

**SUPREME COURT OF ONTARIO
(DIVISIONAL COURT)**

B E T W E E N:

THE CORPORATION OF THE TOWN OF MILTON

Applicant

- and -

**THE JOINT BOARD (ESTABLISHED UNDER SECTION 4
OF THE CONSOLIDATED HEARINGS ACT, 1981, S.O.
1981, C.20, AS AMENDED), THE REGIONAL
MUNICIPALITY OF HALTON, THE CORPORATION OF
THE CITY OF BURLINGTON, NSP INVESTMENTS
LIMITED, THE WEST BURLINGTON CITIZENS' GROUP,
THE MILTON AREA CITIZENS' COALITION, THE
HALTON FEDERATION OF AGRICULTURE, WATKIN AND
DOREEN MARTIN, WALTER TOMOSKY, THOMAS AND
MARY-JEAN MARTIN, MICHAEL AND CYNTHIA REED,
GRAHAM AND EVELYN GILLIES, SALLY VERTULIA,
RAY AND ANNETTE WINTER, KIP AND ANNE CHAPUT,
WILFRED AND FRED A LAWRENCE, BILL AND BEVERLEY
KETELAARS, JOHN VITETTA, STEVE AND SHIRLEY
DOLBY, KEN WETFLAUER, HOWARD GOWLAND, MR.
AND MRS. PIETRO MOSCATO, MR. AND MRS. L.
CIACCO, RICK AND COLLEEN SIMONS, MR. AND
MRS. ALBERTA SILVA AND THE HONOURABLE JAMES
BRADLEY, MINISTER OF THE ENVIRONMENT**

Respondents.

**APPLICATION UNDER THE JUDICIAL PROCEDURE ACT,
R.S.O., 1980, C. 224, SUBSECTIONS 2(1), 2(3)
AND 2(4) AND RULE 68 OF THE RULES OF CIVIL
PROCEDURE**

APPLICATION RECORD

**O'CONNOR, LEITCH, HAYS
Barristers & Solicitors
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**SOLICITOR: F. E. LEITCH, Q.C.
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The Corporation of the
Town of Milton**

/

I N D E X

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Court File No.: 773/89

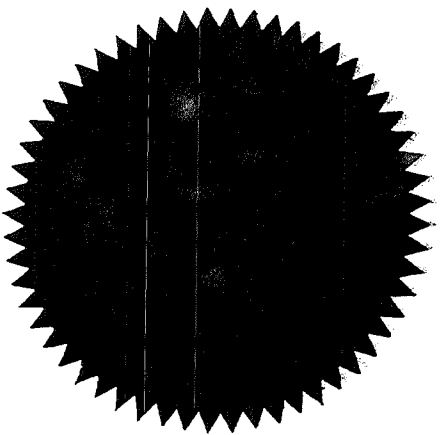
SUPREME COURT OF ONTARIO
(DIVISIONAL COURT)

B E T W E E N:

THE CORPORATION OF THE TOWN OF MILTON

Applicant

- and -



THE JOINT BOARD (ESTABLISHED UNDER SECTION 4 OF THE CONSOLIDATED HEARINGS ACT, 1981, S.O. 1981, C. 20, AS AMENDED), THE REGIONAL MUNICIPALITY OF HALTON, THE CORPORATION OF THE CITY OF BURLINGTON, NSP INVESTMENTS LIMITED, THE WEST BURLINGTON CITIZENS' GROUP, THE MILTON AREA CITIZENS' COALITION, THE HALTON FEDERATION OF AGRICULTURE, WATKIN AND DOREEN MARTIN, WALTER TOMOSKY, THOMAS AND MARY-JEAN MARTIN, MICHAEL AND CYNTHIA REED, GRAHAM AND EVELYN GILLIES, SALLY VERTULIA, RAY AND ANNETTE WINTER, KIP AND ANNE CHAPUT, WILFRED AND FRED LAWRENCE, BILL AND BEVERLEY KETELAARS, JOHN VITETTA, STEVE AND SHIRLEY DOLBY, KEN WETTLAUER, HOWARD GOWLAND, MR. AND MRS. PIETRO MOSCATO, MR. AND MRS. L. CIACCO, RICK AND COLLEEN SIMMONS, MR. AND MRS. ALBERTA SILVA AND THE HONOURABLE JAMES BRADLEY, MINISTER OF THE ENVIRONMENT

Respondents

Application under the Judicial Review Procedure Act, R.S.O. 1980, c. 224, Subsections 2(1), 2(3) and 2(4) and Rule 68 of the Rules of Civil Procedure.

NOTICE OF APPLICATION FOR JUDICIAL REVIEW

TO THE RESPONDENTS:

A LEGAL PROCEEDING HAS BEEN COMMENCED by the Applicant.

The claim made by the Applicant appears on the following page.

THIS APPLICATION FOR judicial review will come on for a hearing before the Divisional Court on a date and at a place to be fixed by the Registrar of the Divisional Court. The Applicant requests that this application be heard at Toronto, Ontario.

IF YOU WISH TO OPPOSE THIS APPLICATION, you or an Ontario lawyer acting for you must forthwith prepare a notice of appearance in Form 38C prescribed by the Rules of Civil Procedure, serve it on the Applicant's lawyer or, where the Applicant does not have a lawyer, serve it on the Applicant, and file it, with proof of service, in the office of the Divisional Court, and you or your lawyer must appear at the hearing.

IF YOU WISH TO PRESENT AFFIDAVIT OR OTHER DOCUMENTARY EVIDENCE TO THE COURT OR TO EXAMINE OR CROSS-EXAMINE WITNESSES ON THE APPLICATION, you or your lawyer must, in addition to serving your notice of appearance, serve a copy of the evidence on the Applicant's lawyer or, where the Applicant does not have a lawyer, serve it on the Applicant and file it, with proof of service, in the office of the Divisional Court within thirty days after service on you of the Applicant's application record, or not later than 2:00 p.m. on the day before the hearing, whichever is earlier.

IF YOU FAIL TO APPEAR AT THE HEARING, JUDGMENT MAY BE GIVEN IN YOUR ABSENCE AND WITHOUT FURTHER NOTICE TO YOU.

4.
Date: July 26, 1989

Issued by "A.P. Bridges" per
Registrar
Divisional Court Rose
Osgoode Hall Sha
130 Queen Street West
Toronto, Ontario
M5H 2N5

TO: The Joint Board
Office of Consolidated Hearings
2300 Yonge Street
P.O. Box 2382
Suite 1201
Toronto, Ontario
M4P 1E4

AND TO: The Regional Municipality of Halton
c/o T.R. Lederer and N.D. Hodgson
Messrs. Osler, Hoskin & Harcourt
Barristers & Solicitors
P.O. Box 50
First Canadian Place
Toronto, Ontario
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AND TO: The Corporation of the City of Burlington
c/o M.J. McQuaid, Q.C.
Messrs Weir & Foulds
Barristers & Solicitors
Suite 1600
Exchange Tower
Box 480
2 First Canadian Place
Toronto, Ontario
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AND TO: NSP Investments Limited
c/o Eleanor A. Cronk
Fasken & Calvin
Box 30, Toronto-Dominion Bank Tower
Toronto-Dominion Centre
Toronto, Ontario
M5K 1C1

AND TO: The West Burlington Citizens' Group
c/o Toby Vigod
Canadian Environmental Law Association
243 Queen Street West
4th Floor
Toronto, Ontario
M5V 1Z4

AND TO: The Milton Area Citizens' Coalition,
The Halton Federation of Agriculture,

Watkin and Doreen Martin,
Walter Tomosky,
Thomas and Mary-Jean Martin,
Michael and Cynthia Reed
c/o S. Garrod
Barrister & Solicitor
337 Woolwich Street
Guelph, Ontario N1H 3W4

AND TO: The Honourable James Bradley
Minister of the Environment
c/o Ms. Bonnie J. Wein
Director of Legal Services
Ministry of the Environment
11th Floor
135 St. Clair Avenue West
Toronto, Ontario
M4V 1P5

AND FURTHER, TO:
The Attorney General of Ontario
c/o Thomas Marshall, Q.C.
Director Crown Law Office - Civil
8th Floor
720 Bay Street
Toronto, Ontario
M5G 2K1

AND FURTHER TO:
Azova Investments Limited
c/o Robert Fishlock
Messrs. Blake, Cassels & Graydon
Barristers & Solicitors
Box 25, Commerce Court West
Toronto, Ontario
M5L 1A9

