

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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BEFORE:	H. H. Lancaster, Q.C.	-	Chairman
	Dr. D.J. Kingham	-	Member
	S. Tanner	-	Member



Nethercut & Co. Ltd.

Toronto, Ontario

Hearing conducted at The Oakville
Granary Commercial Centre, 105 Robinson
Street, Oakville, Ontario, on
Friday, June 19, 1987

VOLUME 23

APPEARANCES:

T.R. Lederer and H.D. Hodgson	for the Regional Municipality of Halton (Proponent)
J.R. Tidball	for the Ministry of the Environment
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
M.J. McQuaid, Q.C. and C.J. Tzekas	for the City of Burlington
C. Mansfield	for the Ministry of Natural Resources
P. Renaud	for Cumis



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Toronto, Ontario

APPEARANCES (Cont'd):

1	C. Stevenson	for Framgard Holdings,
2	P. Hancock	Fosseri Investments
3		Limited, Seriphos
4		Investments Limited and
5		Topic Investments
6		
7	J.H. Olah	for the Halton Region
8		Conservation Authority
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Per: C. F. Nethercut, C.V.R.



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

2 THE CHAIRMAN: Good morning and thank you.
3 Please be seated.

4 ALFRED A. SOBANSKI, (resumed):

5 JAMES BEECHINOR, (resumed):

6 MR. TIDBALL: Two preliminary matters
7 before we start. Yesterday I had Mr. Sobanski and
8 Mr. Beechinor colour up a particular drawing, drawing 7
9 from Exhibit H-40 and Mr. Nethercut has reminded me there
10 are numerous references in the transcript to the coloured
11 areas and we thought perhaps it should be given an
12 exhibit number. I think perhaps H-40, and I don't know
13 whether to say drawing 7 or 7.

14 THE CHAIRMAN: I think 7 would probably
15 identify it. Are there any other possibilities in 40?

16 MR. TIDBALL: We are up to 5 in that
17 series. There are figures.

18 THE CHAIRMAN: There are figure numbers
19 so perhaps H-40-D7 for drawing.

20 MR. TIDBALL: That would be fine.

21 --- EXHIBIT NO. H-40-D7: Coloured version of Drawing
22 No. 7 from H-40

23 MR. TIDBALL: Mr. Sobanski said there is
24 something he wants to correct from his evidence yesterday.

25 MR. SOBANSKI: Thank you. As one relives



1 the experience in the evening it occurred to me that we
2 talked yesterday about inputting data at the nodes of
3 the model in terms of the hydraulic conductivity and
4 in fact the data is input into the elements, the tri-
5 linear elements and that is where we take into account
6 the thickness and the hydraulic conductivity and the
7 calculation is done at the node so the node calculation
8 takes into account all the surrounding elements.
9 Yesterday we talked about putting the data in at the
10 node but the calculation is done at the node and the
11 data goes in between the nodes.

12 CROSS-EXAMINATION BY MR. TIDBALL, (continued):

13 Q. The elements are the triangular shape...

14 MR. SOBANSKI: A. The triangular shape
15 and it goes into the model as three co-ordinates and
16 that defines its thickness and you also give it its
17 hydraulic conductivity.

18 Q. And you get a head value for each
19 of the nodes that comes out of that?

20 A. You get head values and flow lines
21 at each of the nodes, a hydraulic value for the node.

22 Q. I would like to start this morning
23 with the tritium analysis and could you turn, Mr. Sobanski,
24 to Appendix 12 and it's part of Appendix 12 which is
25 the water chemistry and it's called Appendix 12 (iii) and



1 I don't know how to describe it partway through the
2 water chemistry stuff and it's one page so you do have
3 to search for it. It's just before the Chemistry from
4 Barringer Magenta. Do you have it?

5 A. Yes, I do.

6 Q. Can you confirm for me that the
7 two wells we are looking at here HC 5 and HC 8 are the
8 two in the centre of the cross-section, drawing 7 that
9 is up there?

10 A. Yes, that is correct.

11 Q. Just so that we have it clear,
12 piezometer No. 2 of HC 5 is within the highly fractured
13 unit?

14 A. Yes.

15 Q. Piezometer 1 is below it?

16 A. Yes, that's right.

17 Q. For HC 8 it appears that piezometers
18 2 and 3 could be in that unit.

19 A. Yes, that is correct.

20 Q. I have a few questions about that.
21 First of all looking at HC 5, down at the lowest piezo-
22 meter, piezometer 1 we are seeing a tritium concentration
23 of 4.57.

24 A. That's right.

25 Q. As I understand that you would



1 refer to that as tritiated water or post-1952 water?

2 A. Yes.

3 Q. I am wondering if with reference
4 to the model generated by the computer, could you tell
5 me what kind of a flow path water at that point would
6 have had to have taken to get to that point?

7 A. At HC.5?

8 Q. At the bottom of that well.

9 A. There would be some water coming
10 downward to the unit from above and part of the more
11 regional system from behind coming into the unit from
12 behind and that is shown on the macro model.

13 Q. You are saying it is both and
14 water would be coming down from above plus that long
15 flow line from the left?

16 A. According to the model and we can
17 look back at it but it shows essentially water coming
18 down from above in this particular area.

19 Q. Mr. Beechinor, could you put up
20 the result of the model, figure 6?

21 — MR. BEECHINOR: A. If I can find it.

22 Q. We are referring to figure 6 on
23 page 62 of H-40. Mr. Sobanski, behind you HC 5 is in
24 the middle, in the middle of the area where you see the
25 dramatic effect from the highly fractured unit.



1 MR. SOBANSKI: A. We can see here we
2 are projecting or the model is indicating a downward
3 flow towards the fractured unit.
4

5 Q. When you talk about the long flow
6 path, are you talking about something like one of those
7 stream tubes that come in from the far side?

8 A. Possibly something back from HC 1.

9 Q. I refer back to yesterday where
10 in our discussion I think we agreed that given that
11 model we should be seeing upward gradients from below
12 the highly fractured unit to the highly fractured unit?

13 A. Well, we do and we don't. We are
14 comparing a macro model and perhaps micro models and how
15 the gradients show on one of these models depends on the
16 whole picture. It depends on the whole picture. We are
17 using some generalizations here and I am not trying to
18 back off, I know what we said yesterday, but again we
19 are becoming very specific in that the model itself is
20 a macro model looking at the generalities of a large
21 flow system and when you start talking specific piezo-
22 meters you are coming into a micro scale and we haven't
23 calibrated it in the micro scale.

24 Q. Drawing your attention back to the
25 tritium data, if we can agree that the water in piezometer
1 of HC 5 is post-1952 water, is it likely in your



1 opinion that we are seeing an effect on that long flow
2 path which you would show coming from up in the air at
3 HC 1 or behind that, or is it likely that it is coming
4 from directly above?

5 A. I wouldn't know for sure. It
6 could be coming from above in this case but how can I
7 tell which part it might be coming from?

8 Q. I wonder if you had any opinion
9 on how long you might expect water to travel along that
10 long flow path?

11 A. The tritium is there and as I say
12 I ran some rough calculations which would indicate that
13 using the values we see in the individual piezometers,
14 that we could explain the tritium at depth that way or
15 it could be a local flow path, I don't know. It is a
16 fractured medium.

17 Q. Staying with HC 5 can you look at
18 the second piezometer and that is the one we agreed is with-
19 in the highly fractured unit? Can you simply confirm
20 that what we see there is a level of about nine which
21 I guess would also be post-1952 water?

22 A. Yes, that is correct.

23 Q. As I understand your model which
24 is still up there on the overhead it is predicting a
25 relatively fast lateral flow, isn't it?



1 A. Yes.

2 Q. In terms of velocity you are
3 predicting something like 75 days, or isn't it something
4 like 75 days travel time through it or were you predict-
5 ing instantaneous travel time?

6 A. It's very fast. Very fast.

7 Q. Looking at HC 8 I would refer you
8 specifically to piezometers 2 and 3. I think we can
9 agree, can we not, that those piezometers show, and
10 there is little doubt that those piezometers show pre-
11 1952 water?

12 A. They are low enough to be pre-1952,
13 yes.

14 Q. Would you agree with me that when
15 you are doing tritium analysis the one thing you can
16 be absolutely sure of is if you find a low number it
17 means it's pre-1952?

18 A. If we accept what Dr. Cherry says,
19 yes, but Dr. Kingham asked me a question which I don't
20 know an answer to and that's whether it reacts with
21 organic carbon and there is nothing in the literature I
22 have to indicate whether it does or doesn't. Dr. Cherry
23 says it moves with the groundwater freely but that is
24 based on the use of it in the hydrogeologic community,
25 that is the assumption.



1 Q. I think I was getting to in fact
2 a simpler point. I think the question was a bit simpler.
3 Can we agree that if you had a sampling error of some
4 sort it is likely your error will be high and you might
5 show tritiated water where there isn't because you had
6 some kind of cross-contamination?

7 A. The interpretation we made, and
8 I'm not trying to back off because the interpretation
9 we made was that this was pre-1952 water and I'm not
10 trying to be evasive or anything like that.

11 Q. Just looking at this, looking at
12 HC 5 and HC 8 sort of in combination, we see in HC 5
13 piezometer 2, which we agree is within the highly
14 fractured unit, tritium values of nine and within two
15 piezometers in that unit in HC 8 we are seeing tritium
16 values down below one and out of that we agree that in
17 one we are seeing post-1952 and in the other we are
18 seeing pre-'52. Can you explain why that is when you
19 have this kind of lateral flow you are predicting?

20 A. I don't have an exact answer for
21 that. I can see what you are getting at and it's
22 obvious to me the point you are trying to make. I
23 mentioned yesterday that I didn't visualize this unit,
24 this highly fractured shale unit as being present every-
25 where. Gartner Lee believes they found it and in their



1 report they talk about it in a couple of the wells as
2 being feasible and a couple not being feasible and we
3 didn't think we found it in all wells, just as we haven't
4 in HC 8. We may have some local tight sections that
5 have their own little fracture systems and the piezo-
6 meters are straddling one little fracture zone as
7 opposed to the whole unit. Certainly at this well it
8 would appear that given the upward gradient from three
9 to four, that this somehow prevents the tritium from
10 coming into the well and which would indicate at HC 8
11 at least we are dealing predominantly with downward
12 flow and for whatever reason the fracture networks or
13 whatever, these two piezometers are not picking up the
14 more regional network.

15 We have projected that higher permeability
16 unit in from the east. We felt we were justified in
17 doing that, but individually some of these wells may not
18 behave in that manner. It's just like a sand and gravel
19 zone, as an example, when I did some drilling at
20 Schomberg at one time we offset a municipal well there
21 and the municipal well was located in the sand and gravel
22 unit and the well flows at a couple of hundred gallons
23 a minute and it's in a sand and gravel unit and we
24 drilled a well outside the building to accommodate some
25 expansion to the water supply system and the first well



1 we put in was about 50 feet away from the original well
2 and all we ran into was silt and it was impossible to
3 develop a municipal well in that unit at all. We then
4 cut our distance in half and put in the next well right
5 beside the building and we were back into the sand and
6 gravel unit again and we had a well that flowed 200
7 gallons a minute and was capable of being pumped at
8 over 400.

9 So, even within sand and gravel units we
10 can run into these heterogeneities in the rock and again
11 we are coming down into the micro, and I know it isn't
12 proving my case when we look at one of these things, but
13 it does happen in geology and it happens in sand and
14 gravel units as well as in the more complex units such
15 as shale.

16 Q. Before we leave that I wanted to
17 touch on that point because you said to me several times
18 now that what the model is giving you is a macroscale
19 and you are going to see microscale anomalies. Am I
20 characterizing that properly?

21 A. Yes.

22 Q. But at page 61 of H-40, and this
23 is the sentence we read yesterday, you talk about the
24 computer simulation representing a reasonable approxima-
25 tion?



1 A. Yes.

2 Q. I'm wondering in a general sense
3 how can you make that kind of statement, how can you say
4 it's a reasonable approximation when you look at all
5 these microscale things and it doesn't seem to prove
6 what your simulation says?

7 A. These fits are far better than
8 most of the other assumptions we made within those
9 documents that were provided in the interrogatories.
10 We have all types of other models and simulations that
11 were run as well, and they don't give us as good a fit
12 as this one does. It's a problem with modelling. I
13 mean, it certainly is not an exact science and what
14 we are using it here to help us with is to try and
15 understand the flow system at the site, and why the
16 gradients are the way the gradients are. We have
17 strong downward gradients on the site and as soon as
18 we get off the site we are into lateral type gradients
19 and why is there this dramatic change as we cross
20 Highway 403, it's not a magic marker and they didn't
21 do anything at 403 like put in a curtain wall and why do the
22 gradients change so quickly from strongly downward to
23 being nearly horizontal and to guess at it and do it by
24 hand is a very difficult task because we are considering
25 a large flow system. We are not saying we simulated it



1 perfectly but we are saying we have a reasonable appro-
2 ximation, we believe, to explain why we have these very
3 strong downward gradients on the site and then suddenly
4 as we cross 403 everything changes and it's a different
5 system. Something had to happen between our site and
6 403 to change those gradients so dramatically and we
7 feel this is the kind of approach or this type of approach
8 gives us a reasonable simulation of what is happening.

9 Now, to back that up we have run pumping
10 tests and demonstrated that the zone does exist. We
11 may argue from point to point on whether it is there or
12 not, but in general we manage to spread a cone a great
13 distance from our pumping well in the fractured rock
14 indicating it is not a minor zone, it has some
15 continuity to it so our interpretation on this, in our view
16 these small features, the macro features from now until
17 the cows come home, but the fact is that the well pumping
18 test indicates there is a unit there and we do see
19 fractures within the rock, we are seeing these very
20 strange gradients on the site and different gradients
21 off-site and we have done our best as professionals to
22 show how this is done. Modelling in Ontario is a fairly
23 new technique and I am advising people, I think we have
24 an explanation for the system and everyone says "You
25 can't do it so you can't have a model and I'm sorry we



1 don't believe in models"but I can't help that. We have
2 tried to give our best professional judgment as to what
3 is happening here and when we get on to the microscale
4 of course we can find these discrepancies.

5 For example if we are talking about
6 further downward gradients as we talked about yesterday,
7 perhaps we haven't got exactly the right hydraulic
8 conductivity for that zone and by tightening it up a
9 bit and having a lower hydraulic conductivity in that
10 zone and trying to refine it even more, perhaps the
11 gradients would have fit a bit better but we don't
12 feel it's that justified when we are looking at such a
13 large system to try to get it down to that degree because
14 everyone will be arguing with us that we fudged the
15 numbers. We used the best data we had and developed a
16 hydrostratographic model and we take the data we
17 generated from various sites, glacial tills, several
18 points of hydraulic conductivity, about 30 points in
19 the upper weathered shale and we have had to assume the hy-
20 draulic conductivity of the tight shale in the blue and we
21 have used a pumping test value for this and it has been
22 projected into the section, we agree, and all the data
23 in here don't agree but our modeller says it's not bad.
24 For the lower unit we have had quite a few points too --
25 how many points were there?



1 MR. BEECHINOR:A. Twenty-nine data points
2 based on all the studies done in this area for the bottom
3 zone so there is a statistical base for coming up with
4 the hydraulic conductivity for the bulk shale unit at
5 this site.

6 MR. SOBANSKI: A. And maybe when we talk
7 about the downward gradients perhaps we haven't got the
8 zone interpreted properly and perhaps the zone is
9 actually deeper and perhaps this so-called highly
10 fractured unit which again is a variable unit, perhaps
11 it's thicker and that is why you are seeing downward
12 gradients below this thing and we don't have absolute
13 answers because we are looking at macro, we are looking
14 at a block of ground that has an area of one-and-a-half
15 square kilometres and now we are projecting some fine
16 features from several observation wells onto that and
17 we feel that given the techniques and that, we think
18 we have a reasonable fit and we think we have an
19 explanation for why the site behaves the way it does.

20 Q. Mr. Sobanski, if in fact the
21 highly fractured unit is deeper than we have shown up
22 there on Exhibit H-40-D7, would that change your opinion
23 as to where it discharges?

24 A. Well, it would still be partly
25 that but it would probably be more diffusive if the zone



1 carried on further and it would be a more diffuse zone
2 of discharge but I still feel that we have the swampy
3 areas south of 403 and everyone has wondered for some
4 time as they investigated this thing as to why the
5 marshes are there, and they are there, and there are
6 springs in the area, I have seen them and, you know,
7 right now, and I don't know if it's exactly six gallons
8 a minute because we must remember it's a macro model.
9 Is it exactly six gallons a minute because maybe it's
10 one or maybe it's ten? There is a range in there.
11 If this unit were less permeable on this side of the
12 site and we know it's not on the other side and we know
13 from the pump test if it's less permeable here then
14 there is less discharge or less water to be moved
15 through that section.

16 Q. Can I ask you some more questions
17 about the discharge zone?

18 A. Yes.

19 Q. We talked about that relatively
20 extensively yesterday but I would like to come back to
21 that if I could. I wanted to clarify first of all your
22 evidence on this point because I thought yesterday you
23 gave me an answer and I wasn't sure if it was a sort of
24 alternative answer or if you were saying something
25 different. I thought it was fairly clear in the report and



1 in your evidence in chief that in your opinion the
2 material that flows through the highly fractured unit
3 is discharging to the surface, but yesterday I thought
4 you said it could be flowing along the sand layer and
5 I wonder which you think it is or whether you are
6 admitting of either possibility?

7 A. It is possibly both. We have the
8 swampy areas which represent the water table and so
9 perhaps in those areas it might discharge but I must
10 admit they are not salt flats so obviously the
11 fresh water precipitation can dilute whatever is coming
12 into it if that is the discharge zone itself. It is
13 both. In terms of discharge though it certainly does
14 not necessarily have to be at the surface to mean at surface there
15 is a rising at the water table and it isn't necessarily right
16 straight onto the ground. As I mentioned it could be
17 intersurface water in the swampy areas and it could be
18 into this interface zone that occurs in the sand units
19 and it flows up just fast enough to be counterbalanced
20 by what is coming in from above. It doesn't actually
21 rise to the ground surface because not enough is coming
22 in but it can be discharging into a sand unit and then
23 carried off laterally because the amount of water moving
24 up is so small.

25 Q. I guess you can appreciate from



1 some people's point of view the latter statement about
2 it being carried off laterally through the sand unit
3 would be of some concern. I wonder if you could be more
4 specific as to where it would go?

5 A. It would then be into the local
6 streams if that were the source. It would discharge
7 into the creek on site there along the railway tracks.

8 Q. I was going to come to that.
9 There is a creek, and I guess it's a CNR drainage ditch.

10 A. It is quite a deep ditch along
11 the north side of the railway tracks.

12 Q. Do you know by any chance if that
13 intersects the whole sand layer there?

14 A. I don't know. We haven't drilled
15 a hole there and I'm not sure.

16 Q. Do you see any data from that
17 ditch which would indicate you are getting a discharge
18 of that kind of material into that ditch? Yesterday we
19 talked about conductivity.

