



Ontario

Sub # 5370

APR 30 1987

Niagara
Escarpment
Commission

416/877-5191

232 Guelph Street
Georgetown, Ontario
L7G 4B1

February 16, 1987

FOR INFORMATION

Re: Comparative Analysis of Alternative Sites for
Sanitary Landfilling in the Regional Municipality of
Halton.
Site D and Site F
Waste Management Environmental Assessment.

The final comparison of proposed sites D (Town of Milton) and F (City of Burlington) for landfilling purposes has been carried out by the Regional Municipality of Halton's consultants. The two sites were evaluated using the following factors:

- Public Health and Safety;
- Natural Environment;
- Social Environment;
- Cultural Environment; and
- Costs, Engineering and Operations.

With respect to Public Health and Safety, the consultants preferred Site F over Site D by a small margin. Under the category of Natural Environment, the agricultural impact at Site D is proposed to be moderated by the after use. Alternatively, there are major biological impacts with Site F. On balance, the consultants concluded that Site D may be marginally preferable when the Natural Environment is considered.

With respect to the Social Environment, Site F is preferred in particular when the sub-categories of population impact, land use compatability and visual impact is considered. Similarly, Site F is preferred with respect to the Cultural Environment and in particular heritage resources. No preference is given where costs, engineering and Operations are concerned.

The consultants have identified Site F as the preferred site overall. The matter is now going to the Environmental Assessment Hearing.



MAP 'A'