AND FURTHER TO:
The Honourable Vincent Kerrio
Minister of Natural Resources
c/o C. Mansfield
Barrister & Solicitor
Whitney Block, Queen's Park
Toronto, Ontario
M7A 1W3

AND FURTHER TO:
Cumis Limited
P.O. Box 5065
151 North Service Road
Burlington, Ontario
L7R 4C2

AND FURTHER TO:

The Halton Region Conservation Authority
c/o J. H. Olah
Messrs. Beard, Winter
Barristers & Solicitors
9th Floor
150 King Street West
Toronto, Ontario
M5H 2K4

APPLICATION

1. The Applicant makes application for:

(a) an Order quashing the decision of the Joint Board (the "Joint Board") dated February 24, 1989, as amended March 2, 1989, that:

(i) the proposed landfill site referred to in Halton's environmental Assessment as "Site D, in the Town of Milton is hydrogeologically "acceptable and "suitable" for landfilling on the basis of the evidence presented to the Joint Board;

(ii) an Order remitting the matters referred to in sub-paragraph²(a) herein back to the Joint Board for re-hearing and re-consideration in accordance with proper legal principles and the rules of natural justice, or

- (iii) in the alternative, an Order quashing the decision of the Joint Board dated February 24, 1989, as amended March 2, 1989, approving Halton's application for approval to proceed with landfilling at Site "D" subject to the conditions set out in the decision of the Joint Board and directing the Approvals Director to issue a Certificate of Approval in accordance with the said Conditions, pursuant to Section 38 of the Environmental Protection Act, R.S.O. 1980, c. 141;
- (iv) an interim Order staying the decisions of the Joint Board set out in (a) and (c) above pending the hearing of this application; and
- (v) such further and other relief as counsel may advise and this Honourable Court may permit.

2. The grounds for the application are:

- (a) the Joint Board acted arbitrarily and in so doing exceeded its jurisdiction and breached the rules

of natural justice in that it:

(i) rejected, the uncontroverted reply evidence of Halton's reply witness regarding the hydrogeological suitability of Site "D" for landfilling in relation to the existence of fractures in the unweathered upper clay till at Site "D";

(ii) declined to hear and consider evidence which demonstrated the existence of such fractures;

(iii) delegated its exclusive jurisdiction to the Director of Approvals under the Environmental Protection Act in the guise of establishing conditions of approval;

✓ (iv) developed and applied its own opinion as to design and engineering of protective facilities at Site "D" in the absence of expertise and expert engineering and landfill design evidence in respect of such facilities;

(v) such further and other grounds as counsel may advise and this Honourable Court may permit.

3. The following documentary evidence will be used at the hearing of the application:

- (a) The record to be filed by the Joint Board pursuant to Section 10 of the Judicial Review Procedure Act, R.S.O. 1980, c. 224; and
- (b) Such further and other materials as counsel may advise and this Honourable Court may permit.

Date: *July 26*, 1989.

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The Corporation of the
Town of Milton.

10

THE CORPORATION OF THE TOWN OF MILTON
Applicants

and

THE JOINT BOARD ET AL

Respondents

(Short title of proceeding)

Court file no. 773/89

SUPREME

(Supreme or District)

COURT OF ONTARIO

(DIVISIONAL COURT)

Proceeding commenced at TORONTO

NOTICE OF APPLICATION
FOR JUDICIAL REVIEW

DYE & DURHAM CO LIMITED - Form No 909

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L6L 5G8

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The Corporation of the Town
of Milton.

FEL/jh



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Toronto, Ontario

42067

11.

1 MR. HODGSON: If this could be the next
2 exhibit.

3 MR. LANCASTER: H-936.

4 --- EXHIBIT No. H-936: Witness statement of
5 Stanley Feenstra

6 MR. HODGSON: Mr. Feenstra had heard
7 there was a prize for Exhibit 1000 and he was hoping he
8 would win it!

9 MR. LANCASTER: He'll have to do a lot
10 of writing before that.

11 MR. HODGSON: Perhaps by the time the
12 cross-examination is completed someone else will have
13 won it.

14 Q. Are you responsible for the
15 preparation of Exhibit H-936?

16 A. I am.

17 Q. Are you giving evidence both as a
18 hydrogeologist and as a hydrogeochemist?

19 A. That's right, yes. If I may just
20 point out one correction in the witness statement at
21 this time?

22 Q. Yes.

23 A. At page 17, and this is something
24 you can write in in pen, page 17 paragraph 52, in the
25 second line it says "the private wells" and it should
read "the UGU" or the upper granular unit and not



1 vertical fractures through the unweathered upper till.

2 Q. Could you, in the context of that
3 question and answer, describe for the Board the state
4 of the art in terms of what hydrogeologists in Ontario
5 thought they had understood about the extent of the
6 fracturing of tills in Ontario?

7 A. Yes. I think as an indication of
8 what hydrogeologists consider the state of
9 understanding was with respect to fractured tills in
10 Ontario, it is probably best to refer to page 47 of
11 Trow's original hydrogeology report for Site D, H-39,
12 and I can just read a few sentences from page 47.

13 "An upper weathered and fractured zone
14 in the Upper Till is interpreted to
15 extend from ground surface to an
16 approximate depth of 4 to 5 m. Freeze
17 and Cherry (1979) note that deposits of
18 clayey or silty till in Southern Ontario
19 contain networks of hairline fractures
20 which are essentially vertical and which
21 are responsible for hydraulic
22 conductivities one to three orders of
23 magnitude greater than in unfractured
24 materials. Assuming this, the
25 (fractured) zone is estimated to



1 have....."

2 Q. Excuse me, it's:

3 "Assuming this, the weathered zone."

4 A. I am sorry:

5 ".... the (fractured) zone....".

6 Q. You said fractured.

7 A. I am sorry, the weathered zone.

8 "Assuming this, the weathered zone is
9 estimated to have a hydraulic
10 conductivity of about 1×10^{-5} cm/s
11 which is about two orders of magnitude
12 greater than the unfractured Upper Till.
13 This is considered to be a conservative
14 assumption since recent research
15 (Dusseault, 1985) indicates that
16 fractures do not appear to substantially
17 increase the bulk hydraulic conductivity
18 of the till."

19 What Trow was relating to here was the
20 findings as reported by Freeze and Cherry of the
21 occurrence of fractures in tills in Southern Ontario,
22 but if one refers back to Freeze and Cherry, one is
23 also reminded of fracturing in tills in the central
24 plains of Canada, which impart a higher hydraulic
25 conductivity to the clayey till materials.



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Feenstra, ex.
(Hodgson)

14.

1 At the time this document was prepared,
2 that pre-dated the research I commented on earlier, in
3 October of last year, which suggested that the action
4 of augering and installing boreholes in fractured clay
5 materials can lead to smearing on the outside of the
6 boreholes and give one an erroneous interpretation of
7 the hydraulic conductivity. At the time Trow prepared
8 this document that possibility was not yet
9 realized and consequently the statement by Trow was
10 that "recent research...indicates that fractures do not
11 appear to substantially increase the bulk hydraulic
12 conductivity", but at the present time we know that
13 that is not correct.

contradicts
Trow

14 Recent studies, particularly reported by
15 Dusseault et al in 1988, indicate the hydraulic
16 conductivity in the weathered tills in the Sarnia area
17 are indeed considerably more permeable than the
18 unweathered tills.

19 One interesting point to note here is
20 Trow's assumptions based -- Trow's assumptions about
21 the nature of the weathered till at Site D are largely
22 based on the findings of the University of Waterloo in
23 the area of the Sarnia clay plain. It was taken almost
24 as a given that the weathered zone was slightly more
25 permeable and extended to a depth of approximately four



1 to five metres, and in fact that wasn't specifically
2 investigated by Trow at Site D.

3 The weathered zone is generally
4 identified by a colour change from a grey till to a
5 brown to reddish till, based on the oxidation of iron-
6 rich chloride in the clay. This colour change was
7 identified in the continuously sampled boreholes that
8 Trow installed, but no specific investigations with
9 respect to test pits or trenches were actually
10 undertaken to confirm that extent of weathering.

11 The basis of our understanding at that
12 time, and that would have been in 1985 or '86, was that
13 the weathered zone extended to approximately four to
14 five metres and the weathered zone was cracked and any
15 features of weathering, colour change or fracturing do
16 not extend any deeper than that.