20 A. Again when we say "that kind of
21 material" remember it's going to be a mix of the fresh
22 water that's come in and the discharge of the poor
23 quality water from below. As I say, there is some
24 evidence from the conductivity that that area maintains
25 relatively high conductivity as the stream traverses the



1 site. There isn't a huge drop in the conductivity
2 indicating that something may be happening in that area
3 to maintain the relatively high conductivity in the
4 stream. As we come down we start possibly in the 2,500
5 range, 2,400, 2,400, 2,500 again, 2,400, 2,300, 2,500,
6 and so within this area here, despite the fact we are
7 probably getting some fresh water inflows we would
8 expect into the stream from the upper unit, we are
9 maintaining a relatively high conductivity in that area.
10 So, I am using this as again you asked me, "Mr. Sobanski,
11 what evidence after all of this do you have?" and I
12 have provided you with an added piece of information
13 that indicates there could be a discharge of poor quality
14 water in that area.

15 DR. KINGHAM: So the record is very
16 clear, you talked about high conductivity in that area
17 and you are talking specific conductants or concentra-
18 tion of salts and not high hydraulic conductivity?

19 MR. SOBANSKI: Yes.

20 DR. KINGHAM: So we don't confuse that
21 with the other term conductivity you use.

22 MR. SOBANSKI: That is correct. We
23 start off as well from the Bayview site at relatively
24 high values of 2,100 and then the quality starts to
25 improve from there down until we hit the highway and



1 once we get to the highway we are getting an indication
2 of discharge of groundwaters on site which are improving
3 the water quality, but once we pass the highway we still
4 expect to have groundwater discharge but the groundwater
5 discharge stays at a relatively high level of salts.
6 If it were road salts you would expect to just see the
7 hydraulic conductivity falling away as you move down
8 the site but it isn't really doing that, it stays
9 relatively high. So, it's indirect evidence and we
10 haven't got a nest of wells out in the swampy area, but
11 from what we can see there is still some evidence of
12 this and the model indicates we would expect to have
13 some discharge in that area and the conductivity values
14 are indicating to me there is some discharge in that
15 area.

16 MR. TIDBALL: Q. You just referred to
17 the swampy areas and said you didn't have a nest of
18 piezometers. Could you indicate in a general way, and
19 you might have to do it on the large air photo, but
20 where the main swampy areas are out there?

21 MR. SOBANSKI: A. Well, we have some ...

22 Q. The area we want to see on the
23 air photo is blocked of course.

24 A. It's sort of a diffuse area in a
25 way. I have walked relatively large portions of the



1 site and in some cases the areas are relatively small
2 and you see little springs coming up out of the ground
3 and I don't know if I can remember them all. We have
4 a swampy area located in this vicinity east of King
5 Road ...

6 MS. CRONK: I don't think some of us can
7 see it unless you put it on the other easel. We can't
8 see the bottom.

9 MR. HODGSON: I don't think this is
10 going to reproduce very well in the transcript unless
11 we find some method of either marking the exhibit or
12 describing more accurately the places on the map being
13 identified.

14 MR. TIDBALL: Q. If you want to mark
15 the exhibit with a marker that might work out better
16 then if you feel comfortable doing that.

17 MR. HODGSON: It's Mr. Estrin's exhibit.

18 MR. ESTRIN: No problem and I have some
19 markers.

20 THE CHAIRMAN: Don't use a red one.

21 MR. ESTRIN: How about green for the swamp?

22 MR. SOBANSKI: Blue. Blue for water.

23 I am going from memory on this one and Mr. Beechinor
24 will give me a hand because he has walked portions of
25 the area.



1 MR. HODGSON: I wonder, Mr. Sobanski --
2 I wonder if Mr. Sobanski could tell us when it is he
3 walked these marshy areas and examined the wet spots.

4 MR. SOBANSKI: Gee, I couldn't remember
5 the date without going back to my notes.

6 MR. HODGSON: Before Christmas, was it
7 not?

8 MR. SOBANSKI: It was in that area and
9 I remember saying it was less than ideal conditions.
10 There was just a bit of snow left on the ground and
11 there was still ice covering in the ponds and the ground
12 was fairly clear and the bulrushes were fairly clear.

13 MR. HODGSON: I can remember it was
14 December because Mr. Sobanski told me he had been out
15 there looking at these things and in the circumstances
16 I wonder if this witness, notwithstanding he is under
17 cross-examination, rather than going by memory because
18 he clearly has no notes or anything else to rely on,
19 but if he could go back out and survey this area over
20 the weekend and to the extent he can refresh his memory
21 of the location take another crack at drawing this
22 thing on Monday rather than provide us with evidence
23 that is somewhat vague given the time that has elapsed.

24 MR. TIDBALL: I would think that would
25 be very useful if Mr. Sobanski is willing to do that



1 and I can move to another area. That would be the best
evidence.

2 Q. Is that suitable?

3 MR. SOBANSKI: A. Fine. It will be fine.

4 I have a reasonable memory of it but if you like I don't
5 mind walking it. I wanted to walk it again anyway.

6 Q. I have a couple of more things
7 to ask you about this and perhaps we could move on. On
8 page 63 of H-40 -- sorry -- page 64, the concluding
9 paragraph of your discussion of the computer model it
10 reads as follows:

11 "With respect to contaminant migration,
12 the model indicates that leachate conta-
13 minated groundwater discharge (via the
14 highly fractured shale unit) will be
15 limited to a small area (62 acres) south
16 of HC 9-85 and HC 14-85 (south of Hwy 403).
17 The total discharge rate would be about
18 14,000 m³/year (6 gpm)." This is simply
19 an approximation?

20 A. These are the numbers from the model.

21 Q. We have a question about how you
22 calculated the 62 acres.

23 A. We took I believe, and, Jim, you
24 can correct me if I am wrong, but we took the approxi-
25 mate discharge area, just let me confer. My colleague



1 advises me he believes that was just calculated from
2 the width of the discharge area shown on the model versus
3 the horizontal width of the landfill being around 500
4 metres, I believe and so in other words it was calculated
5 from the model we believe.

6 Q. I'm still not clear on that. As
7 I understood the model you came up with an output of
8 the model which said for every metre laterally you would
9 have a discharge of 28 cubic metres per year, and that's
10 how I understood the model.

11 A. Yes.

12 Q. Did you take that -- I'm not clear
13 whether you are saying it's simply a geographic inter-
14 pretation of the width of the site.

15 A. Well, I am advised that what has
16 happened is if we look at page 62 ...

17 Q. Figure 6?

18 A. Yes, and we can see where the
19 upflow lines start to come in to the model and we have
20 taken that width approximately and projected that in
21 either direction to cover the width of the landfill at
22 about 500 metres.

23 Q. All right, fine. That is for
24 my information, and I don't think we need to get into
25 exhibiting this, but in H-85, the interrogatory responses



1 to the Canadian Environmental Law Association, the last
2 page of that exhibit, you were asked to show on a map
3 where it was and you show the general configuration and
4 I think the Board does have it now but is that the 62
5 acres, the very last page?

6 A. I'm sorry, I'm not sure. I would
7 have to check and I know the figure to which you refer
8 but I haven't measured it off myself and would have to
9 check that but it's in that general area.

10 Q. Could Mr. Beechinor be of
11 assistance?

12 MR. BEECHINOR: A. I believe in that
13 document it is a conceptualization of the discharge
14 area defined by the model, yes.

15 Q. So we are looking at this map and
16 you say this is the area where it is discharging?

17 A. I can get that confirmed for you
18 on Monday.

19 Q. Just before we leave this I
20 wanted to go back to the whole business about this
21 discharge being upward and in fact you call it discharge
22 zone till and I believe you told me in evidence yester-
23 day that you would expect to see upward gradients in
24 this area in general.

25 MR. SOBANSKI: A. In the discharge zone



1 area, yes.

2 Q. The problem is we don't have any
3 hard data in the sense of data measured in the field
4 showing discharge gradients because you essentially have
5 this zone occurring south of the two monitoring wells
6 or three monitoring wells I should say?

7 A. We do have some hard data but if
8 you mean we have no heads measured in the unit that is
9 hard data we don't have.

10 Q. Let's be specific. You have no
11 hydraulic head information which shows upward gradients
12 in that area?

13 A. That's right.

14 Q. We have talked fairly extensively
15 about the so-called swampy areas and you will be going
16 out this weekend and having a look and coming back and
17 telling us about where those occur, but I wonder
18 before we even get into that, are there any other
19 explanations for swampy areas in that area?

20 A. If the areas they occur in have
21 been dug, perhaps into the water table, that could
22 explain it as well.

23 Q. Is it possible that that entire
24 area is topographically low vis-a-vis the surrounding
25 area, and I'm thinking for example just from sight, the
403 seems elevated as does the CNR and is it possible it



1 is a relatively low area that doesn't drain well?

2 A. I would have to look at topo maps
3 to confirm that.

4 Q. One other question on that ...

5 A. The topography on that piece of
6 property is variable.

7 Q. Maybe this is too simplistic, but
8 if you put up the drawing we coloured, drawing No. 7,
9 could you confirm, and I realize there is vertical
10 exaggeration, but could you confirm that the area between
11 HC 14 and the CNR appears to be a hollow, if you will?

12 A. That's what it looks like but I am
13 not sure, I don't think that's the way it is in the
14 field.

15 Q. You wouldn't go on that?

16 A. No, I wouldn't use that. This is
17 done on an entirely different scale than what we are
18 talking about.

19 Q. The other thing I am wondering
20 about is you have already told us that you think it's
21 a possibility that material could be coming out from
22 the highly fractured unit and discharging through a
23 sand layer and I just pose the question, is it possible
24 in your opinion that that kind of lateral discharge
25 could be occurring along the bedrock interface and moving



1 laterally towards the lake?

2 A. As a possibility, I suppose that
3 might be but I haven't given that much thought. Normally
4 we are finding better quality water at that interface in
5 that it is still within the unit that is receiving a
6 better portion of the push-pull we have going on in
7 terms of water quality. In the one case we looked at
8 on the map the well is located right at the interface
9 of the overburden-bedrock contact and it contained
10 a chemistry of about 126 milligrams per litre.

11 Q. Just for the record it is cross-
12 section A-A?

13 A. We are referring to HC 9. I'm not
14 sure about it because we find in our own core holes, we
15 felt that the till or the shale in some areas was
16 relatively unweathered and I suppose it's a potential
17 pathway. We tried that type of an interpretation in
18 our modelling as well, and we did not get as good a
19 correlation of heads when we attempted to put a permeable
20 layer in parallel to the ground surface below the
21 overburden contact. We didn't generate the gradients
22 at all and it started acting as a layer or drain for
23 the deeper groundwaters within the main flow systems
24 and that is my recollection and I would have to look at
25 my notes but it started producing gradients that we
weren't observing too. So, if there is a layer there



1 it possibly is quite discontinuous and at least from the
2 modelling we weren't able to generate those types of
3 gradients in that area that we actually see.

4 Q. So I can be clear, you are talking
5 about one of the 30 or I forget the number, 50, calibra-
6 tions you ran?

7 A. In our first looks at this we
8 started the modelling fairly early and in our first looks
9 at this they were parallel to ground surface interpre-
10 tation because all other investigators had said we have
11 this weathered zone taking all of the water away and some
12 of our initial interpretations or rather modelling
13 attempts were made at putting a permeable layer in on
14 top of the rock surface and we didn't get very good
15 fits with this. The final calibration of the model,
16 we did a lot of simulations and we felt we weren't
17 getting good values, we were getting recharge areas
18 where discharge areas should be and discharge areas
19 where recharge areas should be, everything was topsy-
20 turvy. Until we ran the pumping test and then did a
21 horizontal type of interpretation to the various units
22 we interpreted we were getting no fit at all. At least
23 then we got downward gradients where downward gradients
24 should have been and lateral gradients where lateral
25 gradients should have been.



1 Unfortunately we also had got an upward
2 gradient where we did not have a nest as well and so we
3 could talk about the proofs for that but our modelling
4 indicated that the parallel to ground surface wasn't
5 giving us very good results.

6 Q. For the purpose of completing the
7 record and if it's not there I don't know it's important
8 and somebody else may want it, but is the calibration
9 we have been talking about running the permeable layer
10 along the surface, is that one of the ones produced in
11 the interrogatory responses to CELA, H-85 as there is
12 a handful of them in here?

13 A. I would have to look.

14 Q. Mr. Beechinor might know.

15 MR. BEECHINOR: A. I don't have it here.
16 I might add that is not the full package of the simula-
17 tions and I don't know if it's in there or not but we
18 did run that.

19 Q. I don't know if it's necessary to
20 go through it but perhaps you could confirm it at the
21 break.

22 A. Sure.

23 Q. Could you put up drawing 21, the
24 chloride contours? Is there any way to get that higher
25 because people back here -- I don't know how we would do



1 it. Perhaps you could put up a high exhibit and clip it
2 to the top. Now, just to refresh everyone's memory
3 on this, this is your predicted version based on the
4 data that you have of what the various chloride concen-
5 trations are going to depth between the site and the
6 lake?

7 MR. SOBANSKI: A. No, this is a contour
8 map of actual values we obtained in the field.

9 Q. The lines you have drawn between
10 them are simply connecting up where you assume you would
11 find about those concentrations?

12 A. That's correct.

13 Q. Much like equipotential lines?

14 A. Yes.

15 Q. I want to refer you to your
16 description of what we have been calling a freshwater
17 rind and that occurs I think your evidence is somewhat
18 discontinuously south of Highway 403?

19 A. Yes.

20 Q. In your opinion is there a fresh-
21 water rind in the area between HC 9 on that map, and
22 perhaps you could indicate it with the pointer and the
23 CNR tracks and that is simply the zone we have been
24 talking about, the discharge zone?

25 A. Yes.



1 Q. Is there a freshwater rind in that
2 area?

3 A. I don't know. We don't have a
4 well there to base that on.

5 Q. Given your opinion that there are
6 upward gradients there, shouldn't the contour lines
7 that we see through that area, shouldn't they, and I
8 don't know how you can express this, but go up to the
9 surface? Shouldn't there be a local area of higher chlorides
10 because there is a discharge of salty water to be simple
11 going up?

12 A. It's quite possible that we could
13 have shown the line to go a little higher but we didn't
14 have a basis to draw it so we have drawn the line
15 relatively flat.

16 Q. But that makes sense given your
17 conclusion?

18 A. One could have drawn one of the
19 contour lines a little higher.

20 Q. They shouldn't intersect the
21 surface?

22 A. I'm sorry?

23 Q. They wouldn't intersect the
24 surface?

25 A. We talked about that already and



1 I'm not sure whether they would or wouldn't and they
2 could but they might just intersect the top of the sandy
3 units and then move laterally.

4 Q. Because we have it there, wouldn't
5 it look like a trend and it's easy to see because the
6 blue line is there, but around HC 8?

7 A. It may, it may. We are talking
8 about the higher chlorides at HC 8 and there may be a
9 bulge in it? There may be.

10 Q. That is what you would expect to
11 see?

12 A. We had no basis to draw it.

13 Q. Can I now turn to a completely
14 different area and that is your use of the reasonable
15 use concept at this site? As I understood your
16 evidence, and please correct me if I have got it wrong,
17 but your evidence is that you don't think the reasonable
18 use concept applies at Site F?

19 A. I wouldn't apply it at Site F.

20 Q. I just wanted to ask you a few
21 more questions about that. As I understood what you
22 were saying, I believe what you were saying was that
23 you don't think it applies at Site F because the area
24 downgradient of the site is totally serviced with
25 municipal water supply and there isn't -- there is very



1 limited use and very limited potential of water, ground-
2 water south of Highway 403. Am I characterizing it
3 right?

4 A. Approximately but there also to me
5 doesn't appear to be any reasonable use in the area
6 south of that.

7 Q. That is what I want to come to.
8 I wonder if what you aren't really saying is that the
9 only reasonable use of the groundwater in the highly
10 fractured unit and in the discharge area, you aren't really
11 saying that the only reasonable use of groundwater in
12 those areas is leachate treatment?

13 A. You are saying then as opposed to
14 drinking water which I have been approaching as in the
15 reasonable use concept and you are saying what about
16 the use of it for leachate treatment?

17 Q. Yes. I am wondering if that is
18 what you are saying and if you agree fine, and if not,
19 we can move on.

20 A. I suppose you could look at it
21 that way as a reasonable use.

22 Q. You have read the policy document
23 and can we agree that the policy admits of other
24 reasonable possible uses other than drinking water?

25 A. Yes, it does, yes.



1 Q. I wanted to explore a little bit
2 further and move you sort of off the discharge area and
3 ask you whether you think there is any reasonable use
4 of what we have been calling the freshwater rind through-
5 out the Aldershot area, throughout the whole area south
6 of 403 and let's talk specifically south of the CNR
7 tracks.

8 A. Well, we know there are reports of
9 some wells in use and we have talked to people who are
10 still using wells in the area. I suppose there will be
11 quite a bit of evidence brought on that and some people
12 there for whatever reason prefer to use the groundwater
13 and they are using it in a couple of cases for lawn
14 watering and there isn't much use downgradient. All the
15 wells we were able to find are more than a kilometre from
16 the site but we did find a few. In one case, or in a
17 couple of cases it's apparently used for drinking water
18 and my understanding is that there's one street that's
19 a sort of blind alley and although the water services
20 are down on the main street a line has not been run up
21 to them and for whatever reason of course that can be
22 changed at any time.

23 Overall in the Aldershot area other than
24 a few people who insist on using that small quantity of
25 potable water which is sort of on the surface, everything



1 else is serviced in the area and I would be very hesitant
2 to say that that is a reasonable use down there and
3 people would switch to the groundwater supply. (I believe
4 it would go very quickly into a salty condition with
5 saltwater intrusion. I don't know if I am answering
6 the question but I know there are some uses some distance
7 from the site.

8 Q. Perhaps I can ask it a different
9 way. (Can we agree that there is a small groundwater
10 resource in the lacustrine sands or in the overburden
11 in the Aldershot area?

12 A. Yes, there is a small amount of
13 groundwater.

14 Q. There is some use, albeit limited,
15 of that resource?

16 A. Yes, there is.

17 Q. I think we come to the critical
18 question and I will simply put it to you directly. Is
19 it reasonable in your opinion to try to protect that
20 groundwater?

21 A. Yes, I believe it is but I believe
22 that the system we are proposing will protect it.

23 Q. If in fact we were to say that
24 the reasonable use concept applies at this site and we
25 followed it through to the next step which is to set
some kind of boundary criteria, and we can talk in a



1 minute about what those would be, but I am wondering why
2 it wouldn't be a relatively easy task to monitor for
3 those criteria given the flow system -- to monitor for
4 exceedances of certain criteria during the flow system
5 that you have?

