

RED HILL VALLEY PARKWAY INQUIRY

TRANSCRIPT OF PROCEEDINGS
HEARD BEFORE THE HONOURABLE J. WILTON-SIEGEL
held via Arbitration Place Virtual
on Thursday, May 19, 2022 at 9:29 a.m.

VOLUME 16

REVISED TRANSCRIPT

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1 Arbitration Place Virtual

2 --- Upon resuming on Thursday, May 19, 2022

3 at 9:29 a.m.

4 CHRIS ROGERS; AFFIRMED

5 EXAMINATION BY MR. LEWIS:

6 Q. Good morning, Mr. Rogers.

7 Thank you for coming.

8 A. Good morning.

9 Q. Just to begin, I would
10 just like to take you through your background,
11 education and work history, just to get started,
12 and we can use your CV for that.

13 Registrar, if we could go to
14 MTO38699. And going back to your education at the
15 top there, you received your Bachelor of Science,
16 Honours, in geology from the University of
17 Manchester in the UK in 1973 and then your
18 Master's in science and geology at the University
19 of Windsor in 1977. Is that right?

20 A. Yes, I did.

21 Q. And so you are a
22 geologist, is that right, by trade?

23 A. Yes. Well, in Ontario,
24 not a professional geologist.

25 Q. Sorry, not a?

1 A. Professional geologist.

2 Q. Okay. Sorry, what's the
3 distinction that you mean there?

4 A. Well, it's something they
5 introduced around 2000 where, if you were a
6 geologist, you had to be a professional geologist,
7 but I never applied.

8 Q. Okay, so a professional
9 designation?

10 A. A professional
11 designation. Thank you.

12 Q. All right. And you were
13 employed by the MTO from 1976 until April 2008,
14 when you retired. Is that correct?

15 A. Yes, sir.

16 Q. And I gather you've been
17 a consultant since then. Is that right?

18 A. Yes, and teaching at the
19 university.

20 Q. Okay. Yes, at Ryerson
21 and University of Toronto. Is that right?

22 A. Yes.

23 Q. And are you still doing
24 that?

25 A. No, I am not.

1 Q. Okay. I don't know if
2 your volume is down. I'm finding it a little bit
3 hard to hear you at the end. I'm not sure if
4 that's the volume at your end.

5 A. Perhaps I should speak
6 up. Is that better?

7 Q. Yes, that is a little
8 better. Thank you.

9 And I see on the latter pages
10 of your CV there's a large number of papers and
11 presentations or publications over the years?

12 A. Yes.

13 Q. I don't plan to go
14 through them, but there's quite a large number of
15 them, I see.

16 A. Yes, sir.

17 Q. Six or seven pages. And
18 in terms of your work at the MTO, you were a
19 petrographer in the soils and aggregates section
20 from 1978 to 1990. Is that right?

21 A. Yes. And a petrographer
22 is a geologist who specializes in the study of
23 rocks as opposed to the earth.

24 Q. I see, okay. It's a
25 branch of geology?

1 A. It's a branch of geology.
2 It involves the use of microscopes and so on.

3 Q. All right. And then from
4 1990 until your retirement in 2008, you were the
5 manager of soils and aggregates section of MERO in
6 the MTO. Is that right?

7 A. That is correct.

8 Q. Okay. And you were in
9 that section before as the petrographer and then
10 you became the head of the section. Correct?

11 A. Yes. My whole business
12 life was with the soils and aggregates section.

13 Q. Okay. And could you just
14 describe what your job as the manager of soils and
15 aggregates entailed?

16 A. We had a staff of between
17 18 and, at one time, 40 people running a
18 laboratory and also providing professional
19 services to the regions in the area of soils and
20 construction aggregates, of which Ministry of
21 Transportation used to use around 10 million
22 tonnes a year or more.

23 Q. Okay. And that's the
24 general thing and what sort of duties did you
25 perform in that?

1 A. Regrettably,
2 administrative duties, signing papers.
3 Occasionally I would get to do technical work and
4 sit on committees.

5 Q. Sorry, I didn't catch the
6 last thing you said. Technical work and?

7 A. Sitting on committees.

8 Q. Okay. And what else did
9 you do? You were involved in the Designated
10 Sources for Materials administration. Is that
11 right?

12 A. Yes. We had two lists
13 that we were responsible for: One for geofabrics
14 and one for frictional aggregates for the top
15 surface.

16 Q. The surface course
17 aggregates. Right?

18 A. Surface course
19 aggregates.

20 Q. And that wasn't the only
21 thing that the soils and aggregates section was
22 responsible for. What were the other areas?

23 A. I said running a testing
24 laboratory. Rock, slope stability along the
25 Ontario highway network, and providing advice on

1 stabilization and inspection of rock cuts, pretty
2 much anything to do with aggregates.

3 Q. Okay.

4 A. And, plus, we tried to do
5 some research as well, although that wasn't our
6 main focus.

7 Q. Okay. And if we could
8 then -- were you involved in the establishment of
9 Designated Sources for Materials list as it
10 related to aggregates and surface courses?

11 A. Yes. That started in
12 around 1984.

13 Q. Okay. And could you give
14 us a short history on how that came about and came
15 to be?

16 A. Right. In about 1980, we
17 only had two sources of aggregate for surface
18 course paving of roads in Southern Ontario. In
19 Northern Ontario, we used local materials that
20 were composed of granites and nices and we didn't
21 have a concern about pavement friction in that
22 area. But in Southern Ontario, we had two sources
23 of so-called trap rock and we wanted to increase
24 the number of sources that were available, and so
25 my job at that time, as the petrographer, was to

1 find new sources and find people who were
2 interested in supplying this material and then
3 setting up a system to test and evaluate this
4 material before it went on the list.

5 We were very successful in
6 Eastern Ontario with what is known as the
7 dolomitic sandstone, and then we transferred our
8 energies from Eastern Ontario to the north of
9 Toronto area from Orillia northerly and we set out
10 a system that we thought was reasonable in
11 approving these materials. Would you like me to
12 describe that?

13 Q. Yes, please. We've heard
14 evidence on it, but it would be good to get your
15 perspective on it, given your length and your
16 history with it.

17 A. Okay. We adopted two
18 tests, laboratory tests, that are not normally
19 done. One is something called the aggregate
20 abrasion value test, which is a very old test
21 originally developed for granite pavers. It's an
22 English test or British test. And that measures
23 the real resistance of the aggregate in the
24 laboratory and simulates what happens on the road
25 surface.

1 The other test we adopted was
2 a polished stone value test and we had been
3 playing around with this since the early 1970s,
4 before I joined the Ministry, and there were some
5 technical difficulties with it that weren't really
6 resolved until about the mid-1980s when British
7 standards brought out a new version of the test,
8 and then we were satisfied from that point on that
9 it was doing the right job in terms of predicting
10 the likely microtexture or polished resistance of
11 aggregates in the road surface. I can go into a
12 long discussion about what was wrong with the
13 earlier version of the test, but to summarize -- I
14 beg your pardon?

15 Q. A very brief one, if
16 you --

17 A. Yes. When we first
18 started using the test, we found that it didn't
19 properly separate the limestones, which we knew
20 polished in the road surface, from the trap rocks.
21 We got very similar numbers, but we glanced down
22 on trap rock and it wasn't working. And the
23 reason it wasn't working was because of a rubber
24 tire used in the test was grinding the surface
25 rather than polishing the surface. With an

1 introduction of a new tire or flat section in the
2 mid-1980s, we started to get polishing of the
3 limestones that we knew had poor field performance
4 and better results with the so-called trap rocks.

5 Q. I see, okay. All right.
6 And, in a bit, I want to just take you through the
7 requirements of DSM inclusion, of which those two
8 tests, as you just mentioned, that's part of the
9 testing requirements that were part of the DSM
10 application process. Is that right?

11 A. Yes, and in addition they
12 had to meet other physical requirements, such as
13 resistance to freezing and thawing.

14 Q. Right, okay. We'll come
15 to the list of that, I think. But, as I
16 understand, Bob Gorman reported to you up until
17 the time you retired. Is that right?

18 A. That is correct.

19 Q. And was he, although as
20 you were obviously the head responsible for
21 overseeing the DSM as part of your duties, that he
22 was the primary person responsible for managing it
23 on a day-to-day basis. Is that fair?

24 A. Yes, I think so. He and
25 are I worked pretty closely together on this

1 particular topic.

2 Q. And so, what was his
3 role? What sort of things did he do in relation
4 to the DSM?

5 A. He would visit the
6 quarries periodically that were supplying
7 aggregates that were on the DSM, he would meet
8 with people who had aggregate sources that were
9 not on the DSM to see if they were interested in
10 supplying or getting on to the DSM, he would
11 manage, to the extent necessary, the setting up of
12 physical test sections on highways, and he would
13 prepare correspondence and generally did most of
14 the legwork on that. He did a very good job.

15 Q. Okay. And just on
16 preparing the letters, am I correct that,
17 typically speaking, he would prepare letters to
18 DSM applicants for signature by you. Is that
19 right?

20 A. Yes, indeed.

21 Q. Okay. Then another
22 person who worked with soils and aggregates,
23 although not in the soils and aggregates section,
24 was Frank Marciello who operated the lock-wheel
25 skid tester. Is that right?

1 A. That's correct.

2 Q. And we understand that he
3 reported to the head of pavements and foundations
4 but did skid testing for soils and aggregates.
5 Correct?

6 A. And for others, of
7 course.

8 Q. Yes.

9 A. It was a relatively small
10 part of his work.

11 Q. Okay. And typically how
12 did those requests from soils and aggregates for
13 DSM purposes happen in respect of skid testing?

14 A. I don't actually
15 physically know. I imagine that we sent in
16 requisitions or we went down to his office and had
17 a talk with him or sent him a memo or an e-mail or
18 whatever it was. That's how we would do that.

19 Q. Okay. We expect and we
20 have heard that there was a memo that typically
21 went out on an annual basis to the manager of
22 pavements and foundations with a list of pavements
23 that soils and aggregates wanted to have tested.
24 Does that sound right?

25 A. Yes. That was later on

1 in the process. Pretty early on, we only had a
2 very few sources and really only a very few test
3 sections, but as we got more and more sources with
4 more and more test sections, then we needed to
5 have to do some proper paperwork to keep track of
6 what was going on.

7 Q. So, more --

8 A. Prior to 2000, it wasn't
9 quite as formal as that.

10 Q. Okay. More of an
11 informal approach at that point, given the number
12 of requests that were involved?

13 A. Right.

14 Q. Okay. Now, if we could
15 go, Registrar, to overview document 4, image 8,
16 please. Before I do anything with that,
17 Commissioner, if we could make Mr. Rogers' CV an
18 exhibit?

19 JUSTICE WILTON-SIEGEL: Sure.

20 MR. LEWIS: That will be
21 Exhibit 50 and that, Registrar, is MTO38699.

22 THE REGISTRAR: Noted,
23 counsel. Thank you.

24 MR. LEWIS: Thank you.

25 EXHIBIT NO. 50: CV of

1 Chris Rogers, MTO38699.

2 BY MR. LEWIS:

3 Q. So this, Mr. Rogers, is
4 from what we call the overview document, which is
5 a document which has been made an exhibit which
6 sets out documents and summarizes documents and
7 excerpts from documents for the purpose of
8 entering evidence in the inquiry, so from time to
9 time I'll take you a paragraph or two in this
10 document, but if you need to go to the underlying
11 document that it's referring to, I'm happy to do
12 that. I will be taking you to the underlying
13 documents as well, but if you want to look at the
14 underlying document, please let me know when I'm
15 just looking at the overview document.

16 So, this paragraph 16 refers
17 to a July 2003 MTO publication by you and Bob
18 Gorman, Becca Lane and --

19 A. Frank Marciello.

20 Q. Yes, and Frank Marciello.
21 Sorry, thank you. Titled "Skid Resistant
22 Aggregates in Ontario." And do you recall this
23 article, this publication?

24 A. Very much so and it was
25 one of several places we had published this

1 information, starting --

2 Q. Right. And there's
3 another one that I'll come to, which is called
4 "Pavement Surface Friction on Ontario Highways,"
5 from 2004, is another one. That's another one
6 that you were just referring to?

7 A. Yes.

8 Q. Okay. But this
9 publication, the July 2003 "Skid Resistant
10 Aggregates in Ontario," just generally speaking,
11 it sets out the approach to selecting aggregates
12 with good frictional qualities, their sources and
13 friction test methods. Is that a fair overall
14 summary of it?

15 A. Yes, it is, and the
16 intent was that it would educate people about this
17 issue and we published this information in a
18 number of different venues.

19 Q. Okay. And were you the
20 primary author? You appear first. Were you the
21 primary author?

22 A. That's conventional. The
23 person who puts pen to paper usually puts their
24 name first.

25 Q. And that was the case

1 here?

2 A. Yes, it is.

3 Q. Okay. And it's a history
4 as well of the activities over a period of time at
5 the MTO in soils and aggregates with respect to
6 aggregate selection. Is that fair?

7 A. Yes. It lays out the
8 philosophy and all the steps as it evolved.

9 Q. Okay. And if we could go
10 to, Registrar, MTO3580, this is the cover page of
11 the paper with the image of Ontario on it.

12 And if we go to image 2, which
13 is the abstract, and maybe if you could expand the
14 abstract, please.

15 A. I notice on this page,
16 Frank Marciello's name isn't there.

17 Q. It is on the -- take that
18 down for a second, please. That's true. Yes,
19 this one -- I think the other one, you had
20 mentioned that. If you go back to the first page,
21 Registrar. Second page. You're right, I believe
22 his name is on the 2004 piece. One second.

23 A. You might go to the next
24 page, which is the real title page.

25 Q. Okay. Go to the next

1 page.

2 A. No, his name still isn't
3 there.

4 Q. Yes, just the three of
5 you. And that is what was indicated on the
6 overview document as well, just for clarity.

7 Okay. So, if we could go to
8 image 2 and expand the abstract. Just in the
9 first paragraph, referring to aggregates making up
10 about 95 percent of asphalt and concrete
11 pavements:

12 "As a result, the
13 physical properties of
14 the aggregates have a
15 great influence on the
16 frictional properties of
17 the pavement."

18 And then there's a larger
19 explanation of that. When you speak of physical
20 properties in that, could you tell us specifically
21 what you're talking about?

22 A. As opposed to chemical
23 properties, I might add.

24 Q. Okay.

25 A. Which is a concern in

1 concrete aggregates. But in physical properties,
2 we mean resistance to wear, to fracture, to
3 freezing and thawing, we mean the shape of the
4 aggregates, we also mean the gradation of the
5 aggregates, we mean the absorption and density of
6 the aggregates. Those are some of the physical
7 properties that we consider. And also we consider
8 the polished, polishing, properties, which are
9 physical properties as well.

10 Q. Okay. And then you refer
11 to the polished stone value test as being
12 measuring the ability of an aggregate to retain or
13 develop microtexture?

14 A. That is correct.

15 Q. And then above that you
16 refer to the macrotexture and then the aggregate
17 abrasion value test, which you already referred
18 to?

19 A. Exactly.

20 Q. So, when you say wear as
21 distinct from polishing, could you just describe
22 that?

23 A. So, for instance, if you
24 take sand and you put it on the road surface and
25 then you drive vehicles over it, you will get

1 abrasion between the sand and the car or vehicle
2 tire, which will slowly remove small particles
3 from the aggregates in the road surface. So, when
4 we talk about wear, we want to have an aggregate
5 that will resist the abrasion created by the sand
6 and the vehicle tire, to the extent possible.

7 Q. Okay. As distinct from
8 polishing?

9 A. As distinct from
10 polishing.

11 Q. And then if we could go
12 to overview document 4, image 9. Actually, I
13 guess it's 9 and 10, paragraph 19. And this
14 refers, in paragraph 19, to the one that I
15 mentioned a few minutes ago, a subsequent MTO
16 paper dated April 28, 2004 titled "Pavement
17 Surface Friction on Ontario Highways," and then it
18 sets out a number of items.

19 And this one is listed as you,
20 Mr. Gorman, Ms. Lane and Mr. Marciello as being
21 the authors. Again, were you the primary author
22 on this one?

23 A. Yes, and I think this one
24 is a summary for an international conference where
25 we were limited to ten pages, and so it's a précis

1 of what's in the previous report.

2 Q. Was that at what's called
3 the SURF conference?

4 A. Yes, it was, and it was
5 held --

6 Q. What's that short for?

7 A. I can't remember. It was
8 French initials.

9 Q. Okay. And if we could go
10 to the -- if we could expand the three paragraphs
11 in the middle of page 10. Thank you.

12 And, as I understand it, this
13 portion of the paper sets out, in summary form,
14 the various requirements that a quarry or an
15 aggregate provider must meet in order to be listed
16 on the DSM for surface course aggregates. Is that
17 correct?

18 A. That is correct.

19 Q. All right. And the first
20 thing is it indicates that the aggregate
21 processing operation is inspected and the bedrock
22 evaluated for quality and consistency, and it goes
23 on to a description about that.

24 Could you just describe that,
25 that process?

1 A. You mean the inspection?

2 Q. Yes.

3 A. We would meet with the
4 quarry operator or proponent, if it wasn't open
5 already, and we would have a discussion about the
6 rock that was available at the surface that we
7 could see in the quarry face and indicate to them
8 and have a discussion with them about any areas or
9 any problems with the material that was available
10 there and explain that we didn't want that
11 material in the final product. And we wanted to
12 make sure that they understood this property or
13 that they were quarrying in the right area of the
14 deposit, if it was a very large quarry.

15 Q. I see.

16 A. Now, the quarrying plan
17 at that time I don't think was in writing. It was
18 an understanding between us, Bob, myself, Becca in
19 some cases and the quarry owner.

20 Q. And an understanding as
21 to what?

22 A. An understanding as to
23 whereabouts in the quarry they should be
24 extracting the desired rock.

25 Q. I see. And that was

1 based on -- above that it talks about, in general,
2 satisfactory quarry sources containing rocks that
3 are even grained, homogenous and consistent with
4 uniform quality and consistent aggregate density?

5 A. Yes.

6 Q. That's what you're
7 looking for, is the plan in order to get that. Is
8 that right?

9 A. Yes. In many cases it
10 wasn't a very hard thing to do, but occasionally
11 we ran into quarry sources where there might be
12 some undesirable material.

13 Q. Okay. And did you
14 yourself make visits to quarries?

15 A. Oh, of course, yes.

16 Q. And did that include
17 while you were the manager of soils and
18 aggregates?

19 A. Yes. Well, Bob and I or
20 others, we would go out periodically and look at
21 these new potential sources or ones that were
22 already approved.

23 Q. And then it refers to the
24 polished stone value and aggregate abrasion value
25 test that you have already described. And first

1 on the polished stone value, it says that the
2 requirement is a minimum -- sorry, an average,
3 minimum average polished stone value of 50 with no
4 value less than 48?

5 A. That is correct.

6 Q. And where was that
7 threshold, those two thresholds, derived from?

8 A. It was derived from the
9 availability of aggregates in Ontario and also the
10 polished stone value of the previously approved
11 materials, which were the two trap rock sources
12 that were available to us in the early 1980s that
13 managed to meet a PSV of around 50 or above.