17 Q. Taking you back to Mr. Petrie's
18 comment at Volume 122 at page 29566, he says:

19 "Obviously if evidence were provided by
20 yourself or the proponent, one would
21 have to consider that fracturing with
22 respect to assessing site suitability,
23 but I am only going on the data that has
24 been provided to me."

25 Were you here when Mr. Petrie was cross-

cross X-
by David
of Petrie



1 examined by Mr. Estrin?

2 A. Yes, I was.

3 Q. Now, since that cross-examination,
4 would you describe for the Board the events that
5 occurred which have led you to consider further the
6 evidence that Mr. Petrie gave during his cross-
7 examination by Mr. Estrin?

8 A. Yes. From the cross-examination of
9 Mr. Petrie by Mr. Estrin, the possibility or evidence
10 for fracturing was raised with respect to the Maryhill
11 till, the clayey till in the Waterloo region, the
12 Vandalia till, which is a clayey till in the Illinois
13 area, and the possibility of fracturing in the Halton
14 till in Peel, at one of the sites for a candidate site
15 in the Region of Peel.

16 I had personally not considered the
17 possibility of fractures extending below the weathered
18 zone, a zone of approximately four to five metres in
19 depth at Site D. I must admit that the cross-
20 examination by Mr. Examination..... excuse me, the
21 cross-examination by Mr. Estrin of Mr. Petrie certainly
22 perked my curiosity and based on that cross-
23 examination, I spoke to Dr. Cherry at the University of
24 Waterloo and asked him some related questions regarding
25 the penetration of tritium into fractured materials.



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Feenstra, ex.
(Hodgson)

17.

1 One point raised by Mr. Estrin with Mr.
2 Petrie was the fact that we don't find or don't observe
3 tritium concentrations in the UGU or in the deeper
4 parts of the unweathered upper till could be simply
5 that it's lost by matrix diffusion and indeed there are
6 fractures there, but matrix diffusion is sufficient to
7 remove the tritium before it penetrates into the deeper
8 zones of the unweathered upper till or the UGU. I
9 asked Dr. Cherry whether any of his students or any of
10 the current research going on had considered modelling
11 matrix diffusion in that type of scenario, much in the
12 same way Dr. Rowe has modelled matrix diffusion at Site
13 F. I was told at that time that that work hadn't been
14 done, but as an actual by the way comment, Dr. Cherry
15 mentioned the work that was being conducted at that
16 time or had just been completed at that time in the
17 Sarnia area by one of his graduate students, Wilf
18 Ruland, and he indicated verbally at that time that
19 there was evidence that tritium had penetrated into the
20 unweathered till at Sarnia to a much greater depth than
21 they had ever previously observed, and that was
22 approximately in May of this year, approximately a
23 month after the cross-examination by Mr. Petrie of Mr.
24 Estrin.

25 So, Dr. Cherry at that point was aware

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of
at D

end of
mm



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42077

Feenstra, ex.
(Hodgson)

18.

1 that I was interested in that type of problem. In late
2 June of this year he sent me a copy of a paper he had
3 in preparation with Mr. Ruland which described the
4 results of Mr. Ruland's recent research in the Sarnia
5 area and Dr. Cherry asked me for my comments on this
6 paper, which was still in preparation and intended to
7 be submitted to the Journal of Groundwater for
8 publication.

9 This paper was based primarily on the
10 thesis work of Mr. Ruland and, in general, is his
11 synthesis or abbreviated version of the research
12 performed by Mr. Ruland. Mr. Ruland's Masters project
13 was completed during July and I received a completed
14 bound copy of Mr. Ruland's thesis or Masters project on
15 July 19 of this year, and it is that Masters project
16 that is the basis for much of my opinion with regard to
17 the possibility of fracturing at Site D, which I would
18 like to present today.

19 Q. This paper Dr. Cherry sent to you,
20 what state of preparation is it in?

21 A. It is still in preparation and
22 being reviewed internally by the authors, Dr. Cherry
23 and Mr. Ruland, and their professional colleagues.

24 Q. Did you provide comments them which
25 you expect to have incorporated into that paper?

Cross x
Paul
Aug 8(?) *

*



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42078

Feenstra, ex.
(Hodgson)

19.

1 A. Yes, I have.

2 Q. Have you relied on that paper in
3 any way in giving your opinion to this Board on this
4 subject?

5 A. On that particular document, no.
6 My opinions are based on the Masters project as
7 prepared and published by Mr. Ruland and included as
8 Attachment 1 to my witness statement.

9 Q. The draft Dr. Cherry sent you of
10 that paper you returned to him with your comments?

11 A. I Fax'd copies or sent by facsimile
12 copies of my comments to Dr. Cherry.

13 Q. Have you seen a subsequent draft of
14 the paper?

15 A. I have not, no.

16 Q. Could you then take us to the
17 Ruland document and describe for the Board the
18 implications of that document for Site D?

19 A. I have several overheads I would
20 like to show you that are all derived from Mr. Ruland's
21 project and they are all included in Attachment 1 to my
22 witness statement.

23 Q. Is Attachment 1 the complete thesis
24 of Mr. Ruland as you received it?

25 A. It is complete with the exception



1 an abandoned borehole nearby, an abandoned borehole
2 being 20 to 40 metres distant laterally, which would
3 still have to be in some way connected to the
4 piezometers in which he monitored the response.

5 One hypothesis is that that response in
6 the piezometer is due to vertical connection through
7 the Maryhill till. With an adjacent unsealed borehole,
8 if that were to have an effect, there would have to be
9 some kind of horizontal connection through the Maryhill
10 till. Either way, it indicates there is some kind of
11 secondary permeability or hydraulic conductivity in
12 that clay unit. I think what Mr. Petrie indicates in
13 terms of his caution is probably correct, that the
14 numerical value of hydraulic conductivity calculated
15 for the Maryhill till should be taken with some
16 caution, but I think the fact that the Maryhill till
17 did in fact respond to pumping is a very significant
18 observation.

19 I think the main point to note from the
20 study of the Maryhill till is the possibility that open
21 fractures may exist, permeable fractures may exist in a
22 clay till material, and even a clay till material that
23 is not a surfacial deposit or a material that is
24 actually varied by other strata and occurs at a depth
25 of 10 to 20 metres. There is much discussion by geo-



1 technical engineers that, on a theoretical basis, once
2 you get below a certain depth, lateral and vertical
3 stresses exerted on a fracture or other discontinuity
4 in clay material will actually be closed because the
5 stresses are greater as you increase in depth. The
6 findings on the Maryhill till and likewise the findings
7 on the Vandalia till, which is situated in a very
8 similar setting to the Maryhill till, being at a depth
9 of 10 to 15 metres, those tests indeed suggest those
10 fractures may be open at that considerable depth and
11 that is a significant observation.

12 Q. You have spoken about your concerns
13 about fracturing in the till at Site D and you referred
14 to Mr. Ruland's research and the importance of Mr.
15 Ruland's research, but to what extent do you also make
16 use of Mr. Petrie's research in this regard?

17 A. I think the main use I made of Mr.
18 Petrie's work and largely the confirming work performed
19 by Mr. Usher as described in M-721, that was also
20 presented to Mr. Petrie during cross-examination by Mr.
21 Estrin, suggests that one should seriously consider the
22 possibility of fracturing in clayey materials at a
23 depth considerably deeper than the surfacial weathered
24 zone.

25 Q. With regard to the papers on the



1 Vandalia till, what use do you make of those?

2 A. The use I make of the reference or
3 the previous research on the Vandalia till is very
4 similar to my considerations of the Maryhill till. The
5 Vandalia till is a much older till deposit than the
6 tills we are dealing with in Ontario and may have
7 undergone quite a different geological history. So the
8 actual nature and occurrence of the fractures may be
9 different, but I think the fact the fractures can be
10 shown to exist at a significant depth below the
11 weathered zone is a very important observation.

12 Q. Those discussions of the Vandalia
13 till are from M-710 and M-711?

14 A. And M-711, correct.

15 Q. And the evidence we have discussed
16 so far from Ruland and Petrie, Usher and about the
17 Vandalia till is all evidence that relates to sites
18 other than Site D. Is there any direct evidence from
19 Site D to which you want to draw the Board's attention?