BRITANNIA ROAD

FIRST LINE

SCREENING BERM

FILL AREA

HWY No. 25

SCREENING
BERMS

ACCESS
ROAD

SERVICE
AREA

SITE 'D' SKETCH PLAN OF PROPOSED SANITARY LANDFILL SITE

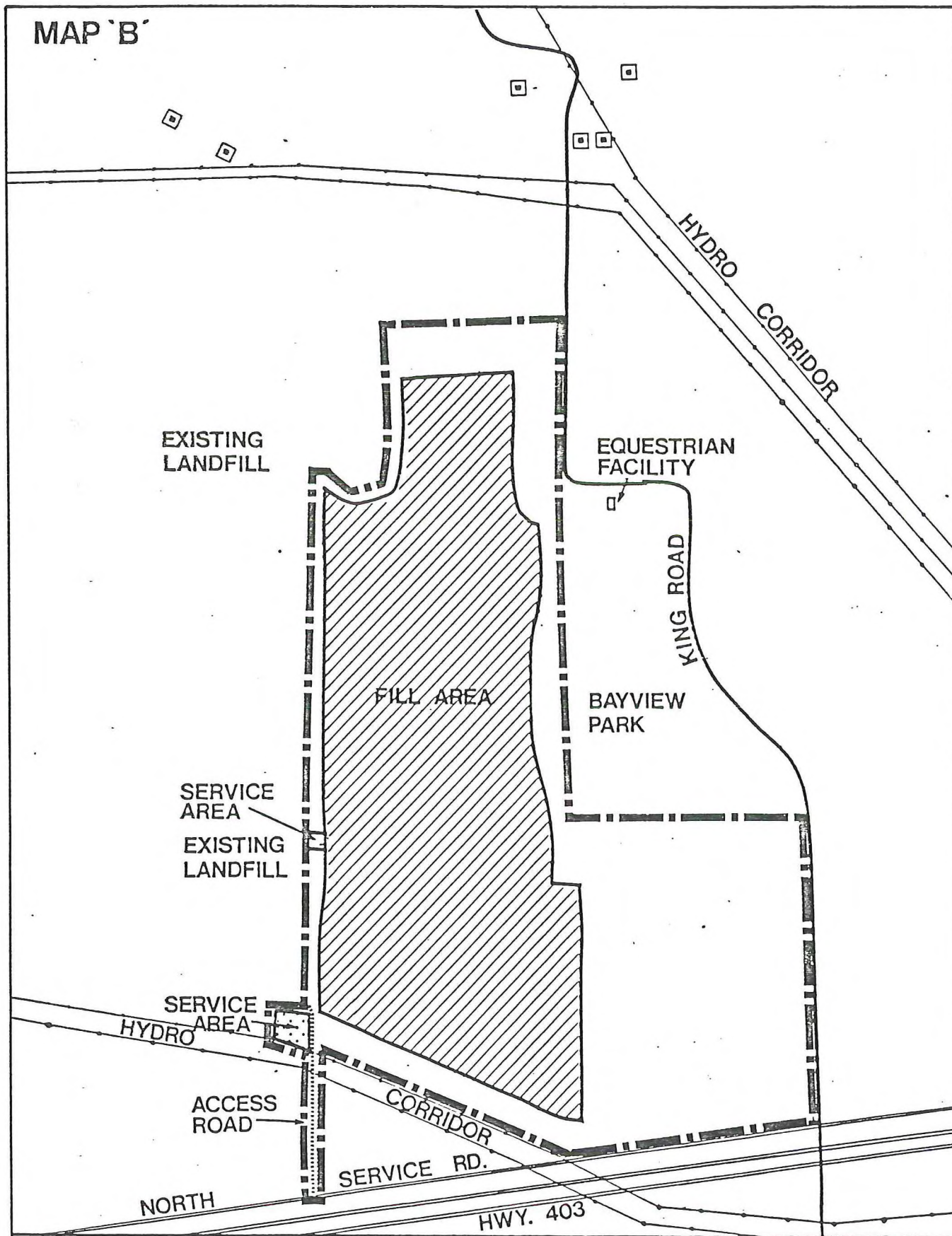
SITE PLAN AREA BOUNDARY 
RESIDENCES 

0 200 400 600m

1: 10 000



MAP 'B'



SITE 'F' SKETCH PLAN OF PROPOSED SANITARY LANDFILL SITE

SITE PLAN AREA BOUNDARY
 RESIDENCES

0 200 400 600m
 1: 10 000





Ontario

APR 30 1987

Niagara
Escarpment
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416/877-5191

232 Guelph Street
Georgetown, Ontario
L7G 4B1

January 22, 1987

Mr. Roger Clarke
Environmental Assessment Branch
Ministry of the Environment
135 St. Clair Avenue West
Suite 100
Toronto, Ontario
M4V 1P5

Dear Mr. Clarke:

Re: Supplementary Review of Additional Information
submitted by the Regional Municipality of Halton,
Landfill Component Environmental Assessment
E.A. File No. 1-82-0006-000/MU-0290

The Niagara Escarpment Commission has reviewed supplementary documentation prepared by the Regional Municipality of Halton subsequent to the release of the Government Review. The analysis and recommendations contained in those reports and in the Design and Operations report address the Commission's outstanding concerns.

Yours very truly,

C. A. Louis
Manager
Plan Administration

GMCK/na





Ontario

Sub #5319

Niagara
Escarpment
Commission

416/877-5191

232 Guelph Street
Georgetown, Ontario
L7G 4B1

January 9, 1987

Re: Waste Management Environmental Assessment
Regional Municipality of Halton
E.A. File No. I-82-006-000

Date Received: November 20, 1986.

Source: Planning and Development Department
Regional Municipality of Halton.

Summary Recommendation: Remaining concerns have been adequately dealt with.

Background: The Regional Municipality of Halton is completing an Environmental Assessment of alternative landfill sites. One of the preferred sites is Site F which is located in the City of Burlington north of Highway 403 in the Escarpment Link portion of the Parkway Belt West Plan. The Commission has been active in commenting on the Assessment throughout its preparation because of the site's location overlapping the lower slopes of the Niagara Escarpment.

The Commission's comments on Site F are set out in a letter to the Environmental Assessment Branch dated December 10, 1985 (attached). The Branch prepared and subsequently released a Review of the Assessment which contained a number of concerns and criticisms of the Assessment. Subsequently, Commission, Ministry and Regional staff met to determine a course of action to resolve these concerns. A number of supplementary reports and design changes were made as a result. Those reports which deal with the Commission's concerns have been forwarded for comment.

Analysis: The Commission's concerns about the Environmental Assessment dealt with the following:

1. potential surface and groundwater impacts,
2. visual impacts, and
3. biophysical impacts.

The following reports deal with these concerns and have been sent to the Commission for comment:

1. Schedule G.D. - Visual Analysis Report Site D.
2. Schedule G.F. - Visual Analysis Report Site F.
3. Schedule E.F. - After Use Report Site F.
4. Halton Region's Response to the Ontario Government Review of Halton's Environmental Assessment.