14 We also knew that there were
15 some materials with numbers higher than 50,
16 particularly in Eastern Ontario, but that was our
17 minimum. And we had one source that wasn't able
18 to maintain that minimum and we removed them from
19 our approved list.

20 Q. And is that a high value,
21 50? I don't know if that's the right way to put
22 it, but you've described how it was derived. Is
23 that a --

24 A. It's not as high as you
25 would like. You would like much higher values,

1 but you also have to look at what's available.
2 Steel slag and some sandstones would give us
3 numbers up around 60 and, from a polishing point
4 of view, we would have preferred to use those, but
5 they weren't always available and we were trying
6 to find sources that were reasonably economic and
7 close to the market area where we're planning on
8 using them. So, to some extent, the value of 50
9 is a compromise.

10 Q. I see. You referred to
11 the steel slag. Was there also an issue with
12 durability for steel slag, that was a problem? I
13 think it's referred to in this paper.

14 A. There was a durability
15 problem with steel slag pavements when they used a
16 fine aggregate in combination with a coarse
17 aggregate in the steel slag pavement, and that was
18 partly a chemical problem.

19 The steel slag coarse
20 aggregate by itself, using a normal natural sand,
21 behaved rather well and gave exceptional
22 frictional values. But it became less and less
23 available as time went on and I don't think we
24 have time for a digression into that?

25 Q. No. I think you're

1 correct.

2 A. I should point out one
3 thing. An AV of 6 is -- a low value is good, a
4 high value is not so good -- lower than the
5 standards required in the United Kingdom. In
6 United Kingdom, they use an AV value of 10. In
7 other words, a somewhat softer aggregate. We were
8 able, with our sources that were available to us,
9 to reduce that to 6 and still get satisfactory
10 supply.

11 Q. Right. So, a number of
12 5, an AV of 5, would pass your requirements but an
13 AV of 7 would not?

14 A. That is correct.

15 Q. Okay. And, as I
16 understand it, you correct me if I'm wrong, but
17 just to stick for a moment with polished stone
18 value, it's a predictive test. Right? It's
19 telling you what the expected frictional qualities
20 are in the future once polishing has occurred. Is
21 that right?

22 A. Yes. It doesn't tell you
23 what the friction will be of the pavement, though.
24 That will depend on other characteristics in
25 conjunction with the PSV.

1 Q. Right. But it's
2 predicting by the process of polishing the
3 pavement to its -- sorry, the aggregate to its
4 terminal polished state, I think I've seen it
5 referred to?

6 A. Yes.

7 Q. About when it's maximally
8 polished, what the polished stone value is at that
9 point. Is that right?

10 A. Yeah, what the friction
11 level is at that point. Yes.

12 Q. At that point in time,
13 okay. The next paragraph there refers to that MTO
14 normally requires a 500-metre pavement test
15 section using the new aggregate, that the
16 aggregate producer is responsible for arranging
17 construction of, and it is tested then, that
18 pavement, with the brake-force trailer for two
19 years for frictional characteristics before it
20 will be considered for inclusion.

21 And then I understand,
22 although it's not referred to here, that the
23 normal practice was to have a control section as
24 well. Is that right?

25 A. Yes. The control section

1 would normally be the whole of the contract, so
2 you might have a 10 kilometre section of pavement,
3 9.5 kilometres would be paved with an already
4 approved aggregate and the contractor would
5 negotiate to get a 500-metre test section inserted
6 into the contract, into the pavement, and we left
7 that up to the proponent to organize that, in most
8 cases.

9 Q. And what's the purpose of
10 having the control section and the -- the rest of
11 the pavement and the skid testing on that and the
12 new approval seeking aggregate section?

13 A. You're getting a direct
14 comparison under identical climatic and vehicle
15 travel conditions between the two aggregates, and
16 so you want to ensure that the proposed new
17 aggregate behaves at least as well or better than
18 the existing already approved aggregate. It's a
19 good way to do this.

20 Q. And would you typically,
21 in those circumstances, be using the same surface
22 course mix, whether it's, you know, HL1 or dense
23 friction course? Would you typically be using the
24 same mix but just with a different aggregate?

25 A. Yes, and the bituminous

1 section would approve and compare the two mixes
2 that were going to be paved on that section of
3 highway before it was put down. So, yes, we want
4 similar stone content, similar fine aggregate and
5 so on.

6 Q. And it says normally
7 requires a 500-metre test section. Were there
8 occasions -- this is written in 2004. Were there
9 occasions when that was not the case, do you
10 recall?

11 A. Yes. In Eastern Ontario
12 where we had two quarries side by side producing
13 sandstone, I seem to remember that we had -- the
14 quarry next door is identical to the quarry across
15 the fence line. You don't have to go through the
16 pavement test section process.

17 Q. And then the skid
18 testing, as we've heard, is typically conducted at
19 the highway's posted speed. Right?

20 A. Always.

21 Q. Always, okay.

22 A. Always, I should say, in
23 the context of what we're talking about here.

24 Q. Yes, I understand, for
25 the purposes of testing for the DSM inclusion and

1 maintenance?

2 A. Exactly.

3 Q. Okay. And although it
4 refers here to the polished stone value and AV
5 specific requirements, as we've discussed, the AV
6 6.0 or less and 50 or more, average of 50 or more,
7 with no value less than 48 for polished stone
8 value, there is no mention of a skid number or
9 friction number against which the pavement will be
10 evaluated. Why is that?

11 A. It never occurred to me.
12 It was a comparison thing. We would hope always
13 that we were getting good friction and I suppose
14 we normally were.

15 Although I do remember one
16 case where we had an aggregate that went into a
17 test section and it didn't perform as well as the
18 existing pavement, although they were paved at the
19 same time, and that aggregate then had to be put
20 in another test section two years later, so it
21 took them four or five years to get approval
22 rather than two or two and a half years.

23 Q. Okay. And so, if I
24 understood you correctly, it's because it's a
25 comparative test to the control, to do better than

1 the control, which you've already expected will
2 have good frictional qualities. Is that right?

3 A. Exactly.

4 Q. Okay. Then in the last
5 paragraph it refers to MTO staff visit each source
6 on a yearly basis and take samples for testing.

7 And are those among the visits that you went on?

8 I appreciate you wouldn't have gone to every
9 annual visit, but did you go to those sometimes?

10 A. Periodically, yes.

11 Q. Okay. Even when you were
12 the manager?

13 A. And I should point out we
14 didn't visit every source on a yearly basis. We
15 only visited those sources, quarries, that were
16 being used consistently. If it wasn't being used,
17 we usually didn't inspect it.

18 Q. Okay. And what's done at
19 those visits? It says take samples for testing.

20 A. We take samples, we would
21 look at the quarry face, we would look to make
22 sure they weren't contaminating the material by
23 bringing in foreign material or material from part
24 of the quarry face that we didn't think was
25 acceptable, and we would have a chat with the

1 quarry owner or operator to find out if they had
2 encountered any problems of one kind or another.

3 Q. And so those, in a
4 nutshell, are the requirements?

5 A. Yes. Very
6 straightforward.

7 Q. We can take that excerpt
8 down, please, Registrar.

9 And then the next paragraph,
10 if you could pull that up, please, refers to, in
11 1999 and 2000, that random testing was conducted
12 on the frictional properties of pavements in
13 Central and Northeastern Ontario and it goes on to
14 talk about the average skid number was 43 with a
15 range from 32 to 54, and then this is comparable
16 to the range in SN found when specially selected
17 aggregates are used on the more heavily travelled
18 highways in Southern Ontario. Can you comment on
19 that?

20 A. Yes. This is north of
21 Huntsville or somewhere around there. We didn't
22 require that the aggregates come from one of these
23 designated sources. We used local sources owned
24 by contractors or owned by the Ministry of
25 Transportation and we used these for paving

1 without doing polished stone value testing,
2 although they had been tested for other physical
3 properties, and we were usually satisfied that
4 they were satisfactory aggregates from a pavement
5 friction, likely to be satisfactory, from a
6 pavement friction point of view.

7 This was a check and there's a
8 graph in one of the papers showing the range of
9 these numbers, that, in fact, we were getting
10 pretty good friction in the north and, lo and
11 behold, we were. That was very satisfactory.

12 Q. Okay. A check on the
13 assumption that you had made about the --

14 A. Yes. We knew we had good
15 friction, but this was some physical testing just
16 to do a check on that.

17 Q. Okay. If we could take
18 that down, Registrar, and go to image 7 of
19 overview document 4. And these paragraphs 12 to
20 14 briefly describe the DSM and aggregate sources
21 and paragraph 12 and 13 talk about the DSM
22 criteria for approval. It's actually all three
23 paragraphs. Sorry, Registrar, 12, 13 and 14.
24 There we go. Thank you.

25 So, the "DSM Materials

1 Engineering Criteria for Approval" dated June 4,
2 2003, am I correct this is the formal document
3 setting out the criteria that we were just looking
4 at for approval?

5 A. I don't have it in front
6 of me, but yes, that's the --

7 Q. We can look at it.

8 A. Okay. And we had
9 criteria before that, but at some point someone
10 decided to put them all together in one book so
11 you could find them more easily.

12 Q. Okay. So, just to
13 unpack, this is the formal document setting out
14 the criteria that were previously applied but
15 hadn't been assembled, as you said, in one formal
16 place. Is that right?

17 A. Well, yes. It included
18 all the other DSM sources as well.

19 Q. Right, so it's not just
20 about aggregates for surface courses; it's all the
21 stuff on the DSM. Is that right?

22 A. Right.

23 Q. Okay. And if we could
24 go, then, to MTO4472, which is the document.
25 There's the overall. There's the date, June 4,

1 2003. It's quite a long document, 73 pages.

2 If we could go to image 20,
3 and this is the section on the surface courses
4 that we were talking about. Correct?

5 A. That is correct.

6 Q. That's DSM 3.05.25. And
7 it sets out, this time in bullet points, the
8 criteria, but somewhere in there -- could you pull
9 up the next image as well, Registrar. Yes. So,
10 am I correct, first of all, that those bullet
11 points set out the criteria that we were talking
12 about previously?

13 A. Quick look, yes.

14 Q. And the one addition, it
15 appears to me, to be the last bullet, which is the
16 payment requirement. There's a fee for the
17 application. Is that right?

18 A. That is correct.

19 Q. Okay.

20 A. And there's one other
21 thing that we hadn't previously mentioned. The
22 quarry would have to put up a thousand tonne
23 stockpile to show they could make aggregate of the
24 right physical properties and shape and so on.
25 That's the fourth bullet point down from the

1 beginning.

2 Q. The fourth one. Right.

3 And that's what the samples would be?

4 A. That would be the sample
5 that you would then do polished stone value and
6 aggregate abrasion value testing. And that
7 stockpile would probably be enough to build the
8 test section.

9 Q. Okay. You can take that
10 down, Registrar. So, we've heard evidence from a
11 few people about the MTO's use of the friction
12 number or skid number, characterize it either way,
13 and the value of 30 being used.

14 Can you describe your
15 perspective on the MTO's use of that number, up to
16 obviously the point of your retirement, in
17 particular within soils and aggregates but also
18 generally?

19 A. Well, I'm not sure that
20 it was in the context of soils and aggregates. It
21 was in the context of the highway system itself.

22 Q. Okay.

23 A. Our experience was that
24 as you got friction numbers significantly lower
25 than 30, your reports of vehicles skidding,

1 roads.

2 Did I answer your question?

3 Q. I think so. We've also
4 heard that there was no published standard about
5 the use of FN30. You would agree with that?

6 A. No, absolutely not. And
7 the reason being, in part, the issue of winter
8 conditions.

9 Q. Sorry, I just want to be
10 clear. No, absolutely not, there was no published
11 standard?

12 A. Well, there's the paper
13 by Kamel and Gartshore where they're picking a
14 number of 30, but there was no -- we wouldn't do
15 that because you often get pavements that were
16 less than 30 and particularly in the winter. As
17 you go to Northern Ontario, we've got snow and
18 ice-covered roads for many months of the year with
19 values well below 30.

20 Q. Right. Well, if there's
21 ice on it or snow, you're certainly going to have
22 lower frictional values, but that isn't what you
23 were measuring it at. Right? On snow and ice?

24 A. You wouldn't attempt to
25 remove the snow and ice on these roads. We would

1 leave it there. Now, they're not high-volume
2 roads. We're not talking the 401 here.

3 Q. Sorry, just give me one
4 moment. You mentioned the Kamel and Gartshore
5 paper, and that is referred to in the 2004
6 publication that we looked at, "Pavement Surface
7 Friction on Ontario Highways," the one that had
8 you, Mr. Gorman, Ms. Lane and Mr. Marciello on it.

9 If we could go to image 8 in
10 OD4. And at paragraph 17 at the bottom there,
11 you'll see there's a reference with the footnote
12 there that, in your paper, the 2004 paper, that
13 the Kamel and Gartshore paper is referenced.
14 That's the one you were talking about?

15 A. Yes, it is, although --
16 yes. Yes, that was published at ASTM and also as
17 a research report by the research branch.

18 Q. Okay. And you cite it in
19 your paper. Were you familiar with it at the
20 time, back in 1982, with that paper?

21 A. Yes. Yes, of course.

22 Q. Okay. And --

23 A. I started in the pavement
24 friction business from about 1977.

25 Q. Okay. So, if we could go

1 to RHV610. And this is the paper?

2 A. This is the paper.

3 Q. Okay. If we could go
4 to -- it's the Ontario Wet Pavement Accident
5 Reduction Program. Could we go to image 5. And
6 the second paragraph from the bottom there that
7 starts "pavement skid resistance," if you could
8 expand that. Yes, there.

9 I just want to make sure about
10 what you were referring to earlier. It talks
11 about the brake-force trailer and it refers to the
12 tentative guidelines shown in table 1 are used for
13 this purpose, being evaluating the difference
14 between desirable and existing friction levels.
15 Is that what you were referring to?

16 A. Without looking at
17 table 1 --

18 Q. I'm taking you there. If
19 we could go to image 8 and that's at the top
20 there, table 1. So, this is the tentative
21 guidelines you were talking about?

22 A. Yes, I think so. It's
23 titled "Tentative Guidelines."

24 Q. I mean, what were these?
25 It's been around. It was in this paper in 1982

1 and looking at this pavement and concluding why it
2 had such low values.

3 And we wanted to repave it,
4 but we didn't have enough money in the budget,
5 because it was quite a long section of highway.
6 It was Old Highway 69. And it took a number of
7 years to find the money to repave it, and those
8 were values that were less than 25. And that was
9 unsatisfactory, at least in that context in terms
10 of the traffic volumes on Highway 69.

11 So, yeah, you certainly didn't
12 want values on a high-traffic-volume highway lower
13 or much lower than 25. That's what it is for
14 borderline.

15 And good of 31, personally I
16 always like to see numbers in the 40s or 50s.

17 Q. Fair about what you would
18 like to see, but these are framed as tentative
19 guidelines, so can you tell us, you know, did this
20 inform MTO practice at all or --

21 A. No.

22 Q. -- was it just reflecting
23 what was done or something else?

24 A. Nabil Kamel retired
25 shortly after this paper was published and he went

1 to work, I think, for Gulf Oil. And when he left,
2 they didn't replace him in the research division,
3 and so his endeavours here were, to a large
4 extent, lost or forgotten.

5 But nevertheless, I remembered
6 them and those numbers for the 100 kilometre per
7 hour speed limit were certainly ones that have
8 stuck in my mind over the years.

9 Q. And if you would,
10 Registrar, take that down and go to overview
11 document 4, image 11. Actually, 11 and 12.

12 And it's a November 4, 2004
13 presentation slide deck by Guy Cautillo within the
14 MTO and it's a, sort of, description summary of
15 MTO's practices, including with evaluating new
16 aggregates and so forth.

17 And on the second page there,
18 image 12, under "MTO Practice Wet Pavement
19 Conditions," in the last -- actually, you can
20 highlight the whole thing. Thank you. The last
21 paragraph there seems to reflect what you were
22 just saying. It says:

23 "1980? Systematic
24 procedures for
25 identification and

1 treatment of highway
2 locations with high rates
3 of wet pavement
4 collisions were abandoned
5 after N. Kamel left MTO."

6 Is that sort of along the
7 lines of what you were talking about?

8 A. Yes, except we still had
9 or had in each region pavement evaluation officers
10 and they each would be responsible for a certain
11 part of their region and it was their job to
12 periodically go out and look at these pavements
13 and also to monitor issues such as collisions or
14 excessive collisions.

15 So, although the endeavours of
16 Nabil Kamel weren't formally followed by the
17 research group, nonetheless, the Ministry was
18 monitoring and keeping an eye on all of the
19 pavements under the jurisdiction of the Ministry
20 of Transportation.

21 Q. Okay.

22 A. Typically we have two
23 officers in each region --

24 Q. And I think we've heard
25 that requests from the regions for, among other

1 things, skid testing would be made from the
2 regions if they had identified issues that they
3 wanted looked into?

4 A. Exactly.

5 Q. Okay. That's what you're
6 talking about, that type of thing. All right.

7 Now, we already heard quite a
8 bit -- you can take that down, please,
9 Registrar -- about the SMA early age friction
10 issue, so I don't want to go into too much detail
11 about it, but as I understand it, you were on the
12 SMA task group, the joint SMA task group, convened
13 by the MTO with industry to investigate and
14 resolve it. Is that correct?

15 A. To try to resolve it,
16 yes.

17 Q. Okay. And you were on
18 the task group from the beginning when it was
19 formed in January 2006, is that right, until your
20 retirement?

21 A. That is correct, but you
22 should be aware that there was a prior committee
23 to 2006, which was an internal MTO committee that
24 had been formed as part of the geotechnical
25 committee in 2005, which was of course triggered

1 by the meeting in 2004 where we first learned in
2 detail about some of the problems with SMA
3 friction.

4 Q. Right. So, internally in
5 the MTO after learning about the issue potentially
6 in 2004, internally it was being dealt with by a
7 committee and then the joint industry committee?

8 A. We realized that we had
9 to get industry involved in this. It was
10 essential.

11 Q. Right. Was that at the
12 same conference, the SURF conference, the 2004
13 paper you referred to?

14 A. Yes.

15 Q. Same conference?

16 A. Yes. And this is
17 important to understand this. There was a very
18 dramatic paper by an engineer or a series of
19 engineers from the Netherlands who were
20 experimenting with stone mastic asphalt and they
21 were able to produce dramatic skids on freshly
22 paved stone mastic asphalt where they locked the
23 wheels on a vehicle and the friction developed
24 would melt the liquid asphalt or melt the asphalt
25 where it would become a liquid and lubricate the

1 sliding of the vehicle on the freshly paved road.
2 This was pretty dramatic stuff and we weren't
3 happy to hear about that.

4 Q. I see. And that's
5 what --

6 A. You can read their paper.
7 It's there.

8 Q. I don't know -- I know
9 that MTO was going to produce the SURF conference
10 materials. I don't know if those have yet been
11 ingested into the database, but if they haven't,
12 they will be.

13 A. I've passed, I think,
14 some of the more critical papers on.

15 MS. MCIVOR: Mr. Lewis, I
16 believe that they're now in the database, that
17 they were in one of the more recent releases.

