

CONSOLIDATED HEARINGS BOARD

IN THE MATTER OF Sections 2 and 3 and 6 (3) of the Consolidated Hearings Act, 1981, S.O. 1981, c.20;

— and —

IN THE MATTER OF Section 12(2) of the Environmental Assessment Act, R.S.O. 1980, c.140;

— and —

IN THE MATTER OF Sections 30, 35 and 38 of the Environmental Protection Act, R.S.O. 1980, c.141, as amended;

— and —

IN THE MATTER OF Sections 24 and 61 (2) of the Ontario Water Resources Act, R.S.O. 1980, c.361, as amended;

— and —

IN THE MATTER OF Section 28 (3) of, and Regulation 164 under, the Conservation Authorities Act, R.S.O. 1980, c.85, as amended;

— and —

IN THE MATTER OF Section 40(12) of the Planning Act, S.O. 1983, c.1, as amended; in connection with site plan control of the sanitary landfill site;

— and —

IN THE MATTER OF Section 22(1) of the Planning Act, 1983 in connection with a referral to this Board by the Honourable Bernard Grandmaitre, Minister of Municipal Affairs, on a request by the Regional Municipality of Halton to amend the Official Plan for the Town of Milton to redesignate a parcel of land comprising Part Lots 3 and 4, Concession 2 N.S. in the Town of Milton from "Agriculture" and "Conservation and Hazard Lands" to permit the construction, operation and maintenance of a landfill site, Minister's File No. 24-OP-0208-A01;

— and —

IN THE MATTER OF Section 34(11) of the Planning Act, 1983 in connection with an appeal to this Board by the Regional Municipality of Halton for an order directing an amendment to By-law 61-85 of the Town of Milton to rezone the lands situated at Lot 3 and part of Lot 4, Concession 2 N.S., in the Town of Milton from "Agriculture" to permit a regional sanitary landfill site and ancillary uses;

— and —

IN THE MATTER OF Section 15(1) of the Planning Act, R.S.O. 1980 ch.379 in connection with a referral by the Honourable Claude F. Bennett, Minister of Housing on a request by Tremaine Britannia Citizen's Group for consideration of part of the Official Plan for the Halton Planning Area with respect to Sections 1 to 5 inclusive, 7, 9 and 10 of Part III D3 Solid Waste Management, Minister's File No. OPC-0026;

— and —

IN THE MATTER OF Section 64 of the Ontario Municipal Board Act, R.S.O. 1980, c.347 as amended in connection with an application by the Regional Municipality of Halton for an order approving:

a) the acquisition of land for the construction, operation and maintenance of a sanitary landfill site to contain 7.96 million cubic metres of waste in the Regional Municipality of Halton and to do so by one of two alternative methods as follows:

- (i) landfilling at the site referred to in Halton's Environmental Assessment as Site F in the City of Burlington;
- (ii) landfilling at the site commonly referred to in Halton's Environmental Assessment as Site D in the Town of Milton

at an estimated cost of \$12,775,000.00, and the borrowing of money by way of temporary advances not exceeding in the aggregate such estimated cost pending the sale of debentures, and

(b) the issuance of necessary debentures to a maximum of \$12,775,000.00 for a term not to exceed fifteen years;

— and —

IN THE MATTER OF Section 193(5) and Paragraph 84 of Section 210 of the Municipal Act, R.S.O. 1980, c.302, as amended;

— and —

IN THE MATTER OF Sections 6, 7 and 8 of the Expropriations Act, R.S.O. 1980, c.148;

— and —

IN THE MATTER OF an undertaking of the Regional Municipality of Halton to provide facilities for the purpose of receiving, dumping and disposing of waste as required by section 137 of the REGIONAL MUNICIPALITY OF HALTON ACT, R.S.O. 1980, c.436, as amended, by acquiring the land for, constructing, operating and maintaining a landfill to contain 7.96 million cubic metres of waste in the Regional Municipality of Halton.

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I N D E X

WITNESS:

MICHAEL KERR HOFFMAN (Sworn)

Examination in Chief by Mr. Leitch 16104
Cross-examination by Mr. Lederer 16241

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Toronto, Ontario

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BEFORE: H. H. Lancaster, Q.C. - Chairman

Dr. D.J. Kingham - Member



Hearing conducted at The Oakville
Granary Commercial Centre, 105 Robinson
Street, Oakville, Ontario, on

Monday, December 7, 1987

VOLUME 69

APPEARANCES:

T.R. Lederer and
H.D. Hodgson

for the Regional
Municipality of Halton
(Proponent)

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for the Ministry of the
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T. Vigod
J.F. Castrilli

for the West Burlington
Citizens Group

D. Estrin,
F.E. Leitch and
H. Dahme

for the Corporation of the
Town of Milton

S.R. Garrod and
A. Nurvo

for the Milton Area Citizens
Coalition and several
affected Milton area
landowners

R.B. Tuer, Q.C.
E.A. Cronk and
F. Perrier

for National Sewer Pipe
Limited

L.F. Longo

for Azova Investments
Limited

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for the City of Burlington

C. Mansfield

for the Ministry of Natural
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for Cumis Limited



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2	P. Hancock	Fosseri Investments
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4		Investments Limited and
5		Topic Investments
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J.H. Olah

for the Halton Region
Conservation Authority

* * * * *

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Per: P. D. McQueen



Oakville, Ontario
December 7, 1987

---Upon commencing at 9:30 a.m.

MR. LANCASTER: Good morning.

MR. TZEKAS: Mr. Chairman, we are missing the Milton group who are the group who will be presenting the first witness this morning.

MR. LANCASTER: I was talking to Mr. Leitch, he is here, I know.

MR. LEITCH: My apologies, Mr. Chairman. I have been in last minute preparation with Mr. Hoffman.

DR. KINGHAM: All right, it has given us a few minutes to get our exhibits from Thursday in order.

MICHAEL KERR HOFFMAN (Sworn):

EXAMINATION IN CHIEF BY MR. LEITCH:

Q. Mr. Hoffman, do you have a copy of your curriculum vitae before you?

A. Yes, I do.

Q. Would you describe for the Board what an agrologist is?

A. An agrologist is one who specializes in agriculture studies.

Q. Would you describe yourself as an agrologist?



1 A. Yes, I would.

2 MR. LEITCH: Mr. Chairman, I would like
3 to distribute the witness' curriculum vitae if I may.

4 MR. LANCASTER: Thank you. We will mark
5 that as Exhibit M-371.

6 ---EXHIBIT NO. M-371: Curriculum Vitae of M.K. Hoffman

7 MR. LEITCH: Q. You were awarded a
8 Bachelor of Arts at Queen's University in Biology in
9 1971?

10 A. That is correct.

11 Q. You took a further year at the
12 University of Guelph in Soil Studies in 1973?

13 A. Yes, I did.

14 Q. And received the degree of Master
15 of Science from the University of Guelph, Agricultural
16 College, in Soils and Land Use in 1975?

17 A. That's right.

18 Q. I understand, sir, that presently
19 you are continuing your studies in a formal way and
20 that you are a Ph.D candidate?

21 A. That is true. I am taking a Ph.D
22 at the University of Waterloo in Planning where I am
23 working on the relationship of planning to agriculture
24 and applying the work specifically to waste management
25 study.



1 Q. Can you give a more precise
2 statement of your thesis than that?

3 A. Well, the thesis research
4 encompasses, as I mentioned agriculture, as well as
5 planning and looks at the effects of spills, for
6 example, within an environment. Using existing
7 information I am putting together a capability system
8 which will rate different soils for the way that spills
9 either stay within the profile or move through the soil
10 profile.

11 Q. You are a Member of the Ontario
12 Institute of Agrology, the Agricultural Institute of
13 Canada?

14 A. Yes, I am.

15 Q. You are a member of the Ontario
16 Society for Environmental Management?

17 A. That is correct.

18 Q. A member of the Soil Conservation
19 Society of America, Ontario Chapter?

20 A. Yes.

21 Q. A Member of the Federation of
22 Ontario Naturalists?

23 A. Yes.

24 Q. A Member of the Canadian Land
25 Reclamation Association?



1 A. Yes.

2 Q. You sit as a Member on the
3 Committee of Adjustment for the City of Guelph?

4 A. Yes.

5 Q. I understand the firm you are a
6 principal of is called Smith, Hoffman Associates
7 Limited?

8 A. That is correct.

9 Q. There is another Hoffman involved
10 in that firm in your area of work?

11 A. He periodically works with us, my
12 father.

13 Q. I noticed in reviewing your
14 bibliography to the report which will be marked
15 shortly, that your father has been active in the area
16 of agrology for a number of years?

17 A. That is correct.

18 Q. And has done some seminal soil
19 capability studies?

20 A. Yes. He has been working in
21 soils, probably for 40 years.

22 Q. Sir, in 1971 through to 1979 you
23 were a soil consultant with a number of firms. What
24 was that?

25 A. Most of the time I prepared soil



1 surveys and soil interpretations for a number of
2 different kinds of projects, anything from gravel pits
3 through to pipelines.

4 Q. And from 1975 to 1979 you had the
5 position of Environmental Analyst with Ontario Hydro?

6 A. Yes. At that time I was with the
7 Forestry Department, it is now called the Department of
8 Transmission Environment. Again, I was the
9 agricultural specialist as part of a team doing
10 planning studies as well as looking at the operation
11 side of transmission lines for Ontario Hydro.

12 Q. On your curriculum vitae the next
13 entry under career history shows 1978 and 1983,
14 lecturer, Macdonald College, McGill University. Is
15 that a period of time or were those two separate years?

16 A. Those are two separate years. I
17 talk a block course in soil survey during the years '78
18 and '83.

19 Q. You were a soil scientist with
20 Ecoplans Limited in 1979 through 1981?

21 A. Yes, I was.

22 Q. From 1981 to the present you have
23 been a principal of Smith, Hoffman Associates Limited?

24 A. That is correct.

25 Q. The following lists of projects



1 that you worked on representing professional
2 experience, there is a category of pipeline and Hydro
3 transmission corridors which I don't propose to go into
4 in detail.

5 What generally did that work relate to?

6 A. This kind of work involved the
7 review of the existing literature, the preparation of
8 soil surveys and their interpretation for planning
9 studies. So we would be looking at transmission route
10 planning, where to put the transmission route or where
11 to put a pipeline.

12 Q. The next section dealing with
13 transportation projects, was it the same general kind
14 of work?

15 A. Yes, the same general kind of
16 work. It also included a social factor, if you like,
17 for agricultural, where communities -- agricultural
18 communities meet. Some analysis of existing economic
19 data on farm returns, for example.

20 Q. The next section I have, I am
21 sorry, Mr. Reporter, I do not have a copy of the
22 curriculum vitae which has this section in it in your
23 report, but I go very slowly with it so you can take
24 the words down.

25 This deals with land reclamation and



1 rehabilitation studies, Mr. Hoffman, and I would like
2 you to describe the work, in particular, in the first
3 two projects which I listed.

4 The Dawn, D-a-w-n, Kerwood,
5 K-e-r-w-o-o-d Loop Pipeline and the rehabilitation of
6 sand and gravel pits for tree fruit and tender fruit
7 production. In particular I want to know what your
8 work was and who was involved in it and what the roles
9 of the parties were?

10 A. The first study listed the
11 rehabilitation of agricultural lands on the Dawn to
12 Kerwood Loop Pipeline. It involved three different
13 consulting companies, a consortium of three different
14 consulting companies, Ecological Services for Planning,
15 Robinson, Merritt & deVries and Smith, Hoffman
16 Associates.

17 Each one of us took a slightly different
18 role within that project. Ecological Services for
19 Planning had the project management side of the project
20 and also looked at infrared aerial photography and its
21 use to identify lands that had been damaged by pipeline
22 construction.

23 Q. Ecological Services for Planning
24 is Dr. Mackintosh's firm?

25 A. That is correct. The second firm,



1 Robinson, Merritt & deVries looked at agricultural
2 yield in this study and they measured yields on the
3 former trench as well as in the rest of the fields, so
4 that a comparison could be made and crop yields on the
5 trench versus what it is on the rest of the field.

6 Smith, Hoffman Associates looked at the
7 soils component of this particular study. We went out
8 and dug a number of trenches and in the company, then
9 the company looked at soil characteristics and took
10 bulk density measurements within the soil profiles
11 bulk density is just basically a mass per unit volume.

12 We also supervised the sub-soiling
13 portion of that study. Part of the recommendation of
14 the study was to complete sub-soiling and to put in
15 legume crops to improve soil structure. So, we
16 supervised then the sub-soiling.

17 Q. When you say "we" who did that?

18 A. I did that out in the field.

19 Q. In the field?

20 A. Yes.

21 Q. Was a report produced in respect
22 of that particular project?

23 A. Yes, that is correct. There were
24 a number of reports completed for that particular
25 study. Each year there was a progress report and we



produced again, Smith, Hoffman produced a report that outlined our findings relative to soils each year.

Q. Tell us then in the same way about the rehabilitation of sand and gravel pits for tree fruit and tender fruit production?

A. That was a project funded by the Ministry of Natural Resources and the Ontario Ministry of Agriculture and Food. In that particular study, Smith, Hoffman, and in this case I was out in the field, looked at a number of different orchards that were now on what were former gravel pits so that I travelled throughout Southern Ontario to look at 14 different orchards and reported on, if my memory serves me correctly, 12 orchards where rehabilitation to fruit crops had been completed.

Q. In that work what role did Ecological Services for Planning have?

A. Ecological Services for Planning was part of the consortium with Smith, Hoffman. Again, Ecological Services for Planning completed the project management associated with that project and also had the opportunity to look at rehabilitation of former gravel pits to tender fruit in California.

Q. Then leaving that area, the land reclamation area, you have a section dealing with



1 sanitary landfill and waste management. Dealing with
2 the last three of those projects, did they have any
3 relation to the kind of work that has been done here?

4 A. They have relation in that we were
5 producing information to be used in the planning
6 process. We completed the soil survey and looked at the
7 capability of the lands that were going to be effected.
8 So, for example, in the Tricil Corporation work we did
9 a soil survey and a capability analysis and wrote a
10 brief report which was incorporated into a large
11 report. So we were a sub-consultant.

12 In the Ontario Waste Management
13 Corporation work we completed a critique of the work
14 done by Ecologistics for the Ontario Waste Management
15 Corporation. In this case we were looking more at the
16 process and the kinds of information being used to make
17 site selection decisions.

18 The proposed sanitary landfill, again we
19 were collecting information on soil capability.

20 MR. LEITCH: Mr. Chairman, I would ask
21 that the witness be qualified to give opinion evidence
22 with respect to agricultural aspects in this case.

23 MR. LANCASTER: So qualified.

24 MR. LEITCH: Q. You were retained by
25 the Town of Milton to do certain work in connection



1 with this Halton landfill project?

2 A. That is correct.

3 Q. I understand, sir, that you have
4 done some work and have produced some reports?

5 A. Yes, we have.

6 Q. I am showing you two blue
7 documents, one entitled "Agricultural Characteristics
8 and Impacts of the Proposed Halton Region Landfill Site
9 D." Did you produce that report?

10 A. Yes.

11 Q. And I show you a report entitled
12 "Appendices Agricultural Characteristics and Impacts of
13 the Proposed Halton Region Landfill Site D". Is that
14 your work?

15 A. Yes.

16 Q. And the appendices are a companion
17 piece to the report?

18 A. That is correct.

19 MR. LEITCH: Mr. Chairman, I propose to
20 file the report. My friends have copies of them as the
21 next exhibit.

22 MR. LANCASTER: The report itself will
23 be marked as M-372 and the Appendices will be marked
24 M-373.

25 MR. LEITCH: Thank you



1 ---EXHIBIT NO. M-372: Document entitled "Agricultural
2 Characteristics and Impacts of
the Proposed Halton Region

Landfill Site D

4 ---EXHIBIT NO. M-373: "Appendices Agricultural
5 Characteristics and Impacts
of the Proposed Halton Region
Landfill Site D"

6 MR. LEITCH: Q. Mr. Hoffman, would you
7 first give the Board an overview of the work that you
8 did preparatory to preparing your report?

9 A. We did a number of things before
10 we prepared our report. We reviewed existing
11 literature on the characteristics of the site,
12 particularly soils and soil capability. This is
13 information published by the Ontario Ministry of
14 Agriculture and Food.

15 We then subsequently went out in the
16 field and looked at two principal pieces of
17 information. The first involved the mapping of the
18 soils on the site. The interpretation of those soils
19 for agricultural capability. The second was to look at
20 agricultural land use, that is the crops that were
21 found on the site and adjacent to the site. This kind
22 of information we have summarized here on these two
23 exhibits.

24 MR. LEITCH: I wonder, Mr. Chairman, if
25 we could have the exhibits marked as Mr. Hoffman gives



1 his overview of his work. I think you will find that
2 that will give you a better context.

3 MR. LANCASTER: Which one are you going
4 to start with?

5 THE WITNESS: This one here.

6 MR. LANCASTER: Would you mark that one
7 374, please and explain what it is.

8 THE WITNESS: This is a map overlaid
9 on an aerial photo mosaic which shows the soil map and
10 soil capability of Site D.

11 ---EXHIBIT NO. M-374: Map overlay showing soil map
12 and soil capability of Site D

13 MR. LANCASTER: Thank you. And the other
14 one?

15 THE WITNESS: This is Site D
16 agricultural land use.

17 MR. LANCASTER: M-375.

18 ---EXHIBIT NO. M-375: Site D Agricultural
19 Land Use

20 MR. LEITCH: Q. Mr. Hoffman, then just
21 explain these before you move to the next exhibit, what
22 you did to compile those two exhibits which have been
23 marked as M-374 and M-375?

24 A. In Exhibit 374 we travelled across
25 the site in two directions more or less north-south and
then again east-west. We dug a number of boreholes



1 which are shown here on Exhibit M-374 as dots. Each
2 one of those is numbered. There are approximately 67
3 boreholes. We used either a shovel or a manually
4 operated soil probe to find the soils there.

5 We then subsequently interpreted the
6 soils we found into capability classes following the
7 system used throughout Canada for placing soils in
8 agricultural capability classes, 1 to 7.

9 Q. You have three colours in the
10 overlay on M-374. Do they represent three classes of
11 soil?

12 A. Yes, they do. The green colour
13 represents Class 1 soils which are the best soils for
14 common field production. The orange is Class 2 and the
15 area that has no colour is Class 3.

16 Q. You can then perhaps go to M-375
17 and give a similar description of how you produced the
18 information shown on M-375?

19 A. While we were on the site we
20 recorded the various crops that we found in each field
21 and then we travelled around the site on the roads that
22 are there and observed what crops were being grown.

23 So, the symbols that are shown on this
24 exhibit, M-375, refer then to different kinds of crops.
25 The legend for this is found in our report, Figure 19,



1 page 35.

2 Q. That then is a larger
3 representation of a similar diagram in your report?

4 A. That is correct. We have added
5 additional information around the site that is not in
6 the report. The other thing that I might explain is
7 that I will briefly go through some of the symbols that
8 are here. SMG, for example, is small grains. Pl is
9 ploughed. Be is beans, C is corn, F is forage.

10 Q. That legend is found in the
11 report?

12 A. That is correct.

13 Q. Proceed with the next exhibit you
14 described?

15 A. While we were out in the field we
16 also took photographs. I have a 360 degree panorama of
17 the site. These photographs were taken from a location
18 shown here on this exhibit and the A through J
19 corresponds with the photographs identified as A
20 through J.

21 MR. LEITCH: Could we then mark the
22 exhibit beginning with photographs as M-376,
23 Mr. Chairman?

24 MR. LANCASTER: Yes.

25 ---EXHIBIT NO. M-376: Photographs A through J



1 MR. LANCASTER: Perhaps the location
2 plan as M-376-A.

3 ---EXHIBIT NO. 376-A: Location Plan

4 MR. LEITCH: Q. You were there when the
5 photographs were taken, Mr. Hoffman?

6 A. I took the photographs.

7 Q. What time of year was that?

8 A. That was in April 1987.

9 DR. KINGHAM: The Exhibit M-375
10 relates to a figure in your report? I wonder if you
11 could just tell us what that figure is? It is written
12 on the bottom, I just can't read it?

13 THE WITNESS: Legend, refer to Figure
14 19, Page 35, Exhibit No. M-372.

15 DR. KINGHAM: Page 35, thank you.

16 MR. LEITCH: Q. Can you just check that
17 Mr. Hoffman to ensure that we have the correct page?

18 A. Yes, it is page 35.

19 Q. Page 35, Figure 19 is a
20 description key to map crop symbols. Can you tell us
21 where the crop map is found in the report? At page 23?

22 A. Yes, that is correct, Figure 11,
23 page 23 is the crop map which is similar to Exhibit
24 M-375. The key which is found on page 35 should be
25 used for both Figure 11 as well as an additional



1 figure, Figure 16 on page 31.

2 Q. The Figure 16 on page 31 is a crop
3 map of Site F?

4 A. That is correct, yes.

5 Q. So, in using the key to the map
6 crop symbols, you can go to either site and see what
7 your findings were in terms of what were grown at the
8 time of your site visits?

9 A. That is correct.

10 Q. All right then. If you would
11 carry on then with your overview.

12 A. After mapping the site we did a
13 literature review that looked at the rehabilitation of
14 former mined lands to be used for landfill and
15 ultimately to be used for agricultural after uses. We
16 have referred to that literature throughout our report.

17 After completing those two components we
18 reviewed the reports produced by Ecological Services
19 for Planning, the Phase 2B and 2C reports as well as
20 the after use report. We also reviewed the Trow
21 Limited one on operations and design. On the basis
22 then of the information we gathered and that which we
23 reviewed we looked at the rehabilitation plan for Site
24 D.

25 We first took the information supplied



1 by Dr. Mackintosh and went through a mathematical
2 calculation to show what current cropping potential was
3 on the site and what cropping potential would be after
4 rehabilitation.

5 This exhibit uses the areas already
6 outlined by Dr. Mackintosh in his report and these
7 areas then were used to calculate productivity for the
8 entire site.

9 Q. I wonder if that exhibit entitled
10 "Site D Agricultural Rehabilitation Plan" might be
11 marked, Mr. Chairman?

12 MR. LANCASTER: We will give it M-377.

13 ---EXHIBIT NO. M-377: "Site D Agricultural
14 Rehabilitation Plan"

15 THE WITNESS: In addition to that work
16 we considered some of the other characteristics of the
17 site. We wanted to see what the effect of the berms
18 were that were on the east side of the site as well as
19 former soil storage pile area.