5. Schedule D. F. - Biophysical Analysis Report, Site F.
6. Hydrogeologic Report, Volume 1 of 3.
7. Appendices, Volume 2 of 3.
8. Design and Operations Report, Volume 3 of 3, Part 1 of 2.
9. Design and Operations Report, Volume 3 of 3, Part 2 of 2,
10. Amendment to the Definition of the Undertaking.

With respect to the first concern, ground and surface water quality, detailed hydrogeological work has been carried out by the Region and it appears that appropriate steps have been prescribed for the site. These are contained in the Design and Operations Report.

The visual impact concerns are dealt with in the following reports:

Schedule G-F - Visual Analysis Report, Site F.
Schedule E-F - After Use Report, Site F.
Design and Operations Report.

The relevant recommendations and conclusions are contained in the attached appendices B and C. With respect to the visual impact of Site F, the following 7 recommendations are made:

1. The south, east and west sides of the site should be heavily screened with vegetation to reduce visual impacts on Bayview Park, the existing Regional landfill site and views from the south.
2. The height of the landfill should be kept as low as possible to allow visual access to the Niagara Escarpment from south of the site.
3. The existing woodlots and hedgerows adjacent to the boundary of the site should be preserved and incorporated into an overall planting scheme.
4. Progressive rehabilitation along the side slopes of the landfill will help to screen the site.
5. Continuation of rehabilitation of the existing Regional landfill site will help screen views from residences in the northwest.
6. The service area should be set back and screened from either the north Service Road or King Road.
7. The top of the landfill should reflect topographic variation similar to the surrounding "natural slopes" of the foot of the Niagara Escarpment.

In terms of after use, the Region's consultant has recommended that the site be revegetated with natural forest cover in character with the Escarpment slopes to the north, east and west. Passive recreation trails are recommended to link the site with other Escarpment public open spaces.

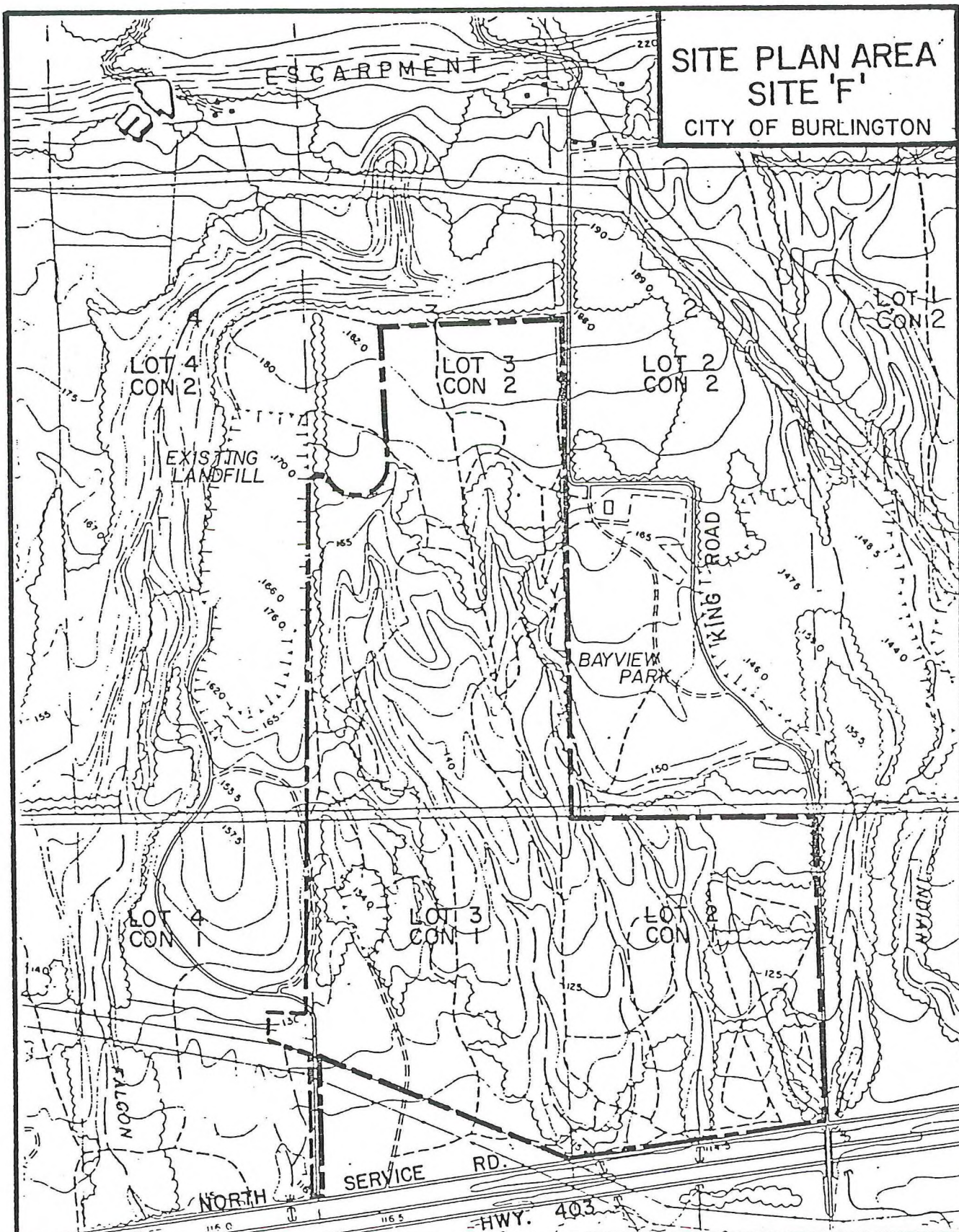
With respect to biophysical impacts, it has been acknowledged that Site F has greater biophysical impacts than alternative sites. However, of these alternative landfill designs for Site F, alternative (#3) has been selected. This alternative attempts to minimize (to the extent that it is possible) these impacts.