20 A. As I mentioned earlier and as Mr.
21 Petrie indicated in his cross-examination, there is no
22 direct evidence for fracturing at Site D and
23 specifically the studies undertaken by Trow weren't
24 directed at obtaining that type of evidence. Test pits
25 were not dug and angled boreholes were not drilled. A



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Feenstra, ex.
(Hodgson)

23

1 pumping test of the type Mr. Petrie conducted on the
2 Maryhill till was not performed on Site D. There is,
3 however, some evidence from Site D from the
4 investigations that have been done that probably relate
5 to the possibility of fracturing at Site D. Some of
6 this evidence is confirming evidence and some of it is
7 contradictory evidence and I don't think any of it is
8 particularly direct or particularly conclusive, but I
9 think for the purpose of completeness, I would like to
10 mention those other bits of evidence. Actually many of
11 the pieces of evidence I am going to discuss now have
12 been raised previously, in previous testimony.

13 The first additional evidence relates to
14 the findings in the Comcor boreholes that were drilled
15 on Site D by Comcor during 1985. It was pointed out to
16 Mr. Petrie, and unfortunately I don't have a transcript
17 reference, that there was evidence of weathering and
18 fracturing noted in the Comcor borings, or in one of
19 the Comcor borings. With a closer examination of the
20 Comcor borehole logs, and this is an overhead of the
21 borehole log for CC-1 which comes from M-438, Appendix
22 D. I don't actually recall which borehole log Mr.
23 Petrie was referred to, but on close examination of all
24 three Comcor borehole logs, there is evidence of
25 weathering and fracturing in all three and not just in

check further here



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42105

Feenstra, ex.
(Hodgson)

24

1 site.

2 So, I think the conclusion based on this
3 evidence is that there is no suggestion from the
4 tritium profile itself of the penetration of tritiated
5 water to depths deeper than the weathered zone and no
6 direct suggestion that there are fractures through the
7 unweathered upper till, but I think that much of those
8 findings and the finding of lack of tritium in the
9 granular units could be explained by other viable
10 mechanisms.

11 Q. Could we just pause for a moment,
12 Mr. Feenstra, and summarize where we are at this point.
13 You have taken the Board through the work of Mr. Ruland
14 and Mr. Petrie, Mr. Usher and the work done on the
15 Vandalia till and you have taken the Board to direct
16 evidence such as it is from Site D that bears on this
17 question. What opinion do you have as to this matter
18 of fracturing in the unweathered till at Site D?

19 A. It is my opinion that based on the
20 findings at several other sites, that being the
21 Maryhill till at Waterloo and the Vandalia till in
22 Illinois, the Halton till in Peel, and I think probably
23 the most significant extent on the findings of the
24 research of Mr. Ruland in the clay till in the Sarnia
25 area, there is a reasonable possibility that fractures



1 exist in the weathered till at Site D.

2 Q. I am sorry, you said weathered
3 till?

4 A. Unweathered till, excuse me, at
5 Site D.

6 Q. Could you re-state your conclusion?

7 A. Yes. It would be my opinion that
8 there is a reasonable possibility that fractures exist
9 in the unweathered upper till at Site D. We don't have
10 direct evidence that these fractures do exist, nor have
11 we performed the appropriate investigations I think to
12 confirm that the fractures do not exist. I think there
13 is a reasonable possibility that they do exist and I am
14 sure later this morning I will describe to you what
15 those implications are with respect to the assessment
16 of Site D, and I think they are very significant
17 implications.

18 Q. For the purposes of further
19 discussion, would it be fair to describe this opinion
20 as a hypothesis; that you have a hypothesis as to the
21 possibility of fracturing in the unweathered upper till
22 at Site D?

23 A. I think it would be quite correctly
24 described as a hypothesis, yes.

25 MR. HODGSON: I am going to go on to ask



1 background. Is that how we are to understand it?

2 MR. FEENSTRA: The concentration in the
3 intervening....

4 DR. KINGHAM: Between fractures.

5 MR. FEENSTRA: Between fractures would
6 be somewhat lower than that because there is diffusion
7 of contaminants out into the matrix which occurs due to
8 the concentration gradient. The high concentrations in
9 the fracture are inducing diffusion outward into the
10 matrix and so the concentrations out in the matrix are
11 somewhat lower because there is still some degree of
12 matrix diffusion out.

13 DR. KINGHAM: When you say "somewhat
14 lower" what do you mean?

15 MR. FEENSTRA: Close to the crack it
16 will only be slightly lower than in the crack itself
17 and as you go out from the crack some distance, the
18 concentration becomes progressively lower until it
19 reaches background. Over these very short time
20 intervals, I think that distance will only be in the
21 order of 10 centimetres or so. Obviously the longer
22 time period you consider, the further migration will
23 carry contaminants out into the matrix.

24 So, what these calculations indicate is
25 that for all but one combination of the parameters



1 which I suggested here of hydraulic conductivity and
2 fracture spacing, that after a period of one year, the
3 concentrations of contaminants exiting a landfill under
4 failure conditions would be arriving at the base of the
5 fractured unweathered upper till at concentrations or
6 at significant concentrations with respect to the input
7 concentrations. In periods of less than a year,
8 contaminants will be able to find their way through
9 cracks of this nature very readily.

10 One should note that very readily it is
11 still much reduced by matrix diffusion from what you
12 would have calculated based on the actual velocity of
13 water through those cracks, but in the context of
14 assessing a landfill at Site D, matrix diffusion does
15 not give you sufficient attenuation to reduce the
16 travel times through a fractured unweathered upper
17 till.

18 There is one other aspect of the
19 presence of fractures, possible presence of fractures
20 in the unweathered upper till which I feel needs to be
21 addressed, and that is the possibility of heaving and
22 some stress relief during the excavation and
23 construction of the landfill itself. Right now I am
24 going to present some concepts that are largely in the
25 domain of geotechnical engineering and as a



1 geologist/hydrogeologist, I am quite aware of the
2 processes, but I am not capable of doing a detailed
3 evaluation of their significance at Site D. However, I
4 felt it was appropriate at this time to point out my
5 concerns on this particular point.

6 Given the assumption that fractures
7 extend downward through the upper till and so that
8 fractures exactly exist in the upper till, the nature
9 of the fractures, that is the aperture, and because
10 their aperture relates to hydraulic conductivity, the
11 hydraulic conductivity of these fractures is controlled
12 largely by the horizontal stresses and the vertical
13 stresses acting in the subsurface. When the upper four
14 metres of upper till are removed, you will basically
15 change the stress conditions in the upper till
16 underlying the landfill. You have removed some of the
17 overburden, reduced the vertical stress and the
18 horizontal stresses are going to act to try and move
19 the till around and to compensate for the removal of
20 the overlying material. A very common observation in
21 many excavations is heaving in the base of the
22 excavation caused by stress relief and in some cases
23 groundwater pressures from below. If there are indeed
24 fractures through the lower part of the upper till, on
25 excavation of the 4 metres of upper till for the



1 landfill, many of these cracks could be opened more
2 significantly than they were previously.

3 When the landfill is actually
4 constructed, again you can imagine that you are
5 reloading the base of the landfill and when the
6 landfill is actually completed, the load on this
7 underlying upper till will probably be slightly higher
8 than previously existed. To some degree the cracks
9 that may have opened during excavation will reclose,
10 but there is some question as to whether they will
11 reclose completely. Likewise there should also be the
12 consideration that excavation such as this actually
13 induces new fractures in that relatively thin, three or
14 four metre thickness of unweathered upper till. It
15 would certainly be my recommendation that this type of
16 phenomenon and this type of consideration be given
17 careful attention by a geotechnical engineer prior to
18 the construction of a landfill at Site D. I believe we
19 also have copies of that.

20 MR. HODGSON: Oh yes. If that overhead
21 could be marked as the next exhibit.

22 MR. LANCASTER: H-939.

23 --- EXHIBIT No. H-939: Chart: Possibility for
24 Heaving and Stress Relief
25 in Unweathered Upper Till
due to excavation for
landfill.



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1 heads and basically creating the inverse of a pumping
2 barrier, a hydraulic barrier of higher heads. There are
3 many problems associated with an injection mould system
4 or a recharge system like that, but that could
5 certainly be something else that could be considered
6 to deal with a long-term decline in water levels in
7 underlying units.

8 Q. Now, we have talked about short-
9 term and long-term changes in water levels in the upper
10 granular unit and potential remedial measures to deal
11 specifically with that issue of changes in water levels
12 in the upper granular unit and I would like to tie your
13 expression of concerns with regard to water levels in
14 the upper granular unit with your expression of the
15 possibility of fracturing of the unweathered upper till
16 at Site D, and I would like to ask you what are the
17 implications, keeping in mind both these aspects, what
18 are the implications of your hypothesis regarding
19 fracturing on monitoring and contingencies at Site D?