20 We then completed a detailed
21 agricultural rehabilitation plan that looked at the
22 effects of these things on the overall rehabilitation
23 plan on this site.

24 MR. LEITCH: Q. You prepared an exhibit
25 in respect to that?

A. That is correct.



1 MR. LEITCH: Could that be the next
2 exhibit, please, M-378?

3 ---EXHIBIT NO. M-378: Site D Detailed Agricultural
4 Rehabilitation Plan

5 THE WITNESS: The existing and post-
6 rehabilitation productivity levels on the site can be
7 viewed in two different ways. In the first instance we
8 looked at the production of productivity indices where
9 Class 1 is given the value 1. All subsequent classes
10 are rated relative to that value 1. This system was
11 published by Dr. D. W. Hoffman and looked at a number
12 of sites throughout Southern Ontario. Actual crop
13 yield measurements were taken and the yield values
14 compared with Class 1 lands through to Class 4 lands
15 for common field crops.

16 MR. LEITCH: Q. You have prepared an
17 exhibit in respect of the work that you found and the
18 work that you did in respect to Site D?

19 A. That is correct.

20 MR. LEITCH: Could that then be marked
21 as Exhibit M-379?

22 MR. LANCASTER: Yes, M-379.

23 ---EXHIBIT NO. M-379: Existing and post-rehabilitation
24 productivity indices Site D

25 THE WITNESS: The difference in yields
can be expressed in terms of corn, grain corn yields in



1 tonnes per hectare instead of just in the form of
2 productivity indices.

3 So, Smith, Hoffman then produced this
4 chart which demonstrates existing and post-
5 rehabilitation of grain corn yields on Site D.

6 MR. LEITCH: Q. That is what is
7 commonly called a bar chart?

8 A. That is correct.

9 MR. LEITCH: I wonder if we could have
10 that marked as the next exhibit?

11 MR. LANCASTER: M-380.

12 ---EXHIBIT NO. M-380: Bar Chart of Site D

13 MR. LEITCH: Q. Having marked these
14 exhibits, Mr. Hoffman, are they the exhibits which
15 cover the work which your firm did?

16 A. That is correct.

17 Q. Sir, I understand that you reached
18 certain conclusions as a result of your work which are
19 set forth in the report at page 62. I would like you
20 to state those conclusions to the Board and then
21 commence at the beginning of the report and give the
22 Board a description of your work and how you arrived at
23 those conclusions?

24 A. The first conclusion is that there
25 is no quantitative data on crop yields for



1 rehabilitated landfills in Ontario.

2 The English literature -- the second
3 conclusion is that the English literature shows that
4 rehabilitation requires a specific code of practice, a
5 set of specifications if you like, and that with these
6 crop yields are often reduced by drainage and escaping
7 gas such as methane.

8 The third conclusion, problems of
9 subsidence, gas generation, impeded drainage, crop
10 species, restrictions and nuisance will occur on the
11 rehabilitated site. That is Site D.

12 The fourth conclusion, a site that had
13 the potential to produce crops will have a
14 significantly reduced potential when rehabilitation is
15 complete. In its present condition the site could
16 produce, that is the best it could produce, between 80
17 to 82 per cent of what the best land, that is Class 1
18 land, in Ontario could produce. So this is for common
19 field crops such as corn, wheat, oats and barley.

20 So Class 1 then is at the 100 per cent
21 level. The current site can produce between 80 to 82
22 per cent of that Class 1 land. After rehabilitation
23 the land would produce 45 to 53 per cent of Class 1
24 land.

25 An additional conclusion, a number of



1 factors difficult to quantify, will affect the
2 agricultural community. These include reduced access
3 for slow moving farm machinery, the perceived dangers
4 associated with leaking gas, and the possible down-
5 gradient effects of leachate.

6 We continue then on page 63, agriculture
7 in Halton makes a significant contribution to the local
8 community. Site D is in an area of active agricultural
9 use, Site D is constituted by Class 1, 2, 3
10 agricultural lands which the Food Land Guidelines
11 identifies as lands of agricultural potential which
12 should be preserved.

13 The proposal to landfill on Site D and
14 rehabilitate to an agricultural after-use will result
15 in negative impacts on this agricultural resource. The
16 rehabilitated site's production potential will be
17 reduced. Post-development yield as a per cent of pre-
18 development yield, is 59 to 65 per cent, that is
19 expressed in terms of grain/corn yields.

20 Said in an alternative way, what was 100
21 per cent Class 1 through 3 agricultural land will
22 become predominantly Class 3 and 4.

23 The landfill proposal may create
24 additional negative agricultural impacts such as a non-
25 agricultural intrusion in an agricultural community,



1 interference with machinery movement and access,
2 nuisance such as noise, bird damage, fear of gas
3 explosion, possible contamination of down-gradient
4 wells or surface water.

5 In summary, because of both long-term,
6 that is, loss of soil capability and short-term impact
7 during the life of the landfill, Smith, Hoffman's
8 assessment indicates that in compliance with the Food
9 Land Guidelines, the proposed landfill should be
10 accommodated, if possible, on lands unsuitable or of
11 lower priority for agriculture.

12 Q. Having stated those conclusions
13 and your summary, Mr. Hoffman, I would like to go back
14 to the beginning of the report, section 1, at page 1
15 and present your work chronologically and through the
16 report coming to the conclusions that you have.

17 A. As outlined on page 1, our terms
18 of reference included a review of the agricultural
19 documents prepared for the landfill environmental
20 assessment. An assessment of the agricultural
21 characteristics and impacts on agriculture for landfill
22 proposed on Site D. Finally, our opinion concerning
23 the proposed rehabilitation to an agriculture after-use
24 for Site D. The report looks at three principal
25 subject areas.



1 The first in section 2 describes the
2 agricultural activity in the Region of Halton and
3 reviews current planning methods to differentiate
4 levels of agricultural activity and therefore potential
5 impact.

6 Section 3 reviews the site-specific
7 characteristics of the proposed Sites D and F. As
8 outlined in the report this data includes the data
9 compiled from field studies.

10 Section 4.0 addresses the proposed
11 rehabilitation of Site D and includes a literature
12 section on the state of the art in agricultural
13 rehabilitation.

14 So, from there I took a look at
15 agriculture in an overview. This has to be put in the
16 context of existing government policy. So, I discussed
17 the Food Land Guidelines. The Food Land Guidelines
18 then are part of this provincial government policy
19 which was produced to implement its -- that is the
20 government's commitment to the maintenance of a
21 permanent, secure and economically viable agricultural
22 industry for Ontario.

23 The Food Land Guidelines describe a
24 method for differentiating the better from the poorer
25 farmlands. These better lands include lands with the



1 capability for the production of specialty crops, Class
2 1 to 4 soils as defined in the Canada Land Inventory
3 for soils capability. Additional areas where farms
4 exhibit characteristics of ongoing viable agriculture
5 as well as areas where local market conditions ensure
6 agricultural viability where it might not otherwise
7 exist.

8 So, those four things then are taken
9 from the Food Land Guidelines. These Guidelines also
10 state that lands need to be identified, designated in
11 Official Plans and supported by policy. As well, the
12 Guidelines discuss methods of rating land which include
13 an examination of social, economic and the physical
14 characteristics from an agricultural perspective.

15 We produced a figure which looks at the
16 kinds of information needed to differentiate the better
17 from the poorer lands.

18 Q. Is that Figure 1 following page 4?

19 A. Yes. That figure is not in my
20 document.

21 MR. LANCASTER: Nor is page 5.

22 DR. KINGHAM: I have a copy of the
23 figure in my copy which is presumably this long page,
24 page 5.

25 MR. LEITCH: Q. Just deal then with the



1 figure which appears to be page 5 although not
2 numbered.

3 DR. KINGHAM: Just so that we can
4 check, the current version of page 4 and page 6 that I
5 have seem to continue, the sentence continues. I think
6 we can assume that page 5 is the figure.

7 THE WITNESS: That is correct.

8 MR. LEITCH: Q. What have you done then
9 in Figure 1, Mr. Hoffman?

10 A. We have described a number of the
11 characteristics used to differentiate better from
12 poorer lands in planning studies. If we look under the
13 first column, characteristics, we are interested in
14 capability for the production of specialty crops as
15 well as general production of agricultural products.

16 Factors then include: climate, crops and
17 livestock, capital investment in agriculture,
18 ownership/tenure, farm type and parcel sizes. Impacts
19 off-site, impacts on the agricultural community, the
20 characteristics of adjacent land uses, spin-off
21 effects, a description of the need for a particular
22 project and some description of other miscellaneous
23 factors that we found in different studies.

24 Q. Where do those characteristics
25 come from? What are they relative to?



1 A. These characteristics then are
2 outlined in a number of different planning or policy
3 statements. So, for example, in the Food Land
4 Guidelines we have listed a number of things that are
5 requested within those guidelines, so that an
6 individual can differentiate the better from the poorer
7 lands, agriculturally.

8 Then a second column listed by the
9 Ontario Ministry of Agriculture and Food as part of an
10 environmental assessment statement of requirement for
11 major projects, this is information supplied by the
12 Ministry. In this case they have outlined more
13 specifically the kinds of data they want the proponent
14 to look at when they are reviewing the impacts on
15 agricultural lands.

16 The next column lists those factors that
17 were used by the Region of Halton in its agricultural
18 land evaluation system.

19 Q. Just describe briefly what that is
20 for the Members of the Board?

21 A. The Region prepared a document
22 called "Agricultural Land Evaluation". We have
23 referred to that particular document within our report.

24 Q. Is it also contained in the
25 appendices at Tab 1?



1 A. That is correct. This system
2 rates lands for the entire region and looks at
3 characteristics of specialty crop capability, land area
4 and Canada Land Inventory classes, corn heat units,
5 buildings, tile drainage, road access, ownership/tenure
6 patterns, fragmentation, land parcel size. Continuity
7 of agricultural areas, surrounding development and land
8 uses, a general ownership pattern. There are a number
9 of factors listed.

10 Next to that we reviewed a system used
11 by the Region of Ottawa-Carleton, again to
12 differentiate good agricultural lands and poorer
13 agricultural lands. As you can see in Figure 1 they
14 have looked at anything from capability through the
15 crops and livestock. Ontario Hydro in its transmission
16 line studies has a number of factors when trying to
17 choose transmission routes. Again they range from soil
18 capabilities through to kinds of crops through to
19 agricultural investment and irrigation, to building
20 characteristics. It includes agricultural community
21 factors as well as adjacent land uses.

22 The same is true for the Ontario Waste
23 Management Corporation process and at the end there we
24 have listed the kinds of factors used in the Halton
25 landfill environmental assessment. As can be seen by



1 that, all of the factors tend to be represented. That
2 is anything from capability through to crops and
3 livestock through to capital investment, property
4 ownership, size, fragmentation.

5 Q. How shall the Board use this
6 Figure 1 then in the context of your report?

7 A. This was put together to show that
8 there are a number of things that can be used to
9 differentiate the better from the poorer lands. And to
10 assist the Board in seeing how they are used within
11 different projects, or by different groups.

12 The table shows that the Halton landfill
13 environmental assessment follows an existing accepted
14 planning process for differentiating agricultural
15 lands.

16 Q. At page 6, starting at page 4 and
17 running through to page 7 and 8 with Figures 2 and 3
18 you deal with the Region of Halton agricultural land
19 evaluation system. Would you please review that and
20 show the Board how it designates farmland in Halton?

21 A. As outlined on page 4 the
22 agricultural land evaluation system uses 8 main
23 criteria and 19 specific criteria. The criteria were
24 weighted and a numerical system used to rate lands
25 throughout the region. The system was reviewed and the



1 ranking of categories and the weighting determined by
2 the Halton Agricultural Advisory Committee?

3 Q. What is the Halton Agricultural
4 Advisory Committee?

5 A. A special committee constituted to
6 advise the Region on agricultural matters.

7 The same evaluation system was reviewed
8 by the Niagara Escarpment Commission and the Ontario
9 Ministry of Agriculture and Food. The Region
10 concludes, about the comments of these external
11 reviewers, that while further refinements are possible,
12 it would appear that the consensus of opinions is now
13 the results of the Halton agricultural evaluation
14 system appear reasonably accurate and supportable.

15 Q. Is that statement which is in
16 parentheses found in the report at Tab 1 of the
17 appendices?

18 A. That is correct.

19 Q. Can you give us the page reference
20 for that, Mr. Hoffman?

21 A. I am sorry, I can't at the moment.
22 I could endeavour to do that later.

23 Q. All right. If you could look at
24 that over the break.

25 What is the result of that study?



1 A. The result of the study can be
2 shown in the production of maps. Maps from the study
3 are reproduced in Figure 2 and Figure 3 of Smith,
4 Hoffman's report. If we look at Figure 2 the stippled
5 area on that figure shows those lands which have a
6 higher agricultural value.

7 Q. I see a note at the top left area
8 above 550 threshold value. What does the number 550
9 represent?

10 A. The number 550 refers to the score
11 for each one of the blocks looked at by the Region. The
12 550 value was chosen in consultation with the Halton
13 Agricultural Advisory Committee and with the Ontario
14 Ministry of Agriculture and Food. So that anything
15 that has that value or higher is deemed to be better
16 agricultural land within the Region.

17 DR. KINGHAM: What is it actually a
18 score of, corn units?

19 THE WITNESS: It is out of 1000, it is
20 a numerical value that assigns a value, take capability
21 for example and then gives it a weighting factor. You
22 multiply that together and you will get a value of, for
23 example, of 100 for one block on the map. Then you
24 will go to the next criterion which looks at partial
25 size. Partial size will have a value of 30, it will be



1 weighted for something else.

2 All these factors are then added up so
3 that the best score you can get is 1000.

4 DR. KINGHAM: That includes soil type,
5 parcel size, drainage, the whole bunch?

6 THE WITNESS: That is it exactly. It
7 includes the value of agricultural investments such as
8 tile drainage as well.

9 MR. LEITCH: Q. Is that at Tab 1 in the
10 appendices graphically illustrated at page 19, 20 and
11 21?

12 A. That is correct.

13 Q. That shows the evaluation system
14 and its categories and sub-categories and the numerical
15 values assigned?

16 A. Yes, it does.

17 Q. With a maximum total score then of
18 1000 as it appears on page 21?

19 A. That is correct.

20 Q. This is a system which has been
21 produced by the Region of Halton to identify lands
22 within Halton as to capability?

23 A. That is true. They include
24 capability but they also include the other factors that
25 are listed on pages 19 to 21.



1 Q. This rating, is it a rating based
2 on all of the characteristics set out on those pages?

3 A. That is correct, yes, it is.

4 Q. So then, is there some program,
5 computer program or method of calculation used to
6 determine these ratings?

7 A. Yes. The Region gathered
8 information from existing sources, assigns scores using
9 the rating sheet that is shown in Tab 1, pages 19 to
10 21. Generated then the value for each square, put the
11 information on the computer and then produced these
12 computer-generated maps. The computer-generated maps,
13 as discussed previously, are in Figures 2 and 3, pages
14 7 and 8 of Smith, Hoffman's report.

15 Q. Just looking at Figure 7, Mr.
16 Hoffman, it would appear that in an overall view of the
17 Region of Halton that there is some difference between
18 the lands in the north, the northwest and the lands in
19 the southeast. What can you, as an agrologist, say
20 about that?

21 A. The lands to the southeast have a
22 higher soil capability and are used more actively for
23 farming. Those which are up in the northwest have a
24 lower capability and do not have the same agricultural
25 use. That is they are not into crops in the same way.



1 Q. Is there a geographical barrier or
2 reason for that?

3 A. The Niagara Escarpment
4 differentiates one area from the other.

5 Q. Mr. Hoffman, using the system as
6 set out in the Halton agricultural land evaluation
7 work, would it be possible to inject, if you will, the
8 fact of landfill at Site D to see what effect that
9 might have to the surrounding areas?

10 A. Yes, one could put the landfill in
11 there and then use the computerized information to see
12 how it effects the site and the existing land use.

13 Q. If we turn then over to Figure 3
14 there are certain numerical values which are assessed
15 to certain parcels of land, it would appear?

16 A. Yes.

17 Q. Could you explain to the Board
18 what the numerical values relate to and in particular,
19 I am having some difficulty in determining the
20 numerical values of Site D in the three parcels. You
21 might assist us by giving us those numbers if you have
22 them.

23 A. The numbers in each of the square
24 blocks represent the score achieved after measuring
25 each one of the factors listed for the land evaluation



1 system at Tab 1, pages 19 to 21. The values on the
2 site in the northwest upper corner, that one appears to
3 be 678 out of 1000. The one just south of that is 643
4 and I am unable to read the one that is in the
5 southeast corner. We would have to go back to the
6 original map to try to get that.

7 Q. Is it possible to do that?

8 A. Yes, it is.

9 Q. Can you do that over the break?

10 A. Yes.

11 Q. Are there any areas approaching
12 the 1000 that would be the ideal score?

13 A. No, none of them approach that
14 ideal score.

15 Q. Is there a numerical average set
16 out anywhere?

17 A. I don't presently know if there is
18 a numerical average. Again we would have to try to
19 find that out.

20 Q. Continuing then with the
21 agricultural evaluation system, what conclusions did
22 you reach after having reviewed that?

23 A. Agriculture is active within the
24 Region and there is a system which clearly shows or
25 differentiates the better from the poorer agricultural



1 lands. Site D is situated in an area where there is
2 predominantly better agricultural land.

3 Q. Is there another source that you
4 used to overview the activity of agriculture in Halton?

5 A. Yes. We looked at existing
6 information compiled by the Ontario Ministry of
7 Agriculture and Food as well as Statistics Canada.

8 Q. Where do you find that
9 information, where do you go to find that data?

10 A. The data from the Ontario Ministry
11 of Agriculture and Food is compiled in statistical
12 packages, if you like, or a single report yearly. It
13 is available to any member of the public should they
14 request this information. The Statistics Canada
15 information is obviously compiled by the federal
16 government and can be obtained either directly from the
17 federal government or from some sub-consultants who
18 have already analyzed some of that information.

19 Q. You have looked at those sources?

20 A. Yes, we have.

21 Q. What did you find?

22 A. As outlined on page 9 the amount
23 of improved farmland, the number of farm owners and the
24 amount of land farmed by owners has increased in Halton
25 between 1976 and 1981.



1 Q. You make reference there to Figure
2 8, where would you find that?

3 A. Figure 8 is on page 15.

4 Q. Under the title "Farm Population
5 and Tenure"?

6 A. That is correct.

7 Q. How shall the Board do that, there
8 are two columns, one for 1976 and one for 1981 each of
9 which shows the province relative to Halton?

10 A. That is correct. We can take the
11 figures, for example, under owners for Halton in 1976
12 and compare them to 1981. We went from 415 farm owners
13 in 1976 to 592 in 1981. The number of tenants went
14 down by 2 from 1976 to 1981, 136 to 134.

15 Q. The amount of improved farmland
16 which was referred to at page 9, where would we find
17 that on Figure 8, or is that set out on Figure 8?

18 A. That would be set out in another
19 figure.

20 Q. Which figure is that in, Figure 7?

21 A. Figure 7, page 14.

22 Q. Could you show the Board how you
23 come to the conclusion that the amount of improved
24 farmland has increased between 1976 and 1981?

25 A. Under 1971, column C, we have



1 improved land area under crops. The value there is
2 7,855,890 acres. It is now 8,976,664 acres. That is
3 not now, that is in 1981.

4 Q. If we use the 1976 figures is
5 there again support for the conclusion drawn on page 9?

6 A. Yes, there is. If I continue then
7 with the other factors from information prepared by the
8 Ontario Ministry of Agriculture and Food, Halton ranks
9 22 out of 42 counties or districts in Southern Ontario
10 in terms of total value of census farm sales. That is
11 using 1981 data. Halton ranks 19 out of 42 counties or
12 districts in Southern Ontario in terms of capital value
13 of census farms. That is again using 1981 data.

14 The area in census farms has increased
15 as has the area under crops in Halton. This information
16 is outlined in Figures 6 and 7. We also note at that
17 point that the dollar value that defines census farms
18 was increased in the 1981 census. We define that
19 within the glossary.

20 Q. That is at the back of the report?

21 A. That is correct.

22 Q. What page is that?

23 A. Page 70. On page 70:

24 "The 1981 Census defines census farm as
25 an agricultural holding with annual



1 A. Soybean production, while
2 comprising only about 1 per cent of total farm cash
3 receipts has increased. Acreage was approximately 1728
4 in 1981 and that increased to 4500 in 1986.

5 Q. Who is Mr. MacMaster or P. E.
6 MacMaster?

7 A. That is Phyllis MacMaster and she
8 is the agricultural representative in the Region.

9 Q. The work that Dr. Mackintosh has
10 done has some findings with respect to soybeans. Were
11 you here when he gave his evidence?

12 A. Yes, I was.

13 Q. What is your recollection of that?

14 A. The discussion centering on
15 soybeans was that they are difficult to grow on
16 rehabilitated lands. This relates to some of our
17 experience on the Dawn to Kerwood pipeline.

18 Q. Yes.

19 A. As I recall, that was the gist of
20 his discussion.

21 Q. Do you recall the recommendation
22 with respect to whether or not soybean production would
23 be continued on this rehabilitated land?

24 A. Dr. Mackintosh indicated that
25 soybeans would not be grown on rehabilitated land at



1 Site D.

2 Q. What is the present position of
3 Site D with respect to soybeans, are soybeans being
4 grown there now?

5 A. Yes, there are beans being grown
6 on the site. If I may refer to my land use exhibit.

7 Q. Yes, certainly.

8 A. At the time we did our survey in
9 April bean stubble was found in the southeast corner of
10 Site D in a number of the fields in that southeast
11 corner. We have marked them here in Exhibit M-375 as
12 Be for beans.

13 Q. Were there any beans being grown
14 on the western portion of the site?

15 A. We didn't find any evidence that
16 there was beans being grown there at the time. There
17 were some beans being grown immediately adjacent to the
18 site and north of the site on the east side. These
19 two fields I just pointed out here on Exhibit M-375.

20 Q. What is the importance of bean
21 production on land suited for common field crops?

22 A. Well, with beans one has a better
23 opportunity, as a farmer, of making a profit because
24 the returns that they normally give are higher relative
25 to a number of other common field crops.