18 MR. LEWIS: Thank you.

19 BY MR. LEWIS:

20 Q. Did you have a sense,
21 during your involvement with the task group in
22 2006 and 2007, we know that there was -- the pause
23 was implemented by the MTO on SMA use in November
24 of 2007. But prior to that, in 2006 up to the
25 pause being implemented, did you have a sense of

1 how well the issue of early low age SMA friction
2 was known in the industry in Ontario outside of
3 the MTO and the joint task group?

4 A. Well, the whole purpose
5 of the joint task group was to bring in the
6 industry, which was they would in turn inform
7 their members, so we had someone from the Ontario
8 Road Builders', someone from the Hot Mix Producers
9 and someone from the testing industry and I think
10 one other person from industry. So, yes, the
11 whole intent was that they would go back to their
12 members and tell them what was going on.

13 Q. Okay. But it wasn't
14 emanating from the MTO, but you're saying the
15 expectation was that the industry members would
16 disseminate it --

17 A. Which is why we invited
18 them, to try and solve this problem.

19 Q. Okay. And then jumping
20 forward in time -- actually, not necessarily in
21 time, but Dennis Billings, he was a member of the
22 MTO task group. Do you recall that? On the MTO
23 side.

24 A. Yes, he was, because he
25 had a couple of real problem SMA pavements.

1 Q. And he was in the
2 geotechnical --

3 A. Head of geotechnical.

4 Q. In the central region?

5 A. Central region, yes.

6 Q. Okay. And we'll get to
7 the specific Red Hill Valley Parkway results in a
8 bit, but do you recall if you had discussions
9 about the Red Hill Valley Parkway skid testing
10 results from October 2007 or that it was an SMA
11 pavement with Mr. Billings? Do you recall that?

12 A. No, I don't. Yes, I
13 mean, we probably had discussions, but I don't
14 remember the discussions. Yes, no, he had this
15 serious problem on the 404 southbound where he had
16 a high-occupancy-vehicle lane that went through a
17 tunnel that was paved with SMA and he refused to
18 open this to traffic because of the low friction
19 that he had until we had investigated and done
20 something about it. I think it was diamond ground
21 in the end before --

22 Q. Diamond ground?

23 A. Yes, I think so.

24 Q. And do you specifically
25 recall if there was discussion on the task group

1 more generally about the Red Hill Valley Parkway
2 skid test results?

3 A. No. I very much doubt
4 that we discussed this at all.

5 Q. Okay. Well, if I can
6 then summarize, you don't recall but you probably
7 had a discussion with Mr. Billings about it. You
8 don't think that you had a discussion with the
9 task group as a larger entity about it. Is that
10 fair?

11 A. I might -- it's
12 conceivable that I might have had a conversation
13 with Dennis Billings about it, but I certainly
14 wouldn't say it was probable or anything like
15 that.

16 Q. Okay. But not with the
17 larger joint task group. Is that fair?

18 A. Not as far as I remember.
19 You would have to look at the minutes of the
20 meetings --

21 Q. It's not in the minutes.

22 A. Then I doubt that it
23 became a serious point of discussion.

24 Q. Okay. And from his role,
25 am I correct that Mr. Billings did not have any

1 role with respect to the DSM or DSM applications?

2 Is that right?

3 A. Yes, he did have a role.

4 I remember that he set up two test sections in a
5 contract near Port Perry where he was advocating
6 for the use of two local granite quarries, and
7 rather than having the proponent set up the test
8 sections, he actually built this into his paving
9 contract, in that there were two areas that were
10 designated, and he had arranged for that. So, he
11 was working cooperatively with the quarry
12 producers as well --

13 Q. Okay.

14 A. Dennis is an aggregate
15 guy. He knew a lot about this kind of stuff.

16 Q. Okay. Do you recall when
17 that was approximately? Are we talking in the
18 1980s, the 1990s, the aughts?

19 A. No. This would be in the
20 late 1990s or early 2000s because I know the test
21 sections only disappeared a year or two ago, so we
22 would have had close to 20 years out of them.

23 Q. Okay, so the early '00s,
24 you think?

25 A. In that order of

1 magnitude, but it certainly wasn't mid-1990s or
2 earlier.

3 Q. Okay. And the pause on
4 SMA, as I mentioned, it was imposed in early
5 November 2007, and you were still on the joint
6 task force. You retired in April 2008, so you
7 were still there at the time. And do you recall
8 what the precipitating factor was leading to the
9 pause?

10 A. It was the accumulation
11 of what we thought were unsatisfactory friction
12 numbers on freshly paved highways and an inability
13 to correct it. I had done some research in
14 laboratory with our staff to see if we could apply
15 sand to the freshly paved stone mastic asphalt
16 surface and if we could embed this sand into the
17 fresh asphalt before -- during the rolling
18 process. And we had some success, but we didn't
19 think it was going to work because we didn't have
20 coated sand. The sand grains hadn't been coated
21 with asphalt.

22 Subsequently, a couple years
23 later of course, they decided to go with the
24 coated sand, but we did some early work and we
25 thought this might be easy and cheap. We'll try

1 and do this without coating the sand and without
2 necessarily using special equipment. But in the
3 end, they had to bring SMA back in, but they had
4 to go that route by putting sand on the freshly
5 paved surface to try and correct the problem --

6 Q. That was not -- sorry, I
7 interrupted you. Go ahead.

8 A. The problem imposed by
9 the thick asphalt cement film. Yes, this was
10 after.

11 Q. Right. So, you're saying
12 before you left, one of the things you were trying
13 was the embedded sand --

14 A. We knew that that was
15 going to be the solution and we were trying to
16 find a cheap way of doing it.

17 Q. Okay. And there was,
18 shortly before the pause was implemented, a
19 placement of SMA on the 401 near Woodstock, which
20 had very low results. I'm going to just take you
21 to it. Image 71 in overview document 4, please,
22 Registrar. Yes, so 71 and 72, please.

23 And this is on November 5,
24 2007. Kai Tam sent an e-mail to a number of MTO
25 employees, which included you, and it's referring

1 to a southwest region contract, 2005-3030, and
2 this was on the 401 and it was using, in part,
3 Aecon Marmora trap rock which had quite low early
4 friction results. Do you recall that?

5 A. Vaguely. I was aware of
6 it. I would have a comment.

7 Q. Sure.

8 A. This goes or this relates
9 to behavioural expectation. The highway sections
10 or pavement sections on either side of this
11 contract were a year or more old. They had
12 well-developed pavement friction with a good
13 aggregate. I don't think they were SMA. And the
14 friction numbers would be substantially higher
15 than 23.

16 So, you've got someone driving
17 down the highway in wet weather and they're used
18 to a certain amount of friction on the pavement.
19 They can feel it through their steering wheel or
20 with their brakes, and then unexpectedly they hit
21 something with a relatively low and very low
22 average friction number and there's the
23 possibility of catastrophe. And I always, in the
24 back of my mind, was always thinking about what it
25 would look like if a school bus was involved.

1 Q. Certainly. And so it was
2 cause for concern, these low values, I take it?

3 A. Absolutely.

4 Q. Right. And when you talk
5 about driver expectations, if I understand you
6 correctly, you're saying that it's the issue of
7 going from an adequate or high friction pavement
8 as a driver onto a low friction pavement, and if
9 the driver is used to the reactions or the effect
10 on their driving and braking on the higher
11 friction area, then it can cause problems when it
12 changes abruptly. Is that what you're speaking
13 of?

14 A. Exactly. We all know how
15 to drive on icy roads in the winter after the
16 first snowfall, but initially we don't and we have
17 to relearn that every year and we've got a similar
18 or analogous situation here.

19 Q. And we've heard quite a
20 bit about the issue of performance specifications
21 relating to friction in warranty contracts and the
22 debate that went on for a number of years about
23 that, that went on after your time, after you
24 retired but had certainly begun while you were
25 there. And do you recall that issue?

1 A. Absolutely.

2 Q. Okay. And could you just
3 give us your perspective on that issue and on
4 specifying the minimum friction numbers or failure
5 numbers for friction in a contract as distinct
6 from the DSM pre-qualified aggregate approach to
7 friction management that you have been describing?

8 A. I and my colleagues
9 thought, or many of my colleagues thought, it was
10 a silly idea. We're in a low bid situation. The
11 guy with the lowest number gets the contract.

12 There is nothing to properly ensure, other than
13 some sort of future threat that you didn't meet
14 the specification, that they provide an aggregate
15 that's likely to give adequate pavement friction.

16 And the period of warranty for
17 this, as it was discussed, is somewhere between
18 three years and seven years. We want our
19 pavements to be getting good friction for 20 years
20 or more. So, the DSM levelled, from a bidding
21 point of view, levelled the playing field. The
22 only way you would make some money or get the job
23 was by providing materials that were not on the
24 DSM and there weren't many materials in Southern
25 Ontario that were going to give good pavement

1 friction that weren't on the DSM.

2 Does that cover it as far

3 as --

4 Q. Well, yeah. I think so.

5 I take it it's not surprising, as the person who
6 was an architect of the DSM as you described and
7 as a petrographer by education and practice, that
8 you would have that perspective. Is that fair?
9 And your experience at the time.

10 A. I'm not sure. I think
11 this is a contracting issue and public safety
12 issue. We don't want pavements out there that,
13 after three years, start polishing. We, the
14 Ministry, has a duty to ensure that the pavements
15 give satisfactory friction for the whole of their
16 lives.

17 Q. Right. And your
18 perspective was that the contractual approach to
19 that, using a limited-time warranty, wasn't going
20 to satisfy those purposes?

21 A. It could, but there were
22 risks and we would have to manage those risks in
23 some appropriate way that might be more onerous
24 than using the DSM.

25 Q. Right. Presumably

1 through ongoing monitoring, that sort of thing?

2 A. Absolutely, yeah. You've
3 got it.

4 Q. Okay. If we could go to
5 image 47 in OD4, so this is an e-mail that --
6 actually, maybe we can expand 102 and 103, please.
7 On August 1, 2007, Chris Raymond sent an e-mail to
8 Becca Lane, Kai Tam and you setting out a
9 conversation that he had had the prior day -- we
10 know that's a typo in the first line; it was on
11 July 31 -- that he had with Ludomir Uzarowski of
12 Golder about the enquiry he made about having
13 heard a rumour about SMA pavements and low early
14 friction and not allowing Ontario Trap Rock in SMA
15 and, sorry, that Mr. Raymond informed them that
16 they had early life friction concerns and then
17 further discussion about what the aggregates that
18 were used in the Red Hill creek expressway.

19 Do you recall this e-mail?

20 A. I must have, because I've
21 responded to it.

22 Q. Right. I know you
23 responded --

24 A. I haven't read it
25 recently.

1 Q. You received it. Do you
2 have any independent recollection of the
3 communications around this or is it just as you
4 read it?

5 A. No, no, no.

6 Q. Okay.

7 A. Not the case. The
8 problem is, of course, we've been looking at this
9 stuff off and on for the last year, so it's hard
10 to tell if it was a year ago or ten years ago.

11 Q. Fair enough. And near
12 the end, the second last paragraph, sorry, the
13 second last sentence, Mr. Raymond writes:

14 "Ludomir indicated he was
15 going to follow up with
16 Chris Rogers regarding
17 the background of this
18 source."

19 And do you recall if
20 Dr. Uzarowski contacted you?

21 A. I can't remember, and
22 there's no note in my diary, although that isn't
23 infallible.

24 Q. Right. Okay. And,
25 sorry, on that point, meaning you checked your

1 diary from that time period. There's nothing in
2 it that would reflect a conversation with him, but
3 you did not always reflect every conversation that
4 you had. Is that fair?

5 A. That is correct.

6 Q. Okay. And would you have
7 called Dr. Uzarowski arising out of this or would
8 you just have waited for him to call?

9 A. Would I have called him?

10 Q. Yes.

11 A. After -- no, I don't
12 think so. It was too late anyway. He had this
13 aggregate in the hot mix plant and they were
14 paving the next Monday.

15 Q. Right. Well, in fact,
16 they were doing it the next day. On August 1 is
17 when they started, but you wouldn't have known
18 that at the time from this e-mail?

19 A. I don't know.

20 Q. Well, it doesn't state it
21 in this e-mail, is why I --

22 A. No, I know it doesn't,
23 but I may have been aware that they were at some
24 point going to pave. But I think I knew that they
25 had probably brought in this source from Quebec

1 and it was in the stockpile.

2 Q. Do you mean that you
3 think you knew that at the time or it's what you
4 were inferring from this e-mail?

5 A. Today, you know, however
6 many years later, it's impossible to recollect
7 accurately.

8 Q. Okay. And was this the
9 first that you were aware of the use of Demix
10 Aggregates on the Red Hill Valley Parkway?

11 A. Yes, I think so.

12 Q. And then in the next
13 paragraph, 103, you responded that same morning
14 stating:

15 "What the City of
16 Hamilton does is not our
17 concern, provided we are
18 not putting in money."

19 And what did you mean by that?

20 A. I didn't think that the
21 Ministry of Transportation should be involved in
22 the doings of the City of Hamilton unless we had
23 put in some money to pay or support paying for the
24 highway. If we had put money in, then what we
25 used to call the municipal subsidy rule would kick

1 in, or in that past anyway, where you were
2 required to use materials from the DSM. But I had
3 no knowledge that anyone had given the City of
4 Hamilton money on this highway, but that's why I
5 put in that qualifying note.

6 Q. Okay. Because you --

7 A. We had enough problems
8 with our own highways without having to worry
9 about what the City of Hamilton was doing.

10 Q. I take it, though, you
11 didn't have knowledge at the time that the
12 province had previously committed money to it?

13 A. No. Actually, as I found
14 out very recently, it came as a shock and a
15 surprise. Well, not a surprise. It came as a
16 shock.

17 Q. Okay. Now, the province
18 had simply made its last payment in the prior year
19 to it and we understand was not -- I mean, it was
20 still a municipal project. So, knowing that, does
21 that change your response?

22 A. No. They had the money
23 in the bank to pay for the paving, presumably.

24 Q. And, having received
25 Mr. Raymond's e-mail, did you form a view at the

1 time with respect to the issue of use of Demix
2 Varennes aggregate in the surface course?

3 A. Yes. I either looked it
4 up at the time or I knew, and I can't remember
5 which it was, that we had tested this aggregate
6 previously, in the early 1990s, for polished stone
7 value, I think, and would have at the time
8 obtained a value of 45. And I would have had,
9 although I can't remember if I looked at it,
10 samples of that material still sitting in our
11 laboratory in our display case where we stored
12 this stuff as a future reference.

13 Q. Okay. So, around and
14 about that time, you either checked or you
15 remembered it?

16 A. Yes. I never visited the
17 quarry. Never visited the quarry.

18 Q. Okay. We'll get to that
19 because when Demix later, Dufferin, Demix, later
20 applied for inclusion on the DSM, there's a
21 reference in your responding letters, we'll see,
22 to the 1992 polished stone value test results.

23 But do you recall what the
24 purpose was for the testing way back in 1992?

25 A. No, but I can speculate.

1 Q. Okay.

2 A. Do you want me to
3 speculate?

4 Q. Sure.

5 A. That Demix had applied to
6 us to go on to the DSM or enquired about getting
7 on the DSM. The quarry is close to the water and
8 could be put in barges relatively easily and
9 shipped on the Lawrence system; therefore, it
10 might be a candidate as an aggregate to be used in
11 parts of Ontario.

12 Q. Okay. So, you don't
13 have -- sorry, go ahead.

14 A. My guess is that I said,
15 don't make a formal application. Send me a bag of
16 your material and I'll test it and see if it's
17 worth continuing with the application, save you
18 some money and time and stuff like that. And then
19 I would have tested it and then I would have
20 communicated back the test results to them and
21 they made no further application.

22 Now, did I communicate in
23 writing or by phone? I think I would probably
24 have done it by writing.

25 Q. Well, we don't have any

1 particular record of that, but you're saying that
2 you don't have actually a specific recollection
3 and I just want to be clear, though, that that's
4 what you speculate based upon perhaps your
5 practices at the time how it would have occurred?

6 A. That is exactly how it
7 would have occurred. We did this fairly
8 frequently.

9 Q. Sort of an informal
10 application, sort of run by --

11 A. We didn't want to put
12 someone through the whole business if there was no
13 chance or no hope of subsequently being approved.
14 And we had an interest in this because we were
15 trying to increase the number of sources on our
16 DSM list.

17 Q. Okay. And did it occur
18 to you at the time to advise Dr. Uzarowski or the
19 City of Hamilton about that?

20 A. No. My sample was from
21 1992. This was in 2007. Who knows what happens
22 within that quarry?

23 Q. And with the passage of
24 time --

25 A. Now, if he had phoned me,

1 I would have discussed it with him, consistent
2 with revealing information from Demix to a
3 consultant, but I would have assumed that he
4 was -- had the permission of Dufferin to discuss
5 that kind of information.

6 Q. Okay. Well, he was
7 actually a consultant for the contract
8 administrator hired by the City at that time,
9 so --

10 A. Right, so we would have
11 had to have had a discussion about whether he had
12 permission to see the Demix data.

13 Q. But, as you said, you
14 don't recall having and you don't have any notes
15 of any discussion with Dr. Uzarowski about it, in
16 any event?

17 A. None.

18 Q. Okay. Your comment,
19 though, that it's from 1992 and the passage of
20 time, what can happen with a quarry over the
21 passage of time? We're talking about a distance
22 of 15 years at that point.

23 A. The rock may well have
24 not changed, but the rock or aggregate was being
25 taken from a different part or level in the

1 quarry. Within a quarry, you can often get a
2 variety of different rock types and, over a long
3 period of time, those are quite likely to change
4 or the material being supplied is likely to
5 change.

6 Q. So, you advised just now
7 of the specific concern, given the prior results,
8 about using Demix Aggregates, but did you have a
9 more general concern about it being a non-DSM
10 aggregate or no?

11 A. Yes. I think I thought
12 that the City of Hamilton was taking a risk in
13 using a non-DSM source, for whatever gain, I have
14 no idea.

15 Q. Although presumably you
16 would have been aware that there would be test
17 requirements to determine the suitability of an
18 aggregate outside of the prequalification of the
19 DSM. Is that fair?

20 A. Well, they certainly
21 weren't going to do PSV or AAV testing, which
22 would be, from a frictional point of view, the
23 critical tests to do.

24 Q. To your knowledge?

25 A. To my knowledge what?

1 Q. Well, you don't actually
2 know what the particular contractual requirements
3 were or what tests were performed. Is that fair?

4 A. No, I have no idea.

5 Q. Okay.

6 A. But since I had the only
7 PSV and AAV equipment in Canada and they hadn't
8 knocked on the door, I thought it unlikely that
9 that testing had been done.

10 Q. At that time was that the
11 case, those were the only ones in Canada?

12 A. Pretty much, so yes.

13 Q. Well, they were the only
14 machines in Canada or --

15 A. The only ones I knew of.
16 There used to be a polished stone value test
17 equipment at the Technical University of Nova
18 Scotia in the '60s and '70s, but I think it had
19 fallen out of disuse and I was the only person
20 with the equipment for the AAV testing that I knew
21 of.