These concerns come together in the Design and Operations Report. Excerpts indicating the manner in which each of these concerns has been translated into design guidelines are attached as appendix 4.

In the opinion of staff, the concerns raised previously about groundwater and surface water, visual impact and biophysical resources have been adequately dealt with in the supplementary reports and in the Design and Operations Report.

Recommendation: It is recommended that the Commission comment as follows to the Regional Municipality of Halton and the Environmental Assessment Branch:

"The Niagara Escarpment Commission has reviewed supplementary documentation prepared by the Regional Municipality of Halton subsequent to the release of the Government Review. The analysis and recommendations contained in those reports and in the Design and Operations report meet the Commission's outstanding concerns.



LEGEND

--- SITE PLAN AREA
BOUNDARY

ENVIRONMENTAL ASSESSMENT OF THE LANDFILL
COMPONENT OF HALTON'S SOLID WASTE
MANAGEMENT SYSTEM

SCALE: 1:10 000

DATE: OCT. 1986

MAP B



Ontario

Appendix A

Niagara
Escarpment
Commission

416/877-5191

232 Guelph Street
Georgetown, Ontario
L7G 4B1

December 10, 1985

Mr. Roger Clarke
Review Coordinator
Environmental Assessment Branch
Ministry of the Environment
135 St. Clair Avenue West
Suite 100
Toronto, Ontario
M4V 1P5

Dear Mr. Clarke:

Re: Regional Municipality of Halton
Waste Management Environmental Assessment
E.A. File No. 1-82-006-000

The Niagara Escarpment Commission, at its meeting of December 5, 1985, resolved to provide the Ministry and the Regional Municipality of Halton with the following comments:

- i. Due to the steep slopes, fractured bedrock and numerous streams on Site F the impacts on the natural streams, groundwater and Lake Ontario remain a major concern. The Commission, therefore, maintains that the best available technology, as required, be applied to this site, if chosen, to ensure that further contaminant loading of Escarpment surface and groundwater, as well as, Lake Ontario does not occur.
- ii. The maintenance of the continuity of the Niagara Escarpment is an important part of the Commission's mandate. The clarification that only 30 ha of Site F are licensed changes the Commission's perspective on the visual impacts.

