitigating measure. The move of Bayview Park activities are rationalized on the grounds that the Aldershot area will be left with more than sufficient park land after the move. This reasoning ignores the information supplied to WWY by the City that Bayview Park is a unique regional escarpment facility that attracts international equestrian competitors. Despite the fact that the City could not provide equivalent facilities for these activities elsewhere in its current parks system, no provision is made for defraying the City's costs in obtaining alternative facilities. These costs are estimated at between \$600,000 and \$900,000.

(b) The Role of Transfer Stations in the Disposal System

In January 1983 Regional Council approved the formation of a Transfer Station Task Force of staff from the Region and from area municipalities. The work of that Task Force was suspended several months later in recognition of the fact that the need for a transfer station in Halton is a function of the location of the landfill site(s) selected. This is to say that the issue of the need for a transfer station was to be addressed by WWY. Once a transfer station was shown to be required, the Task Force was to address the issues of transfer station operations and financing.

The 2C Report concludes that there is a need for a transfer station in Halton Hills to support the proposed Escarpment Site F landfill. Subsequent correspondence from WWY in response to a question from Alderman McLaughlin has implied an answer to the question of transfer station financing. Its implication is that the Region is to finance the proposed Halton Hills transfer station. The City finds this implication quite improper since financing responsibility is not addressed in any detail in the 2C Report, and since it encroaches upon the mandate of the Transfer Station Task Force.

It should also be noted that the social impacts associated with the establishment of the proposed transfer station have not been considered in the WWY 2C Report. Since the Escarpment Site F is the only site requiring a transfer station, these impacts might properly be combined with those of the landfill site in the determination of overall impact.

(c) Capital Financing Implications

The City's consultants identify a number of additional costs for works which may be required in the development of the Escarpment Site F (see Table 3.1). These costs total \$4.3-22.9 million depending on the strength of the need for, and on the nature of the construction of, a liner. These costs are in addition to those costs identified by WWY for the Escarpment Site F. In WWY's own terms, the Escarpment Site F would cost \$19.1 million more than Site A in 1984 dollars. With the inclusion of the costs noted above, this differential would be \$23.4-42 million.

The additional costs identified above for the Escarpment Site F are significant, and may require additional Regional capital financing through the issuance of debentures. Such additional debentures may be a source of concern given the proximity of the Region's current and projected debt levels to its approved debt limits.

VII. BURLINGTON PUBLIC OPINION

For several years a sizable number of people in the Aldershot/ Ward 1 area of Burlington have been opposed to continued landfilling in the Escarpment Site F area. Their concern for the social and environmental impacts of landfill in that location led to the formation of the Solid Waste Management Committee of the West Burlington Citizens' Group. The City has on record a petition from 1983, containing the names of 3500 west Burlington residents who opposed further landfilling.

The City received from Mr. A. Coome on March 14, 1985, a list of the names of 767 citizens from west Burlington who oppose the establishment of a new landfill at the Escarpment Site F.

On February 26, 1985, about 500 people attended WWY's first public open house on the 2C Report, at Aldershot High School. From the demeanour of the vast majority, which was relatively civil considering the circumstances, it would be inappropriate to form an opinion of the breadth or intensity of opposition to the Escarpment Site F as a landfill site.

In its newspaper advertisements of the Aldershot High School meeting, the City included a mail-in coupon with which citizens could indicate whether they supported, opposed, or were indifferent to, the new Burlington landfill proposed by the Region. At this writing a total of 251 coupons has been received. Ward 1 residents sent 98 (39%) of these coupons, while 153 (61%) came from residents in other parts of the City. Only 4 (1.6%) of the responses favour the Region's proposal, 3 (1.2%) are indifferent, and 244 (97%) are opposed to a landfill at the Escarpment Site.

VIII. DIVISIONAL COURT DECISION ON HYDRO EA

The City's outside legal counsel has indicated that the Ontario Divisional Court has issued a decision with respect to undertakings in the Environmental Assessment process which has implications to the Halton Landfill E.A. Very briefly, the Court decided that the Environmental Assessment Board does have the authority to require the proponent, as a condition of approval of the undertaking to use one specific method of carrying out the undertaking. This indicates that the Board may consider a somewhat broader definition of the undertaking with variants of the undertaking being considered as alternate methods for the undertaking. This is a very important decision for Halton's E.A. The Region could now define the undertaking as the provision of a landfill site, and present a number of alternate sites for that landfill as alternate methods of carrying out the undertaking. The Board could then select one of the proposed sites as the preferred method for carrying out the undertaking.