6 A. There wouldn't be a problem and in
7 fact we have suggested it in our report, that there
8 would be a monitoring program at the site. Now, I am
9 not for a moment suggesting -- first of all we feel that
10 a very small quantity of leachate will escape the site.
11 That is number one. Number two we have sites on either
12 side where they are having difficulties after many years
13 of even identifying a contaminant plume and so I don't
14 know why everyone is uptight about putting something in
15 between these two. Be that as it may, that must be
16 dealt with on the technical aspects but I am not concerned
17 that this site will create a problem but, on the other
18 hand, if one said to me if there was a chance you were
19 wrong and you are going to unload all kinds of organic
20 contaminants into the groundwater system which may emerge,
21 no, we have no intention of doing that and we have
22 recommended a monitoring program for the site and we
23 think that at some sort of a condition a contingency
24 program which would be purge wells would be implemented
25 at the site. The problem is identifying perhaps what



1 that type of criteria might be. I don't think in this
2 case that the drinking water standards are the approp-
3 riate sort of criteria to apply which is what reasonable
4 use implies.

5 Gartner Lee is still having problems and
6 the plume delineation study is meant to find the type of
7 indicator that can be used and again remembering that
8 that site is put in on shale, the Burlington site is on
9 shale and only has a toe drain, and because the water
10 quality at that depth is so bad you can't use chlorides
11 for an indicator because you are into 10,000 milligrams
12 per litre of chloride and how can you find and expect
13 an increase of 300 or that much in the fluctuations?
14 Gartner Lee so far is stumped at establishing in their
15 latest report, considering the site went in in 1972,
16 they are stumped at establishing what kind of boundary
17 criteria to set for the site. They suggested let's
18 do all the organics once in a while and the thing is
19 we know there are organics in the site but they seem
20 to be attenuated and we are attributing it to that tight
21 layer we believe we have identified.

22 Therefore, what do you set? It hasn't
23 escaped me and I have some ideas on it, but unfortunately
24 the Ministry of the Environment doesn't have very many
25 organic criteria.



1 Q. In fact there are very few?

2 A. Very few. They apply to pesticides
3 and things like that, DDT, and they apply to PCB's and
4 some of the more exotics.

5 Q. On that point aren't there criteria
6 set by other bodies, the World Health Organization?

7 A. The World Health and U.S. EPA, and I
8 have looked into that and I have some numbers I might
9 put forward for discussion but even the World Health and
10 the U.S. EPA don't agree and in some cases there is a
11 wide divergence of opinion on the importance of certain
12 parameters. Quite frankly we are a long way down the
13 road on this and it may sound like a criticism, but I
14 had hoped that the Ministry at this time or by now would
15 have taken some sort of a position to give designers
16 something to work to. We have been looking into all
17 kinds of literature but what are you going to argue,
18 will you argue what Australia's criteria are or
19 Indonesia or World Health or U.S. EPA? We have tried
20 trihalomethanes we can use as a criterion of 350 parts per billion
21 but the Ministry so far hasn't given a great deal of
22 guidance. I don't jump up and down about going to
23 other jurisdictions for these values but we have a bright
24 group of professional people here in the Ministry of
25 the Environment who should be providing us with some



1 guidance on these things and we have a great Ministry of
2 Health that should be looking into environmental matters
3 and then we don't have to guess at these things but we
4 know what we have to design to.

5 Q. I don't think we need take that
6 very much further but I just want to ask you whether
7 you know whether the Ministry itself uses World Health
8 Organization or U.S. EPA criteria in the absence of
9 having ones that are sort of Ontario grown if you will?

10 A. Perhaps the Ministry might use them
11 but a lawyer would have to say if it is legal or not.
12 It seems to me the Ministry should establish its own
13 criteria but World Health can be used and we can use
14 some other jurisdiction but I say which one?

15 Q. Back up a step. You agreed way
16 back at the beginning of yesterday that one of the
17 criteria that should be satisfied in assessing whether
18 a landfill is suitable is whether you can monitor and
19 if I can shorten it down, whether you can monitor the
20 movement?

21 A. Yes.

22 Q. I gather what you are telling us
23 is that what we have at this site is kind of a unique
24 situation because we know or in your opinion we know
25 where all the contaminants are going to be moving? Am



1 I right about that?

2 A. That's correct. And moving toward
3 the lake.

4 Q. But we know in your opinion every-
5 thing is being intersected by this highly fractured unit
6 and moving laterally and discharging in a certain area,
7 right?

8 A. Yes. 

9 Q. I would assume that the monitoring
10 system you propose, and I think you have this in drawing
11 22, and I don't know if we need to put it up, but your
12 monitoring system would propose a fair number of wells
13 within that highly fractured unit, would it not?

14 A. Our monitoring system there would
15 be a fairly conventional type of installation. First of
16 all we are predicting that it is going to move in this
17 unit and that doesn't mean we are necessarily 100 per
18 cent correct and we recognize that and it's an indication
19 that on the modelling it's our best estimate of what will
20 happen on the site, but certainly we would monitor above
21 and below the unit as well. We would always have some
22 concern about whether some contaminants might move into
23 the overburden and perhaps we would have some concern
24 that there might be some weathering as you have discussed
25 on top of the rock and that must be monitored as well.



1 We would monitor probably down to a depth of 30 metres
2 like we are now and we would install piezometers in the
3 grid zones we find and we would monitor at several
4 depths and this would be the measure of our interpreta-
5 tion and its reliability. Now, I wouldn't pretend or
6 propose just to monitor one zone.

7 Q. That is because if I can put it
8 simply, this is a relatively inexact science and things
9 can be -- you can be out?

10 A. We are as exact as we can be and
11 there are interpretations in our work, there is no
12 question of that-- it isn't the only field like that but
13 we do back ourselves up with monitoring systems and
14 contingency systems.

15 Q. So I want to come to the third
16 criterion we talked about which has to do with contin-
17 gency plans.

18 A. Yes?

19 Q. The contingency plans you propose
20 are purge wells within that highly fractured unit much
21 like you pumped that unit during your pump test?

22 A. Yes.

23 Q. Given that you say you could be
24 wrong or it could be behaving somewhat differently I am
25 wondering what contingency plans you propose if in fact



1 it turns out that this highly fractured unit does not
2 behave as predicted and is in fact not draining the
3 whole site?

4 A. Well, if it weren't -- I must think
5 about that for a minute. My feeling is that pumping that
6 unit which we have identified, although it may not be evident
7 locally on one of these diagrams, but we could capture
8 it and another possibility that we would capture it with
9 this type of a pumping system -- it can be dealt with in
10 terms of either, if we just look at a quick schematic
11 and it's not very scientific, but if there is material
12 moving to deeper depths it will go into the deepest
13 system and it will be a relatively small proportion.
14 We have seen based on the model there is one stream tube
15 that covers the bulk of that deeper unit and so if a
16 small portion were to move into the deeper unit it would
17 move into the regional system and end up ultimately in
18 Hamilton Harbour. The quantities we are talking about,
19 and we must put this thing into perspective because we
20 are dealing with very small quantities escaping the
21 system and moving several kilometres to a point of
22 discharge and going through the attenuation that
23 a medium such as the shale will provide. This is domes-
24 tic garbage we are talking about and we are not talking
25 about hazardous wastes and the stuff you put into that



1 plastic bag and throw out on the front of the street, and
2 we didn't die from it when we ate it and now we put it into
3 a concentrated place and create a local problem but we
4 don't create three or four-mile problems with sanitary
5 landfill sites. So what if a little bit got away?
6 Are we required to capture every drop from a landfill?
7 It's impossible.

8 If some gets out of that entrapment
9 system and gets to deeper depths I am not concerned
10 about it, not at all.

11 Q. Just while we are on that I think
12 you are referring to a drawing we have not exhibited
13 and perhaps Mr. Hodgson could help. Perhaps we could
14 exhibit this -- the schematic before this was H-40-5
15 and this should probably be H-40-6. Mr. Sobanski, how
16 would you describe that?

17 A. This is called "Hydrogeology with
18 Landfill and Purge Wells in Operation."

19 --- EXHIBIT NO. H-40-6: Drawing entitled "Hydrogeology
20 with Landfill and Purge Wells
in Operation" from H-40

21 MR. SOBANSKI: When the purge wells go
22 into operation they lower the head within this unit
23 significantly and will alter all of the gradients within
24 the area and we would now be producing a low pressure
25 zone within the highly fractured unit and that would



1 in fact involve bringing some of the deeper water into
2 the unit. It may be now for example another explanation
3 of the head problems we had in our section which is that
4 the system there, the section air is handling all the water
5 it can and a little bit is moving deeper because the unit can't
6 handle the flow coming to it and we don't know exactly
7 why. In this type of system where you lower the hydrau-
8 lic head within the unit which we have identified on
9 the other side of the site that would be pumped to the
10 sewage treatment plant for treatment.

11 MR. TIDBALL: Q. I think those are my
12 questions but if I remember there are a couple of out-
13 standing undertakings and I just want to ask you if you
14 got those or when you might produce them. One is at
15 Site D, you told me you modelled that bedrock pathway?

16 MR. SOBANSKI: A. Oh, yes. Mr. Chairman,
17 I have that with me but perhaps we could get -- if I
18 could give this ...

19 Q. Perhaps we could do it at the
20 break.

21 A. If I could give it to our people,
22 perhaps they could run it for us.

23 Q. We don't need to do it right now.
24 I just wondered what the status of it was. The second
25 one was Mr. Beechinor was going to produce this detailed



1 cross-section with, and I'm not sure what all on it but
2 what he used as the basis for drawing in the four
3 different shale units and I'm wondering about the
4 timing of it.

5 MR. BEECHINOR: A. I can produce that
6 next week.

7 Q. There were a couple of things this
8 morning you were going to check at the break, and I'm
9 trying to remember for the life of me what exactly they
10 were. You were going to check...

11 A. Whether or not the calibration with
12 the weathered zone ...

13 Q. Can you check those at the break?

14 A. Yes.

15 MR. TIDBALL: Those are my questions.

16 THE CHAIRMAN: Do you want to hold your
17 final questions until after the break?

18 MR. TIDBALL: Perhaps we could do that
19 in case there are some questions.

20 DR. KINGHAM: If I may just take a minute,
21 on or about the 11th of May we asked one of your
22 witnesses, Mr. Hodgson, if she could describe the wavelength
23 light used in making these maps that were attached and
24 I'm not sure if it was understood why the question was
25 asked but the witness was not entirely sure about whether



1 these were natural, available, visible light photographs
2 or not and I think it would be useful for the Board to
3 know if that could be confirmed somehow without too much
4 trouble as to whether these are in fact infra-red air
5 photos of whether they in fact are natural light photos.
6 Is there some way that can be done over the next few
7 days or weeks?

8 MR. HODGSON: We will attempt to do that.
9 That was Miss Hellas.

10 DR. KINGHAM: These were the diagrams
11 attached to H-17 and H-18 and one of them is from each
12 of those exhibits. It is just a matter of knowing from
13 the people at the bottom of the map what light they
14 photographed at. Thank you.

15 --- Recess

16 THE CHAIRMAN: Please be seated.
17 Mr. Tidball, did you have anything further with regard
18 to your requests?

19 MR. TIDBALL: Q. Have you the exhibit
20 on the bedrock?

21 MR. SOBANSKI: It's gone up for repro-
22 duction.

23 MR. TIDBALL: Perhaps we could leave it.

24 MR. ESTRIN: Before I commence in sub-
25 stance I want to outline again the logistical problem I



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25 stance I want to outline again the logistical problem I



1 have. I won't be able to be here Tuesday and I might
2 be able to get back Wednesday after lunch and I'm not
3 certain but Wednesday after lunch is the earliest I can
4 get back. On the other hand, as I indicated, I believe
5 if I'm not finished on Monday Ms Cronk and Mr. Garrod
6 are prepared to go, assuming no one objects to that and
7 then I would complete as soon as I could get back or
8 whatever. So, I would anticipate if I'm not finished
9 on Monday at 5:00 or 4:30 or whatever, my friends
10 over here might certainly take as I understand it a day
11 or something like that and perhaps less, perhaps less
12 and that could leave an interregnum if you like of
13 Wednesday morning, but I'm afraid that's about all I
14 can advise you at this point in time. I may well finish
15 Monday, I don't know.

16 THE CHAIRMAN: It would be unfortunate
17 to break your cross-examination but if it's necessary
18 it's necessary.

19 MR. ESTRIN: If I do get back Wednesday
20 after lunch even that would be a significant departure
21 from the schedule I have for next week.

22 MR. HODGSON: I guess Mr. Estrin is
23 disclosing his private arrangements in this fashion and
24 it doesn't constitute some kind of application for some-
25 thing so I don't see a necessity to respond but at the



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25 thing so I don't see a necessity to respond but at the



1 time an application is made the Region does have some
2 submissions to make on the appropriateness of interrupt-
3 ing this hearing. I have no difficulty with my friend
4 breaking the flow of his cross-examination while others
5 go ahead but the Region objects to any kind of an adjourn-
6 ment and certainly one as casually suggested as this one
7 has been.

8 THE CHAIRMAN: We will see what develops.
9 The Board has that in mind as well and so does Mr. Estrin.

10 MR. ESTRIN: I raise it now because I
11 don't think it's axiomatic I go first and if anyone
12 seriously objects to my not being able to continue
13 should it be necessary on Tuesday then we had better
14 hash that out now rather than my commencing at this time
15 because there is nothing magic about the Town of Milton
16 having to go first in this matter. From a hydrogeolo-
17 gical point of view both sites are said to be acceptable
18 as I understand the evidence in general terms. We each
19 take issue with the other one and if Mr. McQuaid -- I
20 don't know what his position is, I haven't had a chance
21 to discuss it with him and the only objection I am
22 hearing so far is from the Region and I'm not sure why
23 we need get into inferences about private arrangements.
24 I mentioned last week that I had a commitment that
25 extended back for over a year to take a session with
the Chairman of the Board, the Environmental Assessment



1 Board and another instructor with regard to a course
2 going on in Toronto which extends from Monday evening
3 through Thursday evening, and while I realize the
4 difficulty it is totally unfortunate that my primary
5 involvement in the hearing to this point will have to
6 come, if it does, during that time. I'm sorry about
7 that but it's something that could not obviously have
8 been predicted out of a whole year or even over the
9 course of this hearing. I have made arrangements for
10 someone else to attend at that session the afternoon of
11 Wednesday and Thursday, but my instructional portion is
12 primarily on the Tuesday and Wednesday morning and I
13 cannot without not only embarrassment but perhaps legal
14 consequences break that arrangement, unless I am ordered
15 by the Board and I hoped that it wouldn't come to that.
16 As I think you, sir, and it has been said at the
17 preliminary hearing, over the course of a matter such
18 as this there is going to be as Mr. Hodgson would be
19 well aware from his many experiences of this nature
20 many reasons for adjournments, and we have already had
21 one and I don't think it's going to cause anyone any
22 undue prejudice and again recognizing we are going to
23 break next week anyway for a couple of weeks. However,
24 in any event ...

25

THE CHAIRMAN: The fact remains that you



1 may finish between today and Monday and you may not and
2 you may have to come back Wednesday afternoon.

3 Mr. Garrod, how long would you expect to be in your
4 cross-examination? Have you any idea?

5 MR. GARROD: I have some idea that I
6 won't be as lengthy as my colleague from Milton or
7 Ms Cronk for National Sewer Pipe, both of whom go ahead
8 of me but to a large extent it depends upon how much I
9 consider is accomplished by those parties.

10 THE CHAIRMAN: I realize that.

11 MR. GARROD: Right now I am indicating
12 anywhere from half an hour to half a day and I'm sorry
13 I can't be more precise but I would be surprised if I
14 would take more than half a day at the upper limit and
15 I understand from Ms Cronk she would take something in
16 the order of a half a day so it's likely that between
17 the two of us we would consume a day roughly. Perhaps
18 while I'm on my feet I might also raise a scheduling
19 problem I have that I hope will not become a problem
20 and it shouldn't be a problem. I would like to do my
21 cross-examination next week and if I don't I cannot be
22 here the first week we are back after our two-week break
23 and my assistant will be here to sit in, but if for
24 whatever reason I don't get to cross-examine next week
25 it will cause me difficult problems so I am hoping some



1 time in those four days I can get my couple of hours in.

2 THE CHAIRMAN: I think that should be all
3 right.

4 MR. GARROD: I assume so.

5 THE CHAIRMAN: We don't want a hiatus of
6 any length of time between Tuesday and Wednesday and it
7 looks like we will fill it.

8 MS CRONK: It may not be a problem and
9 it's difficult to predict in advance of Mr. Estrin's
10 cross-examination but we could well take it to at least
11 Wednesday morning in any event so I think that is a
12 distinct possibility but I can't with certainty under-
13 take it.

14 THE CHAIRMAN: If we are a little faster
15 than we think then we can get into Burlington's cross-
16 examination.

17 MR. HODGSON: My colleague has contacted
18 Miss Hellas over the break in response to Dr. Kingham's
19 question and she advises the photographs in question
20 are Panchromatic black and white air photos and so they
21 are not infra-red. I gather that was the concern.

22 THE CHAIRMAN: Thank you, that is suffi-
23 cient information.

24 MR. HODGSON: The other comment I under-
25 stand is that people are having difficulty hearing. I



1 don't think there is much we can do about the microphone
2 unless the witnesses hold it closer to their mouths
3 when they speak and that's not always easy to do given
4 the nature of the evidence and where they need to point
5 but I wonder if we could try it with the fan off for a
6 while.

7 THE CHAIRMAN: I was going to suggest that.

8 MR. HODGSON: When we get desperate we
9 could turn the fan on and then ask the witness to shout
10 at us.

11 THE CHAIRMAN: Occasionally you turn away
12 to look at the Board and also counsel as well look away
13 and it's very difficult to catch everything and I was
14 more concerned about the reporter catching it. We will
15 just have to try.

16 MR. SOBANSKI: I'll shorten up on the
17 mike a bit too.

18 THE CHAIRMAN: When you turn away to look
19 at an exhibit your voice does trail off.

20 MR. SOBANSKI: I can hear it myself and
21 I realize it's in and out. I don't think we'll have
22 a problem, Mr. Estrin, as it appears now but we will
23 deal with it if there should be a need to.

24 MR. ESTRIN: Thank you.

25 CROSS-EXAMINATION BY MR. ESTRIN:



1 Q. Mr. Sobanski, I have not had the
2 honour of facing you across a microphone at a hearing
3 like this since at least 1978.

4 MR. SOBANSKI: A. Something like that.

5 Q. Every decade we should do this.

6 A. That's enough, Mr. Estrin.

7 THE CHAIRMAN: On a site such as this?

8 MR. McQUAID: Try not to do it on the
9 same day.

10 MR. ESTRIN: Q. As you know I am here
11 representing the Town of Milton and I will focus my
12 attention to some extent on proposed Site D. You have
13 identified in your work a number of wells around Site D
14 and let's go to your Exhibit H-39, page 39. You have at
15 the bottom of that page told us there are about 35 well
16 users within one kilometre of Site D, and in more detail
17 the well distances are then broken down for us and there
18 are four on site and then one within 100 metres, 21
19 within 100 to 500 metres and then a further nine between
20 500 and a thousand. Is that correct?