The Niagara Escarpment and Site F are visually prominent from the Burlington Skyway and Downtown Burlington. These views are not taken into account in the "Limits of Visibility", "Residences in High Visibility Impact Area" (e.g. apartment dwellers) or "Major Roads in High Visual Impact Areas". These factors should be re-evaluated and taken into account in the ranking for visual impacts.

iii. In view of the revised information regarding the extent of the licence, the Commission emphasizes that Site F, in comparison with other sites, would have the "most significant" impact from a biophysical perspective.

2. That in response to the questionnaire circulated by the Ministry, the Commission adopt the observations in the staff report as its reply.

Yours very truly,

C. A. Louis
Manager
Plan Administration and
Development Control

cc: D. Perlin
P. Attack

W.P.

CL

From "Visual Analysis Site - F
Halton Region Landfill Technical Study
Schedule G-F"

5.0 Recommendations for Mitigation

The purpose of mitigation from a visual standpoint is to reduce impacts from surrounding land uses such as residences by providing for screening of the site and for visual integration of the landfill after closure. Site F will be difficult to mitigate because of its raised and tilted position at the foot of the Niagara Escarpment. Longer views to the site are more difficult to mitigate. The lack of site buffer areas (100m setback) to the east and west will visually make the site blend with the existing Regional landfill site. This will tend to increase the visual impact of Site F for long views by making the two landfills appear as one large disturbed area. As the existing Regional Landfill is being rehabilitated with trees and shrubs and will be closed once the proposed landfill at Site F is operational the period of increased impact will be short.

Mitigating measures should be implemented as soon as possible in the landfilling process. The following mitigation measures will help to reduce visual impacts, particularly on residences, and should be considered as part of the final design and after-use plan.

- 1) The south, east and west sides of the site should be heavily screened with vegetation to reduce visual impacts on Bayview Park, the existing Regional landfill site and views from the south.
- 2) The height of the landfill should be kept as low as possible to allow visual access to the Niagara Escarpment from south of the site.
- 3) The existing woodlots and hedgerows adjacent to the boundary of the site should be preserved and incorporated into an overall planting scheme.
- 4) Progressive rehabilitation along the side slopes of the landfill will help to screen the site.
- 5) Continuation of rehabilitation of the existing Regional landfill site will help screen views from residences in the northwest.
- 6) The service area should be set back and screened from either the North Service Road or King Road.
- 7) The top of the landfill should reflect topographic variation similar to the surrounding "natural slopes" of the foot of the Niagara Escarpment.

5.1 After-Use

As part of the final design and after-use process, reduction of visual impacts should be considered. Design

alternatives which allow for flexibility in revegetation of the site and location of screening features are the most desirable from this standpoint. Progressive rehabilitation will create the fastest reduction of visual impacts, particularly on residences in close proximity to the site. On Site F a more natural rehabilitation with a heavy emphasis on revegetation will help the site blend into the natural character of the Niagara Escarpment.

7.0 Conclusions

The most appropriate after-use for the proposed Regional Landfill at Site F is revegetation to reflect the natural forests that are characteristic of the Site and the area. A trail linkage to integrate the site with the surrounding public open space and the Bruce Trail has been included. The major advantages of this concept are:

- . it is highly compatible with the local landscape
- . it takes advantage of the presence of local public open space visually and with trail linkage
- . it is generally consistent with local public and municipal preferences
- . it allows for flexibility in long-range planning through multiple use, sequential use and incorporation of new technical knowledge on landfill revegetation as staged rehabilitation occurs
- . it maximizes the protection of important

biological resources, wildlife habitat

- . there will be minimal environmental impact on site surrounding features

7.1 Comparison with Phase 2, Stage 2C Study

The recommended after-use concept is consistent with the analysis and recommendations of the Phase 2, Stage 2C Reports.

The thrust of the Stage 2C study was to support generally passive after-uses for Site F. These included activities that were recreational in an open space context, revegetation to native tree species, some active recreation activities: picnicking, garden plots and campgrounds. In addition there was a preliminary proposal by the curator of the Halton Regional Museum in a report to Regional Council to consider locating the new site for the Museum in association with the landfill. This after-use proposal and the other suggestions for active recreational after-use concepts were screened from further consideration in our evaluation process. It should be noted, however, that the site planning flexibility inherent in the

recommended concept allows consideration of possible joint use of the site. In the long term some active recreation may be appropriate for the Site if the policies of the local and regional municipalities support it.