The use of a broader definition of the undertaking would be of definite benefit to the Region of Halton in this situation. The Region can now go forward with a broad undertaking and not risk refusal of the Board to approve a landfill for Halton unless all sites are deemed inappropriate by the Board. Proceeding with an undertaking limited to one site only, places the Region at significant risk if that single site is refused by the Board.

IX. CONCLUSIONS

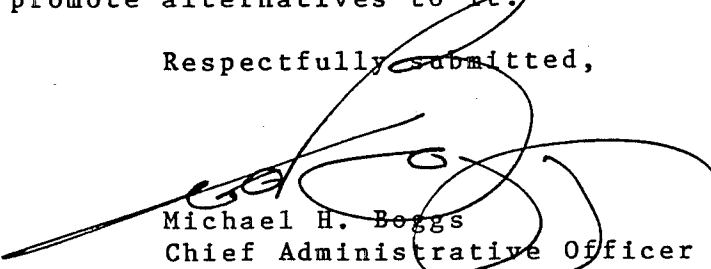
This report and its attachments have presented compelling evidence of the inadequacy of the WWY draft 2C report. The WWY 2C report was prepared on the basis of incomplete information and employed inadequate methods of analysis to generate its conclusion. The selection of the Escarpment Site F as the preferred location of a landfill in Halton is an error. The reports of Ecoplans/CRA and the City's Public Works Department critically demonstrate that Sites A and D are superior locations and, on the basis of WWY's present information, ought to be the preferred site(s).

To remedy the error made by WWY, and in consideration of the tight time schedules within which the Region is working, the City of Burlington recommends that the Region define the undertaking in its EA submission as the Provision of Landfill at Site A or Site D.

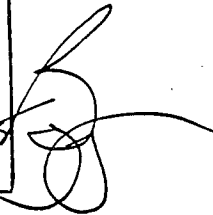
The reason for identifying Site A and D is because they emerge consistently from the systematic analyses of Ecoplans/CRA and the City's Transportation Division as the two best sites.

Should the Region reject this remedy and identify the Undertaking as the Provision of Landfill at Escarpment Site F only, the City of Burlington by every means at its disposal, will oppose the Undertaking and will promote alternatives to it.

Respectfully submitted,


Michael H. Boggs
Chief Administrative Officer

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attch.

APPROVED BY C.A.O. 
Date 

CITY OF BURLINGTON
PUBLIC WORKS DEPARTMENT

REPORT PW 65/85

March 14, 1985

Chairman and Members of the
Solid Waste Management Committee

Re: Public Works Department Review
Walker Wright Young Associates Ltd.,
Environmental Assessment Landfill Component
Of Solid Waste Management
Phase 2, Stage 2C, Transportation Assessment
Giffels Associates Ltd.

1.0 Purpose of the Report

The purpose of this report is to provide a review of the Draft Technical Report #1 containing the Transportation Assessment portion of the Environmental Assessment for the Landfill Component of Solid Waste Management in Halton. Draft Technical Report #1 was completed by Giffels Associates Ltd., as a member of the study team headed by Walker Wright Young Associates Ltd. The major outcome of Draft Technical Report #1 is a ranking of the 6 candidate sites on a comparative basis with respect to traffic safety and traffic service and operation.

This Public Works Report, therefore, lists certain findings and observations with respect to the Giffels report and then presents an alternative evaluation of the 6 sites and the resulting ranking of that evaluation. Also included in this Public Works Report are suggestions for more detailed study which should be undertaken in order to quantify the comparison of alternative sites from a traffic safety and traffic service and operations point of view.

2.0 Findings and Observations

Staff have reviewed the Giffels report in detail. The following findings and observations are based not only on the review of the Giffels report but also based on recent field observations and past knowledge of traffic issues related to the 6 candidate sites.