21 MR. SOBANSKI: A. Those are the numbers,
22 yes.

23 Q. You obtained these numbers from
24 your own investigations I understand as well as looking
25 at what we seem to have called walk and talk surveys



1 conducted by Gartner Lee in the course of their investi-
2 gation for the Ontario Waste Management Corporation?

3 A. Just one moment, please. Perhaps
4 I could defer to my colleague Mr. Beechinor on this
5 matter.

6 Q. Sure.

7 MR. BEECHINOR: A. We used information
8 from the walk and talk survey conducted by Gartner Lee
9 for the Ontario Waste Management Corporation and as well
10 Hydrology Consultants conducted a walk and talk survey
11 of the area and we compiled a data base in addition to
12 that.

13 Q. One of the two significant hydro-
14 geological reports that you rely on for some of your
15 base data in Exhibit H-39 are your own 2C study, report
16 No. 7 as well as the Gartner Lee study, fair enough?
17 You summarize that in your report?

18 A. In addition to the 2C inventory
19 there was an addition to that inventory where we did
20 the walk and talk survey for this technical H-39 level
21 of investigation.

22 Q. But just to stay on that question
23 you took some information out of the well survey informa-
24 tion out of the technical report by Gartner Lee on what
25 was site PI-1N?



1 A. That's right.

2 Q. That is the report that you your-
3 self summarized in Exhibit 39?

4 A. I might point out that that
5 information is not in Exhibit H-39. You will have to
6 refer directly to the Ontario Waste Management
7 Corporation report for that information.

8 Q. There are two things we are
9 talking about at the same time. The walk and talk well
10 survey by Gartner Lee is not in your report?

11 A. That's right.

12 Q. It's in the Gartner Lee technical
13 Appendix PI-1N which I am holding up here?

14 A. That's right.

15 Q. But in addition in your report you
16 have taken hydrogeological information other than water-
17 well surveys and relied on Gartner Lee work and you have
18 taken information about their borehole logs and incor-
19 porated that information in your report?

20 A. Into our data base.

21 Q. In fact you have summarized their
22 work in your report?

23 A. That's right.

24 Q. I will be referring to the Gartner
25 Lee report in several instances and because it is



1 incorporated, the data is incorporated and it is even
2 summarized in here I think it would be helpful to make
3 it an exhibit. I have managed to obtain copies for
4 everyone.

5 THE CHAIRMAN: We will mark that M-155.

6 --- EXHIBIT NO. M-155: Final report for OWMC by Gartner
7 Lee, dated September, 1985

8 MR. ESTRIN: Q. If we specifically
9 examine your map, drawing No. 2 from the Site D report
10 we see, you would agree GL84I-1N, the Gartner Lee
11 borehole ...

12 MR. SOBANSKI: A. That is correct.

13 Q. You see a number of them?

14 A. Yes.

15 Q. In addition you have plotted for
16 example on drawing 2 looking along the First Line to the
17 west of the proposed sign 35 GL which is -- it stands
18 for Gartner Lee and you have given that well a number 35
19 but you have relied for any information on it on Gartner
20 Lee's walk and talk surveys?

21 A. That is correct.

22 Q. The number of that well is your
23 own and it doesn't necessarily correspond to the number-
24 ing in Gartner Lee's walk and talk survey?

25 A. Not necessarily but I think it



1 does in fact for ease of reference.

2 Q. On drawing 2, and I don't think
3 the Board -- they might be able to see. On drawing 2
4 you have indicated overburden wells by a round circle in
5 black and a square in black and you differentiated the
6 overburden wells from the bedrock wells because the bed-
7 rock wells have a little tail on the bottom; is that
8 correct?

9 A. That is correct.

10 Q. So, if we were to highlight, it
11 would be relatively easy to highlight all of the over-
12 burden wells for example immediately around -- we could
13 highlight either a square or a circle without a tail?

14 A. That's right.

15 Q. I'm going to do that and you tell
16 me if I am doing that wrong but you agree that 27 GL
17 is overburden according to your key?

18 A. That's right.

19 Q. And 19 HC is overburden?

20 A. That's right.

21 Q. And 2479?

22 A. That's right.

23 Q. And 17 HC -- is that a tail or not?

24 A. It may be a tail.

25 Q. We can come back. Sixteen HC?



1 A. That's right.

2 Q. Fifteen HC?

3 A. That's right.

4 Q. Thirty-five GL?

5 A. That's right.

6 Q. And going on the other side, there
7 is not much marked by way of overburden according to
8 your key there, and I should check mine. Could we clip
9 drawing 2 on the aerial photograph for a moment so every-
10 one can see it?

11 MR. HODGSON: What have we highlighted
12 in yellow?

13 MR. ESTRIN: Has this been given a
14 separate exhibit number?

15 MR. HODGSON: It doesn't have a separate
16 number.

17 MR. ESTRIN: I wonder ...

18 MR. SOBANSKI: It's in the report.

19 MR. ESTRIN: We have marked this with
20 specific colours and could we mark this as an exhibit?

21 MR. HODGSON: H-39-D2. Is that satis-
22 factory?

23 THE CHAIRMAN: Yes.

24 MR. HODGSON: Could somebody read out from
25 H-39-D2 the well numbers being highlighted so each one



1 of us can highlight our own and have something to refer
2 to?

3 MR. ESTRIN: I wasn't quite finished so
4 we will do that.

5 MR. HODGSON: Perhaps we could do it as
6 you go.

7 --- EXHIBIT NO. H-39-D2: Coloured version of Drawing
8 No. 2 from H-39

9 MR. ESTRIN: Q. On the First Line and
10 if the witness agrees with me starting from the north
11 to the south, 27 GL, 19 HC, 2479 and on site there is 18
12 HC which is overburden?

13 MR. BEECHINOR: A. That's right.

14 Q. Coming down First Line is 16 HC,
15 15 HC, 35 GL and on site 14 HC?

16 A. That's right. I would note for
17 14 HC there is no record.

18 Q. I think I can assist you.

19 A. All right.

20 Q. Along Highway 25 there is 34 HC
21 according to your legend. I'm only marking one.

22 A. There are two wells. There is
23 one well at that location terminating in the overburden.

24 Q. I have read out all those marked
25 so far. There is a scale on this exhibit. Do you
have a scale? I don't know how to use yours but would



1 you agree that my scale agrees with your map?

2 MR. HODGSON: Could I ask my friend to
3 conduct his cross-examination from back here and ask the
4 witness to mark the exhibits and do the scaling? It
5 looks a little crowded up there to say the least.

6 MR. ESTRIN: I can assure you I feel
very crowded.

7 MR. HODGSON: And it is a bit irregular.

8 MR. ESTRIN: I am simply trying to assist
9 under the circumstances.

10 Q. Mr. Sobanski and Mr. Beechinor, if
11 you could could you mark up 500 metres on the north and
12 south along First Line, from the north boundary of the
13 proposed site and 500 metres to the south?

14 MR. BEECHINOR: A. Depending on where
15 I take it from, and I can take it from the edge of the
16 property boundary of site F for simplicity.

17 Q. Yes.

18 A. Do you want me to draw a circle?

19 Q. Have you got it?

20 A. Do you want a bull's eye around it?

21 Q. I think you can just mark it on the
22 roads. Oh, I see you have marked it with black.

23 A. That area just south of Britannia
24 Road, somewhat west of the First Line, somewhat east of
25 Highway 25 and essentially south of Site D, halfway



1 between Site D and the Lower Baseline.

2 Q. So mark that with black dashes
3 on Exhibit H-39-D2. Along First Line there is a well
4 we haven't marked with a colour, 17 HC and looking at
5 your walk and talk you say no record for that. Is that
6 fair?

7 A. That is correct. It was also
8 surveyed by the Ontario Waste Management Corporation.

9 Q. But with no information?

10 A. That's right. We do have some
11 information in that when we spoke to the residents there
12 they felt that the water was found 60 feet below ground
13 surface at that location and they mentioned the water
14 supply was adequate and of good quality and the well
15 itself is west of the house.

16 Q. I didn't mean to imply you didn't
17 have any information. Let's assume on the basis of
18 measurements we have done that the bottom of that well
19 is 43.3 feet below surface. Would that be in your
20 categorization scheme an overburden well?

21 A. I would have to look at a cross-
22 section and plot that to determine that.

23 Q. Could you do that at some break?

24 A. Sure.

25 Q. Could you give us your view on



1 that? There is another well I wanted to raise with you,
2 33 HC and you will see it to the south of the proposed
3 site along Highway 25. I'm going to suggest to you
4 that your designation of that well is wrong.

5 A. Thirty-three did you mention?

6 Q. Thirty-three HC. Your designation
7 of that being a bedrock well is wrong and because it has
8 a depth of 22.6 feet and that property now being owned
9 by Winters as I understand.

10 A. We did not have a well record and
11 we had very little information at that time.

12 Q. You haven't attempted to update it
13 so let me ask you again to assume and get back to me. If
14 it is 22.6 feet deep I suggest that is an overburden well.

15 A. How are we able to confirm these
16 well depths?

17 Q. I can tell you what we did. We
18 sent in someone with a metric measuring tape and a device
19 to go down to the bottom of the hole which would indi-
20 cate the bottom of the hole.

21 A. Very good.

22 MR. HODGSON: Who is "we"?

23 MR. ESTRIN: Our firm. We're not hydro-
24 geologists and a law student on staff is good with a
25 fishing rod and a weight. It wasn't difficult.



1 MR. BEECHINOR: Could you repeat the well
2 depth?

3 MR. HODGSON: I'm good with a fishing rod
4 and a weight if that matters. Are we going fishing?
5 How will that help? Are you going to call evidence or
6 are we supposed to accept it on faith or what do we do?

7 MR. ESTRIN: If it becomes a matter of
8 contention we can prove it because we have the evidence
9 and we can call it and we would be delighted to have
10 your consultant go in and check any wells I am raising.

11 MR. BEECHINOR: Could I have the well
12 depth for well 17 HC again?

13 MR. ESTRIN: Q. I have it as 43.3 feet.
14 Now, there is one more well you don't have on this
15 map at all which I would like to suggest does exist and
16 it is also an overburden well. If you look beside
17 24 HC which is north of the site and west of Highway 25
18 you have a bedrock well indicated there, 24 HC.

19 MR. BEECHINOR: A. Twenty-four HC?

20 Q. Yes.

21 A. North of ...

22 Q. West of Highway 25.

23 A. And north of what?

24 Q. About two inches north of HC 4.

25 That's why I think it would be more helpful if I was up



1 there. What I am suggesting is that Gartner Lee's walk
2 and talk survey indicates a well called 17 GL at that
3 location with a 20-foot depth and I would ask you to
4 check that if you would and, if that is so, to assume as
5 I am that there is another well there at least which is
6 an overburden well.

7 A. I can check that.

8 Q. Have you any idea -- coming back
9 south of the site 33 HC the one you had no record of
10 but which I suggested to you was 22.6 feet deep, have
11 you any idea of what volume of water is obtained there
12 or what that water is used for?

13 A. The only comment we have as a
14 result of our interview with the individual there at the
15 time, and I'm just confirming if we had an interview
16 first of all, but we have an NA so there was no one
17 available at that location to talk to about that well
18 when we did the survey. The only information we have
19 about that well is that the land use in the area is for
20 corn and grazing.

21 Q. You have no information for
22 example that as of the present time that gentleman has a
23 herd of 45 dairy cows he is watering from that source
24 of water?

25 A. We don't have any information on



1 that. I'm just checking in the appendices, Appendix 9
2 of the Site D hydrogeological report and for that well,
3 Figure 33, there was no well record available and the
4 land use is noted as corn, grazing and cattle.

5 Q. All right. Mr. Beechinor, I am
6 not sure if you are familiar with a publication by the
7 Ministry of the Environment, and I'm sure Mr. Sobanski
8 is, in which it is suggested, and this is the waterwells
9 and groundwater supplies in Ontario publication. It's green, and
10 I'm sure you have seen it from time to time but I want
11 to put one thing in it to you. The Ministry says in
12 talking about water demand and water requirements for
13 farms that you should calculate the requirement for each
14 producing milk cow including washing at 15 gallons per
15 day. Does that sound reasonable to you?

16 MR. SOBANSKI: A. Gallons?

17 Q. Per day per cow, milk cow.

18 A. I will accept that if it's in that.
19 I have seen higher numbers used.

20 Q. What numbers have you seen?

21 A. It's around 30, but a calf is 45
22 and if you are using 15 ...

23 Q. Six seventy-five?

24 A. Six hundred and seventy-five
25 gallons per day which is less than half a gallon per



1 minute or roughly domestic well requirements.

2 Q. It certainly wouldn't be unreason-
3 able to water 45 cows and wash 45 dairy cows from that
4 kind of source?

5 A. That is not a large quantity of
6 water and the well can certainly give quantities of that
7 type, a half a gallon a minute.

8 Q. Before we leave marking that
9 exhibit for the moment can we put a question mark on the
10 ones I have raised with you so we don't forget?

11 MR. BEECHINOR: A. Certainly.

12 Q. Thirty-three HC and I will put a
13 question mark and beside 24 HC.

14 A. That's the 17 GL.

15 Q. If we counted very quickly along
16 First Line it would appear that eight out of 15 wells
17 within 500 metres on either side are in the overburden?

18 A. Eight, that is correct.

19 Q. So roughly 50 per cent, just under
20 50 per cent. Just under 50 per cent of the wells on
21 First Line are in the overburden?

22 A. Yes.

23 Q. I understand, Mr. Sobanski, that
24 at one point in your illustrious career you worked for
25 the Ontario Water Resources Commission?



1 MR. SOBANSKI: A. Yes, I did.

2 Q. One of the sources of information
3 in your report is indeed an Ontario Water Resources
4 Commission survey of the County of Halton dated 1965.
5 I don't have the whole thick thing but I have the cover
6 and I think that you and Mr. Beechinor would recognize
7 that publication. It is referenced both in this
8 report, H-39 as well as I believe in the Stage 2.

9 A. Yes. I'm not sure I have seen
10 this specific map but I am aware of maps that were
11 prepared by the OWRC.

12 Q. Perhaps you had access to that
13 publication because you referenced it in two of your
14 reports. Let's assume that -- I'm asking you to look
15 at the map attached to this and I would ask this be made
16 the next exhibit.

5A 17 THE CHAIRMAN: This will be M-156.

18 --- EXHIBIT NO. M-156: Ontario Water Resources
19 Commission Map

20 MR. ESTRIN: Q. You would agree when
21 you look at that map -- can we put it up on the board,
22 please? The map that is attached to this, the legend
23 says overburden wells and the availability of water
24 from the overburden. I have put an orange mark,
25 Mr. Beechinor and Mr. Sobanski, on the copy I handed you



1 to highlight some diagonal hatching corresponding with
2 the legend and the legend would indicate such marking
3 indicates area where groundwater conditions are variable
4 but where supplies of water suitable for domestic and
5 stock purposes are usually obtainable from overburden
6 wells. Do you agree with me that the hatching I have
7 highlighted corresponds to a portion at least of the
8 proposed Site D as well as we can get from a map of
9 this scale?

10 MR. BEECHINOR: A. I would agree it's in
11 the vicinity of Site D.

12 MR. ESTRIN: I don't know if you have a
13 highlighter there. Oh, you've got it.

14 Q. Mr. Beechinor or Mr. Sobanski,
15 looking at this exhibit, M-156, and the map attached,
16 the legend does not indicate there are such resources
17 all over the immediate area, does it?

18 MR. BEECHINOR: A. No, it does not.

19 Q. By the way it doesn't indicate any
20 such resources around the area proposed for Site F?

21 A. That's true.

22 Q. And what the OWRC said in 1965 is
23 consistent with your findings, the Ontario Water
24 Resources Commission, what they found in 1965 is consis-
25 tent with your findings?



1 A. In the sense that there is suffi-
2 cient water in the overburden to supply domestic needs,
3 that is correct.

4 MR. SOBANSKI: A. I might just point
5 out, Mr. Estrin, that our area is actually a little bit
6 larger and we are identifying also to the west of
7 First Line.

8 Q. You have added more data?

9 A. The OWRC, I'm not sure how much
10 of a data base they used for their determination but
11 at least the number of wells are relatively sparse.

12 Q. Let's just talk about the depth
13 of some of these wells along First Line. Nineteen HC;
14 the MOE log would indicate that it's at 41 feet.

15 MR. BEECHINOR: A. I have 47 feet
16 reported here.

17 Q. Let me find mine. That is the
18 depth of the well or the depth at which water was found?

19 A. That's the depth of the well.

20 THE CHAIRMAN: What depth was that
21 again, 40 feet?

22 MR. ESTRIN: Q. I don't think that's the
23 relevant depth.

24 MR. BEECHINOR: A. Water was found at
25 42.



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1 Q. Water was found at 42 feet?

2 A. Yes.

3 Q. The Chaput well, 17 HC, I take it
4 you have no record for that?

5 A. Are we talking about 17 HC now or 19?

6 Q. We have moved.

7 A. I thought we were on 19.

8 Q. I thought we were finished. You
9 agreed that water came in at 42 feet.

10 A. Is that for 17 or 19?

11 Q. Nineteen.

12 A. That's right.

13 Q. And 17 HC, you don't have a record?

14 A. That's right.

15 Q. What about 16 HC?

16 A. Sixteen HC we have a record.

17 Q. And it indicates the depth at which
18 water was found as 44 feet?

19 A. That's right.

20 Q. And 15 HC?

21 A. We have a record.

22 Q. Water was found at what depth?

23 A. I have it in the records as 35 and
24 it was reported by the resident at the time to be 38.

25 Q. Well 54?



1 A. Fifteen HC?

2 Q. Yes. That's MOE well 5663

3 A. Five six six three, that's right.

4 Q. Thirty-five GL. I showed you the
5 MOE well record and would that assist you in determining
6 at what level the water was found at?

7 A. At 35 GL?

8 Q. Mr. Hodgson asked you to clarify
9 15 HC. You said it was either 35 or 38 feet according
10 to your records.

11 A. In the well record it is 35 and
12 in the comment from the resident they indicated 38.

13 Q. Which would you tend to go on, the
14 well driller ...

15 A. It would depend upon whether or
16 not the resident actually measured it but we would ask
17 the resident whether they measured the well recently,
18 the depth to water in the well and if they had I would
19 go with that as being the best information.

20 Q. You don't know what they did in
21 this case?

22 THE CHAIRMAN: Where did the balance of
23 your information come from on the other wells?

24 MR. BEECHINOR: The records on file with
25 the Ministry of the Environment.



1 MR. ESTRIN: Q. The records indicate
2 35 feet.

3 MR. BEECHINOR: A. That's fine.

4 Q. That's 15 HC. Thirty-five GL
5 I believe you do not have a record but I am going to
6 suggest to you if I haven't already that we know the
7 depth of that is 47 feet and that is something if you
8 wish we could certainly facilitate your confirming if
9 you wish.

10 A. Very well.

11 Q. And 14 HC, that was formerly the
12 Ford farm in your walk and talk survey and now occupied
13 or owned by Reid. You don't have a record for that but
14 let me suggest we are talking about a well that is 15
15 feet deep.