The Phase 2, Stage 2C study recommended that no built structures or servicing occur on the active land filled area.

For Site F the agricultural rehabilitation option was not considered appropriate (see Appendix).

8.0 Recommended Mitigative Measures

A series of guidelines for implementing the after-use concept on Site F follows. General guidelines for mitigation will be augmented and expanded once the detailed design for the recommended after-use is undertaken.

8.1 Guidelines for Mitigation

- . Use native plant material indigenous to the region wherever possible for screening and revegetation of the landfill
- . Preserve and incorporate as much of the existing material vegetation on site as possible
- . Undertake staged reclamation and revegetation of the site as landfilling progresses
- . Establish perimeter screenings of vegetation as soon as possible once the Site is confirmed. Vegetation screens should be established before construction begins

- . Shape final contours to reflect the terrain character of the surrounding landscape; 'tie' contours into abutting land to reflect continuity of landform and grade
- . Establish perimeter and entrance control of access to prevent disturbance by off-road and all-terrain vehicles
- . Control the movement of construction machinery and vehicles to designated travel areas to ensure minimal impact on preserved vegetation.
- . Establish effective erosion control practices on disturbed soils and rehabilitated areas
- . Conserve all topsoil; salvage indigenous plant material for reclamation where appropriate
- . Protect Indian Creek and other surface water features from significant siltation and changes in water quality.

- . Establish an appropriate site monitoring program to monitor and evaluate site soils, plant material and potential disturbance to off-site environment.

- . Control the use and ensure safe disposal of potential soil and water pollutants on site; do not use herbicides, dust control chemicals.

4.0 DESIGN CONSIDERATIONS

A variety of factors are considered in the development of a conceptual design of a landfill site. One of the most important, that of the site capacity, has been discussed in the previous chapter. This chapter describes the considerations arising out of studies and investigations on hydrogeology, visual, noise, biophysical, surface drainage, wind, air quality, after use, heritage, and leachate treatability and toxicology. In addition, a study was undertaken as part of the hydrogeologic work, to evaluate the shale resources found on the site. Other factors considered include the remedial works planned for the closed Bayview site and the impact of the present operations at the Regional landfill site.

4.1 Hydrogeology

The hydrogeologic study of the site was carried out by Hydrology Consultants and is submitted under separate cover.

Hydrogeologic studies form the basis for the conceptual design of the landfill. The results from the investigations are used to establish the need for leachate and gas collection systems, the geometry and depths of allowable excavations, leachate collector pipe spacing, quantities of



expected leachate and the need for contingency plans. In addition, the hydrogeologic information will be used to establish monitoring requirements of the landfill.

The primary findings pertinent to the design of the landfill are summarized below.

1. The landfill will be predominantly founded in the Queenston shale.
2. Leachate collection system will be installed at 50 m spacings which is estimated to collect 95 percent of the leachate produced.
3. A liner would not be a cost effective method of providing added protection from leachate migration.
4. Natural attenuation can be considered as the primary back-up to the leachate collection system.
5. Secondary contingencies include purge wells and a perimeter drain system.
6. Shale found at the site is suitable for use as a resource.

7. Gas control system will not be required.

4.2 Visual

The visual analysis of the site was carried out by The Landplan Collaborative Ltd. and is contained in a separate document.

The analysis highlighted the visual concerns on a basis of high or medium to low impact. High impact views included nine residences surrounding the north end of the site and the upper floor of an apartment building on Plains Road. Medium to low impact views included:

- houses and apartments south of Hwy 403 (150 or so residences)
- activities on closed Bayview site (Burlington Rod and Rifle Club, equestrian facilities, model airplane club)
- two industrial plants on the North Service Road
- Burlington Bay
- Burlington Skyway Bridge
- a school on the north side of Plains Road
- various roads in the area including Plains Road, Hwy 403, QEW, etc

The report made a number of recommendations for mitigating the visual impacts. These comprised the following:

- east and west sides of the site should be heavily screened
- height of the landfill should be kept as low as possible
- existing woodlots and hedgerows should be preserved
- progressive rehabilitation will help screening
- existing Regional landfill site should be rehabilitated as soon as possible
- service area should be set back and screened from the North Service Road and King Road
- top of the landfill should reflect the topographic variation similar to the surrounding area

These recommendations have been considered for implementation in the conceptual design in consort with other opportunities and constraints developed in this chapter.