22 Q. Right. Again, I want to
23 be clear. When you say they're the only one
24 Canada, it's that you were aware of?

25 A. Right, but I knew most of

1 the people in the other highway departments,
2 provincial highway departments, and I would have
3 probably heard if such equipment was around.

4 Q. Just bear with me for a
5 moment. If we could go to overview document 4,
6 image 78, please. Yes, thank you, 78 and 79.

7 So, jumping forward now to
8 December 7, 2007, Paul Janicas of Dufferin
9 e-mailed you about applying to place Demix
10 Varennes aggregates on the DSM and you'll see, if
11 you could expand the e-mail, please, he indicates:

12 "The aggregate has
13 already been used in
14 Ontario. It was placed
15 on the City of Hamilton
16 Red Hill creek expressway
17 in the form of SP 12.5,
18 FC2 and SP 12.5 SMA.
19 Please advise us of the
20 next step in this
21 process."

22 And did you, at this point,
23 understand or reflect back and recognize that this
24 was the same aggregate that you had been
25 communicated about previously by Mr. Raymond?

1 A. Yes, indeed.

2 Q. And then if you could
3 take that down, please. If we could go to MTO39.
4 And so, in the bottom there, we see the e-mail we
5 just discussed in the overview document,
6 December 7, 2007, from Mr. Janicas to you. And
7 then at the top, you flip that over to Bob Gorman
8 and Judy Pretty within the MTO:

9 "Bob, can you also
10 prepare a draft response
11 to these people as well?"

12 Was that the normal course? I
13 asked you earlier about whether Mr. Gorman would
14 typically prepare a letter, responses, with
15 respect to the DSM. Was this just the normal
16 course of the process when a DSM application was
17 received?

18 A. Yes, this would be the
19 normal thing to do. And it was pretty much a form
20 letter in reply anyway.

21 Q. Form letter, so the
22 responses were pretty much form letters,
23 presumably with specific detail tailored to the
24 particular instance but there was a form that was
25 followed generally?

1 A. There was a style of
2 letter that we would use and he would have used
3 the previous one as a guide.

4 Q. Okay. All right. And
5 then if we could take that down, please, and go
6 to -- image 70 is already there, I apologize.
7 Image 79 and 80.

8 And so, in paragraph 180,
9 you'll see that a few days later, on December 11,
10 I guess it's one day later at this point,
11 December 11, 2007, Frank Marciello e-mailed the
12 Red Hill Valley Parkway October 16, 2007 friction
13 test results to you and Mr. Gorman with the
14 subject line "Friction Results on Demix Aggregates
15 and SMA in Hamilton."

16 And how did this come about?
17 Did you already know that the skid testing had
18 been conducted?

19 A. Yes, I think so.

20 Q. And do you know how you
21 would have been aware?

22 A. I would have probably
23 have heard of that from being on the SMA task
24 force or joint committee.

25 Q. Okay. And, again, you

1 don't have a specific recollection of it, but
2 probably --

3 A. Not at all, but I think
4 both Bob and I were aware that Frank had gone out
5 there and tested it.

6 Q. Okay. Could you also
7 have heard about it from Mr. Marciello? Were you
8 in the same office?

9 A. We were not in the same
10 office, but on the same floor not very many yards
11 away from each other.

12 Q. Okay, so you might have
13 heard it from him as well?

14 A. He may well have told us.

15 Q. Okay. And so would you,
16 then, have requested this from him, knowing that
17 he had done this?

18 A. Well, certainly in this
19 situation I may have asked him for it, but we may
20 have had it prior to that but I don't know.

21 Q. We'll look at these
22 results, but over the course of your career, how
23 many -- can you estimate sort of an order of
24 magnitude how many skid test results you had
25 reviewed and interpreted in the course of your

1 duties?

2 A. Hundreds.

3 Q. Sorry, hundreds?

4 A. Hundreds, at one time or
5 another.

6 Q. Not at the same time but
7 over time?

8 A. Yeah. Over 32 years, you
9 get to look at a lot of data.

10 Q. Right. And if we could
11 go to overview document 4, paragraph 60 or, sorry,
12 image 60 and 61, I think. 61 and 62. And if you
13 could expand both of those, please.

14 And these are the detailed
15 results. Would you have reviewed those at the
16 time, after receiving them from Mr. Marciello?

17 A. Yes, I would have. I
18 did.

19 Q. You did, okay. And do
20 you recall what you thought about them at the
21 time?

22 A. Yes. My thought was that
23 for an SMA, they looked very good, compared to the
24 data we had been getting out on the 401. But I
25 did note and I think there was some -- well, I had

1 a chat with Frank that we were getting a couple of
2 low values underneath highway structures,
3 Queenston Road, 28.1, a couple other places there,
4 28.7, Barton Street.

5 Frank and I had seen this
6 phenomenon on previous SMAs, I think on the 400 or
7 404, and we had found the same thing, that under
8 highway structures, overhead structures, the
9 friction number was a little bit lower than the
10 general run and we speculated, both Frank and I,
11 that this was due to the asphalt cement still
12 being on the surface of the SMA when it was
13 exposed to sunlight. This was, in this case,
14 before traffic on it or significant traffic on it.
15 But we noticed that we found the same thing, that
16 you needed sunlight to remove part of the asphalt
17 film from the asphalt concrete surface, in this
18 case, SMA surface.

19 So, that accounts for the
20 slightly lower numbers you get there. So, as a
21 general rule, mentally I would remove those
22 numbers from there and calculate my average
23 without those numbers, just to get a feel for what
24 the overall friction number was, knowing that of
25 course in a little while, the asphalt cement would

1 be removed from under those structures and the
2 friction numbers would bump up.

3 Q. And based on your
4 experience with the SMA task group and as you've
5 described?

6 A. Yes. So, you got an
7 average friction number of 34 and 34.

8 Q. Right. All right. And
9 just to go ahead and look at the e-mail that you
10 were, I think, referring to, from Frank Marciello,
11 if we look at image 81, please. Sorry, just give
12 me one moment. I just need to check something.
13 I'm just looking for one document.

14 Okay. So, if we could go
15 to -- I have located it. Okay. If we could go to
16 MT03818, and so I think this is what you were
17 referring to earlier. On December 11, we see
18 Mr. Marciello's e-mail to you and Mr. Gorman,
19 which attached the results from the friction
20 testing. On December 13, you write back:

21 "Thanks, interesting to
22 see the low friction
23 areas. I wonder why rich
24 spots -- "

25 Rich spots being what?

1 A. Slightly higher amounts
2 of liquid asphalt cement on the surface of the
3 pavement.

4 Q. All right. And then
5 Frank responds on December 17:

6 "I can only assume the
7 lower friction spots are
8 underneath structures."

9 Is that what you were
10 referring to before?

11 A. That would coincide with
12 our previous experience. You had asked me about
13 where I had gotten information about the testing
14 of the SMA on the Red Hill. I saw in the previous
15 thing we had up that Becca Lane had e-mailed us
16 this data in October 2007, out of interest.

17 Q. Okay.

18 A. So, we received it
19 earlier than December. We received it in October.
20 I had received it in October and Kai Tam had
21 received it.

22 Q. One moment.

23 A. But it's a small matter.

24 Q. I'm not sure that that's
25 the case. You're talking about in the overview

1 document?

2 A. Yes, the previous page we
3 had up.

4 Q. Hold on.

5 A. It was on the higher
6 line. I think it was page 81.

7 Q. Yes, on the right. So,
8 if we could go to image 81.

9 A. Look at 187.

10 Q. Yes.

11 A. Sorry, 186.

12 Q. 186. Ms. Lane, this
13 is -- yeah. 186 is actually not back in October.
14 I'm going to go to the document itself.

15 A. Okay. My mistake.

16 Q. That's okay. Sorry. If
17 we go to MTO2946, please. And this is on
18 December 13, Ms. Lane sent to you, Dennis Billings
19 and Kai Tam:

20 "I'm not sure if you
21 received this data from
22 the SMA placed on the Red
23 Hill creek parkway in
24 Hamilton. Friction was
25 measured at 90 kilometres

1 an hour prior to
2 opening."

3 But that's December 13. I
4 appreciate that paragraph was referring back to
5 the October 16 testing, but that's what you were
6 just looking at?

7 A. Yes. So, this is clearly
8 how we got the information, if we didn't get some
9 prior information from Frank.

10 JUSTICE WILTON-SIEGEL:
11 Mr. Lewis, I notice that we are about 25 past
12 11:00. There's a matter that I have to attend to
13 very quickly. I wonder if this might be an
14 appropriate time to take our 15-minute break?

15 MR. LEWIS: Yes, that would
16 work. Thank you. Could we make it 20?

17 JUSTICE WILTON-SIEGEL:
18 20 minutes?

19 MR. LEWIS: I would appreciate
20 that.

21 JUSTICE WILTON-SIEGEL: So,
22 we'll return, then, at a quarter to 12:00. We'll
23 stand adjourned until that time.

24 --- Recess taken at 11:25 a.m.

25 --- Upon resuming at 11:47 a.m.

1 MR. LEWIS: We're back. May I
2 proceed, Commissioner?

3 JUSTICE WILTON-SIEGEL: Please
4 proceed.

5 MR. LEWIS: Thank you.

6 BY MR. LEWIS:

7 Q. Before the break you were
8 talking about the issue of the sub-30 results from
9 the October 16, 2007 Red Hill skid testing having
10 been noted as being below structures and you
11 talked about, on a previous placement, that that
12 had been an issue.

13 Am I correct there wasn't any
14 further study or research on that issue?

15 A. As far as I was
16 concerned, we weren't going to do anything more.

17 Q. Sorry, as far as you were
18 concerned what?

19 A. We weren't going to do
20 anything more on the Red Hill, other than what
21 subsequently happened.

22 Q. I know. Sorry, what I
23 meant was, generally, about correlation between
24 being under structures on SMA, that sort of thing?

25 A. No. That is a hypothesis

1 and highly likely to be correct.

2 Q. Sorry, I heard it's a
3 hypothesis?

4 A. I think a hypothesis is
5 highly likely to be correct.

6 Q. Okay. And earlier you
7 mentioned what you called the municipal subsidy
8 rule, which required, then, use of the DSM. Could
9 you elaborate on that?

10 A. Yes. This was an
11 agreement, a long-standing agreement, prior to the
12 Harris regime whereby there was an agreement
13 between the chief engineer of Ministry of
14 Transportation and the municipal affairs
15 association where, if you wanted a subsidy, and
16 most municipalities got a subsidy of some kind,
17 you were required to follow the -- I'm not sure
18 the MTO's specifications, but certainly the OPSS
19 specifications for municipal use and also to use
20 sources from the DSM. And this could be, you
21 know, fence wire, you had a use a source from the
22 DSM.

23 Q. Okay, but I think you
24 mentioned prior to the Harris years. You're
25 talking prior to 1995. Is that right?

1 A. We did away or the
2 Ministry of Transportation did away with municipal
3 subsidies fairly early in the Harris period and my
4 view or my knowledge was that no one else was
5 going to get subsidies, so I was surprised to hear
6 that Hamilton had got some funding for the Red
7 Hill.

8 Q. Well, it was an older
9 project. The project stretched over a number of
10 years, but -- is your understanding that that
11 rule, as you called it, no longer applied?

12 A. I have no knowledge, but
13 I thought it no longer applied.

14 Q. Okay. Thank you. And
15 you spoke of, of course, the polished stone value
16 test and the AAV test that the MTO performed. And
17 are you also familiar with Micro-Deval and LA
18 abrasion tests?

19 A. Very much so.

20 Q. And --

21 A. I wrote a lot of papers
22 on the Micro-Deval test.

23 Q. Okay. And what about the
24 LA abrasion test?

25 A. Not so many papers

1 because it's not such an interesting test.

2 Q. Okay. How do they relate
3 or did they measure the same things or different
4 things than polished stone value and AAV?

5 A. None of those tests
6 related to PSV. The Los Angeles abrasion and
7 impact test, to give it its formal name, is really
8 not an abrasion test at all. It's an impact test
9 and it was developed in Los Angeles, California in
10 the 1920s when they noticed breakdown of gravel
11 under steel rollers and they found that this was a
12 test that simulated, to some extent, that
13 breakdown they were observing.

14 It then subsequently found its
15 way into North American standards and has been
16 largely used. Unfortunately, it's not a useful
17 test in the majority of cases at all. It
18 doesn't -- very rarely is your aggregate exposed
19 to impact, except in the case of railroad ballast,
20 and there's no abrasion or very little abrasion
21 involved in the process.

22 So, I have spent a good part
23 of my career trying to get it dropped from
24 standards and replaced with a real wet abrasion
25 test, which is the Micro-Deval abrasion test,

1 which is a test developed in France in the late
2 1960s. We used slightly different equipment in
3 North America and we've introduced this into MTO
4 standards, provincial standards, Canadian
5 standards for concrete aggregates and into
6 American through standards through AASHTO and
7 ASTM.

8 Q. Right. And the
9 Micro-Deval test, as you said, it's a real wet
10 abrasion test, so is it similar in that sense to
11 the AAV?

12 A. The AAV is done dry. At
13 really low values, there's a relationship between
14 AAV and Micro-Deval. There's a graph of this in
15 one of the papers showing the relationship. At
16 higher values, the Micro-Deval, it loses track on
17 the AAV, so it's not as good as the AAV at
18 predicting wear in the road surface.

19 Q. And in respect of the
20 polished stone value and the AAV, I don't
21 understand you as saying that good results for
22 those are guarantees of good friction on a
23 pavement. Is that fair?

24 A. They're good indicators
25 that you're likely to get satisfactory friction on

1 the pavement.

2 Q. Okay. And under what
3 circumstances can you wind up with poor friction,
4 even if you have aggregates with good PSV and AAV
5 results?

6 A. Well, if the asphalt mix
7 design is indirect and you get asphalt flushing,
8 then you're not going to get a good relationship,
9 obviously. I haven't found many cases where the
10 PSV didn't predict, to some extent, the friction
11 we would get out on the road surface.

12 There's one exception to that
13 and it's highlighted in the paper, which is when
14 we get into very hard aggregates, like quartz, and
15 there, the PSV tends to underestimate the likely
16 behaviour of the aggregate in terms of its
17 friction out on the road surface. And they found
18 a similar relationship in the United Kingdom and
19 they did experiments there, full-scale
20 experiments.

21 Q. Are you talking about the
22 paper being the "Skid Resistant Aggregates in
23 Ontario" paper from 2008?

24 A. Yes. If you look at
25 those papers, there's a whole commentary on it and

1 also there's a graph showing the relationship
2 between aggregate abrasion value and Micro-Deval
3 abrasion.

4 Q. A slightly different
5 topic. Did you share the Red Hill October 16,
6 2007 test results outside of the MTO at any time?

7 A. No. I can't imagine why
8 I would.

9 Q. Okay. Well, potentially
10 at least to the SMA task group, but you indicated
11 that you did not generally to the task group
12 outside of the MTO?

13 A. I have no recollection.
14 You would have to look in the minutes of the task
15 group --

16 Q. And as I said, it's not
17 in the minutes. I wanted to clarify --

18 A. Then I have no
19 recollection of bringing it, but it may well have
20 come up in discussion.

21 Q. Okay.

22 A. But I don't think we
23 would have physically tabled Frank Marciello's
24 test data.

25 Q. All right. If we go to

1 overview document 4, image 79, please. 79 and 80,
2 please. And so, on December 13, 2007, you wrote
3 back, you sent a letter back, to Demix, Dufferin,
4 respecting their request to have the Varennes
5 Quarry aggregate included on the DSM list and we
6 can see the text of the letter there.

7 Am I correct --

8 A. Which letter? Which
9 paragraph are we talking about?

10 Q. It's 182 that straddles
11 the two images.

12 A. Okay. Yes, I can read
13 that fine.

14 Q. My apologies. Am I
15 correct that Mr. Gorman would have written this
16 letter for your review and signature, that he
17 would have taken the initial cut at it?

18 A. He would have taken the
19 initial cut and I may, because of the previous
20 testing we had done, I may have added that
21 paragraph there, about the quarry aggregate.

22 Q. Right. You're talking
23 about the bottom paragraph on the first image that
24 goes on to the top about:

25 "We are somewhat familiar

1 with the rock from your
2 quarry."

3 A. Yes, all of that stuff
4 and the following paragraph.

5 Q. Right. The part about:
6 "I note your quarry
7 aggregate was recently
8 used on Hamilton's Red
9 Hill Valley Parkway"?

10 A. Yes. Bob and I wrote
11 this together, as the formal letter would show
12 you.

13 Q. And then it attaches a
14 map and a copy of the report entitled "Skid
15 Resistant Aggregates in Ontario." That's the same
16 paper we were talking about. Is that right?

17 A. That's correct, and this
18 is for their information, if they so choose, to
19 read up and find out what's going on.

20 Q. And in the letter at the
21 top of the second image -- actually, the end of
22 the first image, it says:

23 "The test results are
24 generally acceptable.
25 The only exception -- "

1 And this is from 1992, those
2 test results:

3 "The test results are
4 generally acceptable.
5 The only exception is the
6 polished stone value
7 (PSV) test results, which
8 did not meet our
9 Ministry's criteria."

10 And so, what was your
11 intention going forward? Number one, why were you
12 providing the previous results, and then what was
13 your intention moving forward with this?

14 A. Well, they owned the test
15 results in the sense that it was on their
16 material. I thought it would be useful
17 information to them and they might think about
18 that as they moved forward.

19 Q. Okay. And if we could
20 put two documents side by side, this is MTO42 and
21 MTO43. This is just the letter itself on the
22 left-hand side that we just were quoting from.
23 And then on the right is the attached table 1
24 that's referred to, the laboratory test data. And
25 I see it's got a number on the upper right there

1 just above the test results, 92-B-40015. What
2 does that tell you?

3 A. 92 is the year, B is
4 testing done in the Downsview or central
5 laboratory, because we had four other laboratories
6 operating, doing testing around the province, and
7 40015, I think 40000 series samples were ones sent
8 in under my signature, so that was my 15th sample
9 that I had submitted that year.

10 Q. And then the results
11 themselves, there's a large number of them and we
12 can see one of them does have the LA abrasion test
13 in there, as the fourth one down?

14 A. Yes. That shows that
15 it's a very strong impact resistant aggregate.

16 Q. And polished stone value
17 of 45, which you had -- now that's the value that
18 you said would not have been acceptable. Is that
19 right?

20 A. Not acceptable to us. I
21 note the aggregate abrasion value is very good,
22 and that, along with the Micro-Deval abrasion of
23 3.5, tells me that it's very wear resistant
24 aggregate, so if there's nothing on the road, it's
25 going to behave quite well and give you, we hope,

1 sharp edges and be resistant to wear and abrasion.

2 Q. Okay. So, yes, the AAV,
3 as you said, it's the lower value is better?

4 A. Yes. And Micro-Deval,
5 certainly exceptionally low.

6 Q. And who was conducting
7 those tests? These are all done internally at the
8 MTO. Is that right?

9 A. Yes. In the soils and
10 aggregates section, we had about four or five
11 laboratories and different laboratories who
12 conduct different tests. And then they would all
13 be assembled together in the format that you see
14 here.