1 Q. Do you deal with that later in
2 your report?

3 A. Yes, we discuss that.

4 Q. Can you deal with the last
5 asterisk, rural farm population?

6 A. Rural farm population and rural
7 non-farm population has decreased in Halton between the
8 years 1976 and 1981. This is outlined in Figure 8,
9 page 15. If we look at the percentage of people living
10 on farms in Halton in 1976 as opposed to 1981 the
11 percentage has changed from 1.6 to 1.2.

12 Q. Is that relative to a percentage
13 of the total population of Halton?

14 A. Yes, it is. The number of farms
15 in 1976 in Halton was 1035 and in 1981 in Halton it was
16 969. The number of owners have increased, however,
17 between '76 and '81, that is owners of a farm.

18 DR. KINGHAM: Is that owners of
19 farmlands who are then farming?

20 THE WITNESS: That is correct.

21 DR. KINGHAM: That is a net increase in
22 farmers.

23 MR. LEITCH: Q. What about increases or
24 otherwise of farm area?

25 A. In terms of total area alone in



1 Halton in 1976 there were 22,507 acres. In 1981 there
2 was 24,973 acres of farmland owned.

3 Q. Leaving aside ownership for the
4 moment, what about just the total farm area in hectares
5 as between 1976 and 1981, is that found in the upper
6 half of the graph?

7 A. Yes. The total farm area in Halton
8 in 1976 is 47,699 acres and in 1981 it is 129,030.

9 MR. LANCASTER: It refers to hectares?

10 THE WITNESS: I am sorry, hectares.

11 DR. KINGHAM: Is that figure correct?

12 THE WITNESS: From the information I
13 gathered from the Ontario Ministry of Agriculture and
14 Food, it is, yes.

15 DR. KINGHAM: Is it not the combination
16 of the last two figures on that page? I would refer
17 you to total farm area of province 5,966,816 which is
18 the sum approximately of the last two figures. Halton
19 47,699 is the sum of the last two figures under Halton.
20 Again in '81 it is approximately but not exactly the
21 same, but in Halton the bottom two figures add up to
22 52,217 as opposed to 129,030. I wonder if you would
23 like to check that?

24 THE WITNESS: There may be a
25 typographical error. We could check that.



1 MR. LEDERER: Mr. Chairman, if Mr.
2 Leitch will permit me, I ran into this. If you look at
3 this chart Figure 8 you will see that it proposes that
4 these figures are in hectares.

5 DR. KINGHAM: Yes.

6 MR. LEDERER: If you go back a page you
7 will see the figures are in acres. If you look at area
8 of census farms in acres you will see precisely the
9 same figure, 129,030. On the other hand if you convert
10 this to hectares you get precisely the figure you said,
11 it is 2.471 acres per hectare you will get to the
12 2000...

13 I appreciate Mr. Leitch allowing me. The only reason
14 in this case is it wasn't converted.

15 DR. KINGHAM: So the 129,030 acres
16 should really be 52,217 hectares?

17 THE WITNESS: That's right.

18 DR. KINGHAM: I didn't see how we could
19 get three times as much farmland in Halton. It was a
20 mystery.

21 MR. LEDERER: Much as that would help
22 us...

23 MR. LEITCH: Q. Having taken all of the
24 data into account did you reach some conclusions with
25 respect to agriculture in Halton?



1 A. On page 17 we have concluded that
2 Halton's agricultural areas are producing crops at
3 average to above-average yields. Some areas are better
4 producers than others and have a higher potential for
5 long-term agriculture. Site D occupies an area of high
6 agricultural potential as well as use.

7 MR. LEITCH: Mr. Chairman, I will be
8 moving into the next section relative to specific
9 agricultural characteristics. If now would be a
10 convenient time to break?

11 MR. LANCASTER: It would be. Would you
12 provide those who are missing Figure 1 in the exhibit.

13 MR. LEITCH: Yes, I will.

14 ---Recess

15 MR. LANCASTER: Please be seated.

16 MR. LEITCH: Q. Mr. Hoffman, there are
17 two matters ...

18 MR. LANCASTER: Just a moment,
19 Mr. Leitch. Give the cameramen a few moments. I think
20 we are ready now, Mr. Leitch.

21 MR. LEITCH: Q. Mr. Hoffman, there
22 were two matters that you looked at over the break.
23 The first relates to on page 8, Figure 3, the land
24 evaluation map and we were looking for the numerical
25 value to be placed in the third block at the southeast



1 corner. Do you have that for us?

2 A. The value from the original
3 report, the southeast corner is 619 points.

4 Q. 619 points?

5 A. That is correct.

6 Q. Just confirming that the other two
7 are 643 and 678 respectively?

8 A. The 643 in the southwest corner
9 might actually be 613, we can't tell from the
10 information available to us which number it is. The
11 one in the northwest corner is 620.

12 Q. 628?

13 A. 620.

14 Q. Six, two, zero.

15 A. They are all difficult to read,
16 even in the original document.

17 MR. LEDERER: I am sorry, what is the
18 southeast corner?

19 THE WITNESS: 619.

20 MR. LEITCH: Q. Then you were going to
21 go to the appendix at Tab 1 and find for us the quote
22 that appears in your report. Did you do that?

23 A. The quote for the agricultural
24 land evaluation system is found, unfortunately the
25 pages in this document are numbered twice. If you look



1 at the bottom of the page where it says page 4.

2 Q. The bottom of the page, page 4?

3 A. Or you can look at the numbering
4 that has been handwritten on it and that is page 6.
5 So, under Tab 1 if you look at the top of the page,
6 page 6, if you look at the bottom of the page, page 4.

7 Q. Can you point to the ...

8 A. It is in the second to last
9 paragraph.

10 MR. LEDERER: I am sorry. Is this the
11 page that everybody else had missing?

12 DR. KINGHAM: No, this is in the
13 appendices. Under Tab 1.

14 MR. LEITCH: I will give my friend
15 another copy of the appendix.

16 Q. Can you identify that then in the
17 second last paragraph, the last sentence?

18 A. The last sentence, yes. That
19 sentence reads:

20 "While further refinements are possible,
21 it would appear that the consensus of
22 opinion is now that the results of the
23 Halton Agricultural Land Evaluation
24 System appear reasonable accurate and
25 supportable."



1 Q. That then would complete the first
2 section of your report. Could we now go to the site
3 specific agricultural characteristics commencing at
4 page 18 of your report, Exhibit M-372?

5 A. Our site specific work is outlined
6 on page 18 of the Smith, Hoffman report. We began by
7 doing a survey of field crops, farm buildings, and
8 residences on both Sites D and F by travelling the
9 roads.

10 As well, we completed road work which
11 looked at agricultural crops as well as soils. Soil
12 observations were made to a maximum depth of 120
13 centimeters using an Oakfield manually operated soil
14 probe. That just means I was out running around in the
15 field taking different probe samples in a number of
16 locations on each site.

17 Q. Just explain more graphically what
18 happens when you take the probe sample and what you
19 look at and what you determine?

20 A. The probe is pushed into the
21 ground and a core is removed. That core is taken out of
22 the probe, a hand texturing is done to find out what
23 the textural class of the soil is. Changes in horizons
24 are noted mostly by colour as well as by structure.

25 The parent materials of the soils are



1 tested for free carbonates by putting dilute
2 hydrochloric acid on them. The description then of any
3 stones or other materials found in the profile is
4 completed.

5 The kinds of tests that are done are
6 outlined in Figure 10 and the characteristics and
7 observation methods, page 19. So, texture we describe,
8 stoniness is grouped into classes following existing
9 classification systems used here in Canada. Slope is
10 measured in percentage by use of either a clinometer or
11 an abney level. Colour follows the Canadian system by
12 using colour charts. Horizons and depths more or less
13 the same thing you are observing changes over depth and
14 carbonates I have already described.

15 Q. In addition to taking those probe
16 samples, you dug some soil pits. Why did you do that?

17 A. The soil pits allow us to get a
18 better three dimensional view of the soils that are
19 presently there. So we dig the larger pits to be able
20 to see the kinds of variability that are present in a
21 three-dimensional sense.

22 Q. Then you classify or characterize
23 the findings?

24 A. That is correct. Each one of the
25 soils was classified and given a series name. Again,



1 this is a system that is used throughout Canada and the
2 names are used within Southern Ontario. So, we found
3 three soils on the site which were called Oneida or
4 Oneida, Chinguacousy and Jeddo. They are basically the
5 same soil. They just have different drainage classes.

6 Q. Referring to M-374 where you have
7 colours representing soils. Can you just point out
8 which is which?

9 A. Exhibit M-374 resembles Figure 13,
10 page 26 within our report. We refer to the soil map
11 then and as well we look at Exhibit 374, the photo
12 mosaic and the overlay. The Chinguacousy soils which
13 are Class 1 are marked in green. On the soil map
14 Figure 13, they are noted by the symbol CH. The Jeddo
15 soils which are marked with the simple J and are
16 relatively low lying, are clear on Exhibit M-374.
17 The Oneida or Oneida soils are orange. They are noted
18 by the symbol ON on the map. The three different kinds
19 of soils and their capability are all outlined on these
20 two maps.

21 MR. LANCASTER: Mr. Leitch, page 26 is
22 missing as well. Is it the map itself?

23 MR. LEITCH: The map itself is the page,
24 Mr. Chairman, I am advised.

25 MR. LANCASTER: Thank you.



1 THE WITNESS: Figure 13, the map, also
2 shows the location of the boreholes where we made our
3 observations. They are marked with a dot and given a
4 number. They are oriented. One line goes from the
5 northwest corner through to the southwest corner. The
6 other goes through the middle of the property more or
7 less east to west.

8 The symbols that we use on the map are
9 described in Figure 14, page 27. They consist of four
10 components. The soil series named, the slope class
11 which is underneath that soil series name, and then a
12 capability class of 1 through 7 and a sub-class
13 limitation.

14 MR. LEITCH: Q. Just dealing with the
15 first convention, with the words defining the meaning
16 of the symbols, tell us what that means to us as we
17 read that?

18 A. Figure 14?

19 Q. Yes.

20 A. So that the convention that we
21 have there shows there is a Jeddo soil, that is the J
22 symbol over level flat land which is a slope Class A.

23 Q. Yes.

24 A. That soil series then has the
25 capability class 3 and it is limited by wetness and low



1 permeability.

2 Q. W is for wetness and D for
3 permeability?

4 A. Yes.

5 Q. What does the D stand for, is
6 there a word that that relates to?

7 A. I don't know why they chose the
8 word D -- or the symbol D.

9 Q. But that is the permeability
10 symbol?

11 A. Excuse me for a moment and I will
12 check the system. Yes, as outlined in the Canada Land
13 Inventory soil capability classification for
14 agriculture, sub-class D is made up of soils adversely
15 affected by soil structure and/or permeability. Why
16 they chose D I am not certain.

17 Q. Tell me this, as well, the slope
18 class A. If we look at the slope class below you have
19 large 'A' and small 'a' together. How does that
20 relate?

21 A. The large 'A' is for simple
22 slopes, basically slopes in one direction. The small
23 'a' would be complex slopes, slopes that involve more
24 than one direction.

25 So, if you like, the large 'A' is quite



1 simple, quite straightforward, the small 'a' represents
2 a more convoluted rolling topography.

3 Q. So if I understand then your
4 Figure 13, soil map of Site D, as we go to the various
5 designations we can determine what soil classes series
6 and capabilities you have determined to compare Site D?

7 A. That is correct. If we look at
8 Exhibit M-374 and lift the overlay up the
9 characteristics of drainage on the site can be observed
10 by looking at the dark areas, the darker areas.

11 So, for example, this drainage area is
12 darker and is Jeddo series. It can be found throughout
13 the site. If we put the overlay back down again those
14 are the clear areas that show up there.

15 DR. KINGHAM: There is only one symbol
16 not defined, but I guess we can guess what it is, that
17 P would stand for pond would it?

18 THE WITNESS: That is correct.

19 DR. KINGHAM: The other question I had,
20 how do you define the boundary of your contours in
21 areas where you don't have boreholes, in the upper
22 right-hand corner for example, there is a large area up
23 there. Leave the overlay down. If you can leave the
24 overlay down. You see the upper, that area. How would
25 you decide where a contour should be?



1 THE WITNESS: These contours relate to
2 the photograph, the aerial photographic interpretation.
3 That is part of the process. A number of samples are
4 taken, sub-samples of the area are completed and then
5 based on the aerial photographic characteristic the
6 lines are drawn. It is a combination of both the
7 boreholes as well as the ...

8 MR. LEITCH: Q. Is the photo
9 interpretation used for any other purpose?

10 A. The photo interpretation is also
11 used to show field boundaries, building locations, any
12 other kind of signature or land use if you like in the
13 area.

14 Q. Is it possible, looking at your
15 Exhibit M-375, looking at the variety of fields that
16 are shown on Site D is it possible to determine those
17 fields by making a site visit or do you have to do
18 something further?

19 A. The field boundaries are located
20 on the basis of the field visit, the aerial photograph
21 and as well the property ownership boundaries are often
22 of assistance to making decisions about where fields
23 are, or field boundaries will be.

24 Q. Continuing back at page 20 of the
25 report where you were assisting us with the



1 classification that you were doing?

2 A. Yes. So, the classification
3 system that we are using, especially the capability
4 classifications are those which were produced for
5 Canada as a whole. It is a system that has been in
6 place now for quite a long time. It has been
7 incorporated, as we mentioned previously, in the Food
8 Land Guidelines. We also looked at a system produced
9 by Ecologistics and Smith, Hoffman Associates for
10 Ontario Hydro where soils series were interpreted into
11 three classes, poor, fair and good for six specialty
12 crop groups.

13 The specialty crop interpretation is
14 limited by the lack of published climate data suitable
15 for application to 1 to 10,000 scale. We can say that
16 data sufficient to state that commercial tender fruit
17 crops cannot presently be grown successfully within the
18 study area.

19 Q. When you are referring to this
20 study area where are you referring to?

21 A. I am referring to the site proper
22 and the area around it.

23 Q. Are you aware of any tender fruit
24 crops that are grown in the larger area?

25 A. I am not aware of any tender



1 fruits grown in the larger area, no. The agricultural
2 crops on and around the proposed site are mapped on
3 Figure 11 for Site D as well as shown on Exhibit M-375.
4 So if you move on to that kind of thing the land use
5 section in the report is at page 22.

6 The proposed Site D is predominantly in
7 active agricultural use. Cropping patterns indicate
8 that approximately one-third of the site in production
9 was winter wheat, one-third in soybeans and one-third
10 in alfalfa.

11 Q. Just stopping there, you were here
12 when Dr. Mackintosh gave his testimony. One of those
13 components would not be part of the agricultural
14 rehabilitation that was proposed?

15 A. The one-third in soybeans will not
16 be part of that agricultural rehabilitation. We
17 continue then from that we did an analysis that looked
18 at field sizes in Site D. We recognized that they will
19 vary from year to year depending on the crops grown and
20 obviously the decisions that the individual farmer
21 wishes to make.

22 The other thing about this site is that
23 fields don't necessarily correspond very well to
24 ownership patterns. However, if fields are measured
25 with no regard to ownership their sizes range from 2 to



1 27 acres with a mean value of approximately 16.6 acres.
2 The area surrounding the site is predominantly in
3 agricultural use with common field crops or
4 pasturelands.

5 There is some rural residential land use
6 predominantly to the south and southwest of the site.
7 On these roads then that I am pointing to on Exhibit M-
8 375.

9 Q. Can they be identified on your
10 Exhibit M-374?

11 A. They show up as the area marked as
12 b for building. This segment here for example is rural
13 residential.

14 Q. Is the Exhibit M-375 to the same
15 scale as Exhibit M-374?

16 A. No, it is not. The scales are
17 different. The approximate scale on Figure 11 is 1 to
18 10,000 and the approximate scale of this one is 1 to
19 1000. Perhaps I will have to check that scale to make
20 sure that my assumption is correct.

21 Q. Indicating M-375?

22 A. Yes. M-375 I will have to check
23 the scale on it.

24 Q. Thank you.

25 A. Figure 12 then summarizes the



1 agricultural land use measurements for Site D. We
2 assigned a map unit number to different things,
3 outlined the crop and then measured, using a
4 planimeter, the relative area of each of those
5 different crops. Other land uses were noted, woodlots,
6 ponds and farm buildings.

7 Q. Did your measurements bring any
8 degree of correspondence between design and operations
9 report and your own observations?

10 A. In terms of the total area of the
11 site, 126 hectares, we measured correspondence with 126
12 hectares outlined in the design and operations report
13 as well as in the front part, not the agricultural
14 portion but the front part of the comparative analysis
15 report by Walker et al.

16 If we move then on to soils and
17 capability, page 25, I have already described the
18 different soils series and the capability
19 interpretation. Specialty crop capability on the site
20 is limited to Oneida and Chinguacousy soils and is
21 restricted to a narrow range of food crops, principally
22 because of the clay texture of the soils. We are
23 talking about growing broccoli and cauliflower.

24 Normally an individual wouldn't choose
25 to plant these kinds of crops on this site unless they



1 had a market close by. They would probably choose land
2 that were a bit easier to work and had a higher sand
3 content.

4 The relative proportion of the different
5 capability classes on-site was measured by Smith,
6 Hoffman. It is also part of a map produced for the
7 Ontario Waste Management Corporation and Ecological
8 Services for Planning also produced a map.

9 Q. What were your findings in that
10 regard?

11 A. We found that 60.34 hectares of
12 the 126 were Class 1, 4.57 were Class 2 and 56.31
13 hectares was Class 3, the Jeddo series.

14 Q. Just going back to Exhibit M-374.
15 Show us where the Class 2 lands would be?

16 A. The Class 2 lands are marked in
17 orange.

18 Q. Class 1? Sorry, go ahead.

19 A. The Class 2 lands are up here in
20 the southeast corner. The Class 1 lands are in green,
21 Chingaucousy, found throughout the site. Class 3 lands,
22 Jeddo or the clear areas interspersed throughout the
23 site.

24 Q. How did that correspond with the
25 findings in the OWMC study?



1 A. The OWMC study showed a similar
2 breakdown of different capability classes as did the
3 map produced by Ecological Services for Planning.

4 Q. You then did some work with
5 respect to Site F?

6 A. We completed work on Site F for
7 comparative purposes and we went through a similar
8 process to the one we went through for Site D. We
9 measured agricultural land use, what kinds of crops are
10 found on and adjacent to the site. We also looked at
11 the soils on that site.

12 From a land use perspective the land
13 uses around the site varied from industrial to
14 agricultural to rural residential and a Hydro right-of-
15 way. The agricultural uses are minimal. While there
16 are some orchards still present around the site they
17 have been neglected except where they have been
18 maintained as landscaping on industrial land. That is
19 found to the south of Site F.

20 Site F is covered, for the most part by
21 former extractive areas or by wooded areas.
22 Agricultural uses were restricted to the extreme north
23 and south ends of the site. Lands in the south are
24 abandoned agricultural fields, while those in the north
25 had forage production in 1986.



1 Q. Is there a way of determining
2 where those lands with forage production are located
3 from Figure 16 at page 31?

4 A. Yes, there is. If you refer
5 specifically to Figure 16 we have used the same kind of
6 classification system and if you look at that figure
7 any of the extractive areas on that map are marked as
8 E. The wooded area is W. Any forage is marked as F
9 and that is up in the north section.

10 The abandoned agricultural is found as
11 A. Just below the F in the north and the southeast
12 corner of the proposed Site F.

13 Q. When did you make your site visit
14 to Site F?

15 A. We made a number of visits to Site
16 F, approximately three. They varied from the late part
17 of 1986 through to mid-summer in 1987.

18 Q. Was there any active agriculture
19 on Site F in the summer of '87 that you could
20 determine?

21 A. There seemed to be a little bit of
22 cropping of the forages up in the north corner. That
23 is all.

24 Q. Did you reach some conclusions in
25 respect of percentages of farmable land relative to



1 other land?

2 A. Yes, we did. The total land in
3 abandoned agriculture and forage is about 16 hectares
4 of 17 per cent of the site. The land use on the site is
5 summarized on Figure 17, page 32 and the information
6 is summarized at the bottom of that figure so that the
7 number of hectares in forage is 4.66, the area then in
8 grass as it doesn't seem to have a legume in it, so we
9 can't really describe whether it is going to be cropped
10 by a farmer or not, is 3.95 hectares and the abandoned
11 area is 8.06 hectares.

12 We added those altogether to give us
13 this agricultural or possible agricultural use figure
14 of 16.67 hectares or approximately 17 per cent of the
15 site.

16 Q. Did you do any soil studies?

17 A. Yes, we did. The soil studies
18 have resulted in the production of a soils map, Figure
19 18, page 34. Much of the site has been extracted so
20 that the original soil profile is no longer present.
21 Some of the rest of the site shows a soil profile that
22 resembles the Chinguacousy series. So, we mapped that
23 and the symbols used on Figure 18 follow the same
24 convention as those which we used for Site D.

25 The boreholes where we did soil



1 descriptions are also shown on Figure 18. They are the
2 dots with the numbers beside them. As before we used
3 the aerial photographic interpretation as well as our
4 borehole information, as well as any information from
5 other sources such as the Ecological Services for
6 Planning document to produce this map.

7 Q. Did you reach some conclusions
8 about the capability of the soil?

9 A. The capability of the soil is
10 relatively low because the area has been extracted.
11 Approximately 51 per cent of the site is Class 7 and
12 the remainder has a breakdown of 6 per cent Class 5, 25
13 per cent Class 4, and 18 per cent Class 2.

14 Q. Does that 18 per cent Class 2
15 relate to the 17.7 hectares or 16.67 hectares?

16 A. There is a correlation between the
17 existing capability and the fields that have been put
18 together for the 17, approximately 17 hectares. So the
19 good soils and the existing crops, or the abandoned
20 croplands correlate.

21 Q. Having done that in respect of
22 Site F and in respect of Site D did you reach any
23 conclusion?

24 A. As outlined on page 33, Site D is
25 in an area of agriculture use where common field crops



1 such as corn, wheat and hay predominate. Some soybeans
2 are also presently being grown. The land has a good
3 capability for common field crop production having
4 Classes 1, 2 3.

5 Site F is located in an area of mixed
6 land uses where agricultural production is minimal. 90
7 per cent of the site is in non-agricultural uses and 51
8 per cent of the land has no agricultural capability.
9 Site F, in my opinion, cannot be considered as
10 farmland.

11 Q. You then turned to the question of
12 rehabilitation of Site D to agriculture after-use. I
13 would like to discuss in a summary way how you went
14 about that particular critique?