16 A. And you wish us to confirm that?

17 Q. If you would like to do so I am
18 inviting you to do that.

19 A. All right.

20 Q. Your witness statement, Mr. Sobanski,
21 indicates at page 12, and I don't know what exhibit we
22 are talking about, but we may not need to get it out. It
23 indicates that the mean water yield from overburden wells
24 in this area is 23 litres per minute. Does that figure
25 sound correct or do you want to check it?



1 A. I can check on that.

2 Q. Let's assume that for a moment and
3 while one of you is looking let me put it in non-metric
4 terms, about five gallons a minute.

5 A. That seems about right.

6 Q. So we are talking about a mean
7 yield in this area from the overburden wells of about
8 five gallons a minute?

9 A. That's right.

10 Q. That is certainly sufficient to do
11 a household?

12 A. That is correct.

13 Q. In fact Mr. Sobanski helped us by
14 saying that they could have half a gallon a minute and
15 run a farm with 45 dairy cattle. Did I get that right?

16 MR. SOBANSKI: A. Just the cattle.

17 Q. People take -- well, proportionately
18 they take more or less than one cow. How is that?

19 A. It's close. People get used to
20 dealing with the amount of water they have and in the
21 city you probably allow them a hundred gallons a day a
22 piece but if you have a low yield well people get used
23 to using a lot less and here we use dishwaters and wash
24 our cars but if you have a low yield well on your farm
25 then you would make do somehow and the type of yields



1 the Ministry uses for a subdivision is about a gallon a
2 minute without storage or a half a gallon a minute with
3 storage built into the system and this is to provide
4 for surges when you turn on the tap which will flow at
5 four or five gallons a minute. The general criteria
6 for domestic use or reasonable use is at least a gallon
7 a minute and you can get away with less but these wells
8 certainly can provide domestic use and they can provide
9 for some stock watering and things like that.

10 Q. It's because I'm on my feet but it
11 does seem to be warm in here, relative to the air
12 conditioning being on. I'll keep my voice up and,
13 Mr. Sobanski, if you imagine the Board was over there
14 and, Mr. Beechinor, and you spoke that loudly I don't
15 think anyone would have a problem. I invite you to look
16 at the Board. I want you to pull out if you would
17 from the Gartner Lee report Exhibit M-155, Figure 8 at
18 the back which is groundwater use if you would.

19 MR. BEECHINOR: A. I don't have a copy
20 of that report.

21 Q. You can look at mine. First of all
22 you would agree with me Figure 8 is at the back and
23 would you agree with me there is a symbol on it for a
24 dugout or pond?

25 A. That's right.



1 MR. HODGSON: Could Mr. Estrin wait for
2 the rest of us? Which is M-155?

3 MR. ESTRIN: That's the exhibit and at
4 the back there is a plate or figure called Figure 8
5 entitled "Groundwater Use."

6 MR. HODGSON: Thank you very much.

7 THE CHAIRMAN: There are no figures in
8 this copy.

9 MR. HODGSON: This is Figure 8 here.

10 MR. ESTRIN: I will give you a complete
11 copy including the figures.

12 Q. Looking at Figure 8 you agree that
13 first of all the symbol for dugout or pond and that is
14 the triangle with the point at the top?

15 MR. BEECHINOR: A. That's right.

16 MR. ESTRIN: Is everyone with me?

17 Q. If you look along First Line,
18 first of all before we get to that there is an area on
19 this figure of hatched lines, an approximate square that
20 would correspond almost completely with your proposed
21 Site D. Is that fair?

22 MR. HODGSON: How does this square
23 correspond with an L-shaped site?

24 MR. ESTRIN: I said almost completely.

25 MR. HODGSON: "Almost completely" is so



1 crude so can't we overlay one map with another and draw
2 the site on it?

3 MR. ESTRIN: I would be happy to assist.

4 Q. Mr. Beechinor, can we put that
5 up and we can figure it out for Mr. Hodgson? Put it at
6 a diagonal so we have north the same way we are used to
7 looking at it.

8 MR. BEECHINOR: A. When you say "put it
9 up" will we actually draw the location on it?

10 Q. Yes.

11 --- (OFF THE RECORD DISCUSSION)

12 MR. ESTRIN: I am going to switch copies
13 because the one I handed him already has markings on it.

14 Q. Mr. Beechinor, take your time but
15 can you basically outline Site D on that?

16 MR. BEECHINOR: A. Site D would follow
17 generally a configuration shown like so. Essentially
18 the only difference is the site shown on the Ontario
19 Waste Management Corporation includes an area where we
20 leave out this block of land and the Ontario Waste
21 Management Corporation includes that block of land in
22 their configuration.

23 Q. Could you highlight in orange
24 marker the area on the OWMC map of proposed Site D?
25 Now, looking at Figure 8 from the OWMC report, do you



1 agree with me there are a number of symbols indicating
2 ponds or dugouts immediately to the west of the proposed
3 site along First Line?

4 A. I do.

5 Q. Would you like to take a blue --
6 some other colour and highlight those for us, please?
7 Is there one on site just in the corner?

8 A. It depends upon how you orient the
9 maps because the triangles mean different things and I
10 don't know whether the point is up or down.

11 MR. SOBANSKI: A. As I look at that map
12 I might ask for a bit of clarification. Fourteen HC
13 was Reid and that was in the corner, was it not? You
14 measured the well at 15 feet deep. However on this map
15 of OWMC they are showing a cistern there and are you
16 sure you haven't measured the cistern as opposed to the
17 well? The cistern is put into the ground and water can
18 be brought in and stored.

19 Q. There will be evidence about that
20 and I think I can assure you that we measured the well,
21 not the cistern. Now, we see there are a number of
22 ponds or dugouts and you can't help us I take it from
23 your personal knowledge at this time?

24 MR. BEECHINOR: A. No.

25 Q. Immediately west of the site or



1 four west and one immediately to the south and over on
2 Highway 25 there is another one and in the middle of the
3 site up Highway 25 is another one and about two or more
4 in that north quadrant, northeast quadrant?

5 A. That is correct.

6 Q. Those ponds or dugouts are not
7 plotted on map 2, are they, drawing 2? It's just up
8 here behind you.

9 A. No, they are not.

10 Q. In terms of looking at the surface
11 water and resources of this immediate area, you would
12 agree it would be fair to indicate them? People may well
13 rely on them.

14 A. Yes.

15 Q. Would you be able to perhaps over
16 the weekend add them to your plate, that is the plate
17 that is the excerpt from drawing 2?

18 A. Yes.

19 Q. And in addition I believe ...

20 A. Go ahead.

21 Q. Can you take down plate 2 so we
22 can see the aerial photograph? Looking at Exhibit M-102,
23 Mr. Beechinor, you would agree with me that there are
24 at least two ponds shown in this aerial photograph in
25 the southern portion of proposed Site D, large ponds we



1 can see on this aerial photograph?

2 A. There are.

3 Q. Could you point them out?

4 A. In fact there

5 are three, there is one in the woodlot here as well.

6 Q. Could you please highlight those
7 for us on M-102? There is already a red mark so I will
8 give you green and green will indicate the ponds are
9 being marked. How large would those ponds be, have you
10 any idea?

11 A. They might be the size of three
12 of these tables put together, where the Board members
13 are sitting.

14 Q. Are you just sort of speculating?
15 They look the size of a house.

16 A. What is the date of the air photo?
17 These things expand and contract depending upon the time
18 of year.

19 Q. Let's take what you would consider
20 to be the maximum extent, the blackest part of the area
21 in the east. It seems to me from my layman's point
22 of view that we have enough room in that one to put in
23 about ten houses given the size of some of the houses
24 there. Do you want to think about that over lunch?

25 A. I can say from my field knowledge
these ponds are dry for most of the year.



1 MR. HODGSON: If these ponds are important
2 perhaps Mr. Estrin could send out his fishing rod and
3 weights and we could get the depth and the width and a
4 few other statistics about the ponds rather than have it
5 done this way through this witness.

6 THE CHAIRMAN: I'm afraid if they're big
7 enough he might not come back.

8 MR. BEECHINOR: I can say from my field
9 knowledge this pond is dry most of the year and there is
10 a bit of water in the spring and the maximum extent of
11 this pond is also in the spring and I think there is
12 some water in here all year round but it is of minimal
13 supply and I would suspect minimal quality. There is
14 also a small pond in the wetland and I think the wetland
15 is a permanent feature and there is probably a more
16 continuous contribution of water to this pond throughout
17 the year.

18 MR. ESTRIN: Q. In terms of the size,
19 and there is a scale on the photograph and it's hiding
20 below the exhibit number I believe, but perhaps at the
21 luncheon break you might tell us what you think.

22 MR. BEECHINOR: A. I don't know if that
23 would be of much assistance. As I said these things
24 expand and contract and I don't know how reliable it
25 would be on a yearly basis or from year to year.



1 Q. I'm not asking you about the
2 reliability in terms of water supply but I'm asking how
3 big in extent they may be given the interpretation
4 of the aerial photograph that they are ponds, that the
5 ponds exist.

6 A. Okay.

7 Q. Let's go if we could to the text
8 for a moment of Exhibit M-155, the Gartner Lee report
9 where they discuss this topic of water supply, et cetera,
10 on page 29. We have seen from the plate we put up,
11 Figure 8, the area they are considering specifically
12 here and can you read for me the first full paragraph
13 on the top of page 29?

14 A. Okay:

15 "Based on waterwell records and field
16 information surveys, it appears that both
17 drilled and dug/bored wells are important
18 sources of water supply in the study area."

19 Q. You would agree with that?

20 A. I would agree with that.

21 Q. Continue.

22 A. "Of approximately 100 wells on
23 record with the Ministry of the
24 Environment, about 40% are dug or bored
25 and about 60% are drilled ..."



1 Q. Is that roughly the proportion you
2 came up with?

3 A. I think that's roughly the pro-
4 portion we came up with as well.

5 Q. Continue.

6 A. "The majority of the drilled wells
7 are completed in the bedrock (about 85%),
8 while most of the dug or bored wells
9 (about 70%), obtain water from the over-
10 burden."

11 Q. Is that more or less consistent
12 with your statistics?

13 A. Yes.

14 "Bedrock wells are most frequent in areas
15 of shallower overburden to the north, east,
16 and south."

17 Q. They have excluded the west of
18 the site in that statement?

19 A. Yes.

20 Q. That is consistent with the data
21 we have here?

22 A. That's right.

23 Q. Would you continue with the next
24 paragraph?

25 A. "Available data indicate that most



1 wells in the study area have relatively
2 low yields."

3 Q. That is consistent with one to five
4 gallons a minute or a five-gallon-per-minute mean?

5 A. Yields suitable for domestic pur-
6 poses only:

7 "However, only six residents indicate
8 water shortages and most residents obtain
9 sufficient water to meet domestic and
10 agricultural needs."

11 Q. Again you would agree with that?

12 A. Yes.

13 Q. Okay.

14 A. "Eight persons reported using
15 cisterns for laundry, toilet, household
16 or livestock watering purposes, or as
17 backup systems for their wells. Eight
18 ponds are reported on the site and some
19 of these are used for livestock watering
20 and agricultural uses."

21 Q. Again you have no basis for dis-
22 agreeing with that?

23 A. No basis ...

24 MR. HODGSON: This is not Site D but a
25 different site and surely we must qualify that.



1 MR. ESTRIN: We can look at the map.

2 Q. If you look at Figure 8 you will
3 see the hatched line and when you read the text it becomes
4 clear that the hatched lines indicate their final area
5 they were considering and they were obviously considering
6 at one point a broader area but this report is summariz-
7 ing the data in essentially Site D. Anyway, Mr. Beechinor,
8 will count the ponds.

9 MR. BEECHINOR: A. I would point out in
10 our field investigations there was no agricultural use
11 of those surface water ponds.

12 Q. When did you make that investiga-
13 tion?

14 A. 1985.

15 Q. Did you make it?

16 A. Yes.

17 Q. What month?

18 A. We commenced work on this project
19 in September, 1985.

20 Q. Keep your voice up.

21 A. We commenced work on this project
22 in September of 1985 and I believe that's also when we
23 were doing our test drilling and walk and talk survey.

24 Q. Both the Region and the Ontario
25 Waste Management Corporation were targeting this specific



1 area for some kind of waste disposal at that time?

2 A. That's right.

3 MR. SOBANSKI: A. They were looking at
4 this property for a treatment plant, not a disposal site
5 and I haven't read the reports in some time but I
6 believe their concern was that they were going to have
7 to put in deep tanks into the ground at their facility
8 and there was therefore some concern about intercepting
9 some of these water-bearing zones.

10 Q. I was going to come to that at
11 some point. Dealing with the data we have in front of
12 us, and we now know there is approximately -- there is
13 a good percentage of overburden wells along First Line,
14 almost 50 per cent, and that is not uncommon in the
15 area and we know there are a number of ponds. Let's
16 compare Site F for a moment in that regard and can you
17 help us? How many wells are there used within one
18 kilometre of Site F?

19 MR. BEECHINOR: A. Let me turn to my
20 data on that.

21 Q. Okay.

22 A. When you speak of wells south of
23 Site F, or downgradient of Site F we don't find any
24 groundwater use from wells between Site F and to a point
25 somewhere south of the CNR Railway tracks. That is



1 approximately one kilometre. So, there isn't any
2 groundwater use from wells within one kilometre of
3 Site F at this time.

4 DR. KINGHAM: Did you just qualify that
5 by saying "downgradient" or "within one kilometre"?

6 MR. BEECHINOR: I am saying downgradient
7 because there is a difference here at Site D as
8 Mr. Sobanski has pointed out, groundwater moves in
9 several directions away from the site and so wells along
10 both First Line and Highway 25 are essentially down-
11 gradient of that site. In this case because of the
12 lineage of the flow system towards Lake Ontario ground-
13 water we know is moving in this direction and I am just
14 referring to wells in that potential flow path.

15 MR. ESTRIN: Q. Let me put this to you,
16 this proposition. From a hydrogeological perspective in
17 terms of taking into account the use of the groundwater
18 resource, you ranked D first of the till plain sites for
19 landfill first of all and let's stop there. You ranked
20 D out of the others, A, B, C and E and it came out first
21 in your hydrogeological perspective of those sites on
22 the till plain?

23 MR. BEECHINOR: A. That is correct.

24 Q. Then you compared F to D and in
25 your ranking both at Stage 2C, that stage, and later you



1 had a preference or F came out higher, slightly higher?

2 A. That's right.

3 Q. What I want to suggest to you is
4 having regard to the use of the groundwater, the ground-
5 water resource that is made and relied on at Site D and
6 what we have heard already about the limited, if not poor,
7 groundwater at Site F and the non-use of it within one
8 kilometre of the site that really I would like you to
9 make a little more separation between D and F and to
10 compare them and say that D comes out just below F in
11 terms of preference is like comparing a superior Ontario
12 wine to perhaps the very best French wine. We may have
13 very good wines in Ontario but I don't think one would
14 want, except the wine growers and I have respect for
15 them of Ontario, but I don't think they want to compare
16 even their most superior Ontario wines to a very good
17 French wine and we are talking orders of magnitude.

18 MR. HODGSON: Somehow when a metaphor
19 turns to food and wine I know it's lunch time.

20 MR. ESTRIN: Q. I guess what I am
21 suggesting is two things and one is looking at the number
22 of wells around D compared to F and the use of the
23 groundwater around D compared to F there is a bigger gap
24 than a mere slight preference and there is a big diffe-
25 rence in that context alone.



1 MR. SOBANSKI: A. In the context of
2 having wells nearby, there is a big difference between
3 the two sites. However, you know we can't just stop it
4 there. We have special hydrogeologic conditions at
5 Site D which allow us to contain the leachate within
6 the site. We have recognized in our comparison as well
7 that there are wells nearby that use these zones and
8 it's of concern to us. However, we feel we have
9 provided for that in the design.

10 Q. I'm not talking about the design
11 and you will have lots of chance to go through that
12 but let's stop at the resource stage of things.

13 A. Well, yes and no. We are talking
14 users here.

15 Q. Talk about users.

16 A. There are more users in close
17 proximity to Site D than Site F, there is no question,
18 yes.

19 Q. Not only users but there is a
20 good groundwater resource at D that is being used and
21 relied on.

22 A. There is a water resource at Site
23 D that is being used and relied on.

24 Q. In terms of the people who are
25 using it, it's good?



1 A. In terms of the people who are
2 using it it's all they have.

3 Q. And they are using it?

4 A. Oh, yes, they are, no doubt of it.

5 Q. Have you any idea approximately
6 how close the municipal water supply is? Is it several
7 kilometres?

8 A. It would be several kilometres
9 but I don't know exactly.

10 Q. From Site D to the nearest municipi-
11 pal supply?

12 MR. BEECHINOR: A.. We would have to
13 check that.

14 MR. SOBANSKI: A. It is several kilo-
15 metres though.

16 MR. ESTRIN: Mr. Chairman, I'm not sure
17 when is the appropriate time to break. What is your
18 pleasure? I can keep going or I can stop here.

19 THE CHAIRMAN: Well, let's do that and
20 come back at 2:00 to give the witnesses a little time
21 to pick up a few pointers on some of the things you have
22 asked for.

23 --- Luncheon recess (12:30 p.m.)

24 --- Upon resuming at 2:00 p.m.

25 THE CHAIRMAN: Please be seated.



1 MS CRONK: Mr. Hodgson is on his way
2 down.

3 THE CHAIRMAN: We don't want to start
4 without him.

5 MR. HODGSON: I apologize, Mr. Chairman.

6 THE CHAIRMAN: You came by a different
7 route.

8 MR. HODGSON: I was looking for a fishing
9 licence. Ms Cronk tells me she has a quarry licence so
10 I perhaps don't need a fishing licence.

11 MR. ESTRIN: We consider checking the
12 depth of wells as part of the training of a law student.

13 DR. KINGHAM: A very professional pas-
14 time.

15 MR. HODGSON: I can hardly wait to cross-
16 examine.

17 MR. ESTRIN: Q. Mr. Sobanski, did you
18 have a chance to plot anything or check anything over
19 lunch?

20 MR. BEECHINOR: A. Yes, we did. I believe
21 you asked us to check the vertical depth of three wells
22 to determine whether or not they were taking water from
23 the overburden or the bedrock and we have plotted the
24 three wells and the one well of interest was 17 HC
25 located on the First Line. I plotted this well on



1 cross-section B-B, drawing 7 and given the depth you
2 provided me, it appears that that well would obtain its
3 water from the lower granular units as we have described
4 in our hydrogeologic analysis of the site.

5 One of the other wells you asked me to
6 check was 33 HC located near Highway 25. We have
7 plotted that on section C-C on drawing 7 and based on
8 the depth you provided me, it appears that it is in the
9 overburden. The third one you asked me to check was a
10 well at or near 24 HC near Highway 25. We have plotted
11 that one as well on section C-C, and we have found that
12 well to finish in the overburden based on the well depth
13 you gave us.