2.1 Study Methodology

Much of the information in the Giffels report is based on the assignment of truck traffic from 10 zones throughout the Region to the various candidate sites on the basis of a single route from each zone to each site. This is a very broad brush approach that is suitable in calculating the relative amount of total travel to and from the 6 candidate sites and relative haulage costs.

The single path assignment from each zone is totally inadequate, however for evaluating the matter of traffic safety of the candidate sites. In actual fact, traffic travelling to any of the candidate sites from a given zone will utilize different routes in accessing the site. For example, with respect to Site E, traffic from the Burlington south zone will not all necessarily use the Queen Elizabeth Way to Highway 25 and Britannia Road. Other alternative routes would be Appleby Line north to Britannia Road or any Burlington arterial road north to Highway 5 and then to Highway 25 and Britannia Road.

The potential for conflict between traffic destined to the Site and background traffic on the roadway in question, varies significantly, depending on the roadway itself.

It would be impossible to ensure that in real life, all traffic from a given zone to a particular site, would follow the one path shown in the Giffels report. It may be possible to encourage or require municipal contractors to follow certain routes, however, 40% of the traffic destined to the Landfill Site is private operators who would not in fact follow one single route.

This situation is borne out in Burlington today, in that municipal garbage trucks from Oakville utilize many routes to get to the present Landfill Site. These include the Queen Elizabeth Way to Plains Road and Brant Street and also include Highway 5 to Guelph Line or Highway 5 to Brant Street. There are many reasons for a driver choosing one route over another, some of which would have to do with traffic congestion, others would be personal preference, etc.

2.2 Multi-Route Assignment

In our opinion the use of a multi-route assignment of traffic destined to the various candidate sites would have to be used to fully evaluate the matter of traffic safety on routes being used to the various sites. A multi-route assignment would more closely model the real world situation which would then provide information to facilitate a more meaningful evaluation of the 6 candidate sites.

2.3 Highway Network Improvements

The Giffels report mentions two highway network improvements which they have assigned completion years to. The latest information that we have from the Ministry of Transportation and Communications shows that the completion years in regard to both improvements are wrong and this can significantly impact the evaluation that is carried out in the report.

(a) Highway 403 Waterdown Road Interchange

The Giffels report suggests that this interchange will be in place by 1988. The Ministry of Transportation and Communications have indicated that the interchange is not presently in their five year budget. The interchange has been discussed recently in conjunction with GO-ALRT, however, the GO-ALRT work in Burlington has slowed down and its exact timing is not known.

(b) Highway 403 from Highway #5 to Trafalgar Road

The Giffels report assumes that the section of Highway 403 from Highway 5 to Trafalgar Road will be in place by 1996. The most recent information from the Ministry of Transportation and Communications indicates that Highway 403 from its present location to Highway 5 is not scheduled to be completed until 1993 and that the section from Highway 5 to Trafalgar Road is going to be considerably after that and very questionable whether or not it would be in place by 1996.

(c) Brant Street Interchange at the Queen Elizabeth Way

The Ministry of Transportation and Communications are planning the construction of the Brant Street Interchange at the Queen Elizabeth Way as early as 1989. With this installed, access to Site F from the Queen Elizabeth Way, could be gained very easily by the Brant Street Interchange. This Interchange, therefore should be taken into consideration in this evaluation.

Given the uncertainty of the timing of improvements to the Provincial highway network, and in view of the comments on multi-route assignment of traffic, the evaluation of Site F cannot be based solely on a Waterdown Road Interchange at Highway 403 and must consider and include the various alternatives that traffic destined to Site F would undoubtedly take.

2.4 Potential Conflict Analysis

The matter of traffic safety has not been treated uniformly in the Giffels report for all Sites. The Giffels report does mention potential conflict between Landfill destined traffic and local traffic or background traffic. In the case of trucks travelling through Milton on Highway 25, the Giffels report indicates some potential for conflict with background traffic. In other areas, however, the Giffels report ignores the same type of potential conflict such as

- (a) other areas of Highway 25 including the area between the Queen Elizabeth Way and Highway 5.
- (b) All sections of Highway 5 and the Queen Elizabeth Way.
- (c) the North Service Road in Burlington between Waterdown Road and Brant Street.