15 A. We took two approaches to the
16 rehabilitation to agricultural after uses. One was to
17 review the literature and the other was to use our own
18 field experience and supplement that with a review of
19 three sites in Waterloo region.

20 So that what we found by looking at the
21 information available through the Ministry of the
22 Environment, perhaps I should explain that the Ministry
23 of the Environment has a great pile of files where they
24 have attempted to find out where former landfill sites
25 are and how they are presently being used.



1 This information is not in a published
2 form so Smith, Hoffman went down to the Ministry of the
3 Environment and looked through their files. We
4 interpreted those files rather liberally to include
5 then any former landfill areas that might be used for
6 agriculture.

7 So, that was one piece of information we
8 used. The other was to go and do a computerized
9 literature search as well as to contact individuals in
10 England to see what they were doing presently for
11 rehabilitation. We also reviewed the literature
12 available here in Canada.

13 So, on that basis then we start out then
14 on page 36 by stating that in Ontario no data specific
15 to landfills could be found that quantify or predict
16 the success of rehabilitation to agriculture. We
17 discuss that later on in the report. Because of this
18 lack of data we reviewed on a broader basis the
19 literature to include lands disturbed due to right-of-
20 way construction for pipelines and Hydro transmission
21 lines and lands reclaimed after sub-surface mining.
22 That would include gravel pits.

23 The literature was reviewed to ascertain
24 if pre-disturbance agriculture yields could be obtained
25 after rehabilitation. We didn't re-review in detail



1 the information that has already been discussed by
2 Ecological Services for Planning in a report on the
3 former Region of Halton landfill study. These reports
4 were produced in 1980 and 1978.

5 Q. Are they relative to old Site F?

6 A. That's right, they are. We
7 summarized the information from these reports in Figure
8 20, page 38. The author McAllister in 1977 looked at
9 Alberta strip mines and found that good yields could be
10 obtained where sub-soil and topsoil was replaced. The
11 paper had no comparison to pre-disturbance yields or
12 yields on surrounding properties.

13 A paper by Power et al in 1978 stressed
14 the importance of soil cover, but had no specific yield
15 data comparisons.

16 Q. What do they mean by soil cover?

17 A. In this particular instance we are
18 talking about the -- how shall I say it -- putting a
19 soil profile back on top of formerly mined lands. So
20 you are putting in sub-soil as well as topsoil.

21 If you look at pits and quarries in
22 Southern Ontario a paper by Yundt in 1977.

23 Q. Who is Yundt? Do you know him?

24 A. She works for the Ministry of
25 Natural Resources out of Toronto and her primary



1 interest is former gravel pits.

2 Q. I take it some pits were found?

3 A. Yes, and pasture is being produced
4 in those areas. So that didn't help us find specific
5 information on common field crops.

6 A study in Burlington had no specific
7 data to compare to pre-disturbance yields. A study in
8 Brantford in 1975 by TCG Materials showed that yields
9 of corn were last in surrounding farmland. Take 47 as
10 opposed to 80 bushels per acre. In Brantford in 1977
11 TCG Materials' study looking at yields of winter wheat
12 and again the yields were less than surrounding
13 farmland. 34 as opposed to 54 bushels per acre.

14 In the Fonthill area TCG Materials has
15 been producing information from 1977 to the present.
16 The data originally compiled in the Ecological Services
17 report talked about cherry orchards but had no data at
18 the time of review. When we discussed the small
19 orchard that is on a former siltation pond in our
20 review of rehabilitation to tender fruit crops existing
21 data was available. The system is set up in such a way
22 that no specific information about pre-disturbance
23 yields versus post-rehabilitation yields could be
24 found.

25 The cherries that are there are dwarf



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23 yields versus post-rehabilitation yields could be
24 found.

25 The cherries that are there are dwarf



1 varieties. They would have a different root stock and
2 a different form relative to the ones that were planted
3 before the area was mined. The particular study of the
4 cherry orchard in part was an experiment. As they ran
5 into certain kinds of problems they produced different
6 management techniques to improve the yields. It has
7 been a learning experience for TCG Materials.

8 Q. Were you involved in that work?

9 A. I was involved in the tender fruit
10 crop evaluation study, yes, but I wasn't involved in
11 the Sarah Lowe's work with TCG Materials.

12 Q. The pits and quarries in Britain,
13 the information has mostly been produced by an author
14 by the name of McRae. That piece of paper, the
15 requirements for good rehabilitation and suggested
16 there were problems with winter conditions on
17 rehabilitated lands. Webber in 1973 obtained
18 information in Britain and looked at six sites. The
19 report indicated that good or comparable yields were
20 achieved but no numerical data was given in that
21 report.

22 Then landfill sites in the Waterloo
23 Region were looked at in the Ecological Services
24 document and they quote Pihura from the Region of
25 Waterloo and they look at two areas of forage



1 production and there is no yield data on that one
2 either.

3 The rehabilitation of pits and quarries
4 in agriculture in Ontario, Dr. Mackintosh,
5 Mr. Mozuraitis in 1982 outlined problems associated
6 with former pits and quarries. The report suggests
7 that rehabilitation is a success but no yield
8 information is reported in this statement. If we go to
9 a more specific study that reports on the same program
10 and outlined under the authorship of the Ontario
11 Institute of Pedology and the University of Guelph.
12 This report shows that the success of rehabilitation
13 was measured using the soil capability grading system.

14 This is the same kind of rating system used by land
15 assessors for the Ministry of Revenue. It deals with
16 the application of points to specific soil
17 characteristics.

18 On the basis of a capability rating
19 system it was a success but no yield information was
20 used to rate that success.

21 The second paper by Dr. Mackintosh and
22 myself in 1985 surveyed the rehabilitation of former
23 aggregate pits to fruit production. The paper listed
24 problems associated with the work and discussed the
25 requirements for rehabilitation and success. No data



1 on fruit yields before and after extraction were
2 available.

3 Q. Is that the report you referred to
4 in your curriculum vitae earlier?

5 A. That is correct. That report I
6 believe was also entered as evidence.

7 MR. LEDERER: The earlier one was the
8 one -- I am sorry -- they both were. One is B-116, I
9 don't know what the other one is.

10 MR. LEITCH: Q. That's a 1985 paper,
11 Mr. Hoffman, has there been to your knowledge any
12 yields before and after extraction since that time?

13 A. The TCG Materials cherry orchards
14 probably would have data available. The other pits we
15 looked at were under private ownership. I have no idea
16 if anyone has collected dated from those private
17 owners.

18 Q. Is there a difference, in your
19 opinion, between the rehabilitation of pits and
20 quarries and the rehabilitation of a landfill such as
21 that proposed at Site D?

22 A. The requirements for
23 rehabilitation are similar. If one compares pits and
24 quarries relative to a landfill. The same kinds of
25 requirements to deal with soil compaction, soil



1 handling, soil measurement, fertility, those kinds of
2 things are all common to both former gravel pits as
3 well as a landfill.

4 There are some problems, of course, that
5 are specific to a landfill. Those are differential
6 subsidence or subsidence overall as well as methane gas
7 production. You don't normally find those kinds of
8 problems in former gravel pits unless the gravel pit
9 was filled up with, what shall I say, unless it was
10 used as a landfill.

11 Q. Was that in fact done anywhere in
12 the world that you know of?

13 A. Yes. There are a number of former
14 gravel pits that have been landfilled in Britain.

15 Q. Do you deal with those later in
16 this report?

17 A. Yes, that is correct.

18 Q. Go back then to page 39 and talk
19 about yield levels relative to your pipeline work?

20 A. Yield levels were actually taken
21 in some work put together by Ecological Services for
22 Planning, Robinson, Merritt & deVries as well as Smith,
23 Hoffman in 1982 to 1984. Yield reduction was due
24 primarily to soil degradation, compaction and topsoil
25 loss ranged to 50 per cent. There were a number of



1 problems associated with drainage in those particular
2 soils as well.

3 After sub-soiling and use of green
4 manures like an alfalfa crop, yield differences ranged
5 from 20 to 40 per cent. That is if you compared the
6 former pipeline trench and access area to the rest of
7 the field there was still reduced yields on the trench
8 of 20 to 40 per cent.

9 The yield differences correspond to
10 those measured on Ontario Hydro access roads, on
11 rights-of-way. Up to 40 per cent in corn after chisel
12 ploughing in some cases. That is a report produced by
13 Ontario Hydro in 1978.

14 Q. Just explain that in respect of
15 use of those roads and rights-of-way and how it has
16 been attempted to rehabilitate to agriculture?

17 A. When I worked for Ontario Hydro I
18 was part of a planning team as well a team that looked
19 at rehabilitation. The transmission route would be
20 chosen on the basis of agricultural characteristics and
21 an access route to go from tower to tower would be
22 chosen. That particular access route in many cases was
23 run directly over the farm field. There wouldn't be
24 any gravel added. There would be no attempt to build
25 up any part of the field except in a low lying area



1 where they might put in a culvert and a bit of gravel.

2 So, they would use these things during
3 the construction phase, they would travel back and
4 forth with labourers, they would transport concrete and
5 all the steel required for the towers. So, at the end
6 of that construction period the roads were then ripped
7 with a chisel plough and then put back into
8 agricultural production because in most cases the roads
9 ran right through the middle of the fields.

10 In 1978 there was a question of how much
11 yields would be reduced on these roads so a colleague
12 and I at Ontario Hydro did a number of measurements on
13 the former access road as it goes through the rest of
14 the field. We looked specifically at corn yields that
15 were measured and bulk density samples were taken.
16 These figures then refer to that particular study.

17 Q. You do a similar description of
18 the pipeline problem and its attempted solution?

19 A. The pipeline problem was a long-
20 term problem. It was a result of having to construct a
21 pipeline twice. The pipe went into the ground, the
22 steel was inappropriate, I think there was a problem
23 with its collapse in some form or another. Anyway, the
24 pipeline didn't meet test requirements. It had to be
25 taken out of the ground and a new one put in. This



1 occurred in November when the soils were very wet and
2 there was a great deal of soil rutting and compaction
3 and mixing in general.

4 Many years after this particular
5 construction Union Gas was still having problems with
6 yields and suggested to the three companies involved,
7 that is, Ecological Services, Robinson, Merritt,
8 deVries and Smith and Hoffman that they should put
9 together a proposal to look at the problem, that is
10 identify what the problem is and to recommend
11 mitigation so that yield differences would not be as
12 great as they were at the time the study was initiated.

13 Q. Did you look at some other
14 literature you were discussing at the bottom of page
15 39?

16 A. That is correct. As we stated in
17 our report other literature sources in North America
18 listed the problems associated with landfills and they
19 proposed solutions for it. They didn't really go into
20 specifics about the success of different kinds of
21 rehabilitation. The best published literature which
22 outlines a plan, a planned, controlled and monitored
23 work and landfill rehabilitation to agricultural after
24 uses is British. Much of it is written by one author
25 by the name of McRae, Stuart McRae.



1 Q. I understand some of his work is
2 contained in the appendix to the report at Tab 4?

3 A. That is correct. Tab 4 contains
4 just a portion of one of the yearly reports associated
5 with joint agriculture and land restoration
6 experiments. Appendix B includes a revised code of
7 practice. That code of practice describes the kinds of
8 things that need to be looked at, the kinds of specific
9 planning and/or construction matters which should be
10 followed during both the use of the landfill and
11 ultimately its rehabilitation from the landfill area.

12 Q. Are you aware of how the Bush Farm
13 experiment was set up and over what timeframe that work
14 has been going on in Britain?

15 A. Yes. I am familiar with that
16 study. I took a tour of rehabilitated lands in 1984
17 and part of that tour included the work that is being
18 done on Bush Farm in Britain. The work has been in
19 progress for a number of years. I believe it goes back
20 at least to 1982.

21 The work, as outlined in our report, has
22 put together a specific code of practice. This code of
23 practice has evolved to cover a number of factors. The
24 kind of machinery used for soil pile placement, soil
25 movement, and reinstatement, the area of movement. In



1 other words, where these machines are going to move on
2 one portion of the site relative to the other.

3 If you control that movement in some
4 cases you can restrict your compaction to a specific
5 portion of the site. The code of practice also deals
6 with the separation of topsoil and sub-soil. The
7 placement form and erosion control for soil storage
8 piles. It outlines the character of soils imported to
9 the site. The code also discusses the kinds of wastes
10 permitted in the landfill, landfill construction detail
11 and landfill site control.

12 Obviously, some kind of landfill site
13 control is required if they want to look specifically
14 at the kinds of wastes that would be permitted in that
15 landfill. The code also talks about soil management
16 and cropping programs, weather and climate
17 restrictions. That is, they have a specific wet
18 weather shutdown policy If it gets wet then moving
19 soils will increase soil compaction. The code also
20 discusses artificial drainage requirements, their
21 methods and timing of their placement. It also looks
22 at deep cultivation requirements, again the methods
23 used and the time at which it is best done.

24 Q. When you went to England and
25 visited this site in 1984, were you able to determine



1 what had been filled with solid waste?

2 A. There were some areas that had
3 been filled and were currently under crops. We toured
4 those particular areas and looked at lands which had
5 had different rehabilitation schemes. So, for example,
6 there were some areas where there was no gas venting
7 system. There were other areas where there were gas
8 venting systems.

9 Q. Was the fill mounded in a way that
10 is proposed at Site D or was it different?

11 A. No, in this particular instance, a
12 hole had been dug in the ground. The hole had been
13 filled with garbage and the current field I guess was
14 flat relative to the adjacent fields. So there was no
15 mound.

16 Q. Did you have discussions with the
17 people who were in charge of those projects?

18 A. Yes, as part of our tour we
19 travelled across the sites and discussed the particular
20 problems found on-site, the methods of measurement and
21 some of the conclusions associated with the studies
22 that had been completed.

23 Q. Were you doing that work relative
24 to any particular work that you were engaged in at the
25 time?



1 A. Well, I found about this study
2 because of Dr. Mackintosh's trip to California,
3 Dr. Mackintosh went down to California to look at the
4 rehabilitation of some of the orchards there. The
5 rehabilitation tour was being sponsored by a group out
6 of California called the Institute for the Human
7 Environment.

8 At that time the particular program was
9 mentioned to me so that I signed up for it to see what
10 the state of the art was over in Europe.

11 Q. Is it your view that the state of
12 the art there is better than the state of the art here?

13 A. It is better in some respects in
14 that they have been working at it longer and have had
15 more controlled experiments to make decisions about
16 what is happening on their landfills. The state of the
17 art relative to compaction alleviation or the use of
18 legumes or the construction timing is exactly the same
19 as it is here in North America.

20 Q. You go on to deal with the
21 problems that were identified and mitigations proposed
22 at page 41?

23 A. That is correct. The problems are
24 outlined in Figure 21, page 42. The first one is gas
25 production, the production of gases such as methane



1 ethylene and carbon dioxide. The solution proposed for
2 these particular problems was to control the waste
3 materials type. In other words, try to put materials
4 in there that are not going to break down. The other
5 is to place gas collection systems under an impermeable
6 clay cap. They recommended this particular system
7 could be passive or active.

8 Q. When you say "they recommended"
9 who are you talking about?

10 A. I am talking about the researchers
11 such as Hewitt and McRae out of Great Britain who have
12 discussed some of these things in various papers. Or
13 the Department of the Environment papers that we
14 reviewed. These are the Department of the Environment
15 in Britain.

16 Q. Now, from your reading of the
17 design and operations report and of the after-use and
18 agricultural rehabilitation reports, is there any
19 specific control of the waste materials that are going
20 into the landfill proposed at Site D?

21 A. As I understand it there will be
22 no control of the type used in Britain.

23 Q. What were they trying to use to
24 fill in Britain?

25 A. They were trying to reduce the



1 amount of household garbage that was going to be going
2 into the landfill so that they were trying to obviously
3 keep kitchen wastes, for example, to a minimum within
4 their landfills.

5 Regardless of this control they still
6 found that, they did find that the rate and amount of
7 the gas generated changed with material type. There
8 was still gas in the soil profile. They went out and
9 measured it.

10 Q. What is the problem with methane,
11 ethylene and carbon dioxide in the soil profile?

12 A. These gases tend to displace the
13 oxygen within the profile. When that occurs the
14 profile tends to resemble a poorly drained soil. You
15 get reducing conditions in this very grey colour and
16 also the characteristic odour. What is does is that
17 crops don't grow there because they need the oxygenated
18 soil profile.

19 Q. So far as the solution of gas
20 collection is concerned, what did you observe when you
21 were in England as to how they did that in portions
22 which were treated for gas collection?

23 A. Where they treated for gas
24 collection I could not see any areas where there was
25 reduced crop. The crop was very even throughout the



1 field. In the area where they hadn't put in a gas
2 collection they had upwards of 20 per cent yield
3 reduction. That was found in patches dispersed
4 randomly through the crop within a single field.

5 Q. What was happening as far as you
6 were aware where these patches were to be found?

7 A. At the location where the patches,
8 they took in a measuring device that allowed them to
9 see if methane was in the soil profile and it was. So
10 that the gases were coming up and displacing oxygen.
11 If you dug down into the soil as we did on-site, the
12 very grey rather foul smelling characteristic of the
13 soil was present.

14 Q. Has there been any work set up on
15 a scientifically consistent basis to determine the
16 effects of gas production at a landfill in Canada that
17 you are aware of?

18 A. Not to my knowledge.

19 Q. You have got in your appendix
20 report, an appendix of the investigation -- that's at
21 Tab 5?

22 A. That's correct.

23 Q. That is as I read the report is
24 relative to a sanitary landfill site and properties
25 adjacent to it?



1 A. That's right.

2 Q. In Mississauga?

3 A. Uh-huh.

4 Q. What were they attempting to
5 determine there?

6 A. As the paper outlines, they were
7 trying to investigate cause of vegetation injury on
8 properties adjacent to a sanitary landfill site. They
9 found, as their summary indicates, that tree mortality
10 and other vegetation damage evident on the private
11 properties is directly due to the deleterious factors
12 emanating from the above-mentioned landfill operation.
13 They talk about again root asphyxiation and the absence
14 of oxygen.

15 They go on to describe other things, the
16 mechanism including the presence of ethylene on the
17 affected sites aggravate plant mortality. This
18 particular study didn't look at things from an
19 agricultural perspective however.

20 Q. It was just a question of
21 vegetation damage off-site?

22 A. That is correct.

23 Q. What is your understanding, Mr.
24 Hoffman, of the design and operation recommendation
25 with respect to a gas collection system for Site D?



1 A. As I understand it no gas
2 collection system has been recommended.

3 Q. Have you an opinion as to what
4 effect that might have on attempts to establish
5 agriculture on the site?

6 A. The lack of the gas collection
7 system in all probability will result in some yield
8 reduction where gas escapes. Some gas escape is
9 possible because of differential settlement of the
10 landfill materials. If we follow the example of that
11 found in the British literature, 20 per cent crop yield
12 reduction is possible.

13 Q. Have you taken that into account
14 in arriving at the reductions in yield that you have
15 included in your report?

16 A. No, we haven't included that type
17 of information in our estimate of lost productivity.

18 Q. Then deal with the other problems
19 and solutions which are listed on Figure 21, please?

20 A. The second problem is one of
21 insufficient soil. Obviously the solution is to import
22 soil or control the soil stripping and require
23 particular conservation methods for topsoil and sub-
24 soil materials. This kind of recommendation has been
25 made for Site. D.



1 The other thing to note is if the
2 imported soil was going to be brought in, a loam
3 texture was recommended to minimize compaction
4 potential. They also emphasized that sub-soil and
5 topsoil should be saved separately in domed piles.

6 Q. This is material you gathered from
7 the British report?

8 A. That is correct. The other
9 problem was that of soil compaction and they proposed
10 solutions that included the control of soil
11 reinstatement traffic, its location and the time it
12 occurred. Also control machinery type. In other
13 words, use machines with low bearing pressure.

14 They also recommended deep tillage and
15 the kind of deep tillage and machine used would assist
16 in alleviating any compaction that did occur.
17 Afterwards a specific crop program would be recommended
18 to improve the soil structure.

19 The British data didn't show clearly
20 which soil movement system is best. They used two
21 systems called the conventional system and a bed
22 system. The conventional tended to allow machines to
23 move in a general movement from one area of the site to
24 another but not on a specific road. The bed system
25 required that the machines follow one track.



1 Now as well, the soil ripping was
2 completed, and the author suggested that better
3 shattering might have occurred if a winged tined sub-
4 soiler was used. A winged tined sub-soiler was used in
5 the Union Gas right-of-way in that particular study.
6 The cropping programs of grass or forage production to
7 improve soil structure and reduce density.

8 The next problem is soil structure and
9 we have already discussed the fact it can be used to
10 reduce soil compaction. It added organic matter to the
11 soil and improved soil structure.

12 Soil drainage is also a problem. So for
13 surface drains they recommended that a dome or a
14 sloping of the landfill occur. The improvement of
15 structure and the reduction of compaction will also
16 improve soil drainage. They also suggested that the
17 installation of underdrainage was a good idea. They
18 actually used continuous plastic tile instead of clay
19 because of differential settlement. They found that
20 tile was necessary to prevent waterlogging and the
21 effectiveness of grass crops was reduced because of
22 excess water.

23 Q. Just stop now and deal briefly
24 with soil drainage. What about these soils? Are they
25 sensitive in relation to drainage? The soils at Site



1 D?

2 A. Yes. They are relatively more
3 sensitive than a number of other soils because of their
4 high clay content. So that when structure is altered
5 within them there is a greater probability of a
6 drainage problem. So, if there were sands on-site or
7 loams on-site it would be less of a problem.

8 Q. You have reviewed the design and
9 operations report. Do you find a recommendation for
10 the installation of tile or plastic tile drainage?

11 A. No, to the best of my knowledge
12 there is no recommendation for tile drainage.

13 Q. Considering the land form which
14 will ultimately be constructed if this site is chosen,
15 what is your opinion about the tile drainage?

16 A. I would recommend that tile
17 drainage be installed.

18 Q. What happens when the soil becomes
19 laden with excess moisture in terms of its productive
20 capability?

21 A. Its productive capability goes
22 down. Most plants, if I can use the common term, don't
23 like wet feet, so they just don't grow as well.