14 Q. Well, looking at how you plotted
15 those three on the cross-sections, even if our measure-
16 ments were out by a foot or a metre it wouldn't appear
17 to make much difference, they are all in the overburden,
18 fair enough?

19 A. Fair enough.

20 Q. I think just to complete 39-D2
21 subject to the evidence that will be brought in if
22 necessary to deal with these other wells, I wonder if
23 we could mark those three in yellow to complete this for
24 the moment.

25 MR. HODGSON: Since Mr. Estrin must bring



1 some evidence on these three wells perhaps it might be
2 more appropriate if we marked them because don't forget
3 they are all subject to further proof. I am sure he
4 can provide the further proof but I see no point in
5 departing from the normal methods whereby facts are
6 proven in a case like this.

7 THE CHAIRMAN: Are you going to mark them
8 on the other as well?

9 MR. BEECHINOR: I had intended to mark
10 the lower drawings.

11 THE CHAIRMAN: Perhaps you could mark them
12 in a different colour.

13 MR. ESTRIN: All right. I wonder if we
14 could use something close.

15 MR. HODGSON: Pink.

16 MR. ESTRIN: All right, pink.

17 THE CHAIRMAN: That's appropriate because
18 we have used red and that corresponds.

19 MR. ESTRIN: Q. You have marked H-39-D2
20 showing three pink locations.

21 MR. BEECHINOR: A. In addition you asked
22 me to determine the size of the ponds on Site D.

23 Q. Could you use the mike or speak up?

24 A. Yes. As we determined the size
25 of the ponds on Site D, I looked at the largest pond



1 from the air photograph and that pond is located in the
2 southeast portion of Site D between drilling sites
3 HC 5-85 and HC 8-84 and it is located -- it's this pond
4 here (indicating) and the area of that is 25 metres times
5 85 metres or roughly a quarter -- 25 metres by 45 metres.
6 It's just less than a quarter of an acre.

7 Q. Just before we broke we were
8 discussing the comparison between the use of the water
9 resource and the potential impact on wells on Site D
10 versus Site F and, Mr. Sobanski, in H-14, the comparative
11 analysis, you have a letter as Appendix A and I don't
12 know if the Board needs to dig that out but I just want
13 to ask about one aspect of that. At Table 1 under the
14 heading -- the table is "Existing Constraints to Site
15 Development Summary" and under the factor "Downgradient
16 Well Users" with regard to Site D you have it medium to
17 high whereas at F you have it as nil.

18 MR. SOBANSKI: A. Yes, that is correct.

19 Q. Given that what you have already
20 said in your evidence in chief about the relative non-
21 use of the water resource at F, or below F and what you
22 also know about Site D and that the people up there do
23 depend on it absolutely with no alternative supply
24 being within kilometres, you would agree that probably
25 overall you could probably rank them H on one side for D



1 and nil for F?

2 A. Well, I think we have but I think
3 we are quibbling on whether we say M to H or say H but we
4 have marked it as potentially high for Site D as compared
5 to Site F in terms of groundwater supply users.

6 Q. We were looking at Appendix A to
7 H-14, Table 1 after the letter and I wanted to refer you
8 to a quotation which I find in Exhibit H-38, your Stage
9 2C final report No. 7 at page 7, and do you have that
10 report handy? I think we will need it for a couple of
11 questions. At page 7 of H-38, under the heading "Type
12 and Distribution of Aquifers" you say:

13 "In the general areas of the candidate
14 sites, groundwater supplies are derived
15 from aquifers in sand and gravel deposits,
16 sand and gravel beds and lenses that
17 occur in the overburden, and from
18 weathered and fractured zones in the
19 Queenston Shale."

20 A. Could you bear with me? What page?

21 Q. Page 7.

22 A. In the 2C report?

23 Q. Yes.

24 A. I'm sorry, yes, I see now where
25 we are. Could you repeat that?



1 Q. I don't need to repeat it but look
2 at that paragraph.

3 A. The bottom paragraph?

4 Q. The second from the bottom. That
5 was a general statement relative I take it to the till
6 plain sites you were comparing at that point, A, B, C,
7 D and E?

8 A. Yes.

9 Q. It is the case that we do have
10 at Site D aquifers in sand and gravel deposits?

11 A. Yes.

12 Q. We do have sand and gravel beds
13 and lenses that occur in the overburden?

14 A. Yes. I point out though that I
15 prefaced this section by saying that we were looking for
16 the presence of significant aquifer zones, municipal
17 type aquifers as opposed to the more moderate yields
18 because we find over most of the province it is difficult
19 to avoid aquifers entirely. I talked about in terms of
20 risk of possibly contaminating a couple of domestic
21 wells versus contaminating a municipal water supply
22 system. As well, even in this area it isn't as though
23 these units are sole source aquifers, there is still
24 the rock aquifer available to these people and I did
25 describe how supplies might be restored as well but this



1 was not a factor to eliminate aquifer materials because
2 we really can't avoid them, there are aquifers every-
3 where but they were to help us avoid the major aquifers.

4 Q. I appreciate that in a general
5 level of statement that would be correct, but, for
6 example, the OWRC in 1965 didn't for example identify the
7 whole of the area around Site D as being an area where
8 groundwater supplies are going to be found in adequate
9 supply. Going back to that one-page map for example as
10 we looked a moment ago at it before lunch, there was
11 this sand it came through south of area Site D and
12 extended to the south. We are talking in relative terms.

13 A. Yes, but even in their own
14 relative terms they have said that the area where ground-
15 water supplies are variable but where supplies of water
16 are suitable for domestic and stock purposes, they are
17 usually obtained from overburden wells and the areas of
18 concern to us would be much larger than that and we know
19 everywhere in the province will get domestic supplies just about
20 everywhere we drill but we have to design around the
21 constraints we find on the properties because in
22 southern Ontario we have 100-acre farms and there are
23 always neighbours near the lands we look at for waste
24 disposal if we are looking out in the country.

25 MR. BEECHINOR: A. Perhaps I could point



1 out as well if I can that there are large expanses of
2 the Region where there are no waterwells and so there
3 is no information and we weren't able to classify areas
4 where there were no waterwells for the data.

5 MR. SOBANSKI: A. That may not be, they
6 may have ignored that and mapped those little overburden
7 zones.

8 Q. They were trying to provide some
9 useful information.

10 A. I appreciate that but again,
11 Mr. Estrin, and I don't wish to be argumentative, but
12 the type and distribution of aquifers we were concerned
13 with here was the municipal type of aquifer so we wouldn't
14 run into problems even in the reasonable use criteria
15 where we were advised to avoid those type of areas. We
16 cannot avoid aquifers in southern Ontario, there will be
17 aquifers on any piece of property we look at and
18 potential impacts on nearby residents.

19 Q. But you, Mr. Sobanski, in your
20 Stage 2C work did look at the proximity of groundwater
21 use to the candidate sites and in fact you took the
22 trouble to show on your comparative photographs in this
23 volume the numbers of wells that were logged with the
24 Ministry of the Environment within 500 metres or 1,000
25 metres of each of the proposed sites?



1 A. That is correct and again that
2 comes into our assessment that you just showed me in our
3 letter. We have recognized that as a constraint for this
4 site and we recognize it in terms of the pros and cons --
5 rather the advantages of the sites as well and you know
6 here we say an advantage for one is an obvious dis-
7 advantage for the other as opposed to giving it both
8 ways. So we are recognizing these wells but at this
9 stage of an investigation, and we are dealing with silt
10 layers providing water supplies and I know the type of
11 design we are going to propose, I don't have the concern
12 any more because we can engineer the site and we can
13 provide alternate supplies and we could provide alter-
14 nate supplies if needed whether that be hauling water
15 or whatever we have to do that is required.

16 Q. When you say "we", you are saying
17 you would advise that that is what the Region should do?

18 A. The Region would have to do it,
19 they would have to restore supplies.

20 Q. You are not an employee of the
21 Region?

22 A. No, I am not. I'm not sure
23 whether I am on retainer so I am not sure whether or
24 not I am an employee.

25 Q. I know you have been doing a lot



1 of work. Mr. Sobanski, yesterday I gave you and
2 Mr. Beechinor a piece of paper which looks like this, and
3 I would ask you to look at this.

4 A. If I may I'll turn this back to
5 Mr. Beechinor. He reviewed this information.

6 Q. What we did here under this piece
7 of paper entitled "Number of Waterwells in the Vicinity
8 of Areas A to E" was to simply look at your report 2C,
9 Mr. Beechinor, and to take the number of wells that you
10 showed in your aerial photographs in regard to each of
11 the sites, A to E, which were first of all within 500 metres
12 and, secondly, 500 to 1,000 or a kilometre from each of
13 the sites. I understand that you haven't had the
14 opportunity to look at the sub-categories we divided
15 these things into, but, for example, if you move halfway
16 over from the left under the first total column the
17 numbers are intended to indicate the total number of
18 wells within 500 kilometres of each of the proposed
19 site boundaries at that time and I think you can agree
20 with me that as of the information from the 2C report
21 we have extracted that correctly.

22 MR. BEECHINOR: A. Well ...

23 THE CHAIRMAN: Did you mean 500 kilometres?

24 MR. ESTRIN: Five hundred metres, sorry.

25 MR. BEECHINOR: What I would say to that



1 is that the order of magnitude appears right and it could
2 be plus or minus one or two wells.

3 MR. ESTRIN: Q. Let's look for example
4 at the middle column under the heading "Total." It
5 would appear, based on your own work that Site D clearly
6 had more wells within 500 metres than any of the other
7 till plain sites?

8 MR. BEECHINOR: A. It does appear that
9 that's the case, yes.

10 Q. The number in brackets below that
11 total is the total number that would be in the overburden
12 if one breaks these down according to the information
13 in the report. For example, looking at Site D out of
14 17, the furthest left column and the second column from
15 the left added together makes five and if you look at
16 the key you see that O stands for overburden and the
17 second is overburden with sand lens so if you add four
18 and one you get five and similarly for the other ones.
19 Again D ranks with E as having the highest number of
20 overburden wells of all of them, right?

21 A. That's right.

22 Q. Today we determined that the
23 accurate number of wells within 500 metres either side
24 appears to be -- well, you have in your report that I
25 referred you to today 22 wells?



1 A. Yes, we had 22 wells between 100
2 metres and 500 metres and we have four wells on the site.

3 Q. So according to your report of
4 1985 the 17 number would jump up to about 22?

5 A. That's right.

6 Q. I just would like to consolidate
7 all this data in one place. Then, moving over another
8 500 metres and going to the right, the total wells on
9 site within one kilometre taken from 2C is 31 wells and
10 that's the same number I think you reported today.

11 A. That's right. I think our report
12 in total would come up to approximately 35.

13 Q. Today?

14 A. Today.

15 Q. So making that accurate for today
16 it's 35, but again it tells us that Site D had almost
17 one-third again as many as the second highest Site B
18 for the total number of wells within one kilometre?

19 A. Could you repeat that question
20 again?

21 Q. Site B has 22 wells?

22 A. Yes.

23 Q. Site D, 31?

24 A. Yes.

25 Q. So we are going from roughly



1 speaking 20 to 30 so it's approximately another third
2 so 33 per cent more wells then the next site?

3 A. That's right.

4 MR. ESTRIN: Could we mark this document
5 as the next Exhibit?

6 THE CHAIRMAN: This will be M-156.

7 MR. HODGSON: We have an M-156, the Ontario
8 Water Resources survey map.

9 THE CHAIRMAN: One fifty-seven.

10 --- EXHIBIT NO. M-157: Chart

11 MR. HODGSON: While we are making
12 exhibits we have a complete set now of the responses.
13 More paper.

14 THE CHAIRMAN: As if we didn't have
15 enough.

16 MR. ESTRIN: Q. Now that -- sorry.

17 MR. BEECHINOR: A. Go on.

18 Q. Having talked about the number of
19 wells that exist around the site and understanding that
20 many of these wells derive their source from sand and
21 gravel deposits, I would like to go over with you,
22 gentlemen--let's have a closer look at where the sand
23 and gravel units are. I want to ask you to produce if
24 you would your cross-sections for Site D, cross-sections
25 D-D and B-B.



1 A. Which one?

2 Q. B-B and D-D.

3 MR. SOBANSKI: A. They are both up.

4 Q. What we have done is we have
5 prepared some equivalent cross-sections, that is taking
6 into account the same general cross-sections but adding
7 some further information we had available to us. We
8 gave those cross-sections at the beginning of this week
9 to Mr. Sobanski and we gave him the further information
10 other than the information he already had available to
11 him which we have used and what we have done is we have
12 redrawn or revised cross-sections B-B and D-D adding
13 this further information and we are going to be calling
14 someone at a later date to prove those to the extent
15 they need to be proved, and I say that because of course
16 the information presented to us by these gentlemen is
17 not only their own work but a compilation of Gartner Lee
18 work and Water Resources wells and so on so everyone to
19 some extent is relying on work from various sources but
20 I would be willing to call first-hand evidence with
21 respect to all of that material if necessary, and
22 certainly we will be calling someone to address this
23 topic.

24 In any event can you put up for us -- can
25 you put this up for a moment?



1 --- (OFF THE RECORD DISCUSSION)

2 MR. ESTRIN: Q. First of all ...

3 MR. HODGSON: Is it now official that
4 everyone can take off their jackets?

5 THE CHAIRMAN: Yes. If you wish, go
6 ahead.

7 MR. BEECHINOR: Does that include us?

8 THE CHAIRMAN: Especially you.

9 MR. SOBANSKI: Just jackets?

10 MS CRONK: This is sort of fun. I've
11 never seen this happen before.

12 MR. HODGSON: We spent a summer in a
13 schoolroom where we had it deemed that we were wearing
14 a jacket and tie after eleven every morning.

15 MRS. TANNER: I don't want it deemed I'm
16 wearing a tie.

17 MR. ESTRIN: Q. To understand the cross-
18 sections, at least for me, we need to know where they
19 are. What we have mounted on the left, or my left, is
20 something called -- it shows us some cross-section
21 locations and what we have there is one going diagonally
22 through the site which is labelled RH, and perhaps you
23 might want to follow that through. Let's take the one
24 that goes down First Line, B(prime) to B. You have such a
25 cross-section on your own material, is that fair?



1 MR. BEECHINOR: A. That is correct, shown
2 here, drawing 7.

3 Q. We have called it RB to indicate
4 we are talking about a revised B. We have copies...

5 MR. HODGSON: Can we mark those as we go?

6 MR. ESTRIN: Could we mark the key plan
7 which is really called a site plan as the next exhibit
8 and perhaps they need a number plus letters for the
9 sub-units? The site plan perhaps could be the next
10 number and the specific cross-sections could be A, B,
11 C and D.

12 THE CHAIRMAN: Do they not come out of
13 an exhibit?

14 MR. ESTRIN: No.

15 THE CHAIRMAN: That will be M-158.

16 MR. ESTRIN: M-158 and then we will have
17 sub-units so that is really 158 over there as well.

18 MR. SOBANSKI: A?

19 MR. ESTRIN: Let's avoid confusion as
20 much as possible.

21 MR. HODGSON: What's it called?

22 MR. ESTRIN: It's called cross-section RB.

23 MR. HODGSON: How about that as 158 and
24 that as 158-RB(prime)?

25 MR. ESTRIN: That makes sense.

MS CRONK: M-158 is described as what?



1 MR. ESTRIN: Site plan.

2 --- EXHIBIT NO. M-158: Site Plan

3 MR. HODGSON: Site D?

4 MR. ESTRIN: Site D. The cross-section
5 RB-RB' will be 158.

6 --- EXHIBIT NO. M-158-RB-RB': Cross-section RB

7 MR. ESTRIN: Q. Looking at 158-RB-RB',
8 and for the sake of comparison we can also look at the
9 same time at your B cross-section above. You understand
10 I think that one difference or the physical difference
11 between the two is the fact that in M-158-RB we have
12 a ten times vertical exaggeration? Could you say yes
13 or no?

14 MR. BEECHINOR: A. Yes, that's right.

15 MR. SOBANSKI: A. I should point out it's
16 the same in B-B, our drawing because it's scaled
17 horizontally.

18 Q. You used the ten-to-one vertical
19 exaggeration and so have we except we are taking a
20 smaller physical area?

21 A. Correct.

22 Q. That's the reason for the diffe-
23 rence. Would you agree with me that to those of us who
24 are not trained at examining these cross-sections in
25 great detail it generally speaking is a little easier to



1 see that to the extent there are different layers of
2 stratigraphy that it's a little easier to look at 158-RB
3 as it is drawn than yours to define more detail?

4 MR. BEECHINOR: A. I don't know if it
5 defines more detail but it is easier to read because it
6 is coloured up.

7 Q. You have had some opportunity to
8 look at this since Monday and we have also given you
9 some further data upon which this is based. Have you,
10 or are you able to say that generally the data that has
11 been plotted on Exhibit 158-RB conforms to the data it
12 purports to represent?

13 A. What our section B-B shows,
14 drawing No. 7, and this was a regional geologic cross-
15 section running north-south, generally parallel to
16 First Line, and it was drawn at this scale over that
17 distance to give us a regional perspective of the
18 hydrogeology of the area beyond the site itself. What
19 we show on the actual site area is denoted by this line B
20 between HC 1-85 and just south of NBLNOW2. In that area
21 we defined the geology as consisting of overburden, and
22 that is denoted by the dark and white spotted texture
23 and this is the till, the upper and lower till as we
24 describe later in the detailed geologic cross-sections.
25 Contained within the till, and in this case we call it



1 overburden at this level, but there are two granular
2 units which we define later in detail as the upper
3 granular unit and the lower granular unit, and those are
4 the two units that some individuals or some residents
5 are utilizing for their water supplies.

6 Now, in looking at Mr. Estrin's section,
7 M-158-RB-RB', over the area designated to represent
8 Site D I see the overburden and I don't see it designated
9 -- it is designated as the upper till, the green is
10 designated as the upper till and there is also the lower
11 till, the lower sandy or silt till below it, but they also
12 define two granular units, the upper granular unit and
13 the lower granular unit. They also define a sand and
14 gravel unit that sits on the bedrock at HC 1-85 and that
15 in fact is also shown in our HC 1-85 as a sliver of
16 granular material which rests on the bedrock at that
17 location. Those seem to be the units that are high-
18 lighted here and I will confer with Mr. Sobanski. Have
19 you any comments?

20 THE CHAIRMAN: I think eventually we
21 will have our own waste management problem!

22 MR. SOBANSKI: We did check these but
23 there is one anomaly which we would just like to check
24 out. It may be just the difference in scale here that we
25 have a thicker section.



1 MR. ESTRIN: Q. I'm sure you'll have
2 over the weekend to have a better look at these.

3 MR. SOBANSKI: A. I'm not sure we'll
4 have time to look at everything over the weekend. We
5 volunteered for the field and swamps.

6 Q. There may be something you may wish
7 to check but my question is a general one at this level.
8 You have had an opportunity to check them and I'm going
9 to ask you generally speaking subject to some specific
10 points, would you agree that how we have plotted the
11 data on there appears to be an accurate representation
12 of the data available to be plotted?