20 A. I think the main implication with
21 respect to fracturing at Site D is related to the event
22 of failure of the hydraulic trap. If the hydraulic
23 trap operates as designed, then there will basically be
24 no egress of leachate out of the landfill. In the
25 event of a failure of the hydraulic trap, however, if



1 the unweathered upper till is fractured, it could
2 result in very rapid movement of leachate contaminants
3 through the unweathered upper till into the underlying
4 granular units.

5 Now, if the groundwater monitoring
6 program that is in place at Site D in the event of such
7 a failure is a typical monitoring program, and that is
8 where groundwater levels are monitored a few times a
9 year and groundwater samples are collected maybe once a
10 year or maybe twice a year, then it is quite possible
11 that there will be a considerable time lag between the
12 actual arrival of contaminants in the granular units
13 and the detection and confirmation of the presence of
14 contaminants in those granular units.

15 If monitoring is only conducted annually
16 and bi-annually and the process of sampling, sample
17 analysis, data analysis, sample preparation is several
18 months, it could easily be a year or more between the
19 time the contaminants may arrive in the UGU and the
20 contaminants are actually identified as being present
21 in the UGU.

22 Likewise in the event or at the time the
23 contaminants are detected in the UGU, the time required
24 to implement appropriate contingencies such as a purge
25 well system, the time will probably be measured in many



1 Site D. Now, you haven't put it any higher or lower
2 and you hold this hypothesis. Holding this hypothesis,
3 what is your view as to how this hypothesis could be
4 approached from the point of view of a hydrogeologist?

5 A. I think with respect to any
6 hypothesis such as this, there are three alternatives
7 that one could take. One is to simply accept the
8 hypothesis as being likely, the likely situation, and
9 then dealing with the implications and the consequences
10 of that hypothesis with the various alternatives I have
11 described: detailed monitoring with purge wells
12 installed beforehand; the piped water and purge wells
13 or to line Site D with a recompacted clay liner.

14 Q. Stopping you there, what would be
15 involved in lining Site D and what would your
16 recommendation be as to how it would be done?

17 A. It would be using the native till
18 material on site and so it would be a matter of
19 probably over-excavating the base of the landfill and
20 replacing the material and compacting it. So it is
21 basically re-working and cutting off the fractures that
22 exist at the base of the landfill.

23 Another alternative approach to deal
24 with this hypothesis is to simply reject the hypothesis
25 as being either improbable or very unlikely. In that



1 situation, if one felt confident with this decision,
2 then one could operate the landfill as designed and go
3 on with routine monitoring and go on with the business
4 of running a landfill.

5 Now, somewhere in between the acceptance
6 and the rejection of this hypothesis, one could test to
7 see if the hypothesis is valid.

8 Q. Could I ask you before you continue
9 with your evidence on that, on the decision tree, could
10 you discuss for the Board briefly what would be
11 involved in testing for the existence of the
12 fracturing?

13 A. Certainly. To investigate the
14 existence of fractures, I would think that the first (1)
15 thing one would do would be to design a program of test
16 pits to investigate to see if one could visually
17 determine the presence of fractures at depths between 4
18 and 8 metres below the ground surface, representing
19 that depth interval which would be the unweathered
20 upper till underlying Site D.

21 In addition to looking at some test
22 pits, visual evidence from test pits, one could provide
23 or develop a program of some angled boreholes in an
24 attempt to firstly identify whether vertical fractures
25 are present at those depths and, secondly, allow the



1 installation of piezometers in these angled boreholes,
2 which might allow an estimation of the vertical
3 hydraulic conductivity of this unit.

4 In addition, one could attempt to (3)
5 undertake a program of pumping tests similar to those
6 undertaken by Mr. Petrie on the Maryhill till to
7 identify whether upon pumping of the underlying upper
8 granular unit, that piezometers in the unweathered
9 upper till respond in a way that reflects fracturing
10 in the unweathered upper till. (There are a variety of
11 techniques one could use, but the main components would
12 probably be test pits, sample angled boreholes and
13 pumping tests.)

14 Q. Could one makes use of the wells
15 developed for pumping tests as contingency wells as
16 well?

17 A. Oh, the wells developed for the
18 purpose of these types of pumping tests and these types
19 of investigations could, with a bit of forethought,
20 probably be designed to act as purge wells in the
21 future.

22 Q. And monitoring wells?

23 A. And monitoring wells, correct.

24 So, upon investigating the presence of
25 fracturing in this unweathered upper till, one could



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leave it for debate

1 either come to the conclusion to a varying degree of
2 confidence that the till was either fractured or
3 unfactured. If one is reasonably confident with ones
4 results that the till is fractured, then one could
5 basically look at the same alternatives we considered
6 up on the righthand corner of this decision tree for
7 dealing....

8 Q. That's the lefthand corner?

9 A. Sorry, the lefthand corner of the
10 decision tree for dealing with the presence of
11 fractures in that unit. If we find following the
12 investigation that we can be reasonably confident, and
13 I don't think we will ever be one hundred per cent
14 confidence there are no fractures because I don't think
15 one hundred per cent confidence is possible, but if we
16 can be reasonable confident there are no fractures in
17 the unweathered upper till, then one more aspect I
18 think we need to evaluate is whether it is possible
19 that the landfill will actually induce fracturing in
20 the unweathered upper till when the upper 4 metres of
21 the upper till is excavated.

22 If this possibility is evaluated in
23 detail by a geotechnical engineer and it is determined
24 that it is unlikely that the landfill itself will
25 induce fractures in the upper till, and that might well



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1 be the conclusion, then we could proceed to landfill as
2 designed with the typical monitoring program.

3 If on an evaluation of the possibility
4 of landfill-induced fractures, we find that it is quite
5 possible or quite likely that these fractures might be
6 induced, then again we are in this same or similar set
7 of alternatives we have encountered at earlier stages
8 in the decision tree.

9 MR. HODGSON: Mr. Chairman....

10 MR. FEENSTRA: If I may say one more
11 thing.

12 With respect to this hypothesis, this is
13 a generic type of decision tree and a hypothesis as
14 stated. I think it should be evident from my
15 testimony this morning that it is certainly my opinion
16 that there is a reasonable possibility that fractures
17 do indeed exist in the unweathered upper till at Site D
18 and so it would be my opinion that one should not
19 reject this hypothesis. I have not formulated in my
20 mind at the present time whether one should accept it
21 and do something about it or whether one should test it
22 and then act accordingly, depending upon what one found
23 when one investigated the presence of fractures at the
24 site.

25 MR. HODGSON: Mr. Chairman, I am now



Q. Then I will sit down.

A. It is my opinion that at Site D the site can be made suitable for landfilling. In the event -- or while the hydraulic trap is functioning, there should be no release of leachate from the landfill into the underlying subsurface environment. However, in the event of failure of the hydraulic trap, leachate could escape the landfill and move downward into the granular units underlying the site which could result in contamination of private well water supplies which lie closest to the western side of Site D.

If the unweathered upper till unit as identified at the site is unfractured, then contaminant migration through that lower part of the unweathered till will take years, and most likely in the order of 10 years to 20 years, and there will be ample time for the detection of failure of the hydraulic trap and the implementation of any contingencies that might be required based on a failure of the hydraulic trap.

Seasonal fluctuations which result in temporary or short-term failures of the hydraulic trap under that condition will be of little significance because the rate of travel across the unweathered upper till is so great. However, if the unweathered upper till is indeed fractured, then the travel times for any



1 contaminants from Site D in the event of failure of the
2 hydraulic trap will be very short, and it is possible
3 that the underlying granular units could become
4 contaminated over a very short period of time.

5 It is my opinion that based on the
6 evidence from other sites, that is not Site D, but the
7 observations of fracturing in similar clayey materials
8 at other sites would lead me to the conclusion that it
9 is a reasonable possibility that such fractures do
10 indeed exist in the deeper part of the unweathered
11 upper till at Site D.

12 Because of that possibility, it would be
13 my opinion that alternatives such as a more detailed
14 monitoring program combined with the installation of a
15 purge well system at Site D prior to landfilling, or
16 the connection of the private residences in the area to
17 piped water or the construction of a compacted liner or
18 a liner of recompacted native till on Site D should be
19 used to avoid the possibility or eliminate the
20 possibility of rapid contamination of the underlying
21 upper granular unit.