We agree with the idea of analysing potential conflict, however, this must be done on a uniform basis and also should take into consideration the multi-route assignment mentioned previously. What is needed therefore is a review of potential conflict on all of the road sections impacted by destined traffic to landfill sites. Such an analysis would be relatively easy to carry out and would include such items as

- (a) the amount of destined traffic to the Landfill Site.
- (b) background volume of the given road section.

- (c) the number of driveway access points on the given road section.
- (d) existing accident rates on the given road section.
- (e) development type adjacent to the given road section such as single family, schools, churchs, etc.,
- (f) the necessity of pedestrians to cross the given road section with particular emphasis on school age pedestrians.

This potential conflict analysis would provide the best indication of potential safety hazard created by landfill destined vehicles throughout Halton Region.

2.5 Total Amount of Travel

The Giffels report includes the total amount of vehicle travel expressed in total vehicle kilometres per day for the various Sites. This information, however, is not used in regard to traffic safety. It is obvious that the more vehicle travel there is the higher the possibility of potential conflict between destined and background traffic. This being the case, it is essential that this criteria be used not only for traffic service and operations, but also for traffic safety. The potential conflict analysis as outlined above would take into consideration this amount of total travel.

2.6 Existing Travel Patterns

The draft summary report completed by Walker, Wright, Young Associates Ltd., utilizes the Giffels report in evaluating traffic safety. Chart 1 indicates that under Site F, there is an advantage to maintaining general existing haulage truck routing, creating the least amount of change to existing conditions. Staff object totally to this remark as it has nothing to do with traffic safety. The fact that trucks travel on certain routes today, does not mean that they promote traffic safety. In fact, this report identifies that other sites are superior to Site F from a traffic safety point of view. The matter then of "creating the least amount of change" is totally irrelevant to assessing traffic safety.

3.0 Evaluation

The purpose of this section of our report is to evaluate the candidate sites on a qualitative basis in view of the above findings and observations. This evaluation takes into consideration both traffic safety and traffic service and operations.

Traffic safety is approached from the potential conflict analysis point of view and includes a review of various routes which would be taken to the candidate sites. Also included is discussion concerning the exact entrance location of the various sites from a traffic safety point of view. The reader will note considerable differences between this evaluation and the one from the Giffels report.

3.3 Site DTraffic Safety

- Traffic from Halton Hills and Milton could utilize either Highway 25 or Trafalgar Road in travelling from the north. Highway 25 through Milton passes through a mainly commercial type area with several direct access driveways and therefore potential conflict would be moderate to high, however, traffic volumes of destined traffic are very low. Traffic utilizing Trafalgar Road from Halton Hills to Britannia Road and then Britannia Road to Highway 25 travel roads with good geometrics and minimum adjacent development and therefore potential conflict would be low.
- From Oakville, the main access route would be the Queen Elizabeth Way to Highway 25. Potential conflict would be low.
- Some traffic from Oakville would gain access more directly to Highway 5 and utilize Highway 5 from Trafalgar Road to Highway 25. Depending on the road taken, potential conflict would range from low to moderate.
- Traffic from Burlington would primarily utilize the Queen Elizabeth Way to Highway 25 presenting low potential conflict.
- Some traffic from Burlington however, would utilize north/south arterial streets to gain access to Highway 5 and then to Highway 25 presenting either low or moderate conflict.
- The access for Site D on Highway 25 is suitable and provides low potential conflict.

Traffic Service and Operations

- Access from all areas in the Region is good. Service and Operations Index 1.11 to 1.13.

3.4 Site ETraffic Safety

- Traffic from Halton Hills and Milton will travel to Site E in a very similar fashion to Site D and so the same comments would apply. Likewise, traffic from Oakville would travel past Site D, utilizing Britannia Road and Tremaine Road. Possible high potential conflict exist on Britannia Road between First Line and Tremaine Road due to limited road geometrics and an at grade railway crossing.
- Burlington traffic would tend to utilize various minor routes to gain access to Site E, rather than Highway 25 as suggested in the Giffels report. Particularly Appleby Line provides good access from Burlington to Britannia Road and then Britannia Road into Tremaine Road. Once again high potential conflict exists with this route because of lower geometrics, turning radii, etc.