13 MR. BEECHINOR: A. Yes, I would agree
14 with that.

15 Q. Just so we are clear we made
16 available to you and part of the information base for
17 these cross-sections prepared by us are some further
18 details on hydrology on Morrison Beatty logs you already
19 included in your cross-sections.

20 A. Yes, and I would like to elaborate
21 on that a little bit if I can.

22 Q. Yes.

23 A. We were provided with generalized
24 borehole logs from Morrison Beatty Limited that catego-
25 rized -- the only information in the logs was whether it



1 was till or stratified drift, stratified drift meaning
2 a granular or sand and gravel unit. We were not provided
3 with the very detailed descriptions and so we were left
4 with interpreting the geology based on what I would call
5 not the fully detailed logs. They were not provided to us.
6 This also happened in the situation with three Comcor bore-
7 holes advanced on this site, three boreholes drilled by
8 Comcor and logs were prepared for those boreholes and
9 we requested that information and that information was
10 never provided to us. We requested that information
11 on several occasions. I think some of what you will see
12 now is bringing in for example the Comcor data and on
13 Monday the Comcor well records became available to us
14 so essentially I think what we will see is an update
15 of our geologic cross-sections now that we have the
16 full information.

17 Q. Just to be clear in respect of
18 Comcor, Comcor did some work for a citizens' group called
19 MEAG, Milton Environmental -- Environmental Advisory
20 Group and that was a citizens' group formed in response to
21 a concern over the OWMC proposal which as the Board now
22 understands was for the same site and MEAG retained
23 Comcor, an engineering hydrogeology firm based in
24 Milton to do some drilling of that site. Those results
25 became available to the Town of Milton and we have now



1 incorporated those.

2 THE CHAIRMAN: You will be calling
3 evidence?

4 MR. ESTRIN: Right, but I just wanted to
5 make that clear.

6 Q. Mr. Sobanski and Mr. Beechinor, we
7 then see -- let's point out what we are able to see from
8 this. First of all we are looking from First Line into
9 the area of the proposed site as if we were standing
10 on the west side of First Line looking in toward the site?

11 MR. BEECHINOR: A. That is correct.

12 Q. Can you point out for the Board
13 with your pointer the actual area of the landfill
14 proposed? It runs along from the arrow along the top
15 to the other end and that is the actual area to be
16 filled further into the plan?

17 A. Correct.

18 Q. We also have on there -- let's
19 explain the symbols and starting from the left, WW 2479
20 and that stands for the waterwell we discussed earlier
21 into the overburden 2479, an MOE well log number?

22 A. That's right.

23 Q. HC 1-85 is your borehole right
24 down to the bedrock?

25 A. That's correct.



1 Q. GL 84-1 is a hole that is not
2 exactly on that line, along First Line but it is pro-
3 jected 75 metres into it and I think we can see that on
4 the key plan or the site plan. It's not directly on
5 the line but 75 metres off?

6 A. That is correct.

7 Q. That is a common technique if you
8 don't have a hole exactly on the line, you might take
9 one within a reasonable distance?

10 A. "Reasonable distance" I would under-
11 line.

12 Q. You yourselves used one 150 metres
13 off site on one of your regional cross-sections.

14 A. I would have to look at that to
15 know.

16 Q. We will have a look. Then we
17 come to waterwell 4074 and perhaps we had better put up
18 that key plan of waterwells and can we do that, drawing
19 2? We are taking data and the next vertical marking
20 on there is waterwell 4074. Does that appear on there?
21 That corresponds to one of your holes along the First Line?

22 A. That corresponds to our HC -- 4074
23 is HC 16 or 16 HC.

24 Q. Then we go along and there is
25 another waterwell immediately to the right -- put your



1 pointer down there and what does that say?

2 A. That says 27 GL and 16 HC.

3 Q. We know where 16 HC is from your
4 key plan and how about 27 GL? Okay. Now, we continue
5 and we see more waterwells and what is the next thing
6 there? I can't read it from here.

7 A. WW 5663.

8 Q. Can you tell me what that corres-
9 ponds to in terms of your waterwell designation?

10 A. Fifteen HC.

11 Q. Let's look at some of those water-
12 wells for a moment. Two four seven nine, going back to
13 the left side of this drawing, it appears to intercept
14 the lower granular unit as it goes through and ends
15 somewhat below it; is that correct?

16 A. That is correct.

17 Q. Then, let's go over to the next
18 waterwell.

19 A. I have a notation here and maybe
20 we should check the well depth at 2479. It seems to
21 extend a little bit deeper than the record I show or
22 what I have here would indicate.

23 Q. I'm not sure how much "a little bit
24 deeper" is and it would have to go a long way to get to
25 bedrock.



1 A. The way I would see it that well
2 may well terminate closer to this granular unit rather
3 than terminating much below it.

4 Q. When we come to waterwell records
5 the elevations will not be exact, are they?

6 A. But the question is how would a
7 well that has penetrated below the granular unit be
8 getting water and where is it getting water from and
9 that's my question.

10 Q. Logically it ought to terminate ...

11 A. More than logic, I think it's a
12 fact.

13 Q. You can check that. Moving over
14 to the next waterwell, 4074, it would seem to terminate
15 again -- that would seem to terminate in the lower
16 granular unit?

17 A. That's right.

18 Q. So that's its source of water?

19 A. That's right.

20 Q. The next waterwell we talked about
21 at depth today and it is that depth approximately as
22 indicated -- sorry -- the one to your left. What is
23 the number?

24 A. Twenty-seven GL 16 HC.

25 Q. Assuming it's that depth its source



1 would probably be would you say the upper granular unit?

2 A. We have 8-16 HC shown taking the water
3 from the lower granular unit and I would expect that
4 that is the case.

5 Q. It's one of them. Moving over to
6 the next waterwell 5663 it would appear to intercept
7 the upper granular unit?

8 A. That's right.

9 Q. Then we come to the next waterwell
10 which would appear to be just into the bedrock?

11 A. That's correct. Fourteen HC.

12 Q. No, that's not 14. That's the
13 Morrison Beatty hole, the one that goes right to the
14 bedrock, MBOW2 is the one I think we are looking at.

15 A. I think that's right.

16 Q. There is a waterwell immediately
17 to the right, 14 HC and that is the one I suggested to
18 you was the shallow one on the old Ford farm.

19 A. That's right.

20 Q. It would appear to not even get
21 below your clay silt till if that is plotted correctly?

22 A. That is correct.

23 Q. The next set of waterwells appears
24 to be into the Queenston shale?

25 A. That is correct.



1 Q. After that going down First Line
2 to the south we are basically into the shale?

3 A. That's right.

4 Q. And we are south of the area.
5 Okay. Now...

6 MR. SOBANSKI: A. The bottom of the
7 granular unit in this well and the bottom of the hole,
8 this is one well we discussed, but it terminates just
9 below this zone according to the well record.

10 MR. LEDERER: That is 2479 and he has
11 marked with a pencil mark and with a circle on Exhibit
12 M-158-RB and he is indicating or the record indicates
13 that it ends in the lower granular unit.

14 MR. SOBANSKI: We discussed this well
15 at some length as to which zone we would gain water from.

16 MR. ESTRIN: Q. One of the other things
17 we asked you to have a look at and would like you to put
18 up at this time is an overlay that goes over this.

19 MR. BEECHINOR: A. Which does it overlay?

20 Q. This overlays RB. What we have
21 done here is to try and approximate the shape of the
22 final form of the landfill upon completion, keeping in
23 mind that what we are looking at is a section in the
24 mid-part of the site projected from First Line. So, the
25 height as shown and which is the same scale as what it is



1 pinned onto would be how it would appear at the mid
2 point of the heap of garbage and fill as opposed to what
3 it would look like from First Line. Mr. Sobanski, would
4 you agree that where we have shown the bottom elevation
5 of the waste is accurate in terms of what is proposed?

6 MR. SOBANSKI: A. I don't know. I didn't
7 review this against the design drawings and Mr. Hiraichi
8 would speak to that but in general we are looking at a
9 couple of metres of cut so I presume it is about right.
10 I looked at the general shapes in terms of location
11 and the side slopes are too steep and nearly twice as
12 steep as what are actually on the drawings and the
13 maximum side slopes are in the order of four to one and
14 these are closer to two to one so they would tend to be somewhat
15 flatter. The top elevation I believe on the drawing,
16 and I didn't look at the bottoms, but the top elevation
17 is a maximum of about 204 and so that would be about
18 right, the 203 or 204 range. It would be similar to
19 what is shown on the drawings but I did not check that
20 against the base contours.

21 DR. KINGHAM: So we can understand it
22 and the record understands it, these are all shown as a
23 20 times exaggeration in height. It is not ten, not five
24 but 20 times.

25 MR. SOBANSKI: This is a ten-times



1 exaggeration again. Its' at 200...

2 DR. KINGHAM: The vertical is one to 200
horizontal and one to 4,000?

3 MR. SOBANSKI: You're right, it is a
4 20 to one vertical exaggeration as opposed to ten to one.
5 It is a 20 to one exaggeration.

6 MR. HODGSON: Can I get this clear? The
7 Hydrology Consultants' cross-sections are ten to one and
8 these are 20 to one?

9 MR. SOBANSKI: These are at ten to one
10 plus much longer which makes them look thinner and this
11 is a 20 to one exaggeration and indeed according to the
12 horizontal scale it's one to 4,000 and the vertical is
13 one to 200 which makes it a 20 to one exaggeration.

14 DR. KINGHAM: Could you review Hydrology
15 Consultants' and tell us if it's ten to one or five to
16 one?

17 MR. SOBANSKI: I understand. This one
18 here? Thank you, Dr. Kingham. Hydrology Consultants'
19 on a regional scale is apparently a five to one exaggera-
20 tion.

21 DR. KINGHAM: And these are 20 to one at
22 the bottom?

23 MR. SOBANSKI: Yes. For the record that is
24 drawing 7 cross-section B-B and C-C. According to
25 their scales we are dealing with a 20 to one so it is



1 four times difference between the two in vertical
2 exaggeration. I am now trying to remember whether or
3 not my testimony on the side slopes would be correct or
4 not and if I might just have a moment.

5 I believe on that type of exaggeration
6 that the slopes would be acceptable.

7 MR. ESTRIN: Q. Okay. I think that
8 that assists us with regard to where those wells are
9 in relation to the granular units and/or the Queenston
10 shale along First Line and then perhaps we could move
11 to another topic. Could we mark the overlay?

12 THE CHAIRMAN: That is in conjunction
13 with M-158-RB-RB'?

14 MR. HODGSON: Dash O.

15 MR. ESTRIN: Very good but it takes a
16 very special kind of pen to mark the overlay.

17 --- EXHIBIT NO. M-158-RB-RB'-O: Overlay to Exhibit No.
18 M-158-RB-RB'

19 MR. SOBANSKI: I think there is a problem
20 with relation to the bedrock on ours versus theirs at
21 four times difference in exaggeration.

22 MR. ESTRIN: The same number.

23 Q. The next one we could look at is D
24 and we already have yours up and perhaps you could take
25 down the one we were just looking at. Mr. Sobanski or



1 Mr. Beechinor, before we look at D we need to know where
2 it is and could you pull out your key map to show us
3 where, or would you agree by looking at the one we put
4 in that would tell us? I guess it's right in behind.

5 MR. BEECHINOR: A. I think we'll pull our
6 own out, thank you.

7 THE CHAIRMAN: This describes the cross-
8 section RB-RB'?

9 MR. ESTRIN: Yes, that's what we're
10 coming to.

11 Q. Mr. Beechinor, you were going to
12 point out your D section. Could you do that? It runs
13 generally north but zig-zags to the west; correct?

14 MR. BEECHINOR: A. That's correct.

15 Q. Before it goes off on the south?

16 A. Correct.

17 Q. If you can look at RD on Exhibit M-
18 158 you will see it generally corresponds to that.

19 A. That's right.

20 Q. We are looking essentially at the
21 same area?

22 A. Are these the same scale? No,
23 they're not, this is one to 4,000 and ours is one to
24 5,000 I believe.

25 Q. The last hole picked up on the



1 south in both of them is HC 6-85?

2 A. Correct.

3 Q. We are also picking up HC 4-85,
4 HC 5-84, 2-85, OW-3 and HC 3-84?

5 A. Yes.

6 Q. So we are picking up all the same
7 holes. Could you put RD-RD' parallel, or whatever is
8 best for comparison purposes to your D?

9 A. We are looking at D-D.

10 Q. I'm told this is at the same
11 vertical scale as yours, both at ten to one. Okay. Have
12 you had a chance to think about the scale?

13 MR. SOBANSKI: A. Yes, we are satisfied
14 with the scale.

15 MR. ESTRIN: Could we mark this? This
16 would be M-158-RD-RD'.

17 --- EXHIBIT NO. M-158-RD-RD': Chart

18 MR. BEECHINOR: What was that?

19 MR. ESTRIN: Q. M-158-RD-RD'. Looking
20 at this exhibit and comparing it to your plate or
21 cross-section D-D -- first of all with regard to the
22 one I presented you, are you satisfied that generally
23 speaking it accurately portrays the information it
24 purports to plot?

25 MR. BEECHINOR: A. We would say that



1 generally the geologic framework shown in your cross-
2 section is quite similar to our cross-section. There
3 are some small differences, but, in general, as we
4 brought it in in chief we have the upper clay silt till,
5 the upper till, a lower clear area, silty sand to silty
6 sand till and denoted as lower till and within the
7 lower till are two granular units, an upper granular
8 unit and a lower granular unit. There are a few small
9 differences and I note for instance that you have
10 stopped the lateral extent of the upper granular unit
11 just past HC 4-85 whereas we extended it from HC 4-85
12 to HC 6-85 so our extension of the upper granular unit
13 is longer.

14 MR. SOBANSKI: A. I might say that
15 they have a zone here but have called it silty clay
16 and they didn't extend it through the silty clays on
17 HC 6 and we did to show some extension and I think they
18 are showing that in terms of hydrostratigraphy they say it isn't that
19 significant in this area. In ours we did more geologic interpretation
20 but overall there is a little bit of change I think in
21 Morrison Beatty OW-3 and our HC 2-85 and it is probably
22 based on our very vague description we have presented
23 in our report which was all that was provided to us
24 at the time and that was referring to two zones of
25 stratified drift which really don't say very much. We



1 really didn't know what to do with them and how to correlate
2 them with our HC 2-85. So, I would presume given
3 all things being equal that this may in fact perhaps
4 be a better portrayal than what we have shown in...

5 Q. You'll have to keep your voice up,
6 Mr. Sobanski.

7 A. I think after several days my
8 voice just gave out. Thank you, Mr. Estrin. It could
9 be that at Morrison Beatty OW-3 the portrayal is a bit
10 better than ours and it is hard to tell. They have
11 detail now that we just didn't have before. They are
12 showing it essentially as a different unit than the
13 bouldery, gravelly, silt till where we showed it as an
14 extension but we really had no basis for doing it before.

15 Q. Just to be clear, and in looking
16 at this cross-section we are looking east with the
17 left-hand side being the north end of the site so it's
18 as if we were standing in the middle of the site and
19 looking east toward Highway 25.

20 MR. BEECHINOR: A. That is correct.

21 Q. If we were able to get down into
22 the ground and we were able to colour the units we would
23 see something that hopefully approximates what either
24 you or I have put forward?

25 A. That's right.



1 Q. It would appear -- could you point
2 out, please, the area of the proposed landfill on that
3 if you look at the upper drawing and I think it is
4 indicated by the arrow on the top line?

5 A. It is shown on the drawing denoted
6 M-158-RD-RD' as being between or just north of MB OW-3
7 and southward to a location just north of HC 6-85.

8 Q. We don't have an overlay for that
9 one. In addition to the two clearly seen granular units,
10 there also appears to be something identified called,
11 if you begin at the left, a thin layer just below the
12 green line called silt gravel there and then it
13 doesn't continue over except as a dashed line and if
14 you go further to your right under HC 4-85 there is a
15 sandy silt which shows up again at that point and you
16 would agree I think that there does seem to be in a
17 number of your boreholes at that depth where the till
18 changes a silty layer?

19 A. That is correct. We denoted with
20 these thick dashes for instance at HC 2-85 and we called
21 it a marker bed, a silt or very thin silt or sand unit
22 that marks the separation between the upper till and
23 the lower till.

24 Q. That silt, depending upon its
25 exact characteristics, could have some hydrogeological



1 significance if there was sufficient of it, I take it?

2 A. If it was of a greater thickness
3 we would have concern but for the units that we encountered
4 we are talking in the order of inches.

5 MR. SOBANSKI: A. We discussed that in
6 direct evidence. We felt that it wouldn't be particularly
7 significant in terms of the total flow because essentially
8 it is a silt within a silt till unit and that was handled
9 in the direct evidence.

10 Q. Right, but it is distinguishable
11 enough from your clay silt till that you yourselves
12 identified it as another sub-unit if you like?

13 MR. BEECHINOR: A. We had to dash it
14 because it was not really a mappable unit at this scale
15 and so you could see the relative thinness of that unit.
16 You can't map it at this scale.

17 Q. We are talking about a layer that
18 is inches?

19 A. Yes.

20 Q. By the way there is a yellow marker
21 and if you look at HC 2-85, that is about the third
22 borehole from the left under PW-2, that is also where you did
23 your pumping tests or one of them.

24 A. Yes.

25 Q. Just below the pink line there is



1 an indication of sand and gravel there and that is from
2 one of your holes; is that right?

3 A. Let's check that. That is correct,
4 there is a seven-inch-thick sand and gravel seam at that
5 location.

6 Q. Now, that appears just below the
7 proposed base contour for the garbage or for the landfill
8 area itself?

9 A. I can't confirm at this point the
10 base contour of the landfill.

11 Q. Perhaps that's something you could
12 check between now and Monday, just to confirm what it is
13 on these so we can assure ourselves we are talking about
14 what it portrays. There is also something on there,
15 another pink line, a very short one just to the left of
16 HC 4-85 called perforated sub-header piping.

17 A. What number, 4-85?

18 Q. Just to the left, move to the left.
19 There. What we have attempted to do at that point and
20 maybe this is something you can look at if you haven't
21 already, but to indicate taken from your design drawings
22 that that is the lowest elevation at which you will have
23 a perforated pipe collecting the leachate.

24 MR. SOBANSKI: A. Mr. Hiraichi will have
25 to talk to his design and what has been provided to my



1 understanding are detailed conceptual designs and I
2 further understand that our engineering staff are still
3 looking at the tile designs for both sites.

4 Q. So what you are saying I gather
5 is that we don't know whether (a) we will have perforated
6 pipes or (b) they will be one metre above where they are
7 indicated or one metre below or five metres below. I don't
8 know what level of concepts or detail we are now discussing.

9 A. I am not familiar with all of
10 Mr. Hiraichi's drawings, I have not looked over every
11 inch of them, but I know that we are still considering
12 depth and grades on drains. They have been looking at
13 this for three or four weeks and they are still looking
14 at them for both sites so that when he gives his evidence
15 he can give his best evidence.