4.3: Noise

The analysis for noise impacts was carried out by Barman Coulter Swallow Associates and is contained in a separate document.

The analysis showed that the existing noise levels at the site and the surrounding area are such that the operation of the proposed landfill at Site F would not seriously impact the present conditions. Concerns remain, however, with the

- considerations with respect to hours of operation and Saturday operations, specifically with the existing equestrian facility in the north area of the closed Bayview site

4.5 Heritage

Analysis of the impact on heritage features was carried out by The Landplan Collaborative Limited and is contained in a separate document.

The report concluded that no heritage features exist on the site and therefore no recommendations were made.

4.6 Biophysical

The biophysical analysis of the site was carried out by Bird and Hale Limited and is contained in a separate document.

The report identified the existence of a number of significant plant species on the proposed site including:

- four provincially rare
- eight provincially uncommon
- six regionally rare
- thirteen regionally sparse
- twenty regionally uncommon

It concluded that the large number of significant plant species gives the site biological importance that cannot be recovered. However, the report also states that the fill area as proposed will not disturb a substantial portion of the natural vegetation communities found on the site although not as diverse and significant as found in the actual fill area.

It recommended the following mitigative measures:

- no landfilling activity or off-road vehicles to be in the non-fill areas
- buffer vegetation to be planted in the areas where structurally diverse vegetation does not exist

In addition, the report recommended the implementation of procedures for landfilling that would minimize the problems associated with animal and bird control on landfill sites. These are generally accepted standard practices at landfill sites.

The site design concepts recognized the sensitivity of the area from a biophysical point of view. Notwithstanding the overall ranking of Site F in the Stage 2C reports, the significance of the vegetative communities in the area was considered in the development of the design concepts. Primarily, this involved the reduction in the actual fill

area to be used from the area shown in the Stage 2C report to the proposed area for landfilling found in this report. By the reduced use of the actual fill area, significant portions of the vegetative communities can be saved and incorporated with an after use plan that will best realize the potential of the site.

4.7 Agricultural

Agricultural potential of Site F was carried out by Ecological Services for Planning Ltd. and is contained as an appendix to the After Use Report prepared by The Landplan Collaborative Ltd.

The analysis for agricultural indicated that the area could not be classified as having a high potential. If agriculture were to be selected as the preferred after use for the area, significant financial costs would be incurred because of the need to import large quantities of materials including topsoil. It therefore concluded that agriculture was not a feasible option for the after use for Site F.

4.8 After Use

The analysis of after use concepts was carried out by The Landplan Collaborative Ltd. and is contained in a separate document.

Various after uses were considered for the site including, conservation, passive recreation, active recreation, agriculture and industrial/commercial. Preliminary screening eliminated active recreation, agriculture and commercial/industrial after uses. The conservation and passive recreation uses considered further included:

- natural area reforestation
- buffer area
- biking and ski trails
- outdoor education
- interpretive trails and viewing areas
- picnicking.

Natural reforestation is the recommended after use concept. Major advantages of this concept include:

- compatibility with local landscape
- consistency with preferences of the public and the municipality
- flexibility in long range planning with respect to other potential uses, uses prior to landfill completion, and incorporation of new techniques in revegetation and rehabilitation of landfills
- maximizing protection of biological resources
- minimizing environmental impact on surrounding features.

Development guidelines to achieve the after use include the following:

- use of native material for screening and revegetation
- preservation and incorporation of existing vegetation on site
- progressive rehabilitation
- perimeter screening of vegetation prior to landfill start-up
- final contour design to reflect character of surrounding landscape and continuity with contiguous lands
- site control to minimize unauthorized entry of vehicles
- control of on-site equipment and vehicles to authorized areas
- establishing erosion control on landfilled areas
- conservation of all topsoil
- protection of surface water features
- implementation of site monitoring
- control of potential contaminants such as dust control chemicals.

Design and Operations of the landfill will accommodate the needs with respect to the after use concept.