Traffic service and operations is reviewed from an accessibility point of view but relies heavily on the information contained in the Giffels report with respect to the Service and Operations Index on Table 13 of the report.

3.1 Site A

Traffic Safety

- traffic from the north can be accommodated on Trafalgar Road. Trafalgar Road north of Site A is suitable because of good road geometrics and sparse roadside development. Conflict potential on this roadway would be low.
- Much of the Oakville traffic will utilize Trafalgar Road from the Queen Elizabeth Way to Highway 5. This section of road contains good geometrics and while there is considerable adjacent development, it is well controlled at major driveways. There is a minor exception to this, on the east side of Trafalgar Road where a small group of single family homes exist. This route would provide moderate potential conflict.
- Much of the Burlington traffic and some of the Oakville traffic will utilize Highway 25 from the Queen Elizabeth Way to Highway 5 and then Highway 5 into Trafalgar Road. Highway 25 from the Queen Elizabeth Way to Highway 5 is a very suitable haul route as the road geometrics are good and development is sparse. This section of Highway 25 would offer low potential conflict. Highway 5 from Highway 25 to Trafalgar Road does contain some adjacent development, however, here again, low potential conflict would exist.
- Depending on traffic conditions Burlington traffic could utilize the Queen Elizabeth Way directly to Trafalgar Road. This would provide a situation of higher potential conflict by the use of Trafalgar Road between Queen Elizabeth Way and Highway 5.
- The access arrangements at Site A are good and provide low potential conflict.

Traffic Service and Operations

- good access from all parts of the Region, Service and Operations Index 1.00.

3.2 Site B and Site C

Same as A.

- The existence of the at grade railway crossing on Britannia Road between First Line and Tremaine Road and on Derry Road between First Line and Tremaine Road require a significant amount of at grade railway crossings which offer high potential conflict.
- The access to the Site E could be provided in an appropriate fashion and would provide low potential conflict.

3.5 Site F

Note: This analysis assumes the Brant Street/Queen Elizabeth Way Interchange completed and that the Highway 403/Waterdown Road Interchange is not completed.

Traffic Safety

- Traffic from Halton Hills would use either Trafalgar Road or Highway 25 in gaining access to Highway 5. Trafalgar Road offers low potential conflict while Highway 25 through Milton represents moderate to high potential conflict. When this traffic from Halton Hills reaches Highway 5, it is likely that access to the Queen Elizabeth Way would be gained by Highway 25 which represents low potential conflict.
- Access from Milton north and Burlington north would be via Guelph Line. Guelph Line north of Highway 5 contains some areas of poor geometrics with moderate adjacent residential development which could provide moderate to high potential conflict.
- Traffic from Oakville south for the most part would utilize the Queen Elizabeth Way to the Brant Street Interchange. Potential conflict on the Queen Elizabeth Way is low. Potential conflict, however, on the North Service Road between Brant Street and the Site F entrance would be moderate in view of the limited geometrics of the roadway at King Road and ongoing commercial and residential development on the north side of the North Service Road.
- Some traffic from Oakville south and traffic from Oakville north would utilize several alternative routes to Site F. One of those routes would be Highway 5 to either Guelph Line or Brant Street. As mentioned previously, the situation today is that municipal garbage vehicles from Oakville do utilize Highway 5 to Guelph Line and Brant Street. Highway 5 and this location offers low potential conflict. Guelph Line, however, between Highway 5 and the Queen Elizabeth Way, while providing good geometrics, contains a significant amount of direct access points and also includes clusters of single family homes. Potential conflict on this street section is moderate and comparable to Trafalgar Road between the Queen Elizabeth Way and Highway 5. Brant Street between Highway 5 and the North Service Road however, offers

high potential conflict due to the fact that there are no schools located west of Brant Street and therefore all school children travel across Brant Street. Two crossing guards are in operation on Brant Street.

- Traffic from Burlington to Site F is difficult to analyse because of the many routes that exist. Traffic today, however, utilizes arterial streets throughout Burlington. As an example, King Road is utilized from Plains Road to the North Service Road. The situation offers high potential conflict in view of the at grade crossing on that street.
- The access to Site F is suitable and provides low potential conflict.