22 Based on my assessment of Site F and
23 Site D, and the possible eventualities at Site D and
24 the fact that I consider some very detailed monitoring
25 and very careful monitoring is going to be required at



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1 Site D, depending upon precisely how the site is
2 developed, it is my opinion that Site F would
3 definitely be preferable to Site D for the proposed
4 Region of Halton landfill.

5 MR. HODGSON: Thank you, Mr. Chairman,
6 those are my questions.

7 MR. LANCASTER: Thank you, Mr. Hodgson.
8 That completes the Region's examination of this witness
9 and now we will set down until Monday, September 12, at
10 9:30; is that your understanding?

11 MR. FEENSTRA: Yes.

12 MR. LANCASTER: The Board will adjourn
13 until Wednesday, September 12 at 1:00 p.m. Is there
14 anything further at the moment?

15 You might consider the order of cross-
16 examination.

17 MR. HODGSON: Perhaps that could be
18 discussed now with my friends.

19 MR. McQUAID: Why would it be any
20 different than it was when Mr. Feenstra was in the box
21 previously?

22 MR. LANCASTER: I wouldn't think it
23 would be. The Board wouldn't want to start Monday
24 morning with an argument.

25 MR. McQUAID: I can't remember where



1 here.

2 DR. KINGHAM: Okay. Well, I think you
3 can take the load off your feet for a minute. I would
4 just like to make an observation because this matter
5 has been of concern to the Board for the last year and
6 a half. This has been pointed out many times. This is
7 quite a new departure in terms of hearings.

8 Throughout this hearing and especially
9 over the past few weeks, this Board has been concerned
10 about the proper place of "scientific uncertainty" in
11 the legal process of deciding fairness and social
12 equity with respect to a complex technological issue.

13 As you are all aware, we have the
14 ultimate responsibility and obligation of assigning
15 weight to evidence, including the scientific evidence
16 brought before us. We have heard a great deal of
17 evidence concerning the hydrogeology of Sites D and F.
18 The data presented to us have assisted in our
19 assessment of that evidence. Throughout the hearing we
20 have also received hypotheses about the -- this is not
21 the first and I don't think it will be the last in the
22 broader context of hearings -- we have received
23 hypotheses about the likely hydrogeology at these
24 sites.

25 From time to time it has occurred to the



1 Board that the measurement of additional parameters
2 would assist us in assigning the proper weight to the
3 evidence presented. We asked ourselves, and on occasion
4 the witnesses, whether or not additional tests would
5 materially and clearly assist in our appreciation of
6 the evidence. An example of this is found at pages
7 32,096 to 32,103 of the transcript of this hearing. In
8 each case we concluded, upon review of all the evidence
9 to that point, that we could properly judge the value
10 of the evidence based on the data available.

11 This kind of question has come to the
12 surface again in the past few weeks. Again, we have
13 asked ourselves whether it would be necessary to have
14 more data collected to test the hypothesis and, if so,
15 whether the data collected would materially assist us
16 in arriving at an unequivocal decision on the weight to
17 be accorded to the evidence at hand.

18 It is sometimes desirable under these
19 circumstances to have all the information one can get.
20 The scientist always wants more data to better
21 understand the phenomenon he is trying to describe. In
22 this case, as we considered whether or not we should on
23 our own initiative order additional data be collected,
24 we concluded that it would be unreasonable to do so
25 because the total evidence available was sufficient to



1 assign appropriate weight to the various proposals
2 before us.

3 In so concluding, we were mindful of the
4 fact that hydrogeology is still an evolving field. By
5 the time we exhaust all possible tests concerning one
6 hypothesis, another may emerge which may also demand
7 testing. We feel that such "ad infinitum"
8 possibilities could only be justified if meaningful
9 data had not been collected in the first place. We do
10 not feel this is the case in this hearing.

11 This is how this Board has approached
12 this difficult issue over the past year and a half.
13 While our own conclusions do not preclude parties from
14 taking whatever actions they consider necessary, we
15 thought an understanding of our approach might be
16 helpful at this time, and I think we will adjourn for a
17 few minutes, until we hear reply.

18 MS. CRONK: Yes, Dr. Kingham. I notice,
19 sir, that you were reading from a document. Would you
20 be prepared to make that available?

21 DR. KINGHAM: Absolutely.

22 MS. CRONK: Secondly, on behalf of
23 myself and other counsel, if we could put a question to
24 you, if it was appropriate. I would take it, sir, that
25 the comments that you have just made were made for the



1 Board, and I believe should be made available to the
2 Board simply so that you can identify various parcels
3 of land.

4 I may as well advise you at this moment
5 that based upon the combinations of discussions with
6 Ms. Cronk on behalf of National Sewer Pipe Company and
7 elements of the evidence that Mr. Feenstra has given,
8 the document that I am filing with you has already
9 probably going to require some revision. We will
10 update you on the first day of argument as to whether
11 or not that is the case and the extent to which that is
12 the case.

13 In the meantime here is a copy of the
14 survey for Site F which is inconveniently, someone has
15 written on the back, Site D.

16 DR. KINGHAM: Did we set aside a number
17 when we got the survey for Site D? No, we did not set
18 aside a number at that time.

19 MR. LANCASTER: 960.

20 ---EXHIBIT NO. H-960: Survey of Site F.

21 MR. HODGSON: You didn't make it to a
22 thousand, but 960 is pretty close. I think
23 Mr. McQuaid has some comments for you.

24 MR. MCQUAID: Yes, Mr. Chairman,
25 Dr. Kingham.



1 I think in the circumstances that we
2 find ourselves in I -- having I suppose -- requested
3 that there might be clarification and on the urging of
4 counsel that you not clarify, we are left with the
5 reading of the document and the submission of the
6 document as presented.

7 That puts the responsibility of what it
8 means I guess on us, or on me, and those of the City of
9 Burlington and Ms. Vigod. I think we will just have to
10 treat the understanding we have and judge accordingly.

11 Now, having said that, I want to advise
12 the Board that I will not be urging the motion that was
13 served upon the other counsel. I will not be seeking a
14 return date for that motion.

15 In addition, we will not be asking for a
16 motion for rejoinder to submit additional evidence. We
17 effectively retire and adjourn until the argument.

18 MR. LANCASTER: Thank you,
19 Mr. McQuaid.

20 MR. LEITCH: Mr. Chairman, I regret to
21 rise to ask for five minutes at this point. It may be
22 necessary for Mr. Estrin and I to make a decision on
23 what Mr. McQuaid said.

24 MR. LANCASTER: Five minutes.

25 ---Recess



1 MR. LANCASTER: Please be seated.

2 MR. LEITCH: Mr. Chairman, I think as I
3 had indicated yesterday, we -- or it may have been the
4 day before when we broke -- that Mr. Estrin and I were
5 having some difficulty in getting instructions from our
6 client and that we could not get instructions until
7 this coming Monday evening. We are still in that
8 position and we had anticipated that Mr. McQuaid would
9 serve a Notice of Motion which he did this morning, and
10 that the motion would proceed on the basis of the
11 Notice, and the material supporting the Notice of
12 Motion.

13 Now, Mr. McQuaid, has chosen to withdraw
14 the motion. We are still in the position where we do
15 not have instructions and we need instructions in
16 respect of the way we would have dealt with the motion.
17 We would have intended to call certain witnesses in
18 respect of the position on the motion. (Neither one of
19 us is in a position to say to you that our client might
20 not wish, in some fashion, to place the evidence of
21 those witnesses before this Board. We just cannot say
22 that nor can we take that decision ourselves.)

23 So, what we propose is, is that we will
24 proceed as to argument starting on the 11th of October
25 and if, after our meeting with our client on Monday,



1 there is any change, anything that we would request of
2 this Board, we will serve Notice of Motion on all the
3 parties and try to liaise with the Board to find an
4 appropriate date to deal with it. It may be that
5 nothing will come of it. It may be that something will
6 come of it. We are not in a position to be any more
7 helpful than that at this time.

8 MR. LANCASTER: Thank you,
9 Mr. Leitch. Any comments thereon, Mr. Garrod?

10 MR. GARROD: I just wanted to have a
11 word with Mr. Hodgson before the Board rose.

12 MR. LANCASTER: For the record, the
13 Board would just like to say that subject to ...

14 MR. HODGSON: I apologize for
15 interrupting, but, and I apologize with the greatest of
16 respect to make these comments, and that is, that if
17 the statement that I can see in front of you relates in
18 any way to Dr. Kingham's previous statement or the
19 questions that Mr. McQuaid put to you -- it does not.