15 Q. Okay. And then it gives,
16 at the bottom, the rock type description?

17 A. Yep.

18 Q. Which is --

19 A. A cyanite. A feature of
20 cyanites is that they don't contain quartz and
21 usually you like to have a little bit of quartz in
22 your aggregate because it's the hardest commonly
23 natural mineral you're going to encounter. The
24 absence of quartz from a polishing point of view
25 is a downer, meaning not so desirable, so this is

1 a material that I would intuitively expect might
2 be one that might be more likely to polish.

3 Q. And that's what the
4 polished stone value test is evaluating?

5 A. Exactly. We find our
6 best friction with aggregates is where we have an
7 aggregate that contains a mixture of soft minerals
8 and much harder minerals, which is why the
9 dolomitic sandstones of Eastern Ontario are so
10 superior compared to most other aggregates
11 available in the province.

12 Q. And even though, as
13 you've indicated, that the polished stone value
14 test did not meet the Ministry's criteria, as you
15 pointed out, you're considering the application
16 afresh. Is that correct?

17 A. Well, this was testing
18 done, you know, 15 years earlier.

19 Q. Right.

20 A. Of course we would
21 consider it, meaning we wouldn't automatically
22 tell them no based on 15-year old data.

23 Q. Right. And in the letter
24 in the third paragraph on the left, you indicate
25 that:

1 "The quarried aggregate
2 was recently used on
3 Hamilton's Red Hill
4 Valley Parkway. We plan
5 to monitor the
6 performance of your
7 aggregate in the
8 expressway."

9 What's that a reference to?
10 Is that the skid testing that's going to take
11 place?

12 A. Yes. Well, a visual
13 examination, I think, and probably in due course
14 skid testing with a brake-force trailer.

15 Q. Wouldn't that definitely
16 follow, based on the --

17 A. Well, it certainly would.
18 The problem was that we didn't have a control
19 section, so any testing that we did would be of
20 relatively limited value.

21 Q. Okay. For DSM purposes,
22 because there's no control section?

23 A. Yes. Yeah. The absence
24 of a control section is a bit of a problem. And
25 also it's an SMA rather than a dense friction

1 course or FC2. And SMAs give you a different
2 texture than you get with the other pavement
3 types.

4 Q. Okay. But since you
5 don't have a control section and you're saying you
6 planned to monitor the Red Hill, there's no
7 alternate plan, so the decision appears to have
8 been made that that's what's going to happen.
9 It's going to be the --

10 A. No.

11 Q. Is that not true?

12 A. No, not at all, because
13 the next step, bottom paragraph, is to visit the
14 quarry, take a sample and do fresh testing.

15 Back to table 1, though, it
16 tells me that that was a pretty complete set of
17 tests we did on this aggregate from Demix and we
18 would have forwarded that data to them in 1992.
19 It wasn't just doing a polished stone value test.
20 We did the AAV test.

21 So, it may have been that
22 there was an application of some kind at that time
23 and if it was going to be anywhere, it would be in
24 the same correspondence file or one very close to
25 it.

1 Q. Well, we haven't --

2 A. I understand no one has
3 found it.

4 Q. We certainly have not --

5 A. That's understandable.

6 Q. You mean given the
7 passage of time?

8 A. Well, unfortunately, they
9 recently moved laboratories and I suspect that
10 during the move, some of this stuff will have been
11 thrown away or discarded or sent to archives and
12 can't easily be found again. But there would have
13 been a letter to Demix almost certainly at that
14 time.

15 Q. Okay. But coming back,
16 then, to the issue of a test strip and a control
17 strip, you're quite right. You indicate that it
18 says there's going to be a quarry visit and so
19 forth, but that will be the next step, but
20 nonetheless the typical approach it to do the skid
21 testing for a period of two years.

22 So, is that -- you know,
23 there's no reference here to doing another test
24 strip on an existing road or anything like that,
25 so is it not, at this point, just contemplated

1 that the monitoring via the skid testing is going
2 to be done on the Red Hill?

3 A. I think that in, you
4 know, December 13, which is only a few days after
5 they had submitted their initial letter, we were
6 deferring this until April 2008. So, for
7 instance, if the polished stone value that we
8 obtained on fresh samples taken in the summer of
9 2008 were not satisfactory, we wouldn't have
10 proceeded.

11 Q. Right. Okay. Am I
12 correct you don't have a specific recollection of
13 that, but that's what you think is likely, or do
14 you have a specific recollection --

15 A. No. That's what the
16 process would have been. If the polished stone
17 value hadn't been 50 or above, the whole thing
18 would have been dropped.

19 Q. Okay. And this letter
20 doesn't specifically refer to the application
21 being for SMA. It does say it's an approval of
22 your Varennes Quarry -- this is in the re:line --
23 for SP 12.5 FC1 course and SP 12.5 FC2 course and
24 fine aggregates. Does that mean that it's only
25 being evaluated for use in those type of mix?

1 A. Well, no. Obviously,
2 given the specific situation we were in, it would
3 also be evaluated for stone mastic asphalt, but we
4 didn't have a formal list. I think at that time
5 we had a list of aggregates that we thought were
6 acceptable for SMA, and that was a contract
7 specific by special provision in each individual
8 contract.

9 Q. Right. At that point in
10 time?

11 A. Right. Yes. And SMA is
12 a relatively specialized mix, so our major concern
13 would be for the FC1 and FC2.

14 Q. Okay. And then you
15 retired within four months, I guess, of this, a
16 little over that, in April 2008. To your
17 knowledge, up to the date of your retirement, did
18 the MTO inform Hamilton or Golder of the Dufferin
19 Demix application or that the Red Hill was being
20 evaluated to assess the aggregate quality in
21 relation to the DSM?

22 A. No, not at all. I very
23 much doubt that we would have informed anyone.

24 Q. Okay. And was that a
25 typical procedure or lack of procedure, as the

1 case may be?

2 A. I think it would be best
3 described as lack of procedure. We wouldn't
4 normally do that and certainly not in any formal
5 way. We wouldn't be writing a letter to anyone.

6 Q. Typically, who did the
7 soils and aggregates section deal with for an
8 application? Was it the applicant?

9 A. Yes, it would have to be
10 the applicant.

11 Q. And anyone else?

12 A. Well, we would deal with
13 the regions --

14 Q. Sorry, I mean external to
15 the MTO.

16 A. No.

17 Q. All right. And did you
18 consider notifying Hamilton about the application
19 or the assessment or the monitoring that would be
20 done?

21 A. Well, it's not clear to
22 me that we say we planned to monitor the
23 performance of your aggregate in the expressway.
24 As I said, that could be a visual observation. It
25 didn't necessarily require friction testing at

1 that point in time. So, no, we wouldn't tell
2 Hamilton about that. It's a public highway.

3 Q. Right. If you knew at
4 the time that there was going to be skid testing
5 for sure conducted on it, would you have notified
6 Hamilton?

7 A. I don't know, because I
8 wasn't there. I had retired by then.

9 Q. Okay.

10 A. As far as I can
11 recollect.

12 Q. Yes. You had left by the
13 time the skid testing actually took place.

14 A. We might have put our
15 plan together for skid testing for that year in
16 April or March, but I was busy cleaning out my
17 office, so I wouldn't have paid too much attention
18 to that.

19 Q. And did you, at any time
20 subsequent to your retirement, contact anyone in
21 the media, the press, regarding friction testing
22 on the Red Hill?

23 A. No, not at all. It
24 wouldn't occur to me. As far as I was concerned,
25 you know, the initial results -- now, albeit

1 before traffic was on it -- were quite good.

2 Q. To be clear, in the
3 context of it being an early age SMA timing.
4 Right?

5 A. Exactly. It was only
6 going to get better with traffic on it.

7 Q. All right. And the MTO
8 skid tester, there's a seasonal aspect to its
9 operation. Is that right. It wasn't operated in
10 the winter. Right?

11 A. It was not operated in
12 the winter.

13 Q. Right. And apart from
14 the winter and concerns with ice and snow, testing
15 on that, is the friction number obtained by the
16 skid tester affected by the season in which the
17 testing is done?

18 A. Yes. Seasonal variation
19 in friction measurements, at least with the
20 brake-force trailer, is a well-known phenomenon.
21 We tend to get higher numbers early in the season
22 and lower numbers in mid to late summer.

23 Q. And the reason for that
24 being?

25 A. Well, some people, you

1 know, there's some discussion about that. My view
2 has always been that in the winter, you've had a
3 little bit of freezing and thawing going on,
4 perhaps slightly refreshing the surface of the
5 tops of the aggregates, whereas in the summer
6 we've had dry weather, we've had dust on the road
7 and the abrasion between the dust and the vehicle
8 tires has enhanced the polish, as it were.

9 Some people will say, well,
10 it's due to oil and stuff like that in the summer
11 months. I don't know for sure, but we had
12 experienced it and it was well known in
13 Pennsylvania or New York.

14 Q. The seasonal variability,
15 is that one of the reasons why you would, in soils
16 and aggregates, have skid testing done at the same
17 time on the trial section as well as the control
18 section next to it? Is that right?

19 A. Yes, of course. Although
20 you couldn't really separate the two. You
21 wouldn't do one and then come back a week later
22 and do the other.

23 Q. Right. They're adjacent,
24 so you're going to do them at the same time?

25 A. You're going to do them

1 at the same time. So, by using a control section,
2 you control that, which is the whole purpose of
3 the control --

4 Q. Right. What about air
5 and pavement temperature? Does that affect the
6 friction number obtained from the skid testing?

7 A. The pavement temperature
8 can do in as far as it can affect the behaviour of
9 the tire, but I think the ASTM tire is relatively
10 insensitive to temperature. There is data on it,
11 probably quite extensive data. So, you know, the
12 normal range, perhaps from 5 degrees up to
13 30 degrees, I suspect but don't know that it's
14 relatively insensitive to temperature.

15 Q. Not something you've
16 looked into deeply. Is that fair?

17 A. Well, it's something --
18 there is data available on that.

19 Q. Okay. And what about the
20 British pendulum test? Is that something that you
21 have experience with?

22 A. Unfortunately too much,
23 yes.

24 Q. Is that from your time at
25 the MTO?

1 A. Yes. It's a complicated
2 tricky test to do and it's quite useful and it's
3 relatively cheap. The problem is, of course, that
4 it's done at a very low speed, rather slightly
5 across the asphalt surface or the pavement
6 surface, it's travelling at a low speed, so it's
7 only really measuring microtexture and --

8 Q. And it's a static test?
9 I appreciate it's moving, but you're doing it with
10 a standstill device?

11 A. And yes. And the area
12 you're testing is only two and a half inches by
13 four inches or something like that. I mean, it's
14 hardly likely to be representative of a long
15 section of highway, and so that means that you
16 have to do quite a lot of it and also you've got a
17 traffic control problem. You're closing down a
18 section of highway and trying to operate it is
19 hard to do with passing traffic.

20 Q. And what was the purpose
21 that you were conducting British pendulum testing
22 for at the MTO?

23 A. Well, we used it for the
24 polished stone value test, one part of the
25 polished stone value test, and also we used it as

1 an example to -- as a bit of a research tool. For
2 instance, at that time, meaning in 2005, 2006, the
3 maintenance people were purchasing alternative
4 deicers to sodium chloride and we had a concern
5 that these deicing agents that were being sold to
6 us were actually making the pavement slippery, and
7 it turns out that they were.

8 And I personally conducted
9 testing outside in the middle of the winter with
10 the polished stone value, with the pendulum thing,
11 with the British pendulum, using asphalt surfaces
12 and different deicing salts in different degrees
13 of dilution. And we found that plain sodium
14 chloride water gave us the highest friction of all
15 of the alternative deicers being added to the
16 pavement surface. And I think that we had had a
17 fatal collision caused by this. Someone had gone
18 out and applied this material and someone coming
19 along behind it slid off the road.

20 Q. And so this is in the, I
21 think you said, 2005, 2006 period?

22 A. In that period, yes.

23 Q. Okay.

24 A. And I would have written
25 a report on it, but it wasn't published. But so,

1 as a result, there were other experiments on
2 Highway 407, for instance. I have extensive
3 experience using a British pendulum.

4 Q. In the field? I
5 appreciate when you're using it for the purpose of
6 the polished stone value test, that's done in the
7 lab?

8 A. Right.

9 Q. Right? And the other,
10 when you're talking about -- what you're talking
11 about is in the field, so testing --

12 A. And I have used it in the
13 field, but as general rule we prefer to use the
14 brake-force trailer. It's a lot easier.

15 Q. Okay. And so, in
16 performing it in the winter, is that something you
17 had done, you know, once or many times?

18 A. No, but I remember
19 spending several days sitting outside using the
20 British pendulum with these deicing agents. My
21 hands froze.

22 Q. Is that the one occasion?

23 A. Well, it was several
24 days, so --

25 Q. No, I understand several

1 days, but --

2 A. But that was certainly
3 the only time I ever used it in serious winter
4 weather.

5 Q. Okay. And that was the
6 purpose of the testing, as I gather, it was
7 because it was about deicing material. Is that
8 right?

9 A. Right.

10 Q. And what about around
11 zero? Had you in other circumstances done that,
12 around zero temperature or below?

13 A. No. There would be
14 little need. As a general rule, we didn't use the
15 British pendulum out on the highway.

16 Q. Okay. And so, in that
17 instance, was that the only time you yourself did
18 the British pendulum testing in the field on a
19 highway, in the one you described?

20 A. No, I -- oh, in the
21 winter?

22 Q. No, generally.

23 A. No. I had done it
24 several times. We had two tests. One that was
25 devoted entirely for the laboratory, the polished

1 stone value test, and we had the much older one
2 that was Ministry required in the early 1960s,
3 which was the first friction testing done by the
4 Ministry of Transportation with the British
5 pendulum back in about 1962, 1963.

6 Q. Okay. And is there, in
7 your view, an issue about conducting British
8 pendulum test at or below zero in terms of the
9 reliability of the results?

10 A. Well, as long as you
11 don't have ice on the surface, as long as you got
12 liquid water on the surface, then there wasn't an
13 issue, other than to note the temperature at which
14 you're doing it and the rubber or whatever it is
15 you call it of the rubber, the softness of the
16 rubber, rubber slider that's used, there's a
17 special rubber that is used, might well vary with
18 temperature, so you could test it in the winter
19 and then test the same section in the summer. I
20 wouldn't expect to always get the same results.

21 Q. Right. And is it higher
22 or lower when you test at a lower temperature?

23 A. I would think that at a
24 lower temperature, you would get a lower number,
25 but I don't think the difference would be huge.

1 Q. Now, I would like to ask
2 Mr. Rogers about, Commissioner, the 2014 skid test
3 results and the trajectory of the results leading
4 up to that, because he had been evaluating
5 friction test results in his role for so many
6 years. I understand Ms. McIvor, though, may have
7 some comments about my doing so.

8 JUSTICE WILTON-SIEGEL: Okay.

9 MS. MCIVOR: Hello,
10 Commissioner. We actually don't have comments at
11 this time. We've previously raised, however, that
12 there are many MTO witnesses that are involved in
13 this proceeding and some of those witnesses were
14 at the Ministry at the time and had direct
15 involvement in coordinating and reviewing those
16 results. And Mr. Rogers, of course, he's spoken
17 to the fact that he retired in April of 2008, and
18 so wouldn't have, you know, seen these results.

19 But we would be satisfied to
20 address that in closing arguments in terms of the
21 weight issues.

22 JUSTICE WILTON-SIEGEL: Sure.

23 Okay.

24 MS. MCIVOR: Thank you,
25 Commissioner.

1 JUSTICE WILTON-SIEGEL: Noted.

2 Please proceed, Mr. Lewis.

3 MR. LEWIS: Thank you.

4 BY MR. LEWIS:

5 Q. So, if we could go to
6 overview document 4 at image 96 and paragraph 230,
7 you'll see -- you're long retired by this point,
8 as we know, but on July 25, 2014, Mr. Marciello
9 e-mailed Mr. Senior, your successor, along with
10 Mr. Gorman and Mr. Lee the results that were taken
11 shortly before that. And then you'll see he
12 writes in a summary broken down by lane, the two
13 northbound and two southbound lanes, and the
14 results in 2008 as an average versus 2014.

15 And we can go to the actual
16 results. If we go to the next page and, please,
17 97 and 98, and I'm also happy, if you like, to go
18 to the detailed results, which we can do as well,
19 the graphs, like the ones we looked at earlier for
20 the 2007 results. This sort of gives the overall
21 averages.

22 You've had an opportunity to
23 review these previously?

24 A. Yes, I have.

25 Q. Okay. And putting

1 yourself and your hat on as the manager of soils
2 and aggregates, if you're in that role at the time
3 of these results, what would your view have been
4 at the time?

5 A. Looking at it in 2014?

6 Q. Yes. The results are in
7 2014 and showing the historical results in the
8 southbound lanes from 2007 to 2014 on the right
9 and the northbound lanes from 2008 to 2014.

10 A. Well, this, you know,
11 certainly shows averages just above 30 at whatever
12 age this is. They're not going dramatically
13 lower, except perhaps in one instance.

14 But I have a couple of other
15 observations. This is at 90 kilometres an hour.
16 That was a very uncommon speed for us to evaluate
17 pavement friction. It was nearly always done at
18 100 kilometres an hour, and if we had tested this
19 highway at 100 kilometres an hour, we would have
20 got lower values almost certainly than you see in
21 2014.

22 I have another comment, which
23 is much more of a much more sort of philosophical
24 comment. This is being done with a ribbed tire.

25 Q. Yes.

1 A. I am not convinced that,
2 in fact, in this case, with stone mastic asphalt,
3 that the ribbed tire is necessarily the correct
4 tire to evaluate pavement friction. The ribbed
5 tire is not sensitive to macrotexture. You really
6 need to use a smooth tire, unless you're measuring
7 macrotexture in some other way. So, there's
8 advantages to using the ribbed tire, which is it's
9 relatively insensitive to water film thickness
10 compared to the smooth tire.

11 So, these values you're
12 getting here are not values that I would be
13 totally happy with in the sense that they really
14 reflect what the pavement friction is out there to
15 the travelling public. These are values that, on
16 the face of it, were quite satisfactory from an
17 MTO perspective, allowing for the difference
18 between 90 and 100.

19 But I'm not convinced or I
20 have a question, and it's a hypothesis really,
21 that the ribbed tire on SMA may not be the way to
22 go and your expert from Virginia Tech at the
23 beginning of your proceedings made comments,
24 although not I think not in relation to SMA, about
25 the difference between ribbed and smooth tires.

1 Q. He did.

2 A. One of the problems with
3 SMA is that it's a completely different texture
4 from that that was conventionally experienced and
5 used by MTO. In conventional pavements, I'll call
6 them conventional pavements, the aggregates stick
7 up above the matrix a little bit by one or two
8 millimetres and that's what the car tire sees.

9 In SMA, your texture is
10 reversed. You're riding on a relatively flat
11 surface of stone and there's no projections or
12 relatively small projections above that surface,
13 whereas the texture, so-called, is negative, which
14 is holes in the pavement surface that go down into
15 the pavement mat.