24 Q. Does the fact of differential
25 subsidence lead to problems associated with wetness?



1 A. Yes. It will mean than that
2 service drainage will not be as effective. Obviously
3 water will be trapped if there are small valleys
4 created, if you like, on top of the landfill. This
5 subsidence will also cause a problem to any kind of
6 tile drainage system. The original slope and line of
7 the tiles will obviously change as that differential
8 settlement occurs. So that throughout the process some
9 repair of the tiles may be necessary in the areas where
10 differential subsidence has occurred.

11 Q. In respect of the conclusions you
12 reach as to the percentages this site will achieve
13 after rehabilitation, have you taken into account these
14 problems of wetness?

15 A. No, I haven't.

16 Q. What have you assumed in relation
17 to drainage in arriving at your percentage conclusions?

18 A. Well, I have assumed that there
19 will be a drainage problem due to subsidence on the
20 site.

21 Q. What is your opinion as to whether
22 or not there will be?

23 A. There will be subsidence on the
24 site.

25 Q. Will there be a drainage problem



1 as a result of that?

2 A. Yes, there will be until that
3 differential level of the land is reduced.

4 Q. Thank you. If we can go on then
5 to complete the rest of the problems and solutions you
6 found.

7 A. The other things that are listed
8 in the reports were soil fertility and also the
9 solution was to add organic manures and fertilizers.
10 The literature didn't really talk about whether a soil
11 test was used to indicate those fertility requirements.
12 Those kinds of soil tests have been recommended in the
13 Ecological Services for Planning document. McRae has
14 recommended actually that experiments be used to see
15 the effects of different nitrogen rates of application,
16 but it would seem he hasn't been successful in finding
17 funds to look at that research. That is McRae hasn't
18 been able to find funds over in Britain.

19 The other problems are crop yield
20 reduction and these things relate to a number of the
21 facts already discussed. The solution is to attend to
22 soil and gas problems, change seeding rate, spacing and
23 timing, or change seed variety or other farm
24 management.

25 Crop yields appear to be highly variable



1 from place to place and year to year. Obviously, like
2 any farm crop, the weather will make a significant
3 difference to what happens year to year.

4 The yields, for example, on another
5 quarry, the Hatfield Quarry, were higher than -- that
6 should read -- national average. Long-term average on
7 rehabilitated lands is not presently known. The other
8 problem is one of weeds. Weeds are usually found
9 growing very vigorously on the site until a healthy
10 crop is grown. So the weeds were treated successfully
11 with herbicides and as long as the crop is maintained
12 in a healthy state, the weed growth is minimized.

13 Q. Then after having identified the
14 problems and looked at the mitigation measures, did you
15 then relate that work to your review of the after-use
16 reported by Ecological Services for Planning?

17 A. That is correct.

18 Q. What were your findings insofar as
19 Ecological Services for Planning report was concerned?

20 A. We took a number of views of the
21 report prepared by Ecological Services for Planning.
22 Much of that then is found in the report from pages 45
23 on.

24 Q. I wanted you to deal then with
25 page 41 which just narrows to identifying the problems



1 and dealing with mitigation measures?

2 A. The principal thing that we found
3 was that Ecological Services for Planning identifies
4 most of the problems found in other rehabilitation
5 schemes. However, their report, in my opinion, does
6 not adequately assess the potential impact of methane
7 gas generation and control; nor does it address the
8 need for tile drainage.

9 Q. In respect of those two thing you
10 have not taken them into account in determining your
11 opinion of the future yields with respect to the
12 rehabilitated site?

13 A. That is correct.

14 MR. LEITCH: Mr. Chairman, this might be
15 a convenient time for the lunch break.

16 MR. LANCASTER: Yes, it is 12:30. It is
17 a convenient time. A quarter to two.

18

19 ---Luncheon Adjournment at 12:30 p.m.

20

21

22

23

24

25



1 ---Upon resuming at 1:50 p.m.

2 MR. LANCASTER: Be seated, please.

3 MR. LEITCH: I have, Mr. Chairman, a
4 reproduction of the missing page. I am sorry to say on
5 the machine upstairs it had to be reduced and it is
6 somewhat small. If it is not suitable ...

7 MR. LANCASTER: It is still readable.

8 MR. LEITCH; Q. Mr. Hoffman, we had
9 reached the point before lunch where we were moving
10 into the section on page 43 of your report dealing with
11 landfill rehabilitation to agriculture after-use in
12 Ontario. If we could just pick it up there and deal
13 with that portion?

14 Oh, yes, there were some matters with
15 respect to the scale of the maps which you were going
16 to check. Can you give us some help with that?

17 A. In Exhibit M-374 and Exhibit M-375
18 you asked me previously about the scale of these maps.
19 The scale approximately is 1 to 3800 on both exhibits.
20 The scale of some of the other exhibits, those that
21 refer to the detailed agricultural rehabilitation plan
22 in Exhibit M-378, are 1 to 1000. The original aerial
23 photographs used for aerial photographic interpretation
24 of soils, 1 to 10,000.

25 Q. Earlier today you had dealt with a



1
2 search you had conducted of records of the Ministry of
3 the Environment to try and find out where former
4 landfills existed which might have been rehabilitated
5 to agriculture, if you want to do that in more detail
6 at this point, please?

7 A. If we refer to page 43 we found
8 that after reviewing quite a few records, there is very
9 little information available to quantitatively measure
10 the success and/or the problems associated with
11 landfill rehabilitation in Ontario.

12 In 1978 to '80 a questionnaire was
13 prepared by the Ministry of the Environment to
14 ascertain where former landfill sites were located and
15 to find amongst many factors what their current use,
16 zoning and gas or leachate problems were.

17 As mentioned, Smith, Hoffman reviewed
18 the records associated with approximately 2500 former
19 landfills. These again come from the records of
20 completed questionnaires. Of those 2500 only 30 areas
21 had agricultural uses. We interpreted agricultural
22 uses to include field, open spaces and pasture. In
23 other words we were relatively liberal about our use of
24 the word "agricultural uses". Most of the sites are
25 small, sizes range from 0.2 to 20 hectares with a mean



1 size of 2.7 hectares.

2 This kind of information summarized in
3 Figure 22 on page 44. In this particular figure we
4 have a site number which is the one used by the
5 Ministry of the Environment. The location or the
6 municipality in which the landfill is found, the dates
7 of opening and closing of the landfill. The area of
8 the landfill and its current use. They also have made
9 some comments that have come from a questionnaire.

10 Q. Have you visited any of the listed
11 sites?

12 A. We made a visit with Mr. Thompson
13 of the Region of Waterloo to three sites within
14 Waterloo Region. None of these sites were actually
15 found as part of the Ministry of the Environment
16 records previously described. So, obviously there are
17 some problems associated with the questionnaire and the
18 kinds of responses that the Ministry has received.

19 The boundaries of two of these sites
20 were not known. However, on the small sites it
21 appeared, on the basis of Mr. Thompson's direction,
22 that forages were being grown. No bare spots or crop
23 stress were noted on either site, however, no yield
24 data was available that we could use to measure whether
25 the sites were producing from an agricultural



1 perspective and how well I guess they were producing
2 from an agricultural perspective.

3 The third site, a relatively large one
4 has been used for grain corn production and actually
5 was in small grains at the time of inspection. A
6 number of bare spots consistent with gas leakage were
7 observed in the crop. These were randomly spaced
8 throughout that crop. However, Smith, Hoffman did not
9 make any measurements for gas. On the basis of our
10 review of the records, our field work, we found no
11 conclusive evidence on successful landfill
12 rehabilitation in Ontario to agricultural after uses.

13 Q. Who is Mr. Thompson, what is his
14 position with the Region of Waterloo?

15 A. I cannot recall his particular
16 title. It may be in the references. If you will give
17 me a moment to look. At the moment all I can say is he
18 is with the Region of Waterloo, he is in the
19 engineering department, he has been with them for quite
20 a while.

21 MR. LANCASTER: On page 69?

22 THE WITNESS: On page 69 personal
23 communications.

24 MR. LEITCH: Q. How did you make
25 contact with him? What were you looking for?



1 A. We phoned up the Region of
2 Waterloo to look at the sites that had been described
3 in the Ecological Services for Planning report back in
4 '78 and '80. Reference was made to a conversation with
5 an individual by the name of, I hope my pronunciation
6 is correct, Pihura. So we contacted him. He is no
7 longer associated with landfills the way he had been in
8 the past. He suggested that we contact Mr. Thompson
9 because Mr. Thompson had been around when a number of
10 these landfills were actually in use.

11 Q. All right then. Move forward to
12 the Site D rehabilitation scheme as proposed by the
13 Region of Halton?

14 A. We start out this particular
15 discussion with the fact that the landfill results in
16 the production of mound on existing agricultural land.
17 While the amount differs from excavated pits usually
18 used for landfill and described in the rehabilitation
19 literature such as that in Britain, the problems of
20 rehabilitation are found irrespective of the final form
21 of the landfill.

22 The scheme proposed for Site D addresses
23 many of the requirements for soil hauling and
24 management. But, as has been described previously, it
25 does not deal specifically with tile drainage and gas



1 generation. Specific data on the design and treatment
2 of soil berms and roads is missing to our knowledge.
3 The need obviously for this data is described in the
4 following section of the report.

5 Then we have outlined these various
6 problems. The first problem relates to topsoil.
7 Topsoil depth over the site is highly variable. Depths
8 range from 5 to 32 centimetres with a mean value of
9 approximately 15 centimeters. This information is
10 summarized in Figure 23, page 47. These observation
11 points correspond with the borehole numbers that are
12 found in Exhibit M-374. Observation point 1 would
13 correspond, excuse me, to borehole No. 1 on this
14 exhibit.

15 So we went through and took out the
16 depth information we had in each of these boreholes.
17 That has been summarized then in Figure 23. The
18 proposed rehabilitation scheme shows a topsoil depth of
19 approximately 20 centimetres. If that 20 centimetres
20 is going to be maintained some soil will have to be
21 taken from other areas on or off the site if the 20
22 centimetre depth specified in the rehabilitation plan
23 is to be maintained.

24 We also anticipate there will be some
25 difficulties in maintaining even the 15 centimetre mean



1 depth of topsoil which was measured by us in the field.
2 The data shows much variability over a small period.
3 That variability includes both changes in drainage
4 class (imperfect to poor drainage) as well as changes
5 in topsoil depth.

6 For monitoring by an agricultural
7 specialist with some soils training of a skilled
8 machinery operator will be required to maximize the
9 effective separation of sub-soil from topsoil.

10 Q. Just stop there. Perhaps in a
11 little more detail tell the Board how you would go
12 about attempting to do that?

13 A. What it will mean is that an
14 individual who is familiar with soils will have to be
15 on the site and be instructing the machinery operator
16 when they are stripping this field that there will be
17 changes between different soil classes between the
18 Jeddo which is poorly drained and between the
19 Chinguacousy which is imperfectly drained. There will
20 be some additional changes and these will be recognized
21 by changes in soil colour. These changes then are
22 changes in depth and you would differentiate these
23 changes in terms of this background colour.

24 So in some respects the operator will
25 have to be trained to recognize when there are changes



1 and then changes in his blade depth or his scraper
2 depth so that you are collecting the amount of topsoil
3 that is available here and the changes as you move into
4 the next soil and then it changes again as you move
5 back into the same kind of series.

6 What it means is that topsoil depth is
7 variable, it is tending to go up and down. The way that
8 the blade or the scraper is used will have to
9 correspond with the way that that goes up and down. If
10 you don't do that you will either miss some of the
11 topsoil or you will mix it.

12 Q. What is the result of a mix of
13 topsoil with other soils?

14 A. Well, the effect of the mix will
15 vary. If it is a mix where a great deal of sub-soil is
16 incorporated into the topsoil then the fertility of the
17 soil will be reduced and crop yields will be affected.

18 The principal reason for maintaining the
19 topsoil/sub-soil separation is to maintain that
20 fertility and make sure that the yields are good.

21 Q. For the purposes of arriving at
22 your measures of post-development productivity, have
23 you taken in to account, or discounted at all for the
24 likelihood of soil problems in terms of separation?

25 A. No, we haven't. We have assumed



1 in our calculations that we can actively measure the
2 yield losses associated with mixing or topsoil loss.
3 So, our figures then ignore that particular fact.

4 Q. With respect to these particular
5 clay soils, how would you class them in relation to
6 separation of topsoil from other soil relative to loams
7 and sands and those kinds of soils?

8 A. In our opinion it would be more
9 difficult to separate these soils because of their
10 drainage. At the drier times of the year the wetter
11 portions, the Jeddo series shown in Exhibit M-374 as
12 the clear area will be more difficult to separate. The
13 operator will be forced, in some cases, if they were
14 doing things at the proper moisture content to strip
15 the dry areas and leave the wet areas to later.

16 So, timing becomes a problem in this
17 particular soil. The clays also tend, when they are
18 dry, to form large clods so that when they get too dry
19 the large clods come out as clods rather than
20 separating between the topsoil and the sub-soil. So you
21 will be pushing larger clods instead of cutting it at
22 the point where you want to cut it. If you were
23 dealing with loams, if you were dealing with sands,
24 then this cloudiness, especially during dry periods
25 isn't as pronounced, not so much of a problem.



1 Q. Then at page 49 of your report you
2 deal with cropping choices and flexibilities?

3 A. Yes. When you had asked me a
4 question previously about the loss of crops and I had
5 mentioned soybeans I neglected at that time to give a
6 complete answer and mention the fact as well that
7 alfalfa would not be used on-site. So, if we look at
8 the land use map, Exhibit M-375, we see that there is a
9 forage crop which is predominantly alfalfa on-site.
10 This kind of forage crop will not be grown on a
11 rehabilitated site.

12 So the rehabilitation plan produced by
13 Ecological Services for Planning states that two crops
14 would not be grown. One is alfalfa and the second one
15 is soybean.

16 Q. Just relate that back then to page
17 22 of your report where you, I think, you were dealing
18 with the site on an approximately one-third, one-third,
19 one-third basis?

20 A. On page 22 the cropping pattern
21 indicates one-third of the site is in production of
22 winter wheat, one-third in soybeans and one-third in
23 alfalfa forage. After rehabilitation the opportunities
24 for the growth of soybeans in a portion of the area as
25 well as the growth of alfalfa would be reduced.



1 Q. If you could return to page 49,
2 the reasons given for the inability to crop alfalfa and
3 soybeans are specified. What, in your knowledge, is
4 the condition of soybeans and rehabilitated land?

5 A. I agree with the perspective given
6 by Dr. Mackintosh in his report and that is that there
7 are problems associated with soybeans in that they do
8 not produce well on rehabilitated lands.

9 Q. Are you aware of the particular
10 reason for that or has that simply been experienced?

11 A. At the moment that is experience
12 and the specific reason for this problem I am unaware
13 of at the present. One of the things we observed was
14 that the soybean roots do not penetrate the pan layer
15 in the clay soils very well, so the rooting depth is
16 restricted.

17 The other crop that presents the problem
18 to the rehabilitated site is alfalfa because its deep
19 roots may penetrate the clay cap on top of that.

20 So, the loss of these two crops reduces
21 the flexibility of the agricultural producer to meet
22 changing economic conditions and remain flexible. This
23 phrase comes out of the material of the Ontario
24 Ministry of Agriculture and Food, Food Land Guidelines,
25 1978. It is our opinion that this is particularly



1 important when the economic returns for different field
2 crops are reviewed.

3 Figure 24 summarizes information from
4 the Ministry of Agriculture and Food in the time period
5 1982 to 1987, to show that per crops shown in the Site
6 D area gross margins and returns over the cash costs
7 are highest for soybeans and alfalfa hay. Returns are
8 only better for white beans which are not grown
9 extensively in the area.

10 Q. Is there any experience with
11 respect to white beans and rehabilitated lands?

12 A. In pipeline areas, white beans are
13 grown in fields that have been affected by trenches.
14 They appear to have problems similar to those of
15 soybeans.

16 The fact that alfalfa hay can be
17 substituted by red clover does not necessarily help
18 from an economic return viewpoint. That is, alfalfa
19 gets higher prices in the marketplace than does red
20 clover

21 Q. You gave credit to Blair Campbell
22 in respect to that statement, who is the he?

23 A. Blair Campbell is with the
24 Ministry of Agriculture and Food. Page 69 we outline
25 that he is with the Ontario Ministry of Agriculture and



1 Food, Economics Branch. We talked to him about this
2 particular problem.

3 In Figure 24 we talk about gross margins
4 and returns over cash costs for crops grown. We have
5 given figures for 1981 to 1986. The definitions for
6 margins, gross margin and returns over cash costs are
7 included in the glossary of our report, page 70 and 71

8 "The Gross margin is the amount above
9 the variable costs that a crop
10 contributes to the operator for his
11 wages, management, and to the investment
12 in machinery and land."

13 Returns over cash costs are:

14 "The costs are calculated when gross
15 income is subtracted from cash costs.
16 Costs comprise of all variable costs, as
17 well as interest on the debt portion of
18 tractor and machine investments, real
19 estate taxes and other overhead costs."

20 Variable costs include, it doesn't
21 appear to be in the glossary, variable costs include
22 things, so there it is.

23 "Variable costs are those which vary
24 directly with the production of each
25 crop grown. These variable costs include



1 seed, plants, hired labour, fertilizers,
2 herbicides, insecticides, fungicides,
3 other materials, machinery operating
4 costs, marketing charges and interest on
5 operating capital."

6 Q. So if I look at Figure 24, Mr.
7 Hoffman, and I take the three-year average which is on
8 the far right-hand side of the column, can you just
9 explain as we go down through the various crops what
10 the result is?

11 A. If we look then to the right-hand
12 side of Figure 24, for barley our gross margin is
13 \$162.3 per hectare. Therefore, looking at returns over
14 cash costs, I seem to have trouble getting my tongue
15 around cash costs, anyway, that is \$100 per hectare.

16 We move then down to grain corn. For
17 gross margins we are looking at \$284.3 per hectare. If
18 we go through to soybeans and compare it to that we see
19 it is \$354.7. White beans is higher yet at \$423.3.

20 We move down to alfalfa hay and it is
21 \$356.7. We move over then to return over cash costs
22 and continue with soybeans, for example, you have got
23 \$291. White beans is up as high as \$354 and alfalfa is
24 \$397.3.

25 Q. I am sorry, do that one again?



1 A. \$297.3. By that -- so by looking
2 at that table we can see that of the common field crops
3 the soybeans and the alfalfa hay on the existing Site D
4 give a better gross margin or a better return over cash
5 costs.

6 Q. Are the figures for oats correct?

7 A. To the best of my knowledge, they
8 are correct.

9 Q. It is just that the difference
10 seems to be quite significant in relation to the
11 others?

12 A. I don't think people are growing
13 oats very much these days, fewer horses.

14 Q. What is the conclusion in relation
15 to the loss of the ability to grow alfalfa forage and
16 soybeans, as it effects the rehabilitation scheme of
17 Site D?

18 A. Ultimately that reduces the
19 ability of the farmer to get a return on his crops. The
20 better crops, that is the ones that produce more
21 returns will not be available to the farmer on
22 rehabilitated lands. The other thing about the reduced
23 ability to produce a variety of crops, is that it
24 affects the capability class rating for the lands. We
25 continue in our report to discuss this particular



1 factor.

2 The Canada Land Inventory agricultural
3 capability system is based on soil and climatic
4 factors. Different soils are downgraded when the range
5 of crops is restricted and/or special conservation
6 practices are required. The rehabilitated lands will
7 have a reduced range of crops and require special
8 conservation practices relative to the crops originally
9 on the site.

10 For example, if the soils were
11 originally Class 1 and some of them are on-site, then
12 the loss of soybeans and alfalfa would require a
13 downgrading of the soils of at least one class to Class
14 2.

15 Q. Is that part of the Canada Land
16 Inventory capability system?

17 A. That is correct. There is another
18 way of looking at the ability of the soils to produce
19 specific yields and to measure capability. The
20 Ecological Service for Planning in their report state
21 that yields will reach 90 per cent of average yields in
22 Halton after five years of rehabilitation work.

23 Stated in our report on page 52 this 90
24 per cent of average was given the following values by
25 Dr. Stonehouse in his report to Ecological Services for



1 Planning.

2 Q. Just stopping there,
3 Dr. Stonehouse was the agricultural economist whose
4 report was appended to the Ecological Services for
5 Planning report?

6 A. That is correct.

7 Q. Do you know Dr. Stonehouse?

8 A. Yes, I know Dr. Stonehouse. So,
9 taking these average yields we can compare them to
10 average yields measured for different lands in the
11 different classes in Ontario. There are two pieces of
12 research that document the relationship between
13 capability class and the actual yield levels obtainable
14 in each class.

15 The first piece is that produced by
16 D. W. Hoffman and there are two reports which refer.
17 One is an ARDA publication and the other is his thesis.
18 This particular piece of work refers to common field
19 crops and the measurement of yields on different
20 classes. The other piece of work is by Anderson in
21 1971 and that research looked specifically at forage
22 crops.

23 So, what happened there was there were a
24 number of sites chosen. The land was classified into a
25 capability class and yield measurements were recorded



1 for each one of those farms and those fields. In the
2 case of the work by Hoffman in '71 and '73 a step-wise
3 multiple regression model was used to compare different
4 classes of land.

5 We have included some of the information
6 from that study on page 53. So, if we look for example
7 in the middle of that page, that is page 53, on Class 1
8 land, the land has the potential to produce grain corn
9 of 8.53 tonnes per hectare. Class 2 land can produce
10 6.58 tonnes per hectare. Class 3, 5.02 and Class 4,
11 3.7 tonnes per hectare respectively.

12 Q. What are the plus and minus values
13 that follow those tonnes per hectare you have given us?

14 A. The first figure is the mean value
15 and the second figure is the standard deviation on
16 either side of that mean value. In the same way we
17 reported data on barley and then from the Anderson
18 report we have reported data on hay.

19 So, if we take the information then from
20 Dr. Stonehouse's work and we look at 90 per cent of the
21 five year average, grain corn yields tend to match
22 those of lands with a capability class of 3. The same
23 is true for barley and in the case of hay yields on the
24 rehabilitated land will fall in the range of Class 4
25 land.



1 Thus, lands which comprise capability
2 classes 1 through 3 will end up after rehabilitation
3 with yields that are similar to those obtained on
4 capability classes 3 and 4.

5 Q. So 1 to 3 becomes 3 and 4 on the
6 basis of this comparison?

7 A. That is correct. Smith, Hoffman
8 then went further to look at the change in yields
9 anticipated after rehabilitation and use of a single
10 number to compare productivity indices before, that is
11 during current productivity, to post-rehabilitation
12 units.