Traffic Service and Operations

- Accessibility throughout the Region is generally good. The Service and Operations Index, however, ranges from 1.2 to 1.34.

4.0 Ranking Outcome

The following ranking is based on an informed review of both the potential conflict analysis and the Traffic Service and Operations Index. A more detailed study would be required as discussed in Section 6.0 of this report, in order to carry out a more quantitative type ranking analysis. The ranking outcome as a result of this Public Works Report is:

Site D	1
Sites A, B, C	2
Site F	5
Site E	6

5.0 Construction Cost

The Giffels report outlines certain construction costs with respect to the various site alternatives. The following comments relate to the cost associated with Site F.

(a) Entrance Construction

The Giffels report shows the widening of the North Service Road on the south side to facilitate an entrance to Site F. This widening would be impossible as it encroaches on Ministry of Transportation and Communications' property which is not available. Widening to the north, although possible, would be more expensive, possibly in the range of \$100,000.

(b) Waterdown Road Interchange

If it was desirable to include the Waterdown Road Interchange as part of the transportation network for Site F, it may have to be considered as the cost associated with Site F, if the Waterdown Road Interchange is not brought on by the construction for GO-ALRT. This being the case, the cost of the Waterdown Road Interchange is estimated to be in the range of \$2,000,000 to \$2,500,000.

(c) King Road at the North Service Road

There exists today traffic operations problems at the intersection of King Road and the North Service Road. The selection of Site F would require some realignment of that intersection, particularly if traffic destined to Site F utilized the Brant Street Interchange as we suggest. It would be necessary to shift the intersection of King Road and North Service Road to the north in order to avoid present conflicts with the bridge abutments on King Road. This work would be estimated to cost in the range of \$300,000 to \$600,000.

6.0 Further Study

As mentioned previously, a more detailed in depth traffic analysis is required to properly evaluate the alternative sites from a traffic point of view. This work would include the following:

- (a) A multi-route assignment of destined traffic based in the case of Site F, on known travel practices and in the case of other alternative sites, on local knowledge. The multi-route assignment would take into consideration appropriate timing for improvements to the provincial highway network.
- (b) A detailed potential conflict analysis taking into consideration for each route section
 - destined traffic
 - background traffic
 - adjacent development types
 - number and type of access points
 - pedestrians crossing the roadway

This analysis would take into consideration the total amount of travel to the 6 candidate sites and would deal with total travel on individual route sections.

- (c) A refinement of costs associated with each site based on the multi-route assignment. Cost would also include impacts on road surface of various routes from a road construction and maintenance point of view.

7.0 Conclusion

On the basis of our review of the Giffels report and our own investigations into traffic aspects of the 6 alternative sites, we conclude:

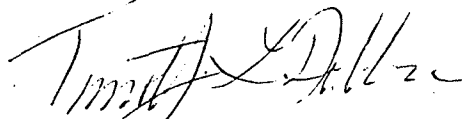
- (a) That the methodology employed in the Giffels report results in an incomplete and inappropriate evaluation of traffic safety related to the 6 alternative sites and that as a result of this methodology, their ranking of the 6 sites with respect to traffic safety and traffic service and operations is not valid.

- (b) That an analysis of potential conflict utilizing multi-route assignment in combination with the Service and Operation Index as defined in Table 13 of the Giffels report results in a ranking as follows:

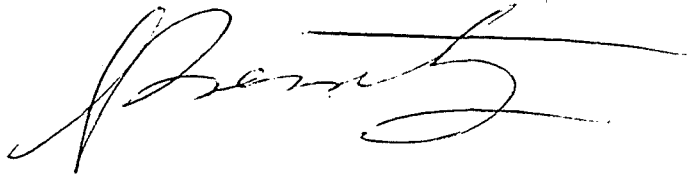
Site D	1
Site A,B,C	2
Site F	5
Site E	6

- (c) That further detailed study is required to provide a more qualitative analysis of traffic safety and traffic service and operations characteristics of the various sites.

Respectfully submitted,



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