16 MTO was beginners, as I think
17 were most jurisdictions, at understanding the
18 frictional characteristics of SMA. SMA, I think,
19 probably requires a much more generous
20 microtexture than perhaps you need with the more
21 conventional mixes. And the macrotexture,
22 although you can measure it with the hockey puck
23 in the sand, I forget what it's called, while
24 you're going to get numbers, they may not be
25 numbers that actually impact on the tire or really

1 reflect what the tire sees. All the sand dribbles
2 down into these holes.

3 So, I'm not sure that this
4 moves you along, other than to say that on the
5 face of it, they look good or satisfactory, but I
6 still have some doubts in my own mind because of
7 the experience of drivers on the Red Hill
8 expressway. There are newspaper reports from 2019
9 or whatever it was, people were sliding off into
10 the ditch. There's got to be something going on
11 on the pavement.

12 MS. MCIVOR: Sorry,
13 Mr. Commissioner. If I may, I understand asking
14 Mr. Rogers about friction numbers, given his
15 experience with the friction numbers and the MTO
16 friction tests. I don't think that it's of value
17 to go into the more current circumstances or
18 accidents on Red Hill itself, and so I would like
19 to perhaps make that clear at this time.

20 JUSTICE WILTON-SIEGEL: I
21 think that's right. I think the question was
22 posed with respect to what his thoughts would be
23 had he received those results in 2014, and the
24 answer should be really restricted to that
25 question.

1 MS. MCIVOR: Thank you,
2 Commissioner.

3 THE WITNESS: Well, I withdraw
4 my comments, if I may.

5 JUSTICE WILTON-SIEGEL: That's
6 quite all right.

7 BY MR. LEWIS:

8 Q. We can look at the
9 specific results, but -- actually, we'll back up
10 for a moment.

11 I appreciate your comments
12 about the use of the ribbed tire, but that is what
13 the MTO used on the skid tester. That's what it
14 had used for years and years?

15 A. Absolutely. It's a
16 ribbed tire. If you get into it, sometimes a
17 smooth tire is better.

18 Q. Right. And your comments
19 about SMA specifically in relation to this issue,
20 are those comments based on any particular
21 research you've done or is this what you are
22 surmising based on what you've seen? I'm just
23 wondering what the basis is for those specific
24 comments that you made about SMA specifically and
25 whether the readings are --

1 A. I've looked at a number
2 of SMA surfaces and I've looked at a large number
3 of other kinds of surfaces and it's on that basis
4 of visual observation that I make that comment.

5 Q. Okay. And I think that
6 perhaps your point is if you are going to have a
7 good reading on it, you would also want
8 microtexture readings to complement it. Is that
9 part of what you're saying?

10 A. I don't think you can
11 measure microtexture in the conventional way on
12 SMA, although I stand to be corrected. I'm not
13 sure what the new laser techniques do.

14 Q. Okay. Thank you. On the
15 specific results, there are quite a number of --
16 and they're not shown. Oh, they are shown the
17 minimum but not the number of them. There are, in
18 the lanes, they're going down to 26 as a minimum,
19 27 -- this is in 2014 -- and 27 and 30 in the case
20 of the one lane.

21 What does that say to you and
22 would that cause you any concern, again,
23 evaluating it from the perspective of your role at
24 the time? Sorry, if you were in the role at the
25 time?

1 A. Well, I certainly don't
2 think that it's likely to be a candidate for the
3 DSM, but we don't have a control, so I would be
4 disappointed to get these values if we were
5 considering it for application into the DSM.

6 Q. If it was at the front
7 end, I hear that. I just want to make sure I
8 understand what you're saying. If it was for an
9 application, but when you have already got it on
10 the DSM --

11 A. Right.

12 Q. -- and you're evaluating
13 it for the purposes of continued maintenance on
14 the DSM, what about that? Because the situation
15 here was that it was already on the DSM.

16 A. Yes. Okay. I don't have
17 a control, so these numbers are not exactly
18 meaningless but they're not very useful.

19 Q. For DSM purposes?

20 A. For any purpose in one
21 sense in terms of evaluating what's going on.

22 Q. Well, I'm thinking back
23 to --

24 A. But yes, from a DSM point
25 of view, I would want to see a control. It might

1 be that there would have been something about the
2 particular abrasion or polishing going on on the
3 surface that resulted compared to perhaps some
4 other surfaces in lower values than you might
5 normally expect.

6 Q. Maybe I'm wrong, but I
7 thought that you had said when I first asked you
8 about this that the results would be acceptable
9 and now it sounds like you're saying they would
10 not be, so I just want to clarify that.

11 A. If you look at the
12 averages, they're acceptable, given that it's 90
13 kilometres an hour.

14 Q. Right. If it was at 100,
15 you would expect the numbers to be somewhat lower,
16 slightly lower at least?

17 A. I might expect them to be
18 slightly lower. I wouldn't think 10 kilometres
19 would make a big difference, but the data from
20 2010 that Ms. Lane referred to a few days ago
21 indicated a slightly different change.

22 Q. Right, when it was
23 conducted at 100. Again, you weren't there at the
24 time. You're talking about Ms. Lane's evidence
25 given in the course of the inquiry?

1 A. Exactly.

2 Q. Well, I want to be clear,
3 then. Would these results at the time have caused
4 you, given the situation, you didn't have a
5 control, would it have caused you, if you were the
6 head of soils and aggregates, to consider removing
7 it from the DSM or no?

8 A. We don't have a control,
9 so I can't recall.

10 Q. All right.

11 A. We certainly had
12 pavements in the past where we didn't have any
13 serious problems in terms of wet weather,
14 collisions, with numbers lower than this on
15 highways like the 401.

16 Q. The next thing,
17 Commissioner, I would like to ask a few questions
18 about the report by Golder that was done in 2019,
19 again, based on Mr. Rogers' experience in
20 particular with polished stone value testing and
21 the later results from the DSM application and as
22 reported in the Golder 2019 report, based on his
23 experience with polished stone value testing and
24 the 1992 results.

25 I understand, again, that

1 Ms. McIvor may have a comment to make before I do
2 so.

3 MS. MCIVOR: Thank you,
4 Mr. Lewis. And, yes, Commissioner. Again, we're
5 satisfied to address this in closing submissions,
6 but it is our position again that Mr. Rogers was
7 not at the Ministry at the time of this report and
8 didn't have knowledge of this report and there may
9 be people that do have that, that are
10 participating in the inquiry, but again, we're
11 happy to address that in closings.

12 JUSTICE WILTON-SIEGEL: Again,
13 duly noted.

14 MS. JENNIFER ROBERTS:
15 Commissioner, may I please chime in on the same
16 point? I'm anticipating there will be expert
17 testimony as this proceeding advances in relation
18 to the Golder reports and I express the same
19 reservation as expressed by Ms. McIvor and reserve
20 our arguments to closing on the subject.

21 JUSTICE WILTON-SIEGEL: Okay.
22 Also noted.

23 MS. JENNIFER ROBERTS: Thank
24 you.

25 MR. LEDERMAN: And,

1 Mr. Commissioner, I agree with the comments that
2 have been expressed by Ms. Roberts and Ms. McIvor,
3 that I think there is some caution that should be
4 applied to this evidence given that the witness
5 hasn't been qualified as an expert to comment on
6 these things, so I just raise that as a point of
7 caution.

8 JUSTICE WILTON-SIEGEL: Thank
9 you, Mr. Lederman.

10 MR. LEDERMAN: Thank you.

11 MR. LEWIS: Thank you. You
12 can take those down, please, Registrar.

13 BY MR. LEWIS:

14 Q. So, if I could go to --
15 this is referred to in overview document 10, but
16 if we could go to GOL6612. This is the version,
17 just for counsel, that is cited in overview
18 document 10, paragraph 321. I believe the
19 number that we had provided to counsel was just
20 the same document but a different version, which
21 is the Hamilton production of the same document,
22 but since it's in the overview document, we'll use
23 GOL6612.

24 So, this is a report dated
25 February 28, 2019 by Golder Associates and it's

1 respecting some testing done and evaluation done
2 by Golder Associates for work done in late 2017
3 and, in particular, polished stone value testing
4 that was done.

5 And if I could go to the top
6 of image 2, it indicates that the PSV testing was
7 done at a lab in Ireland and that PSV is not a
8 standard test in Canada, so it was sent to Europe
9 for testing.

10 I take it from your comments
11 before, you would agree with that, that outside of
12 the MTO, it's not a common test done in Canada.
13 Is that right?

14 A. It's, I think, not done
15 at all. Oh, one exception. In Quebec, they use a
16 French version of the test developed by the
17 Laboratoire of Roads and Bridges in Paris. So,
18 they're a similar testing. It's not identical.

19 Q. And what's that called?

20 A. I can't remember what
21 it's called. I sent a copy to Ms. McIvor, I
22 think.

23 Q. Is that the CPP?

24 A. It may be called that,
25 but I'm not quite sure what that means.

1 Q. Right. Okay.

2 A. And also I note here that
3 the European test method designation there may not
4 be the same as or identical to the British
5 standard test method, 812, although my suspicion
6 is that they are very close.

7 Q. Okay. You're not sure.
8 That's just --

9 A. You would have to read
10 the two test methods together.

11 Q. Okay. Thank you. And
12 then if you could call up the next paragraph,
13 please, I guess the next two, under Analysis and
14 Interpretation. And, here, it indicates that the
15 corrected PSV of the tested aggregates was 45
16 taken from cores on the Red Hill Valley Parkway
17 itself, from the placement in 2007. And so,
18 that's the first part of it.

19 You've read that and you can
20 see the result?

21 A. Yes. They say the
22 corrected value. When you do this test, to
23 calibrate the equipment, you use a fresh sample of
24 a special aggregate of known PSV characteristics
25 and you correct the actual value when you measure

1 based on how those control sample or how the
2 control sample results are, so that's what it
3 means by a corrected PSV.

4 Q. Okay. Thank you. And
5 then we've already looked at the 1992 results that
6 you were involved with with the PSV of 45. Do you
7 recall that?

8 A. Yeah.

9 Q. Okay.

10 A. Yes.

11 Q. And then if we could go,
12 Registrar, to overview document 4, image 85. And
13 this is from the letter in paragraph 98 and the
14 letter continues on to the image on the right,
15 December 4, 2008 from Mr. Senior, your successor,
16 to Demix Aggregates indicating the test results at
17 that time.

18 And as you can see in
19 paragraph 199 at the bottom, it indicates the
20 laboratory test results included a polished stone
21 value of 52. Do you see that? Paragraph 191.

22 A. Yes. Okay.

23 Q. All right. And so, those
24 results, then, are from 2008, so now we have three
25 polished stone value results. Can you tell us,

1 just based on your experience in your role, what
2 those results tell you over those periods of time?

3 A. In the reports that they
4 previously referred to, meaning the paper on skid
5 resistant aggregates, there's a paragraph or
6 chapter, as you will, on variability within a
7 single source.

8 There's a couple of things.
9 We know that if we submit the same aggregate to a
10 number of different laboratories, the maximum
11 range in values of PSV that we're normally going
12 to experience, which is, i.e., 95 percent of the
13 time, is around 5, and this is published value in
14 the British standard test method.

15 So, for instance, if you had a
16 value of 50, you wouldn't expect -- and you had
17 data from other laboratories, you wouldn't
18 expect -- you would expect most of the values to
19 be between 50 and 45, something like that.

20 So, now we have two values
21 that are the same, which are both 45, taken many
22 years apart, and another value of 52, so this is
23 outside the normal range experienced 95 percent of
24 the time.

25 So, there's two possibilities.

1 One, that there's a slightly different aggregate
2 being tested in the paragraph 199 from that that
3 was used or tested by Golders and by the MTO in
4 1992, or that there's -- I'm sorry, back up. Or
5 that they're different materials. I'm sorry, did
6 I say that clearly or not?

7 Q. I think you said slightly
8 different aggregate being tested from that that
9 was used or tested by Golder or the MTO, by Golder
10 in --

11 A. Yes. There's a
12 possibility that this is -- the one tested in
13 paragraph 199 is a slightly different aggregate
14 from the same source from that tested in the other
15 two test results that you have. Or it's at least,
16 in part, related to multi-laboratory variation.
17 We have a laboratory in Ireland and a laboratory
18 in Canada. This test is a notoriously difficult
19 test to calibrate and perform and it requires
20 extensive skills and training to do it.

21 So, I'm not particularly
22 surprised to see this variation in results,
23 although I would say that it's probably at the
24 extreme edges of the variation you would expect to
25 see, but you can look at the paragraph in that

1 report that gives you more information about this.

2 Q. So, if we could go to
3 MTO3580. This is the "Skid Resistant Aggregates
4 in Ontario." Is that the paper you --

5 A. That's the paper and
6 somewhere in the middle of that --

7 Q. I'm not sure what
8 image it is, Registrar, but maybe try image 12.
9 It's page 013, I think.

10 A. It would be further on,
11 if this is the one we're talking about.

12 Q. It's, I think, figure 10.

13 A. Oh, yes. There's a graph
14 showing variation.

15 Q. That's figure 9, so the
16 next one, I think, Registrar. That's it. Is this
17 the one you're talking about?

18 A. Yes, this is it. You can
19 have a discussion about this.

20 Q. And this is -- you're
21 showing the polished stone value of 3HOI aggregate
22 sources over a 20-year period?

23 A. Right. So, forget about
24 the graph with the iron mine waste. That's a
25 highly variable aggregate in and of itself. But

1 the other two, the dolomitic sandstone and the
2 meta-arkose, are remarkably consistent materials.

3 Now, it also shows data from
4 over a period of quite some time and there's some
5 high results, abnormally high results, or
6 abnormally low results, one of each. So, if you
7 knock those off as being uncommon or there may
8 have been a mistake made of some kind, you can get
9 some idea of the kind of variation that I was just
10 talking about, which shows that you're looking at
11 variation within one source over a period of time
12 of a polished stone value of about 5.

13 Q. I just got a freeze.
14 Sorry, I haven't heard the last -- has Mr. Rogers
15 frozen for others? No. Maybe it's fine. The
16 last I heard was, "You can get some idea of the
17 kind of variation that I was just talking about."

18 A. Can you still hear me?

19 Q. I can now.

20 A. Okay. You got some idea
21 of exactly what I said. You get some idea of the
22 variation we were just talking about. You're
23 going to get a range in the order of 5 PSV units
24 with occasional, very occasional, values that fall
25 outside that. Can you hear me now? Because I

1 can't --

2 THE REGISTRAR: Sorry, I think
3 we just lost Mr. Lewis. I don't see him on the
4 screen anymore.

5 MS. MCIVOR: And I also don't
6 see the Commissioner.

7 THE REGISTRAR: We'll just
8 pause the feed right now and get them back. Maybe
9 their internet connection just went out in the
10 office.

11 MS. MCIVOR: Thank you,
12 Registrar.

13 --- Luncheon recess taken at 12:59 p.m.

14 --- Upon resuming at 1:59 p.m.

15 MR. LEWIS: We're back after
16 lunch and an internet outage at our office, but
17 we're back now. May I proceed, Commissioner?

18 JUSTICE WILTON-SIEGEL: Please
19 do.

20 MR. LEWIS: Thank you. I just
21 have a couple questions to finish up.

22 BY MR. LEWIS:

23 Q. Earlier in your evidence
24 this morning, you were speaking of -- and I'll
25 just go from the realtime transcript. You said

1 that values of more than 30, meaning FN of more
2 than 30, you get a relatively short stopping
3 distance, and even if you go up to a friction
4 value of 50, although you get a continued decrease
5 in stopping distance, it's not a dramatic change,
6 but when you get values of around 30, it depends
7 on your vehicle speed, the difference in stopping
8 distance can vary quite dramatically depending on
9 what the so-called friction number is of the
10 highway, and then you go on to talk about winter
11 conditions and so forth.

12 Am I correct in understanding,
13 and correct me if I'm wrong, that the stopping
14 distances don't decline on a straight-line basis
15 as the friction number increases. Is that what
16 you were saying?

17 A. They decline as the
18 friction number increases, but they don't decline
19 as quickly as you would at, say, friction numbers
20 between 20 and 30.

21 Q. Right. The stopping
22 distance --

23 A. And there's a graph of
24 this.

25 Q. Yes, okay. I just wanted

1 to make sure that I understood what you were
2 saying. So, as the friction number increases,
3 while the stopping distances decrease, it's not a
4 linear relationship?

5 A. No. That is correct.

6 Q. That's right? So, an
7 example, just picking two numbers, at an FN30,
8 you're saying, doesn't give you -- it's not twice
9 the stopping distance of FN60. Is that right?

10 A. Generally speaking, no,
11 but it also varies with the speed of the vehicle.

12 Q. At the same speed, I
13 mean. Is that what you're saying?

14 A. Even then, the difference
15 is, as you increase your speed, the differences in
16 stopping distance will become greater.

17 Q. No, I get that, but at
18 the same speed.

19 A. Pick a particular speed.
20 You will get a stopping distance between 30 and 50
21 that isn't as great as the stopping distance
22 between 10 and 30.

23 Q. Right, I appreciate that
24 it would be greater, but you were talking about it
25 not being a straight-line difference between the

1 two?

2 A. It's not a straight line.

3 Q. Okay. There's not as
4 much of a difference as you go up as it is at
5 lower FNs. Is that right?

6 A. That is correct.

7 Q. Okay. Sort of less of a
8 marginal difference, if we can call it that?

9 A. To really understand
10 this, you have to look at the graph.

11 Q. What graph are you
12 talking about?

13 A. It's figure 1 in any of
14 those reports.

15 Q. In your report?

16 A. Yes.

17 Q. All right. If we could
18 go to -- that would be helpful, thank you --
19 MTO3580, please.

20 MS. MCIVOR: Mr. Lewis, if I
21 may, I believe in that document it's image 9.

22 MR. LEWIS: That's great.

23 Thank you.

24 THE WITNESS: Keep going.

25 MR. LEWIS: Yes. Image 9,

1 Ms. McIvor said.

2 THE REGISTRAR: Sorry,
3 counsel, this is image 9.

4 MS. MCIVOR: Sorry, I might be
5 mistaken. It might be page 9 of this document,
6 with this being page 1.

7 THE WITNESS: I think it's on
8 the next page. It was on what would have been
9 page 2.

10 BY MR. LEWIS:

11 Q. Page 2. Okay.

12 A. There you go. And that
13 is the graph I'm referring to.

14 Q. Okay.

15 A. So, you have to
16 understand that this is at 40 kilometres an hour
17 largely but not exclusively on snow covered and
18 ice covered pavement, and it shows the theoretical
19 curve predicted by an equation and it shows the
20 fit of the data, actual field data, around that
21 curve. This was data generated out on Highway 416
22 one winter before it was opened to traffic.

23 So, here, you can see that if
24 we go from 0.3 to 0.5 in terms of coefficient of
25 friction, the stopping distance varies from 20 to

1 about 12 metres, but if we go from 0.1 to 0.3, the
2 stopping distance varies from 20 metres up to 60
3 metres. Practically speaking, you don't get many
4 roads less than 0.15.