13 We used both information that we had
14 derived from our soils map and our capability map. We
15 also used information from the soils and capability map
16 produced by Ecological Services for Planning.

17 Generally what these calculations show
18 is that pre-development productivity indices give a
19 value of 0.82 or 0.80 for Ecological Services for
20 Planning and Smith, Hoffman data respectively.

21 Q. So Ecological Services for
22 Planning is 0.82 and Smith, Hoffman is 0.80. What is
23 that 0.82 and 0.80 of?

24 A. If we compare Exhibit 372 with 379
25 Class 1 land has been assigned a value of one. That



1 is the best attainable. With good farm management
2 practices on Class 1 land. All the other classes then
3 are rated relative to that one value. So that that
4 means then that using Ecological Services for Planning
5 information that the existing site under good farm
6 management practices has the potential to get 82 per
7 cent of the Class 1 lands.

8 So, if we take the soil map such as
9 Exhibit M-374, because, if this were all Class 1 land
10 we would have the one value showing here on Exhibit M-
11 379. Because this consists of Classes 1 through 3 we
12 can take data from the original research and assign a
13 value to each one of these areas, add them all up to
14 find up what the entire site will produce relative to
15 what it could have produced if it were all Class 1.

16 Q. Then you come to a different
17 conclusion than Ecological Services for Planning after
18 going through that calculation. Why is that?

19 A. There is a slight difference in
20 the relative proportion of the different soils and the
21 classes found on the map. That is on our map relative
22 to Ecological Services for Planning's map.

23 So, ESP's report has lands rated
24 slightly higher than the way we have rated lands.

25 Q. On the site?



1 A. On the site. So, the existing
2 lands then can produce at approximately the Class 2
3 level.

4 DR. KINGHAM: I don't understand your
5 Exhibit M-379. Is the horizontal scale meant to be a
6 percentage scale going from zero on the right to 100 on
7 the left? Maybe you can explain it to us?

8 THE WITNESS: This is to be a scale
9 potentially going from where you said you can't see the
10 dot but that is the value 1, then from there things are
11 divided up on the basis of class levels in decimals
12 associated with this.

13 So, Class 2 is 0.8. Class 3 is 0.64,
14 Class 4 is .49 or stated alternatively or Class 4 can
15 produce 49 per cent of what Class 1 can produce under
16 the same circumstances. Class 3 can produce 64 per cent
17 and Class 2 will produce 80 per cent. So, this
18 horizontal scale then goes basically from zero to one.

19 MR. LEITCH: Q. Then the larger lines
20 represent conclusions reached by yourself and
21 conclusions reached by Ecological Services for Planning
22 as reported before this Board?

23 A. That is correct.

24 Q. So that at this line which we can
25 see here on Exhibit M-379 represents the value that can



1 be achieved using Ecological Services for Planning
2 soils map. This one, Smith, Hoffman using their map.
3 That is the site capability, pre-development, am I
4 right about that?

5 A. Yes. By pre-development meaning
6 before landfill occurs.

7 Q. So that is the site as it is
8 exists now. Then go on and describe what the other
9 long lines mean on the chart.

10 A. These lines on the right-hand side
11 of Exhibit M-379 show the value after rehabilitation
12 has occurred on-site. So, for example, using
13 information supplied to this Board by Ecological
14 Services for Planning gives a value that lies between
15 Class 3 and Class 4 lands. Using the information
16 Smith, Hoffman has put together and which I will
17 describe in detail later, gives us a value that is
18 slightly lower than Class 4.

19 So, in the text on page 54, post-
20 development productivity indices give a value of 0.53
21 or 0.45 depending on how much land is actually
22 available for agriculture after rehabilitation.

23 If you want to express that number in
24 terms of yield, the existing site has the potential to
25 produce 6.83 to 7 tonnes per hectare. That range again



1 varies depending on what you are using, Smith,
2 Hoffman's soils map or Ecological Services for Planning
3 map.

4 Q. Which is which?

5 A. Well, the lower value is the
6 Smith, Hoffman value and the higher value is Ecological
7 Services for Planning.

8 Q. And we are talking about grain
9 corn yield?

10 A. That is correct. Then if we look
11 at the rehabilitated site and its potential to produce
12 grain corn, the value ranges from 3.84 to 4.52 tonnes
13 per hectare. In this particular instance the lower
14 number post rehabilitation, that is the number 3.84,
15 the one produced by Smith, Hoffman and the 4.52 is one
16 produced by Ecological Services for Planning. Another
17 way of stating this particular thing is post-
18 development yield as a per cent of pre-development
19 yield is 59 to 65 per cent. Again depending on which
20 soil map or which rehabilitation map you use.

21 Q. Do those ways of measuring yields
22 both before rehabilitation and after rehabilitation
23 take into account problems of methane gas?

24 A. No, they do not.

25 Q. Do they take into account the



1 problems of wetness in the soil?

2 A. No, they do not. I have an exhibit
3 here which we have already shown the Board which I will
4 use to describe the way we have rated the different
5 lands.

6 Q. Just before you do that,
7 Mr. Hoffman, in Dr. Mackintosh's report it is expressed
8 that the return would be to 90 per cent of the county
9 average?

10 A. Yes.

11 Q. What accounts for the difference
12 in that 90 per cent and the figures of 59 to 65 per
13 cent which appear at the bottom of page 54?

14 A. The 90 per cent will relate to the
15 area that is rehabilitated on the top of the mound.

16 Q. Yes.

17 A. Whereas the lower figure relates
18 to the entire site. So that, as I will describe later,
19 there are certain other areas that will be removed from
20 production and this removal then changes the overall
21 productivity of the entire site.

22 So, if I can refer to Exhibit M-377, we
23 have reproduced a diagram from the design and
24 operations report for Site D. This exhibit then shows
25 the area around the mound which includes areas 4 and 5



1 on the west side. It also includes then the sloping
2 lands up to the top of the mound which is area 3 and
3 area 2. Then the top of the mound which is area 1.

4 These areas correspond to areas which
5 were outlined in the exhibit submitted by
6 Dr. Mackintosh. There is an additional area 4 on the
7 east side or the southeast side. This area will be
8 used for access as well as for screening. We have added
9 an area 5 to that which includes the access road and
10 the drop-off areas on the proposed landfill.

11 So, the question that we asked was how
12 would each one of these areas be rated for agricultural
13 productivity. How much can they produce?

14 Well, Dr. Mackintosh's reports and his
15 testimony have indicated that this area will give 90
16 per cent of average.

17 DR. KINGHAM: This area being?

18 THE WITNESS: Area 1, sorry. So, area
19 1 will give 90 per cent of average. By our
20 calculations area 1 is at the same level as Class 3.
21 So the yields which are 90 per cent of average will
22 produce at the same level as Class 3 soils. So, for
23 example, if we had Class 1 lands up here we would be
24 getting much higher yields than 90 per cent of Halton's
25 average yield.



1 Then after that, we have rated the
2 sloping areas. Area 3 is steeply sloping and we agreed
3 with Dr. Mackintosh that this area would be in
4 permanent forage. So, as such, it is no longer used for
5 arable agriculture. That automatically places it in
6 Class 5.

7 MR. LEITCH: Q. That is under the
8 Canada Land classification system?

9 A. That is correct. If we look
10 specifically at area 2 that will also be in forages and
11 limited by topography. We have stated that it is 50
12 per cent Class 4 and 50 per cent Class 5. This is a
13 relatively conservative rating for area 2 because
14 normally the slope that is here is enough that in and
15 of itself it would make this Class 4.

16 Normally what has happened is, you take
17 the best class which is Class 3 as found in area 1 and
18 you downgrade it from there in specific categories on
19 the basis of topography. If we had done that, this
20 land would be far worse. In other words, it would have
21 a lower class than what we have indicated here.

22 Q. What is the purpose of doing it
23 the way you did it then?

24 A. We wanted to take an overall
25 conservative look at what the actual loss of



1 productivity would be on the entire site. So, we
2 started with Dr. Mackintosh's 90 per cent of average
3 figure and we felt that we applied, shall we say, the
4 benefit of the doubt at each point in the process, so
5 that we rated the lands higher rather than lower than
6 they might be.

7 In area 5 the lands are going to be
8 maintained as a buffer zone. So, they are not going to
9 be used for agricultural use. When an area is not
10 going to be used for agricultural use it is
11 automatically a Class 7. This area 5, Smith, Hoffman
12 chose to take out because it is going to be a permanent
13 road and drop-off area. There will be gravel added to
14 the road base as well as to this drop-off area.

15 On the basis then, of our understanding
16 of the design of this access road and area, we have
17 said that this will not be used for agriculture and
18 therefore it is a Class 7. The remainder of area 4
19 which will be subject to machinery movement to the
20 storage of topsoil and to berms, we rated it the same
21 level as Dr. Mackintosh at 90 per cent of the average,
22 which again is the same as Class 3.

23 So, then we move to Figure 25 which puts
24 together the numbers associated with some of these
25 assumptions. As discussed previously on Figure 25,



1 page 55, we calculated pre-development yields. We took
2 the relative proportion of each class and calculated a
3 Class 1 equivalent value using productivity indices.
4 We added all those up to give a total value for the
5 site and we did that for both Smith, Hoffman
6 information as well as Ecological Services for
7 Planning. As can be seen in Part A of that figure, the
8 values are 0.8 to 0.82.

9 We move then to page 56 post-
10 development yields. We have another class area
11 capability. If we look at the left-hand side of Part B
12 we have Smith, Hoffman information. We have 75.2
13 hectares of Class 3 land. We have 2.9 hectares of
14 Class 4 land, 24.3 and 23.6 for both Class 5 and 7
15 respectively.

16 So, if I refer back then to Exhibit
17 M-377, the 75.2 hectares comes from area 1 and area 4.
18 The 2.9 hectares comes from 50 per cent of area 2. The
19 Class 5 comes from, which is 24.3 hectares, comes from
20 area 3 as well as half of area 2. Class 7 comes from
21 area 5 that is marked on the exhibit on the western
22 side of the property as well as the access road and
23 drop-off area to the east and central part of the
24 property.

25 The other way of looking at post-



1 development yields is to use Ecological Services for
2 Planning information. So on the basis of the testimony
3 of Dr. Mackintosh we looked at the information
4 available there. So, in Class 3, for example, we ended
5 up with 101.8 hectares. It follows through in Part B
6 of Figure 25 that there is a breakdown there for
7 classes in each one of these areas.

8 So, the principal difference is that
9 Dr. Mackintosh didn't take this road and drop-off area
10 out of production and he rated all of this area as
11 suitable for forage crops. This perennial forage one
12 in area 3 corresponds with the information previously
13 supplied to the Board. Using that data, we came up
14 with the value of 0.53.

15 Q. Just relating back to
16 Dr. Mackintosh's 90 per cent of the Halton average,
17 what does the 0.45 and 0.53 relate to in terms of the
18 index for Class 1 lands?

19 A. What that means then is that the
20 land after rehabilitation will produce 45 per cent of
21 what Class 1 could produce if you use Smith, Hoffman
22 figures or alternatively it would produce 53 per cent
23 of what Class 1 could produce using Ecological Services
24 for Planning data.

25 Q. What would the site pre-



1 development produce relative to Class 1 lands?

2 A. As stated on page 55 it would
3 produce between 80 per cent and 82 per cent of Class 1
4 land depending on whose figures you use or whose
5 mapping you use.

6 Q. So, if I understand your 80 per
7 cent taken from page 55 by the calculations that you
8 have shown us, reduces to 45 per cent of Class 1?

9 A. That's right.

10 Q. So 80 goes down to 45?

11 A. That's correct.

12 Q. Similarly 82 as taken from
13 Dr. Mackintosh's work goes down to 53?

14 A. True.

15 Q. The reason for that again is the
16 diminution of the amount or acreage of land that can be
17 returned to agriculture after the project is finished?

18 A. That is correct. In addition to
19 the fact that only 90 per cent of average will be
20 produced at the top of the map.

21 Q. All right, carry on. You have
22 done some calculations for grain corn?

23 A. Yes, we decided to state our
24 conclusions in terms of actual yields instead of
25 productivity indices. If we use the research again by



1 Hoffman and Anderson, in this case specifically with
2 Hoffman, because he dealt with grain corn we can
3 compare the existing and post-rehabilitation grain corn
4 yields on Site D. This is illustrated in Exhibit M-
5 380. The best yields obtainable on Class 1, that is the
6 highest potential for the production of grain corn
7 gives a value of over 8.5 tonnes per hectare.

8 Q. That is what it would produce if
9 it was all Class 1 land?

10 A. That is correct, yes. If we look
11 at the data from Smith, Hoffman the existing land would
12 produce 6.83 tonnes per hectare whereas Ecological
13 Services for Planning data indicates that it will
14 produce 7 tonnes per hectare.

15 So the upper line in Exhibit M-380...

16 Q. That is the green bar?

17 A. That is the green bar will produce
18 at 7 tonnes per hectare. That is Ecological Services
19 for Planning data based on their soil map. The lower
20 line is based on the Smith, Hoffman soil map.

21 So, the cross-hatched area on this
22 exhibit shows the difference between what is outlined
23 on those two original soil maps. Then if we look at
24 post-rehabilitation site potential, this can also be
25 put in terms of corn yield. As outlined in our report



1 3.84 tonnes per hectare will be produced using Smith,
2 Hoffman data and 4.52 tonnes per hectare will be
3 produced using Ecological Services for Planning data.

4 On Exhibit 380 the top line in the
5 yellow bar shows Ecological Services for Planning
6 potential yields and the bottom line shows Smith,
7 Hoffman. The cross-hatching shows the difference
8 between those two pieces of information.

9 So, like the previous graph in Exhibit
10 M-379 we had the highest potential which relates to No.
11 1 in Exhibit 379 and relates to more than 8.5 tonnes
12 per hectare in Exhibit M-378. Then we values for have
13 the existing site which is the green bar on Exhibit 380
14 and the lines 0.8 and 0.82 on Exhibit M-379. Then we
15 have post-rehabilitation site potential which is in
16 yellow on Exhibit M-380 and is further to the left on
17 Exhibit M-379.

18 Now there are other ways to interpret
19 this information again that relate to some of the use
20 of the land after rehabilitation. If we look at the
21 design and operations report there is information there
22 that shows the placement of soil berms and soil storage
23 piles. We were unsure what the final treatment of some
24 of these features would be. In addition to that the
25 area marked 4 in the centre going north and west on the



1 rehabilitation plan and the narrow area to the very
2 south of the rehabilitated mound, may or may not be
3 used for agriculture depending on whether any kind of
4 maintenance is required at the base of the mound.

5 So, we asked the question, will these
6 lands be used for agriculture at the end of
7 rehabilitation? We felt that there was some
8 probability that these narrow strips labelled 4g and 4a
9 in Exhibit M-378 might have to be used for access or
10 maintenance of part of the system.

11 As well, there is some question about
12 whether some of the berms will remain screening berms.
13 These berms are labelled 4b through 4e. The additional
14 soil pile area may or may not stay on-site. That area
15 is labelled as 4f. If these areas, that is, 4a through
16 4g are no longer in agricultural production than the
17 overall productivity of the site is reduced even
18 further.

19 Q. Have you done some detailed
20 calculations with respect to the matters you have just
21 given evidence concerning?

22 A. Yes, we have calculated the areas
23 and changed productivity on the basis of that.

24 MR. LEITCH: I am introducing,
25 Mr. Chairman, a document that details rehabilitation



1 site measurements (S.H.) and I would ask that that be
2 marked as the next exhibit?

3 MR. LANCASTER: This will be M-381,
4 Detailed Rehabilitation Site Measurements (S.H.).

5
6 ---EXHIBIT NO. M-381: Detailed Rehabilitation
7 Site Measurements (S.H.)

8 THE WITNESS: If we refer to Exhibit
9 M-380 as well as M-381 the original...

10 MR. LEITCH: Q. Let the record show you
11 have just put an overlay on to M-380 which is a fourth
12 bar on the bar chart which is coloured blue.

13 A. That is correct. I will refer to
14 that blue again as I discuss what I have done.

15 Using the same methods of calculation,
16 that is data on productivity and corn yields, and
17 taking then the areas 4a through g.

18 Q. You are dealing now with Exhibit
19 M-378?

20 A. That is correct. Taking those as
21 no longer being in agricultural production, that is
22 they become Class 7 then we get a different overall
23 rating for the entire site. So, if you look at M-381,
24 area 4 you could take the topsoil piles as listed, we
25 end up with an additional 19.76 hectares taken out of
production.



1 On the second page of that exhibit we
2 have calculated a total value for the entire site.
3 That total value uses the same system as done in other
4 parts of the Smith, Hoffman report and we end with a
5 productivity index of 0.35.

6 Q. That relates then to the indices
7 which were presented at page 56 of your report?

8 A. That is correct.

9 Q. If we go further and calculate
10 this in terms of corn yields, we take 35 per cent of
11 the best corn yield on Class 1 land, we end up with the
12 value of 2.99 tonnes per hectare for grain corn. This
13 level is shown in the blue overlay which I attached to
14 Exhibit M-380.

15 So, if lands like the topsoil piles and
16 the berms no longer go into production then the actual
17 number of tonnes that can be produced on the site after
18 rehabilitation will be 2.99.

19 DR. KINGHAM: I wonder if you can help
20 us, Mr. Hoffman. Your 381 says detailed rehabilitated
21 site measurement, that is presumably when the site is
22 finished?

23 THE WITNESS: Yes.

24 DR. KINGHAM: But it refers to topsoil
25 piles and topsoil stockpiles. Are you anticipating



1 that there will be some 15 acres or so left of topsoil
2 left over when the thing is all finished?

3 THE WITNESS: The use of the word
4 topsoil might be an incorrect word.

5 DR. KINGHAM: That is what I am
6 wondering about.

7 THE WITNESS: We were referring
8 actually to the berm soil piles. I take it that
9 probably that phrase should be used instead of topsoil.
10 So, we are interested in these berms as well as the
11 excess soil pile 4f.

12 DR. KINGHAM: I am curious to know on
13 the sheet that you just gave us what you mean by 4a and
14 4g. Maybe if we can look at that at the same time we
15 will understand it.

16 THE WITNESS: If you refer to Exhibit
17 M-378, 4a is the narrow strip of land at the base of
18 the mound which runs from the centre of the site north
19 and west.

20 DR. KINGHAM: Which you had described
21 as a topsoil pile and retention pond?

22 THE WITNESS: There are some topsoil
23 piles and retention ponds, they are part of the design
24 during the operation of the landfill. This material
25 is stored here and that is going to be used, that



1 phraseology.

2 DR. KINGHAM: During the operation of
3 the landfill?

4 THE WITNESS: That is correct.

5 DR. KINGHAM: As opposed to after the
6 landfill...

7 THE WITNESS: I am sorry for that.

8 DR. KINGHAM: I just wanted to
9 understand what you meant by rehabilitated after the
10 landfill is over and/or during its operation.

11 THE WITNESS: The confusion arises
12 because we have used the base plan from the design and
13 operations report to draw our map when we drew the
14 topsoil piles and the retention pond were shown in this
15 area.

16 After the rehabilitation is complete,
17 the topsoil will be gone. We understand that the pond
18 may be gone as well but the narrowness of this part of
19 this site as well as the need for access may very well
20 preclude the use of 4a for agricultural production.
21 The same kind of rationale goes into making decisions
22 about the area 4g which again is very narrow. It is
23 quite narrow relative to most fields in the area. It
24 is narrow, they will be more difficult to work and in
25 all likelihood it may have to be used to get access to



1 the basic mound.

2 DR. KINGHAM: Thank you for that
3 clarification.

4 MR. LEITCH: Q. Then, Mr. Hoffman, the
5 value set out on page 56 of your report and the values
6 set out on Exhibit M-381 represent, I take it, two
7 different approaches to measuring the productivity of
8 the site after rehabilitation?

9 A. That is correct.

10 Q. Can you express an opinion as to
11 which of those indices is most likely in your opinion?

12 A. In my opinion, the second index
13 described, that is the lower one, is the more likely.
14 There is still some discussion about how these berms of
15 4b through e will be treated. This area will require
16 access, or will provide access rather, to other parts
17 of the site as will 4a as outlined on Exhibit M-378.
18 There seems to be some discussion about how this area
19 will be treated.

20 Q. Indicating the area for the
21 storage of soil in the southeast quadrant?

22 A. That is correct. The area marked
23 4f on Exhibit M-378. Given those kinds of problems it
24 is my opinion that the 0.35 level is more likely. An
25 indication of what the total site productivity will be



1 after rehabilitation.

2 Q. On page 57 of your report you deal
3 with questions of economics. That is a rather
4 discouraging looking comment on agriculture and I think
5 if my memory serves, Dr. Mackintosh made a somewhat
6 similar comment about the profitability of farming in
7 Ontario in the current context. What does it mean to
8 you when you see reductions such as your forecast in
9 relation to agricultural economics?

10 A. What it means is that any
11 individual who is working at site will have difficulty
12 making a profit when he is growing crops on that site.

13 Q. Is that something that time will
14 cure in the context of this project?

15 A. Well, that is an unknown from my
16 perspective. The kinds or the rates of returns
17 associated with common field crops can vary quite
18 dramatically with time. So, I wouldn't be able to say
19 whether things will improve from an economic standpoint
20 or not.

21 Q. That is from the point of view of
22 looking at it from price?

23 A. That's right.

24 Q. What about looking at getting an
25 increase in productivity over time, what do you say



1 about that?

2 A. The only opportunity for
3 increasing productivity will relate to the flat areas
4 shown on M-378. That will be area 1 and portions of
5 area 4 as well as some use of area 2. There will be
6 land permanently lost to production. In that
7 particular instance the berm area on the west side will
8 be lost to production, the sloping areas will be lost
9 to production. The road area and pick-up area will be
10 lost to production.

11 Q. Those losses I take it are
12 permanent?

13 A. That's right.

14 Q. With respect to the kinds of
15 margins of profit which have obtained in common field
16 crops in Ontario in the recent past, what can you say
17 about the economic viability of this farmland following
18 rehabilitation?

19 A. On page 59 we deal with this
20 particular issue. We start by saying that given that
21 capability Class 1 can produce much more than other
22 classes with the same inputs that is, say, farm
23 management. It means that on Class 1 land the farmer
24 has as a much better chance of making a profit. This
25 is outlined in a document produced by the Centre of



1 Resources Development.

2 Q. What is the Centre of Resources
3 Development?

4 A. The Centre of Resources
5 Development is a Centre at the University of Guelph
6 that deals with inter-disciplinary studies. It quite
7 often produces documents that relate to these inter-
8 disciplinary studies. I have an example of the kind of
9 document they would produce here.