20 MR. LANCASTER: No. We just want to
21 say, this is a standard sort of thing. The evidence is
22 now in. This evidence and all of the exhibits filed in
23 support, and the transcripts of this hearing
24 collectively constitute the complete Environmental
25 Assessment for the purposes, for the proposed Halton



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September 30, 1988.

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1 --- Upon commencing at 9:15 a.m.

2 MR. LANCASTER: Good morning, please be
3 seated.

4 MR. HODGSON: Mr. Chairman, I don't want
5 to appear to act as if this is business as usual, but
6 Mr. Feenstra, on his last day of evidence, promised to
7 reproduce two of the one-of-a-kind exhibits, B-955 and
8 WD-958 on his word processor and he has done so. I
9 have already mailed copies.

10 MR. LANCASTER: These are flip-charts?

11 MR. HODGSON: These are for the
12 convenience of the Board.

13 MR. LANCASTER: Mr. Leitch, we have
14 before us, a Notice of Motion.

15 MR. LEITCH: Yes, I am here instructed
16 to bring a motion on behalf of the Town of Milton and I
17 would first file with you, a hard copy of the Notice of
18 Motion, which was sent by FAX machine to your office
19 earlier, and I would ask that the Notice be given an
20 identification number.

21 MR. LANCASTER: It will be M-961.

22 --- EXHIBIT NO. M-961: Notice of Motion

23 MR. LEITCH: And I understand, sir, that
24 you have had a chance to peruse the Notice of Motion
25 and my friends have all had the Notice as well.



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In paragraph 2 on page 3, it sets forth the order asked, firstly, granting leave to the Town to call the evidence of Nicholas Eyles, Ph.D, a quaternary geologist, as to observations in a test pit at the proposed Site D, Milton. The same relates to the hypothesis advanced by Stan Feenstra in the case before the Board.

(b) requiring the evidence to be called forthwith after the order of the Board, and

(c) such further and other order as counsel may advise and the Board may deem appropriate.

The grounds are set forth in paragraph 3 and the sections of the Consolidated Hearings Act and the evidence to be relied on in paragraph 4.

I should say to the Board that Dr. Eyles is here now. He is upstairs in my client's office, his evidence, his prospective evidence, being reviewed by Mr. Estrin.

I know that my friend, Mr. McQuaid, has some preliminary submissions to make about whether or not Mr. Eyles ought to be in the room when we are making submissions with respect to the motion, so I will give the podium to him for the moment.

MR. LANCASTER: Thank you, Mr. McQuaid?

MR. MCQUAID: Mr. Chairman, it may be



1 that the events of preparation upstairs will answer my
2 motion and my concern, but I am formally asking that in
3 the circumstances of the motion, while it is being
4 argued, that Dr. Eyles, Professor Eyles be excluded.

5 We have been provided with some
6 indication of what his evidence is but I don't want him
7 here while we are arguing the pros and cons of the
8 motion and some of the evidence. I don't know how
9 Mr. Leitch is going to handle the material in support,
10 quite frankly, but I do not want to be in a situation
11 where I ultimately am arguing with the witness who sits
12 and listens to the arguments, as it were, especially at
13 this point in the proceedings.

14 So, I guess in a sense, I am asking for
15 an order, if necessary, if Mr. Leitch is not indicating
16 that Mr. Eyles, or Dr. Eyles will be here later. I am
17 asking for an order that while this motion is being
18 argued that he be excluded from the room.

19 MR. LANCASTER: Is there any other
20 comment in that regard?

21 MR. LEITCH: I would like to either go
22 myself or have someone go upstairs and advise Mr.
23 Estrin and Dr. Eyles of the order so that they don't
24 offend it.

25 MR. HODGSON: Mr. Feenstra will do that.



1 MR. LANCASTER: I understand the
2 Environmental Assessment Board regulations provide for
3 such an exclusion in an instance like this and I think
4 it is wise under the circumstances and we have no
5 objection to it.

6 MR. LEITCH: I can see the wisdom of it.
7 It would appear to me that the argument will be wide-
8 ranging about the evidence. If we could have him in
9 the room safely at one point of time and very quickly,
10 it would not be safe.

11 In the interest of fairness to what
12 Mr. McQuaid may later be doing in terms of cross-
13 examination, I think probably the order should be made.

14 MR. LANCASTER: The Board will so order
15 that he be excluded until such time as he is called as
16 a witness.

17 MR. LEITCH: I suppose it goes without
18 saying but the order excluding the witness also goes to
19 anyone communicating the facts of what happens here to
20 him as well.

21 MR. LANCASTER: That would seem
22 advisable. Are you going to conduct cross-examination,
23 or is Mr. Estrin?

24 MR. LEITCH: I hope it is not cross-
25 examination. Direct examination, and Mr. Estrin will



1 be doing that.

2 SUBMISSION BY MR. LEITCH:

3 Mr. Chairman, it would be useful, in my
4 submission, to set forth some facts in chronological
5 order and to assist the Board and my friends in terms
6 of their note-taking, I have borrowed my assertion of
7 those facts from my notes and I am going to distribute
8 them for you.

9 I think that as the motion progresses
10 the chronology of facts will be useful to you in making
11 your determination. The first assertion of fact, which
12 is made, is that the test pit in question was opened
13 in the fill area of proposed Site D on April 6th and
14 7th, 1988.

15 On that date, and for some period of
16 time thereafter, Mr. Petrie was in the witness stand as
17 part of the Burlington case.

18 The purpose of the test pit was to
19 observe the subsurface conditions at Site D in relation
20 to the proposed Trow design and the report of fractures
21 in the Maryhill till which had been reported by
22 Mr. Petrie in earlier work.

23 On April 7th, a decision was taken to
24 close the pit. Subsequent to April 7th, Mr. Petrie was
25 cross-examined by counsel for the Town of Milton.



1 Sixthly, the Town of Milton called its
2 case in reply, being Dr. Rowe and Mr. Gray, prior to
3 the Region of Halton calling its case in reply.

4 Seventh, in the late afternoon of August
5 23, 1988, the witness statement of Stan Feenstra was
6 distributed to all parties by Mr. Hodgson. By that
7 time, the Town of Milton's reply in-chief was
8 completed. I should say also that that was the first
9 indication that the Town of Milton had as to what has
10 become known as the Feenstra hypothesis with respect to
11 Site D.

12 Paragraph 8, subsequently, on the 29th
13 of August, Mr. Feenstra commenced to give his reply
14 evidence in-chief.

15 Ninth, cross-examination of Mr. Feenstra
16 commenced on the morning of the 12th day of September.
17 On the 12th of September, Mr. Feenstra was cross-
18 examined by counsel for the Town of Milton, counsel for
19 National Sewer Pipe and counsel for the Ministry of the
20 Environment.

21 Paragraph 10, on the 13th of September,
22 Messrs. Gray and Rowe were recalled for cross-
23 examination with respect to Mr. Gray's evidence on a
24 liner at Site D and thereafter, at about 3:00 p.m. on
25 the 13th of September, Mr. McQuaid commenced his cross-



1 examination of Mr. Feenstra.

2 Paragraph 11, on the 14th of September,
3 Mr. McQuaid continued his cross-examination of Mr.
4 Feenstra and advised the Board in the course of the
5 afternoon that he would be bringing a motion asking for
6 an order for further investigation at Site D.

7 Paragraph 12, on Friday, the 16th of
8 September, Mr. McQuaid filed a Notice of Motion in
9 respect of an order for further investigation and
10 cross-examination continued. I should say by way of
11 expansion, it is not my understanding that that Notice
12 of Motion received a number, an exhibit number in these
13 proceedings, but it is my understanding that it was
14 distributed to counsel and it was tabled before the
15 Board.

16 MR. LANCASTER: It was tabled in the
17 sense it was put before the Board, it wasn't argued
18 before the Board.

19 MR. LEITCH: I understand that.

20 MR. LANCASTER: I don't know if that is
21 tabled or not.

22 MR. LEITCH: It came to the attention of
23 all the parties and came to the attention of the Board
24 as a document.

25 On the afternoon of the 16th of



1 September, Mr. McQuaid concluded his cross-examination
2 and the Board asked questions of the witness.
3 Thereafter, Mr. Hodgson conducted his reply questioning
4 and following his completion, the Board made its
5 statement concerning the proper place of scientific
6 uncertainty in this legal process.