5 Q. Right. But I think I
6 understand what you're saying and I think I did
7 understand you correctly, but it's certainly
8 helpful to have the visualization of it, as you
9 say?

10 A. And, as I said, there
11 were a family of curves around this one depending
12 upon the speed of the vehicle.

13 Q. And, as you said, this
14 one is at 40 kilometres an hour?

15 A. This is at 40 kilometres
16 an hour, I think. Yes, it says 40 kilometres an
17 hour.

18 Q. Okay. Thank you. I
19 don't have any other questions.

20 I understand, Commissioner,
21 that counsel for Dufferin will not have any
22 questions. Counsel for Golder and the City both
23 do, as well as the MTO. We did not discuss who is
24 going first between counsel for Golder and counsel
25 for the City, however.

1 MS. JENENE ROBERTS: I'm happy
2 to go first for the City.

3 JUSTICE WILTON-SIEGEL: Okay.

4 MR. LEWIS: Thank you.

5 EXAMINATION BY MS. JENENE ROBERTS:

6 Q. Good afternoon,
7 Commissioner and Mr. Rogers. My name is Jenene
8 Roberts and I'm going to ask you a few questions
9 on behalf of the City of Hamilton.

10 First, I want to take you back
11 to a discussion earlier about the Demix aggregate.
12 And are you aware that the City of Hamilton
13 retained Golder Associates to complete quality
14 assurance work with respect to the paving on the
15 Red Hill Valley Parkway?

16 A. Yes, and more than
17 quality assurance, I believe.

18 Q. Yes, that's correct. And
19 do you know Dr. Ludomir Uzarowski?

20 A. Yes, I do.

21 Q. Okay. And part of the
22 work was testing on the Demix aggregate and
23 approval of the use of the Demix aggregate on the
24 pavement. Are you aware of that?

25 A. I was aware that they had

1 done testing.

2 Q. Okay.

3 A. I don't think I've ever
4 seen the test data.

5 Q. Okay. That's fine. And
6 I take it that you would expect that Golder and
7 Dr. Uzarowski in particular would have been
8 diligent in ensuring that the relevant testing was
9 done and the applicable specifications were met
10 with respect to the use of the aggregate in the
11 paving of the Red Hill?

12 A. There's two sets of
13 requirements. There's requirements in OPSS 1003,
14 which talk about Micro-Deval and freeze/thaw, and
15 then there's a set of requirements required in
16 MTO's case to get on the DSM. So, if you do the
17 one and you don't do the other, from MTO point of
18 view, you haven't done the complete job.

19 Q. But you're aware that
20 municipalities in Ontario are not required to meet
21 all of the MTO requirements, such as they're not
22 required to select an aggregate from the DSM list?

23 A. Not as far as I know, but
24 at the back of the municipal specification from
25 1003, there was guidance to municipalities about

1 this very issue. It's a non-mandatory appendix.

2 Q. I'm sorry, I didn't catch
3 that last --

4 A. It's a non-mandatory
5 appendix.

6 Q. Non-mandatory appendix.
7 Thank you. So it's not mandatory for
8 municipalities to follow that appendix?

9 A. No, not at all.

10 Q. Okay. And would you also
11 agree that it was acceptable for the City of
12 Hamilton to rely on Golder and its expertise in
13 evaluating the aggregate that was used in paving
14 the Red Hill Valley Parkway?

15 A. That's a funny question.
16 Can you say it again?

17 Q. Sure. I put the
18 proposition to you that it was acceptable for the
19 City of Hamilton to rely on Golder and
20 Dr. Uzarowski and his expertise and the expertise
21 of other members of Golder Associates to evaluate
22 the aggregate that was being used in paving the
23 Red Hill Valley Parkway?

24 A. I'm not sure that I can
25 comment about what the City of Hamilton did in

1 this context. Normally I would say yes, but I'm
2 not really not in a position to judge what the
3 City of Hamilton should or should not have done in
4 terms of relying on their consultant.

5 Q. Okay. That's fine.

6 Thank you. And, Mr. Rogers, you are also aware, I
7 take it, that the Demix aggregate had been used by
8 the MTQ on a number of projects in Quebec?

9 A. Only recently have I
10 found that out, but I have always assumed that it
11 was used locally in the Montreal area.

12 Q. Okay. Thank you. And
13 you had told us earlier today about some of the
14 testing that was done in 1992 at the MTO on the
15 Demix aggregate and I think your evidence was that
16 you didn't dismiss the second Demix application
17 out of hand in 2002 when they applied for listing
18 on the DSM. Correct?

19 A. In 2007.

20 Q. Yes.

21 A. No, of course not.

22 Q. Yes. Okay. And that's,
23 I think you explained to us, because you knew it's
24 a large quarry and rock could have been coming
25 from a different area or a different level in 2007

1 versus 1992?

2 A. Yes.

3 Q. Okay. And so, the MTO
4 evaluated the application in 2007 based on the
5 results from the 2007, the new sampling and the
6 new testing that was done?

7 A. The new testing and
8 sampling that was done in 2008.

9 Q. In 2008, thank you. Yes,
10 so the application in 2007 and then you had to
11 wait until the spring of 2008 to do the new
12 sampling and testing. Is that right?

13 A. That's right.

14 Q. Okay. And you're also
15 aware that the MTO ultimately did list the Demix
16 aggregate on the DSM?

17 A. Yes, I am now.

18 Q. Okay. So, that means
19 that MTO's process of qualification, it did not
20 identify any problems with the Demix aggregate in
21 the testing that were part of that application in
22 2007 and then based on the sampling in 2008?

23 A. I'm not sure I've seen
24 all of the test data, but --

25 Q. Okay.

1 A. -- that's a fair
2 statement.

3 Q. Okay. Thank you. And,
4 you know, given that you had left in April of
5 2008, I understand you may not have seen all the
6 testing, but to your knowledge you're not aware of
7 the MTO having identified any problems with the
8 Demix aggregate in the testing that was done?

9 A. If they had found a
10 problem, they wouldn't have gone ahead.

11 Q. Okay. Great. Thank you.
12 And you're also aware that the friction testing
13 that supported the listing of the Demix aggregate
14 on the DSM was the testing that was done on the
15 Red Hill Valley Parkway?

16 A. Yes. I am now.

17 Q. Okay. And I understand
18 it would have been your former colleagues, Bob
19 Gorman and Stephen Senior in particular, who had
20 made the decision to list the Demix aggregate at
21 that time?

22 A. Yes.

23 Q. Okay. And you, of
24 course, trusted their judgment in allowing the
25 Demix aggregate to be added to the DSM?

1 A. I trusted their judgment?

2 Q. You would have trusted
3 their judgment, yes.

4 A. In a general way in the
5 sense that you're asking me about something that
6 happened after I retired, but yes. They're both
7 competent geologists and, in Steve's case, he's a
8 very competent engineer, so yes, I think that
9 would be a fair statement.

10 Q. Great. Okay. Thank you.
11 And you're also aware that the MTO did not remove
12 the Demix aggregate from the DSM list because of
13 any sort of friction performance concerns.
14 Correct?

15 A. I don't know.

16 Q. Sorry?

17 A. I'm not aware of that.

18 Q. Okay. Thank you. Sorry,
19 the way I posed the question makes the answer a
20 little confusing sometimes.

21 So, in fact, the Demix
22 aggregate was only removed from the DSM list
23 because the manufacturer essentially made a
24 business decision to stop paying the fees to
25 maintain the listing. Were you aware of that?

1 A. I am now.

2 Q. Okay. Thank you. And
3 switching gears away from the Demix aggregate
4 itself, I take it you're aware that there may be
5 occasions where there is an aggregate that is
6 listed on the DSM but, nevertheless, there's a
7 poor friction result that's obtained when friction
8 testing is done on a highway that's paved using
9 that aggregate?

10 A. Yes, but I'm trying to
11 think of a specific example.

12 Q. Okay. Well, maybe, if we
13 could go back to -- I think there was a brief
14 discussion earlier today about the 401 near
15 Woodstock and the paving that was done there with
16 SMA.

17 And, Mr. Registrar, if we
18 could go to OD4, images 76 to 77. And I'm looking
19 here at paragraph 175 and this refers to a
20 November 26, 2007 MTO geotechnical committee
21 meeting, and you see here the minutes of the
22 meeting are there and it refers to you giving an
23 update on SMA.

24 And then at the bottom of the
25 left-hand image there, we see a discussion of some

1 trials that were done in 2007 and it sort of
2 continues over to the top. Is that big enough for
3 you to read, Mr. Rogers?

4 A. Yes, I can read it.

5 Q. Okay.

6 A. Give me a second to read
7 it. Yes, so I've read the bottom two paragraphs.

8 Q. Okay. So, the Highway
9 401 SMA in the Woodstock area, that used the Aecon
10 Marmora aggregate?

11 A. Yes.

12 Q. And that was an aggregate
13 that was listed on the DSM?

14 A. Yes, it was.

15 Q. Okay. And --

16 A. It was the very oldest
17 aggregate or had been on the list the longest.

18 Q. Okay. Great. And we see
19 here, and the paragraph continues over to the top
20 of page 77, that that aggregate, using the SMA on
21 the 401 near Woodstock, resulted in friction in
22 the low to mid-20s and it was in fact the trigger
23 to pause the further implementation of SMA.
24 Correct?

25 A. Yes.

1 Q. So, that means that
2 selecting an aggregate from the DSM list is not a
3 guarantee that a pavement will give an acceptable
4 level of friction. Correct?

5 A. No. It's dependent, as
6 we can see here, on the mix design.

7 Q. Okay.

8 A. The characteristics. You
9 can take a good material and still made a bad
10 product.

11 Q. Okay. But if we're just
12 talking about the aggregate itself and we're
13 talking about listing on the DSM, that's based
14 upon the characteristics of the aggregate.
15 Correct?

16 A. Yes.

17 Q. Okay. So, I want to ask
18 you a little bit about your evidence this morning
19 and you made what you called a philosophical
20 comment about the use of a ribbed tire versus a
21 smooth tire to measure friction on SMA. And you
22 were at the MTO in 2007 when the initial skid
23 testing was done on the Red Hill Valley Parkway.
24 Correct?

25 A. Yes.

1 Q. And that testing was done
2 using a ribbed tire?

3 A. Yes.

4 Q. Am I right that you never
5 expressed your philosophical comment to any of
6 your colleagues at that time?

7 A. I had no knowledge about
8 the issues that have since arisen.

9 Q. By "issues that have
10 since arisen," are you referring to the issues
11 with the SMA?

12 A. I'm talking about the SMA
13 versus the tire that's used.

14 Q. Okay. So, the
15 philosophical comment that you made is more of a
16 hindsight observation that you're giving us here
17 as opposed to a view that was held at the time you
18 were at the MTO?

19 A. I had no thought at that
20 time that we might want to be thinking about using
21 a smooth tire. There's big disadvantages in many
22 ways to using a smooth tire. But no, I had -- my
23 views on this have developed over the years.

24 Q. Okay. So, that would
25 mean, then, that you wouldn't have advised, for

1 example, Mr. Marciello, who was operating the skid
2 trailer, to use a smooth tire to measure the
3 friction on SMA?

4 A. No.

5 Q. Okay. And you would not
6 have -- sorry. You did not inform, for example,
7 anyone at the City of Hamilton that you had this
8 view as to the use of a smooth tire versus a
9 ribbed tire to measure friction on the SMA?

10 A. No, not at all.

11 Q. And you didn't inform
12 Dr. Uzarowski specifically or, for that matter,
13 anyone else at Golder about your philosophical
14 view as to the use of a smooth tire to measure
15 friction on SMA?

16 A. At that time, I did not
17 have that view.

18 Q. Okay. And I take it
19 you're not aware of anyone else at the MTO, while
20 you were there, sharing that view as to the use of
21 a smooth tire to measure friction on SMA?

22 A. As far as I know, they
23 probably haven't had any discussion about it.

24 Q. Okay. And calling it a
25 philosophical comment, I take it, then, you never

1 actually published anything with respect to this
2 view as to the use of a smooth tire to measure
3 friction on SMA?

4 A. No. I think this is
5 possibly a topic for further research or
6 investigation.

7 MR. LEWIS: Sorry. I'm here.
8 This is not an objection. I just need to advise
9 that the live stream is apparently down on
10 YouTube, and so it's not being broadcast
11 currently. We don't know how long it's going to
12 take to get it back up, so I felt I should advise
13 the Commissioner of that fact.

14 JUSTICE WILTON-SIEGEL: Is
15 someone looking into this at the present time?

16 MR. LEWIS: Yes.

17 JUSTICE WILTON-SIEGEL: Let's
18 break for ten minutes until 2:30 and we'll return
19 at 2:30. Sorry, Mr. Rogers.

20 THE WITNESS: That's okay.

21 JUSTICE WILTON-SIEGEL: We
22 want to make sure that the public is aware or is
23 able to access this inquiry, to the extent they're
24 interested. Let's adjourn until 2:30.

25 --- Recess taken at 2:22 p.m.

1 --- Upon resuming at 2:37 p.m.

2 MR. LEWIS: We're back,
3 Commissioner. We understand that there was a
4 problem with the YouTube link on the inquiry
5 website. We thought it was a general problem, but
6 it's still available, the live feed, apparently,
7 on YouTube directly, and so we understand that,
8 with your approval, we would proceed and the full
9 video will be available subsequently, as with
10 prior days, on the inquiry website.

11 JUSTICE WILTON-SIEGEL: That's
12 fine. Let's proceed.

13 BY MS. JENENE ROBERTS:

14 Q. Thank you,
15 Mr. Commissioner and Mr. Rogers. Those are all my
16 questions.

17 JUSTICE WILTON-SIEGEL:
18 Mr. Lewis, then who is next?

19 MR. LEWIS: Ms. Jennifer
20 Roberts was up next, followed by Ms. McIvor.

21 JUSTICE WILTON-SIEGEL:
22 Ms. Roberts?

23 MS. JENNIFER ROBERTS: Thank
24 you. Mr. Rogers, I am Jennifer Roberts. I am
25 counsel for Golder. Commissioner, may I begin?

1 JUSTICE WILTON-SIEGEL: Please
2 proceed.

3 MS. JENNIFER ROBERTS: Thank
4 you.

5 EXAMINATION BY MS. JENNIFER ROBERTS:

6 Q. Mr. Rogers, I just have a
7 few questions and prevail on your patience here if
8 I take you back to some evidence earlier today.

9 I want to go back to the
10 evidence about the use of the Demix Aggregate in
11 the mix for the pavement for the Red Hill Valley
12 Parkway. One of the things you said this morning,
13 I just want to come back to, you said that you
14 thought that Hamilton took a risk in using a
15 non-DSM aggregate in that application.

16 And that was because the MTO's
17 DSM essentially was a prequalification process?

18 A. Yes.

19 Q. Okay. And that provided
20 confidence that the aggregate listed was of good
21 quality and appropriate for the application.
22 That's what DSM gives anyone using it?

23 A. In terms of its likely
24 frictional properties, frictional properties to
25 the pavement surface.

1 Q. Right. And the issue is
2 here that absent relying on the DSM, that meant
3 that Hamilton and its consultants had effectively
4 to qualify any aggregate being used for the
5 pavement. Do I have that right?

6 A. Yes, in the sense that
7 they needed to qualify these at all.

8 Q. Right. So, the point is
9 if you got the DSM, then you have that confidence,
10 that assurance, that you have an aggregate of
11 quality with good frictional properties, and if
12 you don't have the DSM, then your consultant and
13 the owner ultimately has to take steps to make
14 sure that what's used provides the same quality,
15 but they've got to do it through their own
16 qualification process. That's right?

17 A. Yes. It doesn't have to
18 be the same as the DSM. It has to be satisfactory
19 for the facility involved.

20 Q. Yes. That's exactly
21 where I'm going, sir. Thank you.

22 And I take it that you weren't
23 aware of what qualifications were required as part
24 of the contract to pave the Red Hill Valley
25 Parkway? That's not something you have any

1 knowledge of?

2 A. I have no knowledge at
3 that time.

4 Q. Okay. And so, you
5 mentioned this morning the Ontario Provincial
6 Standards specification 1003, and that, for
7 instance, is the standard for aggregate being
8 used?

9 A. For asphalt and concrete.

10 Q. Thank you. And OPSS 1003
11 has requirements for, among other things,
12 Micro-Deval, petrographic quality, freezing and
13 thawing. Those are all qualities that are also
14 identified and required for the purposes of the
15 DSM list. That is correct?

16 A. Yes.

17 Q. Okay. And I think there
18 are two that you mentioned. The aggregate
19 abrasion value, that's one that's not referenced
20 in OPSS 1003 but you referenced it a number of
21 times?

22 A. It's not in 1003. It's a
23 requirement to the DSM.

24 Q. Right. And I think, if
25 I'm understanding your evidence correctly, it's

1 similar to the Micro-Deval test but not identical?

2 A. It's similar to -- well,
3 it gives somewhat similar values, yes.

4 Q. Okay. Thank you. And
5 the other test that you mentioned as an important
6 indicator of friction is the PSV, the polished
7 stone value test?

8 A. That is correct.

9 Q. Right. And you raised
10 the point this morning that when you were told
11 that a Demix aggregate was being proposed for the
12 Red Hill and you knew it wasn't on the DSM, you
13 said that you also recall that and you were aware
14 of there was a 1992 testing in which the PSV was
15 too low for qualification for the DSM. Do you
16 remember that evidence?

17 A. Yes.

18 Q. And your recollection was
19 that the other laboratory values in 1992 were
20 good, but there was a question about whether PSV
21 was achieved. That's right?

22 A. Until I saw the data
23 today, I don't think I was aware that we had done
24 other testing than PSV.

25 Q. Okay. Fair.

1 A. Or I'm not aware, I
2 couldn't remember that we had done other testing.

3 Q. So, when you were aware
4 that the Demix aggregate was being used on the Red
5 Hill, your question was whether, in fact, the PSV
6 for the aggregate was of an acceptable quality.
7 Do I understand that correctly?

8 A. No. I didn't question
9 that. My view was that it was unknown, other than
10 by looking at a previous sample from 15 years
11 earlier.

12 Q. Okay. Thank you. You
13 mentioned briefly earlier in your testimony that
14 you were aware there was a French test that was
15 used for assessing polishability of aggregate?

16 A. Yes, and I believe that
17 it's used in Quebec and I think I found a copy of
18 it the other day.

19 Q. And if I suggested --

20 A. Though I didn't read it
21 in detail.

22 Q. If I suggested to you
23 that the test was called the polishing by
24 projection coefficient, would that ring bells for
25 you?

1 A. That's starting to come
2 back to me, yes.

3 Q. Thank you. And you're
4 aware that it is an equivalent evaluation of an
5 aggregate's resistance to polishing. That's
6 correct?

7 A. I'm not sure that it is
8 equivalent.

9 Q. I think the French might
10 say, actually, sir, that it's superior, but let's
11 hear your view.

12 A. Well, it can go both
13 ways. The issue is that in the British test,
14 so-called, you actually have abrasion between a
15 rubber tire and the simulated road surface and
16 then you feed an abrasive between the tire and the
17 simulated aggregate surface. And you have to do
18 that with two different kinds of emery for three
19 hours each and then you measure the final friction
20 using the British pendulum.