10 Q. That is a report entitled
11 "Planning for Agriculture in Southern Ontario"?

12 A. That's right, data report No. 7.
13 That was prepared for the ARDA Director of Ontario by
14 the Centre of Resources Development.

15 Q. Do you take their work to be
16 authoritative in your area of expertise?

17 A. Yes, I do.

18 Q. Deal with it if you would?

19 A. "With the 20 per cent decrease
20 in productivity between Class 1 and
21 Class 2 land there is some doubt whether
22 farmers can use Class 2 land to produce
23 the common field crops and still realize
24 a profit. There is little doubt at all
25 that Class 4 lands cannot be the basis



1 for profitable agriculture when only
2 common field crops are grown. A 50 per
3 cent difference between production on
4 Class 1 soils and that on class 4 is too
5 great to warrant using Class 4 soils for
6 most cultivated crops."

7 Q. In your opinion taking
8 rehabilitated Site D as an economic whole, what class
9 is it?

10 A. It is less than Class 4 if we look
11 at the entire site. So, on that basis its production
12 level is too low to warrant using, excuse me, is too
13 low to cultivate crops.

14 Q. There is a statement following the
15 quote dealing with good management and appropriate
16 conservation methods used by farmers. What is that
17 included for?

18 A. It just means that the
19 relationship of classes must take into consideration
20 good farm management. Obviously if farm managers are
21 poor then even Class 1 land won't produce that well.
22 So, Class 1 as a reminder is a potential rating. It
23 says what can the land produce at its best level under
24 good farm management practices.

25 So that that particular thing is in



1 there to make sure that one doesn't try to state that
2 Class 1 will always produce the best. It only produces
3 the best when it is treated well.

4 Q. And the results that we have just
5 worked our way through do not take into account, as I
6 understand your evidence, problems that may occur with
7 respect to drainage and leachate, pardon me, not
8 leachate but methane gas production?

9 A. That is correct. We haven't tried
10 to look at, let us say, for example, the top part of
11 the mound as shown on Exhibit M-378. We haven't rated
12 that land as if there are going to be some yield losses
13 associated with methane gas.

14 So, area 1, for example, we haven't said
15 there will be a 20 per cent yield reduction like those
16 found in Great Britain. We have just assumed 90 per
17 cent of average will be maintained and will be
18 maintained across the entire area.

19 Q. Is it your opinion that there will
20 be some effect of landfill gas on the production of
21 area 1?

22 A. Given that there is no gas control
23 system and given the English experience, there will be
24 some methane gas effect on crop yields.

25 Q. What opinion do you hold with



1 respect to the differential subsidence and wetness in
2 relation to area 1?

3 A. Again, given the literature and
4 our field trip, or my field trip, excuse me, to Great
5 Britain and to the Waterloo sites, there will be
6 differential settlement. There will be some crop yield
7 changes associated with that.

8 Q. There are some miscellaneous
9 impacts which arise out of the design and operation of
10 this site for agriculture. Can you deal with those?

11 A. On page 60 we describe some of
12 these. For example, Ecological Services for Planning
13 documents state that there will be an impact on the
14 agricultural community surrounding Site D. Other
15 possible community impacts that relate to the Ministry
16 of Agriculture and Foods list, that list is found in
17 Figure 1 again, that is the one that talks about the
18 different factors that can affect agriculture and
19 should be considered in agricultural planning issues.

20 Regardless, the other impacts include
21 contamination of wells and surface water by leachate.
22 As well, agricultural access from the home farm to
23 rental land could be affected. As we have stated in
24 the report some of this could be reduced by preventing
25 garbage truck movement on the back roads between the



1 municipal garbage sources and landfill.

2 So, really what the access problem comes
3 down to is that you will have more trucks travelling
4 the roads and farmers will have to compete for space on
5 those roads.

6 Q. What about farming right on the
7 site, are there some impacts there?

8 A. Farming right on the site, there
9 will be certain things associated with methane gas
10 production, for example, the fact that some areas may
11 get crop loss. There will also be difficulties with
12 any kind of differential subsidence. That will have to
13 be looked at. If there are any kind of observation
14 wells or some kind of well system for sampling, then
15 the farm operators will have to move around those
16 particular structures. That will cause a nuisance to
17 anyone trying to farm the site.

18 Q. Mr. Hoffman, we started your
19 review of your report by stating the conclusions and
20 summary which appear at pages 62 and 63. I don't think
21 I will ask you to do that again. They are there. I
22 would, though, ask you to consider whether in the
23 circumstances of the report that you have given you
24 would consider that landfill at Site D with an
25 agricultural rehabilitation is an interim use of good



1 agricultural land within the meaning of the Food Land
2 Guidelines?

3 A. Well, by interim you mean it
4 ultimately will go back into agricultural production.
5 If you look at the amount of land that will no longer
6 be in production there is a significant change in the
7 site. So, on that basis, it is not an interim use.
8 There will be a permanent loss of productivity
9 associated with landfilling on Site D.

10 As well, there will be problems over the
11 time period that landfilling occurs and when
12 rehabilitation is completed. As I understand the
13 design and operations report as well as the Ecological
14 Services report this could continue for 50 years. 50
15 years is a relatively long timeframe, in my opinion, to
16 call it interim use. There could be a number of
17 changes in agriculture within that timeframe. The only
18 thing that is interim about it is the fact that
19 ultimately some of the land will go back into
20 agricultural production. So, for example, in Exhibit
21 M-378 the area on the top of the mound will go back
22 into production so that in that respect, yes, it is
23 interim because sooner or later you can go back to
24 agricultural uses.

25 MR. LEITCH: Thank you, those are my



1 questions.

2 MR. LANCASTER: I think we will break
3 for 15 minutes. Mr. Tzekas will you be going?

4 MR. TZEKAS: Mr. Chairman, we have been
5 discussing order. We think that-- Mr. Lederer and I
6 have discussed it and we thought at the moment he would
7 proceed and that would hopefully reduce the number of
8 questions that I and the Burlington Ratepayers will
9 have. So we may be out of here tomorrow in fact.

10 MR. LANCASTER: I am all in favour of
11 that, not getting out but shortening down the cross-
12 examination. Fifteen minutes.

13 ---Recess

14 MR. LANCASTER: Please be seated.

15 CROSS-EXAMINATION BY MR. LEDERER:

16 MR. LEDERER: Perhaps, Mr. Chairman, I
17 could assist you while we are waiting. I have
18 indicated to the witness that somewhere in this cross-
19 examination we would refer to Exhibit 114 which are the
20 Food Land Guidelines, Exhibit 116 which is a report
21 that was referred to by Dr. Mackintosh and has been
22 referred to you by Mr. Hoffman. It is a report by
23 E.A. Mackintosh and E. J. Mozuraitis, University of
24 Guelph, 1982. Exhibit B-117 which is a report entitled
25 "Rehabilitation of Sand and Gravel Pits for Food



1 Production in Ontario" prepared in 1985 prepared by E.
2 A. Mackintosh and M. K. Hoffman. Exhibit WB-118 which
3 is the Canada Land Inventory. The only copy I have is
4 a 1969 copy.

5 DR. KINGHAM: Did you say 117?

6 MR. LEDERER: It is a report that looks
7 like this.

8 Q. Mr. Hoffman while we are this
9 introductory stage and just to confirm this, I don't
10 have to get another copy overnight, would you agree
11 with me the 1969 copy of the Canada Land Inventory is
12 compatible with 1972?

13 A. Yes, it is.

14 MR. LEDERER: Sir, as Mr. Tzekas
15 indicated, that I would like to precede my friends in
16 this cross-examination and hope that it will speed
17 things up. Of course I maintain the same qualification
18 I raised with you before. I do recognize my prima
19 facia right to go last and this is rather a peculiar
20 situation. Mr. Tidball is not here and I do want to
21 insist on having an opportunity to cross-examine after
22 Mr. Tidball because he has already stated his position
23 here and I would also want to know what he will deal
24 with.

25 I understand from Mr. Parsons he may be



1 here tomorrow morning. There is no way I will complete
2 this this evening and I am prepared to allow him to
3 interject within my cross-examination. Perhaps he can
4 follow me immediately and I can consider whether there
5 are any questions arise from what he has asked.

6 MR. LANCASTER: Fine. We don't want to
7 lose any time.

8 MR. LEDERER: No, sir.

9 Q. Mr. Hoffman, I have a few
10 introductory questions. Just one matter that was left
11 over from the appearance of Mr. Zsadanyi. Mr. Leitch
12 has referred to the fact that you were retained by the
13 Town of Milton. I wonder if you might tell us when you
14 were retained?

15 A. I was retained back in August of
16 1986.

17 Q. If there was then before this
18 Board, as I believe there is, a report of a meeting
19 involving the Milton Solid Waste Management Committee
20 which took place in April of 1986, it stands to reason
21 you have had no opportunity to advise the committee of
22 your draft at that time?

23 A. No, I didn't have an opportunity.

24 Q. Secondly, if I could just again by
25 way of introduction be certain I understand the limits



1 of the work you have done. Would it be fair to say,
2 sir, that you have evaluated the sites, but most
3 particularly Site D from an agricultural perspective?

4 A. That is correct.

5 Q. You haven't looked at anything
6 else?

7 A. That is correct.

8 Q. For example, if I take you to
9 Exhibit M-372 which is your report and to the
10 conclusions at page 62 and 63 and you have reviewed
11 these with Mr. Leitch. If I refer you to the last
12 words which appear on page 62 raising the possibility
13 of down-gradient effects of leachate or turning over
14 the page to the concluding words on page 63:

15 "Nuisance such as noise, bird damage,
16 fear of gas explosion, possible
17 contamination of down-gradient wells or
18 surface water..."

19 Would I be correct in assuming you haven't carried on
20 any independent study of hydrogeology, for example? .

21 A. No. All I have done is take part
22 in agricultural impact studies and understand that some
23 of these things are concerns of the agricultural
24 community.

25 Q. When you say that, would I be



1 right in saying that what you are indicating to the
2 Board is you understand these to be concerns of the
3 agricultural community with respect to any evaluation
4 of any landfill in any agricultural zone. You haven't
5 looked at the potential for those issues to arise in
6 this particular case?

7 A. That is correct.

8 Q. It may very well be through good
9 fortune or good planning or otherwise that these issues
10 simply won't arise in this case?

11 A. That is possible.

12 Q. Thank you, sir. Similarly, when
13 you talk about traffic problems, sir, would I be
14 correct in saying that you haven't taken a particular
15 look at the potential for traffic problems in and
16 around Site D if it were to be operated as a landfill.
17 This is just an issue which the agricultural community
18 very often raises?

19 A. That is correct.

20 Q. I would suggest to you just by way
21 of example of that topic that Dr. Mackintosh has
22 indicated in the course of his cross-examination, Mr.
23 Chairman, you may want to correct me on this, but I
24 believe the transcript reference is page 1512, that in
25 fact, as a result of meetings with HAAC which I



1 understand to be the Halton Agricultural Advisory
2 Committee, are you aware of that group?

3 A. Yes.

4 Q. As a result of meetings with that
5 group it was decided that in this case one might
6 downplay the importance of high traffic because there
7 already are several sideroads with narrow bridges and
8 in effect there was already a restriction on
9 agricultural traffic. You were here for his evidence,
10 do you recall that?

11 A. I was here for his evidence, but I
12 do not recall that.

13 Q. Assuming he said that would you
14 agree that he said that kind of restriction and that
15 may have an impact on traffic at this site as opposed
16 to a general concern raised in a more general fashion?

17 A. That is correct.

18 Q. I am now going to ask you some
19 fairly general questions. I always apologize for
20 asking these ones, but I think it is of value to make
21 sure that we all start from the same place. So, if you
22 will bear with me. Will you agree with me and I did
23 put these questions to Mr. Zsadanyi. Would you agree
24 with me that as a society we are producing garbage?

25 A. That is correct.



1 Q. It is going to be or it appears to
2 be going to be produced in rather significant
3 quantities?

4 A. I agree.

5 Q. We have to dispose of it?

6 A. That's correct.

7 Q. Can we also agree that landfill is
8 a land use that nobody appears to want to have nearby.
9 People don't like to have landfill nearby them?

10 A. I guess if you are talking about
11 surrounding neighbours, yes, I would agree. There are
12 some people who like landfill because in some
13 circumstances they can make money in association with
14 that activity.

15 Q. Fair enough, and these people may
16 well be proponents, but as you have said in looking at
17 non-municipal proponents, I should say, looking at the
18 neighbours who are not directly involved, can we agree
19 that by and large they do not like to have landfills
20 located nearby?

21 A. Yes, the neighbours do not like to
22 have them.

23 Q. Can we agree, however, that since
24 landfill appears to be necessary, waste disposal is
25 necessary, that we are going to have to put it



1 somewhere and that no matter where you put it is has
2 the potential to have a disruptive impact on somebody?

3 A. That is correct.

4 Q. All right. Just by way of
5 example, and these are the examples again that I put to
6 Mr. Zsadanyi. If you put it in the middle of a
7 residential area, those people that reside in that area
8 aren't going to be too happy?

9 A. True.

10 Q. If you put it in an
11 environmentally sensitive area people who are concerned
12 about such areas won't be happy and if I may try to
13 personify the natural environment, it isn't going to be
14 too happy because of the very nature of the area you
15 are placing it in?

16 A. I agree.

17 Q. You have made it fairly clear that
18 there are reasons why you would prefer not to see such
19 a facility in an agricultural zone; would you agree
20 with that?

21 A. Yes.

22 Q. Can we agree, as Mr. Zsadanyi did,
23 that there are going to be people who live in an urban
24 fringe and may want to develop there and for whatever
25 reason they see themselves as being negatively impacted



1 if you put a landfill in such an area as well?

2 A. That is correct.

3 Q. So what we have got again is we
4 need it and we know it is going to disrupt some kind of
5 human activity, can we agree on that?

6 A. Yes.

7 Q. You indicated when Mr. Leitch took
8 you through your CV that you had done some work with
9 respect to landfill and waste disposal and you referred
10 us to the Tricil site and to your work on this project
11 of course and to your work for OWMC?

12 A. Yes.

13 Q. Would I be right in assuming
14 that, first of all, in no case have you acted for a
15 proponent or had to conduct an environmental assessment
16 exercise in which you have done the initial comparison
17 study?

18 A. Would you ask me that question
19 again, please?

20 Q. You understand that the
21 Environmental Assessment Act imposes a rather
22 particular and compact procedure that nobody yet quite
23 understands regarding how to locate certain kinds of
24 facilities, in this case a waste disposal facility
25 operated by the municipality?



1 A. Yes.

2 Q. What I am suggesting to you is
3 that so far as, it is not a major point, I wish to make
4 sure I understand, you have never acted for a proponent
5 on an environmental assessment siting a landfill. Is
6 that a fair statement?

7 A. In the Comcor study, Comcor was a
8 proponent.

9 Q. The Comcor study hasn't yet been
10 completed, hasn't yet been to a hearing?

11 A. It is far from completion. There
12 is no application.

13 Q. You have, however, as I understand
14 it, conducted a research literature review of landfill
15 work; is that correct?

16 A. Yes.

17 Q. A number of papers that you have
18 looked at do deal with landfill and other topics, is
19 that correct?

20 A. Yes.

21 Q. If we go back to page 65 and the
22 following pages of your report, Exhibit M-372, we see a
23 list of the works or reports that you have reviewed in
24 the context of this study and the literature search
25 that you conducted?



1 A. That is true.

2 Q. Just to look at those which deal
3 with landfill, I am on page 66, the fifth down, Hewitt,
4 A. K. J., and S. J. McRae, "The effects of Gases
5 emitted from Landfills on Soils and Crops in
6 Contaminated Soil?

7 A. Yes.

8 Q. The last two on that page,
9 "Restoration of Landfill Sites?"

10 A. That is correct.

11 Q. Again Stuart J. McRae and A. K. J.
12 Hewitt, "Landfill Gas Emission and Their Effect on
13 Soils and Crops?"

14 A. Yes.

15 Q. Turn over the page, page 67, the
16 third study, the National Centre for Resource Recovery,
17 1974 Sanitary Landfill?

18 A. Yes.

19 Q. The last one on that page, the
20 "Report on Investigations of Cause of Vegetation Injury
21 on Properties Adjacent to Sanitary Landfill Sites," the
22 Town of Mississauga?

23 A. Yes.

24 Q. Then over the page you have
25 reference to the Trow and Walker studies of this



1 particular project?

2 A. That is correct.

3 Q. Finally, L. R. Webber, 1973,
4 "Agricultural Crop Products," do you see that?

5 A. Yes.

6 Q. Can we agree that these reports
7 deal with generally the impact of soils on crops and
8 the restoration of a landfill after operations?

9 A. Yes, it deals with both those
10 components and includes not only the restoration but
11 some of the results of a different method used during
12 that restoration.

13 Q. But they don't deal with the
14 original problem which is the matter of originally
15 siting and locating a landfill site?

16 A. They are not planning studies in
17 and of themselves.

18 Q. I appreciate that, thank you. You
19 also have indicated at page 43 of your study, I think
20 you said this in evidence, that you reviewed some 2500
21 landfills and found 30 that were in an agricultural
22 after-use?

23 A. Possibly 30, yes.

24 Q. Possibly 30, thank you. With that
25 background, can we agree nonetheless that as things



1 have developed in this area landfills have in fact been
2 placed on agricultural lands?

3 A. That is correct.

4 Q. For whatever reasons and you may
5 not agree but those responsible for planning and
6 locating these facilities have from time to time
7 determined that agricultural lands are the best place
8 to locate them?

9 A. A number of these lands are
10 actually wastelands. That is they are areas of poor
11 agricultural capability within an agricultural
12 community. Many of them are very small sites. So, for
13 example, if we look at the information historically a
14 number of the sites are chosen because they are part of
15 land that wasn't used by the farmers.

16 Q. If I were to suggest to you that
17 we could find through Southern Ontario landfills that
18 were in fact on Classes 1,2,3 and 4 lands, those
19 classified as high priority lands by the Canada Land
20 Inventory, would you agree with that statement?

21 A. There are some that would be like
22 that, yes.

23 Q. There may be planning reasons for
24 making that choice, perhaps fewer people would be
25 affected or perhaps there will be fewer other uses



1 impacted, would you agree that is one rationale, one
2 consideration of making such a decision?

3 A. If I can state it as part of a
4 planning team I have often seen these kinds of
5 decisions made, yes.

6 Q. Can we also agree, quite apart
7 from the planning background, that clay soils in
8 Southern Ontario are considered to be good for
9 agriculture generally?

10 A. Yes, a number of clay soils are
11 Class 1 and 2 for agricultural use.

12 Q. Can we agree as well and if you
13 don't know the answer to this I would be happy to
14 accept that. Clay soils are also considered to be
15 good for landfill because they have the ability to hold
16 water back and they may have a high attenuation
17 capacity as well?

18 A. Yes, I understand that the clay
19 soils to which you refer are those which lie underneath
20 the agricultural soils. In some cases there may be a
21 correlation between the surface clay soils and the
22 sub-surface clay soils. In other instances there may
23 not be. For example, there may be some very sandy
24 sites that are actually underlain by clays.

25 Q. In your report in this case is it



1 not correct that the Chinguacousy, the Oneida and the
2 Jeddo soils developed from those series; isn't that
3 somewhere in your report?

4 A. All of those are soil series and
5 they are developed, there are the same what they call
6 parent materials, southern clay, parent materials.

7 Q. Doesn't that indicate that we find
8 clay below them in this particular site?

9 A. In this case we do.

10 Q. That may be the same on other
11 sites?

12 A. Yes.

13 Q. Can we agree that in those
14 circumstances you have what I am prepared to concede to
15 you is an unfortunate situation where you have two land
16 uses, agriculture and landfill, competing as it were
17 for the same land because there are benefits for both
18 uses in locating on such soils?

19 A. Yes, they are competing uses.

20 Q. Can we agree that this whole
21 matter of what happens to water beneath a landfill can
22 be a critical issue in determining the location of a
23 landfill. It is a pretty important question for that
24 kind of study?

25 A. Again I can only address that as a



1 member of a team and yes it seems to be a criterion
2 that people use as important.

3 Q. Now, with that background, can we
4 turn to the Food Land Guidelines which are Exhibit M-
5 114. First of all, as I understood your evidence in
6 response to questions from Mr. Leitch, you indicated
7 that these guidelines were provincial government
8 policy. Do I recall you saying that correctly?

9 A. That is correct.

10 Q. They have I believe you said
11 existed since 1978 and in fact they bear that date on
12 the outside, the copy I have?

13 A. That is correct.

14 Q. Would I be right that they have
15 been relied upon by the province since that time?

16 A. That's true.

17 Q. Are you aware of the import of
18 section 3 of the Planning Act?

19 A. As it presently stands, I don't
20 know section 3. You would have to put that before me.

21 Q. Perhaps you will just permit me,
22 and I think Mr. Walker has discussed this and I don't
23 think it really is a matter of contention. Perhaps,
24 Mr. Hoffman, we can just read this together into the
25 record. I am reading from the Planning Act, 1983:



1 "The Minister or the Minister together
2 with any other Minister of the Crown..."

3 And just to assist Mr. Hoffman, the Minister you will
4 see is defined as being the Minister of Municipal
5 Affairs and Housing?

6 A. Yes.

7 Q. "...may from time to time issue
8 policy statements which have been
9 approved by the Lieutenant Governor-in-
10 Council in matters relating to municipal
11 planning that in the opinion of the
12 Minister are of provincial interest."

13 A. Yes.

14 Q. Now, the evidence of Mr. Walker,
15 the planner here is that the Food Land Guidelines which
16 of course existed prior to the Planning Act 1983 had
17 been redrafted but has not yet been approved by Cabinet
18 in a fashion that would have them recognized as policy
19 under section 3 of the Planning Act. Are you in any
20 position to agree with that or disagree with that or do
21 you know?

22 A. I certainly would agree with you
23 that they are being redrafted. On the basis of my
24 practice the existing policy, the existing policy
25 statement that is the Food Land Guidelines are included



1 in the planning studies and included quite a bit in
2 planning studies.

3 Q. No question about it. I am
4 suggesting to you that they have, for the moment
5 anyway, maintained their status as a guidelines; would
6 you agree with that?