7 DR. KINGHAM: That is not correct. It
8 was made before Mr. Hodgson's reply.

9 MR. LEITCH: I apologize for that and
10 ask then that that stand corrected as to the
11 chronology.

12 Subject to that correction in paragraph
13 12, then paragraph 13 says, subsequently on the 16th of
14 September, Mr. McQuaid on behalf of the City of
15 Burlington, advised withdrawal of Burlington's motion
16 and the Town of Milton requested an opportunity to seek
17 instructions in the matter of evidence which it had
18 proposed to call on the motion by Burlington.

19 Those are the assertions of fact and
20 their chronology that I want to have before the Board
21 as I make my submissions.

22 Mr. Chairman, in my initial submissions,
23 I don't propose to describe the evidence sought to be
24 called any more fully than I have done in the Notice of
25 Motion. I think, again as a matter of fairness, the



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Toronto, Ontario

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1 I suppose A for identification or B for
2 identification, some such thing as that.

3 MR. LANCASTER: We could now mark it as
4 an exhibit.

5 MR. LEITCH: That would be satisfactory
6 as well.

7 MR. LANCASTER: That will become Exhibit
8 M-962.

9 --- EXHIBIT NO. M-962: Witness statement, and
10 supporting documents of
Nicholas Eyles

11 --- Adjournment at 2:43 p.m.

12
13 CERTIFIED CORRECT:

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15 
16 P.D. McQueen

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****(Page 43851 follows)****

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1 ---- Upon resuming at 2:35 p.m.

2 MR. LANCASTER: Thank you, please be
3 seated.

4 It has been suggested a number of times
5 throughout this hearing that the purpose of the
6 Environmental Assessment Act is to ensure that the
7 Board hearing an application has all the information
8 necessary to make its decision on behalf of all parties
9 concerned.

10 Mr. Garrod re-emphasized that purpose
11 this morning when he suggested that this forum should
12 not be a dispute between parties. In this case,
13 between municipalities and Halton. In gathering this
14 information we understand that the Regional
15 Municipality of Halton has acted in the spirit of the
16 Act and in particular with respect to hydrogeology,
17 they allowed for observations and participation by the
18 other parties to the hearing. This helped the Board
19 to have a clear understanding of the evidence brought
20 before us.

21 The Board now understands that
22 additional hydrogeological studies were undertaken on
23 April 6th and 7th of this year. With the exception of
24 the Milton parties, other parties were not informed of
25 the test and this result and were not invited to



1 participate in it. Within 30 hours the T-shaped hole,
2 more than eight metres deep had been dug, examined and
3 filled in again. In subsequent days, particularly on
4 April 12th, 1988, counsel for the party on whose behalf
5 the test pit had been dug was cross-examining a witness
6 on the hypothetical existence of fractures in clay
7 tills across southern Ontario. The witness stated
8 that he had no evidence to support such a hypothesis,
9 but that "If evidence were provided by yourself or the
10 proponent, one would have to consider that fracturing
11 with respect to assessing site suitability."

12 It was not suggested to the Board at
13 that time or at any time since then that such evidence
14 was available. When the expert witness for the
15 proponent, Mr. Feenstra, proposed an hypothesis about
16 fracturing in such tills, he also stated that he had no
17 data to support such a hypothesis in the vicinity of
18 Site D. Again, it was not suggested to the Board that
19 such data might exist. When cross-examined about his
20 hypothesis by counsel for the City of Burlington about
21 the extent of the testing necessary to prove his
22 hypothesis, Mr. Feenstra gave evidence that conclusive
23 evidence could not be assured with even five test pits.

24 Additional tests of a different kind
25 would be needed to clearly support or refute that



1 hypothesis.

2 Now the Board has been asked to consider
3 a motion to admit additional evidence, evidence that
4 was known to the party since on or about April 7th of
5 this year, evidence that was collected in the absence
6 of experts for the other parties, evidence that has not
7 been alluded to in the months since it was gathered,
8 evidence for which the hydrogeologist in charge is not
9 present to testify.

10 The witness statement of Dr. Eyles
11 confirms the general hydrostratigraphy in the area, it
12 describes some fractures and concludes that a single
13 test pit is inadequate to define the frequency, spacing
14 and ultimate depth of the penetration of such
15 fractures. The first observation is not at issue and
16 the second is itself qualified by the inadequacy of the
17 data base. This confirms the evidence of the proponent
18 of the hypothesis, Mr. Feenstra, about the
19 insignificance of a single test pit result.

20 As previously, throughout this hearing,
21 the Board has considered whether the admission of
22 evidence would materially assist in its deliberations.
23 We are mindful of precedents brought to our attention
24 by Ms Cronk that suggest that such evidence could be
25 admitted although our acceptance of this approach is



1 tempered by the suggestion in Sopinka and Lederman, and
2 I quote:

3 "... the evidence must be newly
4 discovered evidence which reasonable
5 diligence could not have discovered
6 during the trial, ..."

7 We are mindful as well of Ms Vigod's
8 reference to cases where such evidence has not been
9 admitted.

10 Taking all these factors into account
11 and especially the discretion allowed us under the
12 legislation, we conclude that the evidence proposed to
13 be introduced by Dr. Eyles should not be admitted
14 because it will not clearly assist us in arriving at
15 our decision. We rule against the motion to have such
16 evidence introduced at this late date.

17 The Board will adjourn this hearing
18 until Tuesday, October 11th, at 9:30 a.m.

19 MR. LEITCH: Mr. Chairman, with respect
20 to the witness statements which were handed forward and
21 which you have had an opportunity to look at before
22 your ruling, could you mark those for identification
23 purposes, not as exhibits, but rather for
24 identification for the public record which is being
25 created here.

LIST OF AUTHORITIES

1. Tandy Electronics Ltd. and UAW (1980) 30 O.R. 2(d) 29 p.42
2. Hughes Boat Works Inc. and UAW, Local 1620, 1979, 26 O.R. (2d) (Divisional Court)

TEXT OF STATUTES

1. Judicial Review Procedure Act:

Section 1(g):

1(g) "Statutory Power" means a power or right conferred by or under a statute,

- (i) to make any regulation, rule, by-law or order, or to give any other direction having force as subordinate legislation,
- (ii) to exercise a statutory power of decision,
- (iii) to require any person or party to do or to refrain from doing any act or thing that, but for such requirement, such person or party would not be required by law to do or to refrain from doing,
- (iv) to do any act or thing that would, but for such power or right, be a breach of the legal rights of any person or party. 1971, c.48, s.1; 1972, c.1, s.104(6).

2. Consolidated Hearings Act:

Section 4(11):

- (11) The joint board has the authority and the duty,
 - (a) to hold a hearing in respect of and to consider the matters that could be considered at the hearings specified in the notice to the Hearings Registrar under section 3; and
 - (b) to make and issue a decision in respect of matters considered by the joint board. 1981, c.20, s.4

Section 5(7)):

- (7) The standards and criteria in or under an Act specified in a notice under section 3 that relate to the undertaking specified in the notice apply with necessary modifications in respect of a decision that may be made by a joint board under this Act. 1981, c.20, s.5.

3. Environmental Assessment Act:

Section 11:

- (1) Where, before accepting an environmental assessment, the Minister is of the opinion that the environmental assessment as submitted does not comply with this Act or the regulations, is inconclusive or is otherwise unsatisfactory to enable a decision to be made as to whether approval to proceed with the undertaking with respect to which the environmental assessment is submitted should or should not be given or should be given subject to terms and conditions, the Minister shall give notice to the proponent that he proposes, by order, to require the proponent to carry out such research, investigations, studies and monitoring programs related to the undertaking in respect of which the environmental assessment is submitted as are mentioned in the notice, together with written reasons therefor.
- (2) The Minister, after considering any written submissions of the proponent made within fifteen days of the giving of the notice or within such longer period as may be stated in the notice, may by order require the proponent to carry out such research, investigations, studies and monitoring programs related to the undertaking in respect of which the environmental assessment is submitted and to submit such reports thereon as the Minister considers necessary.
- (3) The Minister shall, in such manner as the Minister considers suitable, give notice of the order to any person who has made a written submission to the Minister pursuant to subsection 7(2).
- (4) Upon submission of the reports to the Minister they shall be incorporated as part of the environmental assessment and the review thereof that the Minister caused to be prepared may be revised accordingly. R.S.O. 1980, c.140, s.11.

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4. Environmental Protection Act:

Section 33(4):

33(4) The Environmental Assessment Board shall serve notice of its decision, together with reasons therefor, on the parties to the hearing, and the Director shall implement the decision.