16 Q. I think we can then perhaps turn
17 to the next cross-section.

18 THE CHAIRMAN: Could we take ten minutes
19 before you do that?

20 MR. ESTRIN: Sure.

21 DR. KINGHAM: As we do take ten minutes
22 could you tell me, Mr. Sobanski, your borehole logs and
23 what we call here HC 2-85 is what you call BH 2-85?

24 MR. SOBANSKI: That is correct.

25 MR. ESTRIN: It was brought to my attention



1 that the pink line does not appear to be on the copy
2 that the Board has and the pink line is meant to
3 conform -- as you see it there to something noted on
4 your copy called "Proposed Landfill Base Contour" so if
5 you want over the break we can colour that line in for
6 you.

7 --- Recess

8 THE CHAIRMAN: Please be seated. Never-
9 theless I think we will rise at 4:30.

10 MR. HODGSON: Not 4:00?

11 THE CHAIRMAN: We promised Mr. Garrod a
12 full day and he'll get it.

13 MR. ESTRIN: Q. Mr. Sobanski, you have
14 assumed in the modelling as I understand it that there
15 would be a mean thickness of seven metres between the
16 landfill base and the upper granular unit; is that
17 correct? We didn't get a chance over the break to
18 colour in all the pink lines and I did on one or two of
19 them but I didn't realize it was missing from all sets.
20 Perhaps that is something we can correct for you at some
21 point. If you want your own pink marker I can provide
22 it right now. However, we will do it for you.

23 I'm looking at page 93 of your report on
24 Site D.

25 MRS. TANNER: Ninety-three of which?



1 MR. ESTRIN: Page 93 of the Site D
2 Volume 1 report, H-39.

3 MR. SOBANSKI: Yes, I see it, Mr. Estrin,
4 yes.

5 MR. ESTRIN: Q. Now, I would like to
6 understand why you chose seven metres, or did you do
7 some calculation to arrive at seven metres? Are you
8 designing to seven metres or could you simply tell us
9 how you got that figure or chose that figure?

10 MR. SOBANSKI: A. No, that is derived and we prepared
11 a contour map -- we prepared our contour map for our
12 civil engineering people on the depth we wanted their
13 cells to be so we could have a hydraulic trap on the
14 base of the landfill and then we simply have taken from
15 that how much would be left between that base approxi-
16 mately and the top of the upper granular unit. So, we
17 are talking about on general or on average on the site
18 as best we could determine from average values at the
19 wells, the average thickness from the base of the cell at
20 the level we were dealing with to the top of the
21 upper granular unit which includes two
22 zones of till, it would be about seven metres. We
23 provided them with the base contours for the cells
24 that would be required to form the hydraulic trap and
25 that is based on the hydraulic potential in the zone
beneath the site that has the lowest hydraulic potential.



1 In most cases it was the bedrock and in one case it was
2 the lower granular unit had a slightly higher potential
3 and so in that area it was adjusted a little bit. So,
4 what we did is one more time we prepared a contour map
5 of the lowest hydraulic potential in the area and we
6 then knew that to form the trap we had to be about
7 two metres below that, 1.9 metres -- 1.5 to take into
8 account the mounding between the tiles and another 0.4
9 to take into account that we expected a lower water
10 level during the summer months and when we looked back
11 at some previous data we determined that and so we gave
12 them the lowest potentiometric surface that we saw on
13 the site less nearly two metres and we gave that to our
14 designers to be the base contours of the site and they
15 had to maintain it at about that elevation to form the
16 trap over most of the year.

17 That is how they prepared that. We then
18 took the various wells within the unit and we contoured
19 that to see roughly how thick was the remaining unit
20 and that averaged about seven metres. So, in some
21 places it's a little thicker and in some places it's a
22 little thinner, but overall the model is developed on
23 an average condition.

24 Q. When you talk about base contours,
25 base contours for the garbage, is that what you are



1 talking about?

2 A. Yes. Perhaps if I could do a
3 drawing it might explain it a bit better. Looking down
4 on the site we have various boreholes on the site and
5 we looked at the various potentials within that unit so
6 that if we look into the site looking down we know that
7 we have various water levels depending on what the
8 piezometer depth was. Let's assume a general recharge
9 condition. We then took the deepest which was usually
10 at the overburden/bedrock contact and we took that value
11 and we placed it on that well, and let's call it 150
12 for argument's sake and we did the same for all the
13 other wells and then we did -- we did that for the rest
14 of the wells. The design on the base of the site goes
15 like thus, if we can put the landfill on and be at
16 our 30-metre tile spacing the height of the mound between
17 the tiles will be about 1.5 metres. We then felt there
18 was potential for 0.4 of a metre of fluctuation in this
19 level based on data we had collected since 1984.

20 Q. When you say "this level" you are
21 referring to the level where?

22 A. We are referring to the level in
23 April in the deepest piezometers, in April of 1986. We
24 felt there was also potential for about 0.4 of a metre
25 below that so we allowed for another 0.4 metre and we



1 took this elevation of April, 1986 and we subtracted
2 from that 0.4 to allow for seasonal fluctuations and
3 we subtracted again from that 1.5 metres to take into
4 account the height of the water mound between the tiles with-
5 in the fill. We then plotted the values on our map and
6 we contoured them and we told our civil engineering
7 staff we must get to at least that elevation on the
8 base of your cells and they fall very close.

9 Q. When you say "get at least to that
10 elevation" do you mean downward or the downward direction?

11 A. The base of the landfill will be
12 at that elevation.

13 Q. In other words to collect the
14 leachate and make sure the mounding doesn't go any higher
15 than you wish it to, the tile collection system had to
16 be no higher than a certain elevation. Did I under-
17 stand that correctly?

18 A. The base of the cells were to be
19 no higher than that elevation and we will put tiles
20 across that area and drain that off so we maintain the
21 situation as shown here and this water level across the
22 top of those zones is very close to what we feel would
23 be the seasonally low water table within the lower units and
24 we are not going to worry about a centimetre or so or
25 a few centimetres or even a half a metre because if we



1 are wrong a little bit and at times the water level were
2 to drop so the water level was a bit too high and we get a
3 little bit of migration into the till, the velocities
4 are very low in that clay silt till unit and when the
5 water level has recovered seasonally it will push it
6 back into the landfill. If there was a bit of leakage
7 over a couple of months period it's not that significant
8 because as the water levels rise seasonally in the year
9 it will push it back up into the fill, but this was the
10 basis of the design then we have taken into account and
11 have laid out the base elevations of the cells along
12 this line.

6A

13 Q. Just so I understand one other
14 aspect of this, you didn't tell Mr. Hiraichi at what
15 depth he had to put his collection pipes or did you?

16 A. I don't recall. We had some
17 discussions on it and I didn't look at all his final
18 design on the tiles. We had some discussion on sloping
19 tiles versus flat tiles and there is still some matter
20 of it being investigated by Mr. Hiraichi.

21 Q. Who is it that specified -- is it
22 you who specified what elevation the tiles had to be
23 placed in order to make sure the hydraulic traps worked?

24 A. Not the tiles. We have specified
25 the base elevations of the cells and the tiles will be



1 placed on that.

2 Q. The tiles are above the base
3 elevation or below?

4 A. The tiles are supposed to be at
5 least at the base elevation of the cells.

6 Q. When you say "at least" what does
7 it mean; up or down?

8 A. Not up and "at least" means down.

9 DR. KINGHAM: Can we be clear on that?
10 Are you saying that the tiles must be no less deep than
11 that depth which will be 0.4 of a metre below the water
12 table and they could be deeper and that would only
13 increase the efficiency of your hydraulic trap?

14 MR. SOBASNKI: They could be somewhat
15 deeper but we would have to be careful and strike a
16 balance there. That is being looked at. We have to
17 watch the balance on that, we don't want to get too deep
18 with the tiles, but we are taking a look at these tiles
19 and the Site F tiles to make sure they meet these
20 minimum requirements. I am not talking about the height
21 of a tile and if we have a six-inch tile I'm not concerned
22 that it has a height of six inches because it won't have
23 much water in it anyway, but basically the minimum depth
24 they were to be laid was on this contour line we pro-
25 vided Mr. Hiraichi with and they would provide us with



1 the hydraulic containment system and it varies across
2 the site. It's a contour map like some of the water
3 table contour maps.

4 MR. ESTRIN: Q. So the hydraulic trap could be
5 more efficient if it was in fact -- if the collecting
6 pipes were somewhat lower?

7 MR. SOBANSKI: A. Possibly. We have to
8 strike a balance here now because we have also calculated
9 water inflow from below if you were, you know, to get
10 them too deep and you might have too much water inflow,
11 more than you want, and that is why they are rechecking
12 things to make sure everything is pretty well as I asked
13 it to be to be laid out. If they go a little deeper
14 with the site then the tiles, some tiles may collect a
15 little more groundwater but the trap would be better,
16 there would be a higher sink into the site. There would
17 be a lower hydraulic potential then within the site
18 itself, but this is the minimum I have specified and
19 it has to meet those minimum specifications.

20 Q. Just so I understand this, the
21 collection system, the leachate collection system will
22 be collecting and is intended to collect both leachate
23 and uncontaminated groundwater, it mixes?

24 A. That is correct. We need to
25 maintain the potential into the site from all important



1 water-bearing zones and therefore some groundwater will
2 come upward through the till zones and into the landfill.
3 It's relatively small and I think it was eight gallons
4 a minute and if I'm wrong then the record speaks for
5 itself, but over the entire area it's about eight gallons
6 a minute.

7 Q. It will come up?

8 A. Come up and also come in from the
9 sides, from the weathered zone.

10 Q. That is when the hydraulic trap is
11 working and when you are pumping?

12 A. That is correct.

13 Q. As I understand it though you
14 won't be pumping certainly at all times, at least not in
15 the first year or two or more, or do you know?

16 A. Mr. Hiraichi will have to speak to
17 how he plans to handle that, but there are times that
18 when we dig this material out we have dug a hole that
19 was 15 feet deep that is empty and that you could put
20 garbage into and you could allow for a short period of
21 time I think for a rise in water level and when you do
22 start to drain the system out the trap forms and any
23 water that might have migrated into the formations would
24 be pulled back.

25 Q. Will we hear from Mr. Hiraichi as



1 to whether the design drawings contained in your report
2 are going to be modified or not? Are we going to have
3 an opportunity of knowing at what depth the leachate
4 will be collected and other aspects of the leachate
5 collection system?

6 MR. HODGSON: Yes.

7 MR. ESTRIN: Q. If there is -- if there
8 are any changes in those drawings which are now in that
9 part of I guess it's Volume 3 to Exhibit D I hope we could
10 have them a couple of days or so before Mr. Hiraichi
11 testifies but that probably won't be a problem given our
12 present schedule.

13 MR. SOBANSKI: A. As I say they are
14 being reviewed. He may not even know where they are,
15 I don't know.

16 Q. Let's assume that the landfill
17 base -- you don't intend to change the base contour
18 of the landfill itself, or is that something that is
19 possible as well when we get into more detailed design?

20 A. I have seen the base contours and compared them
21 to the drawings I gave them and they met my criteria.

22 Q. Does that mean they are the same
23 as are now in Volume 3?

24 A. Roughly. There may be the odd
25 spot that is a little bit deeper that they have required



1 for some grade but it is essentially the very same.

2 Q. We may have to redraw our cross-
3 sections when we get the new information or at least
4 amend them?

5 A. I can't be sure but I don't think
6 Mr. Hiraichi is looking at changing the base contours
7 of the site. He is looking at the tile collection system
8 and how it relates again to the trap.

9 Q. You would agree that certainly there
10 is less than seven metres looking at M-158-RD-RD', there
11 is less than seven metres beneath the base contour of the
12 landfill, the pink line and the end of the till unit
13 marked in green, the one that has a silt layer in some
14 of your boreholes?

15 A. Yes. In this case we are dealing
16 with about four metres and in the odd case about three
17 to the top of that unit, but if we look at the model --
18 if we look at the model shown on page 100 when we
19 looked at the first flow path which was from the base of
20 the site down to the sand till unit, we assumed a
21 thickness of only three metres and then we take another
22 four metres of the next material which is the sandy silt
23 till to take us down to the granular units so the model
24 considers that this till unit, the clay till unit is only
25 three metres thick.



1 Q. And it assumes that there is
2 nothing as I understand it, you put that -- you have a
3 velocity to that point of 2×10^{-7} and is there anything
4 to take into account the silt unit when it is encountered?

5 A. As we said we did not take the
6 silt unit into account because we do not feel it is a
7 significant hydrostratigraphic unit. It is ten
8 centimetres or less in thickness and it's a silty material
9 similar to the till and we did not include that as being
10 of any significance in terms of migration.

11 Q. Let me suggest that if you were
12 being conservative you would.

13 A. We have been very conservative and,
14 no, we haven't.

15 Q. Let's assume that we have plotted
16 correctly and taken from your design -- the design
17 drawing presented to all of us, the lowest points in
18 the leachate collection system, in the perforated pipe
19 system which is marked on there and perhaps you could
20 point it out for the Board, the perforated pipe, and I
21 can't quite read it from here. What does it say?

22 A. Perforated sub-header piping.

23 Q. Let's assume we have taken that
24 correctly from the design drawing as presented to the
25 Board and all of us. You would then agree we are talking



1 about again only about four metres between that zone
2 where you would be in fact having leachate and the upper
3 granular unit roughly?

4 A. If that were the case, yes, but
5 again the hydraulic potential into that zone is much
6 higher and if it were perforated -- I haven't looked at
7 this and I'm being asked to answer questions on design
8 and I don't want to go too far into this because we paid a
9 man a lot of money to do this for us and there is a
10 designer involved who is a very good designer.

11 Q. He won't answer questions on
12 hydraulic conductivity and rates of velocity and all
13 those kinds of things, is he?

14 A. Perhaps not, no. At this point
15 I haven't looked at this, and I'm not really sure,
16 but at that point we have a perforated sub-header piping
17 and then the distance from here to there is lower than
18 seven metres. However the hydraulic potential up to
19 the zone is higher and so it would be capturing more
20 groundwater if that were the case.

21 Q. Let's get it clear. If that was
22 the lowest point on your leachate collection system that
23 is essentially where you are trying to get -- collect
24 all the leachate from a higher gradient down to that
25 point?



1 A. I really can't tell you, I'm not
2 sure.

3 Q. What about manholes? I understand
4 the design has several manholes into it and the bottom
5 elevation of those manholes is even lower, that is
6 closer to the upper granular unit than the depth of
7 the sub-header pipe. I'm looking at Volume 3 and I'm
8 looking at drawing 2 of 8 from I guess Volume 3 of D.
9 I guess we had better put it up. It's not quite 4:30.
10 Can you put that up? Looking at the manhole schedule
11 on your right there is a number 19, correct, 19G? Can
12 you point that out for the Board?

13 A. It's located -- I don't know how
14 to describe this. Perhaps I can just point at it because
15 it's nowhere, it's sort of in a jog in the header pipe.

16 Q. Then there is a point 20 just to
17 the east?

18 A. Yes.

19 Q. First look at the schedule and
20 tell us what elevations 19G and 20 are at.

21 A. One seventy-five point five and
22 20 is at 169.7.

23 Q. I suggest that if you look at the
24 schedule there you will see those are about the lowest
25 points intended in the leachate collection system with



1 point 20 I believe being the lowest point because that
2 is where you intend to pump from and everything would flow
3 down to there.

4 A. In general, yes, that is correct.

5 Q. If you have regard to the lines
6 that run east-west from, say, 19G, and you see a dashed
7 line, and if you had regard to the legend which we can't
8 see at the moment, that would indicate perforated pipe.
9 Perhaps you could flip the end of the page and you will
10 see.

11 A. I'm sorry, from where to where?

12 Q. Running west from there.

13 A. There to there, yes.

14 Q. We are looking at a perforated pipe
15 design, perforated leachate sub-header.

16 A. Yes, that's what it's saying.

17 Q. Whereas other pipes are not
18 necessarily indicated as perforated?

19 A. You are pointing between 18 and 19?
20 Yes. First of all I should point out that the main line
21 you are talking about as I read that drawing is outside
22 the landfill site and it isn't located within the fill
23 at all. It will likely be, and I'm just going to guess,
24 but I would think they would be installed in some manner
25 and dug in in some manner and backfilled with glacial till



1 so they will be essentially a solid unit isolated from the system within
2 other than by the tiles that lead to it. So, the depth
3 of that particular unit -- it's not like a manhole that
4 is sealed up and it's not like a pumping well within
5 this unit at all. It is essentially an isolated unit
6 I would think within the till but these are detailed
7 conceptual and there is not enough detail to really know.

8 Q. Let me suggest ...

9 A. These are conceptualizations as I
10 can see them. They are not detailed. He has given some
11 manhole elevations for discussion and he is looking at
12 it again right now but certainly the materials within
13 here are solid pipes and will not be connected to the
14 leachate itself and we don't backfill these things with
15 garbage or anything, they will be backfilled with native
16 materials.

17 Q. I just want to get it clear before
18 we go. That is the pipe from which -- the solid pipe
19 on that diagram represents the piping that leads to the
20 pumping station, right?

21 A. Yes. The solid pipe around the
22 outside edge.

23 Q. The perforated pipe running east-
24 west is called your leachate sub-header?

25 A. Yes.



1 Q. That is intended to collect
2 leachate, say, from cell 3 and cell 4, for example?

3 A. It is collecting from the various
4 laterals.

5 Q. And it's bringing it over to the
6 pumping station?

7 A. Yes.

8 MR. ESTRIN: We will have to leave it
9 there for today.

10 THE CHAIRMAN: Mr. Estrin, that exhibit...

11 MR. ESTRIN: I don't believe it's in as
12 a separate piece of paper at this point.

13 MR. HODGSON: It probably doesn't need to
14 be entered.

15 THE CHAIRMAN: There is nothing new on it
16 yet.

17 MR. HODGSON: I think it's from H-44,
18 drawing ...

19 MR. SOBANSKI: Drawing No. 2 of 8.

20 THE CHAIRMAN: It's in there anyway.

21 MR. SOBANSKI: That is from the design
22 report. Has it been introduced?

23 MR. ESTRIN: Mr. Garrod has it marked
24 H-41. It must be right.

25 MR. HODGSON: I am not mistaken it would be



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Sobanski, Beechinor,
cr-ex (Estrin)

1 H-41, the design and operation report for Site D.

2 THE CHAIRMAN: Just to tie it down.

3 MR. ESTRIN: We have been talking about
4 H-41, drawing 2.

5 THE CHAIRMAN: Thank you. We stand
6 adjourned until 9:30 on Monday.

7 MR. ESTRIN: Was it 9:30?

8 THE CHAIRMAN: Nine-thirty.

9 --- Adjournment (4:30 p.m.)

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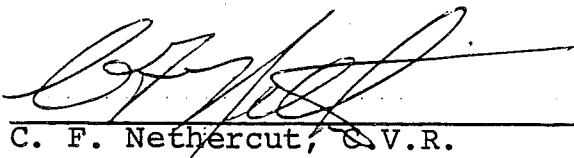
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