7 A. That is correct.

8 Q. Can we agree that what that means,
9 the significance of that is you apply a guideline as is
10 appropriate in the particular circumstances that you
11 are dealing with?

12 A. That is correct.

13 Q. To put it another way there is
14 some discretion, although you may have to justify your
15 decision, some discretion not to follow the guidelines
16 exactly?

17 A. If you don't follow them you do so
18 at your peril.

19 Q. There is some discretion and it
20 may well be as you have suggested... that's a
21 possibility?

22 A. Yes, it is a possibility.

23 Q. By way of example then, if we were
24 to turn to Figure 1 of your report which is page 5, it
25 may be that for whatever reason, and I am just again



1 giving this to you as a hypothetical, and I want to
2 make sure that we agree as to the ramifications of the
3 Food Land Guidelines, it may very well be that one of
4 these characteristics which you have outlined as being
5 the ones one finds considered in these various
6 guidelines, policy statements and such, it may be that
7 one or the other of them may not apply in some
8 particular case, basically not have an application?

9 A. That is correct.

10 Q. Now, with that, can we look at the
11 Guidelines, and can we turn to page 24, paragraph 5.1
12 and you see 5.1 where really it just outlines the
13 construction of the guidelines, can we agree?

14 A. That is correct.

15 Q. If we could look at the third
16 point:

17 "-analyze the competing demands for
18 resource lands..."

19 Do you see that?

20 A. Yes.

21 Q. Would you agree that the substance
22 of that is to suggest that as we agreed a moment ago
23 the Guidelines recognize there will be competing
24 demands for resource land?

25 A. That is true.



1 Q. If we could, just to follow it up,
2 go to page 10 of the Guidelines and paragraph 3.12.
3 First of all, can we agree that the heading which
4 precedes the paragraph in fact is an evaluation of
5 alternative uses?

6 A. Yes.

7 Q. What follows is a description of
8 how that may be done in the particular circumstances;
9 can we agree?

10 A. That is correct.

11 Q. That is a further indication that
12 there may be competing values with respect to resource
13 agricultural lands?

14 A. That is true.

15 Q. If we can look at paragraph 3.12:
16 "The allocation of land for the many
17 uses that must be accommodated is rarely
18 simple within a municipality. A parcel
19 of land may be suitable for several uses
20 or several uses may be competing to
21 locate on it."

22 That is a pretty clear statement of what we have been
23 saying; isn't it?

24 A. Yes.

25 Q. "The municipality must decide



1 which use will be permitted. These trade-
2 offs must be made for all land on which more than one
3 use might be feasible. Needs must be analyzed to
4 determine where industry, housing, forestry,
5 agriculture or environmental areas will be in
6 competition for the same land."

7 You agree it is at this point it just repeats the same
8 point, you are going to have competing uses?

9 A. Yes.

10 Q. "The resolution of these
11 conflicting demands will vary according
12 to the types of use to be accommodated,
13 the amount and nature of the land
14 available, and the future growth
15 pressures expected. The following
16 examples outline some of the situations
17 that may arise in those situations."

18 Just to summarize, can we agree that one deals with
19 forestry, sand and gravel extraction?

20 A. Yes.

21 Q. Two deals with highway
22 and commercial buildings?

23 A. Yes.

24 Q. Three deals with the potential
25 development?



1 A. Yes.

2 Q. Can we agree that landfill may
3 well be another?

4 A. Yes.

5 Q. Can we turn to paragraph 3.13
6 which is a continuation of the section evaluation of
7 alternative uses and can we perhaps, it would be just
8 as well if I read that into the record with you as
9 well.

10 "Where high capability agricultural
11 lands have been identified, use of these
12 lands for productive agricultural
13 purposes must be given priority in
14 evaluating alternative uses. If the
15 land is to be used for another purpose,
16 the requirement must be justified. The
17 need for the alternate use within the
18 municipality or planning area must be
19 documented, as must reasons why lower
20 capability on marginal land cannot be
21 used."

22 So can we agree that when you are going to use land for
23 some purpose other than agriculture that appears in
24 this section you have to justify it?

25 A. That's correct.



1 Q. Paragraph 3.14 and 3.15 give you
2 an outline as to what the Guideline suggests are the
3 main sources of study for the justification?

4 A. That's right.

5 Q. Can we agree, as we did before
6 that in a particular case some aspect of this
7 justification may not apply? These are only guidelines
8 as we agreed before?

9 A. Some aspects may not apply, that
10 is correct.

11 Q. Now, can we agree that, perhaps,
12 you don't know this, if you don't please say so and I
13 will put it to you as an assumption. Are you aware
14 that in this case the environmental assessment process
15 began with a look at the whole Region and has slowly
16 winnowed its way down to the two sites that are before
17 the Board?

18 A. As I understand the process that
19 is correct.

20 Q. If this Board were ultimately
21 determined that Site D is the site which should be
22 approved here can we agree that in a sense you would
23 have a justification for that simply by eliminating
24 everything else on, presumably, a rational basis. That
25 would be the position of the Region?



1 A. I am not sure I understand the
2 question.

3 Q. I have said it in an incoherent
4 fashion. I apologize. What I am suggesting to you is
5 that if you have a process that starts with the whole
6 Region and through a rational decision-making process,
7 a logical progression ultimately comes out with one
8 site and demonstrates from that process that this is
9 acceptable, hopefully, the best site. That is a form
10 of justification for going to that particular location?

11 A. Yes, if we can assume that the
12 process is rational, yes.

13 Q. I will leave that open for debate
14 later. Now, just looking at this final choice here
15 then, that final decision and looking at Sites D and F,
16 and looking at page 29 of your report and you did refer
17 Mr. Leitch to this. I don't want to in any way suggest
18 you didn't. Your decision after an evaluation of Site
19 F is that it is not the farmland, can we agree?

20 A. That is correct.

21 Q. The basis for that is, if I
22 understand page 29 correctly, is first of all Halton
23 Region didn't rank the lands south of Highway 5 which
24 is where Site F is located in its report Agricultural
25 Land Evaluation system. So they made an assumption as



1 to farmland?

2 A. That is correct.

3 Q. That is the work that is found at
4 Tab 1 of the volume, appendices to agricultural
5 characteristics, the appendices to your report, Exhibit
6 M-373?

7 A. Yes, it is.

8 Q. Secondly, the Halton environmental
9 assessment process you point has given it a low
10 agricultural rating?

11 A. Meaning that its value for
12 agriculture is low, yes.

13 Q. You point out that the Ministry of
14 Agriculture and Food does not as part of its normal
15 practice consider land within urban areas as worthy of
16 agriculture preservation even when the land is
17 farmland. Would that be another reason?

18 A. That is correct.

19 Q. Finally the Food Land Guidelines
20 support this view and you have included this view with
21 the statement on page 29 of your report?

22 A. Yes.

23 Q. For all those reasons, if you
24 like, we have a justification why Site F ought not to
25 be considered for the purpose of this study, do we



1 agree?

2 A. Yes, in addition to that, the
3 current soils and their capability as well as the land
4 use of the site support the view that it is not
5 agricultural land.

6 Q. In fact I was just, I jumped to
7 where I have gone, if you in fact proceed at page 30 to
8 look at land use at Site F and at page 31 to map those
9 uses; can we agree?

10 A. That is correct.

11 Q. Now, just one very small point, I
12 just noted that you have entitled this map on page 31,
13 Figure 16, crop map Site F. If I look at the legend
14 there are a number of uses there that I at least agree
15 is not terribly educated, you don't think of some of
16 these things as being crops. I don't consider
17 recreation being crops, I don't consider E extracted to
18 be crops, or I, industrial crops, or A to be abandoned
19 to be crops. Personally I have had difficulty seeing W
20 wooded as crops. Can we agree that this is a land use
21 map, it is just not too well titled as a crop map?

22 A. I normally have difficulties
23 defining land use as opposed to cropping. Land use
24 sometimes include planning information, a restricted
25 area by-law designations. In this particular instance



1 all we are trying to indicate is what is on the ground
2 in this particular area.

3 Q. So to put it fairly it might be
4 better titled land use map?

5 A. That is quite possible, yes.

6 Q. You have gone on at page 32 to
7 define the area of each of the uses, is that fair?

8 A. That is true.

9 Q. On page 33 you look at the soil
10 capability of this land?

11 A. That's correct.

12 Q. Presumably using the Canada Land
13 Inventory classification system to which you have
14 referred?

15 A. That is correct.

16 Q. Ultimately all of that is mapped,
17 as I understand it, on page 34 Figure 18, soil map?

18 A. That's correct.

19 Q. The conclusion in all of this is
20 as we see now again on page 33, the last paragraph of
21 the text, dealing with Site F. I am looking at that
22 paragraph perhaps I just read it to you:

23 "Site F is located in an area of mixed
24 land uses where agricultural production
25 is minimal. 90 per cent of the site is



1 non-agricultural uses and 51 per cent of
2 the land has no agricultural capability.
3 Site F cannot be considered as
4 farmland."

5 In fact you have ended as you begun, in fact it is not
6 farmland?

7 A. That is right.

8 Q. So if we analyze these two sites
9 from an agricultural perspective and that you have
10 indicated is the substance of your work, it is not a
11 very difficult choice. Site D has agriculture on it,
12 it is good agricultural land, Site F isn't farmland at
13 all and therefore in that respect we can agree that F
14 for landfill is the preferable site?

15 A. From an agricultural perspective,
16 yes.

17 Q. I presume, I presume from your
18 very careful qualification, not from an agricultural
19 perspective, we can agree that is not the only thing
20 you have looked at in determining where to look for a
21 landfill?

22 A. It is normally the only thing I
23 look at. The team looks at a lot.

24 Q. When I say "you" I mean the
25 collective you of someone who was ... if that's the way



1 you read it I apologize. Anyone who undertakes this
2 kind of study does not solely look at the agricultural
3 perspective. They look at a whole range of topics that
4 are raised before this hearing and raised in the
5 environmental assessment document by the Region of
6 Halton?

7 A. Normally the team looks at the
8 whole perspective.

9 Q. As a way, for example, you look at
10 hydrogeology?

11 A. Yes.

12 Q. You look at matters like traffic,
13 noise?

14 A. Exactly.

15 Q. Other impacts on people and land
16 uses?

17 A. That is true.

18 Q. By way of example in this case if
19 we could again turn to page 30 of your report, you have
20 referred to the fact that part of Site F, looking at
21 the first sentence of the second paragraph on that
22 page:

23 "Site F is covered for the most part by
24 former extractive areas or by wooded
25 areas."



1 Do you see that?

2 A. Yes.

3 Q. I am interested in the
4 observations of wooded areas on the site. Can we agree
5 that wooded areas may themselves raise some issues of
6 sensitivity for the location of a landfill. You may
7 have rare species, rare flora or fauna located in it?

8 A. That is correct.

9 Q. For some people that is an issue
10 that needs to be considered and weighed in the balance
11 as to whether or not to locate a landfill?

12 A. I agree.

13 Q. Can we agree then that in this
14 case, as it has developed, we have the odd balance. On
15 the one hand we have the natural environment and
16 biophysically issues that may be raised, and on the
17 other hand, we have the agricultural resource, that use
18 of land which may be raised as a reason for not
19 locating a landfill on these respective sites?

20 A. Breaking the comparison down into
21 those two factors alone, I don't necessarily agree with
22 that, as I understand the process. As I understand it,
23 there are a number of hydrogeological questions that
24 need to be addressed and there are certainly social
25 concerns that need to be addressed.



1 Q. I in no way mean to suggest that
2 these are the only two factors. It would be fairly
3 foolish of me to do that. There is a similarity in the
4 growth and growing that is supported on these various
5 sites. In that sense, I am not suggesting they are the
6 only things you look at. There is an odd competition
7 here. One you might want to consider the natural
8 features and in the other you want to conserve this
9 valuable resource of agriculture?

10 A. Those are two different things you
11 might want to preserve, yes.

12 Q. In this particular case having
13 that choice you can't have it both ways. There may be
14 all kinds of other factors that play in the decision?

15 A. That may very well be far more
16 important than either.

17 Q. Can we agree then that in fact you
18 have to look at all these factors to which we have
19 referred? Noise, hydrogeology, and as you have said I
20 think just a moment ago, some of those which are
21 outside your sphere and the biophysical sphere may turn
22 out to be the most important perhaps in determining the
23 issue?

24 A. Normally one has to look at those
25 things if they want to say they have completed, how



1 shall I say it, a comprehensive environmental
2 assessment.

3 Q. Given the complexity of the
4 process then and all the many things that you need to
5 look at, would you agree with me that if ultimately
6 this Board determines that Site D is to be an approved
7 site, that that whole process again, assuming it is
8 rational and with all due respect to the Board, and we
9 can agree that the Board's decision is rational, that
10 what we have got then is a justification of the form
11 and the way the process is operating. I mean no
12 disrespect, sir.

13 MR. LANCASTER: You made your
14 assumption.

15 THE WITNESS: It is a justification in
16 one sense, yes.

17 MR. LEDERER: Q. It completes the
18 planning process and incorporates into the
19 justification which looks at all of these various
20 issues?

21 A. That is correct.

22 Q. Now, can we agree from all of this
23 that from your particular area of expertise, your
24 particular interest, your particular study alone, you
25 would have preferred to see this landfill located at



1 Site F?

2 A. That is correct.

3 Q. Can we agree, however, that in
4 view of these other things, it may nonetheless, as part
5 of the team, if you had been part of a team here, that
6 it might yet be necessary or preferable to site this
7 landfill on Site D?

8 A. It certainly wouldn't be
9 preferable from my perspective.

10 Q. But you can accept that overall
11 that may nonetheless be the choice given the other
12 features and characteristics in the study?

13 A. As a team I figure if they beat me
14 up and force me to agree to something else.

15 Q. You might agree that it is what is
16 required being a rational person yourself?

17 A. I am usually rational.

18 Q. For some reason I am totally
19 confident that that is so. But my point is a serious
20 one, Mr. Hoffman, you can agree that even as a member
21 of the team, even feeling from your particular area you
22 would rather have it go somewhere else, even you might
23 be persuaded that overall nonetheless it might have to
24 go elsewhere?

25 A. I might accept a consensus of



1 opinion.

2 Q. If we turn to page 64 of your
3 decision, this is really the last paragraph of the text
4 in this report:

5 "In summary, because of both long-term
6 (loss of soil capability) and short-
7 term impact (during the life of the
8 landfill) this assessment indicates that
9 in compliance with the Food Land
10 Guidelines, the proposed landfill should
11 be accommodated, if possible, on lands
12 suitable or of low priority for
13 agriculture."

14 I presume you are recognizing in the use of the words
15 "if possible" as the fact and nonetheless, all things
16 considered, this might have to come to Site D. That
17 possibility exists and you might have to accept it?

18 A. That possibility does exist, yes.

19 Q. Now, what you are telling us in
20 the context of your work here is that you would prefer
21 it to go to Site F, but if all factors are considered
22 it has to go to Site D that is something you might be
23 able to understand and accept?

24 A. I can understand it only as part
25 of a particular process. The acceptance of it is a



1 different matter. The process in and of itself, might
2 have included an examination of additional sites or of
3 additional areas. I am not familiar enough with that
4 particular process to know whether it did.

5 Q. I am not asking you to make a
6 judgment about this particular process. I am just
7 saying that at the conceptual level you can see that
8 possibility and you could accept it assuming the study
9 has?

10 A. I can see that Site D might be
11 chosen.

12 Q. Now, what I would like to do is
13 look at the Food Land Guidelines -- I am sorry -- can I
14 just have a moment?

15 MR. LANCASTER: Yes.

16 MR. LEDERER; Q. Would it be fair to
17 say, Mr. Hoffman, you indicated to Mr. Leitch that you
18 were a member of the Committee of Adjustment in Guelph?

19 A. That's right.

20 Q. Would it be fair to say in the
21 past as a member of that committee you have had to
22 justify a trade-off?

23 A. I have the option as a member of
24 that committee to disagree with a particular decision
25 and refuse to sign that decision.



1 Q. Fair enough. But don't you make
2 trade-offs and ...

3 A. Oh, yes.

4 Q. You do?

5 A. Yes, we do.

6 Q. Can we look at the Food Land
7 Guidelines and how they classify land. Perhaps what we
8 could do would be to start with page 5, paragraph 2.5
9 and page 3 of your report.

10 If you look at paragraph 2.5 you have:
11 "Land with agricultural potential
12 includes: 1. Lands with a capability for
13 the production of specialty crops."

14 Does that turn out to be the highest priority around?

15 A. That's right.

16 Q. "2. Class 1 to 4 soils as defined
17 in the Canada Land Inventory of Soil
18 Capability for Agriculture?"

19 A. That's true.

20 Q. The second highest level.

21 Then:

22 " 3. Additional areas where farms
23 exhibit characteristics of ongoing
24 viable agriculture?"

25 A. That's true.



1 Q. "4. Additional areas where local
2 farm conditions ensure agricultural
3 viability where it might not exist
4 otherwise?"

5 A. That's true.

6 Q. This is a general ordering of
7 priorities for agricultural lands?

8 A. That's the way they are set out in
9 the guidelines.

10 Q. In fact you have set that out at
11 page 3 of your report?

12 A. That is correct.

13 Q. Precisely the same words and
14 paragraphs appear again in the Food Land Guidelines at
15 page 9, paragraph 3.4?

16 A. That is correct.

17 Q. "The actual cut-off of high
18 priority lands will depend on the
19 circumstances within an individual
20 municipality. On a provincial basis,
21 however, high priority agricultural
22 lands will include the following..."
23 And then it goes with the same priority listing of four
24 items?

25 A. That is correct. Excuse me, if I



1 may interject. This kind of prioritization, if you
2 like, of agricultural lands is the kind of thing that I
3 discussed previously as part of the Halton agricultural
4 land evaluation system.

5 Q. I understand. That is the sort of
6 thing they did although as I understand they didn't
7 entirely use the Canada Land Inventory capability class
8 system?

9 A. They used parts of it, yes.

10 Q. Looking at the Food Land
11 Guidelines, can we agree, first of all, that tender
12 fruits, so-called tender fruit soils are specialty crop
13 lands?

14 A. That's right.

15 Q. Looking at page 21 of your report
16 and at the middle paragraph:

17 "The specialty crop interpretation is
18 limited by the lack of published climate
19 data suitable for application to
20 1:10,000 scale. However, data is
21 sufficient to state that commercial
22 tender fruit crops cannot presently be
23 grown successfully within the study
24 area."

25 Do you see that?



1 A. Yes.

2 Q. Could we in the same light turn to
3 page 25 and here to the last sentence again in the
4 middle paragraph:

5 "Normally specialty crops are not grown
6 extensively on these soils."

7 Meaning the three soils you found on Site D?

8 A. That is correct.

9 Q. So can we agree then that in this
10 case, the analysis of Site D, we are not dealing with
11 the highest priority of specialty crop lands?

12 A. Under current circumstances we are
13 not.

14 Q. The second order of priority,
15 looking at, as you will, page 3 of your report, or
16 paragraph 2.5 or paragraph 3.5 of the Food Land
17 Guidelines is the Class 1 to 4 soils as defined in the
18 Canada Land Inventory of soil capability for
19 agriculture?

20 A. Yes.

21 Q. As I understand it, all lands
22 where we have soils that fall within Classes 1, 2, 3
23 and 4, as defined by that system of classification are
24 said to be high priority lands?

25 A. That is correct.



1 Q. That is principally what you
2 looked at in your study here, isn't it?

3 A. That is one of the principal
4 components, yes.

5 Q. It is principally what
6 Dr. Mackintosh looked at in the course of conducting
7 his work?

8 A. That is true.

9 Q. If we go to paragraph 2.10, page 6
10 of the Food Land Guidelines can we agree that this
11 classification applies to common field crops. Perhaps
12 we can just read that paragraph:

13 "The system provides a classification of
14 Ontario soils. It groups the many
15 diverse soils within the province into
16 seven classes based on the capability to
17 produce common field crops (corn, wheat,
18 oats and barley)."

19 A. Yes.

20 Q. That is the basis of the
21 classification system essentially?

22 A. That's right.

23 Q. I have a copy of Exhibit 118, a
24 form of Exhibit 118. This is the Canada Land Inventory
25 system. Do you have a copy of that, sir?



1 A. Yes, I do.

2 Q. If I could confirm something I
3 asked you earlier. Unhappily for me the only one
4 that's available is the '69 version. Can we agree that
5 the '72 version is the same?

6 A. I think it is substantially the
7 same.

8 Q. Now, can we turn to page 3 of this
9 document. I want to see if we can get some basic
10 understanding of how this works and what it is. I am
11 going to perhaps read for a few paragraphs from the
12 copy I have and should in any way the words be
13 different if you would just correct me because I think
14 the more up to date version is the one the Board should
15 have adherence to.

16 DR. KINGHAM: The Board actually has
17 the 1976 version printed in 1977 so we will follow very
18 carefully.

19 MR. LEDERER: Q. Which one do you have?

20 A. I have the 1972. It is the '72.

21 Q. We have the whole range here.

22 Mr. Tsekas has loaned me a copy of the '76 and I hope--
23 is it on the same ...

24 DR. KINGHAM: That's the one.

25 MR. LEDERER: Q. The base references



1 are going to be quite different, let us share a copy
2 and see how we do here.

3 MR. LEITCH: I wonder, Mr. Chairman,
4 since it is 4:30, I wonder if we can copy the one that
5 we are going to use and distribute it tomorrow morning.

6 MR. LEDERER: It is twenty after four.
7 Whatever the Board wishes. It is immaterial to me.

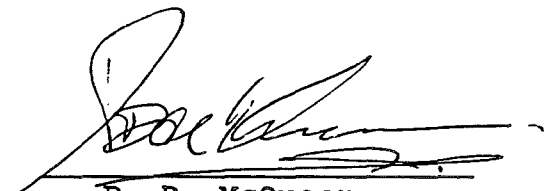
8 MR. LANCASTER: Are we going to go into
9 this in great depth?

10 MR. LEDERER: We are going to be some
11 time. I am going to go into it in quite some depth.

12 MR. LANCASTER: We are going to do it
13 overnight and we will continue with it tomorrow. We
14 will adjourn until 9:30.

15
16 ---Adjournment a 4:20 p.m.

17
18
19
20 ---CERTIFIED CORRECT:


P. D. McQueen

21 (Page 16350 follows)
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23
24
25