21 In the French test, my
22 understanding is that they sandblast the surface
23 with some grit or abrasive material, and that is
24 supposed to simulate the polishing that takes
25 place between the rubber tire and the road surface

1 in the English test.

2 Q. All right. So, I think
3 we'll probably have expert testimony exactly on
4 that point, so I'm not going to dwell on it.

5 But I take it in both cases,
6 the Quebec use of CPP and the MTO use of PSV, are
7 both trying to achieve the same result; that is,
8 testing the resistance of aggregate to
9 polishability?

10 A. Yes.

11 Q. And you have no reason to
12 doubt, sir, that an aggregate that met the
13 threshold for Quebec would have established that
14 it had a good resistance to polishability? You
15 have no reason to doubt that, do you, sir?

16 A. I have no knowledge about
17 it, so I can't know one way or the other.

18 Q. And then though if we can
19 go forward, in 2008, and you were taken to this
20 earlier, you were aware that there was laboratory
21 testing done through the MTO that included
22 polished stone value for the Demix aggregate?

23 A. In which year?

24 Q. 2008.

25 A. That was after I had

1 retired, so I had no further involvement at that
2 time. Since then, of course, through these
3 proceedings, I found out about that testing --

4 Q. Right, so you knew --

5 A. -- seeing the full test
6 report.

7 Q. Sorry, I missed that.

8 You don't recall whether you saw it at the time?

9 A. I certainly didn't see it
10 at the time and I'm not sure that I've seen it
11 subsequently.

12 Q. Okay. It's referenced in
13 the overview document and we looked at that, but I
14 think maybe it warrants actually going to the
15 text. It's MTO45. Registrar, can we please go to
16 that. There you go.

17 A. That's it. So, I
18 wouldn't have seen this in 2008 because it was
19 none of my business.

20 Q. Okay. But you'll agree
21 with me, and let's go through this, that when you
22 actually look at the test results, you've got a
23 PSV there of 52?

24 A. Right.

25 Q. Do you see that?

1 A. Yes.

2 Q. And that was satisfactory
3 for inclusion in the DSM?

4 A. Yes.

5 Q. And you have a
6 Micro-Deval abrasion percentage of 2.7 here?

7 A. Yep, very similar to the
8 previous one.

9 Q. Right. And I take it,
10 sir, that that is a very good value for a
11 Micro-Deval?

12 A. Yes. And the aggregate
13 abrasion value is, again, similar to the one
14 tested in 1992 and satisfactory.

15 Q. Thank you. And then some
16 of these other tests, I think there's one for
17 freeze/thaw that's important for our winter
18 climate there, freeze/thaw percentage?

19 A. Yes, and the
20 specification, maximum of 6 percent, so it meets
21 that with these.

22 Q. And petrographic quality,
23 where is that one? I'm not seeing it here.

24 A. Oh, yes. At the top.

25 Q. There we go.

1 A. HL and concrete PN is
2 100. That tells us the sample examined consisted
3 of 100 percent what was classed as good quality
4 aggregate.

5 Q. Okay. And so, I take it
6 that looking at these test results, these
7 laboratory test results, would have more than
8 satisfied you that the physical qualities of the
9 Demix aggregate were more than satisfactory for
10 inclusion on the DSM list?

11 A. No, because there's a
12 next step.

13 Q. No, sorry. Listen to my
14 question. The question is whether these
15 laboratory results, I recognize that there are
16 other things that require to be considered for
17 inclusion, but on the basis of the laboratory
18 results that you're seeing, that that would more
19 than satisfactory the requirements of the DSM
20 list. Do I have that right?

21 A. No.

22 Q. Okay.

23 A. Because you're required,
24 once you have satisfactory test data like this, to
25 establish a test section and measure the friction

1 for at least two winters.

2 Q. Right. But, as I said in
3 my question, the question was the laboratory
4 results, what you're looking at, sir --

5 A. Yes. If we're focusing
6 on the laboratory results, you're correct, but it
7 wouldn't meet all the requirements for the DSM.

8 Q. Because of the
9 requirement for testing, the friction testing that
10 happened?

11 A. In the field.

12 Q. Right. Okay. And we
13 looked at that earlier this morning and while you
14 thought that, when you looked at 2007, that the
15 preliminary results were good and I think that's
16 correct. I understood you correctly, sir?

17 A. I looked at results that
18 we had to hand from 1992 and they were very
19 similar to the results we see here, other than the
20 polished stone value.

21 Q. Right. Sorry. I was
22 making reference to the friction testing. You
23 looked at that earlier this morning, the 2007
24 friction testing that was done.

25 A. It certainly didn't raise

1 any issues.

2 Q. Thank you. Okay.

3 A. But that was on an
4 untrafficked road surface.

5 Q. Right, right. Well,
6 let's stick with the science right now, shall we,
7 on the laboratory results.

8 I want to address a slightly
9 different point. You've given testimony about the
10 PSV testing and earlier today you expressed the
11 opinion that there were a number of data sets for
12 that. So, can we please go to Golder 3580.
13 Registrar?

14 THE REGISTRAR: Sorry, is this
15 a native document or is it --

16 MS. JENNIFER ROBERTS: I think
17 it's the one that commission counsel took the
18 witness to just earlier at 3580. There's also a
19 Hamilton reference.

20 MR. LEWIS: Are you talking
21 about the Golder 2019 report?

22 MS. JENNIFER ROBERTS:
23 Correct.

24 MR. LEWIS: Okay. No, it's
25 GOL6612.

1 MS. JENNIFER ROBERTS: Sorry.

2 I misheard or miswrote it down. Forgive me.

3 THE REGISTRAR: That's okay.

4 Thank you.

5 MS. JENNIFER ROBERTS: I've
6 got the Hamilton reference, too, here, and I was
7 trying to stay consistent. There we go. Thank
8 you. All right.

9 BY MS. JENNIFER ROBERTS:

10 Q. So, Mr. Rogers, you were
11 taken to this earlier today and you expressed some
12 concern with inconsistency in the PSV given the
13 data, and I just want to go back to that point.

14 If I understood you correctly,
15 you had data sets that you referenced from 1992,
16 the 2008 that we just looked at, and then a data
17 set that's reported on in this February 28, 2019
18 report from Golder.

19 And, Registrar, can you please
20 turn up image 2 and the paragraph after Analysis
21 and Interpretation beginning, "The correct PSV."
22 Can you please call that up. Okay. Can you make
23 that a little bit smaller? Thank you. I can't
24 see everybody. There we go. That helps me,
25 anyway.

1 And this is the corrected PSV.
2 The tested aggregates was 45. Do you remember
3 looking at that?

4 A. Yes, I do.

5 Q. Okay. And perhaps we can
6 turn to image 7. There we go. So, this is the
7 James Fisher Testing Services. This is their
8 report. Do you see that?

9 A. Yes, I do.

10 Q. Okay. And this gets you
11 the result of 45, okay.

12 Now, what you don't have, and
13 I just want to identify it for you, there's
14 another data set, which is the CPP test provided
15 to Hamilton by Dufferin in 2007. But you didn't
16 know about that one, did you?

17 A. I have no information at
18 all.

19 Q. And you didn't consider
20 that in your theory about the variability of the
21 PSV testing, did you?

22 A. No, not at all. I
23 haven't seen it yet.

24 Q. All right. And I think,
25 if I understood you, you identified two possible

1 reasons for the variability in the testing, the 45
2 in 1992, the 45 here and the 52 from 2008. You
3 suggested that it was perhaps because different
4 rock was extracted from different layers or areas
5 of quarry and you identified the potential for
6 variability in the testing procedures. Did I
7 understand you correctly?

8 A. That's correct.

9 Q. Okay. And I just want to
10 note something in here, and that is that the
11 aggregate that's reported on, did you understand
12 that that in fact had been extracted from a core
13 taken from the Red Hill Valley Parkway?

14 A. Thank you for reminding
15 me. Yes, I am aware, now.

16 Q. Okay. And so obviously
17 the 1992 aggregate, the aggregate tested in 1992
18 and 2008 from the Varennes Quarry, were, in both
19 cases, virgin aggregate. That's correct?

20 A. The 1992 had never been
21 used in asphalt. What was the other one?

22 Q. 2008, the aggregate that
23 you tested --

24 A. Well, that was sampled by
25 other people after I retired and I'm -- well, can

1 be assured that it's coming from a stockpile in
2 the Varennes Quarry.

3 Q. In other words, it's
4 virgin aggregate, is it not?

5 A. It's never seen asphalt.

6 Q. Right. Okay. And here,
7 the aggregate that's being tested was extracted in
8 2017 and extracted after ten years in service?

9 A. Correct.

10 Q. And once that core is
11 obtained, the aggregate itself is extracted using
12 chemical solvents. Do you know that?

13 A. Yes.

14 Q. Okay. So, in evaluating
15 the data sets, did you contemplate in the reasons
16 for the variability the fact that the aggregate
17 that's being sampled here in the James Fisher
18 Testing Services reports was not virgin aggregate,
19 that it had been in use in aggregate for ten years
20 and had been extracted using chemical solvents?
21 Did you consider any of those points of
22 variabilities?

23 A. I do now, but what I
24 would say is that the actual aggregate particles
25 that are at the surface of the asphalt making up a

1 very small proportion of the bulk aggregates in
2 the asphalt core of the surface course, and so
3 almost certainly the majority of the materials
4 that were tested in this test that we see the
5 results of here had not been previously polished
6 in the road surface.

7 Q. Right. I understand
8 that, but that still doesn't account for the
9 effect of the extraction process and the chemicals
10 used to extract them, does it?

11 A. The solvents dissolve
12 hydrocarbons. It's an interesting question. Do
13 the hydrocarbons affect the polishability of the
14 aggregate? My guess is no, but I don't have
15 absolute iron clad information on that.

16 Q. Okay. So, in evaluating
17 the reason for the variability here, you cannot
18 dismiss the potential for the chemical extraction
19 process to have an important -- to have a role in
20 explaining the variability?

21 A. I think it highly
22 unlikely that the hydrocarbon solvents would
23 affect the minerality or the behaviour of the
24 minerality of the stone because of the abrasion
25 process and the nature of the minerals --

1 Q. So, in your -- sorry.

2 I'll let you finish. Forgive me.

3 A. These are silicious
4 minerals. I would be surprised if they were
5 affected by a hydrocarbon solvent in a material
6 way in terms of the pavement friction, that --

7 Q. Okay.

8 A. -- I would also be
9 prepared to believe if someone could show me data
10 otherwise.

11 Q. Sorry, I missed what you
12 said. You would also what?

13 A. I would also be
14 interested in seeing any data that proves me
15 wrong.

16 Q. Otherwise. So, your
17 thesis, notwithstanding the use of the chemical
18 solvents and the fact that the aggregate were in
19 use, you still maintain your theory that the
20 reason for the variability is either differences
21 in testing or differences in where the aggregate
22 was obtained?

23 A. Yes, but you used the
24 word "differences in testing." It's an
25 inherent -- you do any test, there's an inherent

1 variability that may not be related to differences
2 in testing.

3 Q. Okay. I just want to
4 address briefly the British pendulum testing. Can
5 we please go back to image 2. The last two
6 paragraphs on that page, can you please call them
7 out, Registrar. A little smaller for me. Thank
8 you.

9 Can you read that, Mr. Rogers?

10 A. Yes, I can.

11 Q. All right. So, in this
12 case, the British pendulum testing that was done,
13 it's actually done December of 2017 and reported
14 on here, showed an average of 39 but variability.

15 And your testimony this
16 morning indicated that you had experience in the
17 application of a British pendulum tester in the
18 winter because you tested and researched the
19 effect of deicers that you were concerned were
20 making pavement slippery?

21 A. That is correct.

22 Q. And your conclusion was
23 that, if I understood you, deicers could have an
24 effect on measurements on the British pendulum
25 tester?

1 A. Yes. In the case of my
2 testing, I was testing with the pendulum
3 immediately after flooding the surface with the
4 deicing fluid, but not hours or minutes later.

5 Q. Okay, and so that could
6 have an effect. And I understood you to say that
7 British pendulum testing was a methodology that
8 could be used in the winter. Do I have that
9 correct?

10 A. As long as you've got
11 unfrozen water.

12 Q. Right. So, that's the
13 very point I was going to. So, if you have water
14 that is freezing because the pendulum method uses
15 a water film to facilitate the testing -- that's
16 correct?

17 A. That's correct.

18 Q. So, as long as that's not
19 freezing, then you're going to get consistent
20 accurate reads from the British pendulum testing
21 machine. Right?

22 A. Provided you do it all
23 properly, and it's hard to do when it's very cold.

24 Q. Right, because frozen
25 hands?

1 A. Frozen hands.

2 Q. But if you have film
3 that's freezing, then you're going to get
4 inconsistencies in the numbers. That is correct?

5 A. Yes. There would be two
6 ways of doing this. One would be to do it on
7 cores taken from the pavement and taken back to
8 the laboratory, and the other one would be to do
9 it in the field. I would prefer to take the cores
10 back to the laboratory. But I'm not sure that the
11 data taken at zero degrees is going to be
12 equivalent to what you might have got at
13 20 degrees Celsius. I suspect it's similar, but I
14 don't know this for sure.

15 Q. Right. But my question
16 to you, sir, was that if you have got points at
17 which the film is freezing, you're going to get a
18 variable number that reflects the freezing.
19 That's correct?

20 A. Yes, of course.

21 Q. Okay. Thank you. And I
22 just want to go back, if we might, to just one
23 last point. Let's see if I can find it.

24 Registrar and Commissioner and Mr. Rogers, please
25 bear with me for two seconds while I try and find

1 something.

2 Could we please go to the
3 overview document 4, image 97 and 98. There we
4 go. So, you were taken to these briefly before,
5 but you'll agree with me that the numbers are
6 consistently above that threshold number of 30
7 friction?

8 A. The average numbers are
9 indeed above the number.

10 Q. Right. And these numbers
11 by themselves would not cause you any concern in
12 terms of the friction on the Red Hill Valley
13 Parkway. I take it that's true?

14 A. I'm not sure that -- I've
15 probably been asked this before and I've given an
16 answer. Because there's the issue of geometry.

17 Q. Right. You are exactly
18 right and that word sort of hits a whole theme
19 that is going to be front and centre in much of
20 the evidence. I'm going to ask you just to
21 confine your answer to your reading of this
22 friction report.

23 A. We have certainly had
24 many pavements in the Ontario highway system that
25 now normally tangent sections or close to tangent

1 sections with values like this, without issues.

2 Q. So, the numbers by
3 themselves would not cause you concern, would
4 they, sir?

5 A. No, I don't think so.

6 Q. Thank you. Thank you.
7 Those are my questions, Commissioner.

8 A. You're welcome.

9 JUSTICE WILTON-SIEGEL: Okay.
10 Ms. McIvor?

11 MS. MCIVOR: Good afternoon,
12 Commissioner. I'll be quite brief.

13 EXAMINATION BY MS. MCIVOR:

14 Q. Hello, Mr. Rogers. My
15 understanding of your earlier evidence is that in
16 the normal course, and we know there are
17 exceptions, but in the normal course of qualifying
18 for the DSM list, a fresh test section of the
19 aggregate would be laid on an MTO contract using
20 an already approved aggregate. Is that right?

21 A. For comparison purposes.
22 Yes, that is correct.

23 Q. Okay. And when you say
24 "for comparison purposes," that's because this MTO
25 contract aggregate would naturally provide a

1 control strip to compare it with. Correct?

2 A. That is correct.

3 Q. Okay. Now, in the case
4 where, for whatever reason, there's no control
5 strip for the initial evaluation, the initial
6 inclusion on the DSM list, would consideration
7 ever be given to arranging one on a future
8 contract, in your experience?

9 A. Well, we never have
10 encountered this situation, as far as I can
11 remember. But yes, that would be the preferred
12 way of doing it.

13 Q. And if you -- go ahead.

14 A. You do want to establish
15 a control at some point.

16 Q. And so, if you felt that
17 the control data would be useful or necessary in
18 making decisions moving forward, I take it that's
19 something you would consider in those
20 circumstances?

21 A. I'm not quite sure. Can
22 you repeat it for me? What would I not consider?

23 Q. So, you mentioned earlier
24 in answering Mr. Lewis' question that this control
25 data, in some circumstances, is quite helpful for

1 making decisions about, for instance, removing
2 from the DSM list.

3 A. I would say it was
4 critical or crucial.

5 Q. And so it follows that,
6 in making those decisions, that might be an
7 instance where a control strip in the future is
8 arranged for. Is that fair?

9 A. Yes. If I've been there,
10 assuming that we had agreed to put it on the DSM
11 in the first place, we would certainly have asked
12 for a real control strip the next time it was
13 used.

14 Q. And by "the next time it
15 was used," you mean, I assume, used in Ontario on
16 an MTO roadway?

17 A. Yes, in a situation that
18 we controlled. Yes.

19 Q. Okay. Thank you,
20 Mr. Rogers. Those are my questions.

21 A. Thank you.

22 JUSTICE WILTON-SIEGEL: Okay.
23 Mr. Lewis?

24 MR. LEWIS: Thank you.

25 FURTHER EXAMINATION BY MR. LEWIS:

1 Q. Mr. Rogers, when
2 Ms. Jennifer Roberts was asking you questions
3 regarding the British pendulum testing, you agreed
4 with her that if there are points at which the
5 water film is freezing, that you're going to get
6 variable numbers that reflect that freezing. Do
7 you recall that?

8 A. You would expect that,
9 but I would also say it would very rarely occur
10 because you're flooding the surface with unfrozen
11 water. You would have to have a very cold
12 environment to get freezing in the time it takes
13 between applying the water and dropping the
14 pendulum.

15 Q. Okay. And at night in
16 the winter, are the pavement temperatures the same
17 as the air temperature?

18 A. It depends entirely on
19 the climatic situation.

20 Q. Right. What the weather
21 was that day, presumably?

22 A. Yes. So, if the sun was
23 out in the late afternoon, then you'll see that
24 the pavement temperature is going to be warmer
25 than the air temperature, for a time, until the

1 pavement starts to freeze over.

2 Q. Okay. All right. Thank
3 you very much.

4 A. You're welcome.

5 Q. I have no further
6 questions.

7 JUSTICE WILTON-SIEGEL: All
8 right. So, Mr. Lewis, I take it that ends the
9 evidence for today?

10 MR. LEWIS: It does.

11 JUSTICE WILTON-SIEGEL: Okay.

12 Well, first of all, Mr. Rogers, thank you very
13 much for appearance before the inquiry. You're
14 excused if you want to leave.

15 THE WITNESS: Thank you, sir.

16 JUSTICE WILTON-SIEGEL: For
17 the rest, tomorrow is not a sitting day on the
18 schedule, so we'll stand adjourned until Tuesday,
19 this being the long weekend. Let me take the
20 opportunity to wish everyone a good Victoria Day
21 weekend and we'll stand adjourned, as I say, until
22 Tuesday morning at 9:30. Thank you.

23 --- Whereupon the proceedings adjourned at
24 3:15 p.m. until Tuesday, May 24, 2022 at 9:30
25 a.m.